JAERI-Data/Code
98-009

THERMLIB: A MATERIAL PROPERTY DATA LIBRARY FOR THERMAL ANALYSIS OF RADIOACTIVE MATERIAL TRANSPORT CASKS

March 1998

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編集兼発行　日本原子力研究所
印　　刷　いばらき印刷㈱

JAERI-Data/Code 98-009

THERMLIB: A Material Property Data Library for Thermal Analysis of Radioactive Material Transport Casks

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(Received January 30, 1998)

The paper describes an heat conduction data library and graphical program for analysis of radioactive material transport casks. More than 1000 of material data are compiled in the data library which was produced by Lawrence Livermore Laboratory. Thermal data such as, density, thermal conductivity, specific heat, phase-change or solid-state, transition temperature and latent heat have been tabulated. Using this data library, a data library processing program THERMLIB for thermal analysis has been developed.

Main features of THERMLIB are as follows:

(1) data have been tabulated against temperature,

(2) more than 1000 material data are available,

(3) it is capable of graphical representations for thermal data and

(4) not only main frame computer but also work stations (OS UNIX) and personal computer (OS Windows) are available for use of THERMLIB.

In the paper, brief illustration of data library is presented in the first section. The second section presents descriptions of structural data. The third section provides an user's guide for computer program and input data for THERMLIB.

Keywords: Computer Program, Data library, Thermal Data, Heat Conduction Data, Heat Conduction Analysis, Heat Transfer Analysis, Transport Cask, Cask

JAERI-Data/Code 98-009

THERMLIB：放射性物質輸送容器の熱解析用 材料物性データライブラリー

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幾島　毅

（１９９８年１月３０日受理）

本報告書は放射性物質輸送容器の通常時および火災時の温度分布解析に必要な材料の熱特性データ、およびその図形処理プログラム THERMLIB についてまとめたものである。データライブラリーはローレンスリバモア国立研究所において作成されたものである。材料データライブラリーには約1000種類の材料データが含まれている。材料データの種類は比量、熱伝導率、比熱および溶融・凝固温度とその潜熱である。このデータライブラリーを用い、熱解析のためにデータプロセッシングプログラム THERMLIB を開発した。

THERMLIB の主要な特徴は次の通りである。

（１）熱伝導率と比熱は温度の関数として与えられている。

（２）約1000種類のデータが集められている。

（３）データは図表で表示できる。

（４）大型計算機以外にもワークステーション(OS　UNIX)およびパーソナルコンピュータ(OS Windows 3.1)によっても使用できる。

本報告書はデータライブラリーの説明、THERMLIB プログラムおよび入力データ等のユーザーガイドについて記述したものである。

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1 . Introduction

In the thermal analysis for radioactive transport casks, it has become possible to perform them in detail by computer programs, such as TRUMP3[1], HEATING5[2], HEATING6[3], NASTRAN[4], ABAQUS[5], TOPAZ2D[6] and TOPAZ3D[7]. Availability of these computer programs, makes it possible to accurately solve large numbers of problems involving a wide variety of material data provided that accurate input data are used. The thermal properties of the materials, including density, thermal conductivity (temperature dependent data), specific heat (temperature dependent data), phase change or solid-state transition temperature and latent heat should be known as accurately as possible. Some of these properties are difficult to measure. In paticular, heat conduction may vary from data to data depending on test methods. Therefore, when they are used in calculations, the possible in accuracy of variability of thermal data should be accounted for to properly interpret the results. For this reason, Lawrence Livermore National Laboratory (LLNL) has made an effort to collect thermal data and makes it available in a form convenient for handling by computer. More than 1000 material data[8] have been compiled,.

Using this data library, a data library processing program THERMLIB[9],[10] for thermal analysis has been developed. The THERMLIB is one computer program of CASKET[11]~[16] code system for thermal and structural analysis of radioactive material transport and/or strage casks as shown in Fig. 1.1.

Main features of the computer program THERMLIB are as follows;

(1) data have been tabulated against temperature,

(2) more than 1000 material data are available,

(3) it is capable of graphical representations for structural data and

(4) not only main frame computers but also work stations (OS UNIX) and personal computers (OS Windows 3.1) are available for use of THERMLIB.

In the paper, brief illustration of data library is presented in the first section. The second section presents descriptions of structural data. The third section provides an user's guide for THERMLIB.

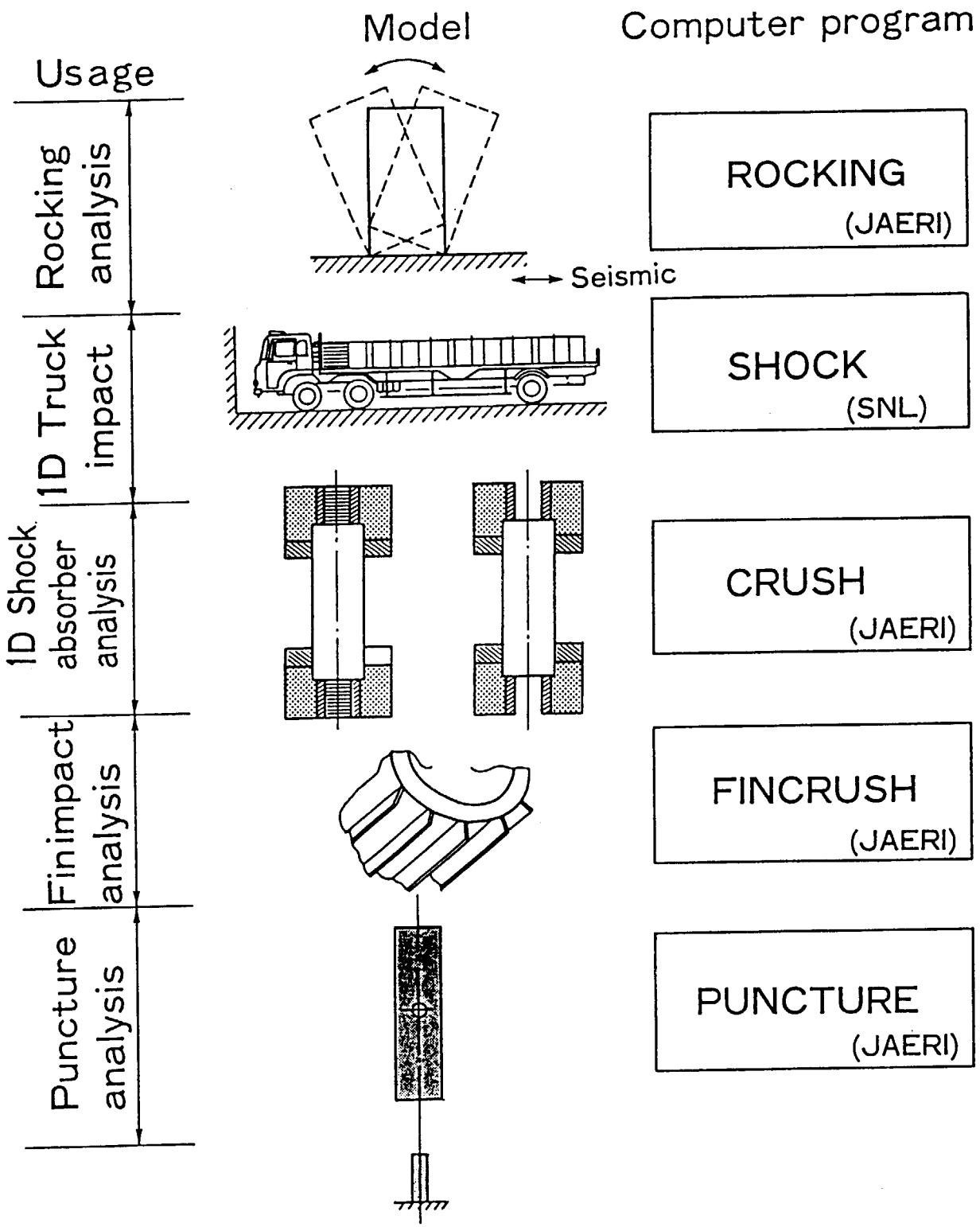

Fig. 1.1 Simplified analysis computer programs

2. Description of Material Property Data

The material property data are necessitated for thermal analysis of casks using the computer programs such as TRUMP3, HEATING5, HEATING6, NASTRAN, ABAQUS, TOPAZ and so on. Therfore, a computer program THERMLIB including a material property data library and data processing has been developed. More than 1000 material data have been compiled and are summerized by LLNL.

The thermal property data including density, specific heat (temperature dependent data), thermal concutivity (temperature dependent data), phase change or solid-state transition temperature and latent heat have been compiled. These data have been collected from over 50 references.

The data have been arranged in computer card image and stored in magnetic disks (hard or floppy disks) in a format suitable for computer processing, with the material identified numerically according to a general and flexible classification system. An accompanying numerical index, also in a card image form, describes each material, assigns it an identification number, references the sources of the data by a code number. The CGS-cal-℃(centimeter, gram, second-calorie-degree C) unit system is used for all data. In addition the data are obtained from a source list. The THERMLIB has been written to search the material data list for a specific material identification number.

3. Material Property Data Library

(1) Material property data

The computer program THERMLIB has been developed for searching data and plotting data from the data library compiling by LLNL. Thermal property data for over 1000 materials have been compiled and are summerized in the data library. The compilation includes:

(a) a numbered list of data sources,

(b) a numerical classification system used as a guide in assigning an identification number,

(c) a system of quality indicators used to show the gerneral reliability or accuracy of data,

(d) thermal property data for each material collected and estimated by LLNL and converted to a standard unit system,

(e) an alphabetical index of materials that includes the identification number assigned to each material and

(f) a list of material property data arranged in order of the material identification numbers and in the format used for input data in the computer program TRUMP.

These material property data incude the material identification number and alphanumeric designator, density, specific heat, thermal conductivity, phase-change or transition temparature, the latent heat effect, and tables of specific heat and thermal conductivity versus temperature.

(2) Data source

The sources for most of the included data in the compilation and several other general sources are listed in abbreviated form in Table 3.1. The numbers of the first column are used in the alphabetical material index to cross-reference the sources. Asterisks indicate the data sources actually used for this compilation.

(3) Material classification system

The material classification system tabulated in Table 3.2 is used to assign identification numbers to the materials included in the data library.

(4) Quality indicator system

The numerical quality indicators as shown in data sheet columns 73-79 in Table 3.3 may be interpreted approximately as follows:

(a) Quality type 0 (or Blank):

Data was good or no statement was made in data source restricting its accuracy. No conflicting data was found in any other data sources.

(b) Quality type 1:

Good data, but specific heat or thermal conductivity was reported only for a limited temperature range.

(c) Quality type 2:

Either the accuracy of the data was poor or values reported by different sources disagreed.

(d) Quality type 3:

No data could be found in literature; the LLNL author made an estimate based on theoretical or empirical grounds, or on data for similar materials.

(e) Quality type 4:

No data could be found in literature; and no accurate estimate could be made. The data, therefore, is consided to be a rough estimate based, in most cases, on data for similar materials.

(f) Quality type 5:

No data could be found in literature; and no accurate estimate could be made. A minimum requirement for inclusion of a material in the alphabetical index and material data list is the availability of at least estimated constant values of density, specific heat and thermal conductivity.

(5) Material index

Table 3.3 is an alphabetical index of material descriptions that are available on a computer data set.

(6) Material data list

Table 3.4 lists the material data set format. The material data by material identification number is listed in Appendix F.

Table 3.1 Material properties references

Ref. No.		Authors	Titles	Published
1	*	PERRY J H	CHEMICAL ENGINEERS HANDBOOK 4TH ED	1963
2	*	MCADAMS W H	HEAT TRANSMISSION 3RD ED	1954
3	*		LIQUID METALS HANDBOOK 2ND ED	1952
4	*	MARKS L S	MECHANICAL ENGINEERS HANDBOOK 5TH ED	1951
5	*	FLEMING P	PRIVATE COLLECTION OF PLASTICS DATA	1968
6	*		MATERIALS ENGR MATL SELECTOR ISSUE	1967
7		PFEIFER H	PRIVATE COLLECTION OF MATERIALS DATA	1968
8	*	JAMES E	PROPERTIES OF CHEMICAL EXPLOSIVES UCRL 14592	1965
9			ASRE DATA BOOK	
10			AIRPLANE AIR CONDITIONING ENGR DATA	1952
11			INTERNATIONAL CRITICAL TABLES	1926
12		JOHNSON A I	THERMAL CONDUCTIVITY CHART FOR GASES	1954
13		HILSENRATH J	TABLES OF THERMAL PROPERTIES OF GASES NBS 564	1955
14	*	TIPTON C R JR	THE REACTOR HANDBOOK 2ND ED VOL 1	1960
15		KUONG J F	THERMAL PROPERTIES OF LIQUIDS	1963
16			THE REACTOR HANDBOOK VOL 3 ENGINEERING	1963
17			ENGLISH TRANSL OF HANDBUCH DER PHYSIC	1962
18		HOYT S L	METAL DATA	1952
19		AVDUYEVSKIY V S	FUNDLS OF HEAT TRANSFER IN AV AND RKT ENGR	1962
20	*	TOULOUKIAN Y S	THERMOPHYSICAL PROP OF HIGH TEMP SOLID MATLS	1967
21			PRELIM REPT ON THE PROP OF LI BE MG AL NBS6297	1959
22			TH PROP OF SELD LIGHT ELEMENT CPDS NBS7437	1962
23		KOWALCZYK L S	THERMAL COND AND ITS VARN WITH T AND P	1955
24		JOHNSON V J	A COMPDM OF PROP OF MATL AT LOW TEMP NBS	1960
25			JANAF THERMOCHEMICAL TABLES	
26		KELLEY K K	ENTROPIES OE ELEMENTS AND INORG CPDS BM592	1961
27	*	WEAST R C	HANDBOOK OF CHEMISTRY AND PHYSICS 47TH ED	1966
28	*	JESTER M	PRIVATE COLLECTION OF LIQUID METAL PROPERTIES	1968
29	*	WICKS C E	THERMODYN PROP OF 65 ELEMENTS BU MINES 605	1963
30	*	PETERS R L	MATERIALS DATA NOMOGRAPHS	1965
31	*	THOMPSON B	ENERGY CONTENT VS TEMP FOR D-PU A-PU AND U	

Table 3.1 (Continued)

Ref. No.		Authors	Titles	Published
32	*	KELLEY K K	ENTHALPY PLOTS DWG K38745 BU MINES 584	1960
33	*	KELLEY K K	BU MINES 371	1939
34	*	LABER D	BMI FINAL REPT ON SANL TASKS 309/032A 401/027	1967
35	*		Y-12 DATA SHEETS	
36	*	SCHAUER D	WEAPONS MATL DATA BOOK	
37	*	SCHORSCH R H	ENGINEERING PROPERTIES OF SELECTED MATLS	1966
38	*		MODERN PLASTICS ENCYCLOPEDIA	1968
39	*		HANDBOOK OF MOLDED AND EXTR RUBBER GOODYEAR	
40	*		MACHINE DESIGN REFERENCE ISSUE PLASTICS	1964
41	*		METALS HANDBOOK 8TH ED	1961
42	*	STULL D R	THERMODYNAMIC PROPERTIES OF THE ELEMENTS ACS	1956
43	*	HAMPEL C A	RARE METALS HANDBOOK 2ND ED	1961
44	*	MOYER J	PRIVATE COLLECTION OF THERMAL DATA	1968
45	*	HODGE A W	PROP OF HIGH TEMP TI ALLOYS DMIC MEMO 230	1968
46	*	CARSLAW H JAEGER J	CONDUCTION OF HEAT IN SOLIDS 2ND ED OXFORD	1959
47	*	SMITHELLS C J	METALS REFERENCE BOOK 4TH ED VOL 3	1967
48	*	LYNCH J F RUDERER	ENGR PROP OF SEL CERAM MATLS BMI AM CER SOC	1966
49	*		PROP OF KENNAMETAL HARD CARBIDE ALLOYS	1963
50	*		PROP HANDBOOK CARBOLOY ETC GE MET PROD	1958
51	*	CLARK S P JR	HANDBOOK OF PHYSICAL CONSTANTS GEOL SOC AMER	1966
52	*	STEPHENS D R MAIMO	THE THERMAL COND OF ROCK SALT UCRL 6894-II	1964
53	*	SEDDON B J	PHYS PROP OF PU CERAMIC CPDS TRG1601	1968
54	*	STORMS E K	THE REFRACTORY CARBIDES	1967

Table 3.2 Material classification system

Material ID No.	Material classifications
1000	ELEMENTS
1001-1499	SOLIDS, LIQUIDS
1501-1599	GASES
1601-1999	NOT USED
2000	ALLOYS
2001-2099	ALUMINUM ALLOYS
2101-2399	COPPER ALLOYS
2401-2499	MAGNESIUM ALLOYS
2501-2599	NICKEL ALLOYS
2601-2699	COBALT ALLOYS
2701-2799	TITANIUM ALLOYS
2801-2999	NOT USED
3000	ALLOYS (CONTINUED)
3001-3099	IRON ALLOYS
3101-3299	STEELS
3301-3499	SUPER ALLOYS (CR-NI-FE)
3501-3599	BERYLLIUM ALLOYS
3601-3649	LEAD, TIN, AND INDIUM ALLOYS
3651-3679	MOLYBDENUM ALLOYS
3681-3699	NIOBIUM (COLUMBIUM) ALLOYS
3701-3749	PLUTONIUM ALLOYS
3751-3779	SILVER ALLOYS
3781-3799	TANTALUM ALLOYS
3801-3829	TUNGSTEN ALLOYS
3831-3859	URANIUM ALLOYS
3861-3879	ZINC ALLOYS
3881-3899	ZIRCONIUM ALLOYS
3901-3999	MISCELLANEOUS ALLOYS
4000	INORGANIC COMPOUNDS
4001-4199	OXIDES (SINGLE)
4201-4299	OXIDES (MIXED)
4301-4399	SILICATES
4401-4499	NITRIDES
4501-4599	CARBIDES
4601-4699	BORIDES
4701-4739	BERYLLIDES

Table 3.2 (Continued)

Material ID No.	Materials
4741-4759	SULFIDES
4761-4769	PHOSPHIDES
4771-4799	SILICIDES
4801-4899	HALIDES
4901-4949	INTERMETALLICS, METALLOIDS
4951-4999	MISCELLANEOUS COMPOUNDS
5000	INORGANIC MIXTURES
5001-5199	GLASSES
5201-5299	CERAMICS, BRICKS
5301-5399	NOT USED
5401-5499	CERMETS
5501-5799	GAS MIXTURES
5801-5999	NOT USED
6000	INORGANIC COMPOSITES
6001-6099	ROCKS, MINERALS, SANDS, SOILS
6101-6999	NOT USED
7000	ORGANIC COMPOUNDS AND MIXTURES
7001-7499	POLYMERS (INCLUDING FOAMS)
7501-7599	HIGH EXPLOSIVES (INCLUDING MOCK H. E.)
7601-7699	NOT USED
8000	ORGANIC COMPOSITES AND NATURAL MATERIALS
8001-8499	MISCELLANEOUS
8501-8599	WOODS
8601-8999	NOT USED
9000	MISCELLANEOUS
9001-9099	IDEALIZED MATERIALS
9101-9999	NOT USED

Table 3.3 Material index

Abbr.	No.	Material	References	Quality	DCKTHCK
ABSR1	7001	ABS RESIN (LOW K)	6		25555
ABSR2	7002	ABS RESIN (HIGH K)	6		25555
ACDEL	7006	ACETYL (DELRIN)	6, 38		2555
ACRLP	7011	ACRYLIC (LUCITE, PLEXIGLASS)	6, 20, 38		22555
ACRLH	7012	ACRYLIC (HIGH K)	6, 38		22555
AC	1426	ACTINIUM	20, 27, 42		340035
AIR	5501	AIR	1, 2, 46		0
ALKIS	7016	ALKYD ISOCYANATE FOAM (DENSITY 0.16)	20		2525
ALLY1	7021	ALLYL, CAST RESINS (HIGH HEAT CAPACITY)	6, 38		2200555
ALLY2	7022	ALLYL, CAST RESINS (LOW HEAT CAPACITY)	6, 38		2200555
KALUM	4972	ALUM (K2SO4.AL2(SO4)3.24H20) (CRYSTAL)	1, 27		550
BRALF	5212	ALUMINA BRICK, FUSED (AL203 96) (22 P)	1, 20, 47		2330
BRAL1	5214	ALUMINA BRICK, HIGH (AL203 53) (20 P)	47		322335
BRAL2	5215	ALUMINA BRICK, HIGH (AL203 83) (28 P)	47		322335
BRAL3	5216	ALUMINA BRICK, HIGH (AL203 87) (22 P)	20		303330
PORAL	5281	ALUMINA PORCELAIN, HIGH	20		3005500
AL	1001	ALUMINUM	20, 1, 32, 34, 27, 37, 42,		2
AL	1001	ALUMINUM	+14, 47, 51		2
ALLIQ	1002	ALUMINUM (LIQUID)	2, 42, 47, 14, 51		0
ALAL5	2011	ALUMINUM ALLOY (AL84.0, AVERAGE TRTMT)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL7	2013	ALUMINUM ALLOY (AL84.0, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL4	2010	ALUMINUM ALLOY (AL84.0, WROT OR ANNLD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL6	2012	ALUMINUM ALLOY (AL90.0, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL3	2009	ALUMINUM ALLOY (AL92.0, WROT OR ANNLD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL4	2010	ALUMINUM ALLOY (AL93.0, AVERAGE TRTMT)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL5	2011	ALUMINUM ALLOY (AL94.0, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL3	2009	ALUMINUM ALLOY (AL96.0, AVERAGE TRTMT)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL2	2008	ALUMINUM ALLOY (AL96.0, WROT OR ANNLD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL4	2010	ALUMINUM ALLOY (AL96.5, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL2	2008	ALUMINUM ALLOY (AL98.0, AVERAGE TRTMT)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL3	2009	ALUMINUM ALLOY (AL98.5, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL1	2007	ALUMINUM ALLOY (AL99.0, AVERAGE TRTMT)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL1	2007	ALUMINUM ALLOY (AL99.0, WROT OR ANNLD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL2	2008	ALUMINUM ALLOY (AL99.2, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
ALAL1	2007	ALUMINUM ALLOY (AL99.8, CAST OR TEMPD)	1, 6, 14, 20, 37, 41, 47		2022212
A202A	2006	ALUMINUM ALLOY 2024-5-T4 (ANNEALED)	20, 41		300

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
A707A	2002	ALUMINUM ALLOY 7075-T6 (ANNEALED)	20, 41		300
A7075	2001	ALUMINUM ALLOY 7075-T6 (AS RECEIVED)	20, 41		300
A7079	2004	ALUMINUM ALLOY 7079	37, 41		305
ALAMG	2003	ALUMINUM ALLOYS (AL, MG 2.5-5.0)	1, 41		2002
A2024	2005	ALUMINUM ALLOYS 2024-T4 AND 24S-24 (AR)	20, 41		300
TOPAZ	4301	ALUMINUM FLUOSILICATE (TOPAZ) (A-AXIS)	27, 51		305550
TOPAC	4302	ALUMINUM FLUOSILICATE (TOPAZ) (C-AXIS)	27, 51		305551
ALN	4412	ALUMINUM NITRIDE (ALN) (PRS AXIS, 98 D)	20, 27, 47, 48		2500
ALOXF	4018	ALUMINUM OXIDE (AL203) (FOAM, D = 0.5)	1, 20, 27, 32, 47, 48, 51		202
ALOXL	4019	ALUMINUM OXIDE (AL203) (FOAM, D = 1.9)	1, 20, 27, 32, 47, 48, 51		200
ALOXD	4012	ALUMINUM OXIDE (AL203) (POLYXTAL 100 D)	1, 20, 27, 32, 47, 48, 51		200
ALOXP	4014	ALUMINUM OXIDE (AL203) (POLYXTAL, 55 D)	1, 20, 27, 32, 47, 48, 51		200
ALOXS	4016	ALUMINUM OXIDE (AL203) (SINGLE XTAL)	1, 20, 27, 32, 47, 48, 51		202
ALCR1	5412	ALUMINUM OXIDE + CR (AL203 23, CR 77)	20, 48		302530
ALCR2	5413	ALUMINUM OXIDE + CR (AL203 70, CR 30)	20, 48		302535
ANDAL	4312	ALUMINUM SILICATE (AL203.SIO2) (ORTHO)	20, 27, 47, 51		20505
KYAN	4314	ALUMINUM SILICATE (AL203.SIO2) (TRICL)	20, 27, 47, 51		500
MULL	4316	ALUMINUM SILICATE (3AL203.2SIO2) (100D)	20, 27, 47, 48, 51		500
AM	1430	AMERICIUM	20, 27		342555
NH3	4881	AMMONIA (NH3) (GAS)	1, 27, 47		0
NH3LQ	4880	AMMONIA (NH3) (LIQUID UNDER PRESSURE)	1, 27, 47		500
NH4BR	4812	AMMONIUM BROMIDE (NH4BR) (PRSD 8 KB)	27, 47		300530
NH4CL	4814	AMMONIUM CHLORIDE (NH4CL) (PRSD 8 KB)	27, 47		10
ANALC	4329	ANALCITE (NA2O.AL203.4SIO2.4H2O) (XTAL)	27, 51		305555
ANDAL	4312	ANDALUSITE (AL203.SIO2) (ORTHO XTAL)	20, 27, 51		20505
SB	1006	ANTIMONY	20, 1, 32, 42, 27		0
SBLIQ	1007	ANTIMONY (LIQUID)	1, 47, 42, 27, 20, 14		0
SBTEC	4913	ANTIMONY TELLURIDE (SB2TE3) (CPR, N DR)	20, 27		300555
SBTEP	4912	ANTIMONY TELLURIDE (SB2TE3) (POLYXTAL)	20, 27		300555
ARGAS	1501	ARGON (GAS)	27, 2, 42, 41		0
AS	1008	ARSENIC, GREY	1, 27, 41, 42		40005
ASTEX	4914	ARSENIC TELLURIDE (AS2TE3) (V ZONE MLT)	20		3305555
ART1	9001	ARTIFICAL MATERIAL 1 (D=C=K=0)			0
ART2	9002	ARTIFICAL MATERIAL 2 (D=C=0, K=10**9)			0
ART3	9003	ARTIFICAL MATERIAL 3 (D=C=K=1)			0
ART4	9004	ARTIFICAL MATERIAL 4 (D=C=1, K=10**9)			0

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
ART5	9005	ARTIFICAL MATERIAL 5 (D=1, C=K=10**9)			0
ART6	9006	ARTIFICAL MATERIAL 6 (D=C=K=TM=HM=1)			0
ART7	9007	ARTIFICAL MATERIAL 7 (DCKTM=1, HM=10**9)			0
AT	1437	ASTITINE	42		3343335
BRTOL	7501	BARATOL H.E. (TNT 26, BA NITRATE 76)	8		555
BA	1241	BARIUM	20, 27, 29, 42, 43		40005
BAB6	4612	BARIUM BORIDE (BAB6)	27, 48		300555
BAF2	4816	BARIUM FLUORIDE (BAF2) (SINGLE CRYSTAL)	20, 27, 51		300230
BANO3	4952	BARIUM NITRATE (BA(NO3)2) (PRSD 8 K8)	1, 27		300050
BASO4	4954	BARIUM SULFATE (BASO4) (CRYSTAL)	27, 51		300550
BATIS	4213	BARIUM TITANATE (BAO.TIO2) (SINTERED)	20, 27, 48		500
BATIT	4212	BARIUM TITANATE (BAO.TIO2) (100 D)	20, 27, 48		500
BATIM	4214	BARIUM TITANATE (BAO.TIO2) (+MN, NB OX)	20, 27, 48		500
BK	1440	BERKELIUM	27		4445555
BERYL	4318	BERYL (3BEO.AL2O3.6SIO2)	20, 27, 51		320502
BE	1011	BERYLLIUM	20, 6, 1, 32, 34, 27, 36, 42		22
BEBEO	5420	BERYLLIUM + BEO (BE, BEO 0.6-1.7)	20		3300
BE96A	3501	BERYLLIUM ALLOY (BE96.5) (AS RECEIVED)	20		303331
BE96H	3502	BERYLLIUM ALLOY (BE96.5) (ANNEALED)	20		303331
BE98A	3503	BERYLLIUM ALLOY (BE98.5) (AS RECEIVED)	20		303331
BE98H	3504	BERYLLIUM ALLOY (BE98.5) (ANNEALED)	20		303331
BE995	3505	BERYLLIUM ALLOY (BE99.5)	20		3033313
BERYL	4318	BERYLLIUM ALUMINOSILICATE (BERYL)	20, 27, 51		320502
BE2C	4512	BERYLLIUM CARBIDE (BE2C) (HP OR SNT)	14, 20, 28, 47		2220022
CUBER	2181	BERYLLIUM COPPER (CU BAL, BE 0.38-0.55)	1		331
CUBEH	2182	BERYLLIUM COPPER (CU BAL, BE1.7-1.9)	1, 6, 41		2335
BE3N2	4414	BERYLLIUM NITRIDE (BE3N2) (PRSD 3.4 KB)	20, 47		5
BEOXP	4024	BERYLLIUM OXIDE (BEO) (76 PC DENS)	14, 20, 27, 36, 43, 44,		0
BEOXP	4024	BERYLLIUM OXIDE (BEO) (76 PC DENS)	+47, 48, 51		0
BEO	4022	BERYLLIUM OXIDE (BEO) (96 PC DENS)	14, 20, 27, 36, 43, 44,		0
BEO	4022	BERYLLIUM OXIDE (BEO) (96 PC DENS)	+47, 48, 51		0
BEOBE	5414	BERYLLIUM OXIDE + BE (BEO, BE 3-12)	20		5500
BEOMO	5416	BERYLLIUM OXIDE + BE + MO (BE 7, MO 7)	20		5501
BEOSI	5418	BERYLLIUM OXIDE + BE + SI	20		305530
PORBE	5280	BERYLLIUM OXIDE PORCELAIN 4811	20		305530
BSPOD	4320	BETA-SPODUMENE (LI2O.AL2O3.4SIO2) (TET)	20, 27, 51		305550

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
BI	1016	BISMUTH	2, 1, 27, 43, 41, 42, 47		0
BILIQ	1017	BISMUTH (LIQUID)	1, 14, 27, 43, 47		0
BITEP	4916	BISMUTH TELLURIDE (BI2TE3-P) (PLANE DR)	20, 47		220522
BITES	4918	BISMUTH TELLURIDE SULFIDE (BI2TE2S)	20		3305550
ZRB2Z	5498	BORIDE Z CERMET (ZRB2 81-87, MOSI2 13)	47, 48		2000500
ZRB2B	5496	BOROLITE 101 CERMET (ZRB2 93-96, B 4-7)	47, 48		505
BORON	1266	BORON	20, 27, 30, 42, 43, 48		20205
B4C-D	4514	BORON CARBIDE (B4C) (DENSE)	20, 27, 48		2002500
B4C-P	4515	BORON CARBIDE (B4C) (POROUS)	20, 27, 48		2002500
BN	4416	BORON NITRIDE (BN) (PERP PR AXIS, 95 D)	20, 27, 36, 47, 48		500
BNPPA	4418	BORON NITRIDE (BN) (PRS AXIS, 94 D)	20, 27, 36, 47, 48		500
BNAC	4424	BORON NITRIDE (BN 80, C 20) (PRS AXIS)	20		5500
BNOX2	4420	BORON NITRIDE (BN 97, BN203 2) (PERP P)	20		5500
BNOXP	4422	BORON NITRIDE (BN 97, BN203 2) (PRS AX)	20		5500
SIB4	4614	BORON SILICIDE (B4SI)	27, 48		300530
BRALM	2101	BRASS, ALUMINUM (CU76, ZN22, AL2)	1		555
BRCAR	2105	BRASS, CARTRIDGE (CU70, ZN30)	1, 2, 20, 41, 46		500
BRPBL	2111	BRASS, LEADED	6, 41		3555
BRMUM	2116	BRASS, MUNTZ METAL	1, 41		5555
BRRDC	2121	BRASS, RED, CAST (CU85, ZN5, PB5, SN3)	1, 41		3555
BRRDW	2122	BRASS, RED, WROUGHT (CU85, ZN15)	1, 41		20555
BRTIN	2126	BRASS, TIN (NAVAL AND ADMIRALTY)	1, 2, 41		2555
BRYEL	2131	BRASS, YELLOW (CU65, ZN35)	1, 6, 41		555
BRICR	5232	BRICK, CHROME (CR203 32)	1, 27, 41		5530
BRCRM	5234	BRICK, CHROME MAGNESITE (SEE REF 47)	20, 47		330
DIATA	5246	BRICK, DIATOMACEOUS EARTH (ACCR STRATA)	4		305530
DIATH	5249	BRICK, DIATOMACEOUS EARTH (HIGH BURN)	4		305530
DIATM	5248	BRICK, DIATOMACEOUS EARTH (MOLDED, FRD)	4		305530
DIATP	5247	BRICK, DIATOMACEOUS EARTH (PRLL STRATA)	4		305530
DIATT	5251	BRICK, DIATOMACEOUS EARTH (USE TO 1100)	4		305530
DIATL	5250	BRICK, DIATOMACEOUS EARTH (USE TO 850C)	4		305530
BRIEF	5256	BRICK, EGYPTIAN FIRE (SIO2 64-71)	20		2323532
BRICF	5224	BRICK, FIRED CARBON	1, 20, 27, 42, 47		5505
BRIFR	5262	BRICK, FORSTERITE (MGO 58 SIO2 38)(20P)	20, 47		335
BRALF	5212	BRICK, FUSED ALUMINA (AL203 96) (22 P)	1, 20, 47		2330
BRISI	5294	BRICK, HARD FIRED SILICA (SIO2 94-95)	20		330

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
BRAL1	5214	BRICK, HIGH ALUMINA (AL203 53) (20 P)	47		322335
BRAL2	5215	BRICK, HIGH ALUMINA (AL203 83) (28 P)	47		322335
BRAL3	5216	BRICK, HIGH ALUMINA (AL203 87) (22 P)	20		303330
BRIKB	5265	BRICK, KAOLIN INSULATING (D = 0.30)	1, 20		5510
BRIKA	5264	BRICK, KAOLIN INSULATING (D = 0.43)	1, 20		5510
MAGNP	5267	BRICK, MAGNESITE (MGO 87)	1, 20, 27, 47, 48		330
MAGNA	5268	BRICK, MAGNESITE A (MGO 90) (14.5 P)	1, 20, 27, 47, 48		330
MAGNB	5269	BRICK, MAGNESITE B 93) (22.6 P)	1, 20, 27, 47, 48		330
MAGNC	5270	BRICK, MAGNESITE C 86) (17.8 P)	1, 20, 27, 47, 48		330
MAGNS	5266	BRICK, MAGNESITE SPALL RES (MGO 89)	1, 20, 27, 47, 48		335
BRIMM	5218	BRICK, MASONRY, MEDIUM	1, 2, 27, 46		2025535
BRIFM	5259	BRICK, MISSOURI FIRECLAY	1, 47		3300530
BRIFN	5258	BRICK, NORMAL FIRECLAY (22 P)	47		535
BRISL	5296	BRICK, SILICEOUS (SIO2 89 AL203 9)(25P)	47		335
BRIFS	5260	BRICK, SILICEOUS FIRECLAY (23 P)	47		535
BRISK	5298	BRICK, SILLIMANITE (22 PC POROSITY)	20		300530
BRIDS	5254	BRICK, STABILIZED DOLOMITE (22 P)	1, 47		530
VERMI	4986	BRICK, VERMICULITE	20		305550
BRGAS	1546	BROMINE (GAS)	27, 1, 42		0
BRONZ	2141	BRONZE (CU75, SN25)	1, 2		305555
BROAL	2146	BRONZE, ALUMINUM (CU92, AL8)	1, 6, 41		2000555
BROAR	2151	BRONZE, ARCHITECTURAL	1, 41		2300555
BROCM	2156	BRONZE, COMMERCIAL	1, 2, 38, 41		555
BROMN	2161	BRONZE, MANGANESE	1, 41		555
BROPH	2166	BRONZE, PHOSPHER 10 PERCENT	1, 41		5555
BROPL	2168	BRONZE, PHOSPHER 1.25 PERCENT	6, 41		555
BROPM	2167	BRONZE, PHOSPHER 5 PERCENT	6, 41		555
BRSIH	2171	BRONZE, SILICON, HIGH	1, 6, 41		550
BRSIL	2172	BRONZE, SILICON, LOW	1, 6, 41		555
BRSNH	2176	BRONZE, TIN (CAST), HIGH LEADED	6, 41		23555
BRSNL	2177	BRONZE, TIN (CAST), LEADED	6		3555
BUACR	7026	BUTADIENE-ACRYLONITRILE RUBBER + C	20		5555
BUTYR	7031	BUTYL RUBBER	6, 39		555
CD	1041	CADMIUM	2, 1, 32, 42, 43, 27, 41, 47		0
CDLIQ	1042	CADMIUM (LIQUID)	2, 1, 32, 42, 43, 27, 41, 47		0
CACCP	4957	CALCITE (CACO3) (CRYSTAL) (C AXIS)	1, 27, 51		0

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
CACCS	4958	CALCITE (CACO3) (CRYSTAL) (A AXIS)	1, 27, 51		0
CA	1306	CALCIUM	27, 1, 42, 43, 41		5
CAB6	4616	CALCIUM BORIDE (CAB6)	27, 48		300555
CACCP	4957	CALCIUM CARBONATE (CACO3) (CALCITE) (C)	1, 27, 51		0
CACCS	4958	CALCIUM CARBONATE (CACO3) (CALCITE) (A)	1, 27, 51		0
CACON	4956	CALCIUM CARBONATE (CACO3) (NATURAL)	1, 27, 51		5
CAF2A	4820	CALCIUM FLUORIDE (CAF2) (MINERAL AGGR)	1, 20, 27, 47, 51		205
CAF2	4818	CALCIUM FLUORIDE (CAF2) (SINGLE XTAL)	1, 20, 27, 47, 51		200
DOLOM	4960	CALCIUM MAGNESIUM CARBONATE (CAMGC206)	1, 27, 51		20515
CAO	4026	CALCIUM OXIDE (CAO) (PRESSED, 91 DENS)	1, 20, 27, 47, 48, 51		200
CAOPP	4028	CALCIUM OXIDE (CAO) (PACKED PWD, 50 D)	1, 20, 27, 47, 48		200
GYPSM	4962	CALCIUM SULFATE DIHYDRATE (CASO4. 4H2O)	1, 27, 51		555
CATIT	4216	CALCIUM TITANATE (CAO. TIO2)	20, 27, 48, 51		500
CF	1443	CALIFORNIUM			4445555
CAMOR	1071	CARBON, AMORPHOUS (CARBON STOCK)	27, 1		22
CGEM1	1061	CARBON, DIAMOND GEM QUALITY TYPE 1	1, 20, 27		500
CGRAF	1066	CARBON, GRAPHITE (TYPICAL K)	1, 2, 20, 27, 32, 42, 51		2000002
BRICF	5224	CARBON BRICK, FIRED	1, 20, 27, 42, 47		5505
CO2	4027	CARBON DIOXIDE	1, 2, 27		0
COGAS	4029	CARBON MONOXIDE	1, 27		300030
CELA2	7037	CELLULOSE ACETATE (HIGH K)	6, 38		20555
CELA1	7036	CELLULOSE ACETATE (LOW K)	6, 38		20555
CEAB2	7042	CELLULOSE ACETATE BUTYRATE (HIGH K)	6, 38		225555
CEAB1	7041	CELLULOSE ACETATE BUTYRATE (LOW K)	6, 38		225555
CENIP	7046	CELLULOSE NITRATE (PYROXYLIN)	6, 38		200555
CEPR1	7051	CELLULOSE PROPRIONATE (LOW K)	6, 38		225555
CEPR2	7052	CELLULOSE PROPRIONATE (HIGH K)	6, 38		225555
CETRA	7056	CELLULOSE TRIACETATE	38		5555
CE	1356	CERIUM	41, 27, 20, 42		20205
CEB6	4626	CERIUM BORIDE (CEB6) (99. 0 PC DENSE)	48		300555
CEO2	4030	CERIUM OXIDE (CEO2) (PRSD, SNTRD, 86 D)	1, 20, 47		201
CES	4742	CERIUM SULFIDE (CES)	20, 48		22505
CE2S3	4744	CERIUM SULFIDE (CE2S3)	20, 48		20512
CS	1231	CESIUM	1, 14, 27, 28, 32, 43, 47		40005
CSLIQ	1232	CESIUM (LIQUID)	14, 27, 28, 32, 43, 47		22
CHALK	6018	CHALK (AV PROP)	1, 46		25555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
CLGAS	1506	CHLORINE (GAS)	27, 1, 42, 2		0
CRALM	4973	CHROME ALUM (CR2(SO4)3. K2SO4. 24H2O)	1, 27		550
BRICR	5232	CHROME BRICK (CR2O3 32)	1, 27, 41		5530
BRCRM	5234	CHROME MAGNESITE BRICK (SEE REF 47)	20, 47		330
CNISA	3312	CHROME-NICKEL-IRON SUPERALLOYS	6		555
CR	1201	CHROMIUM	20, 1, 27, 32, 43, 42		0
CHCNI	5422	CHROMIUM CARBIDE + NI (CR(X)C(Y), NI)	48		2000555
CUCHR	2183	CHROMIUM COPPER (CU BAL, CR0. 5)	6, 20, 47		2330
CRN	4426	CHROMIUM NITRIDE (CRN) (PRSD, 100 PC D)	27, 47, 48		505
CR2N	4428	CHROMIUM NITRIDE (CR2N) (PRSD, 100 D)	27, 47, 48		200505
CRSI2	4772	CHROMIUM SILICIDE (CRSI2)	20, 27, 48		500
CO	1046	COBALT	20, 27, 1, 32, 43, 30, 41,		0
CO	1046	COBALT	+42		0
COCRW	2646	COBALT ALLOY (CO64, CR30, W6)	20		330333
COHE1	2612	COBALT ALLOY HE-1049	20		3300
COH21	2614	COBALT ALLOY HS-21 (AS CAST)	1, 14, 20, 41		310
COH2A	2615	COBALT ALLOY HS-21 (AGED)	1, 14, 20, 41		310
COH23	2616	COBALT ALLOY HS-23	14, 20		303330
COH25	2618	COBALT ALLOY HS-25 (L-605) (WROUGHT)	1, 14, 41		330
COH27	2620	COBALT ALLOY HS-27 (AS CAST)	14, 20		303330
COH30	2622	COBALT ALLOY HS-30 (422-19) (AS CAST)	14, 20		333333
COH31	2624	COBALT ALLOY HS-31 (X-40) (AS CAST)	1, 14, 20, 41		300330
COH36	2626	COBALT ALLOY HS-36 (CAST)	1, 14, 20		333
COJG3	2628	COBALT ALLOY JESSOP G-32	20		303330
COJ15	2630	COBALT ALLOY J-1570	20		3333330
COK42	2632	COBALT ALLOY K-42B	14		3323332
COMTL	2636	COBALT ALLOY MULTIMET (N-155) (LOW C)	1, 14, 20, 41		330
COMTM	2634	COBALT ALLOY MULTIMET (N-155) (WROUGHT)	1, 14, 20, 41		330
COS59	2638	COBALT ALLOY S-590 (WROUGHT)	14, 41		330
COS81	2640	COBALT ALLOY S-816 (WROUGHT)	1, 14, 20, 41		330
COV36	2642	COBALT ALLOY V-36 (WROUGHT)	41		333333
COW52	2644	COBALT ALLOY WI-52	20		3333330
COW5G	2645	COBALT ALLOY WI-52 (CR COATED SAMPLE)	20		3333330
CNLOX	4218	COBALT NICKEL OXIDE (46COO. 46NIO. 8LIO)	20, 27		3305555
COBOX	4034	COBALT OXIDE (COO)	20, 27, 47, 48		2005
COS	4774	COBALT SILICIDE (COS)	20, 48		305555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
NBTAW	3681	COLOMBIUM ALLOY (CB61, TA28, W10, ZR0.5)	20		3300
NBWMO	3684	COLOMBIUM ALLOY (CB80, W15, MO5)	20		3300
NBTIZ	3682	COLOMBIUM ALLOY (CB85, TI10, ZR5)	20		3300
NBTA5	3683	COLOMBIUM ALLOY (CB95, TA5)	20		3303330
CMB-3	7502	COMPOSITION B-3 H.E. (RDX 60, TNT 40)	8		555
CMC-4	7503	COMPOSITION C-4 H.E. (RDX 90, BINDERS)	8		5555
CONCN	5240	CONCRETE, CINDER	1, 2, 20, 27, 46		25535
CONLW	5243	CONCRETE, LIGHTWEIGHT	1, 2, 20, 27, 46		5530
CONCS	5241	CONCRETE, STONE (1-2-4 MIX)	1, 2, 20, 27, 46		25535
CON14	5242	CONCRETE, 1-4 DRY	1, 2, 20, 27, 46		25535
CU	1051	COPPER	20, 1, 27, 32, 34, 37, 42,		0
CU	1051	COPPER	+47		0
CUWGT	2191	COPPER, WROUGHT (ETP, DHP, TE0.5, PB1)	41		3535
CUBER	2181	COPPER ALLOY (CU BAL, BE 0.38-0.55)	1		331
CUBEH	2182	COPPER ALLOY (CU BAL, BE 1.7-1.9)	1, 6, 41		2335
CUCHR	2183	COPPER ALLOY (CU BAL, CR0.5)	6, 20, 47		2330
CUPR3	2203	COPPER ALLOY (CU70, NI30)	1, 6, 41		2555
CUPR1	2202	COPPER ALLOY (CU90, NI10)	1, 6, 41		2555
CUAL1	2201	COPPER ALLOY (CU99.4, AL0.3, ZR0.27)	20		3303331
NICON	2506	COPPER ALLOY CONSTANTAN (CU55, NI45)	1, 2, 14, 41, 47		331
CUMAN	2195	COPPER ALLOY MANGANIN	2		3305550
CUNIS	2185	COPPER ALLOY NICKEL SILVER (NI 10-20)	1, 2, 6, 41, 47		2222555
CUGZN	2186	COPPER GILDING METAL (CU95, ZN5)	1, 41		555
CUOLI	4220	COPPER LITHIUM OXIDE (96CU0.4LI0)	20, 27		3305550
CUO	4036	COPPER OXIDE (CUO) (TENORITE)	1, 20, 27, 47, 51		2002220
CUSO4	4966	COPPER SULFATE (CUSO4) (CRYSTAL)	27		550
BLUEV	4967	COPPER SULFATE HYDRATE (CUSO4.5H2O)	1, 27, 51		555
CORDR	4322	CORDIERITE (2MGO.2AL2O3.5SIO2)	20, 51		5510
CORKG	8514	CORK, GROUND	2, 46		5555
CORKR	8515	CORK, GROUND, REGRANULATED	2, 46		5555
CUPR3	2203	CUPRONICKEL (CU70, NI30)	1, 6, 41		2555
CUPR1	2202	CUPRONICKEL (CU90, NI10)	1, 6, 41		2555
CM	1446	CURIUM	20, 27		4445555
DAN35	3901	DANDELION 35	34, 36		5500
DATB	7504	DATB H.E. (DIAMINO TRINITROBENZENE)	8		300555
D-GAS	1551	DEUTERIUM	27		3305530

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
D20	4118	DEUTERIUM OXIDE (D20) (LIQUID)	14, 27		300
DIABG	5020	DIABASIC GLASS (ARTIFICIAL)	27, 51		3305530
DAPON	7061	DIALLYL PHTHALATE (DAPON)	35		2025555
DIATA	5246	DIATOMACEOUS EARTH BRICK (ACCR STRATA)	4		305530
DIATH	5249	DIATOMACEOUS EARTH BRICK (HIGH BURN)	4		305530
DIATM	5248	DIATOMACEOUS EARTH BRICK (MOLDED, FRD)	4		305530
DIATP	5247	DIATOMACEOUS EARTH BRICK (PRLL STRATA)	4		305530
DIATT	5251	DIATOMACEOUS EARTH BRICK (USE TO 1100C)	4		305530
DIATL	5250	DIATOMACEOUS EARTH BRICK (USE TO 850C)	4		305530
DOLOM	4960	DOLOMITE (CAMG(CO3)2) (AVG PROP)	1, 27, 51		20555
BRIDS	5254	DOLOMITE BRICK, STABILIZED (22 P)	1, 47		530
DY	1391	DYSPROSIUM	41, 27, 20, 42		35
BRIEF	5256	EGYPTIAN FIRE BRICK (SIO2 64-71)	20		2323532
ES	1449	EINSTEINIUM			4445555
EPCR1	7066	EPOXY, DER 332 (C), HYSOL 6000-OP (K)	6, 20, 38		2220505
EPGFM	7071	EPOXY, GLASS FIBER FILLED (MOLDED)	20, 38		25552
EPSFC	7076	EPOXY, SILICA FILLED, CAST	38		2225555
EPUNC	7081	EPOXY, UNFILLED, CAST	38		2025555
EPSOM	4971	EPSOMITE (MGSO4. 7H20) (CRYSTAL)	1, 27, 51		555
ER	1401	ERBIUM	41, 27, 20, 42		5
ETHCE	7086	ETHYL CELLULOSE (WIDE RANGE OF C, K)	6, 38		225555
ETHVA	7091	ETHYL VINYL ACETATE	38		25555
EU	1376	EUROPIUM	20, 27, 41, 43		30005
EUB6	4634	EUROPIUM BORIDE (EUB6) (93. 0 PC DENSE)	48		305555
FM	1452	FERMIUM			4445555
FBRFX	8201	FIBERFAX PAPER (CARBORUNDUM CO.)	44		5500
BRIFM	5259	FIRECLAY BRICK, MISSOURI	1, 47		3300530
BRIFN	5258	FIRECLAY BRICK, NORMAL (22 P)	47		535
BRIFS	5260	FIRECLAY BRICK, SILICEOUS (23 P)	47		535
FLINT	5022	FLINT GLASS	1, 27, 46		25532
ART5	9005	FLUID, HEAT SINK (D=1, C=K=10**9)			0
ART4	9004	FLUID, WELL STIRRED (D=C=1, K=10**9)			0
F-GAS	1511	FLUORINE (GAS)	27, 42		0
FCCTF	7101	FLUOROCARBONS, CFE AND CTFE	6, 38		555
FCFEP	7106	FLUOROCARBONS, FEP	6, 38		555
FCTFE	7111	FLUOROCARBONS, TFE (TEFLON)	1, 6, 20, 38		2500

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
GLASF	5024	FOAMED GLASS (D = 0.144)	1		305532
FORST	4324	FORSTERITE (2MGO.SIO2) (100 PC DENSE)	1, 20, 27, 51		0
BRIFR	5262	FORSTERITE BRICK (MGO 58 SIO2 38)(20 P)	20, 47		335
FR	1455	FRANCIUM	42		4343335
SIO2	4062	FUSED SILICA GLASS	1, 20, 27, 47, 51		2200
SIO2	4062	FUSED QUARTZ GLASS (SIO2)	1, 20, 27, 47, 51		2200
GD	1381	GADOLINIUM	41, 27, 20, 42		5
GDB6	4636	GADOLINIUM BORIDE (GDB6) (95.6 PC DENS)	48		300555
GD2O3	4038	GADOLINIUM OXIDE (GD2O3) (MONOC) (98 D)	20, 47, 48		2000505
GA	1311	GALLIUM	27, 42, 43, 1		20005
GALIQ	1312	GALLIUM (LIQUID)	1, 14, 27, 43, 47		20005
GE-IP	1261	GERMANIUM (INTRINSIC, P-TYPE)	20, 27, 42, 43, 1, 48		2
GE-N	1262	GERMANIUM (N-TYPE)	20, 27, 42, 43, 1, 48		0
GLASS	5012	GLASS (SEE REF 27, PP E5-E8) (AVG PROP)	27		2225555
GLABC	5014	GLASS, BOROSILICATE CROWN	27, 51		25502
PYRC6	5018	GLASS, CERAMIC, PYROCERAM 9606	20		5500
PYRC8	5019	GLASS, CERAMIC, PYROCERAM 9608	20		5500
DIABG	5020	GLASS, DIABASE (ARTIFICIAL)	27, 51		3305530
FLINT	5022	GLASS, FLINT	1, 27, 46		25532
GLASF	5024	GLASS, FOAMED (D = 0.144)	1		305532
SIO2	4062	GLASS, FUSED QUARTZ (SIO2)	1, 20, 27, 47, 51		2200
SIO2	4062	GLASS, FUSED SILICA OR VITROUS SILICA	1, 20, 27, 47, 51		2200
GLASL	5026	GLASS, LEAD	20		305530
GLASW	5028	GLASS, LIME WINDOW	20		305530
OBSID	5030	GLASS, OBSIDIAN	27, 51		305530
PYREX	5016	GLASS, PYREX	2, 20, 27, 51		500
GLASP	5034	GLASS, SODA PLATE	20, 51		305532
GLASC	5032	GLASS, SODA-LIME	20, 27		3325532
VYCOR	5036	GLASS, VYCOR	20, 27		500
AU	1056	GOLD	20, 6, 1, 32, 27, 42, 41, 2		0
AULIQ	1057	GOLD (LIQUID)	14, 20, 27, 42, 43		40005
GRNTM	6014	GRANITE (AV PROP) (SEE REF 51)	1, 2, 27, 46, 51		25555
GRNTH	6013	GRANITE (HIGH K)	1, 2, 27, 46, 51		25555
GRNTL	6012	GRANITE (LOW K)	1, 2, 27, 46, 51		25555
GYPSM	4962	GYPSUM (CASO4.4H2O) (MINERAL) (HIGH D)	1, 27, 51		555
GYPSA	4964	GYPSUM (CASO4.4H2O) (ARTIFICIAL)	1, 27		555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
HF	1271	HAFNIUM	20, 32, 27, 42, 43, 41		0
HFB2	4618	HAFNIUM BORIDE (HFB2)	20, 27, 48		20502
HFC	4518	HAFNIUM CARBIDE (HFC)	20, 27, 48, 54		22502
HFN	4430	HAFNIUM NITRIDE (HFN) (HP STRD 78-92 D)	20, 27, 48		2020502
HFO2	4040	HAFNIUM OXIDE (HFO2) (MONOC) (94 D)	20, 27, 48		21
D2O	4118	HEAVY WATER (D2O) (LIQUID)	14, 27		300
HEGAS	1516	HELIUM (GAS)	27, 1, 2, 42		0
FE2O3	4042	HEMATITE (FE2O3)	1, 27, 32, 47, 48, 51		20505
HO	1396	HOLMIUM	20, 27, 41, 42, 43		30005
H-GAS	1521	HYDROGEN (GAS)	27, 2, 42, 1		0
ICE	4116	ICE (H2O) (SOLID)	27, 46, 51		0
IN	1211	INDIUM	1, 27, 43, 30, 42, 41		20005
INLIQ	1212	INDIUM (LIQUID)	1, 42, 43, 47		5
SOLD1	3611	INDIUM ALLOY (IN25, SN37.5, PB37.5)	36		3355
INSBP	4920	INDIUM ANTIMONIDE (INSB) (IMP 0.16)	20, 27		3000000
INSBS	4921	INDIUM ANTIMONIDE (INSB) (IMP 0.33-1.2)	20, 27		3000000
INASP	4922	INDIUM ARSENIDE (INAS) (POLYX, IMP 3.0)	20, 27		3000500
INASS	4923	INDIUM ARSENIDE (INAS) (PURE, S-DOPED)	20, 27		3000500
INTE	4924	INDIUM TELLURIDE (IN2TE3)	20, 27		300550
I-SOL	1316	IODINE (SOLID)	27, 42, 41, 1		5
IR	1276	IRIDIUM	27, 41, 20, 42, 43		20002
FEFUR	1083	IRON (0 TO 3000 DEG C)	20, 1, 32, 27, 42, 44, 51		0
FECRY	1082	IRON (-273 TO 763 DEG C)	20, 1, 32, 27, 42, 44, 51		0
FE	1081	IRON (-51 TO 1537 DEG C)	20, 1, 32, 27, 42, 44, 51		0
IND02	3022	IRON, DUCTILE (MG CONTAINING)	1		300355
IND03	3023	IRON, DUCTILE (MG CONTAINING, HEAT RES)	1		300355
IND01	3021	IRON, DUCTILE (0.06 MG)	1, 6		323333
GCI01	3001	IRON, GREY CAST, FERRITIC (2.3-3.0 C)	1, 2, 6, 20, 27, 33, 46		3300
GCI02	3002	IRON, GREY CAST, FERRITIC (3.2-3.8 C)	1, 2, 6, 20, 27, 33, 46		303330
GCI03	3003	IRON, GREY CAST, PEARLITIC (2.3-3.0 C)	1, 2, 6, 20, 27, 33, 46		303330
GCI04	3004	IRON, GREY CAST, PEARLITIC (3.0-3.2 C)	1, 2, 6, 20, 27, 33, 46		303330
GCI05	3005	IRON, GREY CAST, PEARLITIC (3.4 C)	1, 2, 6, 20, 27, 33, 46		303330
GCI06	3006	IRON, GREY CAST, PEARLITIC (3.7-3.8 C)	1, 2, 6, 20, 27, 33, 46		303330
GCI07	3007	IRON, GREY CAST, PEARLITIC (4.12 C)	1, 2, 6, 20, 27, 33, 46		303330
FE	1081	IRON, INGOT (FE99.9+)	1, 20, 27, 32, 42, 44		0
KOVAR	3031	IRON, NI-HARD TYPES 1 AND 2 (KOVAR)	1, 20		200320

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
INNRD	3035	IRON, NI-RESIST, TYPE D2 (CAST)	1		300355
INNR3	3033	IRON, NI-RESIST, TYPE 3 (CAST)	1		355
INNR4	3034	IRON, NI-RESIST, TYPE 4 (CAST)	1		355
INNIR	3032	IRON, NI-RESIST, TYPES 1 AND 2 (CAST)	1, 20		325
INNIT	3041	IRON, NI-TENSYLIRON (CAST, HEAT TREAT)	1		300355
INCFB	3026	IRON, NODULAR CAST, FERRITIC BASE	1, 2, 20		303330
INCPB	3027	IRON, NODULAR CAST, PEARLITIC BASE	1, 2, 20		303330
INMAL	3036	IRON, MALLEABLE (2.5 C)	1, 6		5555
INWRT	3037	IRON, WROUGHT (VARIOUS)	1, 2, 6, 27		2330
NINVR	2501	IRON ALLOY INVAR (FE64, NI36)	6, 41, 47		20355
FE203	4042	IRON OXIDE (FE203) (HEMATITE)	1, 27, 32, 47, 48, 51		20505
FE304	4044	IRON OXIDE (FEO. FE203) (MAGNATITE)	20, 27, 47, 51		2000005
FES2	4746	IRON SULFIDE (FES2) (SINGLE CRYSTAL)	27, 47, 51		505
BRIKB	5265	KAOLIN BRICK, INSULATING (D = 0.30)	1, 20		5510
BRIKA	5264	KAOLIN BRICK, INSULATING (D = 0.43)	1, 20		5510
KRGAS	1556	KRYPTON (GAS)	27, 1, 42		0
KYAN	4314	KYANITE (AL203. SIO2) (TRICL CRYSTAL)	20, 27, 51		500
LA	1351	LANTHANUM	41, 27, 1, 20, 42		5
LAB6	4624	LANTHANUM BORIDE (LAB6) (99.5 PC DENSE)	48		300555
LW	1491	LAWRENCIUM			4445555
PB	1091	LEAD	2, 1, 32, 27, 37, 42		0
PBLIQ	1092	LEAD (LIQUID)	1, 2, 14, 27, 37, 42, 43, 47		2
PB	1091	LEAD (0.07 CA)	36		0
PBANT	3601	LEAD, ANTIMONIAL (PB, SB 4-6) (HARD)	1, 6, 41		355
PBSBH	3602	LEAD, ANTIMONIAL (PB, SB 8-9)	1, 6, 41		355
PB	1091	LEAD, ANTIMONIAL (PB, SB1)	1, 41		0
PB	1091	LEAD, TELLURIUM	1		0
SOLD1	3611	LEAD ALLOY (PB37.5, SN37.5, IN25)	36		3355
SOLD2	3612	LEAD ALLOY (PB39.2, SN60.8) (SOLDER)	34, 41		5
SOLD4	3613	LEAD ALLOY (PB50, SN50) (SOLDER)	1, 41		50
SOLD3	3614	LEAD ALLOY (PB60, SN40) (SOLDER)	1, 41		55
GLASL	5026	LEAD GLASS	20		305530
PBO	4046	LEAD OXIDE (PBO) (YELLOW)	1, 20, 27, 32, 47		201
PBTEP	4927	LEAD TELLURIDE (PBTE) (POLYXTAL)	20, 27		300550
PBTES	4926	LEAD TELLURIDE (PBTE) (SINGLE CRYSTAL)	20, 27		300550
LIMST	6016	LIMESTONE (DENSE, DRY)	1, 2, 27, 46, 51		5555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
LIMSW	6017	LIMESTONE (H2O 15.3)	1, 2, 27, 46, 51		5555
LI	1216	LITHIUM	1, 27, 28, 41, 43, 42, 47		0
LILIQ	1217	LITHIUM (LIQUID)	1, 27, 28, 41, 42, 43, 47		202
BSPOD	4320	LITHIUM ALUMINUM SILICATE (B-SPODUMENE)	20, 27, 51		305550
CNLOX	4218	LITHIUM COBALT NICKEL OXIDE (8-46-46 M)	20, 27		3305555
CUOLI	4220	LITHIUM COPPER OXIDE (4LIO.96CUO)	20, 27		3305550
LIH	4882	LITHIUM HYDRIDE (LIH) (CAST, VAC VOIDS)	20		200
LIH	4882	LITHIUM HYDRIDE (LIH) (POWDER COMPACT)	20		200
LIHCG	4884	LITHIUM HYDRIDE (LIH) (CAST, GAS VOIDS)	20		200
LIF	4822	LITHIUM FLUORIDE (LIF) (SINGLE CRYSTAL)	1, 20, 27, 47, 51		20202
LIFPB	4824	LITHIUM FLUORIDE (LIF 96) (PLASTIC BND)	1, 20, 27, 47, 51		200
MNSEL	4928	LITHIUM MANGANESE SELENIDE (97MN.3LI.-)	20, 27		3305530
NIOLI	4222	LITHIUM NICKEL OXIDE (5LIO.95NIO)	20, 27		3305550
LITBR	4968	LITHIUM TETRABORATE (LI2O.2B2O3) (EPOX)	27		555
LU	1416	LUTETIUM	20, 27, 41		230025
LX041	7505	LX-04-1 H.E. (HMX 85, VITON A 15)	8		200551
FE3O4	4044	MAGNATITE (FEO.FE2O3)	20, 27, 47, 51		2000005
MAGNA	5268	MAGNESITE A BRICK (MGO 90) (14.5 P)	1, 20, 27, 47, 48		330
MAGNB	5269	MAGNESITE B BRICK (MGO 93) (22.6 P)	1, 20, 27, 47, 48		330
MAGNP	5267	MAGNESITE BRICK (MGO 87)	1, 20, 27, 47, 48		330
MAGNS	5266	MAGNESITE BRICK, SPALL RES (MGO 89)	1, 20, 27, 47, 48		335
MAGNC	5270	MAGNESITE C BRICK (MGO 86) (17.8 P)	1, 20, 27, 47, 48		330
MG	1096	MAGNESIUM	20, 1, 32, 27, 42		0
MGLIQ	1097	MAGNESIUM (LIQUID)	1, 14, 20, 27, 32, 43		30005
MG042	2462	MAGNESIUM ALLOY (MG, AG2.5, CE2, ZR0.6)	47		333
MG001	2421	MAGNESIUM ALLOY AM100A	41	(CASTING)	33
MG002	2422	MAGNESIUM ALLOY AZ31(X, S)	14, 20, 47	(WROUGHT)	10
MG003	2423	MAGNESIUM ALLOY AZ31B(P, S)	1, 20, 41	(WROUGHT)	0
MG004	2424	MAGNESIUM ALLOY AZ61A(X), AZM	14, 41, 47	(WROUGHT)	33
MG005	2425	MAGNESIUM ALLOY AZ63A(AC, F)	14, 41	(CASTING)	33
MG006	2426	MAGNESIUM ALLOY AZ80A(X, FRGD)	1, 20, 37, 41	(WROUGHT)	303
MG007	2427	MAGNESIUM ALLOY AZ81A(T4)	41	(CASTING)	300333
MG008	2428	MAGNESIUM ALLOY AZ855(X)	47	(WROUGHT)	333
MG009	2429	MAGNESIUM ALLOY AZ91A, B (DC)	1, 14, 41, 47	(CASTING)	31
MG010	2430	MAGNESIUM ALLOY AZ91C(AC)	1, 41	(CASTING)	33
MG011	2431	MAGNESIUM ALLOY AZ92A(AC)	1, 14, 41	(CASTING)	33

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
MG012	2432	MAGNESIUM ALLOY A3A (WROUGHT)	41		33333
MG013	2433	MAGNESIUM ALLOY A8(AC OR ST) (CASTING)	47		333
MG014	2434	MAGNESIUM ALLOY BZ33A(AC, AH) (CASTING)	1		333
MG015	2435	MAGNESIUM ALLOY EK30A, H812 (CASTING)	20, 41		31
MG017	2437	MAGNESIUM ALLOY EK33A, H811 (CASTING)	20, 41		32
MG016	2436	MAGNESIUM ALLOY EK41A(T5, T6) (CASTING)	41		333
MG018	2438	MAGNESIUM ALLOY HK31A(H24) (CASTING)	1, 20, 41		0
MG019	2439	MAGNESIUM ALLOY HK31A(O) (CASTING)	1, 20, 41		0
MG020	2440	MAGNESIUM ALLOY HK31A(T6) (CASTING)	1, 20, 41		0
MG021	2441	MAGNESIUM ALLOY HM21A(O, H24) (WROUGHT)	41		313
MG022	2442	MAGNESIUM ALLOY HM31A (WROUGHT)	20, 41		3
MG023	2443	MAGNESIUM ALLOY HZ32A(AC), ZT1 (CASTING)	1, 20, 41, 47		33
MG024	2444	MAGNESIUM ALLOY MAGNOX A12(X) (WROUGHT)	47		333
MG025	2445	MAGNESIUM ALLOY M1(AC) (CASTING)	14, 47		333
MG026	2446	MAGNESIUM ALLOY M1(X, S) (WROUGHT)	14, 47		333
MG027	2447	MAGNESIUM ALLOY M1A (WROUGHT)	41		33
MG028	2448	MAGNESIUM ALLOY PE (WROUGHT)	41		30033
MG029	2449	MAGNESIUM ALLOY ZA(AC) (CASTING)	47		3333
MG030	2450	MAGNESIUM ALLOY ZE10A(O, H24) (WROUGHT)	41		33
MG031	2451	MAGNESIUM ALLOY ZE41A(T5, HT) (CASTING)	20, 41, 47		330
MG032	2452	MAGNESIUM ALLOY ZH42 (CASTING)	41		33
MG033	2453	MAGNESIUM ALLOY ZH62A(AC), TZ6 (CASTING)	20, 41, 47		31
MG034	2454	MAGNESIUM ALLOY ZK20A (WROUGHT)	20, 41		3303333
MG035	2455	MAGNESIUM ALLOY ZK51A, H807 (CASTING)	20, 41, 47		0
MG036	2456	MAGNESIUM ALLOY ZK60A, B, ZW6 (CASTING)	1, 14, 20, 41, 47		1
MG037	2457	MAGNESIUM ALLOY ZRE0 (EZ30) (CASTING)	20		303331
MG038	2458	MAGNESIUM ALLOY ZRE1(AA) (CASTING)	47		333
MG039	2459	MAGNESIUM ALLOY ZTY(X) (HK11) (WROUGHT)	20, 47		331
MG040	2460	MAGNESIUM ALLOY ZW1(X) (ZK11) (WROUGHT)	47		333
MG041	2461	MAGNESIUM ALLOY ZW3(X) (ZK31) (WROUGHT)	47		333
MG043	2463	MAGNESIUM ALLOY 1959 (MG, CE4. 33)	20		3303335
MG044	2464	MAGNESIUM ALLOY 1960 (MG, CE6. 7)	20		3303330
MG045	2465	MAGNESIUM ALLOY 1961 (MG, CE11. 85)	20		3303330
MG046	2466	MAGNESIUM ALLOY 1964 (MG, CE5, CO2, MNO. 8)	20		3303330
MG047	2467	MAGNESIUM ALLOY 1992 (MG, CE4. 45, CO3)	20		3303330
SPINX	4224	MAGNESIUM ALUMINATE (MGO. AL2O3) (XTAL)	20, 27, 47, 48, 51		500

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
SPINL	4225	MAGNESIUM ALUMINATE (MGO. AL203) (100 D)	20, 27, 47, 48, 51		500
CORDR	4322	MAGNESIUM ALUMINUM SILICATE (CORDIERIT)	20, 51		5510
MGOPX	4050	MAGNESIUM OXIDE (MGO) (POLYXTAL, 100 D)	1, 20, 27, 47, 48, 51		2000
MGOX	4048	MAGNESIUM OXIDE (MGO) (SINGLE CRYSTAL)	1, 20, 27, 47, 48		0
FORST	4324	MAGNESIUM SILICATE (2MGO. SIO2) (100 D)	1, 20, 27, 51		0
STEAT	4326	MAGNESIUM SILICATE (MGO. SIO2) (COMMERC)	1, 20, 27, 51		505
MG2SI	4776	MAGNESIUM SILICIDE (MG2SI)	20, 27, 48		300530
MGSO4	4970	MAGNESIUM SULFATE (MGSO4) (CRYSTAL)	1, 27		50
EPSOM	4971	MAGNESIUM SULFATE HYDRATE (MGSO4. 7H20)	1, 27, 51		555
PORMT	5283	MAGNESIUM TITANATE PORCELAIN	20, 48		305530
MNCRY	1101	MANGANESE	20, 1, 32, 27, 43, 42		0
MNO	4052	MANGANESE OXIDE (MNO) (SINGLE XTAL)	1, 27, 48		5
MN304	4054	MANGANESE OXIDE (MN304) (87 PC DENSE)	20, 27, 48, 51		22005
MNSEL	4928	MANGANESE SELENIDE (97MNSE. 3LISE)	20, 27		3305530
MNSI2	4778	MANGANESE SILICIDE (MNSI2)	20, 27, 48		300530
MNTEA	4930	MANGANESE TELLURIDE (95MNTE. 5MNAS)	20		3305530
MNTEN	4931	MANGANESE TELLURIDE (99MNTE. NATE)	20		3305530
CUMAN	2195	MANGANIN (CU84, NI4, MN12)	2		3305550
MARBL	6021	MARBLE (AV PROP) (SEE REF 51)	1, 27, 51		25555
MARBD	6020	MARBLE DIELECTRIC (XTAL) (CACO3 99. 99)	1, 27, 51		5550
MELM2	7122	MELAMINE (HIGH DENS, HIGH K)	6, 38		2022555
MELM1	7121	MELAMINE (LOW DENS, LOW K)	6, 38		2022555
MELAC	7123	MELAMINE, ALPHA CELLULOSE FILLED	38		22555
MELAS	7124	MELAMINE, ASBESTOS FILLED (MST 95-205)	38		2022555
MELAF	7125	MELAMINE, CELLULOSE FILLED (MST 95-205)	38		22555
MELFF	7127	MELAMINE, FABRIC OR FLOCK FILLED	6, 38		555
MELGF	7126	MELAMINE, GLASS FIBER FILLED (MST 205)	6, 38		555
MD	1461	MENDELEVIUM			4445555
HGLIQ	1207	MERCURY (LIQUID)	1, 27, 28, 42, 43, 47, 14		0
HGCL2	4826	MERCURY CHLORIDE (HGCL2) (PRSD 8 KB)	1, 27, 47		10
CH4	4890	METHANE (CH4) (GAS)	1, 27		0
MEMAC	7131	METHYL METHACRYLATE	1, 38		25550
MICAX	4982	MICA (SINGLE CRYSTAL) (A OR B AXES)	20, 51		305555
MICAC	4983	MICA (SINGLE CRYSTAL) (C AXIS)	20, 51		305555
MICAS	4984	MICA (SINGLE CRYSTAL) (SYNTHETIC) (98D)	20		305550
MICAB	4985	MICA BRICK (RED OR WHITE) (AVG PROP)	20		305552

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
MICAP	4987	MICA INSULATING POWDER	20		305550
HEM01	7514	MOCK H.E. LM-04-0 H4-048-A294-3	5, 8		5530
HEM02	7515	MOCK H.E. LM-04-0 H7-048-A522.1	5, 8		5500
HEM03	7506	MOCK H.E. RM-04-BG (LX-04-1 MECH MOCK)	8		5555
HEM04	7507	MOCK H.E. 90010 (PBX-9404 MECH MOCK)	8		5555
MO	1106	MOLYBDENUM	20, 6, 1, 32, 41, 43, 42,		0
MO	1106	MOLYBDENUM	+47, 14		0
MOAFE	3672	MOLYBDENUM ALLOY (MO BAL, FE 0.25)	20		333311
MOW30	3673	MOLYBDENUM ALLOY (MO70, W30)	20		3300
MOATI	3671	MOLYBDENUM ALLOY (MO99.5, TI0.5)	1, 6, 41		300
MOBED	4712	MOLYBDENUM BERYLLIDE (MOBE12)	20, 48		500
MO2C	4520	MOLYBDENUM CARBIDE (MO2C)	20, 27, 48		2022502
MO2N	4432	MOLYBDENUM NITRIDE (MO2N) (PR SRD 100D)	47, 48		2000505
MOSE2	4932	MOLYBDENUM SELENIDE (MOSE2)	20		3303555
MOSI2	4780	MOLYBDENUM SILICIDE (MOSI2)	20, 27, 48		2500
MOTE2	4934	MOLYBDENUM TELLURIDE (MOTE2)	20		3305555
MULBY	3831	MULBERRY (U90, NB7.5, ZR2.5)	34, 36, 37		0
MULL	4316	MULLITE (3AL2O3.2SIO2) (100 PC DENSE)	20, 27, 48, 51		500
ND	1366	NEODYMIUM	41, 20, 42		30225
NDB6	4630	NEODYMIUM BORIDE (NDB6) (97.3 PC DENSE)	48		300555
NEGAS	1526	NEON (GAS)	27, 2, 1, 42		20000
NEOPR	7136	NEOPRENE RUBBER	6, 38, 39		555
NP	1464	NEPTUNIUM	20, 27		2440555
NI	1111	NICKEL	20, 2, 1, 32, 37, 41, 42, 51		2
NIAL3	2588	NICKEL ALLOY (NI35, CR20, FE45)	41		5533
NIAL2	2586	NICKEL ALLOY (NI60, CR16, FE24)	41		5533
NIAL1	2584	NICKEL ALLOY (NI62, CR12, FE26)	2, 41		3305533
NI995	2590	NICKEL ALLOY (NI99.5) LOW C, 220, 225	1, 14		320
NICKA	2503	NICKEL ALLOY A (NI99.4) (ANNEALED)	1, 14, 20		2
NICAN	2502	NICKEL ALLOY CALITE N	14		333
NICH3	2504	NICKEL ALLOY CHLORIMET 3	14		3333
NICON	2506	NICKEL ALLOY CONSTANTAN (NI45, CU55)	1, 2, 14, 41, 47		331
NICOD	2508	NICKEL ALLOY CORROSIST	14		333
NIDAE	2592	NICKEL ALLOY D AND E	1		30
NIDUH	2512	NICKEL ALLOY DURANICKEL (AND -R) (HARD)	1, 14, 47		333
NIDUS	2510	NICKEL ALLOY DURANICKEL (AND -R) (SOFT)	1, 14, 47		333

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality DCKTHCK
NID20	2514	NICKEL ALLOY DURIMET 20 (CAST)	1	303333
NIHSA	2516	NICKEL ALLOY HASTELLOY A (ANNEALED)	1, 14, 20	20332
NIHSB	2518	NICKEL ALLOY HASTELLOY B	1, 14, 20, 41, 47	300
NIHSC	2520	NICKEL ALLOY HASTELLOY C	1, 14, 41, 47	302
NIHSD	2522	NICKEL ALLOY HASTELLOY D	1, 14, 41, 47	333
NIHSN	2523	NICKEL ALLOY HASTELLOY N AND INOR-8	20, 41	330
NIHSR	2524	NICKEL ALLOY HASTELLOY R-235	1, 14, 20	300
NIHSX	2526	NICKEL ALLOY HASTELLOY X	1, 14, 20, 41	330
NIH80	2528	NICKEL ALLOY HY MU 80	14	200333
NILLG	2530	NICKEL ALLOY ILLIUM G	1, 14, 20, 41, 47	2002333
NILLR	2532	NICKEL ALLOY ILLIUM R	1, 14, 41, 47	2000333
NINCL	2534	NICKEL ALLOY INCOLOY	1, 14	323
NINC9	2536	NICKEL ALLOY INCOLOY 901	1, 20	3310
NINCN	2540	NICKEL ALLOY INCONEL (CAST)	1, 14, 20, 41, 47	302
NINCA	2538	NICKEL ALLOY INCONEL (WROUGHT, ANNLD)	1, 14, 20, 41, 47	302
NINCW	2542	NICKEL ALLOY INCONEL W	1	333
NINCX	2544	NICKEL ALLOY INCONEL X AND X-750	1, 20, 41	301
NINC6	2545	NICKEL ALLOY INCONEL 600 (ANNEALED)	1, 47	2003330
NINC7	2546	NICKEL ALLOY INCONEL 700	1, 14, 20, 41	330
NINC2	2543	NICKEL ALLOY INCONEL 702 (ANNEALED)	1, 20	3320
NIN7C	2547	NICKEL ALLOY INCONEL 713C (CAST)	1, 20	200320
NINVR	2501	NICKEL ALLOY INVAR (HOT-ROLLED OR FRGD)	6, 41, 47	20355
COK42	2632	NICKEL ALLOY K-42B	14	3323332
NIMOC	2551	NICKEL ALLOY MONEL (CAST)	1, 41	200333
NIMOU	2549	NICKEL ALLOY MONEL (COLD-DRAWN)	1, 14, 20, 41	333
NIMON	2548	NICKEL ALLOY MONEL (HOT-ROLLED)	1, 14, 41, 44, 47	0
NIMLH	2552	NICKEL ALLOY MONEL, H (AS CAST)	1, 41	220333
NIMHU	2555	NICKEL ALLOY MONEL, H (CAST, VAR COMP)	1, 20, 41	220333
NIMLK	2554	NICKEL ALLOY MONEL, K (ANNEALED)	1, 14, 20, 41, 44	200300
NIMKR	2556	NICKEL ALLOY MONEL, KR (ANNEALED)	1, 14	200333
NIMLR	2558	NICKEL ALLOY MONEL, R (HOT-ROLLED)	1, 20, 41	200330
NIMLS	2560	NICKEL ALLOY MONEL, S (CAST, ALL COND)	1, 14, 20	200330
NIMOW	2553	NICKEL ALLOY MONEL WELDABLE ALLOY	1	200333
NIM4H	2557	NICKEL ALLOY MONEL 400	47	205533
NIML4	2550	NICKEL ALLOY MONEL 403 (HOT-ROLLED)	1	203333
COMTL	2636	NICKEL ALLOY MULTIMET (N-155) (LOW C)	1, 14, 20, 41	330

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
COMTM	2634	NICKEL ALLOY MULTIMET (N-155) (WROUGHT)	1, 14, 20, 41		330
NIM25	2561	NICKEL ALLOY M-252 (GE J-1500)	20		3310
NICHR	2562	NICKEL ALLOY NICHROME V (NI80, CR 20)	1, 47		23302
NIMND	2564	NICKEL ALLOY NIMONIC DS	47		303333
NIM10	2577	NICKEL ALLOY NIMONIC 100	20		3303330
NIM15	2575	NICKEL ALLOY NIMONIC 105	47		3330
NIM75	2566	NICKEL ALLOY NIMONIC 75	1, 14, 20		330
NIM80	2568	NICKEL ALLOY NIMONIC 80	1, 14, 20, 41, 47		330
NIM8A	2570	NICKEL ALLOY NIMONIC 80A	1, 20, 41, 47		330
NIM90	2572	NICKEL ALLOY NIMONIC 90	1, 14, 20, 41		330
NIM95	2573	NICKEL ALLOY NIMONIC 95	20, 47		303330
NIPER	2574	NICKEL ALLOY PERMANICKEL	1, 14		335
NIREN	2576	NICKEL ALLOY RENE 41	20, 41		303320
NIUDM	2578	NICKEL ALLOY UDIMET 500 (WROUGHT)	1, 20, 41		300330
NIWSP	2580	NICKEL ALLOY WASPALLOY	1, 20, 41		300330
NI330	2582	NICKEL ALLOY 330 (NI99.55) (ANNEALED)	1		335
CNLOX	4218	NICKEL COBALT OXIDE (46NI0.46COO.8LI0)	20, 27		3305555
NIOLI	4222	NICKEL LITHIUM OXIDE (95NI0.5LI0)	20, 27		3305550
NIOPL	4060	NICKEL OXIDE (NIO) (POLYXTAL, 68-74 D)	20, 27, 32, 47, 48, 51		0
NIOPX	4058	NICKEL OXIDE (NIO) (POLYXTAL, 88-100 D)	20, 27, 32, 47, 48, 51		0
NIO	4056	NICKEL OXIDE (NIO) (SINGLE XTAL)	20, 27, 32, 47, 48, 51		5
CUNIS	2185	NICKEL SILVER (CU BAL, NI 10-20)	1, 2, 6, 41, 47		2222555
NIZNF	4226	NICKEL ZINC FERRITE (NI(ZN)0.FE203)	20		2025502
NB	1246	NIOBIUM	20, 27, 32, 43, 44, 42		0
NBTAW	3681	NIOBIUM ALLOY (NB61, TA28, W10, ZR0.5)	20		3300
NBWMO	3684	NIOBIUM ALLOY (NB80, W15, MO5)	20		3300
NBTIZ	3682	NIOBIUM ALLOY (NB85, TI10, ZR5)	20		3300
NBTA5	3683	NIOBIUM ALLOY (NB95, TA5)	20		3303330
NBBED	4714	NIOBIUM BERYLLIDE (NBBE12) (HP, 93-97D)	20, 48		2000500
NBBE8	4716	NIOBIUM BERYLLIDE (NB2BE17)	20, 48		300530
NBB2	4620	NIOBIUM BORIDE (NBB2) (PRESSED, SNTRD)	20, 27, 48		2500
NBC	4522	NIOBIUM CARBIDE (NBC)	20, 27, 48, 54		20502
NBN	4434	NIOBIUM NITRIDE (NBN)	20, 47, 48		505
NB2N	4436	NIOBIUM NITRIDE (NB2N)	20, 47, 48		300535
NBSI2	4782	NIOBIUM SILICIDE (NBSI2)	20, 27		300535
NOGAS	4061	NITRIC OXIDE (NO) (GAS)	1, 27		500

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality DCKTHCK
NITRR	7141	NITRILE RUBBER	6, 39	5555
NITRC	7508	NITROCELLULOSE H. E. (12. 7 N)	8	305555
N-GAS	1531	NITROGEN (GAS)	27, 2, 42, 1	0
NO	1467	NOBELIUM		4445555
NYLON	7151	NYLON 6, 11, 66, 610 (POLYCAPROLACTAM)	1, 6, 38	500
NYLGF	7156	NYLON, GLASS FILLED		202555
OBSID	5030	OBSIDIAN GLASS	27, 51	305530
ORTHC	4328	ORTHOCLASE (K2O. AL2O3. 6SIO2) (CRYSTAL)	27, 51	325555
OS	1114	OSMIUM	27, 20, 42, 41	0
O-GAS	1536	OXYGEN (GAS)	27, 42, 1, 2	0
PD	1236	PALLADIUM	20, 41, 42, 27, 43	0
E9011	7509	PBX-9011 H. E. (HMX 90, ESTANE 10)	8	555
E9404	7510	PBX-9404-03 H. E. (HMX 94, NC 3, BIND 3)	8, 44	511
PETN	7511	PETN H. E.	8	555
PHCAF	7172	PHENOLIC, CAST, ASBESTOS FILLER	6, 38	2555
PHCNF	7171	PHENOLIC, CAST, NO FILLER	6, 38	222555
PHMHD	7177	PHENOLIC, MOLDED (HIGH DENSITY, K)	6	22555
PHMLD	7176	PHENOLIC, MOLDED (LOW DENSITY, K)	6	22555
PHRPD	7181	PHENOLIC RESIN, PRESSED, TYPES 40, 50	20	305555
PFPPF	7161	PHENOL-FORMALDEHYDE + PHENOL-FURFURAL	20	2225555
PHNXY	7191	PHENOXY	6, 38	2000555
P	1321	PHOSPHORUS (WHITE)	27	40005
PLASL	4963	PLASTER, BUILDING (MOLDED, DRY)	1, 27	555
PLAMT	7201	PLASTIC LAMINATE, VARIOUS TYPES	6, 20	2222555
GLASP	5034	PLATE GLASS	20, 51	305532
PT	1116	PLATINUM	20, 1, 32, 27, 41, 43, 42	0
PU	1121	PLUTONIUM	20, 31, 3, 27, 43, 42, 41,	0
PU	1121	PLUTONIUM	+36, 44	0
PUSTD	3701	PLUTONIUM ALLOY (DELTA PHASE)	20, 27, 31, 44	200
PUC	4524	PLUTONIUM CARBIDE (PUC) (ARCM OR CAST)	20, 48, 53, 54	2025502
PUN	4438	PLUTONIUM NITRIDE (PUN)	27, 48, 53	300530
PUP	4762	PLUTONIUM PHOSPHIDE (PUP) (90 PC DENSE)	53	500
PUS	4747	PLUTONIUM SULFIDE	53	550
UPUOX	4242	PLUTONIUM URANIUM OXIDE (PUO2. 4UO2) SEE	53	303530
PO	1473	POLONIUM	20, 27	20005
PALLO	7211	POLYALLOMER	6, 38	22555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
PCARB	7221	POLYCARBONATE, VARIOUS FILLERS	6, 38		2022555
PESTG	7231	POLYESTER, GLASS FIBER REINFORCED, TAC	20		2555
PETHH	7243	POLYETHYLENE, HIGH DENSITY	6, 38		2555
PETHL	7241	POLYETHYLENE, LOW DENSITY	6, 38		2555
PETHM	7242	POLYETHYLENE, MEDIUM DENSITY	6, 38		2555
PIMHF	7251	POLYIMIDE, H-FILM, KAPTON	6, 40		555
MEMAC	7131	POLYMETHYL METHACRYLATE	1, 38		25550
PPROC	7262	POLYPROPYLENE, COPOLYMER	6, 38		20555
PPROP	7263	POLYPROPYLENE, FILLED	6		20555
PPROM	7261	POLYPROPYLENE, MOPLIN	6, 38		555
PSTYF	7271	POLYSTYRENE, FOAMED-IN-PLACE, RIGID	6		2020555
PSTYG	7276	POLYSTYRENE, GENERAL PURPOSE	6, 20, 38		2550
PSTYM	7281	POLYSTYRENE, MODIFIED	6		22555
PSTYP	7286	POLYSTYRENE, PREFOAMED, RIGID, DOW Q103	6, 20		2002550
PSTYL	7287	POLYSTYRENE FOAM (D = 0.038) (1 ATM)	1		20552
PSTYV	7289	POLYSTYRENE FOAM (D = 0.046) (VACUUM)	1		20552
PSTYH	7288	POLYSTYRENE FOAM (D = 0.046) (1 ATM)	1		20552
PSULF	7291	POLYSULFONE	5, 6, 38		555
PURRF	7302	POLYURETHANE FOAMED-IN-PLACE, RIGID	6, 20		2320555
PUREF	7301	POLYURETHANE FOAM, FLEXIBLE	6, 20, 38		2020555
PURER	7311	POLYURETHANE RUBBER L-100	6, 38		20555
PVINA	7321	POLYVINYL ALCOHOL	6		5555
PVINB	7331	POLYVINYL BUTYRAL	6, 38		555
PVINC	7341	POLYVINYL CARBAZOLE	20		5555
PVCAF	7356	POLYVINYL CHLORIDE ACYTATE, FLEXIBLE	38		2225555
PVCAR	7357	POLYVINYL CHLORIDE ACYTATE, RIGID	38		2225555
PVCFL	7351	POLYVINYL CHLORIDE, FLEXIBLE	6, 38, 20		2222555
PVCRD	7352	POLYVINYL CHLORIDE, RIGID	6, 38, 20		2222555
PVTPX	7371	POLYVINYL TPX-R	5, 38		5555
PVDCM	7362	POLYVINYLIDENE CHLORIDE	6, 38		22555
PVDCF	7361	POLYVINYLIDENE CHLORIDE FILM	6, 38		555
PVDCK	7366	POLYVINYLIDENE FLUORIDE (KYNAR)	5, 38		5555
PORAL	5281	PORCELAIN, HIGH ALUMINA	20		3005500
PORZR	5282	PORCELAIN, HIGH ZIRCON	20		305535
PORMT	5283	PORCELAIN, MAGNESIUM TITANATE	20, 48		305530
PORCE	5286	PORCELAIN, ORDINARY	1, 20		3325535

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
PORBE	5280	PORCELAIN 4811 (BEO)	20		305530
PORC5	5284	PORCELAIN 576	20		325535
K	1226	POTASSIUM	1, 27, 28, 42, 41, 43, 51		0
KLIQ	1227	POTASSIUM (LIQUID)	14, 27, 28, 43, 47, 51		22
KALUM	4972	POTASSIUM ALUM (K2SO4. AL2(SO4)3. 24H2O)	1, 27		550
ORTHC	4328	POTASSIUM ALUMINUM SILICATE (ORTHOCLAS)	27, 51		325555
KBR	4828	POTASSIUM BROMIDE (KBR) (PRSD 8 KB)	1, 27, 47		210
KBRX	4830	POTASSIUM BROMIDE (KBR) (SINGLE XTAL)	1, 27, 47, 51		210
KBR50	4833	POTASSIUM BROMIDE (KBR 50, KCL 50)	1, 27, 47, 51		3303330
KBR75	4832	POTASSIUM BROMIDE (KBR 75, KCL 25)	1, 27, 47, 51		3303330
KBR90	4831	POTASSIUM BROMIDE (KBR 90, KCL 10)	1, 27, 47, 51		3303330
KCL	4836	POTASSIUM CHLORIDE (KCL) (PRSD 8 KB)	1, 27, 47, 51		10
KCLSY	4837	POTASSIUM CHLORIDE (KCL) (SYLVITE XTAL)	1, 27, 47, 51		10
KBR50	4833	POTASSIUM CHLORIDE (KCL 50, KBR 50)	1, 27, 47, 51		3303330
KCL50	4838	POTASSIUM CHLORIDE (KCL 50, NACL 50)	1, 27, 47, 51		303330
KCL75	4834	POTASSIUM CHLORIDE (KCL 75, KBR 25)	1, 27, 47, 51		3303330
KCL90	4835	POTASSIUM CHLORIDE (KCL 90, KBR 10)	1, 27, 47, 51		3303330
KCROM	4233	POTASSIUM CHROMATE (K2O. 2CRO3) (M AXIS)	1, 27		300050
KCROX	4232	POTASSIUM CHROMATE (K2O. 2CRO3) (S AXIS)	1, 27		300050
KF	4840	POTASSIUM FLUORIDE (KF) (PRSD 8 KB)	1, 27, 47		10
KI	4842	POTASSIUM IODIDE (KI) (PRSD 8 KB)	1, 27, 47		10
KFECN	4974	POTASSIUM FERROCYANIDE (K4FE(CN)6. 3H2O)	1, 27		550
KNO3	4976	POTASSIUM NITRATE (KNO3) (PR 8000 KB)	1, 27		0
PR	1361	PRASEODYMIUM	41, 27, 20, 42		205
PRB6	4628	PRASEODYMIUM BORIDE (PRB6) (95 PC DENS)	48		305555
PM	1421	PROMETHIUM	20, 27, 42		3332035
PA	1476	PROTACTINIUM	20, 27		30005
PYREX	5016	PYREX GLASS	2, 20, 27, 51		500
PYRC6	5018	PYROCERAM 9606 CERAMIC GLASS	20		5500
PYRC8	5019	PYROCERAM 9608 CERAMIC GLASS	20		5500
PYROP	4990	PYROPHYLLITE (PARALLEL TO BEDDING)	27, 51		2305530
PYRON	4991	PYROPHYLLITE (PERPEND. TO BEDDING)	27, 51		2305530
SIO2A	4066	QUARTZ CRYSTAL, A AXIS (SIO2)	1, 2, 20, 27, 37, 47, 51		2200
SIO2C	4064	QUARTZ CRYSTAL, C AXIS (SIO2)	1, 2, 20, 27, 37, 47, 51		2200
SANQF	6032	QUARTZ FLOUR, FINE (DRY)	51		305535
SANQN	6033	QUARTZ FLOUR, FINE (H2O 21 PC)	51		305555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
SIO2	4062	QUARTZ GLASS, FUSED (SIO2)	1, 20, 27, 47, 51		2200
SANQP	6039	QUARTZ POWDER, COARSE (H2O 24)	51		305555
SANDY	6034	QUARTZ SAND (DRY) (AV PROP) (SEE REF)	51		2325555
SANDQ	6036	QUARTZ SAND (WET) (H2O 4-23) (AV PROP)	51		2325555
RA	1479	RADIUM	27		2040025
RNGAS	1561	RADON GAS	27		40505
RATTN	8211	RATTAN	44		25555
RE	1251	RHENIUM	27, 43, 41, 42		2
RH	1281	RHODIUM	20, 27, 43, 42, 41		0
ROCKS	6022	ROCK OR STONE (AVERAGE PROPERTIES)	1, 46		3335555
STBRC	7431	RUBBER, BUNA, WITH CARBON BLACK	6, 20, 39		200555
BUTYR	7031	RUBBER, BUTYL	6, 39		555
RUBBD	7382	RUBBER, DIELECTRIC MIX	6, 20		550
RUBBK	7383	RUBBER, HIGH K	6, 20		550
RUBBN	7381	RUBBER, NATURAL	6		555
RUBBF	7386	RUBBER, NATURAL, FOAM	6, 20		320555
NEOPR	7136	RUBBER, NEOPRENE	6, 38, 39		555
NITRR	7141	RUBBER, NITRILE			5555
PURER	7311	RUBBER, POLYURETHANE ELASTOMER L-100	6, 38		20555
RB	1291	RUBIDIUM	1, 27, 28, 42, 43, 47		40024
RBLIQ	1292	RUBIDIUM (LIQUID)	1, 14, 27, 28, 43, 47		20022
RBCL	4844	RUBIDIUM CHLORIDE (RBCL) (PRSD 8 KB)	1, 27, 47		10
RBI	4846	RUBIDIUM IODIDE (RBI) (PRSD 8 KB)	1, 27, 47		10
RU	1301	RUTHENIUM	20, 42, 1, 27		202020
SM	1371	SAMARIUM	20, 27, 41, 42, 43		30205
SMB6	4632	SAMARIUM BORIDE (SMB6) (96.8 PC DENSE)	48		300555
SMS	4748	SAMARIUM SULFIDE (SMS)	20, 48		300550
SANDY	6034	SAND (DRY) (D = 1.36 TO 1.84) (AV PROP)	51		2325555
SANDN	6038	SAND, NORTHWAY (H2O 4-10) (AV PROP)	51		2325555
SANDQ	6036	SAND, QUARTZ (WET) (H2O 4-23) (AV PROP)	2, 51		2325555
SANDM	6026	SANDSTONE (AV PROP) (SEE REF 51)	2, 27, 46, 51		25555
SANDS	6024	SANDSTONE (HIGH DENSITY)	2, 27, 46, 51		25555
SANDL	6025	SANDSTONE (LOW DENSITY)	2, 27, 46, 51		25555
ALOXD	4012	SAPPHIRE (AL2O3) (POLYXTAL) (100 PC D)	1, 20, 27, 32, 47, 48, 51		200
ALOXS	4016	SAPPHIRE (AL2O3) (SINGLE XTAL) (AV DIR)	1, 20, 27, 32, 47, 48, 51		202
SC	1341	SCANDIUM	20, 27, 41, 43		30005

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
SE	1326	SELENIUM (GREY)	27, 43, 42, 1		20005
SHALE	6028	SHALE (AV PROP) (SEE REF 51)	51		2225555
BRISI	5294	SILICA BRICK, HARD FIRED (SIO2 94-95)	20		330
SIO2	4062	SILICA GLASS, FUSED OR VITROUS	1, 20, 27, 47, 51		2200
BRISL	5296	SILICEOUS BRICK (SIO2 89, AL203 9)(25P)	47		335
SI	1256	SILICON	20, 1, 27, 41, 43, 42, 48		0
SIB4	4614	SILICON BORIDE (SIB4)	27, 48		300530
SICAL	4539	SILICON CARBIDE (SIC) (BRICK AL203 1.7)	20, 27, 32, 47		2500
SICCF	4535	SILICON CARBIDE (SIC) (CARBOFRAX BRICK)	20, 27, 32, 47		2500
SICFV	4542	SILICON CARBIDE (SIC) (FOAM, IN VACUUM)	20, 32, 47		2500
SICFB	4536	SILICON CARBIDE (SIC) (FRIT BND BRICK)	20, 27, 32, 47		2500
SICKT	4534	SILICON CARBIDE (SIC) (KT GRADE)	20, 27, 32, 47, 48		2500
SICNB	4541	SILICON CARBIDE (SIC) (NITRIDE BONDED)	20, 32, 47, 48		2503
SICPA	4543	SILICON CARBIDE (SIC) (POWDER, IN AIR)	20, 32, 47		2500
SICPH	4544	SILICON CARBIDE (SIC) (POWDER, IN HE)	20, 32, 47		2500
SICRD	4540	SILICON CARBIDE (SIC) (REFRACTORY D-30)	20, 27, 32, 47		2500
SICRP	4538	SILICON CARBIDE (SIC) (REXTAL, 65-70D)	1, 20, 27, 32, 47		2500
SICRX	4537	SILICON CARBIDE (SIC) (REXTAL, 80-100D)	20, 27, 32, 47, 48		2500
SICX1	4531	SILICON CARBIDE (SIC) (SINGLE XTAL)	20, 27, 32, 47		22500
SICX2	4532	SILICON CARBIDE (SIC) (SINGLE XTAL)	20, 32, 47, 48		22505
SICSB	4533	SILICON CARBIDE (SIC) (SLF BND, HE ATM)	20, 27, 32, 47		2500
SICSI	5424	SILICON CARBIDE + SI (SIC 76, SI 24)	20		3305550
SI3NL	4444	SILICON NITRIDE (SI3N4) (70 PC DENSE)	20, 27, 47, 48		20502
SI3N4	4442	SILICON NITRIDE (SI3N4) (85 PC DENSE)	20, 27, 47, 48		20502
SIO2F	4068	SILICON OXIDE (SIO2) (FOAM, 1 ATM AIR)	1, 20, 27, 47		2200
SIO2	4062	SILICON OXIDE (SIO2) (FUSED QUARTZ)	1, 20, 27, 47, 51		2200
SIO2A	4066	SILICON OXIDE (SIO2) (QUARTZ, A AXIS)	1, 2, 20, 27, 37, 47, 51		2200
SIO2C	4064	SILICON OXIDE (SIO2) (QUARTZ, C AXIS)	1, 2, 20, 27, 37, 47, 51		2200
SITE	4936	SILICON TELLURIDE (SITE)	20		305555
SILFF	7401	SILICONE FOAM, FLEXIBLE (LRL)	6, 20		2022555
SILFR	7402	SILICONE FOAM, RIGID, VARIOUS	6, 20		2022555
SILRH	7423	SILICONE RUBBER, HIGH K (SEE REF 5)	5, 6, 41, 44		220555
SILRL	7421	SILICONE RUBBER, LOW K (SEE REF 5)	5, 6, 41, 44		220555
SILRM	7422	SILICONE RUBBER, MEDIUM K (SEE REF 5)	5, 6, 41, 44		220555
SILR1	7424	SILICONE RUBBER, RTV 521 AND 093-009	5, 6, 41, 44		220555
SILMD	7411	SILICONE, MOLDED, VARIOUS FILLERS	6, 20, 38		2222555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
BRISK	5298	SILLIMANITE BRICK (22 PC POROSITY)	20		300530
AG	1126	SILVER	20, 6, 1, 27, 2, 32, 42, 47,		0
AG	1126	SILVER	+14, 43		0
AGLIQ	1127	SILVER (LIQUID)	27, 32, 42, 43		30005
SILVA	3751	SILVER ALLOYS, STERLING AND COIN	1		325
SNTE2	4940	SILVER ANTIMONY TELLURIDE (SNTE 25 PC)	20		3305555
AGCL	4848	SILVER CHLORIDE (AGCL) (SINGLE CRYSTAL)	27, 47, 51		15
AG2SE	4942	SILVER SELENIDE (AG2SE)	20, 27, 47		20502
SLATE	6030	SLATE (AV PROP) (SEE REF 51)	51		2225555
GLASC	5032	SODA-LIME GLASS	20, 27		3325532
NA	1221	SODIUM	2, 1, 27, 28, 41, 42, 43, 51		0
NALIQ	1222	SODIUM (LIQUID)	1, 14, 27, 28, 42, 43, 47,		1
NALIQ	1222	SODIUM (LIQUID)	+51		1
ANALC	4329	SODIUM ALUMINUM SILICATE HYDRATE (XTAL)	27, 51		305555
NABR	4850	SODIUM BROMIDE (NABR) (PRSD 8 KB)	1, 27, 47		10
NACLO	4978	SODIUM CHLORATE (NACLO3) (CRYSTAL)	1, 27, 51		505
NACL	4852	SODIUM CHLORIDE (NACL) (CLEAR CRYSTAL)	1, 27, 47, 51, 52		10
NACLR	4854	SODIUM CHLORIDE (NACL) (OPAQUE, IMPURE)	1, 27, 47, 51, 52		10
KCL50	4838	SODIUM CHLORIDE (NACL 50, KCL 50)	1, 27, 47, 51		303330
NAF	4856	SODIUM FLUORIDE (NAF) (PRSD 8 KB)	1, 27, 47		10
SOILS	6046	SOIL (AV PROPS) (SEE REFS)	2, 46, 51		2225555
SOIL3	6044	SOIL, CLAY (WET)	51		2225555
SANQF	6032	SOIL, FINE QUARTZ FLOUR (DRY)	51		305535
SANQW	6033	SOIL, FINE QUARTZ FLOUR (H2O 21 PC)	51		305555
SOIL1	6042	SOIL, LOAM (DRY) (AV PROP) (SEE REFS)	2, 51		2225555
SOIL2	6043	SOIL, LOAM (H2O 4-27 PC) (AV, SEE REFS)	2, 51		2225555
SOILM	6048	SOIL, MARS SURFACE (SEE UCRL-50309)			5555
SOLID	6050	SOIL, SANDY DRY	46		5555
SOILW	6052	SOIL, SANDY (H2O 8)	46		5555
ART7	9007	SOLID, REGULATING (D=C=K=TM=1, HM=10**9)			0
ART6	9006	SOLID, UNIT LATENT HEAT (D=C=K=TM=HM=1			0
ART3	9003	SOLID, UNIT PROPERTY (D=C=K=1)			0
SNOWF	8231	SNOW, FRESH	2, 27		55
SNOWP	8232	SNOW, PACKED	27, 46		55
SOLD1	3611	SOLDER (PB37.5, SN37.5, IN25)	36		3355
SOLD2	3612	SOLDER (PB39.2, SN60.8)	34, 41		5

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
SOLD4	3613	SOLDER (PB50, SN50)	1, 41		50
SOLD3	3614	SOLDER (PB60, SN40)	1, 41		55
SPINX	4224	SPINEL (MGO. AL203) (SINGLE CRYSTAL)	20, 27, 47, 48, 51		500
SPINL	4225	SPINEL (MGO. AL203) (100 PC DENSE POLYX)	20, 27, 47, 48, 51		500
H2OGS	4113	STEAM (H2O) (GAS) (SATD)	1, 2, 14, 27, 46		205550
H2OG1	4112	STEAM (H2O) (GAS) (1 ATM)	1, 2, 14, 27, 46		200050
STEAT	4326	STEATITE (MGO. SIO2) (COMMERCIAL GRADES)	1, 20, 27, 51		505
STALL	3101	STEEL, ALLOY AND MILD (4130, 4340)	6, 41, 46		3302
STALC	3106	STEEL, ALLOY, CAST	6		3355
STCAR	3116	STEEL, CARBON, TYPE 1020 (0.2 - 0.6 C)	1, 20, 37		300
STCFC	3111	STEEL, FREE CUTTING, EUTECTOID	2, 4, 6, 20, 41		300
STHSP	3121	STEEL, HIGH SPEED (M1, M10, M-2, TI)	20		3303355
COMTL	2636	STEEL, MULTIMET (N-155) (LOW C)	1, 14, 20, 41		330
COMTM	2634	STEEL, MULTIMET (N-155) (WROUGHT)	1, 14, 20, 41		330
STST4	3141	STEEL, STAINLESS (CR 12-13, NI 0-3)	1, 2, 4, 14, 20		300
STST3	3131	STEEL, STAINLESS (CR 16-26, NI 8-36)	1, 2, 4, 6, 20, 37		2023333
SSC08	3208	STEEL, STAINLESS CA15, CA40 (CAST)	1		355
SSC09	3209	STEEL, STAINLESS CB30, CC50 (CAST)	1		355
SSC13	3213	STEEL, STAINLESS CK, CH, HI (CAST)	1		355
SSC12	3212	STEEL, STAINLESS CF (CAST)	1		355
SSC04	3204	STEEL, STAINLESS CN-7M (CAST)	1		355
SSC06	3206	STEEL, STAINLESS HA (CAST)	1		355
SSC07	3207	STEEL, STAINLESS HC, HD (CAST)	1		355
SSC11	3211	STEEL, STAINLESS HE (CAST)	1		355
SSC05	3205	STEEL, STAINLESS HF (CAST)	1		355
SSC10	3210	STEEL, STAINLESS HH, HL, HK (CAST)	1		355
SSC03	3203	STEEL, STAINLESS HT (CAST)	1		355
SSC02	3202	STEEL, STAINLESS HU (CAST)	1		355
SSC01	3201	STEEL, STAINLESS HW (CAST)	1		355
STST3	3131	STEEL, STAINLESS SERIES 300	1, 2, 4, 6, 20, 37		2023333
STST4	3141	STEEL, STAINLESS SERIES 400	1, 2, 4, 20		300
STPH4	3171	STEEL, STAINLESS 17-4PH	20, 14		23302
STPH7	3176	STEEL, STAINLESS 17-7PH	20, 14		2003300
ST199	3186	STEEL, STAINLESS 19-9DL	41		2300
STST2	3126	STEEL, STAINLESS 201 AND 202	1		3355
ST304	3133	STEEL, STAINLESS 304	1, 4, 37		300

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
ST347	3135	STEEL, STAINLESS 321 AND 347	1, 2, 4, 20, 37, 14		300
STS4A	3146	STEEL, STAINLESS 430, 430F, AND 431	1, 2, 4, 6, 20, 14		302
STS4B	3151	STEEL, STAINLESS 446	1, 14, 20		302
STST5	3161	STEEL, STAINLESS 501 AND 502	2, 4		2303330
WCCO2	5453	STEEL, TOOL, TUNGSTEN CARBIDE CA2	20		3300530
WCCO1	5452	STEEL, TOOL, TUNGSTEN CARBIDE CA4	20		3300530
STUHS	3181	STEEL, ULTRA HIGH STRENGTH TYPE 300-M	1		355
SR	1296	STRONTIUM	20, 28, 42, 27		240024
SRSO4	4980	STRONTIUM SULFATE (SRSO4) (CRYSTAL)	1, 27, 51		550
SRTIT	4234	STRONTIUM TITANATE (SRO. TIO2) (100 D)	20, 48		500
SRTIP	4235	STRONTIUM TITANATE (SRO. TIO2) (80 D)	20, 48		500
STCO1	5426	STRONTIUM TITANATE + CO (CO 10)	20		3300535
STCO2	5427	STRONTIUM TITANATE + CO (CO 20)	20		3300535
STCO3	5428	STRONTIUM TITANATE + CO (CO 30)	20		3300535
STCO4	5429	STRONTIUM TITANATE + CO (CO 40)	20		3300535
STBRC	7431	STYRENE-BUTADIENE RUBBER + CARBON BLK	6, 20, 39		200555
S	1331	SULFUR	27, 1, 42, 30, 2, 41		10001
SO2	4071	SULFUR DIOXIDE (SO2) (GAS)	1		5500
TALC	4994	TALC	20, 27, 51		5505
TA	1161	TANTALUM	20, 1, 27, 32, 37, 43		20002
TANBV	3784	TANTALUM ALLOY (TA62, NB30, V7. 5)	20		3300
TAWHF	3785	TANTALUM ALLOY (TA89, W9, HF2)	20		300
TA10W	3781	TANTALUM ALLOY (TA90, W10)	20, 36		500
TACUZ	3783	TANTALUM ALLOY (TA98, CU0. 7, ZR0. 7)	20		3300
TANB1	3782	TANTALUM ALLOY (TA99. 5, NB0. 5)	20		3303330
TASB	4944	TANTALUM ANTIMONIDE (TASB)	20		3305552
TABED	4718	TANTALUM BERYLLIDE (TABE12) (HP)	20, 48		
TABE8	4720	TANTALUM BERYLLIDE (TA2BE17)	20, 48		500
TAB	4642	TANTALUM BORIDE (TAB) (PSD, SNTR, 85D)	20, 27, 47, 48		500
TAB2	4644	TANTALUM BORIDE (TAB2)	20, 27, 47, 48		2020502
TAC	4562	TANTALUM CARBIDE (TAC)	20, 27, 48, 54		2020502
WCCO5	5456	TANTALUM CARBIDE + WC CERMET K601	49		300530
TAN	4446	TANTALUM NITRIDE (TAN)	20, 27, 48		2220525
TA2N	4448	TANTALUM NITRIDE (TA2N)	20, 27, 48		2220522
TASI2	4784	TANTALUM SILICIDE (TASI2)	20, 27		300535
TC	1164	TECHNICIUM	27, 42		40025

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
FCTFE	7111	TEFLON	1, 6, 20, 38		2500
FCTFR	7112	TEFLON, REINFORCED	20		2500
TE	1488	TELLURIUM	27, 20, 42, 41, 1		20002
TB	1386	TERBIUM	20, 27, 41, 42, 43		30205
TBB6	4638	TERBIUM BORIDE (TBB6) (94.3 PC DENSE)	48		305555
TETRL	7512	TETRYL H.E.	8		300555
TL	1336	THALLIUM	41, 27, 1, 42, 47		0
TLLIQ	1337	THALLIUM (LIQUID)	1, 14, 27, 42, 43, 47		55
TH	1166	THORIUM	20, 32, 34, 27, 37, 43, 44,		2
TH	1166	THORIUM	+41		2
THB4	4646	THORIUM BORIDE (THB4)	20, 27, 48		2002502
THB6	4648	THORIUM BORIDE (THB6)	20, 27, 48		2000535
THC	4564	THORIUM CARBIDE (THC) (80 PC DENSE)	20, 27, 48, 54		300530
THC2	4565	THORIUM CARBIDE (THC2) (69 PC DENSE)	20, 27, 48, 54		300530
THO2	4072	THORIUM OXIDE (THO2) (96-100 PC DENSE)	1, 20, 27, 47, 48, 51		2002300
TM	1406	THULIUM	20, 27, 41, 42, 43		30005
SN	1171	TIN	2, 1, 27, 32, 42, 41, 47		0
SNLIQ	1172	TIN (LIQUID)	1, 14, 27, 32, 41, 42, 43		0
SOLD1	3611	TIN ALLOY (SN37.5, PB37.5, IN25)	36		3355
SOLD3	3614	TIN ALLOY (SN40, PB60) (SOLDER)	1, 41		55
SOLD4	3613	TIN ALLOY (SN50, PB50) (SOLDER)	1, 41		50
SOLD2	3612	TIN ALLOY (SN60.8, PB39.2) (SOLDER)	34, 41		5
SNO2	4074	TIN OXIDE (SNO2) (93-95 PC DENSE)	1, 20, 27, 47, 48		2300
SNTE2	4940	TIN TELLURIDE (SNTE 25, AGSBTE2 75)	20		3305555
SNTE6	4939	TIN TELLURIDE (SNTE 60, AGSBTE2 40)	20		3305555
SNTE8	4938	TIN TELLURIDE (SNTE 80, AGSBTE2 20)	20		3305555
TI	1176	TITANIUM	20, 27, 32, 37, 42, 43, 41,		20002
TI	1176	TITANIUM	+1		20002
TIAL1	2712	TITANIUM ALLOY (TI BAL, AL2, MN2)	20		3303330
TIAL3	2716	TITANIUM ALLOY (TI BAL, AL4, CU2, ZR2)	20		3303330
TIAL7	2730	TITANIUM ALLOY (TI BAL, AL4, CU4, SN2)	20		3303330
TIA11	2732	TITANIUM ALLOY (TI BAL, AL4, MO3, V1)	20		3233323
TIAL5	2720	TITANIUM ALLOY (TI BAL, AL4, V1, MO0.6)	20		3303330
TIAL2	2714	TITANIUM ALLOY (TI BAL, AL4, V2, MO1)	20		3303330
TIAL4	2718	TITANIUM ALLOY (TI BAL, AL4, V3, MO1.5)	20		3303330
TIAL6	2728	TITANIUM ALLOY (TI BAL, AL4, ZR3.5)	20		3303330

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
TIA12	2736	TITANIUM ALLOY (TI BAL, AL5, SN2.5)	41, 45		303330
TI555	2738	TITANIUM ALLOY (TI BAL, AL5, SN5, ZR5)	45		303330
TIA13	2740	TITANIUM ALLOY (TI BAL, AL6, V4)	20, 37, 45		300
TIA15	2742	TITANIUM ALLOY (TI BAL, AL8, MO1, V1)	45		3330
TIA14	2746	TITANIUM ALLOY (TI BAL, CR3.4, MO2.1)	20		3303330
TIAL8	2752	TITANIUM ALLOY (TI BAL, SN4.8, AL4.5)	20		3303330
TIAL9	2754	TITANIUM ALLOY (TI BAL, SN5.5, AL2)	20		3303330
TIV14	2768	TITANIUM ALLOY (TI BAL, V14, CR10, AL4)	20		3003300
TIV15	2766	TITANIUM ALLOY (TI BAL, V15, AL2.8)	20		3003300
TIA10	2770	TITANIUM ALLOY (TI BAL, ZR3, AL2)	20		3303330
TI100	2750	TITANIUM ALLOY C100M (RC130A) (MN7.9)	20		203320
TIH40	2722	TITANIUM ALLOY HYLITE 40 C130AM, RC130B	1, 20, 41		303330
TIH50	2724	TITANIUM ALLOY HYLITE 50 (IMI550)	20, 45		303330
TIH51	2726	TITANIUM ALLOY HYLITE 51 (IMI551)	45		303330
TIH55	2760	TITANIUM ALLOY HYLITE 55 (IMI)	20, 45		303330
TIH60	2758	TITANIUM ALLOY HYLITE 60 (IMI)	20, 45		303330
TIH65	2756	TITANIUM ALLOY HYLITE 65 (IMI)	45		303330
TI679	2764	TITANIUM ALLOY IMI 679 (SN11, ZR5, AL2)	45		303330
TI680	2762	TITANIUM ALLOY IMI 680 (SN11, MO4, AL2)	45		303330
TI140	2748	TITANIUM ALLOY TI140A (FE2, CR2, MO2)	20		3303330
TI150	2744	TITANIUM ALLOY TI150A (CR2.7, FE1.4)	20		3003300
TI155	2734	TITANIUM ALLOY TI155A (AL5, FE2, CR1, MO1)	1, 20		3303330
TIBED	4722	TITANIUM BERYLLIDE (TIBE12) (HP, 95D)	20, 48		2500
TIB2	4650	TITANIUM BORIDE (TIB2) (HP, 95 PC DENS)	20, 27, 47, 48		500
TIC93	4567	TITANIUM CARBIDE (TIC) (93 PC DENSE)	20, 27, 47, 48, 54		22502
TIC96	4566	TITANIUM CARBIDE (TIC) (96 PC DENSE)	20, 27, 47, 48, 54		22502
TICC2	5431	TITANIUM CARBIDE + CO (CO18, NBC, TAC15)	20		3305535
TICC1	5430	TITANIUM CARBIDE + CO (TIC 80, CO 20)	20		305535
TICC3	5432	TITANIUM CARBIDE + NBC + NI	20		3305535
TICCR	5442	TITANIUM CARBIDE + NI OR CO (AVG PROP)	48		2220555
TICC5	5434	TITANIUM CARBIDE CERMET K138A	49		305530
TICC6	5435	TITANIUM CARBIDE CERMET K151A	49		305530
TIC10	5439	TITANIUM CARBIDE CERMET K161B	20		3005500
TICC4	5433	TITANIUM CARBIDE CERMET K162B	49		305530
TICC7	5436	TITANIUM CARBIDE CERMET K163B1	49		305530
TICC8	5437	TITANIUM CARBIDE CERMET K164B	49		305530

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
TICC9	5438	TITANIUM CARBIDE CERMET K165	49		305530
TINIT	4452	TITANIUM NITRIDE (TIN) (HP, 70-90 DENS)	20, 27, 47, 48		2020502
TIO2A	4084	TITANIUM OXIDE (TIO2) (RUTILE, A AXIS)	1, 20, 27, 32, 47, 48, 51		20202
TIO2C	4082	TITANIUM OXIDE (TIO2) (RUTILE, C AXIS)	1, 20, 27, 32, 47, 48, 51		20202
TIO2	4086	TITANIUM OXIDE (TIO2) (RUTILE, 100 D)	1, 20, 27, 32, 47, 48, 51		200
TNT	7513	TNT H. E. (2, 4, 6-TRINITROTOLUENE) (CAST)	8		555
TOPAZ	4301	TOPAZ (2ALFO. SIO2) (A-AXIS)	27, 51		305550
TOPAC	4302	TOPAZ (2ALFO. SIO2) (C-AXIS)	27, 51		305551
TOURM	4996	TOURMALINE	27, 51		305550
T-GAS	1566	TRITIUM GAS			3335533
W	1181	TUNGSTEN	20, 1, 32, 34, 27, 37, 42,		0
W	1181	TUNGSTEN	+41, 43		0
W25RE	3801	TUNGSTEN ALLOY (W75, RE25)			3303330
WNICU	3802	TUNGSTEN ALLOY (W90, NI6, CU2-4)	20		303330
WB	4652	TUNGSTEN BORIDE (WB)	20, 27, 47, 48		2500
WC	4568	TUNGSTEN CARBIDE (WC)	20, 27, 47, 48, 54		2500
WCC12	5463	TUNGSTEN CARBIDE CERMET CARBOLOY 883	50		300530
WCC11	5462	TUNGSTEN CARBIDE CERMET CARBOLOY 905	50		300530
WCC10	5461	TUNGSTEN CARBIDE CERMET CARBOLOY 999	50		300530
WCC02	5453	TUNGSTEN CARBIDE CERMET CA2 TOOL STEEL	20		3300530
WCC01	5452	TUNGSTEN CARBIDE CERMET CA4 TOOL STEEL	20		3300530
WCC03	5454	TUNGSTEN CARBIDE CERMET K6 AND K96	20, 49		300530
WCC05	5456	TUNGSTEN CARBIDE CERMET K601	49		300530
WCC08	5459	TUNGSTEN CARBIDE CERMET K701	49		300530
WCC09	5460	TUNGSTEN CARBIDE CERMET K801 (WC + NI)	49		300530
WCC07	5458	TUNGSTEN CARBIDE CERMET K92	49		300530
WCC06	5457	TUNGSTEN CARBIDE CERMET K94 AND K1	49		300530
WO3	4092	TUNGSTEN OXIDE (WO3) (POLYXTAL. POROUS)	20, 27, 47, 48		20305
WSE2	4946	TUNGSTEN SELENIDE (WSE2)	20, 27		3303550
WSI2	4786	TUNGSTEN SILICIDE (WSI2) (HP, 95 DENSE)	20, 27, 48		2002500
WTE2	4947	TUNGSTEN TELLURIDE (WTE2)	20, 27		3303555
WTIC5	5470	TUNGSTEN TITANIUM CARBIDE KM	49		300530
WCC04	5465	TUNGSTEN TITANIUM CARBIDE K2S	20, 49		300530
WTIC7	5472	TUNGSTEN TITANIUM CARBIDE K21	49		300530
WTIC6	5471	TUNGSTEN TITANIUM CARBIDE K4H	49		300530
WTIC4	5469	TUNGSTEN TITANIUM CARBIDE K5H	49		300530

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
WTIC3	5468	TUNGSTEN TITANIUM CARBIDE K81	49		300530
WTIC2	5467	TUNGSTEN TITANIUM CARBIDE K84	49		300530
WTIC1	5466	TUNGSTEN TITANIUM CARBIDE K86, K7H, K3H	49		300530
U	1186	URANIUM	20, 31, 32, 36, 27, 37, 42,		0
U	1186	URANIUM	+41, 43, 44, 34		0
MULBY	3831	URANIUM ALLOY MULBERRY	34, 36, 37		0
U18ZR	3833	URANIUM ALLOY (U82, ZR18)	20, 34		303330
U90FS	3837	URANIUM ALLOY (U90, FS10)	20		303330
U10MO	3832	URANIUM ALLOY (U90, MO10)	20, 35, 36		300
UFSZR	3838	URANIUM ALLOY (U93, FS5, ZR2)	20		303330
UCREU	3835	URANIUM ALLOY (U94.4, CR5.6) (EUTECTIC)	20		3003300
UZR05	3840	URANIUM ALLOY (U95, ZR5)	20		30303330
U04NB	3834	URANIUM ALLOY (U96, NB4)	20, 34		303330
U97FS	3836	URANIUM ALLOY (U97, FS3)	20		303330
UZR02	3839	URANIUM ALLOY (U98.5, ZR1.5)	20		303330
UBE13	4724	URANIUM BERYLLIDE (UBE13) (SNTRD, 61D)	20, 48		305550
UB4	4654	URANIUM BORIDE (UB4)	20, 48		300555
UCAMC	4572	URANIUM CARBIDE (UC) (ARCM OR CAST, 99D)	20, 48, 53, 54		2502
UCAVG	4574	URANIUM CARBIDE (UC) (AVG, VAR. TYPES)	20, 48, 53, 54		2502
UCSNT	4573	URANIUM CARBIDE (UC) (SINTERED, 90D)	20, 48, 53, 54		2502
UC2	4576	URANIUM CARBIDE (UC2)	20, 27, 48, 54		2000500
UN	4454	URANIUM NITRIDE (UN) (HP, 95-98 DENSE)	20, 27, 48, PWAC481-65		2500
UO2PX	4096	URANIUM OXIDE (UO2) (POLYXTAL, 97 DENS)	20, 27, 47, 48, 51		500
UO2	4094	URANIUM OXIDE (UO2) (SINGLE CRYSTAL)	20, 27, 47, 48, 51		500
U308L	4099	URANIUM OXIDE (U308) (PRSD AT 100 PSI)	1, 20, 27, 47, 48		2002500
U308H	4098	URANIUM OXIDE (U308) (PRSD AT 4200 PSI)	1, 20, 27, 47, 48		2002500
UO2CR	5482	URANIUM OXIDE + CR (UO2 80 VOL) (97 D)	20		4305550
UOMO3	5486	URANIUM OXIDE + MO (UO2 70 VOL) (92 D)	20		4305550
UOMO2	5485	URANIUM OXIDE + MO (UO2 80 VOL) (91 D)	20		4305550
UOMO1	5484	URANIUM OXIDE + MO (UO2 80 VOL) (94 D)	20		4305550
UO2NB	5488	URANIUM OXIDE + NB (UO2 80 VOL)	20		4305550
UO2S1	5490	URANIUM OXIDE + ST STEEL (UO2 70 VOL)	20		4305550
UO2S2	5491	URANIUM OXIDE + ST STEEL (UO2 80 VOL)	20		4305550
UO2Z1	5492	URANIUM OXIDE + ZR (UO2 43, ZR 57)(59 P)	20		4305530
UO2Z2	5493	URANIUM OXIDE + ZR (UO2 80, ZR 20)	20		305535
UPUOX	4242	URANIUM PLUTONIUM OXIDE (4UO2.PUO2) SEE	53		303530

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
U3SI	4788	URANIUM SILICIDE (U3SI)	20, 48		20525
URFMA	7442	UREA-FORMALDEHYDE, ALPHA CELLULOSE FLLR	38		25555
URFMN	7441	UREA-FORMALDEHYDE, MOLDED	38		25555
ART2	9002	VACUUM, CONDUCTING (D=C=0, K=10**9)			0
ART1	9001	VACUUM, INSULATING (D=C=K=0)			0
V	1286	VANADIUM	20, 32, 27, 41, 42, 43		0
VBE12	4726	VANADIUM BERYLLIDE (VBE12) (85 PC DENS)	20, 48		505
VB2	4656	VANADIUM BORIDE (VB2)	20, 27, 48		20555
VC	4578	VANADIUM CARBIDE (VC)	20, 27, 47, 48, 54		2022502
VN	4456	VANADIUM NITRIDE (VN) (PR, STRD, 100 D)	20, 27, 47, 48		22505
VERM2	5292	VERMICULITE, EXPANDED (D = 0.19-0.25)	20		305530
VERM3	5293	VERMICULITE, EXPANDED (D = 0.3)	20		305530
VERMI	4986	VERMICULITE BRICK	20		305550
VERMP	4988	VERMICULITE INSULATING POWDER	20		305550
SIO2	4062	VITROUS SILICA GLASS	1, 20, 27, 47, 51		2200
VYCOR	5036	VYCOR GLASS	20, 27		500
H2OGS	4113	WATER (H2O) (GAS) (SATD)	1, 2, 14, 27, 46		205550
H2OG1	4112	WATER (H2O) (GAS) (1 ATM)	1, 2, 14, 27, 46		200050
WATER	4114	WATER (H2O) (LIQUID)	2, 14, 27, 46		0
ICE	4116	WATER (H2O) (SOLID) (ICE)	27, 46, 51		0
D2O	4118	WATER, HEAVY (D2O) (LIQUID)	14, 27		300
GLASW	5028	WINDOW GLASS, LIME	20		305530
BALS1	8516	WOOD, BALSA (ACROSS GRAIN)	1, 2, 27		305555
BALS2	8517	WOOD, BALSA (ACROSS GRAIN)	1, 2, 27		305555
CYPRS	8518	WOOD, CYPRESS (ACROSS GRAIN)	1, 27		305555
MAHOG	8520	WOOD, MAHOGANY (ACROSS GRAIN)	1, 27		305555
MAPLE	8522	WOOD, MAPLE (ACROSS GRAIN)	1, 2, 27		305555
PINEW	8526	WOOD, NORWAY PINE (ACROSS GRAIN)	1, 2, 27		305555
OAKLD	8525	WOOD, OAK, RED, BLACK (ACROSS GRAIN)	1, 2, 27		05555
OAKHD	8524	WOOD, OAK, WHITE, LIVE (ACROSS GRAIN)	1, 2, 27		05555
PINEL	8527	WOOD, OREGON PINE (ACROSS GRAIN)	1, 2, 27		305555
PINEW	8529	WOOD, PINE (WITH GRAIN)	1, 2, 27		305555
WOOD2	8513	WOOD, SPRUCE (ACROSS GRAIN)	46		5555
WOOD1	8512	WOOD, SPRUCE (WITH GRAIN)	46		5555
TEAK	8530	WOOD, TEAK (ACROSS GRAIN)	1, 2		305555
PINEV	8528	WOOD, VIRGINIA PINE (ACROSS GRAIN)	1, 2, 27		305555

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
FIRWH	8532	WOOD, WHITE FIR (ACROSS GRAIN)	1, 2		305555
PINEA	8534	WOOD, WHITE PINE (ACROSS GRAIN)	1, 2, 27		305555
XE	1541	XENON	27, 42		30000
YB	1411	YTTERBIUM	20, 27, 41, 42, 43		30205
YBB6	4640	YTTERBIUM BORIDE (YBB6) (90.6 PC DENS)	48		305555
Y	1346	YTTRIUM	41, 27, 1, 20, 42, 43		20005
YB6	4622	YTTRIUM BORIDE (YB6) (98.4 PC DENSE)	48		300555
Y2O3	4102	YTTRIUM OXIDE (Y2O3) (96-100 PC DENSE)	20, 27, 47, 48		300
ZINC2	3861	ZILLOY 15	1, 6, 41		355
ZN	1191	ZINC	2, 1, 32, 27, 42, 20, 41,		0
ZN	1191	ZINC	+47, 51		0
ZNLIQ	1192	ZINC (LIQUID)	14, 20, 27, 32, 43, 47		0
ZINC1	3862	ZINC ALLOY ASTM B69	1, 6, 41, 51		355
ZNSB	4948	ZINC ANTIMONIDE (ZNSB)	20, 27, 47		3303550
ZNFEO	4252	ZINC FERRITE (ZNO.FE2O3) (PR, FRD, VAC)	20, 27		500
ZNO	4104	ZINC OXIDE (ZNO) (PRSD, FIRED, 100 D)	1, 20, 27, 47, 48, 51		2000
ZNS	4750	ZINC SULFIDE (ZNS) (CUBIC CRYSTAL)	1, 27, 47, 48, 51		310
ZINC3	3863	ZINC-ALUMINUM ALLOY ASTM 23	1, 6, 41		355
ZINC4	3864	ZINC-ALUMINUM-COPPER ALLOY ASTM 25	1, 6, 41		355
ZIRCN	4330	ZIRCON (ZRO2.SIO2) (SINGLE CRYSTAL)	20, 27, 48, 61		2505
PORZR	5282	ZIRCON PORCELAIN, HIGH	20		305535
ZR	1196	ZIRCONIUM	20, 27, 32, 37, 43, 42, 41		20002
ZR3ZI	3882	ZIRCONIUM ALLOY 3ZI (ZR97, AL1, SN1, MO1)	20		303330
ZIRCA	3881	ZIRCONIUM ALLOYS ZIRCALLOY 2 AND 3	1, 6, 14		200355
ZRBET	4728	ZIRCONIUM BERYLLIDE (ZRBE13)	20, 48		500
ZRB2	4658	ZIRCONIUM BORIDE (ZRB2) (HP, 97 PC DEN)	20, 27, 47, 48		20502
ZRB2B	5496	ZIRCONIUM BORIDE + BORON (BOROLITE 101)	47, 48		505
ZRB2Z	5498	ZIRCONIUM BORIDE + MOSI2 (BORIDE Z)	47, 48		2000500
ZRC	4580	ZIRCONIUM CARBIDE (ZRC) (HP OR SNT, 94D)	20, 27, 48, 54		22502
ZRH12	4892	ZIRCONIUM HYDRIDE (ZRH + ZRH2)	20		2225522
ZRNPF	4458	ZIRCONIUM NITRIDE (ZRN) (PR SR 88-90 D)	20, 27, 47, 48		500
ZRNPS	4459	ZIRCONIUM NITRIDE (ZRN) (PR SR 93 D)	20, 27, 47, 48		20502
ZROYZ	5495	ZIRCONIUM OXIDE (Y2O3 12, ZR 8) (97 D)	20		4305530
ZRO2	4106	ZIRCONIUM OXIDE (ZRO2) (MONOC., 100 D)	1, 20, 27, 47, 48, 51		0
ZRO2C	4108	ZIRCONIUM OXIDE (ZRO2 96, CAO 6, 91 D)	1, 20, 27, 47, 48, 51		0
ZROTI	5494	ZIRCONIUM OXIDE + TI CERMET ZT-15-M	20		5500

Table 3.3 (Continued)

Abbr.	No.	Material	References	Quality	DCKTHCK
ZIRCN	4330	ZIRCONIUM SILICATE (ZRO2. SIO2) (XTAL)	20, 27, 48, 61		2505
ZIRCP	4332	ZIRCONIUM SILICATE (ZRO2. SIO2) (100 D)	20, 27, 48, 61		2500

* Material properties quality code.

0 or Blank : Good data or no way of estimating quality.
1 : Good data. Extended temperature range by extrapolation.
2 : Poor or conflicting data. Used best or average.
3 : No data. Made estimate by accurate method.
4 : No data. Made rough estimate.
5 : No data. Made no estimate.

Note : Columns 73-79 of index are for D, C, K, TM, HM, C(T) and K(T), respectively.

D : Density
C : Specific heat
K : Thermal conductivity
TM : Transition temperature
HM : Latent heat
C(T) : Temperature dependent specific heat
K(T) : Temperature dependent thermal conductivity

Table 3.4 Material data list

Columns	Format	Variables	Descriptions
Data set No.1 : Material identification data.			
1 - 5	A5	XMAT	Material index.
6	1X	-	Blank.
7 - 10	I4	XMATNO	Material identification number (same as in material index).
11 - 15	I5	KA	Always blank. (Used in TRUMP program.)
16 - 20	I5	KB	Always blank. (Used in TRUMP program.)
21 - 25	I5	LTABC	Number of data pairs listed in the table of specific heat versus temperature. This number does not exceed 12. If the number is not zero, it is always two or more.
26 - 30	I5	LTABK	Number of data pairs listed in the table of thermal conductivity versus temperature. This number does not exceed 12. If the number is not zero, it is always two or more.
31 - 40	F10.0	DENS	Density of material, in g/cm^3. This is normally the value at or near room temperature of the lowest temperature for which specific heat or thermal conductivity is tabulated, whichever is highest.
41 - 50	F10.0	CAPT1	Specific heat of material, in cal/g-℃, if constant or if the temperature dependence is unknown. When a table of specific heat versus temperature is listed, the value given here is normally the value at or near room temperature, or at the lowest temperature is tabulated, whichever is highest.
51 - 60	F10.0	CONT1	Thermal conductivity of the material, in cal/s-cm-℃, if constant or if the temperature dependence is

Table 3.4 (Continued)

Columns	Format	Variables	Descriptions
			unknown. When a table of specific heat versus temperature is listed, the value given here is normally the value at or near room temperature, or at the lowest temperature is tabulated, whichever is highest.
61 - 70	F10.0	TMELT	Transition temperature or maximum temperature, in ℃, at which material may be used. If a latent heat is specified in columns 71-80, this is the transition temperature at which either a phase-change or solid-state transition occurs. If a material has more than one transition with a latent-heat effect, others are included in the table of specific heat versus temperature as a triangular peak superimposed over the actual specific heat curve. This triangular peak as a base width of 10 ℃, a height of 1/5 of the latent heat transition, in cal/g, and is centered at the transition temperature.
71 - 80	F10.0	HMELT	Latent heat absorbed by the material, in cal/g, when the temperature is increased past the transition temperature specified in columns 61-70. Other latent-heat effects may be included in the specific heat table as described above.
Data set No.2 : Specific heat table data. (Only included if at least two data pairs are listed. No blank data set is needed.)			
1 - 10	F10.0	CAPT(1)	Specific heat of the material, in cal/g-℃, at the temperature specified in columns 11-20.

Table 3.4 (Continued)

Columns	Format	Variables	Descriptions
11 - 20	F10.0	TVARC(1)	Temperature, in ℃, at which the material has the specific heat specified in columns 1-10.
21 - 30	F10.0	CAPT(2)	Specific heat of the material, in cal/g-℃, at the temperature specified in columns 31-40.
31 - 40	F10.0	TVARC(2)	Temperature, in ℃, at which the material has the specific heat specified in columns 21-30. Always equal to, or greater than, the preceding temperature in the table.
41 - 50	F10.0	CAPT(3)	The specific heat table data set may list up to four data pairs using ten columns for each value of specific heat or temperature. As many as three data sets with the same format can be used to list the number of data pairs specified in columns 21-25.
51 - 60	F10.0	TVARC(3)	
61 - 70	F10.0	CAPT(4)	
71 - 80	F10.0	TVARC(4)	
		(CAPT(I),TVARC(I),I=1,LTABC)	
Data set No.3 : Thermal conductivity table data. (Only included if at least two data pairs are listed. No blank data set is needed.)			
1 - 10	F10.0	CONT(1)	Thermal conductivity of the material, in cal/s-cm-℃, at the temperature specified in columns 11-20.
11 - 20	F10.0	TVARK(1)	Temperature, in ℃, at which the material has the thermal conductivity specified in columns 1-10.

Table 3.4 (Continued)

Columns	Format	Variables	Descriptions
21 - 30	F10.0	CONT(2)	Thermal conductivity of the material, in cal/s-cm-℃, at the temperature specified in columns 31-40.
31 - 40	F10.0	TVARK(2)	Temperature, in ℃, at which the material has the thermal conductivity specified in columns 21-30. Always equal to, or greater than, the preceding temperature in the table.
41 - 50	F10.0	CONT(3)	The thermal conductivity data set may list up to four data pairs using ten columns for each value of specific heat or temperature. As many as three data sets with the same format can be used to list the number of data pairs specified in columns 21-25.
51 - 60	F10.0	TVARK(3)	
61 - 70	F10.0	CONT(4)	
71 - 80	F10.0	TVARK(4)	
(CONT(I),TVARK(I),I=1,LTABK)			

4. Computer Program

4.1 Program Description

The computer program THERMLIB consists of three parts. These are the material property library obtained by many research institutes, the data processing program and plotting program for the data used with TRUMP3, HEATING5, HEATING6, ABAQUS, NASTRAN, TOPAZ2D and TOPAZ3D computer programs. The TRUMP3, HEATING5 and HEATING6 are finite differnce computer programs and other are finite element computer programs capable of heat conduction problems.

The computer program THERMLIB consists of a main routine and six subroutines. These are MAIN, CURVE, MINMAX, AXFUN1, PLTAX2, and DTLIST. Overall structure of THERMLIB is shown in Fig. 4.1. Functions of subroutines are as follows:

MAIN : initializes start of run, reads input data and searches data, prints of output data and prepares drawing,

CURVE : draws stress-strain curves,

MINMAX : searches maximum and minimum values,

AXFUN1 : prepares to draw axis,

PLTAX2 : draws axis and

DTLIST : prints of input data.

A macroscopic flow chart of THERMLIB is shown in Fig. 4.2.

4.2 Description of Input Data

This section describes the input data required by THERMLIB. The input data consists of a material title, the material selection, and options for output plotting. The input instruction is simple and easy follow. The input data forms are presented in Table 4.1.

4.3 Description of Output Data

This section describes the output data forms of THERMLIB. The contents of these various quantities are described in the followings.

(1) Input data

The input data are printed in two formats. The first print format is exactly the same as they were read. Second, the computer program lists the input data as interpreted by THERMLIB.

(2) Material property data

The material property data are compiled from data library file and printed out on output sheets.

(3) Graphical output

The THERMLIB provides users with graphical output of the material property data.

Table 4.1 Input data for THERMLIB

Columns	Format	Variables	Descriptions
Data set No.1 : Job description.			
1 - 5	A5	KEY	Flag for data type. 'TITLE': flag for job description.
6	1X	-	Blank.
7 - 46	5A8	ATITLE	Job description.
Data set No.2 : Material data.			
1 - 3	A3	KEY	Flag for data type. 'MAT' : flag for material data .
4 - 5	2X	-	Blank.
6 - 10	I5	IUNIT	Selection of unit. 1 : CGS-cal-degree C. 2 : MKS-J-degree K. 3 : MKS-J-degree C.
11 - 15	I5	ICK	Selection of material data. 1 : Specific heat. 2 : Thermal conduction. 3 : Density.
16 - 20	I5	NMAT	Number of data set in one figure.
21 - 25	I5	AMAT(1)	Material identification number.
26 - 30	I5	AMAT(2)	Material identification number.
31 - 35	I5	AMAT(3)	Material identification number.
36 - 40	I5	AMAT(4)	Material identification number.
		(AMAT(I),I=1,NMAT)	

Table 4.1 (Continued)

Columns	Format	Variables	Descriptions
Data set No.3 : Plotter data.			
1 - 4	A4	KEY	Flag for data type. 'PLOT' : flag for plotting.
11 - 20	F10.0	PXMIN	Minimum value of X-axis.
21 - 30	F10.0	PXMAX	Maximum value of X-axis. If PXMIN and PXMAX are zero, PXMIN and PXMAX are automatically determined in the program.
31 - 40	F10.0	PYMIN	Minimum value of Y-axis.
41 - 50	F10.0	PYMAX	Maximum value of Y-axis. If PXMIN and PXMAX are zero, PXMIN and PXMAX are automatically determined in the program.
Data set No.4 : Input data end.			
1 - 3	A3	KEY	Flag for data type. 'END' : flag for input data end.

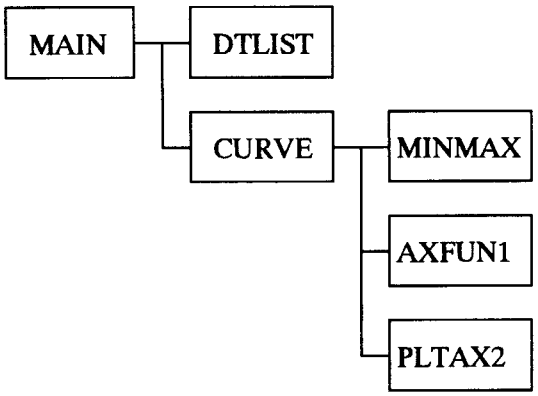

Fig. 4.1 Structure of computer program THERMLIB

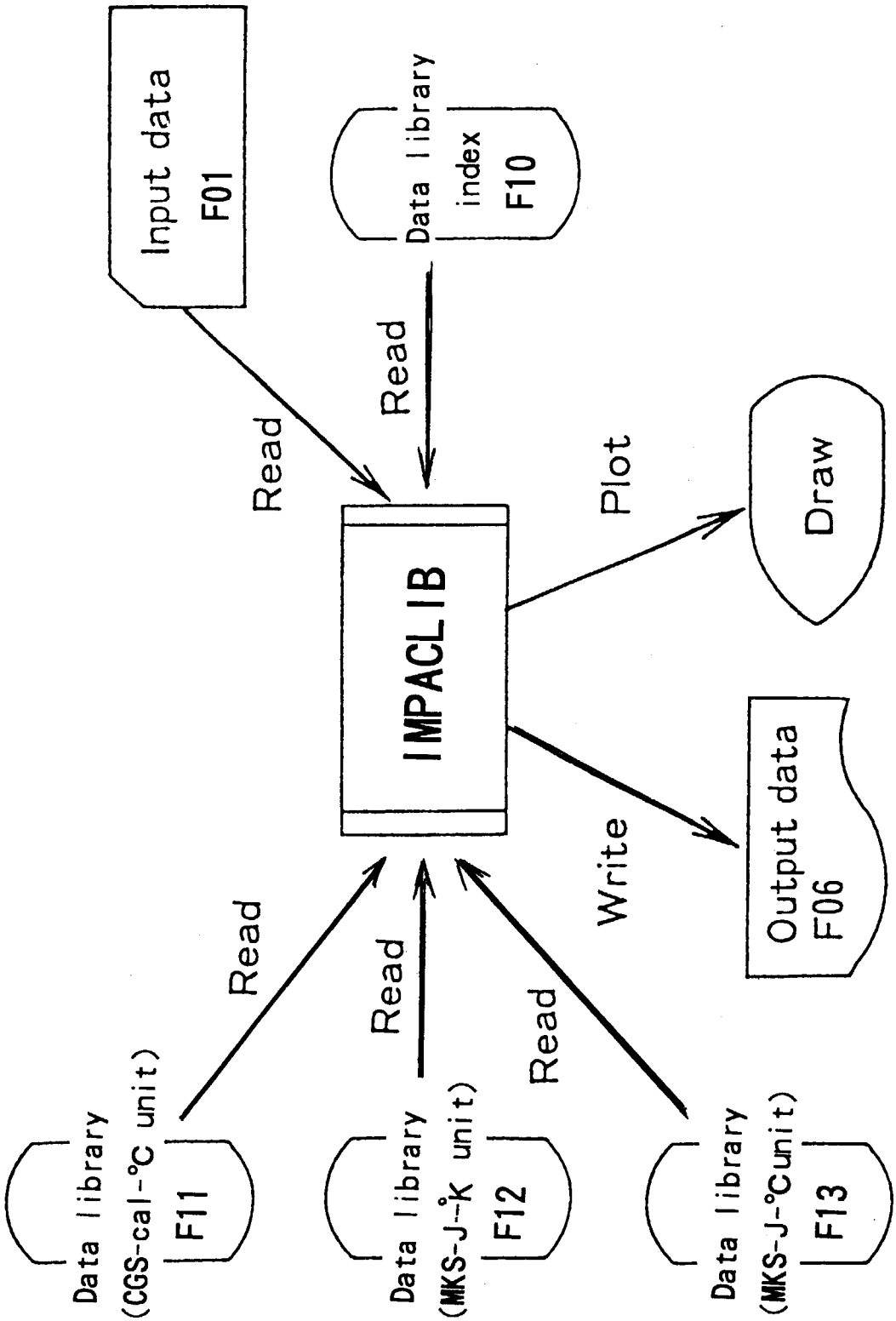

Fig. 4.2 Program flow

5. Conclusions

In regard to the evaluation of temperature distribution of casks in the case of normal transport condition or fire accident, thermal property data are necessary. A material property data library in the report has developed for heat conduction analysis program TRUMP3 by LLNL. Using the data library, a data library processing program THERMLIB for thermal analysis has been developed. The THERMLIB is further being utilized satisfactory for general purpose heat conduction programs such as HEATING5, HEATING6, NASTRAN, TOPAZ2D and TOPAZ3D.

Ackowledgements

The author is indebted Mrs. Junji Oshika and Takashi Ishiwata of CRC Research Institute, Inc. for assistance of making the computer program.

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Appendix A Sample Problem Input

INPUT DATA ECHO

```
         1         2         3         4         5         6         7         8
----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

TITLE     HEAT CAPACITY OF SUS304 (MAT. NO.3133)
MAT      1    1    1 3133
PLOT          0.0       0.0       0.0       0.0
TITLE     HEAT CONDUCTIVITY OF SUS404 (MAT. NO.3133)
MAT      1    2    1 3133
PLOT          0.0       0.0       0.0       0.0
END

----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
         1         2         3         4         5         6         7         8
```

* * * INPUT DATA END * * *

Appendix B Sample Problem Output

```
========  INPUT CHECK LIST ========


     TITLE =      HEAT CAPACITY OF SUS304 (MAT. NO.3133)

     MATERIAL DATA =
          IUNIT     =      1
          ICK       =      1
          NMAT      =      1
          MAT. NO.  =   3133

     PLOT      DATA =
          XMIN      =        0.0000
          XMAX      =        0.0000
          YMIN      =        0.0000
          YMAX      =        0.0000



========  OUTPUT DATA  LIST ========


     X-DATA = TEMPERATURE  (C)

     Y-DATA = HEAT CAPACITY            (CAL/G-C)


     MATERIAL NAME = ST304        MATERIAL NO. =  3133

     DENSITY                            =  7.92000E+00
     HEAT CAPACITY                      =  1.20000E-01
     THERMAL CONDUCTIVITY               =  3.50000E-02
     TRANSIENT TEMPERATURE              =  1.40000E+03
     LATENT HEAT                        =  6.50000E+01
     NO. OF HEAT CAPACITY DATA          =       2
     NO. OF THERMAL CONDUCTIVITY DATA =       6

          SEQ    XDATA         YDATA

           1       0.0000       0.1200
           2     400.0000       0.1350
```

Appendix B (Continued)

```
========  INPUT CHECK LIST ========


     TITLE =      HEAT CONDUCTIVITY OF SUS404 (MAT. NO.3133)

     MATERIAL DATA =
          IUNIT     =      1
          ICK       =      2
          NMAT      =      1
          MAT. NO.  =   3133

     PLOT      DATA =
          XMIN      =        0.0000
          XMAX      =        0.0000
          YMIN      =        0.0000
          YMAX      =        0.0000


========  OUTPUT DATA  LIST ========


     X-DATA = TEMPERATURE  (C)

     Y-DATA = THERMAL CONDUCTIVITY    (CAL/CM-S-C)


     MATERIAL NAME = ST304        MATERIAL NO. =  3133

     DENSITY                              =  7.92000E+00
     HEAT CAPACITY                        =  1.20000E-01
     THERMAL CONDUCTIVITY                 =  3.50000E-02
     TRANSIENT TEMPERATURE                =  1.40000E+03
     LATENT HEAT                          =  6.50000E+01
     NO. OF HEAT CAPACITY DATA            =       2
     NO. OF THERMAL CONDUCTIVITY DATA =       6

          SEQ    XDATA         YDATA

            1   -200.0000      0.0165
            2   -100.0000      0.0260
            3      0.0000      0.0320
            4    100.0000      0.0390
            5    500.0000      0.0520
            6    700.0000      0.0620
```

Appendix C Graphical Output

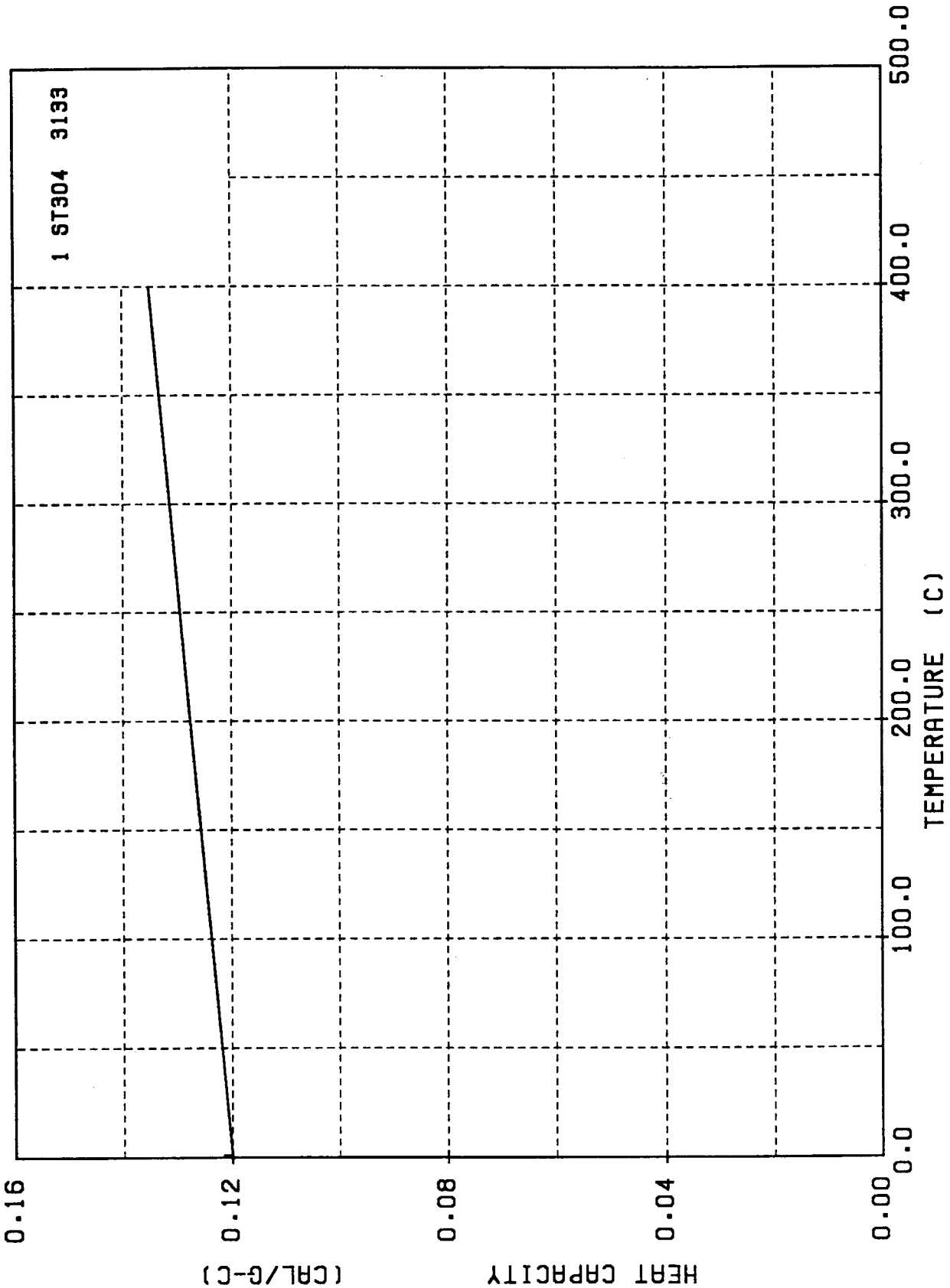

Fig. C.1 Graphical Output of THERMLIB(1)

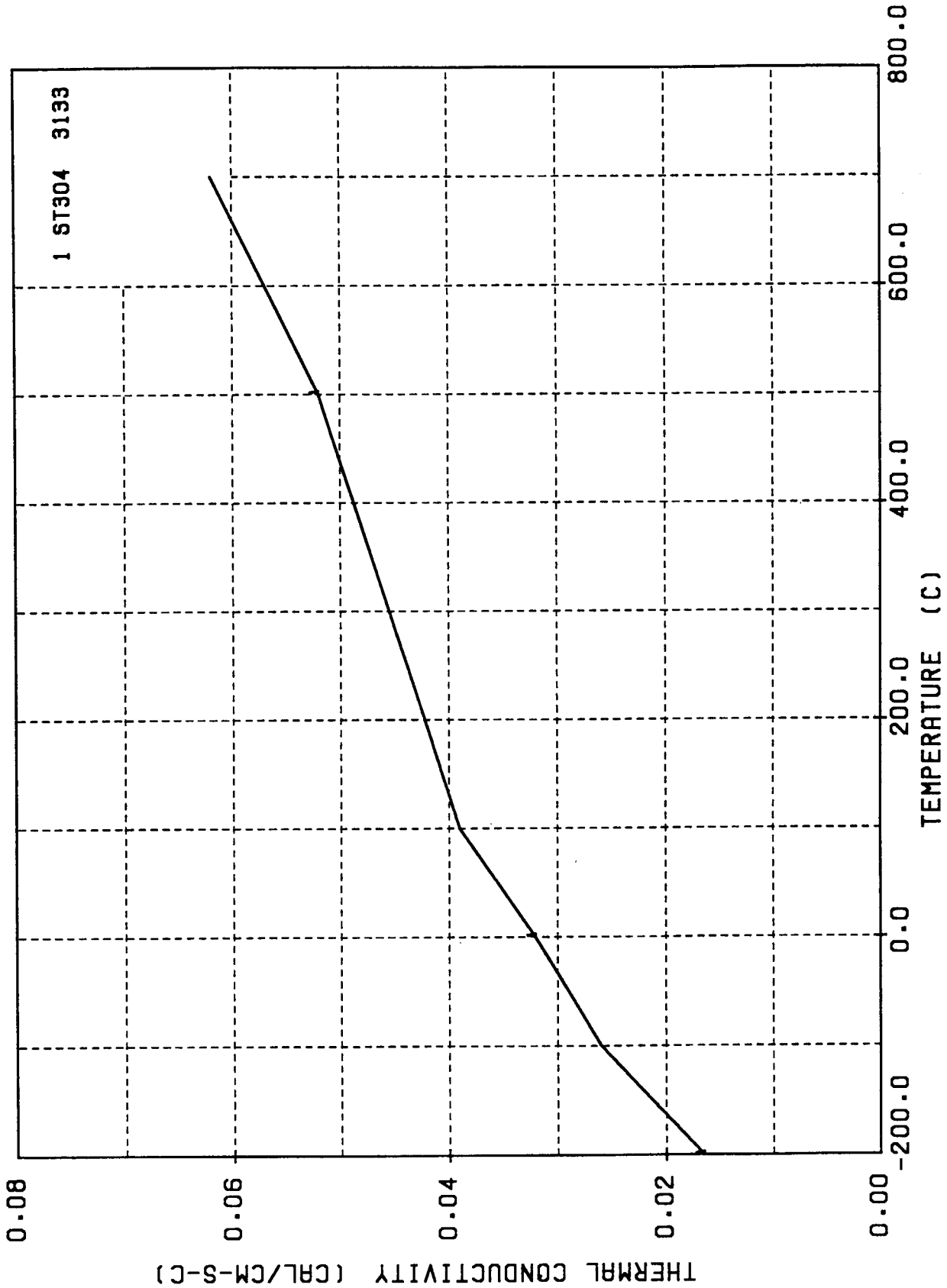

Fig. C.2 Graphical Output of THERMLIB(2)

Appendix D Job Control Data

The job control data for THERMLIB execution on the computer FACOM M-780 in JAERI is as follows:

```
//JCLG JOB
// EXEC JCLG
//SYSIN DD DATA,DLM='++'
// JUSER XXXXXXXX.XX,XXXXXXXX,XXXX.XX,IMPLIB
// T.01 C.02 W.01 I.02 CLS GRP
// OPTP MSGCLASS=A,MSGLEVEL=(2,0,1),CLASS=B,NOTIFY=JXXXX
// OPTP PASSWORD=XXXXXXXX
// EXEC LMGOEX,LM=J2322.LMTHMLIB,PNM=thermlib
// EXPAND GRNLP
//FT01F001 DD DSN=JXXXX.DTTHMDAT.DATA,DISP=SHR
//FT10F001 DD DSN=JXXXX.DTTHMLBD.DATA,DISP=SHR
//FT11F001 DD DSN=JXXXX.DTTHMLB1.DATA,DISP=SHR
//FT12F001 DD DSN=JXXXX.DTTHMLB2.DATA,DISP=SHR
//FT13F001 DD DSN=JXXXX.DTTHMLB3.DATA,DISP=SHR
//
```

pp.1174-1181, Las Vegas, USA, December 3-8,(1995).

11.Machine requirement:

Required 1100 k bytes of core memory.

12.Program language used:

FORTRAN-77.

13.Operating system or monitor under which the program is executed:

FACOM M-780 : MSP.

SUN4 : Solaris 2.1.

IBM PC : Windows 3.1.

14.Any other programming or operating information or restrictions:

The program is approximately 800 source steps(including comment lines).

The graphical programs are as follows:

FACOM M-780 : CALCOMP plotter or the compatible ones.

SUN4 : X-windows.

IBM PC : windows 3.1.

15.Name and establishment of author:

T. Ikushima

Japan Atomic Energy Research Institute,

Tokai Research Establishment,

Department of Fuel Cycle Safety Research,

Tokai-mura, Naka-gun, Ibaraki-ken, 319-11

Japan

16.Material available:

Program source and data library.

Appendix E Program Abstract

1. Name :

THERMLIB.

2. Computer for which the program is designed and others upon which it is possible:

FACOM M-780, SUN4 or IBM-PC.

3. Nature of physical problem solved:

Data processing program of thermal property data for heat conduction calculations (Data library was introduced from Lawrence Radiation Laboratory in USA).

4. Method of solutions:

-

5. Restrictions on the complexity of the problem:

None.

6. Typical running time:

FACOM-M780 : 1 seconds.
SUN4 : 2 seconds.
IBM-PC : 3 seconds.

7. Unusual features of the program:

None.

8. Related and auxiliary program:

None.

9. Status:

-

10.References:

(1)Lawrence Radiation Laboratory, "A Compilation of Thermal Property Data for Computer Heat-Conduction Calculations", UCRL-50589,(1968).

(2)Ikushima,T. and Hode S.,"Simplified Analysis Computer Program and Their Adequacy for Radioactive Materials Shipping casks", PATRAM'89,pp.1202-1209, Washington DC, USA ,June 11-16,(1989).

(3)Ikushima,T. et al.,"Simplified Computer Codes for Cask Impact Analysis", PATRAM'92, pp.1419-1426, Yokohama, Japan, September 13-18,(1992).

(4)Ikushima,T., Ohshika,J. and Ishiwata,T.,"Computer Code System for Structural Anaalysis of Radioactive Materials Transport", PATRAM'95,

Appendix F Program Source List

```
C*********************************************************************
C
C     PLOTTING PROGRAM FOR THERMLIB (HEAT TRANSFER MATERIAL DATA)
C     ORIGINALLY TRUMP-3 MATERIAL DATA LIBRARY
C
C         KEY-WORD
C           TITLE          PLOT MAIN TITLE
C           MAT            MATERIAL DATA
C           PLOT           PLOT DATA
C           END            END DATA
C
C         LIBRARY
C           FT11           CGS-CAL-C
C           FT12           MKS-J  -K
C           FT13           MKS-J  -C
C
C*********************************************************************
      REAL*8  ALIB(13),AMAT(10),XMAT,XMATNO,AMAT1,ANAME,AAA,BLNK8
      LOGICAL*1  KCHAR(1), NBLNK
      COMMON /COMPL1/ ATITLE(18),XXNAME(10),YYNAME(10)
     *               ,XDATA(2000,10),YDATA(2000,10)
      COMMON /COMPL2/ PXMIN,PXMAX,PYMIN,PYMAX,XL1,YL1,NPLOT,NDATA
     *               ,NDATAX(20)
      COMMON /COMPL3/ AMAT1(10),ANAME(10),UNAME(3)
      COMMON /NAL/ NALPHA
      DIMENSION  CAPT(100),CONT(100),TVARC(100),TVARK(100)
      DIMENSION  XT1(6),XT2(6),XT3(6),YT1(6),YT2(6),YT3(3),YT4(3),YT5(3)
      DIMENSION  YT6(6)
      DIMENSION  YT11(3),YT12(3),YT13(3)
      DIMENSION  YT21(3),YT22(3),YT23(3)
      DIMENSION  YT31(3),YT32(3),YT33(3)
      DIMENSION  CAPTMX(10), CONTMX(10), TMELTM(10), HMELTM(10),
     1           LTABCM(10), LTABKM(10), DENSMX(10)
      EQUIVALENCE (ALIB(1),KCHAR(1))
C
      DATA   XT1  /'TEMPERATURE  (C)        '/
      DATA   XT2  /'TEMPERATURE  (K)        '/
      DATA   XT3  /'TIME  (SEC)             '/
      DATA   YT1  /'HEAT CAPACITY           '/
      DATA   YT2  /'THERMAL CONDUCTIVITY    '/
      DATA   YT3  /'(CGS-CAL-C) '/
      DATA   YT4  /'(MKS-J-K)   '/
      DATA   YT5  /'(MKS-J-C)   '/
      DATA   YT6  /'DENSITY                 '/
      DATA   YT11 /'(CAL/G-C)   '/
      DATA   YT12 /'(J/KG-K)    '/
      DATA   YT13 /'(J/KG-C)    '/
      DATA   YT21 /'(CAL/CM-S-C)'/
      DATA   YT22 /'(J/M-S-K)   '/
      DATA   YT23 /'(J/M-S-C)   '/
      DATA   YT31 /'(G/CM**3)   '/
      DATA   YT32 /'(KG/M**3)   '/
      DATA   YT33 /'(KG/M**3)   '/
      DATA   KEYT /'TITL'/
      DATA   KEYM /'MAT '/
      DATA   KEYE /'END '/
      DATA   KEYP /'PLOT'/
      DATA   NBLNK/' '   /
      DATA   BLNK8/'        '/
C...INITIAL SET
```

Appendix F (Continued)

```
      CALL DTLIST(1,6)
      DO 90 I=1,10
      AMAT(I) = BLNK8
   90 CONTINUE
      XBOX   = 300.0
      YBOX   = 210.0
      XWIDTH = 200.0
      YWIDTH = 160.0
      XL1    = 200.0
      YL1    = 160.0
      NGRAPH = 0
      ICKTT  = 0
C...READ INPUT DATA (TITLE)
  100 CONTINUE
      READ(1,1,END=9000)  KEY, (ATITLE(I),I=1,16)
      IF(KEY.EQ.KEYE)            GO TO 9000
      IF(KEY.NE.KEYT)            GO TO 8000
CC100 CONTINUE
      WRITE(6,23)
      WRITE(6,24)  (ATITLE(I),I=1,16)
C...READ INPUT DATA (MAT)
      READ(1,2,END=9000) KEY,NALPHA,IUNIT,ICK,NMAT,(AMAT(II),II=1,NMAT)
      IF(KEY.EQ.KEYE)            WRITE(6,27)
      IF(KEY.NE.KEYM)            GO TO 8000
      IF(IUNIT.EQ.0 )                  GO TO  8200
      IF(IUNIT.EQ.-1)                  GO TO  8210
      IF(IUNIT.EQ.-2)                  GO TO  8220
      IF(IUNIT.EQ.-3)                  GO TO  8230
      IF(IUNIT.LT.0 .OR. IUNIT.GT.3)   GO TO  8010
      IF(ICK  .LT.-2.OR. ICK  .GT.3)   GO TO  8020
      IF(NMAT .LE.0 .OR. NMAT .GT.10)  GO TO  8030
C
      WRITE(6,25)  IUNIT,ICK,NMAT, (AMAT(II),II=1,NMAT)
      IF(ICK.LE.0)     ICKTT = 1
      ICK  = IABS(ICK)
C...READ PLOT DATA
      READ(1,3)  KEY,PXMIN,PXMAX,PYMIN,PYMAX
      IF(KEY.NE.KEYP)            GO TO 8000
      WRITE(6,26)    PXMIN,PXMAX,PYMIN,PYMAX
C...INPUT DATA PRE-PROCESS
C   REORDER ASCENDING MATERIAL NUMBER
C
      IF(NMAT.EQ.1)            GO TO  250
      NMATS1 = NMAT - 1
      DO 200 N=1,NMATS1
      NPLUS1 = N + 1
      DO 150 NN=NPLUS1,NMAT
        IF(AMAT(N) - AMAT(NN))  150,150,110
  110 CONTINUE
      AAA = AMAT(N)
      AMAT(N) = AMAT(NN)
      AMAT(NN)= AAA
  150 CONTINUE
  200 CONTINUE
  250 CONTINUE
C
C...READ MATERIAL LIBRARY
C
      MREAD = IUNIT+10
      REWIND  MREAD
```

Appendix F (Continued)

```
C
      KMAT = 1
      MATCH= 0
      ALIB(2) = BLNK8
  300 CONTINUE
      READ(MREAD,4,END=900)  (ALIB(II),II=1,3)
      IF(KCHAR(1).EQ.NBLNK)  GO TO  300
      IF(AMAT(KMAT).EQ.ALIB(2))    GO TO  400
      IF(AMAT(KMAT).GT.ALIB(2))    GO TO  300
      IF(AMAT(KMAT).LT.ALIB(2))    GO TO  900
  400 CONTINUE
C...MATCHING O.K.
      MATCH= MATCH+1
C
      BACKSPACE  MREAD
      READ(MREAD,5)  XMAT,XMATNO,KA,KB,LTABC,LTABK,DENS,CAPT1
     *              ,CONT1,TMELT,HMELT
      DENSMX(MATCH) = DENS
      CAPTMX(MATCH) = CAPT1
      CONTMX(MATCH) = CONT1
      TMELTM(MATCH) = TMELT
      HMELTM(MATCH) = HMELT
      LTABCM(MATCH) = LTABC
      LTABKM(MATCH) = LTABK
C...READ HEAT CAPACITY DATA
      IF(ICK  .EQ.3)          GO TO  810
      IF(LTABC.EQ.1) LTABC=0
      IF(LTABC.EQ.0)          GO TO  500
      READ(MREAD,6)  (CAPT(II),TVARC(II), II=1,LTABC)
  500 CONTINUE
C...READ THERMAL CONDUCTIVITY DATA
      IF(LTABK.EQ.1) LTABK=0
      IF(LTABK.EQ.0)          GO TO  600
      READ(MREAD,6)  (CONT(II),TVARK(II), II=1,LTABK)
  600 CONTINUE
C
      IF(ICK.EQ.2)            GO TO  700
C...SELECT HEAT CAP.
      IF(LTABC.EQ.0)          GO TO  620
      DO 610 I=1,LTABC
      XDATA(I,MATCH) = TVARC(I)
      YDATA(I,MATCH) = CAPT (I)
  610 CONTINUE
      NDATAX(MATCH) = LTABC
                              GO. TO  800
  620 CONTINUE
      XDATA(1,MATCH) = 0.0
      XDATA(2,MATCH) = 1.0
      YDATA(1,MATCH) = CAPT1
      YDATA(2,MATCH) = CAPT1
      NDATAX(MATCH)  = 0
                              GO TO  800
  700 CONTINUE
C...SELECT THERMAL CONDUC.
      IF(LTABK.EQ.0)          GO TO  720
      IF(LTABK.EQ.0)          GO TO  720
      DO 710 I=1,LTABK
      XDATA(I,MATCH) = TVARK(I)
      YDATA(I,MATCH) = CONT (I)
  710 CONTINUE
```

Appendix F (Continued)

```
      NDATAX(MATCH) = LTABK
                                GO TO  800
  720 CONTINUE
      XDATA(1,MATCH) = 0.0
      XDATA(2,MATCH) = 1.0
      YDATA(1,MATCH) = CONT1
      YDATA(2,MATCH) = CONT1
      NDATAX(MATCH)  = 0
  800 CONTINUE
                               GO TO  850
  810 CONTINUE
C...DENSITY PLOT  ( ONLY 1 DATA )
      XDATA(1,MATCH) =   0.0
      XDATA(2,MATCH) = 100.0
      YDATA(1,MATCH) = DENS
      YDATA(2,MATCH) = DENS
      NDATAX(MATCH)  = 0
  850 CONTINUE
C
      AMAT1(MATCH) = AMAT(KMAT)
      ANAME(MATCH) = ALIB(1)
C
      IF(KMAT.GE.NMAT)          GO TO 1000
      KMAT = KMAT+1
                                GO TO  300
  900 CONTINUE
C...SPECIFIED MAT. NO. NOT FOUND, BUT CONTINUE NEXT MATERIAL
C
      WRITE(6,21)  AMAT(KMAT)
      IF(KMAT.GE.NMAT)          GO TO 1000
      KMAT = KMAT+1
                                GO TO  300
 1000 CONTINUE
C...PLOTTING PRE-PROCESS
      DO 1100 I=1,6
      XXNAME(I) = XT1(I)
      IF(ICKTT.EQ.0 .AND. IUNIT.EQ.2)  XXNAME(I) = XT2(I)
      IF(ICKTT.EQ.1)      XXNAME(I) = XT3(I)
C
      IF(ICK.EQ.1)  YYNAME(I) = YT1(I)
      IF(ICK.EQ.2)  YYNAME(I) = YT2(I)
      IF(ICK.EQ.3)  YYNAME(I) = YT6(I)
 1100 CONTINUE
C
      DO 1200 I=1,3
      IF(ICK.EQ.1 .AND. IUNIT.EQ.1)   UNAME(I) = YT11(I)
      IF(ICK.EQ.1 .AND. IUNIT.EQ.2)   UNAME(I) = YT12(I)
      IF(ICK.EQ.1 .AND. IUNIT.EQ.3)   UNAME(I) = YT13(I)
      IF(ICK.EQ.2 .AND. IUNIT.EQ.1)   UNAME(I) = YT21(I)
      IF(ICK.EQ.2 .AND. IUNIT.EQ.2)   UNAME(I) = YT22(I)
      IF(ICK.EQ.2 .AND. IUNIT.EQ.3)   UNAME(I) = YT23(I)
      IF(ICK.EQ.3 .AND. IUNIT.EQ.1)   UNAME(I) = YT31(I)
      IF(ICK.EQ.3 .AND. IUNIT.EQ.2)   UNAME(I) = YT32(I)
      IF(ICK.EQ.3 .AND. IUNIT.EQ.3)   UNAME(I) = YT33(I)
 1200 CONTINUE
C
C...PLOT INITIAL SET
      NGRAPH = NGRAPH + 1
      IF(NGRAPH.EQ.1)    CALL PLOTS(0.,0.)
CCC   IF(NGRAPH.EQ.1)    CALL PLOT(30.,30.,-3)
```

Appendix F (Continued)

```
      IF(NGRAPH.EQ.1)     CALL PLOT(0.0,0.0,-3)
      IF(NGRAPH.EQ.1)     CALL NEWPEN(2)
      IF(NGRAPH.EQ.1)     GO TO 1250
                          CALL PLOT(300.,0.,-3)
                          CALL PLOT( 0.0, 0.0, 666 )
                          CALL PLOT( 0.0, 0.0, 777 )
                          CALL PLOT( 0.0, 0.0, 888 )
 1250 CONTINUE
C...BOX
      CALL NEWPEN(1)
      XBOXX=XBOX-20.0
      XBST=-20.0
      CALL PLOT(XBST,0.0 , 3)
      CALL DASHP(XBOXX, 0.0, 1.1 )
      CALL DASHP(XBOXX,YBOX, 1.1 )
      CALL DASHP(XBST, YBOX, 1.1 )
      CALL DASHP(XBST,  0.0, 1.1 )
      CALL PLOT ( 0.0,  0.0, 3 )
      CALL NEWPEN(2)
C..TITLE
      CALL SYMBOL(  0.0, 5.0, 3.0, 'FIG.  .   ', 0.0, 10 )
      CALL SYMBOL( 20.0, 5.0, 3.0, ATITLE, 0.0, 64 )
C
      NPLOT = MATCH
C
C...CHECK PRINT
      WRITE(6,40)
      WRITE(6,41)  (XXNAME(I),I=1,6)
      WRITE(6,42)  (YYNAME(I),I=1,6),(UNAME(II),II=1,3)
      DO 1400 I=1,MATCH
      WRITE(6,43)  (ANAME(I),AMAT1(I))
      WRITE(6,46)  DENSMX(I), CAPTMX(I), CONTMX(I), TMELTM(I),
     1             HMELTM(I), LTABCM(I), LTABKM(I)
      JJ = NDATAX(I)
      WRITE(6,44)
      DO 1300 J=1,JJ
        WRITE(6,45)  J,XDATA(J,I),YDATA(J,I)
 1300 CONTINUE
 1400 CONTINUE
C
      CALL CURVE
                                GO TO  100
C
 8000 CONTINUE
      WRITE(6,31)  KEY
                                 GO TO 8100
 8010 CONTINUE
      WRITE(6,32)  IUNIT
                                 GO TO 8100
 8020 CONTINUE
      WRITE(6,33)  ICK
                                 GO TO 8100
 8030 CONTINUE
      WRITE(6,34)  NMAT
 8100 CONTINUE
      STOP 999
 8200 CONTINUE
      CALL DTLIST(10,6)
      GO TO 100
 8210 CONTINUE
```

Appendix F (Continued)

```
      CALL DTLIST(11,6)
      GO TO 100
 8220 CONTINUE
      CALL DTLIST(12,6)
      GO TO 100
 8230 CONTINUE
      CALL DTLIST(13,6)
      GO TO 100
 9000 CONTINUE
C...PLOT END
      CALL PLOT(0.0,0.0,999)
C
    1 FORMAT(A4, 2X, 16A4)
    2 FORMAT(A4,I1,3I5,10A5)
    3 FORMAT(A4,6X,4F10.3)
    4 FORMAT(6A5,6A8,A2)
    5 FORMAT(2A5,4I5,5E10.3)
    6 FORMAT(8E10.3)
   21 FORMAT('  *** SPECIFIED MATERIAL NO. NOT FOUND.   MAT. NO. = '
     *       , A5 )
   22 FORMAT('  ¥¥¥ JOB NORMAL END. ¥¥¥' )
   23 FORMAT('1','========  INPUT CHECK LIST ========' /// )
   24 FORMAT(' ',5X, 'TITLE = ', 16A4 /)
   25 FORMAT(' ',5X, 'MATERIAL DATA = '  /
     *            6X, 5X, 'IUNIT    = ', I5  /
     *            6X, 5X, 'ICK      = ', I5  /
     *            6X, 5X, 'NMAT     = ', I5  /
     *            6X, 5X, 'MAT. NO. = ', 10(A5,3X) ///)
   26 FORMAT(/' ',5X, 'PLOT     DATA = '  /
     *            6X, 5X, 'XMIN     = ', F12.4 /
     *            6X, 5X, 'XMAX     = ', F12.4 /
     *            6X, 5X, 'YMIN     = ', F12.4 /
     *            6X, 5X, 'YMAX     = ', F12.4 //// )
   27 FORMAT(' ',5X, 'END  DATA ' /// )
   31 FORMAT('  *** ERROR ***  KEY WORD SEQUENCE ERROR.  KEY = ', A5)
   32 FORMAT('  *** ERROR ***  DATA RANGE OVER.  INUIT = ', I6  )
   33 FORMAT('  *** ERROR ***  DATA RANGE OVER.  ICK   = ', I6  )
   34 FORMAT('  *** ERROR ***  DATA RANGE OVER.  NMAT  = ', I6  )
   40 FORMAT(' ','========  OUTPUT DATA  LIST ========' /// )
   41 FORMAT(' ',5X, 'X-DATA = ',  6A4 /)
   42 FORMAT(' ',5X, 'Y-DATA = ',  6A4,3A4 /)
   43 FORMAT(/' ',5X, 'MATERIAL NAME = ',A8,4X,'MATERIAL NO. = ',A8 / )
   44 FORMAT(' ',5X, '     SEQ    XDATA        YDATA    ' /  )
   45 FORMAT(' ',5X,3X,I5, F12.4,F12.4  )
   46 FORMAT(' ',5X, 'DENSITY                              = ',  1PE12.5 /
     1          ,6X, 'HEAT CAPACITY                        = ',  1PE12.5 /
     2          ,6X, 'THERMAL CONDUCTIVITY                 = ',  1PE12.5 /
     3          ,6X, 'TRANSIENT TEMPERATURE                = ',  1PE12.5 /
     4          ,6X, 'LATENT HEAT                          = ',  1PE12.5 /
     5          ,6X, 'NO. OF HEAT CAPACITY DATA            = ',  I6      /
     6          ,6X, 'NO. OF THERMAL CONDUCTIVITY DATA = ',  I6      /)
      STOP
      END
```

Appendix F (Continued)

```
      SUBROUTINE CURVE
C*********************************************************************
C
C     PLOTTING PROGRAM
C
C        INPUT DATA
C           ATITLE (18)    =  HEADING  (MAX. 72 CHARS.)
C           XTITLE (10)     =  TITLE OF X-AXIS  (MAX. 40 CHARS.)
C           YTITLE (10)     =  TITLE OF Y-AXIS  (MAX. 40 CHARS.)
C           IPARM           =  PARM.   =1  LINEAR,  =2  SMOOTHING
C           PXMIN,PXMAX     =  USER DEFINED MIN. AND MAX. VALUE OF X-AXIS
C                              IF PXMIN=PXMAX=0.0  THEN  AUTOMATIC SCALE.
C           PYMIN,PYMAX     =  USER DEFINED MIN. AND MAX. VALUE OF Y-AXIS
C                              IF PYMIN=PYMAX=0.0  THEN  AUTOMATIC SCALE.
C           NPLOT           =  NUM. OF PLOTTING CURVE/GRAPH  (MAX. 20)
C           NDATA           =  NUM. OF PLOTTING DATA/CURVE  (MAX. 1000)
C           XDATA  (NDATA) =  XDATA OF 1-ST CURVE
C           YDATA  (NDATA) =  YDATA OF 1-ST CURVE
C           XDATA  (NDATA) =  XDATA OF 2-ND CURVE
C           YDATA  (NDATA) =  YDATA OF 2-ND CURVE
C         END  OR  IF YOU WANT NEXT GRAPH THEN REPEAT FROM ATITLE DATA.
C
C*********************************************************************
C
      REAL*8  AMAT1,ANAME
      COMMON /COMPL1/ ATITLE(18),XXNAME(10),YYNAME(10)
     *               ,XDATA(2000,10),YDATA(2000,10)
      COMMON /COMPL2/ PXMIN,PXMAX,PYMIN,PYMAX,XL1,YL1,NPLOT,NDATA
     *               ,NDATAX(20)
      COMMON /COMPL3/ AMAT1(10),ANAME(10),UNAME(3)
      COMMON /NAL/ NALPHA
      DIMENSION  CNUM1(20)
      DATA  CNUM1 / '1','2','3','4','5','6','7','8','9','A'
     *             ,'B','C','D','E','F','G','H','I','J','K' /
C*********  PLOT INITIAL VALUE SET
      IPARM=1
C
C...CHECK LIST
C...PLOT  INITIAL SET
C...PLOT NODE SYMBOL
      XX1 = 200.0
      YY1 = 180.0
      DO 100 I=1,NPLOT
      YY2 = YY1 - (I-1)*5.0
      FPN1 = I+0.005
      CALL NUMBER(XX1,YY2,2.5,FPN1    ,0.0,-1)
      CALL SYMBOL(XX1+ 5.0,YY2,2.5,ANAME(I),0.0, 5)
      CALL SYMBOL(XX1+20.0,YY2,2.5,AMAT1(I),0.0, 5)
  100 CONTINUE
C
C...SET INSIDE BOX ORIGIN
      CALL PLOT(35.0,30.0,-3)
      CALL PLOT( 0.0, 0.0, 3)
      CALL PLOT( 0.0, YL1, 2)
      CALL PLOT( XL1, YL1, 2)
      CALL PLOT( XL1, 0.0, 2)
      CALL PLOT( 0.0, 0.0, 2)
      CALL NEWPEN(1)
      XXXL1=XL1
      DO 150 I=1,7
```

Appendix F (Continued)

```
      YYHEIT= 20.0 * FLOAT(I)
      IF ( I.GT.6 ) XXXL1=160.0
      CALL PLOT( 0.0, YYHEIT, 3 )
      CALL DASHP (  XXXL1, YYHEIT, 1.1 )
  150 CONTINUE
      YYYL1=YL1
      DO 200 I=1,9
      XXWITH= 20.0 * FLOAT(I)
      IF ( I.GT.8 ) YYYL1=120.0
      CALL PLOT( XXWITH, 0.0, 3 )
      CALL DASHP ( XXWITH, YYYL1, 1.1 )
  200 CONTINUE
      CALL NEWPEN(2)
      VX= XL1
      VY= YL1
C...PLOT  TITLE
      YTPNUM=-20.0
      IF( NALPHA.EQ.4 ) YTPNUM=-22.5
      IF( NALPHA.EQ.5 ) YTPNUM=-25.0
      IF( NALPHA.EQ.6 ) YTPNUM=-27.5
      CALL SYMBOL( 60.0,-11.0,3.0,XXNAME,0.,20)
      CALL SYMBOL(YTPNUM, 35.0,3.0,YYNAME,90.,20)
      CALL SYMBOL(YTPNUM, 100.0,3.0,UNAME ,90.,12)
C
C...MIN.,MAX.
      IF (PXMIN.NE.0.0.AND.PXMAX.NE.0.0)     GOTO   500
      CALL MINMAX(XDATA,NPLOT,NDATAX,PXMIN,PXMAX)
  500 CONTINUE
      IF (PYMIN.NE.0.0.AND.PYMAX.NE.0.0)     GOTO   600
      CALL MINMAX(YDATA,NPLOT,NDATAX,PYMIN,PYMAX)
C
C...DEFAULT  YMIN = 0.0
      IF (PYMIN.GE.0.0)    PYMIN = 0.0
  600 CONTINUE
C...PLOT AXIS
C... X-AXIS
      DX1 = (PXMAX-PXMIN)/5.0
      CALL AXFUN1(DX1,SDX,ISUFX)
      DX  = SDX*5.0/VX
      PXMAX1 = PXMIN + SDX*5.0
      PXMIN1 = PXMIN
C... Y-AXIS
      IF (PYMIN.GE.0.0)     GO TO  650
      TYM1 = -PYMIN
      DY1  =  PYMAX/3.0
      IF (DY1.LT.TYM1)   CALL AXFUN1(TYM1,SDY,ISUFY)
      IF (DY1.GE.TYM1)   CALL AXFUN1(DY1 ,SDY,ISUFY)
      PYMAX1 = SDY*3.0
      PYMIN1 = -SDY
                     GO TO  660
  650 CONTINUE
      DY1 = (PYMAX-PYMIN)/4.0
      CALL AXFUN1(DY1,SDY,ISUFY)
      PYMAX1 = PYMIN + SDX*4.0
      PYMIN1 = PYMIN
  660 CONTINUE
      DY  = SDY*4.0/VY
C
C
      CALL PLTAX2(1,VX,PXMIN1,PXMAX1,SDX,ISUFX)
```

Appendix F (Continued)

```
      CALL PLTAX2(2,VY,PYMIN1,PYMAX1,SDY,ISUFY)
C...PLOT CURVE
      DO 800 I=1,NPLOT
        NDATA = NDATAX(I)
        IF(NDATA.EQ.0)            GO TO  680
        XDATA(NDATA+1,I)=PXMIN1
        XDATA(NDATA+2,I)=DX
        YDATA(NDATA+1,I)=PYMIN1
        YDATA(NDATA+2,I)=DY
                                  GO TO  690
  680 CONTINUE
C...CONSTANT VALUE
        XDATA(1,I) = PXMIN1
        XDATA(2,I) = PXMAX1
        XDATA(3,I) = PXMIN1
        XDATA(4,I) = DX
CCC     YDATA(1,I) = PYMIN1
CCC     YDATA(2,I) = PYMAX1
        YDATA(3,I) = PYMIN1
        YDATA(4,I) = DY
        NDATA      = 2
  690 CONTINUE
C
       CALL LINE(XDATA(1,I),YDATA(1,I),NDATA,1,0,IDMY)
        TTMP1=NDATA/6
        TTMP2=TTMP1/NPLOT
      DO 700 KKK=1,NDATA,2
        TX=(XDATA(KKK,I)-XDATA(NDATA+1,I))/XDATA(NDATA+2,I)
        TY=(YDATA(KKK,I)-YDATA(NDATA+1,I))/YDATA(NDATA+2,I)
        CALL SYMBOL(TX,TY,1.5,CNUM1(I),0.,1)
  700 CONTINUE
  800 CONTINUE
C
C...RESET ORIGIN
      CALL PLOT(-35.0,-30.0,-3)
      RETURN
      END


      SUBROUTINE MINMAX(X,NPLOT,NDATAX,XMIN,XMAX)
      DIMENSION  X(2000,1), NDATAX(1)
      XMAX=-1.0E70
      XMIN= 1.0E70
      DO 200 I=1,NPLOT
      NDATA = NDATAX(I)
      IF(NDATA.EQ.0)    NDATA = 2
      DO 100 J=1,NDATA
      XMAX=AMAX1(XMAX, X(J,I))
      XMIN=AMIN1(XMIN, X(J,I))
  100 CONTINUE
  200 CONTINUE
      RETURN
      END
```

Appendix F (Continued)

```
      SUBROUTINE PLTAX2(IXY,ALEN,XMIN,XMAX,SD,ISUF)
C*********************************************************************
C
C     PLOT AXIS     ( ORIGIN=(0.0,0.0) )
C
C        INPUT
C           IXY     = 1  XAXIS  / =2  YAXIS
C           ALEN    = LENGTH OF AXIS
C           XMIN    = MIN. OF AXIS
C           XMAX    = MAX. OF AXIS
C           SD      =
C           ISUF    = 10.0** ISUF
C
C
C*********************************************************************
C
      COMMON /NAL/ NALPHA
      IX1 = ISUF
      KX1 = ISUF
      KX2 = KX1-2
C
      IF (KX1.EQ.0)    KX2 = KX1
      IF (KX1.EQ.1)    KX2 = KX1 - 1
C
C...
      DELX = SD
      IF (IXY.EQ.2)            GOTO   400
C
C...PLOT X-AXIS
CCC   CALL PLOT(0.0,0.0,3)
CCC   CALL PLOT(ALEN,0.0,2)
C...
CCC   CALL PLOT(ALEN,150.0,2)
CCC   CALL PLOT(0.0,150.0,2)
      DA = ALEN/5.0
      DO 100 I=1,20
      TX=DA*I
      IF (TX.GE.ALEN)          GOTO   100
      CALL PLOT(TX,1.0,3)
      CALL PLOT(TX,-1.0,2)
  100 CONTINUE
      DO 200 I=1,20
      TX=DA*(I-1)-3.0
      TY=-5.0
      IF (TX      .GT.ALEN)    GOTO   200
      TN=XMIN+ DELX*(I-1)
      IF (IX1.LE.-2)      TN=TN*10**(-IX1)
CC    CALL NUMBER(TX,TY,3.0,TN,0.0,-1)
      CALL NUMBER(TX,TY,3.0,TN,0.0, 1)
  200 CONTINUE
      IF (IX1.GT.-2)           GOTO   300
      CALL SYMBOL( ALEN +10.,-5.0,3.0,'(X10  )',0.0,7)
      TN=IX1
      CALL NUMBER( ALEN +10.+12.,-3.0,2.0,TN,0.0,-1)
  300 CONTINUE
                               GOTO   700
  400 CONTINUE
C...PLOT Y-AXIS
CCC   CALL PLOT(0.0,0.0,3)
CCC   CALL PLOT(0.0,ALEN,2)
```

Appendix F (Continued)

```
      DA = ALEN/4.0
      DO 500 I=1,20
      TY=DA*I
      IF (TY.GE.ALEN)          GOTO   500
      CALL PLOT(-1.0,TY,3)
      CALL PLOT( 1.0,TY,2)
  500 CONTINUE
      MMNUM=NALPHA
      IF(NALPHA.EQ.0) MMNUM=2
      YPNUMB=-15.0
      IF(NALPHA.EQ.3) YPNUMB=-17.0
      IF(NALPHA.EQ.4) YPNUMB=-19.5
      IF(NALPHA.EQ.5) YPNUMB=-22.5
      IF(NALPHA.EQ.6) YPNUMB=-25.0
      DO 600 I=1,20
      TX=-12.0
      TY=DA*(I-1)-1.0
      IF ((TY    ).GT.ALEN)   GOTO   600
      TN=XMIN+ DELX*(I-1)
CCC   IF (IX1.LE.-2)      TN=TN*10**(-IX1)
CCC ADD
      IF (KX1.LE.-1)      GO TO 550
      TN = TN*10.0 **(-KX2)
      CALL NUMBER(TX,TY,3.0,TN,0.0,-1)
                          GO TO 600
  550 CONTINUE
C...PLOT  X.XX
      CALL NUMBER(YPNUMB, TY,3.0,TN,0.0,MMNUM )
  600 CONTINUE
CCC   IF (IX1.GT.-2)          GOTO   700
CCC ADD
      IF (KX2.EQ. 0)          GOTO   700
      IF (KX1.LE.-1)          GOTO   700
CCC
      CALL SYMBOL(-20.0, ALEN  +3.0,3.0,'(X10  )',0.0,7)
CCC   TN=IX1
CCC ADD
      TN=KX2
CCC
      CALL NUMBER( -8.0, ALEN  +5.0,2.0,TN,0.0,-1)
  700 CONTINUE
C     WRITE(50,6000)
C     WRITE(50,6010) IXY,ALEN,XMIN,XMAX
C     WRITE(50,6020)       IX1,DELX,DA,KX1,KX2
 6000 FORMAT('0',' ¥¥¥ PLOTAX CHECK LIST ¥¥¥ ')
 6010 FORMAT(' ',' IXY=',I2,3X,'ALEN=',F10.3,3X,'MIN=',E12.4,
     *       3X,'MAX=',E12.4)
 6020 FORMAT(' ',                          3X,'IX1=',I5,3X,'DELX=',
     *       E12.4,3X,'DA=',E12.4, '  KX1=',I5,'  KX2=',I5 )
      RETURN
      END
```

Appendix F (Continued)

```
      SUBROUTINE AXFUN1(DX1,SDX,ISUFX)
C*********************************************************************
C
C     AXIS FUNCTION  (ROUND  N*10**ISUFX )
C
C*********************************************************************
C
      TX = ALOG10(DX1)
      IF (TX.LT.0.0)   TX = TX-1.0
      KX1 = IFIX(TX)
      ISUFX = KX1
      SX1 = FLOAT(KX1)
      F   = DX1/(10.0**KX1)
C
C...DX1 = F*10**KX1  ( 1<= F <10 )
C
      IF (F.GT.5.0)    GO TO  100
      IF (F.GT.4.0)    GO TO  200
      IF (F.GT.3.0)    GO TO  300
      IF (F.GT.2.0)    GO TO  400
      IF (F.GT.1.0)    GO TO  500
C
      SDX = 10.0**SX1
      RETURN
C
  100 CONTINUE
      SDX = 10.0**(SX1+1.0)
      RETURN
C
  200 CONTINUE
      SDX =  5.0*10.0**SX1
      RETURN
C
  300 CONTINUE
      SDX =  4.0*10.0**SX1
      RETURN
C
  400 CONTINUE
      SDX =  3.0*10.0**SX1
      RETURN
C
  500 CONTINUE
      SDX =  2.0*10.0**SX1
      RETURN
      END
```

Appendix F (Continued)

```
      SUBROUTINE DTLIST(LU1,LU2)
      DIMENSION IA(20)
      REWIND LU1
      N = 1
      L = 51
   15 IF ( L .LE. 50 ) GO TO 30
   20 WRITE(LU2,2)
      WRITE(LU2,3) ( I, I=1,8 )
      WRITE(LU2,4)
      L = 1
   30 READ(LU1,1,END=50) ( IA(I),I=1,20 )
      WRITE(LU2,5)      N,( IA(I),I=1,20 ),N
      IF ( L .NE. 50 ) GO TO 40
      WRITE(LU2,6)
      WRITE(LU2,10) ( I, I=1,8 )
      WRITE(LU2,7)
   40 L = L + 1
      N = N + 1
      GO TO 15
   50 CONTINUE
      WRITE(LU2,6)
      WRITE(LU2,10) ( I, I=1,8 )
      WRITE(LU2,8)
      WRITE(LU2,9) LU1
      REWIND LU1
    1 FORMAT( 20A4 )
    2 FORMAT( 1H1, //, 50X, '    INPUT DATA ECHO ' / )
    3 FORMAT( 16X, 'DATA ', 4X, 8( 9X, I1 ) )
    4 FORMAT( 14X, 'SEQ. NO.', 3X, 8('----5----0'), / )
    5 FORMAT( 16X, I4, 5X, 20A4, 2X, I4 )
    6 FORMAT( 1H0, 24X, 8('----5----0') )
    7 FORMAT(1H0, 30X, '* * *  CONTINUE  * * *' )
    8 FORMAT(1H0, 30X, '* * *  INPUT DATA END  * * *' )
    9 FORMAT(1H0,30X,'* * *  INPUT DATA FROM FILE NO. =',I3,' * * *' )
   10 FORMAT( 25X, 8(9X,I1) )
   11 FORMAT(1H0)
      RETURN
      END
```

Appendix G Data Library

```
DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

   1       AL    1001              12   12 2.698     0.22      0.57      660.2     94.9
   2        0.0        -273.15   0.0024    -252.6    0.01      -240.0    0.0431    -217.5
   3        0.0815     -195.8    0.130     -162.0    0.185     -100.0    0.215       0.0
   4        0.270       500.0    0.303      660.0    0.259      660.1    0.259     2467.0
   5        0.91       -269.0    1.7       -266.0    2.4       -263.0    3.8       -253.0
   6        3.8        -243.0    2.0       -223.0    1.43      -213.0    0.7       -173.0
   7        0.57       -100.0    0.54         0.0    0.53       400.0    0.50       660.0
   8       ALLIQ 1002               0    3 2.36      0.259     0.22      660.2     95.0
   9        0.22        660.1    0.247      700.0    0.290      790.0
  10       SB    1006               5    7 6.696     0.0495    0.044     630.5     39.0
  11        0.0492        0.0    0.0575     310.0    0.069      630.0    0.061      630.1
  12        0.061      1400.0
  13        0.045         0.0    0.039      200.0    0.043      400.0    0.047      500.0
  14        0.057       630.5    0.050      630.6    0.050      700.0
  15       SBLIQ 1007               0    0 6.5       0.061     0.050     630.5     39.0
  16       AS    1008               2    0 5.73      0.079     0.01      814.0     88.2
  17        0.0775        0.0    0.096      613.0
  18       BE    1011              11    8 1.848     0.44      0.44      1283.0    310.7
  19        0.0        -273.15   0.015     -200.0    0.045     -175.0    0.34       -50.0
  20        0.41          0.0    0.51       100.0    0.565      200.0    0.645      400.0
  21        0.855      1283.0    0.76      1283.1    0.80      1930.0
  22        0.55        -75.0    0.435       25.0    0.350      200.0    0.280      400.0
  23        0.185       800.0    0.145     1000.0    0.125     1200.0    0.118     1283.0
  24       BI    1016               4    5 9.75      0.029     0.020     271.3     12.0
  25        0.0291        0.0    0.0325     271.3    0.0340     271.4    0.0419    1000.0
  26        0.020        20.0    0.0178     271.3    0.042      271.4    0.037      400.0
  27        0.037       700.0
  28       BILIQ 1017               5    4 10.0      0.034     0.026     271.3     12.2
  29        0.034       271.0    0.0354     400.0    0.0376     600.0    0.0397     800.0
  30        0.0414     1000.0
  31        0.0262      271.3    0.0405     300.0    0.0375     400.0    0.037      700.0
  32       CD    1041               6    4 8.65      0.055     0.22      320.9     13.0
  33        0.0545        0.0    0.055       25.0    0.057      100.0    0.062      320.9
  34        0.063       321.0    0.063      765.0
  35        0.210        18.0    0.250      320.9    0.083      321.0    0.119      435.0
  36       CDLIQ 1042               0    3 8.0       0.063     0.083     320.9     13.2
  37        0.083       320.9    0.105      375.0    0.119      435.0
  38       CO    1046              11    7 8.86      0.107     0.23      1495.0    62.5
  39        0.0        -273.15   0.01      -230.0    0.08      -135.0    0.100       0.0
  40        0.128       450.0    0.28       455.0    0.124      460.0    0.200     1120.0
  41        0.700      1125.0    0.163     1130.0    0.163     1495.0
  42        0.0        -273.15   1.15      -250.0    0.5       -200.0    0.35      -115.0
  43        0.20         25.0    0.19       150.0    0.5       1495.0
  44       CU    1051              12   12 8.94      0.092     0.95      1083.0    32.0
  45        0.0        -273.15   0.0019    -252.6    0.010     -240.0    0.0290    -217.5
  46        0.0471     -195.8    0.0554    -183.0    0.0659    -162.0    0.0808    -106.0
  47        0.0891      -51.0    0.0916       0.0    0.120     1083.0    0.120     1083.1
  48        17.0       -269.0    25.0      -267.0    34.0      -263.0    33.5      -258.0
  49        20.0       -253.0     8.60     -243.0     4.40     -233.0     1.86     -213.0
  50         1.45      -200.0     1.07     -120.0     0.96        0.0     0.80     1083.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
```

Appendix G (Continued)

```
 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

   51      AU    1056              10    7 19.3      0.0306    0.76      1063.6    15.4
   52       0.0        -273.15   0.02      -220.0    0.025     -178.0    0.029     -108.0
   53       0.030       -44.0    0.0307      38.0    0.0312     100.0    0.037     1063.6
   54       0.0355    1063.7     0.0355    2966.0
   55       0.0        -273.15   6.7       -263.0    1.3       -237.0    0.84      -200.0
   56       0.835     -100.0     0.76        0.0     0.60      1063.6
   57      AULIQ 1057              0    0 17.24      0.0355    0.4       1063.6    15.4
   58      CGEM1 1061              12    0 3.51      0.10      1.3       3550.0
   59       0.0        -273.15   0.005     -173.0    0.020     -123.0    0.065      -50.0
   60       0.102        0.0     0.190      100.0    0.255      200.0    0.308      300.0
   61       0.345      400.0     0.375      500.0    0.400      600.0    0.485     1000.0
   62      CGRAF 1066              12    7 2.25      0.16      0.40      3500.0    917.0
   63       0.0        -273.15   0.01      -200.0    0.100      -73.0    0.225      100.0
   64       0.280      200.0     0.320      300.0    0.353      400.0    0.402      600.0
   65       0.437      800.0     0.465     1000.0    0.495     1500.0    0.560     3500.0
   66       0.40         0.0     0.36       100.0    0.31       200.0    0.27       300.0
   67       0.24       400.0     0.22       500.0    0.20       600.0
   68      CAMOR 1071              12    2 1.51                          3500.0    917.0
   69       0.0        -273.15   0.01      -200.0    0.100      -73.0    0.225      100.0
   70       0.280      200.0     0.320      300.0    0.353      400.0    0.402      600.0
   71       0.437      800.0     0.465     1000.0    0.495     1500.0    0.560     3500.0
   72       0.023     -184.0     0.0150      0.0
   73      FE    1081              11    8 7.87      0.107     0.17
   74       0.098       -51.0    0.192       763.0    1.648      768.0    0.168      773.0
   75       0.176      901.0     0.940       906.0    0.148      911.0    0.164     1396.0
   76       0.705     1401.0     0.180      1406.0    0.180     1537.0
   77       0.0        -273.15   2.1       -262.0    0.4       -200.0    0.25      -162.0
   78       0.195       -73.0    0.172        25.0    0.07       800.0    0.075     1300.0
   79      FECRY 1082              10    8 7.87      0.107     0.172
   80       0.0        -273.15   0.0011    -252.6    0.017     -217.5    0.0343    -195.8
   81       0.0441    -183.0     0.0587    -162.0    0.0835    -106.0    0.098      -51.0
   82       0.105        0.0     0.192       763.0
   83       0.0        -273.15   2.1       -262.0    0.4       -200.0    0.25      -162.0
   84       0.195       -73.0    0.172        25.0    0.07       800.0    0.075     1300.0
   85      FEFUR 1083              12    3 7.87      0.107     0.172     1537.0    65.0
   86       0.105        0.0     0.192       763.0    1.648      768.0    0.168      773.0
   87       0.176      901.0     0.940       906.0    0.148      911.0    0.164     1396.0
   88       0.705     1401.0     0.180      1406.0    0.16      1537.0    0.14      3000.0
   89       0.175        0.0     0.072       800.0    0.072     3000.0
   90      PB    1091               6   10 11.35      0.031     0.082     327.5     5.7
   91       0.0305       0.0     0.0315      100.0    0.0338     327.5    0.034      327.6
   92       0.0328    1000.0     0.0303     1744.
   93       0.0826      20.0     0.0809       98.3    0.0757     204.5    0.070      259.4
   94       0.060      305.0     0.050       332.2    0.040      380.6    0.0373     426.6
   95       0.036      526.7     0.0358      691.1
   96      PBLIQ 1092               2    2 10.6      0.036     0.039     327.5     5.7
   97       0.036      327.5     0.0303     1744.0
   98       0.039      327.5     0.036       700.0
   99      MG    1096              12    7 1.74      0.24      0.36      651.0     88.0
  100       0.0        -273.15   0.004     -252.6    0.020     -240.0    0.141     -183.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
```

Appendix G (Continued)

```
 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  101       0.169     -162.0    0.210     -106.0    0.226      -51.0    0.243       25.0
  102       0.283      350.0    0.325      651.0    0.320      651.1    0.335      827.0
  103       0.0       -273.15   3.5       -256.0    1.0       -230.0    0.5       -195.0
  104       0.38      -150.0    0.36         0.0    0.34       400.0
  105      MGLIQ 1097            2     0 1.57       0.320     0.2       651.0     88.0
  106       0.32       651.0    0.34      1100.0
  107      MNCRY 1101            6     3 7.4        0.115     0.02
  108       0.0       -273.15   0.036     -200.0    0.075     -150.0    0.098     -100.0
  109       0.113        0.0    0.162      717.0
  110       0.0       -273.15   0.012     -200.0    0.016     -150.0
  111      MO    1106            5     7 10.2       0.059     0.32      2620.0    65.0
  112       0.0004    -257.0    0.03      -181.5    0.059        0.0    0.076     1100.0
  113       0.105     2500.0
  114       0.0       -273.15   0.85      -240.0    0.50      -190.0    0.33      -130.0
  115       0.33         0.0    0.22      1600.0    0.20      2620.0
  116      NI    1111            12    7 8.9        0.106     0.21      1454.0    72.0
  117       0.0       -273.15   0.0012    -252.6    0.0224    -217.5    0.0621    -162.0
  118       0.0844    -106.0    0.097      -51.0    0.142      355.0    0.446      360.0
  119       0.125      365.0    0.155     1454.0    0.1455    1454.1    0.1455    2732.0
  120       0.0       -273.15   0.6       -240.0    0.3       -180.0    0.25      -100.0
  121       0.21         0.0    0.13       350.0    0.185     1280.0
  122      OS    1114            5     2 22.57      0.031     0.205     3000.0    33.6
  123       0.0311       0.0    0.0385    1600.0    0.0443    3000.0    0.044     3000.1
  124       0.044     5000.0
  125       0.205       50.0    0.205      250.0
  126      PT    1116            8     8 21.4       0.032     0.165     1770.0    25.0
  127       0.0       -273.15   0.01      -253.0    0.020     -210.0    0.028     -130.0
  128       0.0315       0.0    0.043     1770.0    0.0435    1770.1    0.043     3827.0
  129       0.0       -273.15   3.0       -268.0    0.5       -240.0    0.23      -220.0
  130       0.175     -150.0    0.168        0.0    0.185      600.0    0.245     1200.0
  131      PU    1121            11    9 19.2       0.032     0.017     638.0     9.3
  132       0.032        0.0    0.0328     100.0    0.1744     125.0    0.0294     150.0
  133       0.0294     175.0    0.0724     200.0    0.0399     225.0    0.0399     450.0
  134       0.1120     475.0    0.0343     500.0    0.0343     638.0
  135       0.004     -123.0    0.008      -63.0    0.011      -43.0    0.019       17.0
  136       0.024       57.0    0.030       97.0    0.032      117.0    0.038      130.0
  137       0.076      600.0
  138      AG    1126            10   11 10.5       0.0564    1.02      960.8     25.0
  139       0.0       -273.15   0.01      -250.0    0.037     -200.0    0.0485    -150.0
  140       0.053     -100.0    0.056        0.0    0.060      400.0    0.069      960.8
  141       0.07       960.9    0.07      2212.0
  142       3.6    E1 -269.0    4.3    E1 -267.0    2.4    E1 -259.0    1.2    E1 -253.0
  143       4.1       -243.0    2.0       -233.0    1.14      -175.0    1.03      -100.0
  144       1.00         0.0    0.86       350.0    0.86       960.8
  145      AGLIQ 1127            0     0 9.30       0.069     0.6       960.8     25.0
  146      TA    1161            10    6 16.6       0.033     0.17      2996.0    41.0
  147       0.0       -273.15   0.025     -200.0    0.0305    -100.0    0.0330       0.0
  148       0.0342     100.0    0.0353     250.0    0.0365     600.0    0.0433    2996.0
  149       0.044     2996.1    0.044     5425.0
  150       0.0       -273.15   0.161     -250.0    0.175     -100.0    0.171        0.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  151       0.148     1000.0    0.148     3000.0
  152      TC    1164              5    0 11.50     0.058     0.03      2200.0    56.0
  153       0.0581       0.0    0.0986    2000.0    0.1026    2200.0    0.105     2201.1
  154       0.105     2727.0
  155      TH    1166              11    4 11.68     0.028     0.092     1710.0    17.0
  156       0.0      -273.15    0.006     -250.0    0.021     -200.0    0.025     -147.0
  157       0.028        0.0    0.055     1395.0    0.629     1400.0    0.051     1405.0
  158       0.051     1710.0    0.047     1710.1    0.047     2727.0
  159       0.092        0.0    0.096      300.0    0.102      500.0    0.108      650.0
  160      SN    1171              4    5 7.31      0.054     0.146     231.89    14.5
  161       0.0535       0.0    0.064      231.89   0.0568     232.0    0.0662    2270.0
  162       0.153        0.0    0.145      100.0    0.138      231.9    0.08       232.0
  163       0.08       500.0
  164      SNLIQ 1172          2    2 6.85      0.058     0.08      231.9     14.5
  165       0.058      231.9    0.0758    1000.0
  166       0.080      231.9    0.078      500.0
  167      TI    1176              12    7 4.5       0.125     0.050     1675.0    96.0
  168       0.0      -273.15    0.003     -250.0    0.088     -150.0    0.105     -100.0
  169       0.125       25.0    0.142      300.0    0.160      880.0    4.12       885.0
  170       0.158      890.0    0.182     1675.0    0.167     1675.1    0.167     3260.0
  171       0.0      -273.15    0.087     -220.0    0.072     -150.0    0.054      -75.0
  172       0.050        0.0    0.045      400.0    0.043      700.0
  173      W     1181              12    9 19.3      0.032     0.47      3410.0    46.0
  174       0.0      -273.15    0.0005    -250.0    0.0025    -240.0    0.0155    -200.0
  175       0.021    -175.0     0.0245    -150.0    0.027     -125.0    0.030      -75.0
  176       0.032        0.0    0.048     3410.0    0.049     3410.1    0.049     5927.0
  177       0.0      -273.15    3.3       -250.0    1.0       -223.0    0.48         0.0
  178       0.34       300.0    0.28       800.0    0.24      1800.0    0.22      2600.0
  179       0.215     3200.0
  180      U     1186              12    7 19.1      0.028     0.056     1132.0    12.6
  181       0.0      -273.15    0.0075    -250.0    0.021     -200.0    0.0275       0.0
  182       0.035      350.0    0.048      663.0    0.83       668.0    0.045      673.0
  183       0.045      770.0    0.93       775.0    0.0384     780.0    0.0384    3818.0
  184       0.0      -273.15    0.045     -200.0    0.058     -100.0    0.062        0.0
  185       0.083      400.0    0.114      800.0    0.125      900.0
  186      ZN    1191              6    8 7.14      0.093     0.267     419.4     24.0
  187       0.092        0.0    0.0957     100.0    0.1075     400.0    0.108      419.4
  188       0.122      419.5    0.126      907.0
  189       0.269        0.0    0.262      100.0    0.253      200.0    0.242      300.0
  190       0.222      419.4    0.144      419.5    0.142      500.0    0.139      600.0
  191      ZNLIQ 1192          5    2 6.8       0.12      0.142     419.4     24.0
  192       0.120      419.4    0.117      600.0    0.108      800.0    0.104      900.0
  193       0.101     1000.0
  194       0.142      419.5    0.136      700.0
  195      ZR    1196              12    8 6.5       0.068     0.075     1852.0    54.0
  196       0.0      -273.15    0.05      -173.0    0.063      -73.0    0.067        0.0
  197       0.068       25.0    0.076      500.0    0.081      700.0    0.088      855.0
  198       2.078      860.0    0.074      865.0    0.084     1500.0    0.091     1852.0
  199       0.0      -273.15    0.115     -243.0    0.080     -190.0    0.077     -100.0
  200       0.078        0.0    0.056      200.0    0.060      700.0    0.076     1650.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  201      CR     1201              10     8 7.16      0.107     0.21      1890.0    75.6
  202       0.0        -273.15   0.04       -200.0    0.075     -150.0    0.090     -100.0
  203       0.105         0.0    0.125       300.0    0.140      700.0    0.162     1000.0
  204       0.270      1650.0    0.270      1650.1
  205       0.0        -273.15   1.4        -250.0    0.35      -200.0    0.23      -100.0
  206       0.215         0.0    0.170       600.0    0.155      900.0    0.155      900.1
  207      HGLIQ 1207              10     9 13.5      0.033     0.020     -38.87    2.78
  208       0.0333        0.0    0.0328      100.0    0.0325     200.0    0.03234    300.0
  209       0.0324      400.0    0.0330      600.0    0.0346     800.0    0.0382    1000.0
  210       0.0430     1200.0    0.060      1700.0
  211       0.0196        0.0    0.0250      100.0    0.028      350.0    0.030      400.0
  212       0.0324      600.0    0.0344      800.0    0.0358    1000.0    0.0368    1400.0
  213       0.037      1700.0
  214      IN     1211               4     0 7.3       0.057     0.056     156.6     6.8
  215       0.0566        0.0    0.0600      156.6    0.0636    156.7     0.0636    2000.0
  216      INLIQ 1212               0     0 7.03      0.0636    0.105     156.6     6.8
  217      LI     1216               3     0 0.53      0.84      0.17      179.0     99.4
  218       0.79          0.0    0.84         25.0    0.985      179.0
  219      LILIQ 1217               2     9 0.508     1.01      0.101     179.0     100.0
  220       1.01        179.0    0.97       1700.0
  221       0.101       179.0    0.120       400.0    0.137      600.0    0.150      800.0
  222       0.158      1000.0    0.162      1200.0    0.160     1400.0    0.152     1600.0
  223       0.143      1700.0
  224      NA     1221               4     4 0.97      0.29      0.32      97.81     27.4
  225       0.287         0.0    0.303        97.81   0.326       97.91   0.31       200.0
  226       0.32          0.0    0.32         97.81   0.21        97.91   0.20       200.0
  227      NALIQ 1222               8     2 0.93      0.33      0.192     97.81     27.0
  228       0.328        97.81   0.311       300.0    0.305      400.0    0.300      600.0
  229       0.304       800.0    0.316      1000.0    0.340     1200.0    0.425     1700.0
  230       0.202        97.81   0.046      1700.0
  231      K      1226               4     4 0.862     0.18      0.232     63.65     14.2
  232       0.172         0.0    0.192        63.65   0.195       63.75   0.188      200.0
  233       0.232         0.0    0.232        63.65   0.149       63.75   0.140      100.0
  234      KLIQ   1227              11     5 0.82      0.196                63.85     14.6
  235       0.196        63.85   0.189       200.0    0.1825     400.0    0.182      500.0
  236       0.1825      600.0    0.1845      700.0    0.1885     800.0    0.198     1000.0
  237       0.213      1200.0    0.252      1500.0    0.29      1700.0
  238       0.149        63.65   0.112       400.0    0.096      600.0    0.066     1000.0
  239       0.020      1700.0
  240      CS     1231               2     0 1.87      0.052     0.1       28.5      3.8
  241       0.052         0.0    0.056        28.5
  242      CSLIQ 1232               7     7 1.84      0.060     0.060     28.5      3.8
  243       0.060        28.5    0.055       200.0    0.048      400.0    0.054      600.0
  244       0.073       800.0    0.160      1200.0    0.360     1700.0
  245       0.06         28.5    0.048       400.0    0.046      600.0    0.040      800.0
  246       0.033      1000.0    0.017      1400.0    0.001     1700.0
  247      PD     1236              10     7 11.4      0.058     0.182     1552.0    38.7
  248       0.0        -273.15   0.007      -243.0    0.035     -190.0    0.048     -140.0
  249       0.052      -100.0    0.055       -50.0    0.057        0.0    0.0797    1552.0
  250       0.078      1552.1    0.078      2927.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  251       0.0       -273.15   2.7       -264.0    0.5       -240.0    0.2       -206.0
  252       0.18      -120.0    0.182       25.0    0.188      527.0
  253      BA    1241             10    0 3.5       0.045     0.08      725.0     13.3
  254       0.045       0.0     0.047       77.0    0.049      177.0    0.052      277.0
  255       0.064     377.0     0.056      477.0    0.061      577.0    0.068      725.0
  256       0.0546    725.1     0.0546    1627.0
  257      NB    1246              3    7 8.57      0.064     0.12      2468.     62.0
  258       0.064       0.0     0.09      2200.0    0.09      4927.0
  259       0.0       -273.15   0.206     -245.0    0.124     -190.0    0.11      -135.0
  260       0.107     -23.0     0.120       0.0     0.165     1637.0
  261      RE    1251              7    3 21.0      0.033     0.145     3180.0    42.0
  262       0.0       -273.15   0.02      -190.0    0.03      -120.0    0.033       25.0
  263       0.046     2200.0    0.052     2600.0    0.068     2800.0
  264       0.145       0.0     0.11       400.0    0.11      2200.0
  265      SI    1256              8   10 2.33      0.168     0.3       1412.0    431.0
  266       0.164       0.0     0.193      100.0    0.204      200.0    0.224      600.0
  267       0.247     1412.0    0.250     1412.1    0.254     1627.0    0.254     2727.0
  268       0.0       -273.15   3.0       -253.0    1.5       -195.0    0.7       -110.0
  269       0.33        0.0     0.23       100.0    0.133      300.0    0.095      500.0
  270       0.075     727.0     0.070      900.0
  271      GE-IP 1261             11   10 5.325     0.077     0.14      936.0     103.0
  272       0.0       -273.15   0.0015    -256.0    0.052     -163.0    0.0655    -100.0
  273       0.0765      0.0     0.0875     200.0    0.092      400.0    0.0945     600.0
  274       0.097     937.4     0.0965     937.5    0.0965    2830.0
  275       0.0       -273.15   3.5       -260.0    0.9       -200.0    0.3       -150.0
  276       0.17      -50.0     0.15        0.0     0.12       100.0    0.085      300.0
  277       0.085     500.0     0.093      700.0
  278      GE-N  1262             11   10 5.325     0.077     0.13      937.4     103.0
  279       0.0       -273.15   0.0015    -256.0    0.052     -163.0    0.0655    -100.0
  280       0.0765      0.0     0.0875     200.0    0.092      400.0    0.0945     600.0
  281       0.097     937.4     0.0965     937.5    0.0965    2830.0
  282       0.0       -273.15   3.5       -260.0    0.9       -200.0    0.3       -150.0
  283       0.17      -50.0     0.15        0.0     0.105      100.0    0.06       300.0
  284       0.045     500.0     0.045      800.0
  285      BORON 1266             11    0 2.50      0.25      0.005     2030.0    400.0
  286       0.0       -273.15   0.01      -200.0    0.10      -100.0    0.25        0.0
  287       0.34      100.0     0.40       200.0    0.47       400.0    0.51       600.0
  288       0.59      1000.0    0.65      1500.0    0.69      2030.0
  289      HF    1271              11    3 13.2      0.038     0.053     2150.0    33.6
  290       0.0       -273.15   0.005     -243.0    0.025     -200.0    0.030     -150.0
  291       0.0325    -100.0    0.034        0.0    0.041     1077.0    0.044     1500.0
  292       0.049     2150.0    0.044     2150.1    0.044     5400.0
  293       0.053       0.0     0.050      300.0    0.049      550.0
  294      IR    1276              12    6 22.5      0.031     0.35      2454.     34.3
  295       0.0       -273.15   0.001     -248.0    0.012     -216.0    0.016     -200.0
  296       0.024     -150.0    0.028     -100.0    0.030      -50.0    0.031       0.0
  297       0.032      100.0    0.049     2554.0    0.0494    2554.1    0.0494    4527.0
  298       0.55      -200.0    0.425     -175.0    0.38      -150.0    0.365     -100.0
  299       0.35        0.0     0.330      250.0
  300      RH    1281              10    5 12.4      0.058     0.36      1960.0    51.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  301       0.0       -273.15   0.001     -250.0    0.01      -225.0    0.03      -190.0
  302       0.04      -157.0    0.05      -100.0    0.0545     -50.0    0.058        0.0
  303       0.0586      25.0    0.0925    1604.0
  304       0.54      -200.0    0.43      -150.0    0.37       -50.0    0.363        0.0
  305       0.335      200.0
  306      V     1286              6    2 6.10      0.11      0.07      1890.0    80.0
  307       0.108        0.0    0.132      400.0    0.160     1000.0    0.209     1890.0
  308       0.187     1890.1    0.187     3400.0
  309       0.073        0.0    0.118     1600.0
  310      RB    1291              4    4 1.5       0.09      0.12      38.89     6.15
  311       0.086        0.0    0.086       38.89   0.097       38.90   0.092      100.0
  312       0.12         0.0    0.12        38.89   0.07        38.99   0.075      200.0
  313      RBLIQ 1292             8   10 1.475      0.092     0.07      38.89     6.15
  314       0.092       38.89   0.080      400.0    0.078      600.0    0.079      800.0
  315       0.0835    1000.0    0.090     1200.0    0.109     1500.0    0.124     1700.0
  316       0.07        38.89   0.075       50.0    0.075      200.0    0.070      400.0
  317       0.063      600.0    0.054      800.0    0.044     1000.0    0.025     1400.0
  318       0.0155    1600.0    0.010     1700.0
  319      SR    1296              8    6 2.6       0.086     0.10      769.0     25.0
  320       0.072       25.0    0.935      584.0    0.555      589.0    0.0975     594.0
  321       0.112      769.0    0.088      769.1    0.084     1200.0    0.084     1700.0
  322       0.2          0.0    0.2        769.0    0.103      769.1    0.090     1000.0
  323       0.071     1400.0    0.060     1700.0
  324      RU    1301             12    4 12.2      0.056     0.25      2400.0    60.3
  325       0.0       -273.15   0.0005    -250.0    0.021     -200.0    0.040     -150.0
  326       0.048     -100.0    0.053      -50.0    0.056        0.0    0.0708    1000.0
  327       0.071     1200.0    0.072     1400.0    0.074     1600.0    0.074     3900.0
  328       0.26         0.0    0.254       40.0    0.250      200.0    0.250      300.0
  329      CA    1306              9    0 1.55      0.157     0.3       845.0     55.0
  330       0.155        0.0    0.189      400.0    0.193      445.0    1.288      450.0
  331       0.182      455.0    0.1835     500.0    0.23       850.0    0.185      850.1
  332       0.185     1487.0
  333      GA    1311              4    0 5.907     0.089     0.08      29.78     19.1
  334       0.088        0.0    0.0896      29.78   0.0953      29.9   0.0953    2403.0
  335      GALIQ 1312             0    0 6.09      0.0953    0.08      29.78     19.1
  336      I-SOL 1316             6    0 4.93      0.052     1.04  E-5 113.5     14.4
  337       0.052       25.0    0.052      113.5    0.076      113.6    0.076      184.35
  338       0.0354     184.45   0.037     2727.0
  339      P     1321              4    0 1.82      0.177     0.01      44.1      5.0
  340       0.177        0.0    0.177       44.0    0.213       44.1   0.213      280.0
  341      SE    1326              4    0 4.79      0.077     0.0018    217.0     7.7
  342       0.075        0.0    0.093      217.0    0.10       217.1    0.10       684.9
  343      S     1331              7    5 2.0       0.17      6.6   E-4 119.0     9.15
  344       0.166        0.0    0.185       90.5    0.75        95.5   0.191      100.5
  345       0.194      119.0    0.260      119.1    0.285      444.6
  346       6.6   E-4    0.0    6.6   E-4   95.5    4.0   E-4   95.6    4.0   E-4 119.0
  347       4.0   E-4  444.6
  348      TL    1336              7    5 11.85     0.031     0.093     303.0     5.0
  349       0.0307       0.0    0.0361     230.0    0.11       235.0    0.0390     240.0
  350       0.0390     303.5    0.0356     303.6    0.0356    1457.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
   351      0.093       20.0    0.097      100.0    0.103      303.5    0.059      303.6
   352      0.059      400.0
   353     TLLIQ 1337              0    0 11.29     0.036     0.059     303.0     5.0
   354     SC    1341              9    0 3.0       0.132     0.03      1538.0    84.0
   355      0.034     -250.0    0.065     -200.0    0.102     -150.0    0.119     -100.0
   356      0.128      -50.0    0.133        0.0    0.20      1539.0    0.17      1539.1
   357      0.17      2727.0
   358     Y     1346              8    0 4.47      0.07      0.03      1495.0    46.0
   359      0.0       -273.15   0.012     -260.0    0.031     -225.0    0.048     -200.0
   360      0.060     -150.0    0.067     -100.0    0.0705       0.0    0.0712      75.0
   361     LA    1351              9    0 6.2       0.046     0.033
   362      0.045        0.0    0.050      310.0    0.047      310.1    0.054      600.0
   363      0.0605     870.0    0.068      870.1    0.068      920.0    0.059      920.1
   364      0.059     3469.0
   365     CE    1356              8    0 6.79      0.046     0.026     804.      20.0
   366      0.044        0.0    0.046       25.0    0.0525     300.0    0.058      500.0
   367      0.0653     725.0    0.0645     804.0    0.0668     804.1    0.0668    1100.0
   368     PR    1361              9    0 6.8       0.047     0.028     930.0     16.0
   369      0.046        0.0    0.048      100.0    0.0495     200.0    0.052      300.0
   370      0.055      400.0    0.0583     500.0    0.0627     600.0    0.068      700.0
   371      0.074      800.0
   372     ND    1366             10    0 7.0       0.047     0.031     1020.0    20.0
   373      0.045        0.0    0.049      200.0    0.0556     400.0    0.063      600.0
   374      0.073      800.0    0.0767     862.0    0.0736     862.1    0.0736    1020.0
   375      0.081     1020.1    0.081     3027.0
   376     SM    1371             12    0 7.5       0.043     0.03      1072.0    13.8
   377      0.043        0.0    0.052      100.0    0.059      200.0    0.063      300.0
   378      0.0664     400.0    0.0688     500.0    0.071      600.0    0.076      927.0
   379      0.0745     927.1    0.0745    1072.0    0.095     1072.1    0.095     1900.0
   380     EU    1376             11    0 5.3       0.042     0.03      826.0     17.0
   381      0.042        0.0    0.0453     230.0    0.0466     230.1    0.0473     300.0
   382      0.0487     400.0    0.0512     500.0    0.0544     600.0    0.0584     700.0
   383      0.0643     826.0    0.0599     826.1    0.0599    1100.0
   384     GD    1381              7    0 7.87      0.055     0.021     1306.0    23.0
   385      0.071        0.0    0.055       25.0    0.056       82.0    0.045      200.0
   386      0.057     1306.0    0.051     1306.1    0.051     2727.0
   387     TB    1386             10    0 8.25      0.0436    0.02      1400.0    13.8
   388      0.114       -45.0   0.060      -40.0    0.049      -30.0    0.0445       0.0
   389      0.0436      25.0    0.0430      50.0    0.0435      80.0    0.057     1400.0
   390      0.0503    1400.1    0.0503    2800.0
   391     DY    1391              4    0 8.556     0.0414    0.024     1500.0    25.0
   392      0.040       25.0    0.0545    1407.0    0.049     1407.1    0.049     2327.0
   393     HO    1396              4    0 8.8       0.0395    0.024     1500.0    25.0
   394      0.0395      25.0    0.0547    1500.0    0.0485    1500.1    0.0485    2600.0
   395     ER    1401              8    0 9.06      0.0401    0.023     1527.0    24.5
   396      0.035     -175.0    0.0377     -100.0    0.0398       0.0    0.0406      50.0
   397      0.0406      50.1    0.0536    1527.0    0.048     1527.1    0.048     2627.1
   398     TM    1406              6    0 9.3       0.0382    0.02      1545.0    26.0
   399      0.035     -200.0    0.037     -100.0    0.0382       0.0    0.0522    1545.0
   400      0.0473    1545.1    0.0473    1727.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  401      YB    1411              12    0 7.0       0.0355    0.02      824.0     12.7
  402       0.0347       0.0     0.040      150.0    0.0428     275.0    0.039      275.1
  403       0.0413     400.0     0.0434     600.0    0.0437     793.0    2.95       798.0
  404       0.0498     803.0     0.0498     824.0    0.0508     824.1    0.0508    1427.0
  405      LU    1416               6    0 9.85      0.036     0.025     1652.0    26.0
  406       0.0347    -100.0     0.0363       0.0    0.0370      70.0    0.0508    1652.0
  407       0.046     1652.1     0.046     3327.0
  408      PM    1421               2    0 7.2       0.045     0.03      1035.0    21.0
  409       0.045       25.0     0.062     1035.0
  410      AC    1426               4    0 10.1      0.03      0.03      1047.0    11.0
  411       0.03        25.0     0.04      1047.0    0.035     1047.1    0.03      2900.0
  412      AM    1430               0    0 11.7      0.03      0.03      850.0
  413      AT    1437               4    0 7.5       0.0333    0.001     302.0     13.6
  414       0.0333      25.0     0.0333     302.0    0.0476     302.1    0.0476     377.0
  415      BK    1440               0    0 12.0      0.03      0.03
  416      CF    1443               0    0 12.0      0.03      0.03
  417      CM    1446               0    0 7.0       0.03      0.03
  418      ES    1449               0    0 12.0      0.03      0.03
  419      FM    1452               0    0 12.0      0.03      0.03
  420      FR    1455               0    0 12.0      0.034     0.03      27.0      22.4
  421      MD    1461               0    0 12.0      0.03      0.03
  422      NP    1464               0    0 18.0      0.03      0.03      640.0
  423      NO    1467               0    0 12.0      0.03      0.03
  424      PO    1473               4    0 9.32      0.029     0.004     254.0     11.4
  425       0.029     0.0        0.033      254.0    0.043      254.1    0.043      962.0
  426      PA    1476               4    0 15.4      0.029     0.03      1230.0    17.3
  427       0.027        0.0     0.048     1230.0    0.035     1230.1    0.035     1300.0
  428      RA    1479               4    0 5.0       0.0288    0.03      700.0     10.2
  429       0.027        0.0     0.031      700.0    0.035      700.1    0.035     1700.0
  430      TE    1488               4    6 6.24      0.048     0.008     449.5     25.3
  431       0.047        0.0     0.066      449.5    0.0705     449.6    0.0705     989.8
  432       0.020     -150.0     0.014     -100.0    0.009        0.0    0.006      100.0
  433       0.0045     200.0     0.0045     350.0
  434      LW    1491               0    0 12.0      0.03      0.03
  435      ARGAS 1501               1   12 0.001784  0.124     4.3   E-5
  436       0.0       -273.15    2.6   E-5 -100.0    3.96  E-5    0.0    5.1   E-5  100.0
  437       7.05  E-5  300.0     8.39  E-5  500.0    1.05  E-4  800.0    1.30  E-4 1200.0
  438       1.63  E-4 1800.0     1.99  E-4 2500.0    2.22  E-4 3000.0    3.07  E-4 5000.0
  439      CLGAS 1506               4    8 0.003214  0.114     2.1   E-5
  440       0.114       25.0     0.118      100.0    0.121      200.0    0.131     2727.0
  441       1.529 E-5  -40.0     1.653 E-5  -28.9    1.818 E-5   -6.7    1.901 E-5    4.4
  442       2.025 E-5   15.6     2.190 E-5   37.8    2.314 E-5   48.90   2.314 E-5   48.91
  443      F-GAS 1511               4   10 0.001696
  444       0.178        0.0     0.197       25.0    0.228      500.0    0.246     2727.
  445       1.81  E-5 -184.4     3.06  E-5 -128.9    4.34  E-5  -73.3    5.08  E-5  -40.0
  446       5.29  E-5  -28.9     5.54  E-5  -17.8    5.79  E-5   -6.7    6.82  E-5   48.9
  447       7.60  E-5   93.3     7.60  E-5   93.31
  448      HEGAS 1516               1   12 0.000177  1.24      3.59  E-4
  449       0.0       -273.15    0.843 E-4 -240.0    1.63  E-4 -184.4    2.52  E-4 -100.0
  450       3.38  E-4    0.0     3.59  E-4   25.0    3.76  E-4   48.9    4.07  E-4  100.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  451       5.07  E-4  200.0    6.96  E-4  500.0    1.055 E-3 1200.0    1.587 E-3 2500.0
  452      H-GAS 1521              8   11 0.0000899 3.4        4.44  E-4
  453       3.38          0.0    3.41        25.0    3.46       100.0    3.51        500.0
  454       3.72       1000.0    4.18      2000.0    4.33      2400.0    4.45       2700.0
  455       0.0        -273.15   0.599 E-4 -240.0    2.69  E-4 -100.0    4.13  E-4     0.0
  456       5.18  E-4  100.0    7.04  E-4  300.0    0.0025    1500.0    0.0030     1800.0
  457       0.0040     2100.0    0.0080     2300.0    0.0152    2500.0
  458      NEGAS 1526              1   12 0.0008999 0.246      1.16  E-4
  459       0.979 E-4  -40.0    1.09  E-4    0.0    1.21  E-4   50.0    1.35  E-4  100.0
  460       1.58  E-4  200.0    1.78  E-4  300.0    2.17  E-4  500.0    2.68  E-4  800.0
  461       3.29  E-4 1200.0    4.11  E-4 1800.0    4.96  E-4 2500.0    5.53  E-4 3000.0
  462      N-GAS 1531              7    8 0.0012506 0.249      5.74  E-5
  463       0.244          0.0    0.249      100.0    0.260      400.0    0.277       700.0
  464       0.290       1000.0    0.310     2000.0    0.316     2727.0
  465       1.65  E-5 -200.0    3.31  E-5 -128.9    4.44  E-5  -73.3    5.74  E-5     0.0
  466       7.47  E-5  100.0    9.08  E-5  200.0   10.55  E-5  300.0   11.55  E-5  400.0
  467      O-GAS 1536              6    4 0.001429  0.19       6.3   E-5
  468       0.19           0.0    0.22       100.0    0.24      300.0    0.25        500.0
  469       0.27        1100.0    0.30      5000.0
  470       1.57  E-5 -200.0    4.35  E-5  -75.0    5.87  E-5    0.0    7.80  E-5 100.0
  471      XE    1541             0   12 0.005887  0.0379     1.4   E-5 -111.9     5.6
  472       0.97  E-5 -100.0    1.34  E-5    0.0    1.69  E-5  100.0    2.01  E-5  200.0
  473       2.31  E-5  300.0    2.88  E-5  500.0    3.65  E-5  800.0    4.60  E-5 1200.0
  474       5.9   E-5 1800.0    7.29  E-5 2500.0    8.22  E-5 3000.0    1.164 E-4 5000.0
  475      BRGAS 1546              1    3 0.00759   0.056      1.1   E-5
  476       0.909 E-5  -17.8    1.157 E-5   37.8    1.157 E-5   37.81
  477      D-GAS 1551              2   10 0.00018   1.7       33.5  E-5
  478       1.69           0.0    2.2       2700.0
  479       0.46  E-4 -240.0    1.10  E-4 -184.0    1.75  E-4 -128.9    2.38  E-4  -73.3
  480       2.75  E-4  -40.0    3.35  E-4   26.7    3.55  E-4   48.9    3.87  E-4  100.0
  481       4.63  E-4  200.0    5.31  E-4  300.0
  482      KRGAS 1556              1    2 0.0003733 0.059      2.2   E-5 -156.6     4.5
  483       1.984 E-5  -17.8    2.356 E-5   37.8
  484      RNGAS 1561              0    0 0.00973   0.0224     1.0   E-5 -61.8
  485      T-GAS 1566              4    7 0.27  E-3 1.13       2.3   E-3
  486       1.13           0.0    1.24      1000.0    1.39      2000.0    1.46       2700.0
  487       0.3   E-4 -240.0    0.68  E-4 -200.0    1.5   E-4 -100.0    2.2   E-4     0.0
  488       2.7   E-4  100.0    3.4   E-4  200.0    4.5   E-4  400.0
  489      A7075 2001              10    6 2.801     0.20       0.29      660.0      95.0
  490       0.11        -210.0    0.14       -150.0    0.163     -100.0    0.182      -50.0
  491       0.196          0.0    0.216       100.0    0.231      200.0    0.248      300.0
  492       0.270        400.0    0.286       450.0
  493       0.19         -50.0    0.295         0.0    0.33       100.0    0.41       200.0
  494       0.425        300.0    0.40        425.0
  495      A707A 2002              10    6 2.801     0.20       0.39      660.0      95.0
  496       0.11        -210.0    0.14       -150.0    0.163     -100.0    0.182      -50.0
  497       0.196          0.0    0.216       100.0    0.231      200.0    0.248      300.0
  498       0.270        400.0    0.286       450.0
  499       0.29        -150.0    0.39          0.0    0.42       100.0    0.43       200.0
  500       0.425        300.0    0.40        425.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  501      ALAMG 2003              2    0 2.66      0.21      0.3       600.0     90.0
  502       0.21         0.0    0.30       600.0
  503      A7079 2004              9    0 2.74      0.19      0.29      660.0     95.0
  504       0.167     -200.0    0.190     -100.0    0.195       0.0     0.190      100.0
  505       0.182      200.0    0.173      300.0    0.170      350.0    0.170      400.0
  506       0.175      450.0
  507      A2024 2005              9    5 2.78      0.20      0.3       660.0     95.0
  508       0.112     -200.0    0.165     -100.0    0.184      -50.0    0.198        0.0
  509       0.218      100.0    0.230      200.0    0.243      300.0    0.261      400.0
  510       0.276      450.0
  511       0.20      -150.0    0.32       100.0    0.41       200.0    0.45       300.0
  512       0.415      425.0
  513      A202A 2006              9    6 2.78      0.20      0.42      660.0     95.0
  514       0.112     -200.0    0.165     -100.0    0.184      -50.0    0.198        0.0
  515       0.218      100.0    0.230      200.0    0.243      300.0    0.261      400.0
  516       0.276      450.0
  517       0.35      -150.0    0.42         0.0    0.44       100.0    0.45       200.0
  518       0.45       300.0    0.415      425.0
  519      ALAL1 2007              2    2 2.7       0.21      0.50      600.0     93.0
  520       0.20         0.0    0.23       200.0
  521       0.50         0.0    0.51       200.0
  522      ALAL2 2008              2    2 2.7       0.21      0.45      540.0     93.0
  523       0.20         0.0    0.23       200.0
  524       0.45         0.0    0.47       200.0
  525      ALAL3 2009              2    2 2.7       0.21      0.40      500.0     93.0
  526       0.20         0.0    0.23       200.0
  527       0.40         0.0    0.43       200.0
  528      ALAL4 2010              2    2 2.7       0.21      0.35      500.0     93.0
  529       0.20         0.0    0.23       200.0
  530       0.35         0.0    0.39       200.0
  531      ALAL5 2011              2    2 2.7       0.21      0.30      500.0     93.0
  532       0.20         0.0    0.23       200.0
  533       0.30         0.0    0.35       200.0
  534      ALAL6 2012              2    2 2.7       0.21      0.25      500.0     93.0
  535       0.20         0.0    0.23       200.0
  536       0.25         0.0    0.31       200.0
  537      ALAL7 2013              2    2 2.7       0.21      0.20      500.0     93.0
  538       0.20         0.0    0.23       200.0
  539       0.20         0.0    0.26       200.0
  540      BRALM 2101              0    0 8.6       0.09      0.24      970.0
  541      BRCAR 2105              3    5 8.57      0.1       0.24      940.0
  542       0.095        0.0    0.117      200.0    0.126      500.0
  543       0.23         0.0    0.25       100.0    0.26       200.0    0.27       300.0
  544       0.275      400.0
  545      BRPBL 2111              0    0 8.5       0.09      0.28      877.0
  546      BRMUM 2116              0    0 8.4       0.09      0.30
  547      BRRDC 2121              0    0 8.75      0.09      0.172     987.0
  548      BRRDW 2122              0    0 8.75      0.09      0.35      1022.0
  549      BRTIN 2126              0    0 8.46      0.09      0.27      900.0
  550      BRYEL 2131              0    0 8.47      0.09      0.28      932.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 551       BRONZ 2141              0    0 8.8       0.09      0.45
 552       BROAL 2146              0    0 7.9       0.09      0.17      1040.0
 553       BROAR 2151              0    0 8.5       0.09      0.29      890.0
 554       BROCM 2156              0    0 8.8       0.09      0.45      1040.0
 555       BROMN 2161              0    0 8.36      0.09      0.25      900.0
 556       BROPH 2166              0    0 8.78      0.09      0.12
 557       BROPM 2167              0    0 8.86      0.09      0.17      1050.0
 558       BROPL 2168              0    0 8.9       0.09      0.49      1050.0
 559       BRSIH 2171              0    7 8.53      0.09      0.08      1020.0
 560        0.0       -273.15   0.009     -250.0    0.032     -200.0    0.045     -150.0
 561        0.060     -100.0    0.075        0.0    0.09       100.0
 562       BRSIL 2172              0    0 8.75      0.09      0.13      1020.0
 563       BRSNH 2176              0    0 9.2       0.09      0.10      940.0
 564       BRSNL 2177              0    0 8.7       0.09      0.12      844.0
 565       CUBER 2181              2    5 8.75      0.095     0.50      1000.0    30.0
 566        0.092        0.0    0.12      1000.0
 567        0.0037    -270.0    0.030     -250.0    0.090     -200.0    0.50         0.0
 568        0.62       100.0
 569       CUBEH 2182              2    0 8.26      0.095     0.26      1000.0    30.0
 570        0.092        0.0    0.12      1000.0
 571       CUCHR 2183              2    2 8.88      0.09      0.82      1100.0    30.0
 572        0.092        0.0    0.12      1000.0
 573        0.78         0.0    0.71       700.0
 574       CUNIS 2185              0    0 8.8       0.09      0.08      1020      40.0
 575       CUGZN 2186              0    0 8.85      0.09      0.55      1065.0
 576       CUWGT 2191              0    0 8.9       0.09      0.9       1050.0    35.0
 577       CUMAN 2195              0    2 8.7       0.09      0.053
 578        0.053      18.0    0.063       100.0
 579       CUAL1 2201              2    6 8.9       0.09      0.52      1000.     30.0
 580        0.092        0.0    0.12      1000.0
 581        0.525       40.0    0.555       100.0    0.655      300.0    0.690      400.0
 582        0.730      600.0    0.76      1000.0
 583       CUPR1 2202              0    0 8.9       0.09      0.10      1103.0
 584       CUPR3 2203              0    0 8.9       0.09      0.07      1200.0
 585       MG001 2421              5    2 1.81      0.245     0.14      464.0     89.0
 586        0.24         0.0    0.28       300.0    0.315      464.0    0.30       464.1
 587        0.34       800.0
 588        0.13         0.0    0.19       300.0
 589       MG002 2422             10    5 1.775     0.235     0.20      565.0     81.0
 590        0.16      -200.0    0.200     -100.0    0.230        0.0    0.250      100.0
 591        0.265      200.0    0.275      300.0    0.280      350.0    0.34       565.0
 592        0.32       565.1    0.34       800.0
 593        0.13      -125.0    0.185        0.0    0.22       100.0    0.245      200.0
 594        0.26       320.0
 595       MG003 2423              9    5 1.77      0.24      0.20      605.0     81.0
 596        0.236        0.0    0.263      100.0    0.282      200.0    0.296      300.0
 597        0.309      400.0    0.321      500.0    0.332      605.0    0.32       605.1
 598        0.34       800.0
 599        0.13      -125.0    0.185        0.0    0.22       100.0    0.245      200.0
 600        0.26       320.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  601      MG004 2424              5    2 1.80      0.245     0.18      510.0     89.0
  602       0.24          0.0    0.28       300.0    0.32       510.0    0.31       510.1
  603       0.34        800.0
  604       0.17          0.0    0.23       300.0
  605      MG005 2425              5    2 1.835     0.245     0.17      455.0     89.0
  606       0.24          0.0    0.28       300.0    0.315      455.0    0.305      455.1
  607       0.34        800.0
  608       0.16          0.0    0.21       300.0
  609      MG006 2426             10    2 1.80      0.23      0.13      490.0     85.0
  610       0.16       -200.0    0.20      -100.0    0.23         0.0    0.25       100.0
  611       0.263       200.0    0.275      300.0    0.285      400.0    0.292      490.0
  612       0.340       630.0    0.340      800.0
  613       0.12          0.0    0.19       300.0
  614      MG007 2427              5    2 1.80      0.24      0.13      490.0     89.0
  615       0.24          0.0    0.28       300.0    0.32       490.0    0.31       490.1
  616       0.34        800.0
  617       0.12          0.0    0.18       300.0
  618      MG008 2428              5    2 1.80      0.245     0.19      475.0     89.0
  619       0.24          0.0    0.28       300.0    0.32       475.0    0.31       475.1
  620       0.34        800.0
  621       0.18          0.0    0.24       300.0
  622      MG009 2429              5    2 1.81      0.245     0.13      468.0     89.0
  623       0.24          0.0    0.28       300.0    0.32       468.0    0.31       468.1
  624       0.34        800.0
  625       0.12          0.0    0.18       300.0
  626      MG010 2430              5    2 1.81      0.245     0.13      468.0     89.0
  627       0.24          0.0    0.28       300.0    0.32       468.0    0.31       468.1
  628       0.34        800.0
  629       0.12          0.0    0.18       300.0
  630      MG011 2431              5    2 1.825     0.245     0.13      443.0     89.0
  631       0.24          0.0    0.28       300.0    0.31       443.0    0.30       443.1
  632       0.34        800.0
  633       0.12          0.0    0.18       300.0
  634      MG012 2432              5    2 1.77      0.245     0.26      600.0     89.0
  635       0.24          0.0    0.28       300.0    0.34       600.0    0.32       600.1
  636       0.34        800.0
  637       0.25          0.0    0.30       300.0
  638      MG013 2433              5    2 1.81      0.245     0.20      475.0     89.0
  639       0.24          0.0    0.28       300.0    0.32       475.0    0.31       475.1
  640       0.34        800.0
  641       0.19          0.0    0.25       300.0
  642      MG014 2434              5    2 1.83      0.245     0.24      550.0     89.0
  643       0.24          0.0    0.28       300.0    0.335      550.0    0.315      550.1
  644       0.34        800.0
  645       0.23          0.0    0.28       300.0
  646      MG015 2435              5    2 1.79      0.245     0.25      593.0     89.0
  647       0.24          0.0    0.28       300.0    0.34       593.0    0.32       593.1
  648       0.34        800.0
  649       0.24          0.0    0.30       300.0
  650      MG016 2436              5    2 1.81      0.245     0.24      591.0     89.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  651      0.24          0.0     0.28        300.0     0.34        591.0     0.32        591.1
  652      0.34        800.0
  653      0.23          0.0     0.29        300.0
  654     MG017 2437               5     2 1.83       0.245      0.25       543.0      89.0
  655      0.24          0.0     0.28        300.0     0.335       543.0     0.315       543.1
  656      0.34        800.0
  657      0.24          0.0     0.29        300.0
  658     MG018 2438               6     2 1.79       0.245      0.27       589.0      78.0
  659      0.245         0.0     0.263       200.0     0.302       400.0     0.341       589.0
  660      0.318       589.1     0.330       725.0
  661      0.27          0.0     0.32        300.0
  662     MG019 2439               6     2 1.79       0.245      0.25       589.0      78.0
  663      0.245         0.0     0.263       200.0     0.302       400.0     0.341       589.0
  664      0.318       589.1     0.330       725.0
  665      0.25          0.0     0.30        300.0
  666     MG020 2440               6     2 1.79       0.245      0.22       589.0      78.0
  667      0.245         0.0     0.263       200.0     0.302       400.0     0.341       589.0
  668      0.318       589.1     0.330       725.0
  669      0.22          0.0     0.28        300.0
  670     MG021 2441               6     2 1.78       0.245      0.33       605.0      89.0
  671      0.245         0.0     0.263       200.0     0.302       400.0     0.345       605.0
  672      0.32        605.1     0.34        800.0
  673      0.32          0.0     0.335       300.0
  674     MG022 2442               6     2 1.82       0.245      0.25       589.0      79.0
  675      0.24          0.0     0.263       200.0     0.302       400.0     0.341       589.0
  676      0.318       589.1     0.330       725.0
  677      0.245         0.0     0.30        300.0
  678     MG023 2443               5     2 1.83       0.245      0.25       550.0      89.0
  679      0.24          0.0     0.28        300.0     0.34        550.0     0.32        550.1
  680      0.34        800.0
  681      0.24          0.0     0.30        300.0
  682     MG024 2444               5     2 1.75       0.245      0.28       630.0      89.0
  683      0.24          0.0     0.28        300.0     0.34        630.0     0.32        630.1
  684      0.34        800.0
  685      0.28          0.0     0.32        300.0
  686     MG025 2445               5     2 1.76       0.245      0.31       648.0      89.0
  687      0.24          0.0     0.28        300.0     0.34        600.0     0.32        600.1
  688      0.34        800.0
  689      0.30          0.0     0.32        300.0
  690     MG026 2446               5     2 1.76       0.245      0.34       648.0      89.0
  691      0.24          0.0     0.28        300.0     0.34        600.0     0.32        600.1
  692      0.34        800.0
  693      0.34          0.0     0.34        300.0
  694     MG027 2447               5     2 1.76       0.245      0.315      648.0      89.0
  695      0.24          0.0     0.28        300.0     0.34        600.0     0.32        600.1
  696      0.34        800.0
  697      0.31          0.0     0.335       300.0
  698     MG028 2448               5     2 1.76       0.245      0.26       605.0      81.0
  699      0.24          0.0     0.28        300.0     0.34        605.0     0.32        605.1
  700      0.34        800.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  701       0.25          0.0     0.30        300.0
  702      MG029 2449                5     2 1.75      0.245     0.35      630.0     89.0
  703       0.24          0.0     0.28        300.0     0.35       630.0    0.33       630.1
  704       0.34        800.0
  705       0.35          0.0     0.34        300.0
  706      MG030 2450                5     2 1.76      0.245     0.325     560.0     81.0
  707       0.24          0.0     0.28        300.0     0.34       560.0    0.32       560.1
  708       0.34        800.0
  709       0.32          0.0     0.33        300.0
  710      MG031 2451                5     2 1.82      0.23      0.27      510.0     89.0
  711       0.23       0.0        0.28        300.0     0.33       510.0    0.31       510.1
  712       0.34        800.0
  713       0.26          0.0     0.31        300.0
  714      MG032 2452                5     2 1.86      0.23      0.27      550.0     89.0
  715       0.23          0.0     0.28        300.0     0.34       550.0    0.32       550.1
  716       0.34        800.0
  717       0.265         0.0     0.315       300.0
  718      MG033 2453                5     2 1.86      0.23      0.27      500.0     89.0
  719       0.23          0.0     0.28        300.0     0.33       500.0    0.31       500.1
  720       0.34        800.0
  721       0.265         0.0     0.320       300.0
  722      MG034 2454                5     2 1.8       0.245     0.30      550.0     89.0
  723       0.24          0.0     0.28        300.0     0.34       550.0    0.32       550.1
  724       0.34        800.0
  725       0.29          0.0     0.325       300.0
  726      MG035 2455                7     2 1.81      0.244     0.265     549.0     76.0
  727       0.24          0.0     0.26        200.0     0.30       400.0    0.34       549.0
  728       0.32        549.1     0.35        800.0     0.38      1100.0
  729       0.26          0.0     0.31        300.0
  730      MG036 2456                6     2 1.83      0.25      0.28      520.0     76.0
  731       0.246         0.0     0.262       200.0     0.304      400.0    0.333      520.0
  732       0.312       520.1     0.338       725.0
  733       0.27          0.0     0.31        300.0
  734      MG037 2457                5     2 1.8       0.245     0.24      600.0     89.0
  735       0.24          0.0     0.28        300.0     0.345      600.0    0.325      600.1
  736       0.34        800.0
  737       0.23          0.0     0.28        300.0
  738      MG038 2458                5     2 1.80      0.245     0.24      545.0     89.0
  739       0.24          0.0     0.28        300.0     0.34       545.0    0.32       545.1
  740       0.34        800.0
  741       0.235         0.0     0.29        300.0
  742      MG039 2459                5     2 1.76      0.23      0.29      600.0     89.0
  743       0.23          0.0     0.28        300.0     0.345      600.0    0.325      600.1
  744       0.34        800.0
  745       0.28          0.0     0.32        300.0
  746      MG040 2460                5     2 1.80      0.245     0.32      625.0     89.0
  747       0.24          0.0     0.28        300.0     0.35       625.0    0.33       625.1
  748       0.34        800.0
  749       0.315         0.0     0.335       300.0
  750      MG041 2461                5     2 1.80      0.23      0.30      600.0     89.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  751       0.23          0.0     0.28        300.0     0.345       600.0     0.325       600.1
  752       0.34        800.0
  753       0.295         0.0     0.335       300.0
  754      MG042 2462                5     2 1.82       0.23       0.27       550.0      89.0
  755       0.23          0.0     0.28        300.0     0.335       550.0     0.315       550.1
  756       0.34        800.0
  757       0.265         0.0     0.315       300.0
  758      MG043 2463                5     0 1.78       0.24       0.31       600.0      89.0
  759       0.24          0.0     0.28        300.0     0.34        600.0     0.32        600.1
  760       0.34        800.0
  761      MG044 2464                5     2 1.76       0.24       0.284      550.0      89.0
  762       0.24          0.0     0.28        300.0     0.335       550.0     0.315       550.1
  763       0.34        800.0
  764       0.28          0.0     0.29        400.0
  765      MG045 2465                5     2 1.74       0.23       0.23       450.0      89.0
  766       0.23          0.0     0.28        300.0     0.31        450.0     0.30        450.1
  767       0.34        800.0
  768       0.23          0.0     0.25        400.0
  769      MG046 2466                5     3 1.76       0.24       0.29       500.0      89.0
  770       0.24          0.0     0.28        300.0     0.32        500.0     0.31        500.1
  771       0.34        800.0
  772       0.295        50.0     0.301       200.0     0.305       400.0
  773      MG047 2467                5     2 1.74       0.23       0.31       500.0      89.0
  774       0.23          0.0     0.28        300.0     0.32        500.0     0.31        500.1
  775       0.34        800.0
  776       0.31         50.0     0.305       150.0
  777      NINVR 2501    0     0             8.0        0.123      0.026      1425.0     70.0
  778      NICAN 2502                2     2 8.22       0.11       0.033      1390.0     70.0
  779       0.105         0.0     0.130       300.0
  780       0.033        25.0     0.045       325.0
  781      NICKA 2503                5     5 8.89       0.105      0.16       1435.0     73.0
  782       0.103         0.0     0.142       348.0     0.446       353.0     0.125       358.0
  783       0.155      1435.0
  784       0.168         0.0     0.135       200.0     0.109       380.0     0.135       700.0
  785       0.182      1435.0
  786      NICH3 2504                2     2 8.94       0.092      0.030      1270.0     70.0
  787       0.090         0.0     0.100       300.0
  788       0.030        25.0     0.042       325.0
  789      NICON 2506                2    11 8.89       0.095      0.053      1220.0     70.0
  790       0.093         0.0     0.103       300.0
  791       0.0032     -267.0     0.0065     -265.0     0.012      -260.0     0.023      -250.0
  792       0.037      -240.0     0.045      -230.0     0.048      -200.0     0.053      -100.0
  793       0.053         0.0     0.064       100.0     0.076       400.0
  794      NICOD 2508                2     2 7.8        0.11       0.050      1110.0     70.0
  795       0.105         0.0     0.130       300.0
  796       0.050        50.0     0.062       350.0
  797      NIDUR 2510                2     2 8.26       0.104      0.044      1435.0     70.0
  798       0.102         0.0     0.120       300.0
  799       0.044        50.0     0.056       350.0
  800      NIDUH 2512                2     2 8.26       0.104      0.047      1435.0     70.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  801       0.102        0.0    0.120      300.0
  802       0.047       50.0    0.059      350.0
  803      NID20 2514             2    2 7.92       0.11      0.050     1250.0     70.0
  804       0.105        0.0    0.130      300.0
  805       0.050      100.0    0.062      400.0
  806      NIHSA 2516             2    2 8.80       0.094     0.023     1290.0     70.0
  807       0.094       25.0    0.104      325.0
  808       0.023        0.0    0.062      950.0
  809      NIHSB 2518             4    6 9.24       0.091     0.025     1320.0     70.0
  810       0.090        0.0    0.100      300.0     0.122     550.0     0.155     1200.0
  811       0.0201    -253.0    0.0245       0.0     0.029     200.0     0.039      500.0
  812       0.059      800.0    0.066     1050.0
  813      NIHSC 2520             2    9 8.94       0.092     0.025     1270.0     70.0
  814       0.090        0.0    0.167     1200.0
  815       0.023     -253.0    0.025       25.0     0.027     200.0     0.037      500.0
  816       0.043      600.0    0.058      700.0     0.065     800.0     0.069      900.0
  817       0.072     1070.0
  818      NIHSD 2522             2    2 7.80       0.108     0.050     1120.0     70.0
  819       0.105        0.0    0.125      300.0
  820       0.050       25.0    0.062      325.0
  821      NIHSN 2523             2    4 8.79       0.095     0.0231    1300.0     70.0
  822       0.095        0.0    0.115      300.0
  823       0.025        0.0    0.038      400.0     0.049     650.0     0.057      800.0
  824      NIHSR 2524             3    2 8.22       0.105     0.022     1290.0     70.0
  825       0.102        0.0    0.115      400.0     0.21      1290.0
  826       0.0217      25.0    0.069     1200.0
  827      NIHSX 2526             2    3 8.23       0.102     0.021     1280.0     70.0
  828       0.100        0.0    0.115      300.0
  829       0.0225       0.0    0.0565     750.0     0.0655    925.0
  830      NIH80 2528             2    2 8.74       0.118     0.0798    1430.0     70.0
  831       0.105        0.0    0.130      300.0
  832       0.080       50.0    0.090      350.0
  833      NILLG 2530             2    2 8.58       0.105     0.029     1254.0     70.0
  834       0.100        0.0    0.115      300.0
  835       0.029       25.0    0.041      325.0
  836      NILLR 2532             2    2 8.31       0.110     0.031     1324.0     70.0
  837       0.105        0.0    0.125      300.0
  838       0.031      100.0    0.043      400.0
  839      NINCL 2534             2    2 8.01       0.115     0.029     1390       65.0
  840       0.105        0.0    0.140      300.0
  841       0.029       50.0    0.041      350.0
  842      NINC9 2536            11    2 8.23       0.10      0.032     1300.0     65.0
  843       0.10         0.0    0.11       300.0     0.119     500.0     0.132      600.0
  844       0.128      650.0    0.132      700.0     0.145     750.0     0.179      800.0
  845       0.235      870.0    0.164      930.0     0.178     1100.0
  846       0.032       25.0    0.049      800.0
  847      NINCN 2538             4    9 8.47       0.108     0.034     1390.0     70.0
  848       0.105        0.0    0.120      300.0     0.134     600.0     0.155      900.0
  849       0.0007    -269.0    0.0030    -260.0     0.0060    -250.0    0.0130    -230.0
  850       0.0220    -200.0    0.031        0.0     0.0385    200.0     0.047      400.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  851       0.065      775.0
  852      NINCN 2540              4     3 8.3       0.108     0.025     1390.0    70.0
  853       0.105        0.0    0.120      300.0     0.134      600.0    0.155      900.0
  854       0.025        0.0    0.045      500.0     0.062      950.0
  855      NINCW 2542              2     2 8.31      0.105     0.0352    1390.0    70.0
  856       0.105        0.0    0.130      300.0
  857       0.035       50.0    0.047      350.0
  858      NINC2 2543              6     5 8.37      0.11      0.030     1320.0    70.0
  859       0.105        0.0    0.130      300.0     0.133      500.0    0.170      800.0
  860       0.155      900.0    0.155     1100.0
  861       0.028        0.0    0.034      100.0     0.046      500.0    0.072     1000.0
  862       0.081     1200.0
  863      NINCX 2544              4     3 8.28      0.105     0.034     1390.0    70.0
  864       0.103        0.0    0.117      200.0     0.142      700.0    0.200     1200.0
  865       0.032        0.0    0.054      400.0     0.088      900.0
  866      NINC6 2545              2     4 8.48      0.109     0.036     1350.0    70.0
  867       0.105        0.0    0.130      300.0
  868       0.035        0.0    0.044      300.0     0.053      500.0    0.069      870.0
  869      NINC7 2546              2     2 8.17      0.11      0.030     1390.0    70.0
  870       0.105        0.0    0.130      300.0
  871       0.029        0.0    0.0439     900.0
  872      NIN7C 2547              3     2 7.91      0.098     0.029     1260.0    60.0
  873       0.105        0.0    0.130      300.0     0.218     1200.0
  874       0.029      210.0    0.0725    1225.0
  875      NIMON 2548              6    11 8.835     0.103     0.062     1290.0    68.0
  876       0.100        0.0    0.103       30.0     0.1055     100.0     0.110     200.0
  877       0.1135     300.0    0.127     1260.0
  878       0.0022    -269.0    0.0058    -265.0     0.010     -260.0    0.018     -250.0
  879       0.033     -230.0    0.041     -200.0     0.047     -100.0    0.052        0.0
  880       0.062      100.0    0.074      400.0     0.112      950.0
  881      NIMOU 2549              6     2 8.835     0.103     0.041     1290.0    68.0
  882       0.100        0.0    0.103       30.0     0.1055     100.0    0.110      200.0
  883       0.1135     300.0    0.127     1260.0
  884       0.037        0.0    0.112      950.0
  885      NIML4 2550              2     2 8.86      0.105     0.0593    1250.0    60.0
  886       0.100        0.0    0.115      300.0
  887       0.059       50.0    0.071      350.0
  888      NIMOC 2551              2     2 8.63      0.105     0.064     1315.0    60.0
  889       0.100        0.0    0.115      300.0
  890       0.064       50.0    0.076      350.0
  891      NIMLH 2552              2     2 8.48      0.105     0. 050    1280.0    60.0
  892       0.100        0.0    0.115      300.0
  893       0.050       50.0    0.062      350.0
  894      NIMOW 2553              2     2 8.63      0.105     0.064     1315      60.0
  895       0.100        0.0    0.115      300.0
  896       0.064       50.0    0.076      350.0
  897      NIMLK 2554             11     3 8.465     0.102     0.045     1315.0    60.0
  898       0.071     -160.0    0.087      -73.0     0.100       20.0    0.108      100.0
  899       0.114      200.0    0.119      400.0     0.128      600.0    0.136      700.0
  900       0.147      800.0    0.164      900.0     0.190     1000.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  901       0.030     -158.0    0.041        0.0    0.099     900.0
  902      NIMHU 2555            2    2 8.48      0.105     0.064     1285.0    60.0
  903       0.100        0.0    0.115      300.0
  904       0.064       50.0    0.076      350.0
  905      NIMKR 2556            2    2 8.45      0.105     0.045     1320.0    60.0
  906       0.100        0.0    0.115      300.0
  907       0.045       50.0    0.057      350.0
  908      NIM4H 2557            2    2 8.83      0.105     0.062
  909       0.100        0.0    0.115      300.0
  910       0.062      100.0    0.074      400.0
  911      NIMLR 2558            2    5 8.84      0.105     0.062     1300.0    60.0
  912       0.100        0.0    0.115      300.0
  913       0.062       50.0    0.065      200.0    0.074      400.0    0.083      600.0
  914       0.094      800.0
  915      NIMLS 2560            2    2 8.36      0.105     0.047     1230.0    60.0
  916       0.100        0.0    0.115      300.0
  917       0.0468     100.0    0.0640     400.0
  918      NIM25 2561            3    3 8.21      0.105     0.023     1250.0    70.0
  919       0.102        0.0    0.115      425.0    0.22      1200.0
  920       0.023      100.0    0.064     1000.0    0.0725    1150.0
  921      NICHR 2562            2    3 8.36      0.103     0.023     1370.0    70.0
  922       0.103        0.0    0.156      900.0
  923       0.032      100.0    0.0440     500.0    0.0633     950.0
  924      NIMND 2564            2    2 7.91      0.11      0.034     1350.0    70.0
  925       0.105        0.0    0.130      300.0
  926       0.034       50.0    0.046      350.0
  927      NIM75 2566            2    4 8.35      0.11      0.031     1390.0    70.0
  928       0.105        0.0    0.130      300.0
  929       0.030        0.0    0.0325     100.0    0.059      700.0    0.070      900.0
  930      NIM80 2568            2    3 8.25      0.11      0.028     1365.0    70.0
  931       0.105        0.0    0.130      300.0
  932       0.027       50.0    0.045      500.0    0.066      900.0
  933      NIM8A 2570            2    3 8.17      0.10      0.028     1370.0    70.0
  934       0.100        0.0    0.115      300.0
  935       0.027       50.0    0.045      500.0    0.066      900.0
  936      NIM90 2572            2    2 8.25      0.103     0.030     1350.0    70.0
  937       0.103        0.0    0.125      300.0
  938       0.030      100.0    0.066      900.0
  939      NIM95 2573            2    4 8.06      0.11      0.030     1350.0    70.0
  940       0.105        0.0    0.130      300.0
  941       0.026        0.0    0.038      300.0    0.048      600.0    0.0575     800.0
  942      NIPER 2574            2    0 8.75      0.106     0.138     1400.0    70.0
  943       0.103        0.0    0.142      350.0
  944      NIM15 2575            2    4 7.99      0.11      0.028     1350.0    70.0
  945       0.105        0.0    0.130      300.0
  946       0.026       50.0    0.046      600.0    0.055      800.0    0.066     1000.0
  947      NIREN 2576            3    3 8.23      0.105     0.022     1250.0    70.0
  948       0.100        0.0    0.125      500.0    0.225     1250.0
  949       0.024        0.0    0.034      300.0    0.072     1250.0
  950      NIM10 2577            2    4 8.0       0.11      0.027     1350.0    70.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

  951       0.105        0.0    0.130      300.0
  952       0.027       50.0    0.033      300.0    0.044      600.0    0.052      800.0
  953      NIUDM 2578              2    2 8.05      0.105     0.026     1400.0    70.0
  954       0.100        0.0    0.115      300.0
  955       0.026        0.0    0.061      926.0
  956      NIWSP 2580              2    3 8.2       0.100     0.027     1316.0    70.0
  957       0.100        0.0    0.115      300.0
  958       0.0265       0.0    0.050      700.0    0.066      860.0
  959      NI330 2582              2    0 8.85      0.11      0.145     1435.0    70.0
  960       0.103        0.0    0.142      348.0
  961      NIAL1 2584              2    2 8.2       0.11      0.032
  962       0.105        0.0    0.130      300.0
  963       0.032       25.0    0.044      325.0
  964      NIAL2 2586              2    2 8.25      0.11      0.032
  965       0.105        0.0    0.130      300.0
  966       0.032      100.0    0.044      400.0
  967      NIAL3 2588              2    2 7.95      0.11      0.031
  968       0.105        0.0    0.130      300.0
  969       0.031      100.0    0.043      400.0
  970      NI995 2590              2    6 8.89      0.11      0.145     1435.0    73.0
  971       0.097      -51.0    0.142      355.0
  972       0.145      100.0    0.140      200.0    0.122      300.0    0.112      400.0
  973       0.122      500.0    0.136      600.0
  974      NIDAE 2592              2    3 8.8       0.11      0.115     1427.0    70.0
  975       0.10       -50.0    0.14       350.0
  976       0.11         0.0    0.071      300.0    0.118      900.0
  977      COHE1 2612              2    3 8.846     0.084     0.035     1300.0    60.0
  978       0.084      170.0    0.142     1150.0
  979       0.035      160.0    0.055      600.0    0.078     1060.0
  980      COH21 2614              3    2 8.30      0.101     0.030     1350.0    60.0
  981       0.10         0.0    0.138      540.0    0.178     1200.0
  982       0.028        0.0    0.0485     600.0
  983      COH2A 2615              3    2 8.30      0.101     0.060     1350.0    60.0
  984       0.10         0.0    0.138      540.0    0.178     1200.0
  985       0.078      775.0    0.086     1100.0
  986      COH23 2616              2    5 8.54      0.10      0.032     1300.0    60.0
  987       0.095        0.0    0.17      1200.0
  988       0.03         0.0    0.0365     200.0    0.0425     300.0    0.0455     500.0
  989       0.0505     600.0
  990      COH25 2618              2    2 9.15      0.092     0.022     1330.0    60.0
  991       0.090        0.0    0.155     1200.0
  992       0.0215       0.0    0.0630     900.0
  993      COH27 2620              2    4 8.21      0.10      0.03      1300.0    60.0
  994       0.095        0.0    0.17      1200.0
  995       0.026        0.0    0.033      200.0    0.043      500.0    0.047      600.0
  996      COH30 2622              2    2 8.31      0.10      0.03      1300.0    60.0
  997       0.095        0.0    0.17      1200.0
  998       0.028        0.0    0.05       600.0
  999      COH31 2624              2    5 8.61      0.10      0.03      1370.0    60.0
 1000       0.095        0.0    0.155     1200.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.    ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  1001       0.028        0.0    0.0354     200.0    0.0415     300.0    0.0465     500.0
  1002       0.052      600.0
  1003      COH36 2626              2    2 9.04      0.092     0.0224    1390.0     60.0
  1004       0.09         0.0    0.155     1200.0
  1005       0.022        0.0    0.060      900.0
  1006      COJG2 2628              2    2 8.26      0.10      0.035     1300.0     60.0
  1007       0.10         0.0    0.175     1200.0
  1008       0.035      100.0    0.062      800.0
  1009      COJ15 2630              2    2 8.4       0.10      0.024     1300.0     60.0
  1010       0.095        0.0    0.165     1200.0
  1011       0.024       25.0    0.070      900.0
  1012      COK42 2632              2    6 8.4       0.10      0.030     1300.0     60.0
  1013       0.102        0.0    0.170     1200.0
  1014       0.028        0.0    0.035      200.0    0.040      300.0    0.044      400.0
  1015       0.047      500.0    0.052      600.0
  1016      COMTM 2634              2    2 8.215     0.104     0.031     1280.0     65.0
  1017       0.100        0.0    0.17      1200.0
  1018       0.031      100.0    0.058      800.0
  1019      COMTL 2636              2    2 8.215     0.104     0.039     1280.0     65.0
  1020       0.100        0.0    0.17      1200.0
  1021       0.039      100.0    0.059      600.0
  1022      COS59 2638              2    2 8.35      0.10      0.031     1315.0     60.0
  1023       0.095        0.0    0.17      1200.0
  1024       0.031      100.0    0.055      700.0
  1025      COS81 2640              2    4 8.68      0.10      0.031     1287.0     60.0
  1026       0.095        0.0    0.17      1200.0
  1027       0.030        0.0    0.035      150.0    0.050      500.0    0.055      700.0
  1028      COV36 2642              2    2 8.60      0.10      0.030     1300.0     60.0
  1029       0.100        0.0    0.175     1200.0
  1030       0.028        0.0    0.050      600.0
  1031      COW52 2644              2    7 8.4       0.10      0.06      1300.0     60.0
  1032       0.095        0.0    0.17      1200.0
  1033       0.060      100.0    0.063      400.0    0.068      700.0    0.071      800.0
  1034       0.0755     900.0    0.082     1000.0    0.096     1100.0
  1035      COW5C 2645              2    3 8.4       0.10      0.047     1300.0     60.0
  1036       0.095        0.0    0.17      1200.0
  1037       0.047      100.0    0.054      700.0    0.061     1100.0
  1038      COCRW 2646              2    2 8.44      0.10      0.03      1300.0     60.0
  1039       0.10         0.0    0.17      1200.0
  1040       0.028        0.0    0.050      600.0
  1041      TIAL1 2712              3    2 4.5       0.13      0.023     1500.0     90.0
  1042       0.125        0.0    0.145      300.0    0.180     1500.0
  1043       0.0225       0.0    0.0330     400.0
  1044      TIAL2 2714              3    4 4.5       0.13      0.020     1500.0     90.0
  1045       0.125        0.0    0.145      300.0    0.180     1500.0
  1046       0.020      100.0    0.0275     300.0    0.0395     600.0    0.0530     900.0
  1047      TIAL3 2716              3    2 4.5       0.13      0.022     1500.0     90.0
  1048       0.125        0.0    0.145      300.0    0.180     1500.0
  1049       0.022      100.0    0.046      900.0
  1050      TIAL4 2718              3    4 4.5       0.13      0.019     1500.0     90.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1051        0.125        0.0    0.145      300.0    0.180     1500.0
1052        0.0185       0.0    0.0280     400.0    0.0355     600.0    0.0470     650.0
1053       TIAL5 2720              3    2 4.5       0.13      0.020     1500.0     90.0
1054        0.125        0.0    0.145      300.0    0.180     1500.0
1055        0.0195       0.0    0.0510     900.0
1056       TIH40 2722              3    3 4.52      0.13      0.018     1500.0     90.0
1057        0.125        0.0    0.145      300.0    0.180     1500.0
1058        0.012     -253.0    0.017        0.0    0.029      550.0
1059       TIH50 2724              3    2 4.60      0.125     0.018     1500.0     90.0
1060        0.120        0.0    0.145      300.0    0.180     1500.0
1061        0.0175       0.0    0.0305     500.0
1062       TIH51 2726              3    2 4.60      0.125     0.016     1500.0     90.0
1063        0.120        0.0    0.145      300.0    0.180     1500.0
1064        0.0152       0.0    0.0269     400.0
1065       TIAL6 2728              3    2 4.5       0.125     0.018     1500.0     90.0
1066        0.120        0.0    0.145      300.0    0.180     1500.0
1067        0.017        0.0    0.047      900.0
1068       TIAL7 2730              3    3 4.5       0.125     0.020     1500.0     90.0
1069        0.120        0.0    0.145      300.0    0.180     1500.0
1070        0.019      100.0    0.038      600.0    0.0515     900.0
1071       TIA11 2732              3    2 4.5       0.125     0.018     1500.0     90.0
1072        0.120        0.0    0.145      300.0    0.180     1500.0
1073        0.017        0.0    0.033      600.0
1074       TI155 2734              3    3 4.5       0.13      0.020     1500.0     90.0
1075        0.125        0.0    0.145      300.0    0.180     1500.0
1076        0.019        0.0    0.027      400.0    0.035      600.0
1077       TIA12 2736              3    2 4.48      0.13      0.017     1500.0     90.0
1078        0.125        0.0    0.145      300.0    0.180     1500.0
1079        0.0155       0.0    0.0315     500.0
1080       TI555 2738              3    2 4.60      0.12      0.019     1500.0     90.0
1081        0.115        0.0    0.140      300.0    0.175     1500.0
1082        0.0185       0.0    0.0325     600.0
1083       TIA13 2740              6    6 4.45      0.125     0.017     1540.0     90.0
1084        0.120      -50.0    0.134      100.0    0.147      300.0    0.160      500.0
1085        0.189      700.0    0.222      900.0
1086        0.0135    -100.0    0.0165       0.0    0.0215     200.0    0.0285     400.0
1087        0.0360     600.0    0.041      700.0
1088       TIA15 2742              3    2 4.37      0.13      0.014     1500.0     90.0
1089        0.125        0.0    0.145      300.0    0.180     1500.0
1090        0.0138       0.0    0.0285     500.0
1091       TI150 2744              8    2 4.6       0.13      0.038     1500.0     90.0
1092        0.130        0.0    0.132      100.0    0.135      200.0    0.142      300.0
1093        0.153      400.0    0.165      500.0    0.182      600.0    0.202      700.0
1094        0.037        0.0    0.040      650.0
1095       TIA14 2746              3    2 4.6       0.125     0.039     1500.0     90.0
1096        0.120        0.0    0.145      300.0    0.180     1500.0
1097        0.039      100.0    0.039      600.0
1098       TI140 2748              3    4 4.6       0.125     0.028     1500.0     90.0
1099        0.120        0.0    0.145      300.0    0.180     1500.0
1100        0.028        0.0    0.031      200.0    0.035      400.0    0.040      600.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1101       TI100 2750              3    3 4.58      0.125     0.026     1500.0    90.0
1102        0.120        0.0    0.145      300.0    0.180     1500.0
1103        0.0255       0.0    0.0350     400.0    0.0405     550.0
1104       TIAL8 2752              3    2 4.5       0.125     0.018     1500.0    90.0
1105        0.120        0.0    0.145      300.0    0.180     1500.0
1106        0.018      100.0    0.052      900.0
1107       TIAL9 2754              3    3 4.6       0.125     0.022     1500.0    90.0
1108        0.120        0.0    0.145      300.0    0.180     1500.0
1109        0.0215       0.0    0.0325     400.0    0.0485     800.0
1110       TIH65 2756              3    2 4.68      0.125     0.018     1500.0    90.0
1111        0.120        0.0    0.145      300.0    0.180     1500.0
1112        0.0175       0.0    0.0269     400.0
1113       TIH60 2758              3    2 4.65      0.125     0.018     1500.0    90.0
1114        0.120        0.0    0.145      300.0    0.180     1500.0
1115        0.017        0.0    0.029      400.0
1116       TIH55 2760              3    2 4.76      0.125     0.018     1500.0    90.0
1117        0.120        0.0    0.145      300.0    0.180     1500.0
1118        0.017        0.0    0.029      400.0
1119       TI680 2762              3    2 4.84      0.115     0.017     1500.0    90.0
1120        0.110        0.0    0.135      300.0    0.170     1500.0
1121        0.0165       0.0    0.0325     500.0
1122       TI679 2764              3    2 4.84      0.115     0.016     1500.0    90.0
1123        0.110        0.0    0.135      300.0    0.170     1500.0
1124        0.0155       0.0    0.030      500.0
1125       TIV15 2766              9    4 4.8       0.126     0.020     1500.0    90.0
1126        0.0       -273.15   0.010     -240.0    0.055     -200.0    0.088     -150.0
1127        0.108     -100.0    0.126       25.0    0.134      100.0    0.141      200.0
1128        0.158      650.0
1129        0.015     -100.0    0.0285     200.0    0.037      400.0    0.047      650.0
1130       TIV14 2768              9    2 5.1       0.126     0.019     1500.0    90.0
1131        0.0       -273.15   0.010     -240.0    0.055     -200.0    0.088     -150.0
1132        0.108     -100.0    0.118      -50.0    0.126       25.0    0.131      100.0
1133        0.164      650.0
1134        0.018        0.0    0.0565     700.0
1135       TIA10 2770              3    6 4.6       0.125     0.022     1500.0    90.0
1136        0.120        0.0    0.145      300.0    0.180     1500.0
1137        0.0238     200.0    0.0305     250.0    0.034      400.0    0.040      600.0
1138        0.044      700.0    0.0475     800.0
1139       GCI01 3001              3    3 7.19      0.11      0.12      1200.0    65.0
1140        0.106        0.0    0.118      100.0    0.152      400.0
1141        0.122      125.0    0.102      300.0    0.095      425.0
1142       GCI02 3002              3    3 7.19      0.11      0.17      1200.0    65.0
1143        0.106        0.0    0.118      100.0    0.152      400.0
1144        0.172      125.0    0.128      300.0    0.106      425.0
1145       GCI03 3003              4    5 7.19      0.11      0.10      1200.0    65.0
1146        0.106        0.0    0.112      100.0    0.152      400.0    0.19       700.0
1147        0.105      100.0    0.092      300.0    0.078      500.0    0.065      700.0
1148        0.058      900.0
1149       GCI04 3004              4    5 7.19      0.11      0.12      1200.0    65.0
1150        0.106        0.0    0.112      100.0    0.152      400.0    0.190      700.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 1151       0.120      100.0    0.103      300.0    0.088      500.0    0.080      700.0
 1152       0.062      900.0
 1153      GCI05 3005              4    5 7.19      0.11      0.14      1200.0    65.0
 1154       0.106        0.0    0.118      100.0    0.152      400.0    0.190      700.0
 1155       0.14         0.0    0.11       300.0    0.106      400.0    0.088      700.0
 1156       0.074      900.0
 1157      GCI06 3006              4    5 7.19      0.11      0.16      1200.0    65.0
 1158       0.106        0.0    0.112      100.0    0.152      400.0    0.190      700.0
 1159       0.16       100.0    0.128      300.0    0.098      500.0    0.084      700.0
 1160       0.052      900.0
 1161      GC107 3007              4    5 7.19      0.11      0.19      1200.0    65.0
 1162       0.106        0.0    0.112      100.0    0.152      400.0    0.190      700.0
 1163       0.192      100.0    0.138      300.0    0.108      500.0    0.090      700.0
 1164       0.078      900.0
 1165      IND01 3021              4    3 7.43      0.11      0.08      1120.0    65.0
 1166       0.106        0.0    0.112      100.0    0.152      400.0    0.190      700.0
 1167       0.079        0.0    0.074      100.0    0.044      700.0
 1168      IND02 3022              0    0 7.2       0.11      0.079     1150.0    65.0
 1169      IND03 3023              0    0 7.2       0.11      0.069     1150.0    65.0
 1170      INCFB 3026              4    3 7.2       0.11      0.09      1120.0    65.0
 1171       0.106        0.0    0.112      100.0    0.152      400.0    0.190      700.0
 1172       0.094      100.0    0.071      500.0    0.062     1000.0
 1173      INCPB 3027              4    2 7.2       0.11      0.09      1120.0    65.0
 1174       0.106        0.0    0.112      100.0    0.152      400.0    0.190      700.0
 1175       0.093      100.0    0.045      900.0
 1176      KOVAR 3031              7    2 7.7       0.11      0.034     1180.0    65.0
 1177       0.106        0.0    0.112      100.0    0.152      400.0    0.192      763.0
 1178       1.648      768.0    0.14       773.0    0.15      1200.0
 1179       0.034       50.0    0.050      900.0
 1180      INNIR 3032              7    0 7.3       0.11      0.095     1230.0    65.0
 1181       0.106        0.0    0.112      100.0    0.152      400.0    0.192      763.0
 1182       1.648      768.0    0.14       773.0    0.15      1200.0
 1183      INNR3 3033              0    0 7.4       0.11      0.094     1230.0    65.0
 1184      INNR4 3034              0    0 7.4       0.12      0.090     1200.0    65.0
 1185      INNRD 3035              0    0 7.41      0.11      0.032     1230.0    65.0
 1186      INMAL 3036              0    0 7.2       0.126     0.122
 1187      INWRT 3037              7    3 7.7       0.11      0.14      1500.0    65.0
 1188       0.106        0.0    0.112      100.0    0.152      400.0    0.192      763.0
 1189       1.648      768.0    0.14       773.0    0.15      1200.0
 1190       0.144        0.0    0.135      100.0    0.095      500.0
 1191      INNIT 3041              0    0 7.20      0.11      0.11      1175.0    65.0
 1192      STALL 3101              9    6 7.75      0.12      0.10      1450.0    65.0
 1193       0.12       -18.0    0.124      204.0    0.148      427.0    0.18       648.0
 1194       0.20       763.0    1.648      768.0    0.15       773.0    0.14       871.0
 1195       0.145     1094.0
 1196       0.103      -18.0    0.101      204.0    0.0923     427.0    0.077      648.0
 1197       0.062      788.0    0.0645     871.0
 1198      STALC 3106              0    0 7.83      0.11      0.11      1450.0    65.0
 1199      STCFC 3111              7    2 7.83      0.11      0.11      1500.0    65.0
 1200       0.107        0.0    0.145      400.0    0.162      500.0    0.22       722.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 1201       1.69       727.0    0.16       732.0    0.155     1000.0
 1202       0.109       18.0    0.107      100.0
 1203      STCAR 3116            10    4 7.86      0.11      0.17      1536.0    65.0
 1204       0.105        0.0    0.12        75.0    0.135     200.0     0.15       400.0
 1205       0.17       600.0    0.20       700.0    0.20      763.0     1.648      768.0
 1206       0.168      773.0    0.16       950.0
 1207       0.195      -73.0    0.17        25.0    0.07      800.0     0.075     1300.0
 1208      STHSP 3121             0    0 8.2       0.11      0.085     1500.0    65.0
 1209      STST2 3126             0    0 7.7       0.12      0.039     1450.0    65.0
 1210      STST3 3131             3    3 8.0       0.12      0.035     1400.0    65.0
 1211       0.115        0.0    0.137      400.0    0.170     1300.0
 1212       0.033        0.0    0.051      500.0    0.067      900.0
 1213      ST304 3133             2    6 7.92      0.12      0.035     1400.0    65.0
 1214       0.120        0.0    0.135      400.0
 1215       0.0165    -200.0    0.026     -100.0    0.032        0.0    0.039      100.0
 1216       0.052      500.0    0.062      700.0
 1217      ST347 3135             7   12 7.92      0.11      0.035     1400.0    65.0
 1218       0.0       -273.15   0.01      -260.0    0.08     -150.0     0.107        0.0
 1219       0.115      200.0    0.133      400.0    0.17      1300.0
 1220       0.0       -273.15   0.0013    -265.0    0.0022   -260.0     0.0052    -250.0
 1221       0.012     -230.0    0.018     -200.0    0.030    -100.0     0.035      100.0
 1222       0.038      200.0    0.063      900.0    0.065     1100.0    0.070     1300.0
 1223      STST4 3141             3    2 7.75      0.11      0.06      1500.0    65.0
 1224       0.10         0.0    0.17       500.0    0.23      700.0
 1225       0.057        0.0    0.069      500.0
 1226      STS4A 3146             2    2 7.75      0.11      0.04      1470.0    65.0
 1227       0.11         0.0    0.17       500.0
 1228       0.04         0.0    0.07       950.0
 1229      STS4B 3151             5    2 7.6       0.11      0.05      1490.0    65.0
 1230       0.11         0.0    0.175      620.0    1.65      625.0     0.16       630.0
 1231       0.18      1200.0
 1232       0.054        0.0    0.094     1100.0
 1233      STST5 3161             2    2 7.8       0.11      0.09      1400.0    65.0
 1234       0.105        0.0    0.152      400.0
 1235       0.088      100.0    0.081      500.0
 1236      STPH4 3171             2    3 7.75      0.08      0.035     1500.0    65.0
 1237       0.08       100.0    0.22       700.0
 1238       0.035      100.0    0.054      600.0    0.076     1400.0
 1239      STPH7 3176            10    3 7.6       0.08      0.040     1500.0    65.0
 1240       0.081      100.0    0.089      375.0    0.074      425.0    0.085      480.0
 1241       0.127      545.0    0.144      595.0    0.132      655.0    0.116      700.0
 1242       0.098      800.0    0.102     1100.0
 1243       0.040      100.0    0.052      500.0    0.079     1050.0
 1244      STUHS 3181             0    0 7.84      0.107     0.138     1500.0    65.0
 1245      ST199 3186             0    6 7.8       0.12      0.032
 1246       0.0323      20.0    0.0347     100.0    0.0375     200.0    0.0403     300.0
 1247       0.0464     500.0    0.0506     640.0
 1248      SSC01 3201             0    0 8.15      0.11      0.032     1275.0    65.0
 1249      SSC02 3202             0    0 8.03      0.11      0.037     1350.0    65.0
 1250      SSC03 3203             0    0 7.96      0.11      0.047     1325.0    65.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.    ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  1251      SSC04 3204              0    0 8.04      0.11      0.050     1460.0    65.0
  1252      SSC05 3205              0    0 7.75      0.12      0.055     1400.0    65.0
  1253      SSC06 3206              0    0 7.72      0.12      0.070     1520.0    65.0
  1254      SSC07 3207              0    0 7.55      0.12      0.074     1480.0    65.0
  1255      SSC08 3208              0    0 7.61      0.11      0.060     1500.0    65.0
  1256      SSC09 3209              0    0 7.53      0.12      0.052     1500.0    65.0
  1257      SSC10 3210              0    0 7.73      0.12      0.045     1370.0    65.0
  1258      SSC11 3211              0    0 7.68      0.14      0.041     1460.0    65.0
  1259      SSC12 3212              0    0 7.75      0.12      0.0385    1400.0    65.0
  1260      SSC13 3213              0    0 7.73      0.12      0.034     1400.0    65.0
  1261      CNISA 3312              0    0 8.0       0.105     0.056     1300.0
  1262      BE96A 3501              9    7 1.84      0.43      0.34      1200.0    300.0
  1263       0.0        -273.15   0.02      -200.0    0.045     -175.0    0.34       -50.0
  1264       0.41          0.0    0.51       100.0    0.565      200.0    0.645      400.0
  1265       0.84       1200.0
  1266       0.34         50.0    0.31       100.0    0.27       200.0    0.245      300.0
  1267       0.23        400.0    0.14      1000.0    0.12      1200.0
  1268      BE96H 3502              9    8 1.84      0.43      0.42      1200.0    300.0
  1269       0.0        -273.15   0.02      -200.0    0.045     -175.0    0.34       -50.0
  1270       0.41          0.0    0.51       100.0    0.565      200.0    0.645      400.0
  1271       0.84       1200.0
  1272       0.42         50.0    0.38       100.0    0.32       200.0    0.285      300.0
  1273       0.265       400.0    0.21       700.0    0.14      1000.0    0.12      1200.0
  1274      BE98A 3503              9    6 1.823     0.43      0.32      1200.0    300.0
  1275       0.0        -273.15   0.02      -200.0    0.045     -175.0    0.34       -50.0
  1276       0.41          0.0    0.51       100.0    0.565      200.0    0.645      400.0
  1277       0.84       1200.0
  1278       0.32         50.0    0.295      100.0    0.270      200.0    0.250      300.0
  1279       0.14       1000.0    0.12      1200.0
  1280      BE98H 3504              9    7 1.823     0.43      0.38      1200.0    300.0
  1281       0.0        -273.15   0.02      -200.0    0.045     -175.0    0.34       -50.0
  1282       0.41          0.0    0.51       100.0    0.565      200.0    0.645      400.0
  1283       0.84       1200.0
  1284       0.38         50.0    0.34       100.0    0.295      200.0    0.270      300.0
  1285       0.245       400.0    0.14      1000.0    0.12      1200.0
  1286      BE995 3505             11    6 1.84      0.44      0.37      1200.0    300.0
  1287       0.0        -273.15   0.02      -200.0    0.045     -175.0    0.215     -100.0
  1288       0.32        -50.0    0.405        0.0    0.475       50.0    0.51       100.0
  1289       0.565       200.0    0.645      400.0    0.84      1200.0
  1290       0.37         50.0    0.33       100.0    0.29       200.0    0.24       400.0
  1291       0.14       1000.0    0.12      1200.0
  1292      PBANT 3601              0    0 10.96     0.032     0.071     290.0     5.7
  1293      PBSBH 3602              0    0 10.7      0.032     0.0645    290.0     5.7
  1294      SOLD1 3611              0    0 8.69      0.057     0.136     185.0     10.0
  1295      SOLD2 3612              4    0 8.5       0.047     0.12      179.0     15.5
  1296       0.0472       25.0    0.0472     182.0    0.0483     182.1    0.0483    1743.0
  1297      SOLD4 3613              0    0 8.89      0.051     0.11      180.0     13.6
  1298      SOLD3 3614              0    0 9.2       0.055     0.113     186.0     11.6
  1299      MOATI 3671              9    3 10.2      0.061     0.28      2610.0    65.0
  1300       0.064       100.0    0.066      500.0    0.0675     700.0    0.070      900.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 1301       0.075     1200.0    0.0825    1500.0    0.091     1800.0    0.098     2000.0
 1302       0.113     2400.0
 1303       0.282       20.0    0.255      890.0    0.16      2400.0
 1304      MOAFE 3672            4     3 10.2       0.066     0.033     2600.0    65.0
 1305       0.066        0.0    0.057      500.0    0.075     1200.0    0.132     2600.0
 1306       0.33         0.0    0.28       800.0    0.21      2500.0
 1307      MOW30 3673            7     4 9.94       0.048     0.294     2600.0    60.0
 1308       0.048      200.0    0.0515     400.0    0.0595     800.0    0.070     1200.0
 1309       0.086     1700.0    0.1045    2200.0    0.122     2600.0
 1310       0.294      100.0    0.194      900.0    0.105     2000.0    0.092     2500.0
 1311      NBTAW 3681            2     2 10.7       0.048     0.107     2400.0    55.0
 1312       0.048        0.0    0.084     2400.0
 1313       0.107        0.0    0.160     2300.0
 1314      NBTIZ 3682            4     2 7.77       0.061     0.070     2400.0    65.0
 1315       0.0605       0.0    0.0816     900.0    0.0990    1500.0    0.1240    2300.0
 1316       0.070        0.0    0.135     2300.0
 1317      NBTA5 3683            2     4 9.0        0.06      0.107     2400.0    60.0
 1318       0.06         0.0    0.09      2400.0
 1319       0.107        0.0    0.143      300.0    0.160      500.0    0.189      900.0
 1320      NBWMO 3684            6     3 9.60       0.059     0.120     2400.0    60.0
 1321       0.059        0.0    0.064      700.0    0.074     1200.0    0.086     1600.0
 1322       0.101     2000.0    0.119     2400.0
 1323       0.120        0.0    0.149      900.0    0.184     2400.0
 1324      PUSTD 3701            9     4 15.75      0.032     0.020     590.0     2.1
 1325       0.029     -100.0    0.030        0.0    0.032      100.0    0.037      300.0
 1326       0.042      500.0    0.069      550.0    0.036      600.0    0.098      650.0
 1327       0.090      700.0
 1328       0.013     -100.0    0.016        0.0    0.020      100.0    0.046      600.0
 1329      SILVA 3751            0     0 10.5       0.060     0.86      880.0     25.0
 1330      TA10W 3781            5     3 16.96      0.03      0.13      3075.0    41.0
 1331       0.032      250.0    0.042     1000.0    0.048     1500.0    0.0525    2000.0
 1332       0.0565    2600.0
 1333       0.128      150.0    0.167     1500.0    0.190     2600.0
 1334      TANB1 3782            4     4 16.5       0.033     0.108     2900.0    40.0
 1335       0.033        0.0    0.035      200.0    0.0365     600.0    0.043     2900.0
 1336       0.1075       0.0    0.115      300.0    0.130      600.0    0.160     1000.0
 1337      TACUZ 3783            4     4 16.66      0.033     0.1       2900.0    40.0
 1338       0.033        0.0    0.034     1000.0    0.042     2000.0    0.052     2900.0
 1339       0.1          0.0    0.123     1000.0    0.147     1800.0    0.157     2400.0
 1340      TANBV 3784            5     4 11.55      0.027     0.065     2200.0    50.0
 1341       0.027        0.0    0.065      600.0    0.097     1000.0    0.140     1500.0
 1342       0.213     2200.0
 1343       0.065        0.0    0.110     1000.0    0.133     1600.0    0.145     2200.0
 1344      TAWHF 3785            4     3 16.95      0.022     0.097     2983.0    40.0
 1345       0.022        0.0    0.031      800.0    0.040     1500.0    0.056     2500.0
 1346       0.097        0.0    0.208     2000.0    0.224     2500.0
 1347      W25RE 3801            2     2 19.7       0.032     0.155     3300.0    44.0
 1348       0.032       25.0    0.05      2400.0
 1349       0.155     1300.0    0.150     2300.0
 1350      WNICU 3802            2     3 16.7       0.032     0.185     3000.0    45.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1351        0.032        0.0     0.045     3000.0
1352        0.185        0.0     0.175      600.0     0.174      900.0
1353       MULBY 3831              8     5 16.5       0.035     0.025     1210.     15.0
1354        0.0345      25.0     0.0385     200.0     0.040      300.0    0.0496     668.0
1355        0.0445     668.1     0.0445     775.0     0.0398     775.1    0.0398    1000.0
1356        0.026       25.0     0.033      100.0     0.051      300.0    0.063      450.0
1357        0.1        900.0
1358       U10MO 3832              2     3 17.25      0.032     0.035     1250.0    15.0
1359        0.032       40.0     0.043      700.0
1360        0.028        0.0     0.056      400.0     0.090      800.0
1361       U18ZR 3833              2     4 14.1       0.04      0.026     1250.0    20.0
1362        0.04         0.0     0.06       650.0
1363        0.026       25.0     0.040      300.0     0.052      500.0    0.081      900.0
1364       U04NB 3834              2     2 17.7       0.03      0.05      1250.0    15.0
1365        0.03       0.0       0.05       650.0
1366        0.0545     110.0     0.065      350.0
1367       UCREU 3835              3     4 18.5       0.025     0.068     1100.0    15.0
1368        0.012     -200.0     0.025        0.0     0.058      500.0
1369        0.068        0.0     0.078      300.0     0.094      600.0    0.113      900.0
1370       U97FS 3836              2     2 18.3       0.030     0.051     1100.0    15.0
1371        0.030        0.0     0.045      700.0
1372        0.051      100.0     0.096      700.0
1373       U90FS 3837              2     2 17.2       0.032     0.036     1100.0    15.0
1374        0.032        0.0     0.043      700.0
1375        0.036      100.0     0.072      700.0
1376       UFSZR 3838              3     3 17.6       0.03      0.048     1100.0    15.0
1377        0.03         0.0     0.04       400.0     0.06       600.0
1378        0.048      100.0     0.080      600.0     0.090      700.0
1379       UZR02 3839              3     4 18.6       0.028     0.054     1250.0    20.0
1380        0.028        0.0     0.035      350.0     0.048      660.0
1381        0.054       25.0     0.067      300.0     0.081      500.0    0.105      800.0
1382       UZR05 3840              2     4 17.5       0.030     0.045     1250.0    20.0
1383        0.030        0.0     0.050      650.0
1384        0.045       25.0     0.060      300.0     0.073      500.0    0.105      900.0
1385       ZINC2 3861              0     0 7.18       0.096     0.250     422.0     24.0
1386       ZINC1 3862              0     0 7.14       0.094     0.257     419.0     24.0
1387       ZINC3 3863              0     0 6.6        0.10      0.27      386.6     24.0
1388       ZINC4 3864              0     0 6.7        0.10      0.26      386.0     24.0
1389       ZIRCA 3881              0     0 6.56       0.07      0.033     1810.0    55.0
1390       ZR3ZI 3882              2     2 6.46       0.068     0.019     1800.0    50.0
1391        0.068        0.0     0.076      500.0
1392        0.019        0.0     0.045      600.0
1393       DAN35 3901              2     2 6.43       0.10      0.017
1394        0.098        0.0     0.115      900.0
1395        0.0174       0.0     0.055      800.0
1396       ALOXD 4012             10    10 3.98       0.186     0.092     2045.0    132.0
1397        0.0       -273.15    0.01      -200.0     0.140      -50.0    0.174        0.0
1398        0.222      100.0     0.245      200.0     0.265      300.0    0.280      500.0
1399        0.300      900.0     0.312     1700.0
1400        0.10         0.0     0.069      100.0     0.053      200.0    0.042      300.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1401        0.033      400.0    0.028      500.0    0.022      700.0    0.018      900.0
1402        0.020     1200.0    0.025     1700.0
1403       ALOXP 4014             10    10 2.2      0.186     0.042     2045.0    132.0
1404        0.0       -273.15   0.01      -200.0    0.140      -50.0    0.174        0.0
1405        0.222      100.0    0.245      200.0    0.265      300.0    0.280      500.0
1406        0.300      900.0    0.312     1700.0
1407        0.046        0.0    0.032      100.0    0.024      200.0    0.019      300.0
1408        0.015      400.0    0.013      500.0    0.010      700.0    0.008      900.0
1409        0.009     1200.0    0.011     1700.0
1410       ALOXS 4016             10    11 3.98     0.186     0.12      2045.0    132.0
1411        0.0       -273.15   0.01      -200.0    0.140      -50.0    0.174        0.0
1412        0.222      100.0    0.245      200.0    0.265      300.0    0.280      500.0
1413        0.300      900.0    0.312     1700.0
1414        0.105       50.0    0.088      100.0    0.065      200.0    0.050      300.0
1415        0.040      400.0    0.030      500.0    0.018      800.0    0.015     1000.0
1416        0.013     1200.0    0.013     1400.0    0.016     1600.0
1417       ALOXF 4018             10     3 0.5      0.186     1.0    E-4 2045.0    132.0
1418        0.0       -273.15   0.01      -200.0    0.140      -50.0    0.174        0.0
1419        0.222      100.0    0.245      200.0    0.265      300.0    0.280      500.0
1420        0.300      900.0    0.312     1700.0
1421        1.0    E-4  350.0    4.2    E-4  800.0    7.5    E-4 1000.0
1422       ALOXL 4019             10     5 1.9      0.186     0.0125    2045.0    132.0
1423        0.0       -273.15   0.01      -200.0    0.140      -50.0    0.174        0.0
1424        0.222      100.0    0.245      200.0    0.265      300.0    0.280      500.0
1425        0.300      900.0    0.312     1700.0
1426        0.0125     150.0    0.009      300.0    0.007      500.0    0.0052     800.0
1427        0.0048    1000.0
1428       BEO   4022             12    11 2.90     0.25      0.61      2550.0    551.0
1429        0.0       -273.15   0.01      -200.0    0.12      -100.0    0.225        0.0
1430        0.308      100.0    0.36       200.0    0.395      300.0    0.422      400.0
1431        0.456      600.0    0.485      800.0    0.525     1500.0    0.615     2550.0
1432        0.64         0.0    0.46       100.0    0.35       200.0    0.21       400.0
1433        0.14       600.0    0.095      800.0    0.070     1000.0    0.053     1200.0
1434        0.042     1500.0    0.037     1700.0    0.036     2100.0
1435       BEOXM 4024             12    11 2.3      0.25      0.33      2550.0    551.0
1436        0.0       -273.15   0.01      -200.0    0.12      -100.0    0.225        0.0
1437        0.308      100.0    0.36       200.0    0.395      300.0    0.422      400.0
1438        0.456      600.0    0.485      800.0    0.525     1500.0    0.615     2550.0
1439        0.35         0.0    0.24       100.0    0.176      200.0    0.113      400.0
1440        0.081      600.0    0.065      800.0    0.055     1000.0    0.050     1200.0
1441        0.040     1500.0    0.035     1700.0    0.035     2100.0
1442       CAO   4026             11     5 3.03     0.18      0.033     2600.0    220.0
1443        0.0       -273.15   0.04      -200.0    0.094     -150.0    0.133     -100.0
1444        0.160      -50.0    0.176        0.0    0.196      100.0    0.208      200.0
1445        0.218      400.0    0.231      900.0    0.257     2200.0
1446        0.033      100.0    0.024      200.0    0.020      400.0    0.018      600.0
1447        0.017     1000.0
1448       CO2   4027              5     5 0.001977 0.21      3.5    E-5 -78.5     137.0
1449        0.205        0.0    0.225      100.0    0.240      200.0    0.260      300.0
1450        0.275      400.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 1451       2.64  E-5  -50.0     3.47  E-5    0.0     5.29  E-5  100.0     7.31  E-5  200.0
 1452       9.46  E-5  300.0
 1453      CAOPP 4028              11     2 1.7        0.18       0.76  E-3 2600.0     220.0
 1454       0.0        -273.15   0.04       -200.0     0.094      -150.0     0.133     -100.0
 1455       0.160       -50.0    0.176        0.0      0.196       100.0     0.208      200.0
 1456       0.218       400.0    0.231      900.0      0.257      2200.0
 1457       0.76  E-3  100.0     1.17  E-3  900.0
 1458      COGAS 4029               3     3 0.00125    0.25       5.6   E-5 -191.52    51.5
 1459       0.248        25.0    0.249      100.0      0.260       400.0
 1460       1.7   E-5 -191.1     1.9   E-5 -181.1      5.6   E-5    0.0
 1461      CEO2  4030              11    10 6.1        0.084      0.028      2000.0    110.
 1462       0.0        -273.15   0.0075     -225.0     0.045      -150.0     0.062     -100.0
 1463       0.074       -50.0    0.082        0.0      0.091       100.0     0.100      300.0
 1464       0.105       500.0    0.119     1500.0      0.122      1800.0
 1465       0.0275       50.0    0.0246     100.0      0.0193      200.0     0.0130     400.0
 1466       0.0065      800.0    0.0042    1000.0      0.00305    1100.0     0.0024    1200.0
 1467       0.0020     1400.0    0.0022    1700.0
 1468      COBOX 4034              10     0 6.46       0.168      0.024      1800.0    160.0
 1469       0.0        -273.15   0.008      -230.0     0.034      -200.0     0.084     -150.0
 1470       0.123      -100.0    0.197        0.0      0.168        25.0     0.169      200.0
 1471       0.176       500.0    0.202     1500.0
 1472      CUO   4036               5     2 6.5        0.128      0.043      1330.0    40.0
 1473       0.101      -100.0    0.124        0.0      0.150       200.0     0.168      500.0
 1474       0.192      1000.0
 1475       0.045         0.0    0.028      200.0
 1476      GD2O3 4038              11     2 7.64       0.073      0.024      2330.0
 1477       0.0        -273.15   0.005      -250.0     0.040      -150.0     0.054     -100.0
 1478       0.068         0.0    0.074      100.0      0.077       200.0     0.081      500.0
 1479       0.087      1000.0    0.090     1500.0      0.092      1800.0
 1480       0.024      1000.0    0.024     1000.1
 1481      HFO2  4040               2     3 9.1        0.065      0.004      2800.0    81.0
 1482       0.064         0.0    0.146     2600.0
 1483       0.004       100.0    0.006     1000.0      0.0062     1800.0
 1484      FE2O3 4042              12     0 5.24       0.15       0.03       1560.0
 1485       0.024      -200.0    0.098      -100.0     0.146        0.0      0.180      100.0
 1486       0.200       200.0    0.225       400.0     0.257       672.0     0.436      677.0
 1487       0.225       682.0    0.225       777.0     0.210       777.1     0.216     1500.0
 1488      FE3O4 4044               4     0 5.2        0.156      0.012      1538.0    143.0
 1489       0.156        25.0    0.282       630.0     0.207       630.1     0.206     1500.0
 1490      PBO   4046              10     2 8.0        0.049      0.007      890.0     12.6
 1491       0.0        -273.15   0.001      -260.0     0.008      -250.0     0.015     -230.0
 1492       0.024      -200.0    0.034      -150.0     0.0405     -100.0     0.0480       0.0
 1493       0.0585      400.0    0.067       900.0
 1494       0.0075        0.0    0.0028      200.0
 1495      MGOX  4048               8     8 3.58       0.22       0.165      2850.0    460.0
 1496       0.06       -175.0    0.16       -100.0     0.21         0.0      0.25       100.0
 1497       0.265       200.0    0.285       400.0     0.31       1000.0     0.34      2200.0
 1498       0.180         0.0    0.115       100.0     0.090       200.0     0.072      300.0
 1499       0.060       400.0    0.050       500.0     0.038       700.0     0.033      900.0
 1500      MGOPX 4050               8    12 3.58       0.22       0.148      2850.0    460.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.    ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 1501        0.06      -175.0    0.16      -100.0    0.21        0.0     0.25       100.0
 1502        0.265      200.0    0.285      400.0    0.310     1000.0    0.340     2200.0
 1503        0.160        0.0    0.108      100.0    0.078      200.0    0.058      300.0
 1504        0.046      400.0    0.030      600.0    0.020      800.0    0.017     1000.0
 1505        0.015     1300.0    0.017     1600.0    0.027     1900.0    0.041     2100.0
 1506       MNO   4052              5    0 5.4       0.144     0.024     1780.0    184.0
 1507        0.144       25.0    0.164      200.0    0.180      500.0    0.200     1000.0
 1508        0.204     1500.0
 1509       MN304 4054              7    0 4.2       0.15      0.01      1560.0    144.0
 1510        0.150       25.0    0.172      200.0    0.203      800.0    0.219     1167.0
 1511        4.560     1172.0    0.22      1177.0    0.22      1500.0
 1512       NIO   4056             11    0 6.81      0.144     0.11      1960.0    162.0
 1513        0.0       -273.15   0.01      -225.0    0.065     -150.0    0.095     -100.0
 1514        0.120      -50.0    0.137        0.0    0.164      100.0    0.212      250.0
 1515        0.164      300.0    0.189     1000.0    0.196     1500.0
 1516       NIOPX 4058             11    6 6.4       0.144     0.034     1960.0    162.0
 1517        0.0       -273.15   0.01      -225.0    0.065     -150.0    0.095     -100.0
 1518        0.120      -50.0    0.137        0.0    0.164      100.0    0.212      250.0
 1519        0.164      300.0    0.189     1000.0    0.196     1500.0
 1520        0.031       75.0    0.0246     200.0    0.0172     400.0    0.0132     600.0
 1521        0.0112     800.0    0.0103    1000.0
 1522       NIOPL 4060             11    6 5.0       0.144     0.025     1960.0    162.0
 1523        0.0       -273.15   0.01      -225.0    0.065     -150.0    0.095     -100.0
 1524        0.120      -50.0    0.137        0.0    0.164      100.0    0.212      250.0
 1525        0.164      300.0    0.189     1000.0    0.196     1500.0
 1526        0.0235      50.0    0.0176     200.0    0.0126     400.0    0.0100     600.0
 1527        0.0082     800.0    0.0075    1000.0
 1528       NOGAS 4061              6    2 1.34  E-3 0.231     5.71  E-5 -151.8
 1529        0.580     -163.6    0.580     -151.9    0.223     -151.8    0.230        0.0
 1530        0.250      400.0    0.267      700.0
 1531        4.26  E-5  -70.0    5.71  E-5    0.0
 1532       SIO2  4062             11   11 2.20      0.178     3.3   E-3 1665.0    45.0
 1533        0.0       -273.15   0.01      -250.0    0.085     -150.0    0.145      -50.0
 1534        0.169        0.0    0.205      100.0    0.227      200.0    0.265      500.0
 1535        0.290      800.0    0.317     1300.0    0.350     1700.0
 1536        0.28  E-3 -269.0    0.60  E-3 -230.0    0.95  E-3 -200.0    1.95  E-3 -150.0
 1537        2.45  E-3 -100.0    3.17  E-3    0.0    4.1   E-3  200.0    4.8   E-3  400.0
 1538        5.7   E-3  600.0    7.2   E-3  800.0    0.01      1000.0
 1539       SIO2C 4064             12    7 2.65      0.18      0.028     1435.0    45.0
 1540        0.120     -100.0    0.167        0.0    0.206      100.0    0.231      200.0
 1541        0.268      400.0    0.290      500.0    0.305      573.0    0.786      578.0
 1542        0.268      583.0    0.278      800.0    0.303     1300.0    0.324     1700.0
 1543        0.030        0.0    0.021      100.0    0.0182     150.0    0.0158     200.0
 1544        0.013      300.0    0.011      400.0    0.0095     500.0
 1545       SIO2A 4066             12    7 2.65      0.18      0.0155    1435.0    45.0
 1546        0.120     -100.0    0.167        0.0    0.206      100.0    0.231      200.0
 1547        0.268      400.0    0.290      500.0    0.305      573.0    0.786      578.0
 1548        0.268      583.0    0.278      800.0    0.303     1300.0    0.324     1700.0
 1549        0.0162       0.0    0.0126     100.0    0.011      150.0    0.0101     200.0
 1550        0.0088     300.0    0.0080     400.0    0.0075     500.0

             ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 1551      SIO2F 4068              11     2 0.16       0.178      1.32  E-4 1610.0     45.0
 1552       0.0        -273.15   0.01       -250.0     0.085      -150.0     0.145      -50.0
 1553       0.169         0.0    0.205       100.0     0.227       200.0     0.265      500.0
 1554       0.290       800.0    0.317      1300.0     0.350      1700.0
 1555       1.32  E-4 -197.0     1.32  E-4   27.0
 1556      SO2   4071               3     2 2.927 E-3 0.152      2.26  E-5
 1557       0.150         0.0    0.170       200.0     0.193       400.0
 1558       2.07  E-5     0.0    2.85  E-5  100.0
 1559      THO2  4072              11     9 9.6        0.056      0.028      3200.0     68.0
 1560       0.0        -273.15   0.001      -260.0     0.017      -200.0     0.031     -150.0
 1561       0.042      -100.0    0.049       -50.0     0.054         0.0     0.061      100.0
 1562       0.065       300.0    0.068       500.0     0.083      2500.0
 1563       0.030         0.0    0.023       100.0     0.018       200.0     0.015      300.0
 1564       0.011       500.0    0.008       800.0     0.006      1200.0     0.0055    1700.0
 1565       0.0043     2200.0
 1566      SNO2  4074               7     2 5.56       0.082      0.075      1625.0     76.0
 1567       0.077         0.0    0.097       100.0     0.107       200.0     0.114      300.0
 1568       0.118       400.0    0.131       800.0     0.141      1200.0
 1569       0.075        25.0    0.053       150.0
 1570      TIO2C 4082              12     9 4.25       0.164      0.034      1820.0     170.0
 1571       0.0        -273.15   0.008      -240.0     0.080      -150.0     0.110     -100.0
 1572       0.140       -50.0    0.158         0.0     0.182       100.0     0.195      200.0
 1573       0.202       300.0    0.210       500.0     0.220       800.0     0.230     1500.0
 1574       0.032        50.0    0.0285      100.0     0.0255      150.0     0.0184     400.0
 1575       0.0167      500.0    0.0163      600.0     0.0168      700.0     0.0182     800.0
 1576       0.0194      850.0
 1577      TIO2A 4084              12     7 4.25       0.164      0.021      1820.0     170.0
 1578       0.0        -273.15   0.008      -240.0     0.080      -150.0     0.110     -100.0
 1579       0.140       -50.0    0.158         0.0     0.182       100.0     0.195      200.0
 1580       0.202       300.0    0.210       500.0     0.220       800.0     0.230     1500.0
 1581       0.020        50.0    0.0160      200.0     0.0141      300.0     0.0128     400.0
 1582       0.0125      500.0    0.0130      600.0     0.0162      800.0
 1583      TIO2  4086              12     9 4.25       0.164      0.025      1820.0     170.0
 1584       0.0        -273.15   0.008      -240.0     0.080      -150.0     0.110     -100.0
 1585       0.140       -50.0    0.158         0.0     0.182       100.0     0.195      200.0
 1586       0.202       300.0    0.210       500.0     0.220       800.0     0.230     1500.0
 1587       0.0214      100.0    0.018       200.0     0.015       300.0     0.0124     400.0
 1588       0.0105      500.0    9.3   E-3   600.0     8.4   E-3   700.0     7.9   E-3  800.0
 1589       7.9   E-3   900.0
 1590      WO3   4092               9     0 7.16       0.074      0.06       1470.0     73.0
 1591       0.0        -273.15   0.004      -240.0     0.020      -200.0     0.038     -150.0
 1592       0.051      -100.0    0.062       -50.0     0.070         0.0     0.085      100.0
 1593       0.125      1300.0
 1594      UO2   4094              11     8 10.96      0.058      0.025      2880.0
 1595       0.0        -273.15   0.003      -260.0     0.032      -247.0     0.009     -238.0
 1596       0.043      -100.0    0.056         0.0     0.063       100.0     0.0675     200.0
 1597       0.0722      400.0    0.0790     1200.0     0.082      2000.0
 1598       0.025        25.0    0.021       100.0     0.018       200.0     0.015      300.0
 1599       0.0132      500.0    0.0123      700.0     0.0124      800.0     0.0145    1000.0
 1600      UO2PX 4096              11     9 10.6       0.058      0.024      2880.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 1601       0.0        -273.15   0.003      -260.0    0.032      -247.0    0.009      -238.0
 1602       0.043      -100.0    0.056         0.0    0.063       100.0    0.0675      200.0
 1603       0.0722      400.0    0.0790     1200.0    0.082      2000.0
 1604       0.024        25.0    0.018       100.0    0.0155      200.0    0.012       400.0
 1605       9.8   E-3  600.0    7.0   E-3 1000.0    5.3   E-3 1500.0    4.4   E-3 2200.0
 1606       4.7   E-3 2800.0
 1607      U308H 4098              9    4 8.3       0.066      1.3   E-3 1300.0
 1608       0.0        -273.15   0.002      -260.0    0.025      -200.0    0.039      -150.0
 1609       0.050      -100.0    0.064         0.0    0.072       100.0    0.082       300.0
 1610       0.085       700.0
 1611       1.3   E-3  100.0    1.14  E-3  200.0    1.06  E-3  300.0    9.9   E-4  500.0
 1612      U308L 4099              9    3 8.0       0.066      7.1   E-4 1300.0
 1613       0.0        -273.15   0.002      -260.0    0.025      -200.0    0.039      -150.0
 1614       0.050      -100.0    0.064         0.0    0.072       100.0    0.082       300.0
 1615       0.085       700.0
 1616       7.1   E-4   50.0    6.4   E-4  200.0    5.8   E-4  500.0
 1617      Y203  4102             12    8 5.0       0.107      0.034     2410.0     110.0
 1618       0.0        -273.15   0.002      -250.0    0.076      -100.0    0.094       -50.0
 1619       0.104         0.0    0.116       100.0    0.123       200.0    0.127       300.0
 1620       0.132       500.0    0.134       700.0    0.138      1100.0    0.138      1600.0
 1621       0.034       100.0    0.024       200.0    0.0145      400.0    9.5   E-3  600.0
 1622       6.5   E-3 1000.0    6.5   E-3 1600.0    8.7   E-3 1900.0    0.0135     2200.0
 1623      ZNO   4104              5    7 5.63      0.118      0.065     1975.0     54.6
 1624       0.118        25.0    0.139       200.0    0.151       500.0    0.158       800.0
 1625       0.166      1300.0
 1626       0.065        50.0    0.055       100.0    0.042       200.0    0.0265      400.0
 1627       0.0165      600.0    0.0125      800.0    0.0120      900.0
 1628      ZRO2  4106             12    6 5.56      0.109      3.7   E-3 2710.0     169.0
 1629       0.0        -273.15   0.002      -250.0    0.078      -100.0    0.106         0.0
 1630       0.119       100.0    0.129       200.0    0.138       400.0    0.146       700.0
 1631       0.154      1195.0    2.45       1200.0    0.144      1205.0    0.144      1600.0
 1632       4.4   E-3    0.0    5.5   E-3 1200.0    6.0   E-3 1500.0    6.75  E-3 1800.0
 1633       7.7   E-3 2000.0    9.4   E-3 2200.0
 1634      ZRO2C 4108             10    6 5.08      0.109      3.8   E-3 2550.0     169.0
 1635       0.0        -273.15   0.002      -250.0    0.078      -100.0    0.106         0.0
 1636       0.119       100.0    0.13        200.0    0.14        400.0    0.156       800.0
 1637       0.160      1000.0    0.168      2200.0
 1638       3.8   E-3    0.0    4.4   E-3  400.0    5.4   E-3 1000.0    6.0   E-3 1200.0
 1639       6.8   E-3 1400.0    7.7   E-3 1600.0
 1640      H2OG1 4112              0    3 0.598 E-3 0.47       5.6   E-5 100.0      539.55
 1641       5.62  E-5  100.0    7.5   E-5  200.0    1.355 E-4  500.0
 1642      H2OGS 4113              7   10 0.598 E-3 0.45       4.25  E-5
 1643       0.45         40.0    0.47        100.0    0.69        200.0    0.89        250.0
 1644       1.09        275.0    1.58        300.0    2.50        336.0
 1645       3.0   E-5  -50.0    3.8   E-5    0.0    5.62  E-5  100.0    6.9   E-5  150.0
 1646       8.6   E-5  200.0    1.07  E-4  250.0    1.23  E-4  275.0    1.44  E-4  300.0
 1647       1.70  E-4  325.0    1.83  E-4  336.0
 1648      WATER 4114             11    7 1.0       1.0        0.00144   0.0        79.71
 1649       1.008         0.0    0.9977       50.0    1.006      100.0    1.0289      150.0
 1650       1.073       200.0    1.1698      250.0    1.28        275.0    1.41        300.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1651        1.68        325.0     3.5         350.0     5.5         356.0
1652        1.316 E-3     0.0     1.545 E-3    50.0     1.632 E-3   100.0     1.637 E-3   123.9
1653        1.590 E-3   200.0     1.280 E-3   300.0     0.767 E-3   365.0
1654       ICE    4116              12     2 0.917      0.505       0.0050     0.0         79.71
1655        0.0        -273.15    0.0361     -250.0     0.162       -200.0     0.199       -180.0
1656        0.246      -150.0     0.329      -100.0     0.410        -50.0     0.505          0.0
1657        1.00          0.1     1.07        200.0     1.27         250.0     1.41         300.0
1658        0.0085     -130.0     0.0050        0.0
1659       D20    4118               2     2 1.10       1.005       0.00134    3.82         80.0
1660        1.009        10.0     1.004        35.0
1661        0.00128       0.0     0.00153     100.0
1662       BATIT 4212              12     2 5.9        0.105       0.01       1620.0
1663        0.0        -273.15    0.005      -240.0     0.057       -150.0     0.095        -63.0
1664        0.090       -55.0     0.103         0.0     0.113        100.0     0.119        200.0
1665        0.123       300.0     0.128       500.0     0.132        800.0     0.139       1500.0
1666        0.0102       25.0     0.0096      125.0
1667       BATIS 4213              12     2 5.9        0.105       0.0081     1620.0
1668        0.0        -273.15    0.005      -240.0     0.057       -150.0     0.095        -63.0
1669        0.090       -55.0     0.103         0.0     0.113        100.0     0.119        200.0
1670        0.123       300.0     0.128       500.0     0.132        800.0     0.139       1500.0
1671        0.0081       25.0     0.0058      200.0
1672       BATIM 4214              12     2 5.9        0.105       0.0031     1620.0
1673        0.0        -273.15    0.005      -240.0     0.057       -150.0     0.095        -63.0
1674        0.090       -55.0     0.103         0.0     0.113        100.0     0.119        200.0
1675        0.123       300.0     0.128       500.0     0.132        800.0     0.139       1500.0
1676        0.0031       25.0     0.0024      150.0
1677       CATIT 4216              12     2 4.1        0.174       0.011      1970.0
1678        0.0        -273.15    0.006      -240.0     0.085       -150.0     0.123       -100.0
1679        0.150       -50.0     0.168         0.0     0.192        100.0     0.206        200.0
1680        0.214       300.0     0.224       500.0     0.230        800.0     0.238       1500.0
1681        0.011        50.0     0.010       150.0
1682       CNLOX 4218               0     0 6.5        0.18        0.0086
1683       CUOLI 4220               0     5 6.3        0.16        0.0365
1684        0.0365      225.0     0.030       300.0     0.025        400.0     0.0223       500.0
1685        0.0195      800.0
1686       NIOLI 4222               0     7 6.6        0.17        0.0315
1687        0.0315      125.0     0.0193      300.0     0.0155       400.0     0.0125       500.0
1688        0.0100      700.0     0.0093      900.0     0.0095      1100.0
1689       SPINX 4224              12     3 3.60       0.194       0.03       2135.0
1690        0.0        -273.15    0.016      -200.0     0.035       -175.0     0.107       -100.0
1691        0.149       -50.0     0.181         0.0     0.23         100.0     0.26         200.0
1692        0.28        500.0     0.32       1000.0     0.345       1500.0     0.37        2000.0
1693        0.034        25.0     0.029        50.0     0.0227       150.0
1694       SPINL 4225              12     8 3.60       0.194       0.036      2135.0
1695        0.0        -273.15    0.016      -200.0     0.035       -175.0     0.107       -100.0
1696        0.149       -50.0     0.181         0.0     0.23         100.0     0.26         200.0
1697        0.28        500.0     0.32       1000.0     0.345       1500.0     0.37        2000.0
1698        0.036       100.0     0.031       200.0     0.0243       400.0     0.0190       600.0
1699        0.0157      800.0     0.0135     1000.0     0.013       1200.0     0.005       1315.0
1700       NIZNF 4226               6     0 4.7        0.145       0.0089

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 1701       0.0       -273.15   0.007     -250.0    0.101     -100.0    0.124      -50.0
 1702       0.14         0.0    0.154       75.0
 1703      KCROX 4232            0     2 2.68      0.22      0.0050    398.0     30.0
 1704       0.0041    -190.0    0.0050      0.0
 1705      KCROM 4233            0     2 2.68      0.22      0.0041    398.0     30.0
 1706       0.0041    -190.0    0.0041      0.0
 1707      SRTIT 4234           12     3 5.11      0.128     0.014     2038.0
 1708       0.0       -273.15   0.005     -250.0    0.042     -200.0    0.072     -150.0
 1709       0.096     -100.0    0.112      -50.0    0.124        0.0    0.139      100.0
 1710       0.148      200.0    0.155      400.0    0.162      800.0    0.171     1600.0
 1711       0.014       25.0    0.011      200.0    0.011      500.0
 1712      SRTIP 4235           12     2 4.0       0.128     0.057     2038.0
 1713       0.0       -273.15   0.005     -250.0    0.042     -200.0    0.072     -150.0
 1714       0.096     -100.0    0.112      -50.0    0.124        0.0    0.139      100.0
 1715       0.148      200.0    0.155      400.0    0.162      800.0    0.171     1600.0
 1716       0.011     -200.0    0.0045     100.0
 1717      UPUOX 4242            9     9 10.6      0.06      0.0182    2700.0
 1718       0.063      100.0    0.068      200.0    0.074      400.0    0.076      600.0
 1719       0.0765     800.0    0.0765    1000.0    0.0775    1200.0    0.080     1400.0
 1720       0.0845    1600.0
 1721       0.0182     100.0    0.0167     200.0    0.0120     400.0    0.0093     600.0
 1722       0.0074     800.0    0.0060    1000.0    0.00525   1200.0    0.0049    1400.0
 1723       0.0048    1600.0
 1724      ZNFEO 4252            8     3 5.33      0.14      0.0096    1590.0
 1725       0.0       -273.15   0.007     -250.0    0.072     -150.0    0.10      -100.0
 1726       0.122      -50.0    0.137        0.0    0.154      100.0    0.232      700.0
 1727       0.0095    -175.0    0.0096       0.0    0.0098     100.0
 1728      TOPAZ 4301            0     3 3.54      0.30      0.046
 1729       0.046       25.0    0.039      100.0    0.0325     150.0
 1730      TOPAC 4302            0     3 3.54      0.30      0.05
 1731       0.056        0.0    0.041      100.0    0.0345     150.0
 1732      ANDAL 4312            8     0 3.14      0.184     0.0263    1545.0
 1733       0.075     -150.0    0.173        0.0    0.215      100.0    0.240      200.0
 1734       0.254      300.0    0.273      500.0    0.293      800.0    0.327     1500.0
 1735      KYAN  4314            8     2 3.65      0.184     0.0414    1545.0
 1736       0.075     -150.0    0.173        0.0    0.215      100.0    0.240      200.0
 1737       0.254      300.0    0.273      500.0    0.293      800.0    0.327     1500.0
 1738       0.0436       0.0    0.0250     200.0
 1739      MULL  4316            8     8 3.20      0.183     0.015     1850.0
 1740       0.075     -150.0    0.173        0.0    0.215      100.0    0.240      200.0
 1741       0.254      300.0    0.273      500.0    0.288      800.0    0.327     1500.0
 1742       0.0145     100.0    0.0132     200.0    0.0122     300.0    0.0114     400.0
 1743       0.0103     600.0    0.0095     800.0    0.0093    1000.0    0.0092    1200.0
 1744      BERYL 4318            0     0 2.65      0.30      0.015     1410.0
 1745      BSPOD 4320            0     3 3.1       0.30      0.0025
 1746       0.0025     100.0    0.00315    600.0    0.0034     900.0
 1747      CORDR 4322            8     2 2.1       0.185     0.0053
 1748       0.0       -273.15   0.005     -240.0    0.082     -150.0    0.120     -100.0
 1749       0.140      -50.0    0.175        0.0    0.195       50.0    0.3       1000.0
 1750       0.0053     100.0    0.0049    1000.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  1751     FORST 4324              10    5 3.2       0.20      0.014     1910.0    130.0
  1752      0.0       -273.15    0.01      -250.0    0.125     -100.0    0.165     -50.0
  1753      0.185        0.0     0.225      100.0    0.250      200.0    0.274     400.0
  1754      0.292      700.0     0.340     1600.0
  1755      0.014      100.0     0.0102     400.0    0.0081     600.0    0.0066    800.0
  1756      0.0056    1200.0
  1757     STEAT 4326              10    0 3.0       0.20      0.008     1554.0
  1758      0.0       -273.15    0.01      -250.0    0.125     -100.0    0.165     -50.0
  1759      0.185        0.0     0.225      100.0    0.250      200.0    0.274     400.0
  1760      0.292      700.0     0.340     1600.0
  1761     ORTHC 4328               0    0 2.6       0.30      0.01
  1762     ANALC 4329               0    0 2.26      0.32      0.0082
  1763     ZIRCN 4330               9    0 4.6       0.13      0.010     1541.0
  1764      0.0       -273.15    0.005     -225.0    0.085     -100.0    0.123       0.0
  1765      0.149      100.0     0.164      200.0    0.180      400.0    0.192     700.0
  1766      0.212     1600.0
  1767     ZIRCP 4332               9    9 4.6       0.13      0.015     1541.0
  1768      0.0       -273.15    0.005     -225.0    0.085     -100.0    0.123       0.0
  1769      0.149      100.0     0.164      200.0    0.180      400.0    0.192     700.0
  1770      0.212     1600.0
  1771      0.0155     100.0     0.0142     200.0    0.0132     300.0    0.0124    400.0
  1772      0.0112     600.0     0.0102     800.0    0.0097    1000.0    0.0094   1200.0
  1773      0.0084    1900.0
  1774     ALN   4412              10    5 3.2       0.175     0.084     2000.0
  1775      0.0       -273.15    0.008     -220.0    0.13       -50.0    0.175      25.0
  1776      0.210      100.0     0.240      200.0    0.260      400.0    0.275     600.0
  1777      0.290      900.0     0.30      1600.0
  1778      0.084       25.0     0.0655     300.0    0.056      500.0    0.0505    700.0
  1779      0.048      800.0
  1780     BE3N2 4414               2    0 1.7       0.30      0.0017    2200.0    561.0
  1781      0.30        25.0     0.565      500.0
  1782     BN    4416               9    2 2.1       0.19      0.0785    2730.0
  1783      0.0       -273.15    0.01      -240.0    0.19        25.0    0.24      100.0
  1784      0.33       300.0     0.382      500.0    0.435      800.0    0.470    1200.0
  1785      0.480     1900.0
  1786      0.0785      25.0     0.046     2000.0
  1787     BNPPA 4418               9    4 2.1       0.19      0.050     2730.0
  1788      0.0       -273.15    0.01      -240.0    0.19        25.0    0.24      100.0
  1789      0.33       300.0     0.382      500.0    0.435      800.0    0.470    1200.0
  1790      0.480     1900.0
  1791      0.050       25.0     0.042      300.0    0.038      500.0    0.035    1000.0
  1792     BNOX2 4420               5    3 2.1       0.19      0.069
  1793      0.19        25.0     0.237      100.0    0.325      300.0    0.390     500.0
  1794      0.470      800.0
  1795      0.069      350.0     0.065      700.0    0.063     1000.0
  1796     BNOXP 4422               5    3 2.1       0.19      0.036
  1797      0.19        25.0     0.237      100.0    0.325      300.0    0.390     500.0
  1798      0.470      800.0
  1799      0.036      350.0     0.032      700.0    0.029     1100.0
  1800     BNAC  4424               6    4 1.62      0.19      0.0455

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1801        0.190       30.0     0.250      100.0     0.300      200.0     0.335      300.0
1802        0.411      600.0     0.454     1000.0
1803        0.0455     300.0     0.0415     400.0     0.0400     500.0     0.0385    1000.0
1804       CRN   4426              2     0 6.1        0.18      0.029     1500.0
1805        0.167       25.0     0.195      500.0
1806       CR2N  4428              2     0 6.5        0.15      0.054     1650.0
1807        0.15        25.0     0.17       500.0
1808       HFN   4430              7     4 10.85      0.05      0.028     3304
1809        0.050       25.0     0.070      500.0     0.077      700.0     0.078      900.0
1810        0.078     1400.0     0.074     1700.0     0.053     2500.0
1811        0.028      300.0     0.032      900.0     0.038     1400.0     0.068     2000.0
1812       MO2N  4432              2     0 8.0        0.074     0.041     900.0
1813        0.074       25.0     0.106      500.0
1814       NBN   4434              3     0 8.36       0.096     0.010     2204.0
1815        0.096       25.0     0.106      300.0     0.113      500.0
1816       NB2N  4436              2     0 8.31       0.077     0.019     2315.0
1817        0.077       25.0     0.10       500.0
1818       PUN   4438              8     8 14.25      0.045     0.033     2600.0
1819        0.045       25.0     0.050      150.0     0.053      300.0     0.055      500.0
1820        0.055      640.0     0.056      800.0     0.058     1000.0     0.063     1150.0
1821        0.033      250.0     0.032      500.0     0.028      600.0     0.027      800.0
1822        0.030      900.0     0.031     1200.0     0.032     1300.0     0.036     1400.0
1823       SI3N4 4442              4     4 2.8        0.165     0.019     1870.0
1824        0.165       25.0     0.250      500.0     0.330     1200.0     0.380     1800.0
1825        0.019      300.0     0.015      800.0     0.013     1200.0     0.017     1800.0
1826       SI3NL 4444              4     2 2.2        0.165     0.0037    1870.0
1827        0.165       25.0     0.250      500.0     0.330     1200.0     0.380     1800.0
1828        3.7   E-3  200.0     3.7   E-3 1300.0
1829       TAN   4446              3     0 14.36      0.049     0.019     3090.
1830        0.049       25.0     0.071      500.0     0.080     2500.0
1831       TA2N  4448              2     5 15.86      0.03      0.025     2050.0
1832        0.03        25.0     0.09      2500.0
1833        0.025       25.0     0.025      800.0     0.033     1200.0     0.084     2000.0
1834        0.090     2500.0
1835       TINIT 4452              8     3 4.5        0.144     0.06      2930.0
1836        0.10       -80.0     0.138        0.0     0.162      100.0     0.178      200.0
1837        0.192      400.0     0.205      800.0     0.217     1500.0     0.225     2500.0
1838        0.06       200.0     0.03      1000.0     0.06      1800.0
1839       UN    4454              8     4 13.8       0.045     0.033     1600.0
1840        0.045       25.0     0.050      150.0     0.053      300.0     0.055      500.0
1841        0.055      640.0     0.056      800.0     0.058     1000.0     0.063     1150.0
1842        0.033        0.0     0.059     1000.0     0.063     1600.0     0.063     3000.0
1843       VN    4456             11     0 6.1        0.14      0.029     2100.0
1844        0.0       -273.15    0.005     -240.0     0.071     -150.      0.098     -100.0
1845        0.120      -50.0     0.134        0.0     0.155      100.0     0.169      200.0
1846        0.188      500.0     0.200      800.0     0.218     1300.0
1847       ZRNPF 4458              8     6 6.5        0.092     0.025     2980.0
1848        0.092       25.0     0.100      100.0     0.105      200.0     0.112      400.0
1849        0.128     1200.0     0.136     1800.0     0.139     2200.0     0.140     2800.0
1850        0.025      100.0     0.051     1000.0     0.057     1300.0     0.059     1500.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
1851        0.058     1700.0    0.052     2200.0
1852       ZRNPS 4459            8    4 6.8        0.092     0.021     2980.0
1853        0.092       25.0    0.100      100.0   0.105      200.0    0.112      400.0
1854        0.128     1200.0    0.136     1800.0   0.139     2200.0    0.140     2800.0
1855        0.021      100.0    0.040     1500.0   0.041     1800.0    0.038     2200.0
1856       BE2C  4512            3    0 2.1        0.32      0.056     2100.0    559.0
1857        0.34        25.0    0.456      300.0   0.773     1200.0
1858       B4C-D 4514           11    8 2.4        0.22      0.068     2350.0
1859        0.0      -273.15    0.02      -175.0   0.215        0.0    0.258      100.0
1860        0.288      200.0    0.425      700.0   0.495     1000.0    0.550     1300.0
1861        0.600     1700.0    0.625     2000.0   0.635     2300.0
1862        0.069        0.0    0.052      300.0   0.041      600.0    0.035      900.0
1863        0.034     1200.0    0.035     1600.0   0.038     2100.0    0.041     2400.0
1864       B4C-P 4515           11    3 2.0        0.22      0.041     2350.0
1865        0.0      -273.15    0.02      -175.0   0.215        0.0    0.258      100.0
1866        0.288      200.0    0.425      700.0   0.495     1000.0    0.550     1300.0
1867        0.600     1700.0    0.625     2000.0   0.635     2300.0
1868        0.042        0.0    0.019      800.0   0.016     1100.0
1869       HFC   4518           10    0 12.6       0.045     0.07      3900.0
1870        0.0      -273.15    0.0015    -250.0   0.016     -200.0    0.027     -150.0
1871        0.034    -100.0     0.044        0.0   0.056      200.0    0.065      400.0
1872        0.070      600.0    0.073     2200.0
1873       MO2C  4520            9    3 9.0        0.083     0.05      2500.0
1874        0.0855     200.0    0.087      400.0   0.092      600.0    0.115     1200.0
1875        0.124     1500.0    0.126     1700.0   0.1265    1800.0    0.126     1900.0
1876        0.1245    2000.0
1877        0.05      1000.0    0.06      1600.0   0.085     2100.0
1878       NBC   4522            9    0 7.6        0.085     0.08
1879        0.0      -273.15    0.003     -250.0   0.028     -200.0    0.060     -100.0
1880        0.082        0.0    0.094      100.0   0.106      300.0    0.113      600.0
1881        0.140     2500.0
1882       PUC   4524            7    3 13.5       0.044     0.026
1883        0.0443     100.0    0.0480     200.0   0.0503     300.0    0.0518     400.0
1884        0.0538     600.0    0.0564    1000.0   0.0601    1700.0
1885        0.017       70.0    0.023      200.0   0.030      400.0
1886       SICX1 4531           12    3 3.21       0.162     0.21      2700.0
1887        0.0      -273.15    0.002     -230.0   0.013     -200.0    0.041     -150.0
1888        0.118      -50.0    0.150        0.0   0.197      100.0    0.230      200.0
1889        0.250      300.0    0.261      400.0   0.314     1200.0    0.335     1600.0
1890        0.215       38.0    0.206       93.0   0.202      149.0
1891       SICX2 4532           12    0 3.21       0.162     1.17      2700.0
1892        0.0      -273.15    0.002     -230.0   0.013     -200.0    0.041     -150.0
1893        0.118      -50.0    0.150        0.0   0.197      100.0    0.230      200.0
1894        0.250      300.0    0.261      400.0   0.314     1200.0    0.335     1600.0
1895       SICSB 4533           12    6 3.1        0.162     0.4       2700.0
1896        0.0      -273.15    0.002     -230.0   0.013     -200.0    0.041     -150.0
1897        0.118      -50.0    0.150        0.0   0.197      100.0    0.230      200.0
1898        0.250      300.0    0.261      400.0   0.314     1200.0    0.335     1600.0
1899        0.395      300.0    0.255      600.0   0.145      900.0    0.070     1200.0
1900        0.035     1500.0    0.030     1600.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1901       SICKT 4534              12     7 3.1       0.162     0.43      2700.0
1902        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1903        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1904        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1905        0.43         25.0    0.33        200.0    0.19       500.0    0.097      800.0
1906        0.057      1000.0    0.041      1200.0    0.041     1300.0
1907       SICCF 4535              12     3 2.7       0.162     0.052     2700.0
1908        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1909        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1910        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1911        0.052       100.0    0.040       400.0    0.031      800.0
1912       SICFB 4536              12     5 2.7       0.162     0.11      2700.0
1913        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1914        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1915        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1916        0.110       100.0    0.070       300.0    0.040      600.0    0.030      900.0
1917        0.030      1100.0
1918       SICRX 4537              12     4 2.9       0.162     0.124     2700.0
1919        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1920        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1921        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1922        0.124       100.0    0.072       500.0    0.053      800.0    0.049     1000.0
1923       SICRP 4538              12     5 2.07      0.162     0.044     2700.0
1924        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1925        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1926        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1927        0.044       600.0    0.038       800.0    0.033     1000.0    0.029     1200.0
1928        0.026      1400.0
1929       SICAL 4539              12     2 2.51      0.162     0.028     2700.0
1930        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1931        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1932        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1933        0.028       850.0    0.028      1125.0
1934       SICRD 4540              12     2 2.7       0.162     0.10      2700.0
1935        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1936        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1937        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1938        0.10         20.0    0.10        425.0
1939       SICNB 4541              12     4 2.66      0.162     0.1       2700.0
1940        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1941        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1942        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1943        0.1         200.0    0.06        600.0    0.04       900.0    0.03      1200.0
1944       SICFV 4542              12     2 0.46      0.162     0.25  E-3 2700.0
1945        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0
1946        0.118       -50.0    0.150         0.0    0.197      100.0    0.230      200.0
1947        0.250       300.0    0.261       400.0    0.314     1200.0    0.335     1600.0
1948        0.25  E-3   300.0    1.2   E-3   800.0
1949       SICPA 4543              12     3 1.585     0.162     0.6   E-3 2700.0
1950        0.0        -273.15   0.002      -230.0    0.013     -200.0    0.041     -150.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

1951        0.118      -50.0    0.150        0.0    0.197      100.0    0.230      200.0
1952        0.250      300.0    0.261      400.0    0.314     1200.0    0.335     1600.0
1953        0.6   E-3  100.0    0.77  E-3  500.0    0.85      1000.0
1954       SICPH 4544            12    3 1.585     0.162     1.65  E-3 2700.0
1955        0.0       -273.15   0.002     -230.0    0.013     -200.0    0.041     -150.0
1956        0.118      -50.0    0.150        0.0    0.197      100.0    0.230      200.0
1957        0.250      300.0    0.261      400.0    0.314     1200.0    0.335     1600.0
1958        1.65  E-3  100.0    1.8   E-3  500.0    1.7   E-3 1000.0
1959       TAC   4562            11    3 14.0      0.0455    0.08      3850.0
1960        0.0       -273.15   0.018     -200.0    0.027     -150.0    0.034     -100.0
1961        0.044        0.0    0.049      100.0    0.056      300.0    0.0635     800.0
1962        0.071     1500.0    0.075     2000.0    0.0785    2600.0
1963        0.053       25.0    0.08       300.0    0.08      2600.0
1964       THC   4564            12    4 8.5       0.041     0.021     2623.0
1965        0.02      -200.0    0.028     -150.0    0.035     -100.0    0.038      -50.0
1966        0.040        0.0    0.044      100.0    0.048      200.0    0.050      300.0
1967        0.052      400.0    0.054      600.0    0.056     1000.0    0.060     1700.0
1968        0.0213     150.0    0.0195     200.0    0.0179     300.0    0.0177     400.0
1969       THC2  4565            12    4 6.6       0.053     0.0585    2655.0
1970        0.0       -273.15   0.0007    -260.0    0.010     -230.0    0.020     -200.0
1971        0.0307    -150.0    0.0396    -100.0    0.0465     -50.0    0.0512       0.0
1972        0.0575     100.0    0.063      200.0    0.0675     400.0    0.075      800.0
1973        0.0585     150.0    0.0558     200.0    0.0496     300.0    0.048      400.0
1974       TIC96 4566             9    4 4.74      0.136     0.075     3065.0
1975        0.0       -273.15   0.012     -200.0    0.080     -100.0    0.130        0.0
1976        0.160      100.0    0.177      200.0    0.196      500.0    0.215     1200.0
1977        0.225     2100.0
1978        0.075        0.0    0.104     1200.0    0.110     1600.0    0.113     2200.0
1979       TIC93 4567             9    2 4.56      0.136     0.039     3065.0
1980        0.0       -273.15   0.012     -200.0    0.080     -100.0    0.130        0.0
1981        0.160      100.0    0.177      200.0    0.196      500.0    0.215     1200.0
1982        0.225     2100.0
1983        0.039        0.0    0.049      600.0
1984       WC    4568             6    2 15.6      0.044     0.1       2800.0
1985        0.044       25.0    0.055      200.0    0.066     1000.0    0.0785    1800.0
1986        0.082     2200.0    0.082     2500.0
1987        0.10       800.0    0.14      2600.0
1988       UCAMC 4572            12    5 13.6      0.0485    0.063     2500.0
1989        0.0       -273.15   0.001     -260.0    0.019     -200.0    0.0296    -150.0
1990        0.0380    -100.0    0.0433     -50.0    0.047        0.0    0.052      100.0
1991        0.054      200.0    0.058      400.0    0.063      900.0    0.0675    1500.0
1992        0.048      100.0    0.044      300.0    0.045      500.0    0.058      800.0
1993        0.082     1500.0
1994       UCSNT 4573            12    5 12.3      0.0485    0.0415    2500.0
1995        0.0       -273.15   0.001     -260.0    0.019     -200.0    0.0296    -150.0
1996        0.0380    -100.0    0.0433     -50.0    0.047        0.0    0.052      100.0
1997        0.054      200.0    0.058      400.0    0.063      900.0    0.0675    1500.0
1998        0.0415     100.0    0.0410     300.0    0.0415     500.0    0.048      800.0
1999        0.0785    1500.0
2000       UCAVG 4574            12    0 13.5      0.0485    0.057     2500.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 2001       0.0        -273.15   0.001      -260.0    0.019     -200.0    0.0296    -150.0
 2002       0.0380     -100.0    0.0433      -50.0    0.047        0.0    0.052      100.0
 2003       0.054       200.0    0.058       400.0    0.063      900.0    0.0675    1500.0
 2004      UC2   4576              12     4 11.3      0.056      0.08     2427.0
 2005       0.0        -273.15   0.001      -260.0    0.0295    -150.0    0.0402    -100.0
 2006       0.0483      -50.0    0.0535        0.0    0.059      100.0    0.063      200.0
 2007       0.0675      400.0    0.075       800.0    0.09      1200.0    0.125     1815.0
 2008       0.083         0.0    0.030      1200.0    0.028     1400.0    0.044     1800.0
 2009      VC    4578               8     4 5.6       0.14       0.087    2650.0
 2010       0.0        -273.15   0.01       -230.0    0.08      -100.0    0.12         0.0
 2011       0.14        100.0    0.165       300.0    0.235     1400.0    0.38      2500.0
 2012       0.087       900.0    0.080      1400.0    0.092     1800.0    0.114     2100.0
 2013      ZRC   4580               9     2 6.0       0.088      0.080    3300.0
 2014       0.0        -273.15   0.005      -230.0    0.058     -100.0    0.085        0.0
 2015       0.099       100.0    0.112       300.0    0.122      800.0    0.128     1500.0
 2016       0.150      2500.0
 2017       0.080       300.0    0.100      2500.0
 2018      BAB6  4612               0     0 4.34      0.3        0.107    2260.0
 2019      SIB4  4614               4     2 2.46      0.25       0.0235   1093.0
 2020       0.25        100.0    0.40        500.0    0.50      1000.0    0.60      1800.0
 2021       0.0235       40.0    0.0172      300.0
 2022      CAB6  4616               0     0 2.46      0.3        0.0936   2230.0
 2023      HFB2  4618               7     3 11.2      0.060      0.10     3100.0
 2024       0.0        -273.15   0.002      -150.0    0.049      -50.0    0.060       25.0
 2025       0.068       100.0    0.081       300.0    0.119     2600.0
 2026       0.10          0.0    0.15       1000.0    0.25      2000.0
 2027      NBB2  4620               8     3 6.8       0.10       0.04     2900.0
 2028       0.0        -273.15   0.007      -220.0    0.060     -100.0    0.095        0.0
 2029       0.116       100.0    0.198      1000.0    0.217     1500.0    0.227     2000.0
 2030       0.040         0.0    0.040      1000.0    0.085     2000.0
 2031      YB6   4622               0     0 3.6       0.15       0.070    2300.0
 2032      LAB6  4624               0     0 4.6       0.15       0.114    2150.0
 2033      CEB6  4626               0     0 4.7       0.15       0.081    2190.0
 2034      PRB6  4628               0     0 4.6       0.15       0.098
 2035      NDB6  4630               0     0 4.8       0.15       0.113    2540.0
 2036      SMB6  4632               0     0 4.9       0.15       0.033    2540.0
 2037      EUB6  4634               0     0 4.6       0.15       0.055
 2038      GDB6  4636               0     0 5.0       0.15       0.049    2100.0
 2039      TBB6  4638               0     0 5.0       0.15       0.048
 2040      YBB6  4640               0     0 5.0       0.15       0.060
 2041      TAB   4642               4     3 12.1      0.055      0.28     2430.0
 2042       0.05         25.0    0.055       200.0    0.063      500.0    0.078      900.0
 2043       0.28        300.0    0.11        900.0    0.12      2500.0
 2044      TAB2  4644               8     4 12.0      0.054      0.206    3000.0
 2045       0.0        -273.15   0.001      -250.0    0.037     -100.0    0.050        0.0
 2046       0.068       100.0    0.090       500.0    0.110     1000.0    0.110     2500.0
 2047       0.206       400.0    0.103       800.0    0.091      900.0    0.095     1700.0
 2048      THB4  4646               4     3 8.45      0.118      0.038    2210.
 2049       0.118       200.0    0.122       500.0    0.124      800.0    0.124     2000.0
 2050       0.038        20.0    0.064       600.0    0.086     1600.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

2051       THB6  4648                0    0 6.8       0.15      0.103     2150.0
2052       TIB2  4650                8    3 4.3       0.16      0.06      2870.0
2053        0.0        -273.15   0.001      -210.0    0.150        0.0    0.180      100.0
2054        0.220       300.0    0.240       500.0    0.275     1000.0    0.360     2500.0
2055        0.060         0.0    0.080       800.0    0.130     2300.0
2056       WB    4652                5    2 16.0      0.042     0.011     2920.0
2057        0.042        25.0    0.051       100.0    0.061      300.0    0.065      800.0
2058        0.098      2200.0
2059        0.011      1000.0    0.009      2400.0
2060       UB4   4654                0    0 9.38      0.12      0.012     2480.0
2061       VB2   4656                0    0 5.07      0.158     0.136     2424.0
2062       ZRB2  4658                8    3 5.9       0.10      0.06      3000.0
2063        0.0        -273.15   0.005      -230.0    0.095        0.0    0.120      100.0
2064        0.150       300.0    0.185      1000.0    0.200     1500.0    0.200     2300.0
2065        0.06          0.0    0.095      1000.0    0.155     2000.0
2066       MOBED 4712                5    5 2.916     0.26      0.10      1650.0
2067        0.26         25.0    0.293       100.0    0.322      200.0    0.364      400.0
2068        0.428       800.0
2069        0.103       300.0    0.092       600.0    0.0905     800.0    0.094      900.0
2070        0.100      1000.0
2071       NBBED 4714                7    4 2.8       0.264     0.055     1650.0
2072        0.264        25.0    0.295       100.0    0.326      200.0    0.350      300.0
2073        0.364       400.0    0.400       700.0    0.430     1400.0
2074        0.055        25.0    0.060       500.0    0.075     1100.0    0.080     1500.0
2075       NBBE8 4716                4    2 3.2       0.22      0.075     1750.0
2076        0.22         25.0    0.28        200.0    0.31       400.0    0.36       800.0
2077        0.75        300.0    0.084      1500.0
2078       TABED 4718                6    3 4.1       0.185     0.10      1850.0    278.0
2079        0.185        25.0    0.207       100.0    0.241      300.0    0.266      500.0
2080        0.276       700.0    0.300      1500.0
2081        0.10         25.0    0.066       450.0    0.090     1500.0
2082       TABE8 4720                2    3 5.0       0.21      0.070     1980.0
2083        0.21        450.0    0.26       1500.0
2084        0.07        300.0    0.07        600.0    0.078     1500.0
2085       TIBED 4722                5    6 2.2       0.34      0.057     1538.0
2086        0.34         25.0    0.388       100.0    0.429      200.0    0.455      300.0
2087        0.558       800.0
2088        0.057       300.0    0.058       500.0    0.0605     600.0    0.066      700.0
2089        0.075       800.0    0.098      1000.0
2090       UBE13 4724                0    3 2.7       0.2       0.05
2091        0.05        100.0    0.062       400.0    0.065      700.0
2092       VBE12 4726                3    0 1.9       0.35      0.074     1705.0
2093        0.35         50.0    0.46        300.0    0.486      400.0
2094       ZRBET 4728                5    3 2.75      0.272     0.095     1870.0
2095        0.262         0.0    0.338       200.0    0.385      400.0    0.44       800.0
2096        0.48       1500.0
2097        0.095       300.0    0.090       500.0    0.089     1500.0
2098       CES   4742                7    0 5.93      0.070     0.02      2300.0
2099        0.0        -273.15   0.004      -250.0    0.039     -200.0    0.053     -150.0
2100        0.062      -100.0    0.069         0.0    0.105     1000.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 2101      CE2S3 4744              8    2 5.2       0.082     0.0014    1900.0
 2102       0.0        -273.15   0.005     -250.0   0.038     -200.0    0.061     -150.0
 2103       0.073      -100.0    0.079      -50.0   0.082       25.0    0.115     1000.0
 2104       1.4   E-3    0.0     3.0   E-3 1400.0
 2105      FES2  4746              8    0 5.0       0.133     0.0906    1171.0
 2106       0.133       25.0     0.144      100.0   0.153      200.0    0.158      300.0
 2107       0.162      400.0     0.164      500.0   0.166      600.0    0.168      700.0
 2108      PUS   4747              0    3 10.59     0.055     0.023     2350.0
 2109       0.023       25.0     0.019      100.0   0.037      650.0
 2110      SMS   4748              0    5 6.01      0.07      0.009     1940.0
 2111       9.5   E-3    0.0     6.5   E-3  200.0   4.8   E-3  400.0    4.1   E-3  600.0
 2112       3.7   E-3  800.0
 2113      ZNS   4750              9    2 4.10      0.113     0.062     1645.0    93.0
 2114       0.113       25.0     0.120      100.0   0.125      200.0    0.128      300.0
 2115       0.134      600.0     0.140     1015.0   6.74      1020.0    0.140     1025.0
 2116       0.140     1100.0
 2117       0.015     -190.0     0.062        0.0
 2118      PUP   4762              2    2 9.89      0.055     0.013     2600.0
 2119       0.055       25.0     0.056      650.0
 2120       0.013       25.0     0.017      650.0
 2121      CRSI2 4772              5    8 5.00      0.118     0.019     1570.0
 2122       0.118       25.0     0.141      100.0   0.161      200.0    0.189      400.0
 2123       0.210      600.0
 2124       0.019       25.0     0.0159     100.0   0.0125     200.0    0.0098     300.0
 2125       0.0080     400.0     0.0068     500.0   0.00625    600.0    0.0062     625.0
 2126      COS   4774              0    0 6.60      0.14      0.023
 2127      MG2SI 4776              2    4 1.97      0.2       0.02      1071.0
 2128       0.2        100.0     0.3       1000.0
 2129       0.020        0.0     0.015      100.0   0.0117     200.0    0.0093     300.0
 2130      MNSI2 4778              2    6 5.24      0.14      0.0172    1275.0
 2131       0.14        25.0     0.17       500.0
 2132       0.0172      25.0     0.0148     100.0   0.0122     200.0    0.0084     400.0
 2133       0.0062     600.0     0.0058     650.0
 2134      MOSI2 4780              5    6 6.26      0.10      0.108     1970.0
 2135       0.100        0.0     0.113      200.0   0.120      400.0    0.130     1000.0
 2136       0.138     1500.0
 2137       0.108      100.0     0.078      400.0   0.051      800.0    0.033     1200.0
 2138       0.026     1500.0     0.029     1800.0
 2139      NBSI2 4782              2    0 5.29      0.11      0.1       1950.0
 2140       0.11         0.0     0.13       500.0
 2141      TASI2 4784              2    0 8.83      0.075     0.0885    2400.0
 2142       0.075        0.0     0.090      500.0
 2143      WSI2  4786              3    8 9.4       0.0736    0.097     1900.0
 2144       0.0736      25.0     0.0812     900.0   0.0833    1500.0
 2145       0.097      400.0     0.077      700.0   0.073      800.0    0.071     1000.0
 2146       0.074     1300.0     0.0775    1400.0   0.089     1500.0    0.095     1550.0
 2147      U3SI  4788              0    0 15.45     0.042     0.04      950.0
 2148      NH4BR 4812              6    2 2.43      0.24      0.006     452.0
 2149       0.11      -200.0     0.18      -150.0   0.21      -100.0    0.23       -50.0
 2150       0.24         0.0     0.28       400.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  2151      0.016     -190.0    0.0060       0.0
  2152     NH4CL 4814              9    2 1.53       0.401     0.006     340.0
  2153      0.14      -200.0    0.26       -150.0    0.33      -100.0    0.37       -50.0
  2154      0.401       25.0    0.496       179.5    4.30       184.5    0.385      189.5
  2155      0.412      227.0
  2156      0.026     -190.0    0.006        0.0
  2157     BAF2  4816              6    6 4.89       0.105     0.027     1280.0    50.3
  2158      0.048     -200.0    0.077      -150.0    0.091     -100.0    0.100      -50.0
  2159      0.103        0.0    0.13        800.0
  2160      0.048      -50.0    0.035       -25.0    0.030        0.0    0.027       25.0
  2161      0.026       50.0    0.025       100.0
  2162     CAF2  4818             12    7 3.18       0.279     0.023     1360.0    60.0
  2163      0.279       25.0    0.261       100.0    0.254      200.0    0.255      300.0
  2164      0.259      400.0    0.272       600.0    0.288      800.0    0.305     1000.0
  2165      0.318     1146.0    3.25       1151.0    0.337     1156.0    0.384     1360.0
  2166      0.038      -50.0    0.025        0.0     0.0185     100.0    0.012      200.0
  2167      0.008      300.0    0.007       400.0    0.0055     800.0
  2168     CAF2A 4820             12    0 3.18       0.279     0.0096    1360.0    60.0
  2169      0.279       25.0    0.261       100.0    0.254      200.0    0.255      300.0
  2170      0.259      400.0    0.272       600.0    0.288      800.0    0.305     1000.0
  2171      0.318     1146.0    3.25       1151.0    0.337     1156.0    0.384     1360.0
  2172     LIF   4822              6    2 2.64       0.39      0.0265    850.0     247.0
  2173      0.39        25.0    0.43        100.0    0.57       800.0    0.58       850.0
  2174      0.60       850.1    0.60        900.0
  2175      0.0265       0.0    0.015       500.0
  2176     LIFPB 4824              6    4 2.46       0.39      0.024     850.0     247.0
  2177      0.39        25.0    0.43        100.0    0.57       800.0    0.58       850.0
  2178      0.60       850.1    0.60        900.0
  2179      0.0281     -45.6    0.0277      -26.7    0.0230      41.1    0.0223      65.6
  2180     HGCL2 4826              6    2 5.44       0.068     0.0031    277.0     16.0
  2181      0.031     -200.0    0.050      -150.0    0.059     -100.0    0.065      -50.0
  2182      0.068        0.0    0.079       277.0
  2183      0.0041    -190.0    0.0031       0.0
  2184     KBR   4828              8    2 2.75       0.104     0.0091    730.0     45.0
  2185      0.047     -200.0    0.076      -150.0    0.089     -100.0    0.0975     -50.0
  2186      0.101        0.0    0.113       300.0    0.117      400.0    0.126      700.0
  2187      0.022     -190.0    0.0091       0.0
  2188     KBRX  4830              8    0 2.75       0.104     0.0115    730.0     45.0
  2189      0.047     -200.0    0.076      -150.0    0.089     -100.0    0.0975     -50.0
  2190      0.101        0.0    0.113       300.0    0.117      400.0    0.126      700.0
  2191     KBR90 4831              6    2 2.66       0.107     0.0069    742.0     55.0
  2192      0.049     -200.0    0.078      -150.0    0.092     -100.0    0.101      -50.0
  2193      0.104        0.0    0.131       700.0
  2194      0.012     -190.0    0.0069       0.0
  2195     KBR75 4832              6    2 2.55       0.114     0.005     742.0     60.0
  2196      0.052     -200.0    0.083      -150.0    0.098     -100.0    0.108      -50.0
  2197      0.111        0.0    0.139       700.0
  2198      0.0069    -190.0    0.0050       0.0
  2199     KBR50 4833              6    2 2.36       0.127     0.006     742.0     69.0
  2200      0.058     -200.0    0.093      -150.0    0.110     -100.0    0.120      -50.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

2201        0.124        0.0    0.155      700.0
2202        0.006     -190.0    0.006        0.0
2203       KCL75 4834              6    2 2.16      0.143     0.0079    742.0     78.0
2204        0.065     -200.0    0.105     -150.0    0.123     -100.0    0.135     -50.0
2205        0.140        0.0    0.175      700.0
2206        0.011     -190.0    0.0079       0.0
2207       KCL90 4835              6    2 2.05      0.155     0.0120    742.0     83.0
2208        0.071     -200.0    0.114     -150.0    0.134     -100.0    0.147     -50.0
2209        0.152        0.0    0.190      700.0
2210        0.0191    -190.0    0.0120       0.0
2211       KCL   4836              8    3 1.98      0.164     0.02      770.0     86.0
2212        0.075     -200.0    0.121     -150.0    0.142     -100.0    0.155     -50.0
2213        0.163        0.0    0.165      100.0    0.170      200.0    0.206     770.0
2214        0.085     -190.0    0.022        0.0    0.012      100.0
2215       KCLSY 4837              8    3 1.99      0.164     0.02      770.0     86.0
2216        0.075     -200.0    0.121     -150.0    0.142     -100.0    0.155     -50.0
2217        0.163        0.0    0.165      100.0    0.170      200.0    0.206     770.0
2218        0.038     -190.0    0.018        0.0    0.012      100.0
2219       KCL50 4838              6    2 2.07      0.184     0.017     770.0    100.0
2220        0.084     -200.0    0.135     -150.0    0.160     -100.0    0.175     -50.0
2221        0.181        0.0    0.226      700.0
2222        0.045     -190.0    0.017        0.0
2223       KF    4840              6    2 2.48      0.206     0.017     850.0    114.0
2224        0.093     -200.0    0.155     -150.0    0.182     -100.0    0.198     -50.0
2225        0.206       25.0    0.250      850.0
2226        0.056     -190.0    0.017        0.0
2227       KI    4842              8    2 3.13      0.073     0.0069    682.0     30.0
2228        0.034     -200.0    0.054     -150.0    0.064     -100.0    0.070     -50.0
2229        0.072        0.0    0.079      300.0    0.078      500.0    0.0714    682.0
2230        0.029     -190.0    0.0069       0.0
2231       RBCL  4844              6    2 2.80      0.103     0.0050    715.0     36.4
2232        0.047     -200.0    0.075     -150.0    0.089     -100.0    0.098     -50.0
2233        0.101        0.0    0.116      715.0
2234        0.0069    -190.0    0.0050       0.0
2235       RBI   4846              6    2 3.55      0.056     0.0079    640.0     14.1
2236        0.026     -200.0    0.042     -150.0    0.050     -100.0    0.055     -50.0
2237        0.0564       0.0    0.0643     640.0
2238        0.0141    -190.0    0.0079       0.0
2239       AGCL  4848              8    0 5.56      0.085     0.00271   455.0     20.2
2240        0.039     -200.0    0.063     -150.0    0.074     -100.0    0.081     -50.0
2241        0.085       25.0    0.093      100.0    0.099      200.0    0.105     455.0
2242       NABR  4850              7    2 3.203     0.122     0.006     750.0     60.0
2243        0.055     -200.0    0.088     -150.0    0.104     -100.0    0.113     -50.0
2244        0.122       25.0    0.127      300.0    0.14       750.0
2245        0.012     -190.0    0.006        0.0
2246       NACL  4852              8   10 2.165     0.208     0.0195    800.0    120.0
2247        0.096     -200.0    0.153     -150.0    0.181     -100.0    0.198     -50.0
2248        0.208       25.0    0.260      800.0    0.274      800.1    0.274    1400.0
2249        0.082     -190.0    0.040     -100.0    0.022        0.0    0.017      50.0
2250        0.014      100.0    0.010      200.0    0.0085     275.0    0.010     500.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

2251        0.0115     650.0     0.013      800.0
2252       NACLR 4854                8   10 2.165      0.208     0.0132     800.0     120.0
2253        0.096     -200.0     0.153     -150.0     0.181     -100.0     0.198      -50.0
2254        0.208       25.0     0.260      800.0     0.274      800.1     0.274     1400.0
2255        0.043     -190.0     0.025     -100.0     0.015        0.0     0.012       50.0
2256        0.010      100.0     0.0073     200.0     0.0049     400.0     0.0035     600.0
2257        0.0032     700.0     0.0030     800.0
2258       NAF   4856                8    2 2.558      0.266     0.0251     990.0     160.0
2259        0.13      -200.0     0.20      -150.0     0.24      -100.0     0.26       -50.0
2260        0.266       25.0     0.276      100.0     0.318      500.0     0.364     990.0
2261        0.124     -190.0     0.0251       0.0
2262       NH3LQ 4880                6    2 0.618      1.12      1.20  E-4 -77.7
2263        1.05       -60.0     1.10         0.0     1.16        40.0     1.29        80.0
2264        1.48       100.0     1.61       110.0
2265        1.20  E-4  -15.0     1.20  E-4   30.0
2266       NH3   4881                5    3 0.771 E-3 0.498     5.84  E-5 -33.35    327.4
2267        0.498       25.0     0.575      200.0     0.686      500.0     0.794      800.0
2268        1.042     1500.0
2269        4.10  E-5  -50.0     5.24  E-5    0.0     6.45  E-5   50.0
2270       LIH   4882                4    7 0.7        1.0       0.0175     686.0     620.0
2271        0.55      -100.0     0.94         0.0     1.35       200.0     1.90       700.0
2272        0.018        0.0     0.0155     100.0     0.0132     200.0     0.0120     300.0
2273        0.011      400.0     0.0100     500.0     0.0098     600.0
2274       LIHCG 4884                4    8 0.7        1.0       0.031      686.0     620.0
2275        0.55      -100.0     0.94         0.0     1.35       200.0     1.90       700.0
2276        0.032        0.0     0.030       50.0     0.026      100.0     0.019      200.0
2277        0.0145     300.0     0.012      400.0     0.011      500.0     0.0104     600.0
2278       CH4   4890                4    6 0.7167E-3 0.54      8.11  E-5 -161.42   121.7
2279        0.52         0.0     0.58       100.0     0.66       200.0     0.75       300.0
2280        2.80  E-5 -161.42    4.45  E-5 -100.0     5.86  E-5  -50.0     7.30  E-5    0.0
2281        0.890 E-4   50.0     1.090 E-4  100.0
2282       ZRH12 4892                3    0 6.3        0.07      0.044
2283        0.07         0.0     0.12       300.0     0.17       500.0
2284       SBTEP 4912                0    0 6.5        0.05      0.011      629.0
2285       SBTEC 4913                0    0 6.5        0.05      0.0079     629.0
2286       ASTEX 4914                0    0 6.0        0.056     0.0062
2287       BITEP 4916                6    0 7.7        0.0369    0.006      580.0
2288        0.030     -200.0     0.035     -150.0     0.036     -100.0     0.0368       0.0
2289        0.0372     100.0     0.0475     600.0
2290       BITES 4918                0    6 6.8        0.042     0.0057
2291        0.0067    -200.0     0.0052    -150.0     0.0048    -100.0     0.0049     -50.0
2292        0.0054       0.0     0.0061      50.0
2293       INSBP 4920               11    8 7.0        0.052     0.039      535.0     49.0
2294        0.0       -273.15    0.025     -220.0     0.0365    -180.0     0.042     -150.0
2295        0.046     -100.0     0.051        0.0     0.0545     100.0     0.0570     200.0
2296        0.0582     535.0     0.0560     535.1     0.0560     800.0
2297        0.072     -100.0     0.055      -50.0     0.043        0.0     0.031      100.0
2298        0.025      200.0     0.0215     300.0     0.020      400.0     0.019      500.0
2299       INSBS 4921               11    7 7.0        0.052     0.17       535.0     49.0
2300        0.0       -273.15    0.025     -220.0     0.0365    -180.0     0.042     -150.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 2301       0.046     -100.0    0.051        0.0    0.0545     100.0    0.0570     200.0
 2302       0.0582     535.0    0.0560     535.1    0.0560     800.0
 2303       0.28       -80.0    0.22       -50.0    0.18         0.0    0.13       100.0
 2304       0.11       200.0    0.095      300.0    0.090      400.0
 2305      INASP 4922            10     6 6.0      0.060      0.126     943.0
 2306       0.0      -273.15    0.004     -260.0    0.034     -200.0    0.0485    -150.0
 2307       0.0545    -100.0    0.0580     -50.0    0.060        0.0    0.062      100.0
 2308       0.0634     200.0    0.0690     943.0
 2309       0.215     -180.0    0.185     -150.0    0.154     -100.0    0.130      -50.0
 2310       0.116        0.0    0.126       25.0
 2311      INASS 4923            10     5 6.0      0.060      0.064     943.0
 2312       0.0      -273.15    0.004     -260.0    0.034     -200.0    0.0485    -150.0
 2313       0.0545    -100.0    0.0580     -50.0    0.060        0.0    0.062      100.0
 2314       0.0634     200.0    0.0690     943.0
 2315       0.064       25.0    0.0375     200.0    0.031      300.0    0.023      600.0
 2316       0.020      900.0
 2317      INTE  4924             0     4 4.629    0.048      0.003     110.0
 2318       0.0041    -200.0    0.0030    -100.0    0.0029       0.0    0.0035     100.0
 2319      PBTES 4926             0     7 8.16     0.036      0.005     917.0
 2320       0.0246    -200.0    0.012     -100.0    0.0074     -50.0    0.0055       0.0
 2321       0.0030     200.0    0.0028     300.0    0.0034     400.0
 2322      PBTEP 4927             0     7 8.16     0.036      0.0056    917.0
 2323       0.021     -200.0    0.011     -150.0    0.0080    -100.0    0.0060       0.0
 2324       0.0047     100.0    0.0036     300.0    0.0034     500.0
 2325      MNSEL 4928            10     2 5.5      0.092      0.0067
 2326       0.040     -220.0    0.068     -190.0    0.085     -165.0    0.091     -160.0
 2327       0.085     -150.0    0.099      -35.0    0.200      -30.0    0.114      -20.0
 2328       0.092      -10.0    0.092       15.0
 2329       0.0067      25.0    0.0030     600.0
 2330      MNTEA 4930            11     6 5.7      0.096      0.003
 2331       0.035     -225.0    0.045     -200.0    0.0615    -150.0    0.0700    -100.0
 2332       0.0765     -50.0    0.085        0.0    0.092       20.0    0.100       30.0
 2333       0.080       40.0    0.075       50.0    0.08       500.0
 2334       0.0033       0.0    0.0019     100.0    0.00115    200.0    0.00090    300.0
 2335       0.0008     400.0    0.0008     500.0
 2336      MNTEN 4931            11     5 5.7      0.096      0.004
 2337       0.035     -225.0    0.045     -200.0    0.0615    -150.0    0.0700    -100.0
 2338       0.0765     -50.0    0.085        0.0    0.092       20.0    0.100       30.0
 2339       0.080       40.0    0.075       50.0    0.08       500.0
 2340       0.0044     100.0    0.00375    300.0    0.00340    500.0    0.00305    800.0
 2341       0.00285   1100.0
 2342      MOSE2 4932             0     0 5.0      0.072      0.0055   1000.0
 2343      MOTE2 4934             0     0 5.5      0.054      0.0048
 2344      SITE  4936             0     0 3.92     0.08       0.015
 2345      SNTE8 4938             0     0 6.5      0.05       0.0062
 2346      SNTE6 4939             0     0 6.5      0.05       0.00425
 2347      SNTE2 4940             0     0 6.5      0.05       0.00235
 2348      AG2SE 4942            12     2 8.0      0.067      0.002     880.0
 2349       0.0      -273.15    0.017     -250.0    0.034     -225.0    0.046     -200.0
 2350       0.051     -175.0    0.056     -150.0    0.060     -100.0    0.065       0.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 2351       0.067       25.0     0.072      133.0     0.068      133.1     0.067      200.0
 2352       0.002       20.0     0.002       75.0
 2353      TASB  4944              0     2 14.0       0.04      0.045
 2354       0.045       25.0     0.045      425.0
 2355      WSE2  4946              0     5 10.0       0.054     0.0082    1000.0
 2356       0.0070       0.0     0.012      100.0     0.0125     200.0     0.0125     300.0
 2357       0.0125     400.0
 2358      WTE2  4947              0     0 12.0       0.042     0.0038    1000.0
 2359      ZNSB  4948              0     5 6.3        0.065     0.0056    570.0
 2360       0.0056      25.0     0.0043     100.0     0.0031     200.0     0.0030     300.0
 2361       0.0030     400.0
 2362      BANO3 4952              0     2 3.24       0.21      0.0031    592.0      22.6
 2363       0.0079    -190.0     0.0031       0.0
 2364      BASO4 4954              0     2 4.50       0.16      0.0040    1580.0
 2365       0.0041       0.0     0.0036     100.0
 2366      CACON 4956             10     0 2.61       0.20      0.0054    1339.0     127.0
 2367       0.189        0.0     0.218      100.0     0.239      200.0     0.256      300.0
 2368       0.270      400.0     0.284      500.0     0.297      600.0     0.309      700.0
 2369       0.322      800.0     0.33       898.6
 2370      CACCP 4957             10     8 2.71       0.20      0.0105    1339.0     127.0
 2371       0.189        0.0     0.218      100.0     0.239      200.0     0.256      300.0
 2372       0.270      400.0     0.284      500.0     0.297      600.0     0.309      700.0
 2373       0.322      800.0     0.33       898.6
 2374       0.070     -190.0     0.030     -100.0     0.012        0.0     0.0090      50.0
 2375       0.0072     100.0     0.0061     200.0     0.0055     300.0     0.0051     400.0
 2376      CACCS 4958             10     8 2.71       0.20      0.0092    1339.0     127.0
 2377       0.189        0.0     0.218      100.0     0.239      200.0     0.256      300.0
 2378       0.270      400.0     0.284      500.0     0.297      600.0     0.309      700.0
 2379       0.322      800.0     0.33       898.6
 2380       0.043     -190.0     0.022     -100.0     0.010        0.0     0.0085      50.0
 2381       0.0065     100.0     0.0057     200.0     0.0052     300.0     0.0049     400.0
 2382      DOLOM 4960              0     0 2.7        0.22      0.007     730.0
 2383      GYPSM 4962              0     0 2.32       0.26      0.0031    128.0
 2384      PLASL 4963              0     0 1.25       0.26      0.00103   128.0
 2385      GYPSA 4964              0     0 2.11       0.26      0.0018    128.0
 2386      CUSO4 4966              0     2 3.606      0.18      0.005     200.0
 2387       0.0069    -190.0     0.0050       0.0
 2388      BLUEV 4967              0     0 2.284      0.28      0.0054    110.0
 2389      LITBR 4968              0     0 2.14       0.27      0.0042    930.0
 2390      MGSO4 4970              0     2 2.66       0.30      0.006     1124.0     29.0
 2391       0.006     -190.0     0.006        0.0
 2392      EPSOM 4971              0     0 1.68       0.36      0.0058    150.0
 2393      KALUM 4972              0     2 1.8        0.37      0.005     92.5
 2394       0.0031    -190.0     0.0050       0.0
 2395      CRALM 4973              0     2 1.826      0.32      0.005     89.0
 2396       0.0031    -190.0     0.0050       0.0
 2397      KFECN 4974              0     2 1.85       0.27      0.0041    70.0
 2398       0.0041    -190.0     0.0041       0.0
 2399      KNO3  4976              6     2 2.109      0.20      0.0050    336.0      25.6
 2400       0.188        0.0     0.249      128.0     0.259      128.1     0.259      336.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 2401       0.266      336.1     0.266      410.0
 2402       0.0041    -190.0     0.0050       0.0
 2403      NACLO 4978              4    0 2.49       0.22      0.0027    255.0
 2404       0.21         0.0     0.32       255.0     0.30       255.1     0.30      300.0
 2405      SRSO4 4980              0    2 3.96       0.14      0.0043    1605.0
 2406       0.0045       0.0     0.0037     100.0
 2407      MICAX 4982              0    0 2.8        0.2       0.010
 2408      MICAC 4983              0    0 2.8        0.2       0.0017
 2409      MICAS 4984              0    2 2.79       0.2       0.005
 2410       0.005      200.0     0.006      600.0
 2411      MICAB 4985              0    0 0.68       0.2       4.0   E-4
 2412      VERMI 4986              0    2 0.485      0.2       4.0   E-4
 2413       4.0   E-4  200.0     4.4   E-4  400.0
 2414      MICAP 4987              0    2 0.33       0.2       2.9   E-4
 2415       2.9   E-4  200.0     3.75  E-4  500.0
 2416      VERMP 4988              0    2 0.27       0.2       2.9   E-4
 2417       2.9   E-4  200.0     3.75  E-4  500.0
 2418      PYROP 4990              2    5 2.8         0.2      0.0114
 2419       0.2          0.0     0.3        500.0
 2420       0.0119       0.0     0.0100     100.0     0.0085     200.0     0.0075    300.0
 2421       0.0067     400.0
 2422      PYRON 4991              2    5 2.8        0.2       0.0058
 2423       0.2          0.0     0.3        500.0
 2424       0.0060       0.0     0.0050     100.0     0.0043     200.0     0.0038    300.0
 2425       0.0034     400.0
 2426      TALC  4994             10    0 2.79       0.195     0.0071
 2427       0.0       -273.15   0.01      -250.0     0.125     -100.0     0.165     -50.0
 2428       0.185        0.0     0.225      100.0     0.250      200.0     0.274     400.0
 2429       0.292      700.0     0.340     1600.0
 2430      TOURM 4996              0    2 3.1        0.2       0.011
 2431       0.0091    -190.0     0.0110       0.0
 2432      GLASS 5012              0    0 2.3        0.2       0.0025
 2433      GLABC 5014              4    3 2.52       0.16      0.0025
 2434       0.15         0.0     0.18       100.0     0.22       300.0     0.245     600.0
 2435       0.0018    -100.0     0.0025       0.0     0.0027     100.0
 2436      PYREX 5016              7    3 2.22       0.174     0.0027    556.0
 2437       0.087     -150.0     0.118     -100.0     0.163        0.0     0.204     100.0
 2438       0.237      200.0     0.261      300.0     0.274      400.0
 2439       0.0021    -100.0     0.0026       0.0     0.0042     600.0
 2440      PYRC6 5018              6    5 2.6        0.187     0.0095
 2441       0.180        0.0     0.209      100.0     0.231      200.0     0.245     300.0
 2442       0.267      500.0     0.301      900.0
 2443       0.0097       0.0     0.0083     200.0     0.0077     400.0     0.0073    600.0
 2444       0.0070    1000.0
 2445      PYRC8 5019              6    6 2.5        0.193     0.0049
 2446       0.185        0.0     0.218      100.0     0.240      200.0     0.258     300.0
 2447       0.282      500.0     0.312      800.0
 2448       0.0048       0.0     0.0053     200.0     0.00555    400.0     0.00555   600.0
 2449       0.00535    800.0     0.00505   1000.0
 2450      DIABG 5020              4    4 2.4        0.18      0.0028

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 2451       0.17          0.0     0.20        100.0     0.27        500.0     0.30        900.0
 2452       0.00274       0.0     0.00300     100.0     0.00327     200.0     0.00353     300.0
 2453      FLINT 5022               4     3 2.4         0.12      0.0018
 2454       0.12          0.0     0.14        100.0     0.18        500.0     0.19        900.0
 2455       0.0013     -100.0     0.0017        0.0     0.0020      100.0
 2456      GLASF 5024               4     2 0.144       0.18      8.3   E-5
 2457       0.17          0.0     0.20        100.0     0.27        500.0     0.30        900.0
 2458       8.3   E-5  -197.0     8.3   E-5    27.0
 2459      GLASL 5026               3     2 3.04        0.12      0.0027
 2460       0.12          0.0     0.14        100.0     0.17        500.0
 2461       0.0028       50.0     0.0034      150.0
 2462      GLASW 5028               3     2 2.48        0.18      0.0027
 2463       0.17          0.0     0.21        100.0     0.27        500.0
 2464       0.00315      50.0     0.0040      150.0
 2465      OBSID 5030               3     6 2.4         0.18      0.00328
 2466       0.17          0.0     0.21        100.0     0.27        500.0
 2467       0.00321       0.0     0.00348     100.0     0.00374     200.0     0.00400     300.0
 2468       0.00426     400.0     0.00452     500.0
 2469      GLASC 5032               4     4 2.3         0.18      0.003
 2470       0.17          0.0     0.21        100.0     0.27        500.0     0.30        900.0
 2471       0.0032      100.0     0.00395     300.0     0.0051      500.0     0.0061      650.0
 2472      GLASP 5034               3     2 2.5         0.18      0.0029
 2473       0.17          0.0     0.21        100.0     0.27        500.0
 2474       0.0029        0.0     0.0035      500.0
 2475      VYCOR 5036              11     8 2.19        0.178     0.0032    1500.0
 2476       0.0        -273.15    0.01       -250.0     0.085     -150.0     0.145      -50.0
 2477       0.169         0.0     0.205       100.0     0.227       200.0     0.265       500.0
 2478       0.290       800.0     0.317      1300.0     0.350      1700.0
 2479       0.0024     -100.0     0.0030        0.0     0.0036      100.0     0.0040      300.0
 2480       0.0042      400.0     0.0045      500.0     0.0050      600.0     0.0062      800.0
 2481      BRALF 5212               7     2 2.90        0.18      0.0074    1730.0     132.0
 2482       0.17          0.0     0.22        100.0     0.245       200.0     0.265       300.0
 2483       0.280       500.0     0.300       900.0     0.312      1700.0
 2484       0.0074      427.0     0.0055     1000.0
 2485      BRAL1 5214               5     2 2.33        0.18      0.0033    1700.0     100.0
 2486       0.17          0.0     0.215       100.0     0.255       300.0     0.29        800.0
 2487       0.32       1600.0
 2488       0.0033     1000.0     0.0033     1001.0
 2489      BRAL2 5215               5     2 2.57        0.18      0.0036    1700.0     100.0
 2490       0.17          0.0     0.215       100.0     0.255       300.0     0.29        800.0
 2491       0.32       1600.0
 2492       0.0036     1000.0     0.0036     1001.0
 2493      BRAL3 5216               5     5 2.85        0.18      0.0070    1700.0     120.0
 2494       0.17          0.0     0.215       100.0     0.26        300.0     0.295       800.0
 2495       0.32       1600.0
 2496       0.0070      350.0     0.0063      500.0     0.0058      700.0     0.0056      900.0
 2497       0.0055     1200.0
 2498      BRIMM 5218               3     0 2.0         0.20      0.0017
 2499       0.20          0.0     0.25        500.0     0.27      1000.0
 2500      BRICF 5224              10     2 1.47        0.20      0.0086

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 2501       0.10       -73.0    0.225      100.0    0.280      200.0    0.320      300.0
 2502       0.353      400.0    0.402      600.0    0.437      800.0    0.465     1000.0
 2503       0.495     1500.0    0.560     3500.0
 2504       0.0086    1000.0    0.0086    1001.0
 2505      BRICR 5232              5    3 3.20      0.15      0.0028
 2506       0.14         0.0    0.17       100.0    0.20       200.0    0.25       500.0
 2507       0.29      1500.0
 2508       0.0028     200.0    0.00354    650.0    0.00417   1315.0
 2509      BRCRM 5234              5    3 3.00      0.18      0.005    1730.0    250.0
 2510       0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
 2511       0.32      1500.0
 2512       0.0048     400.0    0.0044     800.0    0.0040    1000.0
 2513      CONCN 5240              4    0 1.6       0.15      0.0008
 2514       0.15         0.0    0.22       200.0    0.25       500.0    0.30      1000.0
 2515      CONCS 5241              4    0 2.3       0.15      0.0025
 2516       0.15         0.0    0.22       200.0    0.25       500.0    0.30      1000.0
 2517      CON14 5242              4    0 2.3       0.15      0.0018
 2518       0.15         0.0    0.22       200.0    0.25       500.0    0.30      1000.0
 2519      CONLW 5243              4    2 0.95      0.15      0.0005
 2520       0.15         0.0    0.22       200.0    0.25       500.0    0.30      1000.0
 2521       0.0005     250.0    0.0005     400.0
 2522      DIATA 5246              4    2 0.44      0.19      2.1    E-4
 2523       0.18         0.0    0.23       200.0    0.27       500.0    0.30       800.0
 2524       2.1    E-4 200.0    3.2    E-4 900.0
 2525      DIATP 5247              4    2 0.44      0.19      3.3    E-4
 2526       0.18         0.0    0.23       200.0    0.27       500.0    0.30       800.0
 2527       3.3    E-4 200.0    4.4    E-4 900.0
 2528      DIATM 5248              4    2 0.61      0.19      5.8    E-4
 2529       0.18         0.0    0.23       200.0    0.27       500.0    0.30       800.0
 2530       5.8    E-4 200.0    7.4    E-4 900.0
 2531      DIATH 5249              4    2 0.59      0.19      5.4    E-4
 2532       0.18         0.0    0.23       200.0    0.27       500.0    0.30       800.0
 2533       0.00054    200.0    0.0014    1000.0
 2534      DIATL 5250              4    4 0.44      0.19      2.2    E-4
 2535       0.18         0.0    0.23       200.0    0.27       500.0    0.30       800.0
 2536       2.1    E-4   0.0    2.7    E-4 300.0    2.85   E-4 400.0    3.0    E-4 540.0
 2537      DIATT 5251              4    7 0.60      0.19      5.3    E-4
 2538       0.18         0.0    0.23       200.0    0.27       500.0    0.30       800.0
 2539       5.2    E-4   0.0    5.4    E-4 100.0    5.7    E-4 200.0    6.3    E-4 400.0
 2540       6.6    E-4 540.0    7.4    E-4 800.0    8.3    E-4 1100.0
 2541      BRIDS 5254              5    2 2.7       0.20      0.004     1730.0
 2542       0.19         0.0    0.24       200.0    0.25       500.0    0.27      1000.0
 2543       0.28      1500.0
 2544       0.0040      50.0    0.0052    1000.0
 2545      BRIEF 5256              5    2 0.95      0.175     7.0    E-4 1400.0
 2546       0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
 2547       0.32      1500.0
 2548       7.5    E-4 300.0    8.5    E-4 600.0
 2549      BRIFN 5258              5    2 1.98      0.175     0.0031    1680.0
 2550       0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.    ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  2551       0.32·     1500.0
  2552       0.0031    1000.0    0.0031    1001.0
  2553      BRIFM 5259              5    4 2.0       0.18      0.0024    1680.0
  2554       0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
  2555       0.32      1500.0
  2556       0.0024     200.0    0.0035     600.0    0.0039    1000.0    0.0042    1400.0
  2557      BRIFS 5260              5    2 2.00      0.18      0.0026    1600.0
  2558       0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
  2559       0.32      1500.0
  2560       0.0026    1000.0    0.0026    1001.0
  2561      BRIFR 5262              6    2 2.76      0.19      0.0024    1730.0    130.0
  2562       0.185        0.0    0.225      100.0    0.250      200.0    0.274      400.0
  2563       0.292      700.0    0.340     1600.0
  2564       0.0024     400.0    0.0024     401.0
  2565      BRIKA 5264             11    2 0.43      0.185     6.0   E-4
  2566       0.0       -273.15   0.005     -240.0    0.082    -150.0    0.120     -100.0
  2567       0.140      -50.0    0.175        0.0    0.195      50.0    0.24       200.0
  2568       0.27       500.0    0.30      1000.0    0.32     1500.0
  2569       6.25  E-4  500.0    1.08  E-3 1150.0
  2570      BRIKB 5265             11    2 0.30      0.185     2.0   E-4
  2571       0.0       -273.15   0.005     -240.0    0.082    -150.0    0.120     -100.0
  2572       0.140      -50.0    0.175        0.0    0.195      50.0    0.24       200.0
  2573       0.27       500.0    0.30      1000.0    0.32     1500.0
  2574       2.08  E-4  200.0    4.7   E-4  760.0
  2575      MAGNS 5266              6    2 2.67      0.20      0.0083    1730.0    450.0
  2576       0.16      -100.0    0.20         0.0    0.26       200.0    0.29       500.0
  2577       0.30      1000.0    0.32      1500.0
  2578       0.0083    1000.0    0.0083    1001.0
  2579      MAGNP 5267              6    3 2.53      0.20      0.0092    1730.0    450.0
  2580       0.16      -100.0    0.20         0.0    0.26       200.0    0.29       500.0
  2581       0.30      1000.0    0.32      1500.0
  2582       0.0092     200.0    0.0065     700.0    0.0046    1200.0
  2583      MAGNA 5268              6    2 3.08      0.20      0.0118    1730.0    450.0
  2584       0.16      -100.0    0.20         0.0    0.26       200.0    0.29       500.0
  2585       0.30      1000.0    0.32      1500.0
  2586       0.0118     800.0    0.0080    1200.0
  2587      MAGNB 5269              6    3 2.76      0.20      0.0115    1730.0    450.0
  2588       0.16      -100.0    0.20         0.0    0.26       200.0    0.29       500.0
  2589       0.30      1000.0    0.32      1500.0
  2590       0.0115     800.0    0.0087    1000.0    0.0075    1200.0
  2591      MAGNC 5270              6    4 2.92      0.20      0.0088    1730.0    450.0
  2592       0.16      -100.0    0.20         0.0    0.26       200.0    0.29       500.0
  2593       0.30      1000.0    0.32      1500.0
  2594       0.0088     800.0    0.0086     900.0    0.00835   1000.0    0.0076    1200.0
  2595      PORBE 5280              8    2 2.9       0.24      0.30
  2596       0.12      -100.0    0.225        0.0    0.31       100.0    0.36       200.0
  2597       0.40       300.0    0.42       400.0    0.48       800.0    0.52      1500.0
  2598       0.32         0.0    0.17       200.0
  2599      PORAL 5281              8    3 3.4       0.19      0.045
  2600       0.186        0.0    0.226      200.0    0.261      400.0    0.276      500.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.    ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 2601        0.285      600.0    0.290      700.0    0.30      1000.0    0.32      1500.0
 2602        0.045       50.0    0.039      100.0    0.031      200.0
 2603       PORZR 5282             4    0 3.9       0.14      0.014
 2604        0.14         0.0    0.17       100.0    0.20       500.0    0.23      1000.0
 2605       PORMT 5283             5    2 2.9       0.18      0.0045
 2606        0.17         0.0    0.20       100.0    0.22       200.0    0.25       500.0
 2607        0.28      1000.0
 2608        0.0045      25.0    0.0045    1200.0
 2609       PORC5 5284             4    0 3.4       0.18      0.027
 2610        0.17         0.0    0.22       200.0    0.25       500.0    0.28      1000.0
 2611       PORCE 5286             4    0 3.4       0.18      0.005
 2612        0.17         0.0    0.22       200.0    0.25       500.0    0.28      1000.0
 2613       VERM2 5292             5    2 0.22      0.18      1.0   E-4
 2614        0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
 2615        0.32      1500.0
 2616        1.7   E-4  200.0    2.75  E-4  400.0
 2617       VERM3 5293             5    2 0.3       0.18      1.2   E-4
 2618        0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
 2619        0.32      1500.0
 2620        1.65  E-4  100.0    2.3   E-4  225.0
 2621       BRISI 5294             6    3 1.8       0.18      0.004     1710.0    35.0
 2622        0.17         0.0    0.205      100.0    0.23       200.0    0.265      500.0
 2623        0.300     1000.0    0.320     1500.0
 2624        0.004      500.0    0.0044    1000.0    0.0048    1200.0
 2625       BRISL 5296             6    2 1.93      0.18      0.00224   1630.0    50.0
 2626        0.17         0.0    0.205      100.0    0.23       200.0    0.265      500.0
 2627        0.300     1000.0    0.32      1500.0
 2628        0.00224   1000.0    0.00224   1001.0
 2629       BRISK 5298             5    2 2.31      0.17      0.0035    1545.0
 2630        0.17         0.0    0.24       200.0    0.27       500.0    0.30      1000.0
 2631        0.32      1500.0
 2632        0.0035     650.0    0.0035    1150.0
 2633       ALCR1 5412             2    2 5.9       0.12      0.11      1850.0
 2634        0.12         0.0    0.16       300.0
 2635        0.11        20.0    0.12       260.0
 2636       ALCR2 5413             2    0 5.9       0.15      0.022     1850.0
 2637        0.15         0.0    0.22       300.0
 2638       BEOBE 5414             6    8 2.85      0.26      0.50
 2639        0.260       25.0    0.312      100.0    0.362      200.0    0.393      300.0
 2640        0.436      500.0    0.492      800.0
 2641        0.50        25.0    0.38       100.0    0.28       200.0    0.21       300.0
 2642        0.17       400.0    0.12       600.0    0.090      800.0    0.070     1000.0
 2643       BEOMO 5416             7    6 2.975     0.248     0.21
 2644        0.248       25.0    0.296      100.0    0.356      200.0    0.387      300.0
 2645        0.407      400.0    0.438      600.0    0.470      800.0
 2646        0.38       100.0    0.21       300.0    0.17       400.0    0.12       600.0
 2647        0.087      800.0    0.070     1000.0
 2648       BEOSI 5418            10    2 2.90      0.25      0.46
 2649        0.12      -100.0    0.23         0.0    0.31       100.0    0.36       200.0
 2650        0.395      300.0    0.423      400.0    0.456      600.0    0.480      800.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 2651       0.525     1500.0    0.615     2550.0
 2652       0.46        50.0    0.32       200.0
 2653      BEBEO 5420            8    4 1.84       0.435     0.43      1283.0    310.7
 2654       0.435       25.0    0.490      100.0    0.550     200.0     0.59       300.0
 2655       0.625      400.0    0.675      600.0    0.715     800.0     0.790     1200.0
 2656       0.430        0.0    0.295      400.0    0.195     800.0     0.105     1200.0
 2657      CHCNI 5422            0    0 6.7        0.12      0.027     1454.0
 2658      SICSI 5424            0    3 2.5        0.20      0.145
 2659       0.145      200.0    0.105      500.0    0.075     900.0
 2660      STCO1 5426            3    0 5.5        0.12      0.011     1495.0
 2661       0.12         0.0    0.15       400.0    0.16      800.0
 2662      STCO2 5427            3    0 5.8        0.12      0.015     1495.0
 2663       0.12         0.0    0.15       400.0    0.16      800.0
 2664      STCO3 5428            3    0 6.2        0.12      0.016     1495.0
 2665       0.12         0.0    0.15       400.0    0.16      800.0
 2666      STCO4 5429            3    0 6.6        0.12      0.025     1495.0
 2667       0.12         0.0    0.15       400.0    0.16      800.0
 2668      TICC1 5430            2    0 5.42       0.13      0.085
 2669       0.13         0.0    0.17       500.0
 2670      TICC2 5431            2    0 5.5        0.13      0.075
 2671       0.13         0.0    0.17       500.0
 2672      TICC3 5432            2    0 5.5        0.13      0.080
 2673       0.13         0.0    0.17       500.0
 2674      TICC4 5433            2    2 6.0        0.13      0.046
 2675       0.13         0.0    0.17       500.0
 2676       0.046      100.0    0.054      450.0
 2677      TICC5 5434            2    2 5.6        0.13      0.063
 2678       0.13         0.0    0.17       500.0
 2679       0.063      100.0    0.074      450.0
 2680      TICC6 5435            2    2 5.8        0.13      0.054
 2681       0.13         0.0    0.17       500.0
 2682       0.054      100.0    0.061      450.0
 2683      TICC7 5436            2    2 6.3        0.13      0.047
 2684       0.13         0.0    0.17       500.0
 2685       0.047      100.0    0.057      450.0
 2686      TICC8 5437            2    2 6.6        0.13      0.048
 2687       0.13         0.0    0.17       500.0
 2688       0.048      100.0    0.060      450.0
 2689      TICC9 5438            2    2 5.7        0.13      0.041
 2690       0.13         0.0    0.17       500.0
 2691       0.041      100.0    0.051      450.0
 2692      TIC10 5439            6    5 6.0        0.15      0.056
 2693       0.150      100.0    0.205     1200.0    0.51      1270.0    0.51      1310.0
 2694       0.192     1315.0    0.192     1500.0
 2695       0.056      100.0    0.024      600.0    0.017      800.0    0.014     1000.0
 2696       0.0090    1800.0
 2697      TICCR 5442            0    0 6.0        0.11      0.07      1454.0
 2698      WCCO1 5452            2    4 14.0       0.05      0.27      1454.0
 2699       0.05         0.0    0.07       600.0
 2700       0.27        50.0    0.235      200.0    0.205      400.0    0.190      600.0

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 2701      WCC02 5453              2    3 14.0      0.05      0.13      1454.0
 2702       0.05          0.0    0.07       600.0
 2703       0.13         50.0    0.115      300.0    0.105      700.0
 2704      WCC03 5454              2    2 14.9      0.05      0.24      1454.0
 2705       0.05          0.0    0.07       600.0
 2706       0.239       100.0    0.184      450.0
 2707      WCC05 5456              2    2 15.3      0.05      0.160     1454.0
 2708       0.05          0.0    0.07       600.0
 2709       0.160       100.0    0.145      450.0
 2710      WCC06 5457              2    2 14.1      0.05      0.219     1454.0
 2711       0.05          0.0    0.07       600.0
 2712       0.219       100.0    0.155      450.0
 2713      WCC07 5458              2    2 13.8      0.05      0.177     1454.0
 2714       0.05          0.0    0.07       600.0
 2715       0.177       100.0    0.154      450.0
 2716      WCC08 5459              2    2 14.0      0.05      0.129     1454.0
 2717       0.05          0.0    0.07       600.0
 2718       0.129       100.0    0.123      450.0
 2719      WCC09 5460              2    2 14.8      0.05      0.196     1454.0
 2720       0.05          0.0    0.07       600.0
 2721       0.196       100.0    0.160      450.0
 2722      WCC10 5461              2    2 15.25     0.05      0.29      1454.0
 2723       0.05          0.0    0.07       600.0
 2724       0.29         50.0    0.29       200.0
 2725      WCC11 5462              2    2 15.1      0.05      0.24      1454.0
 2726       0.05          0.0    0.07       600.0
 2727       0.24         50.0    0.24       200.0
 2728      WCC12 5463              2    2 14.95     0.05      0.24      1454.0
 2729       0.05          0.0    0.07       600.0
 2730       0.24         50.0    0.24       200.0
 2731      WCC04 5465              2    2 12.9      0.09      0.126     1454.0
 2732       0.09          0.0    0.11       500.0
 2733       0.126       100.0    0.114      450.0
 2734      WTIC1 5466              2    2 11.1      0.09      0.067     1454.0
 2735       0.09          0.0    0.11       500.0
 2736       0.067       100.0    0.072      450.0
 2737      WTIC2 5467              2    2 11.7      0.09      0.127     1454.0
 2738       0.09          0.0    0.11       500.0
 2739       0.127       100.0    0.110      450.0
 2740      WTIC3 5468              2    2 11.6      0.09      0.102     1454.0
 2741       0.09          0.0    0.11       500.0
 2742       0.102       100.0    0.099      450.0
 2743      WTIC4 5469              2    2 11.5      0.09      0.085     1454.0
 2744       0.09          0.0    0.11       500.0
 2745       0.085       100.0    0.089      450.0
 2746      WTIC5 5470              2    2 12.9      0.09      0.143     1454.0
 2747       0.09          0.0    0.11       500.0
 2748       0.143       100.0    0.118      450.0
 2749      WTIC6 5471              2    2 12.5      0.09      0.112     1454.0
 2750       0.09          0.0    0.11       500.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  2751      0.112      100.0    0.106      450.0
  2752     WTIC7 5472             2    2 12.3      0.09      0.106     1454.0
  2753      0.09         0.0    0.11       500.0
  2754      0.106      100.0    0.105      450.0
  2755     UO2CR 5482             0    3 10.0      0.08      0.038
  2756      0.038      200.0    0.038      700.0    0.046      900.0
  2757     UOMO1 5484             0    5 10.0      0.08      0.044
  2758      0.044      200.0    0.041      400.0    0.045      600.0    0.049      800.0
  2759      0.060      900.0
  2760     UOMO2 5485             0    3 10.0      0.08      0.033
  2761      0.033      100.0    0.027      400.0    0.026      700.0
  2762     UOMO3 5486             0    2 10.0      0.08      0.048
  2763      0.048      100.0    0.048      800.0
  2764     UO2NB 5488             0    2 10.0      0.08      0.023
  2765      0.023      100.0    0.023      900.0
  2766     UO2S1 5490             0    4 10.0      0.08      0.019
  2767      0.019      100.0    0.020      300.0    0.024      500.0    0.034      900.0
  2768     UO2S2 5491             0    4 10.0      0.08      0.015
  2769      0.015      100.0    0.016      300.0    0.018      500.0    0.026      900.0
  2770     UO2Z1 5492             4    2 4.0       0.062     0.032
  2771      0.062        0.0    0.070      200.0    0.075      500.0    0.078      700.0
  2772      0.032       50.0    0.022      700.0
  2773     UO2Z2 5493             4    0 8.71      0.058     0.026
  2774      0.058        0.0    0.069      200.0    0.074      500.0    0.075      700.0
  2775     ZROTI 5494             9    6 5.7       0.106     0.015
  2776      0.106       25.0    0.121      100.0    0.128      150.0    0.1305     200.0
  2777      0.134      300.0    0.138      500.0    0.142      600.0    0.154      800.0
  2778      0.157      900.0
  2779      0.015       25.0    0.0095     400.0    0.0076     600.0    0.0069     800.0
  2780      0.0071    1000.0    0.0076    1200.0
  2781     ZROYZ 5495             5    2 5.5       0.105     0.0059
  2782      0.105        0.0    0.13       200.0    0.14       500.0    0.16      1200.0
  2783      0.14      1600.0
  2784      0.0059     800.0    0.0059    2200.0
  2785     ZRB2B 5496             3    0 5.3       0.11      0.066     3000.0
  2786      0.11        25.0    0.19       500.0    0.25      1000.0
  2787     ZRB2Z 5498             3    2 5.2       0.12      0.050     2370.0
  2788      0.12        25.0    0.16       300.0    0.215     2000.0
  2789      0.050       25.0    0.075     1000.0
  2790     AIR   5501             2    7 0.00129   0.24      6.0   E-5 -194.35   49.0
  2791      0.240     -150.0    0.237      100.0
  2792      1.65  E-5 -194.35   3.76  E-5 -100.0   5.77  E-5    0.0    7.60  E-5  100.0
  2793      9.25  E-5  200.0    1.072 E-4  300.0    1.21  E-4  400.0
  2794     GRNTL 6012             0    0 2.65      0.20      0.0041
  2795     GRNTH 6013             0    0 2.65      0.20      0.0095
  2796     GRNTM 6014             0    0 2.65      0.20      0.006
  2797     LIMST 6016             0    0 2.5       0.22      0.004
  2798     LIMSW 6017             0    0 1.65      0.22      0.0022
  2799     CHALK 6018             0    0 1.54      0.22      0.002
  2800     MARBD 6020             0    2 2.7       0.21      0.0085

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
 2801       0.012     -190.0    0.009        0.0
 2802      MARBL 6021              0    0 2.7       0.21      0.006
 2803      ROCKS 6022              0    0 2.6       0.2       0.0042
 2804      SANDS 6024              0    0 2.6       0.23      0.01
 2805      SANDL 6025              0    0 2.2       0.23      0.0044
 2806      SANDM 6026              0    0 2.3       0.23      0.006
 2807      SHALE 6028              0    0 2.4       0.2       0.004
 2808      SLATE 6030              0    0 2.76      0.2       0.0045
 2809      SANQF 6032              8    0 0.88      0.178     0.0004
 2810       0.145      -50.0    0.169        0.0    0.205      100.0    0.227      200.0
 2811       0.265      500.0    0.290      800.0    0.317     1300.0    0.350     1700.0
 2812      SANQW 6033              0    0 1.82      0.35      0.0053
 2813      SANDY 6034              0    0 1.6       0.18      0.0008
 2814      SANDQ 6036              0    0 1.7       0.18      0.004
 2815      SANDN 6038              0    0 1.7       0.2       0.002
 2816      SANQP 6039              0    0 1.87      0.38      0.0027
 2817      SOIL1 6042              0    0 1.2       0.2       0.0006
 2818      SOIL2 6043              0    0 1.6       0.25      0.001
 2819      SOIL3 6044              0    0 1.5       0.7       0.0036
 2820      SOILS 6046              0    0 1.3       0.25      0.002
 2821      SOILM 6048              0    0 2.0       0.23      3.2   E-5
 2822      SOILD 6050              0    0 1.65      0.19      0.00063
 2823      SOILW 6052              0    0 1.75      0.24      0.0014
 2824      ABSR1 7001              0    0 1.04      0.36      3.3   E-4
 2825      ABSR2 7002              0    0 1.04      0.36      5.0   E-4
 2826      ACDEL 7006              0    0 1.42      0.35      5.5   E-4 85.0
 2827      ACRLP 7011              4    4 1.2       0.34                60.0
 2828       0.11      -200.0    0.22      -100.0    0.28        0.0    0.42       100.0
 2829       2.4   E-4 -100.0    3.5   E-4    0.0    3.65  E-4   25.0    3.75  E-4   75.0
 2830      ACRLH 7012              0    0 1.2       0.34      6.0   E-4 60.0
 2831      ALKIS 7016              0    0 0.16      0.4       1.2   E-4 105.0
 2832      ALLY1 7021              0    0 1.3       0.56      4.9   E-4 150.0
 2833      ALLY2 7022              0    0 1.3       0.26      4.9   E-4 150.0
 2834      BUACR 7026              0    0 1.34      0.345     1.0   E-3
 2835      BUTYR 7031              0    0 0.9       0.47      2.1   E-4 150.0
 2836      CELA1 7036              0    0 1.3       0.35      4.0   E-4 205.0
 2837      CELA2 7037              0    0 1.3       0.35      8.0   E-4 205.0
 2838      CEAB1 7041              0    0 1.2       0.35      4.0   E-4
 2839      CEAB2 7042              0    0 1.2       0.35      8.0   E-4
 2840      CENIP 7046              0    0 1.38      0.35      5.5   E-4 50.0
 2841      CEPR1 7051              0    0 1.2       0.35      4.0   E-4
 2842      CEPR2 7052              0    0 1.2       0.35      8.0   E-4
 2843      CETRA 7056              0    0 1.3       0.35      6.0   E-4
 2844      DAPON 7061              0    0 1.65      0.27      7.3   E-4
 2845      EPCR1 7066              7    0 1.21      0.28      4.65  E-4 80.0
 2846       0.23       -50.0    0.26        0.0    0.36      100.0    0.54       200.0
 2847       0.72       230.0    0.35      290.0    0.35      350.0
 2848      EPGFM 7071              0    4 1.9       0.19      4.0   E-4
 2849       3.0   E-4 -50.0    4.0   E-4   25.0    6.0   E-4 175.0    5.0   E-4 300.0
 2850      EPSFC 7076              0    0 1.8       0.24      1.5   E-3

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
```

Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  2851     EPUNC 7081              0    0 1.2       0.25      4.5   E-4
  2852     ETHCE 7086              0    0 1.15      0.5       5.5   E-4
  2853     ETHVA 7091              0    0 1.2       0.55      1.8   E-4
  2854     FCCTF 7101              0    0 2.12      0.22      6.0   E-4 190.0
  2855     FCFEP 7106              0    0 2.2       0.28      6.0   E-4 205.0
  2856     FCTFE 7111              2    9 2.17      0.24      6.0   E-4 260.0
  2857      0.23          0.0    0.26       100.0
  2858      1.4   E-4 -268.0    2.0   E-4 -265.0    2.7   E-4 -260.0    3.8   E-4 -250.0
  2859      4.7   E-4 -230.0    5.5   E-4 -200.0    5.6   E-4    0.0    8.0   E-4  200.0
  2860      1.0   E-3  300.0
  2861     FCTFR 7112              3    2 1.99      0.22      9.9   E-4 260.0
  2862      0.14       -100.0    0.215        0.0    0.235       25.0
  2863      9.9   E-4   60.0    1.43  E-3  300.0
  2864     MELM1 7121              0    0 1.4       0.4       4.0   E-4 95.0
  2865     MELM2 7122              0    0 2.0       0.4       1.7   E-3 205.0
  2866     MELAC 7123              0    0 1.5       0.4       8.5   E-4 95.0
  2867     MELAS 7124              0    0 1.85      0.4       1.5   E-3 95.0
  2868     MELAF 7125              0    0 1.45      0.4       7.5   E-4 95.0
  2869     MELGF 7126              0    0 1.9       0.4       1.15  E-3 205.0
  2870     MELFF 7127              0    0 1.52      0.4       1.06  E-3 120.0
  2871     MEMAC 7131              0    5 1.18      0.35      5.0   E-4
  2872      1.5   E-4 -270.0    1.5   E-4 -260.0    1.8   E-4 -250.0    2.0   E-4 -247.0
  2873      5.0   E-4   25.0
  2874     NEOPR 7136              0    0 1.25      0.52      4.6   E-4 115.0
  2875     NITRR 7141              0    0 1.0       0.47      5.8   E-4
  2876     NYLON 7151              5    5 1.12      0.4       5.8   E-4 100.0
  2877      0.29        -25.0    0.33         0.0    0.37       25.0    0.50       100.0
  2878      0.67        200.0
  2879      0.3   E-4 -269.0    0.7   E-4 -265.0    1.2   E-4 -260.0    2.5   E-4 -250.0
  2880      5.8   E-4   25.0
  2881     NYLGF 7156              0    0 1.4       0.32      5.0   E-4 150.0
  2882     PFPPF 7161              0    0 1.28      0.4       5.0   E-4
  2883     PHCNF 7171              0    0 1.31      0.35      4.0   E-4 120.0
  2884     PHCAF 7172              0    0 1.7       0.3       8.4   E-4 120.0
  2885     PHMLD 7176              0    0 1.24      0.3       4.1   E-4 150.0
  2886     PHMHD 7177              0    0 3.00      0.3       1.61  E-3 150.0
  2887     PHRPD 7181              0    0 1.38      0.3       9.0   E-4
  2888     PHNXY 7191              0    0 1.25      0.4       4.2   E-4 75.0
  2889     PLAMT 7201              0    0 1.8       0.3       5.0   E-4 120.0
  2890     PALLO 7211              0    0 0.9       0.5       3.0   E-4 110.0
  2891     PCARB 7221              0    0 1.35      0.4       4.6   E-4 120.0
  2892     PESTG 7231              0    0 1.23      0.27      4.2   E-4 120.0
  2893     PETHL 7241              0    0 0.92      0.5       7.9   E-4 95.0
  2894     PETHM 7242              0    0 0.935     0.55      9.9   E-4 95.0
  2895     PETHH 7243              0    0 0.95      0.55      1.2   E-3 95.0
  2896     PIMHF 7251              0    0 1.42      0.27      2.7   E-3 205.0
  2897     PPROM 7261              0    0 0.91      0.46      3.2   E-4 120.0
  2898     PPROC 7262              0    0 0.91      0.56      3.0   E-4 120.0
  2899     PPROP 7263              0    0 1.27      0.46      4.3   E-4 120.0
  2900     PSTYF 7271              0    0 0.1       0.27      8.3   E-5 85.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                     1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA              1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
  2901     PSTYG 7276              0    6 1.05      0.34      3.0   E-4 60.0
  2902      1.1   E-4 -200.0    1.7   E-4  -80.0    2.7   E-4    0.0     3.5   E-4   50.0
  2903      3.8   E-4  100.0    3.8   E-4  200.0
  2904     PSTYM 7281              0    0 1.08      0.32      2.0   E-4 50.0
  2905     PSTYP 7286              0    3 0.04      0.27      1.0   E-4 70.0
  2906      0.35  E-4 -150.0    0.9   E-4    0.0    1.2   E-4   70.0
  2907     PSTYL 7287              0    2 0.038     0.27      7.85  E-5 85.0
  2908      7.85  E-5 -197.0    7.85  E-5   27.0
  2909     PSTYH 7288              0    2 0.046     0.27      6.2   E-5 85.0
  2910      6.2   E-5 -197.0    6.2   E-5   27.0
  2911     PSTYV 7289              0    2 0.046     0.27      1.94  E-5 85.0
  2912      1.94  E-5 -253.0    1.94  E-5 -197.0
  2913     PSULF 7291              0    0 1.25      0.3       6.2   E-4 170.0
  2914     PUREF 7301              0    0 0.06      0.42      1.0   E-4 95.0
  2915     PURFF 7302              0    4 0.04      0.4       1.0   E-4 205.0
  2916      0.2   E-4 -200.0    0.6   E-4 0.0       0.8   E-4   25.0     1.5   E-4  300.0
  2917     PURER 7311              0    0 1.25      0.4       7.0   E-4 115.0
  2918     PVINA 7321              0    0 1.25      0.3       1.9   E-3
  2919     PVINB 7331              0    0 1.1       0.4       2.0   E-4 45.0
  2920     PVINC 7341              0    0 1.18      0.31      3.7   E-4
  2921     PVCFL 7351              0    0 1.5       0.4       4.0   E-4 60.0
  2922     PVCRD 7352              0    0 1.4       0.24      6.0   E-4 60.0
  2923     PVCAF 7356              0    0 1.2       0.4       4.0   E-4
  2924     PVCAR 7357              0    0 1.4       0.24      4.0   E-4
  2925     PVDCF 7361              0    0 1.68      0.32      3.0   E-4 145.0
  2926     PVDCM 7362              0    0 1.7       0.32      3.0   E-4 75.0
  2927     PVDCK 7366              0    0 1.76      0.33      3.0   E-4
  2928     PVTPX 7371              0    0 0.83      0.52      4.0   E-4
  2929     RUBBN 7381              0    0 0.93      0.5       3.3   E-4 80.0
  2930     RUBBD 7382              0    2 1.1       0.5       5.0   E-4 80.0
  2931      5.2   E-4   35.0    5.4   E-4  100.0
  2932     RUBBK 7383              0    2 1.1       0.5       7.0   E-4 80.0
  2933      7.2   E-4   35.0    6.5   E-4  100.0
  2934     RUBBF 7386              0    0 0.1       0.5       1.0   E-4 70.0
  2935     SILFF 7401              0    0 0.25      0.32      4.0   E-4 260.0
  2936     SILFR 7402              0    0 0.3       0.32      2.0   E-4 260.0
  2937     SILMD 7411              0    0 1.8       0.25      4.0   E-4 315.0
  2938     SILRL 7421              0    0 1.3       0.3       3.3   E-4 285.0
  2939     SILRM 7422              0    0 1.3       0.3       8.0   E-4 285.0
  2940     SILRH 7423              0    0 1.3       0.3       1.8   E-3 285.0
  2941     SILR1 7424              0    0 1.4       0.3       6.5   E-4 285.0
  2942     STBRC 7431              0    0 1.0       0.42      5.8   E-4 80.0
  2943     URFMN 7441              0    0 1.5       0.4       3.0   E-4
  2944     URFMA 7442              0    0 1.5       0.4       9.0   E-4
  2945     BRTOL 7501              0    0 2.60      0.192     11.84 E-4
  2946     CMB-3 7502              0    0 1.725     0.324      6.27 E-4
  2947     CMC-4 7503              0    0 1.59      0.28       6.22 E-4
  2948     DATB  7504              0    0 1.795     0.3        6.0  E-4
  2949     LX041 7505              2    9 1.865     0.28      0.001     280.0
  2950      0.28         25.0    0.35       280.0

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                    1         2         3         4         5         6         7         8
```

Appendix G (Continued)

```
 DATA                1         2         3         4         5         6         7         8
SEQ. NO.   ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 2951       1.0   E-3  -54.0    0.967 E-3  -17.8    0.925 E-3   21.1    0.896 E-3   48.9
 2952       0.867 E-3   73.9    0.835 E-3  100.0    0.790 E-3  140.0    0.4   E-3  280.0
 2953       0.4   E-3 1000.0
 2954      HEM03 7506              3    0 1.87      0.23      0.274 E-3
 2955       0.229        35.0    0.233       50.0    0.244       70.0
 2956      HEM04 7507              0    0 1.78      0.30      1.272 E-3
 2957      NITRC 7508              0    0 1.58      0.3       0.55  E-3 135.0
 2958      E9011 7509              0    0 1.77      0.28      1.03  E-3 280.0
 2959      E9404 7510              6    9 1.836     0.24      1.02  E-3 280.0
 2960       0.18        -54.0    0.26       -17.8    0.24        21.1    0.25         54.4
 2961       0.28         84.9    0.35       280.0
 2962       1.15  E-3  -54.0    1.087 E-3  -17.8    1.012 E-3   21.1    0.958 E-3   48.9
 2963       0.916 E-3   73.9    0.790 E-3  140.0    0.4   E-3  280.0    0.2   E-3  400.0
 2964       0.2   E-3 1000.0
 2965      PETN  7511              0    0 1.76      0.4       0.5   E-3 142.0
 2966      TETRL 7512              0    0 1.71      0.3       0.683 E-3 130.0
 2967      TNT   7513              0    0 1.55      0.328     0.622 E-3 80.9
 2968      HEM01 7514              0    2 1.70      0.23      0.0024
 2969       2.44  E-3  106.3    2.28  E-3  207.2
 2970      HEM02 7515              2    2 1.7       0.25      1.26  E-3
 2971       0.265        97.5    0.245       204.8
 2972       1.26  E-3   97.5    2.10  E-3  204.8
 2973      FBRFX 8201              5    4 0.324     0.2       0.6   E-4
 2974       0.17          4.0    0.25       283.0    0.286      558.0    0.300      838.0
 2975       0.300      2000.0
 2976       0.55  E-4   20.0    1.658 E-3  210.0    5.76  E-3  955.0    6.86  E-3 1155.0
 2977      RATTN 8211              0    0 15.0      0.129     0.01
 2978      LITBE 8216              0    0 2.137     0.27      0.0043    930.0
 2979      SNOWF 8231              0    0 0.1       0.5       2.5   E-4 0.0        79.71
 2980      SNOWP 8232              0    0 0.55      0.5       1.12  E-3 0.0        79.71
 2981      WOOD1 8511              0    0 0.41      0.30      5.5   E-4
 2982      WOOD2 8512              0    0 0.41      0.30      3.0   E-4
 2983      CORKG 8514              0    0 0.15      0.48      1.03  E-4
 2984      CORKR 8515              0    0 0.13      0.48      1.07  E-4
 2985      BALS1 8516              0    0 0.13      0.55      1.2   E-4
 2986      BALS2 8517              0    0 0.32      0.55      2.0   E-4
 2987      CYPRS 8518              0    0 0.46      0.55      2.3   E-4
 2988      MAHOG 8520              0    0 0.54      0.55      3.1   E-4
 2989      MAPLE 8522              0    0 0.71      0.55      4.2   E-4
 2990      OAKHD 8524              0    0 0.825     0.57      5.0   E-4
 2991      OAKLD 8525              0    0 0.61      0.57      3.5   E-4
 2992      PINEW 8526              0    0 0.55      0.55      3.6   E-4
 2993      PINEL 8527              0    0 0.51      0.55      2.7   E-4
 2994      PINEV 8528              0    0 0.54      0.55      3.4   E-4
 2995      PINEW 8529              0    0 0.55      0.55      8.2   E-4
 2996      TEAK  8530              0    0 0.64      0.55      4.1   E-4
 2997      FIRWH 8532              0    0 0.45      0.55      2.6   E-4
 2998      PINEA 8534              0    0 0.53      0.55      3.1   E-4
 2999      ART1  9001              0    0 0.0       0.0       0.0
 3000      ART2  9002              0    0 0.0       0.0       1.0    E9

           ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                1         2         3         4         5         6         7         8
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Appendix G (Continued)

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 DATA                1         2         3         4         5         6         7         8
SEQ. NO.    ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0

 3001       ART3  9003              0    0 1.0       1.0       1.0
 3002       ART4  9004              0    0 1.0       1.0       1.0    E9
 3003       ART5  9005              0    0 1.0       1.0    E9 1.0    E9
 3004       ART6  9006              0    0 1.0       1.0       1.0       1.0       1.0
 3005       ART7  9007              0    0 1.0       1.0       1.0       1.0       1.0    E9

            ----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0----5----0
                      1         2         3         4         5         6         7         8
```

国際単位系（SI）と換算表

表1　SI基本単位および補助単位

量	名称	記号
長さ	メートル	m
質量	キログラム	kg
時間	秒	s
電流	アンペア	A
熱力学温度	ケルビン	K
物質量	モル	mol
光度	カンデラ	cd
平面角	ラジアン	rad
立体角	ステラジアン	sr

表2　SIと併用される単位

名称	記号
分，時，日	min，h，d
度，分，秒	°，′，″
リットル	l，L
トン	t
電子ボルト	eV
原子質量単位	u

1 eV=1.60218×10^{-19}J

1 u=1.66054×10^{-27}kg

表5　SI接頭語

倍数	接頭語	記号
10^{18}	エクサ	E
10^{15}	ペタ	P
10^{12}	テラ	T
10^{9}	ギガ	G
10^{6}	メガ	M
10^{3}	キロ	k
10^{2}	ヘクト	h
10^{1}	デカ	da
10^{-1}	デシ	d
10^{-2}	センチ	c
10^{-3}	ミリ	m
10^{-6}	マイクロ	μ
10^{-9}	ナノ	n
10^{-12}	ピコ	p
10^{-15}	フェムト	f
10^{-18}	アト	a

表3　固有の名称をもつSI組立単位

量	名称	記号	他のSI単位による表現
周波数	ヘルツ	Hz	s^{-1}
力	ニュートン	N	m·kg/s^2
圧力，応力	パスカル	Pa	N/m^2
エネルギー,仕事,熱量	ジュール	J	N·m
工率，放射束	ワット	W	J/s
電気量，電荷	クーロン	C	A·s
電位，電圧，起電力	ボルト	V	W/A
静電容量	ファラド	F	C/V
電気抵抗	オーム	Ω	V/A
コンダクタンス	ジーメンス	S	A/V
磁束	ウェーバ	Wb	V·s
磁束密度	テスラ	T	Wb/m^2
インダクタンス	ヘンリー	H	Wb/A
セルシウス温度	セルシウス度	℃	
光束	ルーメン	lm	cd·sr
照度	ルクス	lx	lm/m^2
放射能	ベクレル	Bq	s^{-1}
吸収線量	グレイ	Gy	J/kg
線量等量	シーベルト	Sv	J/kg

表4　SIと共に暫定的に維持される単位

名称	記号
オングストローム	Å
バーン	b
バール	bar
ガル	Gal
キュリー	Ci
レントゲン	R
ラド	rad
レム	rem

1 Å=0.1nm=10^{-10}m

1 b=100fm^2=10^{-28}m^2

1 bar=0.1MPa=10^5Pa

1 Gal=1cm/s^2=10^{-2}m/s^2

1 Ci=3.7×10^{10}Bq

1 R=2.58×10^{-4}C/kg

1 rad=1cGy=10^{-2}Gy

1 rem=1cSv=10^{-2}Sv

(注)

1．表1－5は「国際単位系」第5版，国際度量衡局1985年刊行による。ただし，1 eVおよび1 uの値はCODATAの1986年推奨値によった。

2．表4には海里，ノット，アール，ヘクタールも含まれているが日常の単位なのでここでは省略した。

3．barは，JISでは流体の圧力を表わす場合に限り表2のカテゴリーに分類されている。

4．EC閣僚理事会指令ではbar，barnおよび「血圧の単位」mmHgを表2のカテゴリーに入れている。

換　算　表

力	N(=10^5dyn)	kgf	lbf
	1	0.101972	0.224809
	9.80665	1	2.20462
	4.44822	0.453592	1

粘度　1 Pa·s(N·s/m^2)=10 P(ポアズ)(g/(cm·s))

動粘度　1m^2/s=10^4St(ストークス)(cm^2/s)

圧力	MPa(=10bar)	kgf/cm^2	atm	mmHg(Torr)	lbf/in^2(psi)
	1	10.1972	9.86923	7.50062×10^3	145.038
	0.0980665	1	0.967841	735.559	14.2233
	0.101325	1.03323	1	760	14.6959
	1.33322×10^{-4}	1.35951×10^{-3}	1.31579×10^{-3}	1	1.93368×10^{-2}
	6.89476×10^{-3}	7.03070×10^{-2}	6.80460×10^{-2}	51.7149	1

エネルギー・仕事・熱量	J(=10^7 erg)	kgf·m	kW·h	cal(計量法)	Btu	ft·lbf	eV
	1	0.101972	2.77778×10^{-7}	0.238889	9.47813×10^{-4}	0.737562	6.24150×10^{18}
	9.80665	1	2.72407×10^{-6}	2.34270	9.29487×10^{-3}	7.23301	6.12082×10^{19}
	3.6×10^6	3.67098×10^5	1	8.59999×10^5	3412.13	2.65522×10^6	2.24694×10^{25}
	4.18605	0.426858	1.16279×10^{-6}	1	3.96759×10^{-3}	3.08747	2.61272×10^{19}
	1055.06	107.586	2.93072×10^{-4}	252.042	1	778.172	6.58515×10^{21}
	1.35582	0.138255	3.76616×10^{-7}	0.323890	1.28506×10^{-3}	1	8.46233×10^{18}
	1.60218×10^{-19}	1.63377×10^{-20}	4.45050×10^{-26}	3.82743×10^{-20}	1.51857×10^{-22}	1.18171×10^{-19}	1

1 cal= 4.18605J（計量法）

= 4.184J（熱化学）

= 4.1855J（15℃）

= 4.1868J（国際蒸気表）

仕事率　1 PS(仏馬力)

= 75 kgf·m/s

= 735.499W

放射能	Bq	Ci
	1	2.70270×10^{-11}
	3.7×10^{10}	1

吸収線量	Gy	rad
	1	100
	0.01	1

照射線量	C/kg	R
	1	3876
	2.58×10^{-4}	1

線量当量	Sv	rem
	1	100
	0.01	1

(86年12月26日現在)

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