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REGISTRATION RECORD SERIES  
TEAL SHEETS

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**International Alloy Designations  
and  
Chemical Composition Limits  
for  
Wrought Aluminum and  
Wrought Aluminum Alloys**



1400 Crystal Drive, Suite 430, Arlington, VA 22209  
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**Revised: August 2018**

**Supersedes: January 2015**

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ISSN: 2377-6692

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## FOREWORD

Listed herein are designations and chemical composition limits for wrought aluminum and wrought aluminum alloys registered with The Aluminum Association. Numerical designations are assigned in accordance with the *Recommendation—International Designation System for Wrought Aluminum and Wrought Aluminum Alloys*, which is printed on pages 28 through 30. Additions may be made in accordance with the rules outlined in the Declaration of Accord printed on page 31, and alloys will be deleted when no longer in commercial use (see table of inactive alloys printed on pages 22-23).

Effective July/2015, the practice of registering experimental alloys has been discontinued and new experimental alloy designations shall not be granted. Prior to July/2015, designations for experimental alloys, defined by prefix "X," had been registered in accordance with the system defined in ANSI H35.1, "American National Standard Alloy and Temper Designation Systems for Aluminum." Previously registered and subsequently inactivated experimental alloys remain in the Previously Assigned but Presently Inactive Alloy Designation list. An experimental alloy composition shall retain the prefix "X" for the duration of its inactive status and can only be reactivated with removal of the experimental alloy status and prefix "X."

**Some of the registered alloys may be the subject of patent or patent applications, and their listing herein is not to be construed in any way as the granting of a license under such patent right.**

**This registration record is not intended to address all regulatory requirements that may be imposed by local, national or international governing bodies. Regulatory requirements, which vary by region and end use, can further restrict the chemical composition within the registered limits. When applicable, inclusion of such requirements in the sales agreement is advised.**

**A** list of the organizations that are signatories to the Declaration of Accord on the Recommendation is printed on pages ii-iii.



## SIGNATORIES TO THE DECLARATION OF ACCORD

The following organizations are signatories to the Declaration of Accord on an International Alloy Designation System for Wrought Aluminum and Wrought Aluminum Alloys which is printed on page 31 of this publication.

The Aluminum Association Inc. 1400 Crystal Drive Suite 430 Arlington, VA 22202 <u>USA</u> <a href="http://www.aluminum.org">www.aluminum.org</a>	USA	Associação Brasileira do Alumínio—ABAL Rua Humbertol, n° 220 - 4° .Andar Vila Mariana - CEP: 04018-030 Sao Pãulo-SP <u>BRAZIL</u> <a href="http://www.abal.org.br">www.abal.org.br</a>	BRAZIL
AFA Association Francaise de l'Aluminium 17, rue de l'amiral Hamelin 75783 Paris Cedex 16 <u>FRANCE</u> <a href="http://www.aluminium-info.com">www.aluminium-info.com</a>	FRANCE	Association for the Dutch Metallurgic Industry (VNMI) P.O. Box 190 NL-2700 AD Zoetermeer <u>NETHERLANDS</u> <a href="http://www.vnmi.nl">www.vnmi.nl</a>	NETHERLANDS
All-Russian Institute of Aviation Materials (VIAM) 17 Radio Ulitza 105005 Moscow <u>RUSSIA</u> <a href="http://www.viam.ru">www.viam.ru</a>	RUSSIA	Assomet - Associazione Nazionale Industrie Metalli non Ferrosi Via dei Missaglia, 97 I-20142 Milano <u>ITALY</u> <a href="http://www.assomet.it">www.assomet.it</a>	ITALY
ALRO S.A. 116 Pitesti Street Slatina, Olt County 230048 <u>ROMANIA</u> <a href="http://www.alro.ro">www.alro.ro</a>	ROMANIA	Australian Aluminium Council Limited Level 1, Dickson Square P.O. Box 63 Dickson, Canberra ACT 2602 <u>AUSTRALIA</u> <a href="http://www.aluminium.org.au">www.aluminium.org.au</a>	AUSTRALIA
Aluminium Association of Canada 1010 Sherbrooke Street West, Suite 1600 Montreal, Quebec H3A 2R7 <u>CANADA</u> <a href="http://www.aac.aluminium.qc.ca">www.aac.aluminium.qc.ca</a>	CANADA	Austrian Non-Ferrous Metals Federation Wiedner Hauptstraße 63 1045 Vienna <u>AUSTRIA</u> <a href="http://www.nemetall.at">www.nemetall.at</a>	AUSTRIA
Aluminium Center Belgium Z.I. Research Park 310 B-1731 Zellik <u>BELGIUM</u> <a href="http://www.aluminiumcenter.be">www.aluminiumcenter.be</a>	BELGIUM	Centro Nacional de Investigaciones Metalurgicas (CENIM) Avenida Gregorio del Amo, 8 Ciudad Universitaria 28040 Madrid <u>SPAIN</u> <a href="http://www.cenim.csic.es">www.cenim.csic.es</a>	SPAIN
Aluminium Federation Limited National Metalforming Centre 47 Birmingham Road West Bromwich, West Midlands B70 6PY <u>UNITED KINGDOM</u> <a href="http://www.alfed.org.uk">www.alfed.org.uk</a>	UK	China Nonferrous Metals Techno-Economic Research Institute No. 31 Suzhou Street Haidian District Beijing, 100080 <u>PEOPLES REPUBLIC OF CHINA</u> <a href="http://www.cnsmq.com">www.cnsmq.com</a>	CHINA
Aluminium Federation of South Africa P. O. Box 423 Isando, 1600 <u>REPUBLIC OF SOUTH AFRICA</u> <a href="http://www.afsa.org.za">www.afsa.org.za</a>	SOUTH AFRICA	European Aluminium Association Avenue de Broqueville, 12 B-1150 Brussels <u>BELGIUM</u> <a href="http://www.alueurope.eu">www.alueurope.eu</a>	EAA
Aluminium – Verband Schweiz Hallenstrasse 15 Postfach 71 CH-8024 Zurich <u>SWITZERLAND</u> <a href="http://www.alu.ch">www.alu.ch</a>	SWITZERLAND		

## Signatories (Continued)

European Organization for Aerospace Standardization Rue Montoyer 10/5 1000 Brussels <u>BELGIUM</u> <a href="http://www.asd-stan.org">www.asd-stan.org</a>	ASD-STAN	IRAM-Instituto Argentino De Normalizacion Peru 552/6 C1068AAB Buenos Aires <u>ARGENTINA</u> <a href="http://www.iram.org.ar">www.iram.org.ar</a>	ARGENTINA
Gesamtverband der Aluminium- industrie e.V. (GDA) Am Bonnheshof 5 D-40474 Dusseldorf <u>GERMANY</u> <a href="http://www.aluinfo.de">www.aluinfo.de</a>	GERMANY	Japan Aluminium Association Tsukamoto-Sozan Building 2-15, Ginza 4-Chome Chuo-ku, Tokyo 104-0061 <u>JAPAN</u> <a href="http://www.aluminum.or.jp">www.aluminum.or.jp</a>	JAPAN
Institute of Non-Ferrous Metals Light Metals Divison ul. Pilsudskiego 19 32-050 Skawina <u>POLAND</u> <a href="http://www.imn.gliwice.pl">www.imn.gliwice.pl</a>	POLAND	The Swedish Aluminium Association Svenskt Aluminium Romfartuna Nortuna 1 SE-725 94 Västerås <u>SWEDEN</u> <a href="http://www.svensktaluminium.se">www.svensktaluminium.se</a>	SWEDEN
Instituto Mexicano del Alumino, A.C. Francisco Petrarca No. 133 Piso 9 <u>MEXICO</u> , D.F. 11560 <a href="http://www.imedal.org.mx">www.imedal.org.mx</a>	MEXICO		

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**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

**NATURAL IMPURITY LIMITS FOR WROUGHT UNALLOYED ALUMINUM**

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al Minimum	
No. <sup>17</sup>	Date	By																			Each	Total <sup>3</sup>		
1050	1954	USA	0.25	0.40	0.05	0.05	0.05	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.50 <sup>4</sup>
1050A	1972	EAA	0.25	0.40	0.05	0.05	0.05	...	...	0.07	0.05	...	...	...	...	...	...	...	...	...	...	0.03	...	99.50 <sup>4</sup>
1060	1954	USA	0.25	0.35	0.05	0.03	0.03	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.60 <sup>4</sup>
1065	1973	USA	0.25	0.30	0.05	0.03	0.03	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.65 <sup>4</sup>
1070	1954	USA	0.20	0.25	0.04	0.03	0.03	...	...	0.04	0.03	...	...	...	...	...	...	...	0.05	...	6	0.03	...	99.70 <sup>4</sup>
1070A	1972	EAA	0.20	0.25	0.03	0.03	0.03	...	...	0.07	0.03	...	...	...	...	...	...	...	...	...	...	0.03	...	99.70 <sup>4</sup>
1080	1954	USA	0.15	0.15	0.03	0.02	0.02	...	...	0.03	0.03	...	...	...	0.03	...	...	...	0.05	...	...	0.02	...	99.80 <sup>4</sup>
1080A	1972	EAA	0.15	0.15	0.03	0.02	0.02	...	...	0.06	0.02	...	...	...	0.03	...	...	...	...	...	6	0.02	...	99.80 <sup>4</sup>
1085	1954	USA	0.10	0.12	0.03	0.02	0.02	...	...	0.03	0.02	...	...	...	0.03	...	...	...	0.05	...	...	0.01	...	99.85 <sup>4</sup>
1090	1954	USA	0.07	0.07	0.02	0.01	0.01	...	...	0.03	0.01	...	...	...	0.03	...	...	...	0.05	...	...	0.01	...	99.90 <sup>4</sup>
1098	1972	GERMANY	0.010	0.006	0.003	...	...	...	...	0.015	0.003	...	...	...	...	...	...	...	...	...	...	0.003	...	99.98 <sup>5</sup>

**REGISTERED COMPOSITIONS**

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al Minimum	
No. <sup>17</sup>	Date	By																			Each	Total <sup>3</sup>		
1100	1954	USA	...	...	0.05-0.20	0.05	...	...	...	0.10	...	...	...	...	...	...	...	...	...	...	0.95 Si+Fe <sup>6</sup>	0.05	0.15	99.00 <sup>4</sup>
1100A	2005	JAPAN	...	...	0.05-0.20	0.05	0.10	...	...	0.10	0.10	...	...	...	...	...	...	...	...	...	1.00 Si+Fe	0.05	0.15	99.00 <sup>4</sup>
1200	1966	USA	...	...	0.05	0.05	...	...	...	0.10	0.05	...	...	...	...	...	...	...	...	...	1.00 Si+Fe <sup>6</sup>	0.05	0.15	99.00 <sup>4</sup>
1200A	1991	NORWAY	...	...	0.10	0.30	0.30	0.10	...	0.10	...	...	...	...	...	...	...	...	...	...	1.00 Si+Fe	0.05	0.15	99.00 <sup>4</sup>
1300 <sup>15</sup>	2000	FRANCE	0.20	0.30	0.05	0.03	0.03	...	...	0.20-0.50	0.03	...	...	...	...	...	...	...	...	...	...	0.05	0.15	99.00 <sup>4</sup>
1110	1987	FRANCE	0.30	0.8	0.04	0.01	0.25	0.01	...	...	...	...	0.02	...	...	...	...	...	...	...	0.03 V+Ti	0.03	...	99.10 <sup>4</sup>
1120	1982	AUSTRALIA	0.10	0.40	0.05-0.35	0.01	0.20	0.01	...	0.05	...	...	0.05	...	0.03	...	...	...	...	...	0.02 V+Ti	0.03	0.10	99.20 <sup>4</sup>
1230 <sup>15</sup>	1954	USA	...	...	0.10	0.05	0.05	...	...	0.10	0.03	...	...	...	...	...	...	...	0.05	...	0.70 Si+Fe	0.03	...	99.30 <sup>4</sup>
1230A	2005	JAPAN	...	...	0.10	0.05	0.05	...	...	0.05	...	...	...	...	...	...	...	...	...	...	0.70 Si+Fe	0.03	...	99.30 <sup>4</sup>
1235	1954	USA	...	...	0.05	0.05	0.05	...	...	0.10	0.06	...	...	...	...	...	...	...	0.05	...	0.65 Si+Fe	0.03	...	99.35 <sup>4</sup>
1435	1958	USA	0.15	0.30-0.50	0.02	0.05	0.05	...	...	0.10	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.35 <sup>4</sup>
1145	1954	USA	...	...	0.05	0.05	0.05	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	0.55 Si+Fe	0.03	...	99.45 <sup>4</sup>
1345	1956	USA	0.30	0.40	0.10	0.05	0.05	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.45 <sup>4</sup>
1445	1973	AUSTRALIA	...	...	0.04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.50 Si+Fe+Cu	...	0.05	99.45 <sup>4</sup>
1150	1973	AUSTRALIA	...	...	0.05-0.20	0.05	0.05	...	...	0.05	0.03	...	...	...	...	...	...	...	...	...	0.45 Si+Fe	0.03	...	99.50 <sup>4</sup>
1350 <sup>11</sup>	1975	USA	0.10	0.40	0.05	0.01	...	0.01	...	0.05	...	...	0.05	...	0.03	...	...	...	...	...	0.02 V+Ti	0.03	0.10	99.50 <sup>4</sup>
1350A	1979	GERMANY	0.25	0.40	0.02	...	0.05	...	...	0.05	...	...	...	...	...	...	...	...	...	...	0.03 Cr+Mn+Ti+V	0.03	...	99.50 <sup>4</sup>
1450	1990	EAA	0.25	0.40	0.05	0.05	0.05	...	...	0.07	0.10-0.20	...	...	...	...	...	...	...	...	...	6	0.03	...	99.50 <sup>4</sup>
1370	1976	FRANCE	0.10	0.25	0.02	0.01	0.02	0.01	...	0.04	...	...	0.02	...	0.03	...	...	...	...	...	0.02 V+Ti	0.02	0.10	99.70 <sup>4</sup>

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al	
No. <sup>17</sup>	Date	By																			Each	Total <sup>19</sup>		Minimum
1275	1986	SPAIN	0.08	0.12	0.05-0.10	0.02	0.02	...	...	0.03	0.02	...	...	...	0.03	...	...	...	0.03	...	...	0.01	...	99.75 <sup>4</sup>
1185	1954	USA	...	...	0.01	0.02	0.02	...	...	0.03	0.02	...	...	...	0.03	...	...	...	0.05	...	0.15 Si+Fe	0.01	...	99.85 <sup>4</sup>
1285	1954	USA	0.08	0.08	0.02	0.01	0.01	...	...	0.03	0.02	...	...	...	0.03	...	...	...	0.05	...	0.14 Si+Fe	0.01	...	99.85 <sup>4</sup>
1385	1987	FRANCE	0.05	0.12	0.02	0.01	0.02	0.01	...	0.03	...	...	0.02	...	0.03	...	...	...	...	...	0.03 V+Ti	0.01	...	99.85 <sup>4</sup>
1188	1954	USA	0.06	0.06	0.005	0.01	0.01	...	...	0.03	0.01	...	...	...	0.03	...	...	...	0.05	...	<sup>6</sup>	0.01	...	99.88 <sup>4</sup>
1190	1987	FRANCE	0.05	0.07	0.01	0.01	0.01	0.01	...	0.02	...	...	0.01	...	0.02	...	...	...	...	...	0.01 V+Ti	0.01	...	99.90 <sup>4</sup>
1290	2005	JAPAN	0.050	0.030	0.050	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.01	...	99.90 <sup>5</sup>
1193	1964	USA	0.04	0.04	0.006	0.01	0.01	...	...	0.03	0.01	...	...	...	0.03	...	...	...	0.05	...	...	0.01	...	99.93 <sup>4</sup>
1198	1990	FRANCE	0.010	0.006	0.006	0.006	...	...	...	0.010	0.006	...	...	...	0.006	...	...	...	...	...	...	0.003	...	99.98 <sup>5</sup>
1199	1956	USA	0.006	0.006	0.006	0.002	0.006	...	...	0.006	0.002	...	...	...	0.005	...	...	...	0.005	...	...	0.002	...	99.99 <sup>5</sup>
2001	1979	FRANCE	0.20	0.20	5.2-6.0	0.15-0.50	0.20-0.45	0.10	0.05	0.10	0.20	...	...	...	...	...	0.003	...	...	0.05	...	0.05	0.15	Rem.
2002	1975	FRANCE	0.35-0.8	0.30	1.5-2.5	0.20	0.50-1.0	0.20	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2004	1980	UK	0.20	0.20	5.5-6.5	0.10	0.50	...	...	0.10	0.05	...	...	...	...	...	...	...	...	0.30-0.50	...	0.05	0.15	Rem.
2005	1983	ARGENTINA	0.8	0.7	3.5-5.0	1.0	0.20-1.0	0.10	0.20	0.50	0.20	...	...	0.20	...	...	...	1.0-2.0	...	...	...	0.05	0.15	Rem.
2006	1983	ARGENTINA	0.8-1.3	0.7	1.0-2.0	0.6-1.0	0.50-1.4	...	0.20	0.20	0.30	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2007	1979	GERMANY	0.8	0.8	3.3-4.6	0.50-1.0	0.40-1.8	0.10	0.20	0.8	0.20	...	...	0.20	...	...	...	0.8-1.5	0.20	...	...	0.10	0.30	Rem.
2007A	2001	ITALY	0.8	0.8	3.3-4.6	0.20-1.0	0.40-1.8	0.10	0.20	0.8	0.20	...	...	0.20	...	...	...	0.05	0.8-1.5	...	...	0.10	0.30	Rem.
2007B	2006	SLOVENIA	0.8	0.7	3.3-4.6	0.50-1.0	0.40-1.8	0.10	0.10	0.8	0.20	...	...	0.10	...	...	...	0.10	0.40-1.9	...	...	0.05	0.15	Rem.
2008	1987	USA	0.50-0.8	0.40	0.7-1.1	0.30	0.25-0.50	0.10	...	0.25	0.10	...	...	...	...	...	...	...	0.05	...	...	0.05	0.15	Rem.
2009	1990	USA	0.25	0.05	3.2-4.4	...	1.0-1.6	...	...	0.10	...	...	...	...	...	...	...	...	...	...	0.6 O	0.05	0.15	Rem.
2010	1990	USA	0.50	0.50	0.7-1.3	0.10-0.40	0.40-1.0	0.15	...	0.30	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2011	1954	USA	0.40	0.7	5.0-6.0	...	...	...	...	0.30	...	...	...	0.20-0.6	...	...	0.20-0.6	...	...	...	...	0.05	0.15	Rem.
2011A	1982	SWITZERLAND	0.40	0.50	4.5-6.0	...	...	...	...	0.30	...	...	...	0.20-0.6	...	...	0.20-0.6	...	...	...	...	0.05	0.15	Rem.
2111	1993	USA	0.40	0.7	5.0-6.0	...	...	...	...	0.30	...	...	...	0.20-0.8	...	...	...	0.10-0.50	...	...	...	0.05	0.15	Rem.
2111A	2001	ITALY	0.40	0.7	5.0-6.0	0.15	0.15	...	...	0.30	0.05	...	...	0.20-0.6	...	...	0.05	0.20-0.6	...	...	...	0.05	0.15	Rem.
2111B	2001	SWITZERLAND	0.30	0.50	4.6-6.0	0.05	0.05	...	...	...	...	...	...	0.30-0.6	...	...	...	0.30-0.7	...	...	...	0.05	0.15	Rem.
2012	1993	USA	0.40	0.7	4.0-5.5	...	...	...	...	0.30	...	...	...	0.20-0.7	...	...	...	0.20-0.6	...	...	...	0.05	0.15	Rem.
2013	2003	JAPAN	0.6-1.0	0.40	1.5-2.0	0.25	0.8-1.2	0.04-0.35	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2014	1954	USA	0.50-1.2	0.7	3.9-5.0	0.40-1.2	0.20-0.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2014A	1976	AECMA	0.50-0.9	0.50	3.9-5.0	0.40-1.2	0.20-0.8	0.10	0.10	0.25	0.15	...	...	...	...	...	...	...	...	...	0.20 Zr+Ti	0.05	0.15	Rem.
2214	1954	USA	0.50-1.2	0.30	3.9-5.0	0.40-1.2	0.20-0.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2015	2003	SWITZERLAND	0.8	0.8	3.9-5.2	0.30-1.0	0.30-1.3	0.15	0.20	0.7	0.20	...	...	0.40	...	...	0.20	0.7-1.5	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																			Each	Total <sup>15</sup>		Minimum
2016	2003	GERMANY	0.30-0.7	0.15	3.5-4.5	0.10-0.50	0.30-0.8	...	...	...	0.05-0.15	0.30-0.7	...	...	...	...	...	...	...	0.10-0.25	...	0.05	0.15	Rem.
2017	1954	USA	0.20-0.8	0.7	3.5-4.5	0.40-1.0	0.40-0.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	7	0.05	0.15	Rem.
2017A	1972	EAA	0.20-0.8	0.7	3.5-4.5	0.40-1.0	0.40-1.0	0.10	...	0.25	...	...	...	...	...	...	...	...	...	...	0.25 Zr+Ti	0.05	0.15	Rem.
2117	1954	USA	0.8	0.7	2.2-3.0	0.20	0.20-0.50	0.10	...	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2018	1954	USA	0.9	1.0	3.5-4.5	0.20	0.45-0.9	0.10	1.7-2.3	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2218	1954	USA	0.9	1.0	3.5-4.5	0.20	1.2-1.8	0.10	1.7-2.3	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2618	1954	USA	0.10-0.25	0.9-1.3	1.9-2.7	...	1.3-1.8	...	0.9-1.2	0.10	0.04-0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2618A	1972	EAA	0.15-0.25	0.9-1.4	1.8-2.7	0.25	1.2-1.8	...	0.8-1.4	0.15	0.20	...	...	...	...	...	...	...	...	...	0.25 Zr+Ti	0.05	0.15	Rem.
2219 <sup>8</sup>	1954	USA	0.20	0.30	5.8-6.8	0.20-0.40	0.02	...	...	0.10	0.02-0.10	...	...	...	...	...	...	...	0.05-0.15	0.10-0.25	...	0.05	0.15	Rem.
2319	1958	USA	0.20	0.30	5.8-6.8	0.20-0.40	0.02	...	...	0.10	0.10-0.20	...	...	...	...	...	...	...	0.05-0.15	0.10-0.25	6	0.05	0.15	Rem.
2419	1972	USA	0.15	0.18	5.8-6.8	0.20-0.40	0.02	...	...	0.10	0.02-0.10	...	...	...	...	...	...	...	0.05-0.15	0.10-0.25	...	0.05	0.15	Rem.
2519	1985	USA	0.25	0.30	5.3-6.4	0.10-0.50	0.05-0.40	...	...	0.10	0.02-0.10	...	...	...	...	...	...	...	0.05-0.15	0.10-0.25	0.40 Si+Fe	0.05	0.15	Rem.
2021	1981	UK	0.20	0.30	5.8-6.8	0.20-0.40	0.02	...	...	0.10	0.02-0.10	...	...	...	...	...	...	0.03-0.08	0.05-0.15	0.10-0.25	0.05-0.20 Cd	0.05	0.15	Rem.
2022	2004	FRANCE	0.15	0.20	4.5-5.5	0.15-0.50	0.10-0.45	0.05	...	0.05-0.30	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
+ 2122	2015	USA	0.10	0.15	4.5-5.4	0.15-0.50	0.10-0.6	0.05	...	0.15	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2023	2004	FRANCE	0.10	0.15	3.6-4.5	0.30	1.0-1.6	0.10	...	...	0.05	...	...	...	...	...	...	...	...	0.05-0.15	0.01-0.06 Sc	0.05	0.15	Rem.
2024	1954	USA	0.50	0.50	3.8-4.9	0.30-0.9	1.2-1.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	7	0.05	0.15	Rem.
2024A	1996	FRANCE	0.15	0.20	3.7-4.5	0.15-0.8	1.2-1.5	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2124	1970	USA	0.20	0.30	3.8-4.9	0.30-0.9	1.2-1.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
+ 2124A	2015	USA	0.20	0.30	3.8-4.9	0.30-0.9	1.2-1.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	0.6 O	0.05	0.15	Rem.
2224	1978	USA	0.12	0.15	3.8-4.4	0.30-0.9	1.2-1.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2224A	1997	RUSSIA	0.10	0.15	3.8-4.5	0.40-0.8	1.2-1.6	...	0.05	0.10	0.01-0.07	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2324	1978	USA	0.10	0.12	3.8-4.4	0.30-0.9	1.2-1.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2424	1994	USA	0.10	0.12	3.8-4.4	0.30-0.6	1.2-1.6	...	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2524	1995	USA	0.06	0.12	4.0-4.5	0.45-0.7	1.2-1.6	0.05	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2624	2009	USA	0.08	0.08	3.8-4.3	0.45-0.7	1.2-1.6	0.05	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2724	2010	USA	0.15	0.20	3.8-4.9	0.30-0.9	1.2-1.8	...	...	0.25	0.06	...	...	...	...	...	...	...	...	0.08-0.14	...	0.05	0.15	Rem.
2824	2014	USA	0.08	0.11	3.7-4.3	0.50-0.9	1.1-1.6	0.05	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2025	1954	USA	0.50-1.2	1.0	3.9-5.0	0.40-1.2	0.05	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2026	1999	USA	0.05	0.07	3.6-4.3	0.30-0.8	1.0-1.6	...	...	0.10	0.06	...	...	...	...	...	...	...	...	0.05-0.25	...	0.05	0.15	Rem.
2027	2001	FRANCE	0.12	0.15	3.9-4.9	0.50-1.2	1.0-1.5	...	...	0.20	0.08	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
2028	2005	GERMANY	0.8	0.8	3.3-4.6	0.50-1.0	0.40-1.8	0.10	0.20	0.8	0.20	...	...	0.10-1.0	...	...	1.0	0.10-1.0	...	...	...	0.10	0.30	Rem.
2028A	2006	SLOVENIA	0.8	0.7	3.3-4.5	0.20-1.0	0.50-1.3	0.10	0.10	0.50	0.20	...	...	0.50-0.7	...	...	0.20-0.40	...	...	...	...	0.05	0.15	Rem.
2028B	2006	SLOVENIA	0.8	0.8	3.3-4.6	0.50-1.0	0.40-1.8	0.10	0.10	0.8	0.20	...	...	0.50-0.7	...	...	0.20-0.40	...	...	...	...	0.05	0.15	Rem.
2028C	2006	BELGIUM	0.8	0.7	3.3-5.0	0.20-1.0	0.50-1.3	0.10	...	0.50	0.20	...	...	0.40-1.0	...	...	0.05	0.20-1.0	...	...	...	0.10	0.30	Rem.
2029	2013	USA	0.12	0.15	3.2-4.0	0.20-0.40	0.8-1.1	...	...	...	0.10	0.30-0.50	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
2030	1972	EAA	0.8	0.7	3.3-4.5	0.20-1.0	0.50-1.3	0.10	...	0.50	0.20	...	...	0.20	...	...	0.8-1.5	...	...	...	...	0.10	0.30	Rem.
2031	1974	UK	0.50-1.3	0.6-1.2	1.8-2.8	0.50	0.6-1.2	...	0.6-1.4	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al	
No. <sup>17</sup>	Date	By																			Each	Total <sup>13</sup>		Minimum
2032	2005	JAPAN	0.50-1.3	0.6-1.5	1.5-2.5	0.20	1.2-1.8	...	0.6-1.4	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
+ 2033	2017	ITALY	0.10-1.2	0.7	2.2-2.7	0.40-1.0	0.20-0.6	0.15	0.15	0.50	0.10	...	...	0.05-0.8	...	...	...	...	...	...	...	0.05	0.15	Rem.
2034	1983	USA	0.10	0.12	4.2-4.8	0.8-1.3	1.3-1.9	0.05	...	0.20	0.15	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
2036	1970	USA	0.50	0.50	2.2-3.0	0.10-0.40	0.30-0.6	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2037	1977	USA	0.50	0.50	1.4-2.2	0.10-0.40	0.30-0.8	0.10	...	0.25	0.15	...	...	...	...	...	...	...	0.05	...	...	0.05	0.15	Rem.
2038	1980	USA	0.50-1.3	0.6	0.8-1.8	0.10-0.40	0.40-1.0	0.20	...	0.50	0.15	...	...	...	0.05	...	...	...	0.05	...	...	0.05	0.15	Rem.
2039	1999	SWITZERLAND	0.20	0.30	4.5-5.5	0.20-0.50	0.40-0.8	...	...	...	0.15	0.05-0.50	...	...	...	...	...	...	...	0.10-0.25	...	0.05	0.15	Rem.
2139	2004	FRANCE	0.10	0.15	4.5-5.5	0.20-0.6	0.20-0.8	0.05	...	0.25	0.15	0.15-0.6	...	...	...	...	...	...	0.05	...	...	0.05	0.15	Rem.
2040	2003	USA	0.08	0.10	4.8-5.4	0.45-0.8	0.7-1.1	...	...	0.25	0.06	0.40-0.7	...	...	...	...	...	...	...	0.08-0.15	0.0001 Be	0.05	0.15	Rem.
2041	2006	SLOVENIA	0.40	0.7	5.0-6.0	...	...	...	...	0.30	...	...	...	0.50-0.7	...	...	0.05	0.50-0.7	...	...	...	0.05	0.15	Rem.
+ 2042	2015	FRANCE	0.10	0.15	4.5-5.5	0.15-0.50	0.10-0.45	0.05	...	0.15	0.10	...	...	...	...	...	...	...	...	0.08-0.16	...	0.05	0.15	Rem.
+ 2043	2017	USA	0.08	0.10	2.5-3.1	0.30	0.10-0.6	...	...	0.30	0.10	0.10	...	...	...	1.4-1.9	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
2044	2006	SLOVENIA	0.8	0.7	3.3-4.5	0.20-1.0	0.50-1.3	0.10	0.10	0.50	0.20	...	...	0.20-0.40	...	...	0.05	0.9-1.3	...	...	...	0.05	0.15	Rem.
2045	2006	SLOVENIA	0.8	0.8	3.3-4.6	0.50-1.0	0.40-1.8	0.10	0.10	0.8	0.20	...	...	0.20-0.40	...	...	0.05	0.9-1.3	...	...	...	0.05	0.15	Rem.
2050	2004	USA	0.08	0.10	3.2-3.9	0.20-0.50	0.20-0.6	0.05	0.05	0.25	0.10	0.20-0.7	...	...	0.05	0.7-1.3	...	...	0.05	0.06-0.14	...	0.05	0.15	Rem.
2055	2011	USA	0.07	0.10	3.2-4.2	0.10-0.50	0.20-0.6	...	...	0.30-0.7	0.10	0.20-0.7	...	...	...	1.0-1.3	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
2056	2003	FRANCE	0.10	0.12	3.3-4.3	0.10-0.50	0.6-1.4	...	...	0.40-0.8	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2060	2011	USA	0.07	0.07	3.4-4.5	0.10-0.50	0.6-1.1	...	...	0.30-0.50	0.10	0.05-0.50	...	...	...	0.6-0.9	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
2065	2012	FRANCE	0.10	0.10	3.8-4.7	0.15-0.50	0.25-0.8	...	...	0.30	0.10	0.15-0.50	...	...	...	0.8-1.5	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
2070	2013	USA	0.12	0.15	2.9-3.8	0.10-0.50	0.05-0.40	...	...	0.10-0.50	0.10	...	...	...	...	1.0-1.4	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
+ 2071	2016	USA	0.12	0.15	3.7-4.5	0.10-0.50	0.7-1.4	...	...	0.10-0.6	0.10	0.15	...	...	...	0.8-1.4	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
+ 2073	2018	USA	0.12	0.15	3.0-4.0	0.10-0.50	0.7-1.4	...	...	0.10-0.6	0.10	0.15	...	...	...	1.0-1.7	...	...	...	0.07	...	0.05	0.15	Rem.
+ 2074	2016	USA	0.10	0.10	2.6-3.3	0.10-0.50	0.30-0.7	...	...	0.20	0.10	0.05-0.30	...	...	...	0.6-0.9	...	...	...	...	...	0.05	0.15	Rem.
+ 2075	2014	USA	0.10	0.10	4.1-4.6	0.10	0.30-0.8	0.05	0.05	0.20	0.05	0.10-0.30	...	...	...	0.7-1.1	...	...	...	0.08-0.16	...	0.05	0.15	Rem.
2076	2012	France	0.10	0.10	2.0-2.7	0.15-0.50	0.20-0.8	...	...	0.30	0.10	0.15-0.40	...	...	...	1.2-1.8	...	...	...	0.05-0.16	...	0.05	0.15	Rem.
+ 2081	2018	USA	0.12	0.15	3.0-4.0	0.10-0.50	0.40-1.0	...	...	0.10-0.6	0.10	0.15	...	...	...	0.50-1.0	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
+ 2085	2014	USA	0.10	0.10	2.2-2.7	0.10	0.30-0.8	0.05	0.05	0.20	0.10	0.10-0.40	...	...	...	1.3-1.9	...	...	...	0.08-0.16	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																			Each	Total <sup>13</sup>		Minimum
2090	1984	USA	0.10	0.12	2.4-3.0	0.05	0.25	0.05	...	0.10	0.15	...	...	...	...	1.9-2.6	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
2091	1985	FRANCE	0.20	0.30	1.8-2.5	0.10	1.1-1.9	0.10	...	0.25	0.10	...	...	...	...	1.7-2.3	...	...	...	0.04-0.16	...	0.05	0.15	Rem.
2094	1990	USA	0.12	0.15	4.4-5.2	0.25	0.25-0.8	...	...	0.25	0.10	0.25-0.6	...	...	...	0.7-1.4	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
2095	1990	USA	0.12	0.15	3.9-4.6	0.25	0.25-0.8	...	...	0.25	0.10	0.25-0.6	...	...	...	0.7-1.5	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
2195	1992	USA	0.12	0.15	3.7-4.3	0.25	0.25-0.8	...	...	0.25	0.10	0.25-0.6	...	...	...	0.8-1.2	...	...	...	0.08-0.16	...	0.05	0.15	Rem.
2295	2013	USA	0.08	0.08	3.9-4.5	0.10	0.25-0.8	...	...	0.25	0.10	0.10-0.50	...	...	...	0.9-1.3	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
+ 2395	2014	USA	0.08	0.10	3.6-4.3	0.35	0.25-0.8	...	...	0.25	0.10	0.10-0.45	...	...	...	0.9-1.4	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
2196	2000	USA	0.12	0.15	2.5-3.3	0.35	0.25-0.8	...	...	0.35	0.10	0.25-0.6	...	...	...	1.4-2.1	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
2296	2010	FRANCE	0.12	0.15	2.1-2.8	0.05-0.50	0.20-0.8	...	...	0.25	0.10	0.25-0.6	...	...	...	1.3-1.9	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
2097	1993	USA	0.12	0.15	2.5-3.1	0.10-0.6	0.35	...	...	0.35	0.15	...	...	...	...	1.2-1.8	...	...	...	0.08-0.16	...	0.05	0.15	Rem.
2197	1993	USA	0.10	0.10	2.5-3.1	0.10-0.50	0.25	...	...	0.05	0.12	...	...	...	...	1.3-1.7	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
2297	1997	USA	0.10	0.10	2.5-3.1	0.10-0.50	0.25	...	...	0.05	0.12	...	...	...	...	1.1-1.7	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
2397	2002	USA	0.10	0.10	2.5-3.1	0.10-0.50	0.25	...	...	0.05-0.15	0.12	...	...	...	...	1.1-1.7	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
2098	2000	USA	0.12	0.15	3.2-3.8	0.35	0.25-0.8	...	...	0.35	0.10	0.25-0.6	...	...	...	0.8-1.3	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
2198	2005	USA	0.08	0.10	2.9-3.5	0.50	0.25-0.8	0.05	...	0.35	0.10	0.10-0.50	...	...	...	0.8-1.1	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
2099	2003	USA	0.05	0.07	2.4-3.0	0.10-0.50	0.10-0.50	...	...	0.40-1.0	0.10	...	...	...	...	1.6-2.0	...	...	...	0.05-0.12	0.0001 Be	0.05	0.15	Rem.
2199	2005	USA	0.05	0.07	2.3-2.9	0.10-0.50	0.05-0.40	...	...	0.20-0.9	0.10	...	...	...	...	1.4-1.8	...	...	...	0.05-0.12	0.0001 Be	0.05	0.12	Rem.
+ 3001	2016	KOREA	0.01-0.20	0.05-0.50	0.15-0.45	0.6-1.2	...	...	...	...	0.01-0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3002	1961	USA	0.08	0.10	0.15	0.05-0.25	0.05-0.20	...	...	0.05	0.03	...	...	...	...	...	...	0.05	...	...	...	0.03	0.10	Rem.
3102	1972	USA	0.40	0.7	0.10	0.05-0.40	...	...	...	0.30	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3003	1954	USA	0.6	0.7	0.05-0.20	1.0-1.5	...	...	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3103	1972	EAA	0.50	0.7	0.10	0.9-1.5	0.30	0.10	...	0.20	...	...	...	...	...	...	...	...	...	...	0.10 Zr+Ti <sup>6</sup>	0.05	0.15	Rem.
3103A	1991	NORWAY	0.50	0.7	0.10	0.7-1.4	0.30	0.10	...	0.20	...	...	...	...	...	...	...	...	...	...	0.10 Zr+Ti	0.05	0.15	Rem.
3103B	2002	USA	0.50-1.3	0.8	0.50	0.7-1.3	0.50	...	...	0.50	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3203	1973	AUSTRALIA	0.6	0.7	0.05	1.0-1.5	...	...	...	0.10	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
3403	2001	USA	1.3	0.8	0.50	0.8-1.5	0.6	0.10	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3004	1954	USA	0.30	0.7	0.25	1.0-1.5	0.8-1.3	...	...	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3004A	1985	AUSTRALIA	0.40	0.7	0.25	0.8-1.5	0.8-1.5	0.10	...	0.25	0.05	...	...	...	...	...	0.03	...	...	...	...	0.05	0.15	Rem.
3104	1978	USA	0.6	0.8	0.05-0.25	0.8-1.4	0.8-1.3	...	...	0.25	0.10	...	...	...	0.05	...	...	...	0.05	...	...	0.05	0.15	Rem.
3204	1991	USA	0.30	0.7	0.10-0.25	0.8-1.5	0.8-1.5	...	...	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3304	2001	USA	0.7	0.8	0.6	0.8-1.4	0.8-1.4	0.10	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3005	1954	USA	0.6	0.7	0.30	1.0-1.5	0.20-0.6	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3005A	1997	NORWAY	0.7	0.8	0.30	1.0-1.5	0.20-0.6	0.10	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3105	1960	USA	0.6	0.7	0.30	0.30-0.8	0.20-0.8	0.20	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3105A	1990	FRANCE	0.6	0.7	0.30	0.30-0.8	0.20-0.8	0.20	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3105B	1997	NORWAY	0.7	0.9	0.30	0.30-0.9	0.20-0.8	0.20	...	0.50	0.10	...	...	...	...	...	0.10	...	...	...	...	0.05	0.15	Rem.
3007	1976	USA	0.50	0.7	0.05-0.30	0.30-0.8	0.6	0.20	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.



**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI		
No. <sup>17</sup>	Date	By																			Each	Total <sup>13</sup>		Minimum	
3107	1977	SPAIN	0.6	0.7	0.05-0.15	0.40-0.9	...	...	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3207	1979	GERMANY	0.30	0.45	0.10	0.40-0.8	0.10	...	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.10	Rem.	
3207A	1990	NORWAY	0.35	0.6	0.25	0.30-0.8	0.40	0.20	...	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3307	1986	USA	0.6	0.8	0.30	0.50-0.9	0.30	0.20	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3009	1978	GERMANY	1.0-1.8	0.7	0.10	1.2-1.8	0.10	0.05	0.05	0.05	0.10	...	...	...	...	...	...	...	...	0.10	...	0.05	0.15	Rem.	
3010	1978	USA	0.10	0.20	0.03	0.20-0.9	...	0.05-0.40	...	0.05	0.05	...	...	...	...	...	...	...	0.05	...	...	0.03	0.10	Rem.	
3110	2004	USA	0.25	0.05-0.35	0.05	0.30-0.7	0.05	0.05-0.25	...	0.05	0.05-0.30	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3011	1978	USA	0.40	0.7	0.05-0.20	0.8-1.2	...	0.10-0.40	...	0.10	0.10	...	...	...	...	...	...	...	...	0.10-0.30	...	0.05	0.15	Rem.	
3012	1983	ARGENTINA	0.6	0.7	0.10	0.50-1.1	0.10	0.20	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3012A	2006	CANADA	0.30	0.20	0.05	0.7-1.2	0.05	0.05	0.05	0.05	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3013	1983	ARGENTINA	0.6	1.0	0.50	0.9-1.4	0.20-0.6	...	...	0.50-1.0	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3014	1993	ARGENTINA	0.6	1.0	0.50	1.0-1.5	0.10	...	...	0.50-1.0	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3015	1986	USA	0.6	0.8	0.30	0.50-0.9	0.20-0.7	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3016	1986	USA	0.6	0.8	0.30	0.50-0.9	0.50-0.8	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3017	1989	NETHERLANDS	0.25	0.25-0.45	0.25-0.40	0.8-1.2	0.10	0.15	...	0.10	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3019	2000	ROMANIA	0.6	0.7	0.9	0.30-0.9	0.20-0.9	0.20	0.10	0.20-0.9	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3020	1998	USA	0.50	0.6	0.10	0.6-1.2	0.20	0.20	...	0.05-0.50	0.05-0.25	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3021	2012	JAPAN	0.50	0.7	0.20-0.6	0.05-0.8	0.10	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3025	1997	USA	0.6	0.50-0.9	0.30	0.40-1.0	0.20-0.8	0.20	0.05	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3026	2003	USA	0.25	0.10-0.40	0.05	0.40-0.9	0.10	0.05	...	0.05-0.30	0.05-0.30	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3030	1996	USA	0.15	0.35	0.10	0.10-0.7	0.05	0.05	...	0.05-0.50	0.05-0.35	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3130	2002	USA	0.15	0.20	0.05	0.10-0.40	0.05	...	...	0.05-0.30	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
3065	2008	USA	0.30	0.30	0.40-0.8	0.6-0.9	0.25	...	0.05	0.05	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
4004 <sup>15</sup>	1971	USA	9.0-10.5	0.8	0.25	0.10	1.0-2.0	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
4104	1974	USA	9.0-10.5	0.8	0.25	0.10	1.0-2.0	...	...	0.20	...	...	...	0.02-0.20	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4006	1977	FRANCE	0.8-1.2	0.50-0.8	0.10	0.05	0.01	0.20	...	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
4007	1978	FRANCE	1.0-1.7	0.40-1.0	0.20	0.8-1.5	0.20	0.05-0.25	0.15-0.7	0.10	0.10	...	...	...	...	...	...	...	...	0.05 Co	...	0.05	0.15	Rem.	
4008	1985	USA	6.5-7.5	0.09	0.05	0.05	0.30-0.45	...	...	0.05	0.04-0.15	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.	
4009	1987	USA	4.5-5.5	0.20	1.0-1.5	0.10	0.45-0.6	...	...	0.10	0.20	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.	
4010	1988	USA	6.5-7.5	0.20	0.20	0.10	0.30-0.45	...	...	0.10	0.20	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.	

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al		
No. <sup>17</sup>	Date	By																			Each	Total <sup>15</sup>		Minimum	
4013	1988	USA	3.5-4.5	0.35	0.05-0.20	0.03	0.05-0.20	...	...	0.05	0.02	...	...	0.6-1.5	...	...	...	...	...	...	...	0.05 Cd	0.05	0.15	Rem.
4014	1989	NORWAY	1.4-2.2	0.7	0.20	0.35	0.30-0.8	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4015	1989	NORWAY	1.4-2.2	0.7	0.20	0.6-1.2	0.10-0.50	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4015A	2007	USA	1.4-2.2	0.7	0.35	0.6-1.2	0.10-0.50	0.05	...	0.20	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4115	2006	SWEDEN	1.8-2.2	0.7	0.10-0.50	0.6-1.2	0.10-0.50	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4016	1993	NORWAY	1.4-2.2	0.7	0.20	0.6-1.2	0.10	...	...	0.50-1.3	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4017	1995	NORWAY	0.6-1.6	0.7	0.10-0.50	0.6-1.2	0.10-0.50	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4018	1995	GERMANY	6.5-7.5	0.20	0.05	0.10	0.50-0.8	...	...	0.10	0.20	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4019	1999	UK	18.5-21.5	4.6-5.4	...	...	...	...	1.8-2.2	...	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4020	2005	AUSTRIA	2.5-3.5	0.20	0.03	0.8-1.2	0.01	0.01	...	...	0.005	...	0.005	...	...	...	...	...	...	0.01	...	0.005 Na, 0.005 P <sup>6</sup>	0.02	0.10	Rem.
4021	2011	USA	3.3-4.3	0.20-0.50	0.15	0.40-0.7	0.6-1.1	0.15	...	0.25	0.10	...	...	...	...	...	0.03	...	...	...	...	...	0.05	0.15	Rem.
+ 4025	2017	USA	1.2-2.2	0.7	0.30-0.7	0.6-1.2	0.10-0.50	...	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4026	2001	USA	9.0-11.5	0.50	2.5-3.5	...	0.7-1.4	...	...	0.10	0.05	...	...	1.0-2.0	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4032	1954	USA	11.0-13.5	1.0	0.50-1.3	...	0.8-1.3	0.10	0.50-1.3	0.25	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4043	1954	USA	4.5-6.0	0.8	0.30	0.05	0.05	...	...	0.10	0.20	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4043A	1976	EAA	4.5-6.0	0.6	0.30	0.15	0.20	...	...	0.10	0.15	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4143	2010	USA	4.7-6.0	0.8	0.30	0.05	0.15-0.30	...	...	0.10	0.20	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4343	1954	USA	6.8-8.2	0.8	0.25	0.10	...	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4643	1963	USA	3.6-4.6	0.8	0.10	0.05	0.10-0.30	...	...	0.10	0.15	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4943	2011	USA	5.0-6.0	0.40	0.10	0.05	0.10-0.50	...	...	0.10	0.15	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4044 <sup>15</sup>	1969	USA	7.8-9.2	0.8	0.25	0.10	...	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4045	1964	USA	9.0-11.0	0.8	0.30	0.05	0.05	...	...	0.10	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4145	1957	USA	9.3-10.7	0.8	3.3-4.7	0.15	0.15	0.15	...	0.20	...	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4145A	1976	UK	9.0-11.0	0.6	3.0-5.0	0.15	0.10	...	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4046	1990	EAA	9.0-11.0	0.50	0.03	0.40	0.20-0.50	...	...	0.10	0.15	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4047	1964	USA	11.0-13.0	0.8	0.30	0.15	0.10	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4047A	1976	EAA	11.0-13.0	0.6	0.30	0.15	0.10	...	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
4147	1989	USA	11.0-13.0	0.8	0.25	0.10	0.10-0.50	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
+ 4060	2017	USA	4.0-5.0	0.20-0.40	0.05-0.35	0.05-0.25	0.20-0.50	0.05-0.25	...	0.10	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5005	1954	USA	0.30	0.7	0.20	0.20	0.50-1.1	0.10	...	0.25	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5005A	1979	GERMANY	0.30	0.45	0.05	0.15	0.7-1.1	0.10	...	0.20	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5205	1967	USA	0.15	0.7	0.03-0.10	0.10	0.6-1.0	0.10	...	0.05	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5305	1990	EAA	0.08	0.08	...	0.03	0.7-1.1	...	...	0.05	0.02	...	...	...	...	...	...	...	...	...	...	...	0.02	...	Rem.
5505	1990	EAA	0.06	0.04	...	0.03	0.8-1.1	...	...	0.04	0.01	...	...	...	...	...	...	...	...	...	...	...	0.01	...	Rem.
5605	1990	EAA	0.01	0.008	...	...	0.8-1.1	...	...	0.01	0.008	...	...	...	...	...	...	...	...	...	...	0.008 Fe+Ti	0.003	...	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI		
No. <sup>17</sup>	Date	By																			Each	Total <sup>15</sup>		Minimum	
5006	1997	USA	0.40	0.8	0.10	0.40-0.8	0.8-1.3	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
5106	2001	USA	0.40	0.7	0.30	0.40-0.7	0.8-1.2	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
5010	1961	USA	0.40	0.7	0.25	0.10-0.30	0.20-0.6	0.15	...	0.30	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
5110	1990	EAA	0.08	0.08	...	0.03	0.30-0.6	...	...	0.05	0.02	...	...	...	...	...	...	...	...	...	...	0.02	...	Rem.	
5110A	2005	JAPAN	0.15	0.25	0.20	0.20	0.20-0.6	...	...	0.03	...	...	...	...	...	...	...	...	...	...	...	0.05	0.10	Rem.	
5210	1990	EAA	0.06	0.04	...	0.03	0.35-0.6	...	...	0.04	0.01	...	...	...	...	...	...	...	...	...	...	0.01	...	Rem.	
5310	1990	EAA	0.01	0.008	...	...	0.35-0.6	...	...	0.01	0.008	...	...	...	...	...	...	...	...	...	0.008 Fe+Ti	0.003	...	Rem.	
5016	1982	USA	0.25	0.6	0.20	0.40-0.7	1.4-1.9	0.10	...	0.15	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
5017	1986	USA	0.40	0.7	0.18-0.28	0.6-0.8	1.9-2.2	...	...	...	0.09	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
5018	1992	GERMANY	0.25	0.40	0.05	0.20-0.6	2.6-3.6	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.20-0.6 Mn+Cr <sup>6</sup>	0.05	0.15	Rem.
5018A	1999	ROMANIA	0.40	0.40	0.10	0.35-0.50	3.0-3.6	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.35-0.7 Mn+Cr	0.05	0.15	Rem.
+ 5018B	2018	USA	0.25	0.40	0.10	0.40-0.7	2.9-3.6	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5019 <sup>14</sup>	1972	EAA	0.40	0.50	0.10	0.10-0.6	4.5-5.6	0.20	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.10-0.6 Mn+Cr	0.05	0.15	Rem.
5019A	1998	USA	0.20	0.35	0.15	0.20-0.50	4.4-5.4	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5119	1992	GERMANY	0.25	0.40	0.05	0.20-0.6	4.5-5.6	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.20-0.6 Mn+Cr <sup>6</sup>	0.05	0.15	Rem.
5119A	2001	EAA	0.25	0.40	0.05	0.20-0.6	4.5-5.6	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.20-0.6 Mn+Cr <sup>16</sup>	0.05	0.15	Rem.
5021	1993	NORWAY	0.40	0.50	0.15	0.10-0.50	2.2-2.8	0.15	...	0.15	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5022	1995	JAPAN	0.25	0.40	0.20-0.50	0.20	3.5-4.9	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5023	1995	JAPAN	0.25	0.40	0.20-0.50	0.20	5.0-6.2	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5024	2008	GERMANY	0.25	0.40	0.20	0.20	3.9-5.1	0.10	...	0.25	0.20	...	...	...	...	...	...	...	...	0.05-0.20	0.10-0.40Sc	0.05	0.15	Rem.	
5026	2001	GERMANY	0.55-1.4	0.20-1.0	0.10-0.8	0.6-1.8	3.9-4.9	0.30	...	1.0	0.20	...	...	...	...	...	...	...	...	0.30	...	0.05	0.15	Rem.	
5027	2002	GERMANY	0.05-0.20	0.20-0.40	0.05-0.15	0.40-0.8	4.7-5.4	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5028	2014	GERMANY	0.30	0.40	0.20	0.30-1.0	3.2-4.8	0.05-0.15	...	0.05-0.50	0.05-0.15	...	...	...	...	...	...	...	...	0.05-0.15	0.02-0.40 Sc	0.05	0.15	Rem.	
5040	1961	USA	0.30	0.7	0.25	0.9-1.4	1.0-1.5	0.10-0.30	...	0.25	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5140	2001	USA	0.7	0.6	0.6	0.7-1.3	1.1-1.5	0.10	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5041	2005	JAPAN	0.40	0.40	0.10	0.30-1.0	3.0-4.0	0.50	...	0.10	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5042	1980	USA	0.20	0.35	0.15	0.20-0.50	3.0-4.0	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5043	1982	USA	0.40	0.7	0.05-0.35	0.7-1.2	0.7-1.3	0.05	...	0.25	0.10	...	...	...	0.05	...	...	...	0.05	...	...	...	0.05	0.15	Rem.
5049	1979	EAA	0.40	0.50	0.10	0.50-1.1	1.6-2.5	0.30	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5149	1990	EAA	0.25	0.40	0.05	0.50-1.1	1.6-2.5	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5249	1990	EAA	0.25	0.40	0.05	0.50-1.1	1.6-2.5	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	0.10-0.20	...	...	0.05	0.15	Rem.
5349	1992	USA	0.40	0.7	0.18-0.28	0.6-1.2	1.7-2.6	...	...	0.20	0.09	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5449	1994	BELGIUM	0.40	0.7	0.30	0.6-1.1	1.6-2.6	0.30	...	0.30	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5449A	2010	EAA	0.6	1.2	0.30	0.6-1.1	1.6-2.6	0.30	0.10	0.30	0.10	...	...	...	...	...	...	0.10	...	...	...	...	0.05	0.15	Rem.
5050	1954	USA	0.40	0.7	0.20	0.10	1.1-1.8	0.10	...	0.25	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																			Each	Total <sup>15</sup>		Minimum
5050A	1973	AUSTRALIA	0.40	0.7	0.20	0.30	1.1-1.8	0.10	...	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5050C	2012	BRAZIL	0.25	0.6	0.50	0.20	1.2-1.8	0.10	...	0.50	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5150	1972	FRANCE	0.08	0.10	0.10	0.03	1.3-1.7	...	...	0.10	0.06	...	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
5051	1967	USA	0.40	0.7	0.25	0.20	1.7-2.2	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5051A	1983	GERMANY	0.30	0.45	0.05	0.25	1.4-2.1	0.30	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5151	1970	USA	0.20	0.35	0.15	0.10	1.5-2.1	0.10	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5251	1972	EAA	0.40	0.50	0.15	0.10-0.50	1.7-2.4	0.15	...	0.15	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5251A	1990	ARGENTINA	0.50	0.7	0.25	0.20-0.7	1.6-2.2	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5351	1978	USA	0.08	0.10	0.10	0.10	1.6-2.2	...	...	0.05	...	...	...	...	...	...	...	0.05	...	...	...	0.03	0.10	Rem.
5451	1981	USA	0.25	0.40	0.10	0.10	1.8-2.4	0.15-0.35	0.05	0.10	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5052	1954	USA	0.25	0.40	0.10	0.10	2.2-2.8	0.15-0.35	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5252	1961	USA	0.08	0.10	0.10	0.10	2.2-2.8	...	...	0.05	...	...	...	...	...	...	...	...	0.05	...	...	0.03	0.10	Rem.
5352	1971	USA	...	...	0.10	0.10	2.2-2.8	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	0.45 Si+Fe	0.05	0.15	Rem.
5154 <sup>8</sup>	1954	USA	0.25	0.40	0.10	0.10	3.1-3.9	0.15-0.35	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5154A	1972	UK	0.50	0.50	0.10	0.50	3.1-3.9	0.25	...	0.20	0.20	...	...	...	...	...	...	...	...	...	0.10-0.50 Mn+Cr <sup>6</sup>	0.05	0.15	Rem.
5154B	1978	ITALY	0.35	0.45	0.05	0.15-0.45	3.2-3.8	0.10	0.01	0.15	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5154C	2008	CHINA	0.20	0.30	0.10	0.05-0.25	3.2-3.7	0.01	...	0.01	0.01	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5254	1954	USA	...	...	0.05	0.01	3.1-3.9	0.15-0.35	...	0.20	0.05	...	...	...	...	...	...	...	...	...	0.45 Si+Fe	0.05	0.15	Rem.
5354	1990	EAA	0.25	0.40	0.05	0.50-1.0	2.4-3.0	0.05-0.20	...	0.25	0.15	...	...	...	...	...	...	...	...	0.10-0.20	...	0.05	0.15	Rem.
5454	1957	USA	0.25	0.40	0.10	0.50-1.0	2.4-3.0	0.05-0.20	...	0.25	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5554	1958	USA	0.25	0.40	0.10	0.50-1.0	2.4-3.0	0.05-0.20	...	0.25	0.05-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5654	1968	USA	...	...	0.05	0.01	3.1-3.9	0.15-0.35	...	0.20	0.05-0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5654A	2001	EAA	...	...	0.05	0.01	3.1-3.9	0.15-0.35	...	0.20	0.05-0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5754	1970	USA	0.40	0.40	0.10	0.50	2.6-3.6	0.30	...	0.20	0.15	...	...	...	...	...	...	...	...	...	0.10-0.6 Mn+Cr <sup>6</sup>	0.05	0.15	Rem.
5854 <sup>19</sup>	2009	GERMANY	0.40	0.40	0.10	0.50	2.8-3.6	0.30	...	0.20	0.15	...	...	...	...	0.0009	0.01	...	...	0.05-0.30	0.0009 Ca 0.0009 Na 0.10-0.6 Mn+Cr	0.05	0.15	Rem.
5954	1988	USA	0.25	0.40	0.10	0.10	3.3-4.1	0.10	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5056	1954	USA	0.30	0.40	0.10	0.05-0.20	4.5-5.6	0.05-0.20	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5356	1954	USA	0.25	0.40	0.10	0.05-0.20	4.5-5.5	0.05-0.20	...	0.10	0.06-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5356A	2001	EAA	0.25	0.40	0.10	0.05-0.20	4.5-5.5	0.05-0.20	...	0.10	0.06-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5456	1956	USA	0.25	0.40	0.10	0.50-1.0	4.7-5.5	0.05-0.20	...	0.25	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5456A	1992	GERMANY	0.25	0.40	0.05	0.7-1.1	4.5-5.2	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5456B	2001	EAA	0.25	0.40	0.05	0.7-1.1	4.5-5.2	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5556	1956	USA	0.25	0.40	0.10	0.50-1.0	4.7-5.5	0.05-0.20	...	0.25	0.05-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5556A	1972	UK	0.25	0.40	0.10	0.6-1.0	5.0-5.5	0.05-0.20	...	0.20	0.05-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5556B	2001	EAA	0.25	0.40	0.10	0.6-1.0	5.0-5.5	0.05-0.20	...	0.20	0.05-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5556C	2001	FRANCE	0.25	0.40	0.10	0.50-1.0	4.7-5.5	0.05-0.20	...	0.25	0.05-0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5257 <sup>8</sup>	1961	USA	0.08	0.10	0.10	0.03	0.20-0.6	...	...	0.03	...	...	...	...	...	...	...	...	...	...	...	0.02	0.05	Rem.
5457	1957	USA	0.08	0.10	0.20	0.15-0.45	0.8-1.2	...	...	0.05	...	...	...	...	...	...	...	...	0.05	...	...	0.03	0.10	Rem.
5557	1977	USA	0.10	0.12	0.15	0.10-0.40	0.40-0.8	...	...	...	...	...	...	...	...	...	...	...	0.05	...	...	0.03	0.10	Rem.
5657	1960	USA	0.08	0.10	0.10	0.03	0.6-1.0	...	...	0.05	...	...	...	...	0.03	...	...	...	0.05	...	...	0.02	0.05	Rem.
5058	1991	GERMANY	0.40	0.50	0.10	0.20	4.5-5.6	0.10	...	0.20	0.20	...	...	...	...	...	...	...	...	1.2-1.8	...	0.05	0.15	Rem.
5059	1999	GERMANY	0.45	0.50	0.25	0.6-1.2	5.0-6.0	0.25	...	0.40-0.9	0.20	...	...	...	...	...	...	...	...	...	0.05-0.25	0.05	0.15	Rem.
5070	2003	BELGIUM	0.25	0.40	0.25	0.40-0.8	3.5-4.5	0.30	...	0.40-0.8	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	0.35 Si+Fe <sup>6</sup> 0.35 Si+Fe <sup>16</sup>	OTHERS <sup>13</sup>		AI
No. <sup>17</sup>	Date	By																				Each	Total <sup>9</sup>	
5180	1963	USA	...	...	0.10	0.20-0.7	3.5-4.5	0.10	...	1.7-2.8	0.06-0.20	...	...	...	...	...	...	...	...	0.08-0.25	0.35 Si+Fe <sup>6</sup>	0.05	0.15	Rem.
5180A	2001	FRANCE	...	...	0.10	0.20-0.7	3.5-4.5	0.10	...	1.7-2.8	0.06-0.20	...	...	...	...	...	...	...	...	0.08-0.25	0.35 Si+Fe <sup>16</sup>	0.05	0.15	Rem.
5082	1963	USA	0.20	0.35	0.15	0.15	4.0-5.0	0.15	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5182	1967	USA	0.20	0.35	0.15	0.20-0.50	4.0-5.0	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5083	1954	USA	0.40	0.40	0.10	0.40-1.0	4.0-4.9	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5183	1957	USA	0.40	0.40	0.10	0.50-1.0	4.3-5.2	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5183A	2001	EAA	0.40	0.40	0.10	0.50-1.0	4.3-5.2	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5283	1976	FRANCE	0.30	0.30	0.03	0.50-1.0	4.5-5.1	0.05	0.03	0.10	0.03	...	...	...	...	...	...	...	...	...	0.05	0.05	0.15	Rem.
5283A	1987	EAA	0.30	0.30	0.03	0.50-1.0	4.5-5.1	0.05	0.03	0.10	0.03	...	...	...	...	...	...	...	...	...	0.05	0.05	0.15	Rem.
5283B	1999	USA	0.15	0.35	0.15	0.30-0.9	4.2-5.2	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5383	1995	FRANCE	0.25	0.25	0.20	0.7-1.0	4.0-5.2	0.25	...	0.40	0.15	...	...	...	...	...	...	...	...	...	0.20	0.05	0.15	Rem.
5483	2001	USA	0.30	0.25	0.10	0.7-1.0	4.3-5.2	0.15	...	0.40	0.15	...	...	...	...	...	...	...	...	0.05-0.20	...	0.05	0.15	Rem.
5086	1954	USA	0.40	0.50	0.10	0.20-0.7	3.5-4.5	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5186	1996	FRANCE	0.40	0.45	0.25	0.20-0.50	3.8-4.8	0.15	...	0.40	0.15	...	...	...	...	...	...	...	...	0.05	...	0.05	0.15	Rem.
5087	1990	EAA	0.25	0.40	0.05	0.7-1.1	4.5-5.2	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	0.10-0.20	6	0.05	0.15	Rem.
5187	2001	EAA	0.25	0.40	0.05	0.7-1.1	4.5-5.2	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	0.10-0.20	16	0.05	0.15	Rem.
5088	2002	FRANCE	0.20	0.10-0.35	0.25	0.20-0.50	4.7-5.5	0.15	...	0.20-0.40	...	...	...	...	...	...	...	...	...	0.15	...	0.05	0.15	Rem.
6101	1955	USA	0.30-0.7	0.50	0.10	0.03	0.35-0.8	0.03	...	0.10	...	...	0.06	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
6101A	1974	UK	0.30-0.7	0.40	0.05	...	0.40-0.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
6101B	1979	GERMANY	0.30-0.6	0.10-0.30	0.05	0.05	0.35-0.6	...	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
6201	1960	USA	0.50-0.9	0.50	0.10	0.03	0.6-0.9	0.03	...	0.10	...	...	0.06	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
6201A	1973	AUSTRALIA	0.50-0.7	0.50	0.04	...	0.6-0.9	...	...	...	...	...	0.06	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
6401	1990	EAA	0.35-0.7	0.04	0.05-0.20	0.03	0.35-0.7	...	...	0.04	0.01	...	...	...	...	...	...	...	...	...	...	0.01	...	Rem.
6501	2005	SWITZERLAND	0.20-0.6	0.35	0.20	0.05-0.20	0.20-0.6	0.05	...	0.15	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6002	1983	ITALY	0.6-0.9	0.25	0.10-0.25	0.10-0.20	0.45-0.7	0.05	...	...	0.08	...	...	...	...	...	...	...	...	0.09-0.14	...	0.05	0.15	Rem.
6003 <sup>15</sup>	1954	USA	0.35-1.0	0.6	0.10	0.8	0.8-1.5	0.35	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6103	1984	AUSTRALIA	0.35-1.0	0.6	0.20-0.30	0.8	0.8-1.5	0.35	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6005	1962	USA	0.6-0.9	0.35	0.10	0.10	0.40-0.6	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6005A	1972	FRANCE	0.50-0.9	0.35	0.30	0.50	0.40-0.7	0.30	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6005B	1989	NETHERLANDS	0.45-0.8	0.30	0.10	0.10	0.40-0.8	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6005C	2005	JAPAN	0.40-0.9	0.35	0.35	0.50	0.40-0.8	0.30	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6105	1965	USA	0.6-1.0	0.35	0.10	0.15	0.45-0.8	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6205	1970	USA	0.6-0.9	0.7	0.20	0.05-0.15	0.40-0.6	0.05-0.15	...	0.25	0.15	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
6305	2012	USA	0.6-1.0	0.35	0.10	0.15	0.45-0.8	0.15	...	0.10	0.10	...	...	...	...	...	...	...	...	...	0.12-0.20 Mn+Cr	0.05	0.15	Rem.
6006	1971	USA	0.20-0.6	0.35	0.15-0.30	0.05-0.20	0.45-0.9	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6106	1979	FRANCE	0.30-0.6	0.35	0.25	0.05-0.20	0.40-0.8	0.20	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.10	Rem.
6206	1984	USA	0.35-0.7	0.35	0.20-0.50	0.13-0.30	0.45-0.8	0.10	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6306	1991	USA	0.20-0.6	0.10	0.05-0.16	0.10-0.40	0.45-0.9	...	...	0.05	0.05	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6008	1983	SWITZERLAND	0.50-0.9	0.35	0.30	0.30	0.40-0.7	0.30	...	0.20	0.10	...	...	...	...	...	...	...	0.05-0.20	...	...	0.05	0.15	Rem.
6009	1976	USA	0.6-1.0	0.50	0.15-0.6	0.20-0.8	0.40-0.8	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																			Each	Total <sup>13</sup>		Minimum
6010	1976	USA	0.8-1.2	0.50	0.15-0.6	0.20-0.8	0.6-1.0	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6110	1979	USA	0.7-1.5	0.8	0.20-0.7	0.20-0.7	0.50-1.1	0.04-0.25	...	0.30	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6110A	1996	GERMANY	0.7-1.1	0.50	0.30-0.8	0.30-0.9	0.7-1.1	0.05-0.25	...	0.20	...	...	...	...	...	...	...	...	...	...	0.20 Zr+Ti	0.05	0.15	Rem.
6011	1954	USA	0.6-1.2	1.0	0.40-0.9	0.8	0.6-1.2	0.30	0.20	1.5	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6111	1982	USA	0.6-1.1	0.40	0.50-0.9	0.10-0.45	0.50-1.0	0.10	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6012	1979	GERMANY	0.6-1.4	0.50	0.10	0.40-1.0	0.6-1.2	0.30	...	0.30	0.20	...	...	0.7	...	...	0.40-2.0	...	...	...	...	0.05	0.15	Rem.
6012A	1999	ITALY	0.6-1.4	0.50	0.40	0.20-1.0	0.6-1.2	0.30	...	0.30	0.20	...	...	0.7	...	...	...	0.40-2.0	...	...	...	0.05	0.15	Rem.
6013	1983	USA	0.6-1.0	0.50	0.6-1.1	0.20-0.8	0.8-1.2	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6113	1991	USA	0.6-1.0	0.30	0.6-1.1	0.10-0.6	0.8-1.2	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	0.05-0.50 O	0.05	0.15	Rem.
6014	1983	SWITZERLAND	0.30-0.6	0.35	0.25	0.05-0.20	0.40-0.8	0.20	...	0.10	0.10	...	...	...	...	...	...	...	0.05-0.20	...	...	0.05	0.15	Rem.
6015	1984	ITALY	0.20-0.40	0.10-0.30	0.10-0.25	0.10	0.8-1.1	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6016	1984	SWITZERLAND	1.0-1.5	0.50	0.20	0.20	0.25-0.6	0.10	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6016A	1995	FRANCE	0.9-1.5	0.50	0.25	0.20	0.20-0.6	0.10	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6116	1996	SWITZERLAND	0.9-1.3	0.25	0.20	0.15	0.25-0.6	0.15	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6018	1991	SWITZERLAND	0.50-1.2	0.7	0.15-0.40	0.30-0.8	0.6-1.2	0.10	...	0.30	0.20	...	...	0.40-0.7	...	...	0.40-1.2	...	...	...	...	0.05	0.15	Rem.
6019	1996	USA	0.6-1.0	0.50	0.20-0.6	0.10	0.8-1.2	0.05-0.35	...	0.40-1.0	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6020	1995	USA	0.40-0.9	0.50	0.30-0.9	0.35	0.6-1.2	0.15	...	0.20	0.15	...	...	...	...	...	0.05	0.9-1.5	...	...	...	0.05	0.15	Rem.
6021	2000	GERMANY	0.6-1.5	0.40	0.20	0.40-1.0	0.8-1.5	0.25	...	0.20	0.10	...	...	...	...	...	...	0.6-1.5	...	...	...	0.05	0.15	Rem.
6022	1995	USA	0.8-1.5	0.05-0.20	0.01-0.11	0.02-0.10	0.45-0.7	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6023	2001	SWITZERLAND	0.6-1.4	0.50	0.20-0.50	0.20-0.6	0.40-0.9	...	...	...	...	...	...	0.30-0.8	...	...	...	0.6-1.2	...	...	...	0.05	0.15	Rem.
6024	2001	KOREA	0.7-1.3	0.05-0.7	0.30-0.9	0.30-1.2	0.30-1.0	0.20	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6025	2002	GERMANY	0.8-1.5	0.7	0.20-0.7	0.6-1.4	2.1-3.0	0.20	...	0.50	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6026	2004	ITALY	0.6-1.4	0.7	0.20-0.50	0.20-1.0	0.6-1.2	0.30	...	0.30	0.20	...	...	0.50-1.5	...	...	0.40	0.05	...	...	...	0.05	0.15	Rem.
6027	2010	CHINA	0.55-0.8	0.30	0.15	0.10-0.30	0.8-1.1	0.10	...	0.10-0.30	0.15	...	...	...	...	...	...	...	...	...	...	0.15	0.15	Rem.
6028	2006	SLOVENIA	1.0-1.3	0.50	0.25-0.40	0.6-0.9	0.7-1.0	0.04-0.10	...	0.30	0.20	...	...	0.6-0.8	...	...	...	0.6-0.8	...	...	...	0.05	0.15	Rem.
6031	2014	USA	0.50-0.8	0.25	0.10-0.25	0.40-0.6	0.6-0.8	0.10-0.20	...	0.05	0.05	...	...	...	...	...	...	...	...	...	...	0.03	0.15	Rem.
6032	2014	USA	0.45-0.7	0.25	0.03	0.10-0.20	0.45-0.7	0.03	...	0.05	0.08-0.12	...	...	...	...	...	...	...	...	...	...	0.03	0.15	Rem.
6033	2002	USA	0.8-1.3	0.50	0.40-1.0	0.05	0.7-1.3	0.10	...	0.50-1.0	0.15	...	...	0.30-1.0	...	...	0.05	...	...	...	...	0.05	0.15	Rem.
6040	2002	USA	0.40-0.8	0.7	0.20-0.8	0.15	0.8-1.2	0.15	...	0.25	0.15	...	...	0.15-0.7	...	...	...	0.30-1.2	...	...	...	0.05	0.15	Rem.
6041	2006	USA	0.50-0.9	0.15-0.7	0.15-0.6	0.05-0.20	0.8-1.2	0.05-0.15	...	0.25	0.15	...	...	0.30-0.9	...	...	...	0.35-1.2	...	...	...	0.05	0.15	Rem.
6042	2006	USA	0.50-1.2	0.7	0.20-0.6	0.40	0.7-1.2	0.04-0.35	...	0.25	0.15	...	...	0.20-0.8	...	...	0.15-0.40	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																			Each	Total <sup>13</sup>		Minimum
6043	2006	CHINA	0.40-0.9	0.50	0.30-0.9	0.35	0.6-1.2	0.15	...	0.20	0.15	...	...	0.40-0.7	...	...	...	0.20-0.40	...	...	...	0.05	0.15	Rem.
+ 6050	2016	USA	1.2-1.8	1.3-1.8	0.15-0.50	0.20-0.7	0.50-0.9	0.05-0.25	0.20-1.0	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6151	1954	USA	0.6-1.2	1.0	0.35	0.20	0.45-0.8	0.15-0.35	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6351	1958	USA	0.7-1.3	0.50	0.10	0.40-0.8	0.40-0.8	...	...	0.20	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6351A	1988	FRANCE	0.7-1.3	0.50	0.10	0.40-0.8	0.40-0.8	...	...	0.20	0.20	...	...	...	...	...	0.003	...	...	...	...	0.05	0.15	Rem.
6451	2005	USA	0.6-1.0	0.40	0.40	0.05-0.40	0.40-0.8	0.10	...	0.15	...	...	...	...	...	...	...	...	0.10	...	...	0.05	0.15	Rem.
6951	1954	USA	0.20-0.50	0.8	0.15-0.40	0.10	0.40-0.8	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6053	1954	USA	<sup>9</sup>	0.35	0.10	...	1.1-1.4	0.15-0.35	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6055	2012	USA	0.6-1.2	0.30	0.50-1.0	0.10	0.7-1.1	0.20-0.30	...	0.55-0.9	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6056	1988	FRANCE	0.7-1.3	0.50	0.50-1.1	0.40-1.0	0.6-1.2	0.25	...	0.10-0.7	...	...	...	...	...	...	...	...	...	...	0.20 Zr+Ti	0.05	0.15	Rem.
6156	2003	FRANCE	0.7-1.3	0.20	0.7-1.1	0.40-0.7	0.6-1.2	0.25	...	0.10-0.7	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6060	1972	EAA	0.30-0.6	0.10-0.30	0.10	0.10	0.35-0.6	0.05	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6160	1993	USA	0.30-0.6	0.15	0.20	0.05	0.35-0.6	0.05	...	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6260	1996	USA	0.40-0.6	0.15-0.40	0.10	0.03	0.45-0.7	0.03	...	0.05	0.10	...	...	...	...	...	...	...	0.10-0.25	0.05	...	0.05	0.15	Rem.
6360	2001	USA	0.35-0.8	0.10-0.30	0.15	0.02-0.15	0.25-0.45	0.05	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6460	2001	USA	0.30-0.7	0.15	0.20	0.20	0.20-0.6	0.05	...	0.05	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6460B	2010	BRAZIL	0.20-0.7	0.20	0.10	0.10	0.20-0.40	0.03	...	0.04	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6560	2001	USA	0.30-0.7	0.10-0.30	0.05-0.20	0.20	0.20-0.6	0.05	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6660	2011	USA	0.40-0.8	0.15-0.30	0.10	0.03-0.20	0.30-0.6	0.05	0.05	0.10	0.10	...	...	...	0.05	...	...	...	0.05	...	...	0.05	0.15	Rem.
6061	1954	USA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.35	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6061A	1991	EAA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.35	...	0.25	0.15	...	...	...	...	...	0.003	...	...	...	...	0.05	0.15	Rem.
+ 6061B	2015	USA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.35	...	0.25	0.15	...	...	...	...	...	...	...	...	...	0.6 O	0.05	0.15	Rem.
6261	1968	USA	0.40-0.7	0.40	0.15-0.40	0.20-0.35	0.7-1.0	0.10	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6361	2013	USA	0.6-0.9	0.40	0.20-0.50	0.10-0.20	1.0-1.4	0.10-0.30	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6162	1959	USA	0.40-0.8	0.50	0.20	0.10	0.7-1.1	0.10	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6262	1960	USA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.14	...	0.25	0.15	...	...	0.40-0.7	...	...	0.40-0.7	...	...	...	...	0.05	0.15	Rem.
6262A	2005	BELGIUM	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.14	...	0.25	0.10	...	...	0.40-0.9	...	...	...	0.40-1.0	...	...	...	0.05	0.15	Rem.
6063	1954	USA	0.20-0.6	0.35	0.10	0.10	0.45-0.9	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6063A	1979	UK	0.30-0.6	0.15-0.35	0.10	0.15	0.6-0.9	0.05	...	0.15	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6463	1957	USA	0.20-0.6	0.15	0.20	0.05	0.45-0.9	...	...	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6463A	1973	AUSTRALIA	0.20-0.6	0.15	0.25	0.05	0.30-0.9	...	...	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6763	1972	USA	0.20-0.6	0.08	0.04-0.16	0.03	0.45-0.9	...	...	0.03	...	...	...	...	...	...	...	...	0.05	...	...	0.03	0.10	Rem.
6963	1994	USA	0.40-0.6	0.25	0.15-0.25	0.05	0.35-0.7	0.10	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6064	2006	SLOVENIA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.05-0.14	...	0.25	0.15	...	...	0.50-0.7	...	...	0.20-0.40	...	...	...	...	0.05	0.15	Rem.
6064A	2007	SWITZERLAND	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.14	...	0.25	0.15	...	...	0.40-0.8	...	...	0.20-0.40	...	...	...	...	0.05	0.15	Rem.
6065	2005	BELGIUM	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.15	...	0.25	0.10	...	...	0.50-1.5	...	...	0.05	...	...	0.15	...	0.05	0.15	Rem.
6066	1954	USA	0.9-1.8	0.50	0.7-1.2	0.6-1.1	0.8-1.4	0.40	...	0.25	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6068	2009	SWITZERLAND	0.6-1.4	0.50	0.10	0.40-1.0	0.6-1.2	0.30	0.05	0.30	0.20	...	...	0.6-1.1	0.03	...	0.20-0.40	...	0.05	...	...	0.05	0.15	Rem.
6069	1994	USA	0.6-1.2	0.40	0.55-1.0	0.05	1.2-1.6	0.05-0.30	...	0.05	0.10	...	...	...	...	...	...	...	0.10-0.30	...	0.05 Sr	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																			Each	Total <sup>15</sup>		Minimum
6070	1962	USA	1.0-1.7	0.50	0.15-0.40	0.40-1.0	0.50-1.2	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6081	1972	FRANCE	0.7-1.1	0.50	0.10	0.10-0.45	0.6-1.0	0.10	...	0.20	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6181	1972	EAA	0.8-1.2	0.45	0.10	0.15	0.6-1.0	0.10	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6181A	1997	SWITZERLAND	0.7-1.1	0.15-0.50	0.25	0.40	0.6-1.0	0.15	...	0.30	0.25	...	...	...	...	...	...	...	0.10	...	...	0.05	0.15	Rem.
6082	1972	EAA	0.7-1.3	0.50	0.10	0.40-1.0	0.6-1.2	0.25	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
6082A	1987	FRANCE	0.7-1.3	0.50	0.10	0.40-1.0	0.6-1.2	0.25	...	0.20	0.10	...	...	...	...	...	0.003	...	...	...	...	0.05	0.15	Rem.
6182	2005	BELGIUM	0.9-1.3	0.50	0.10	0.50-1.0	0.7-1.2	0.25	...	0.20	0.10	...	...	...	...	...	...	...	...	0.05-0.20	...	0.05	0.15	Rem.
+ 6086	2017	SLOVENIA	1.3-1.7	0.14-0.25	0.10-0.8	0.6-0.9	0.8-1.1	0.15-0.25	...	0.20	0.10	...	...	...	...	...	...	...	...	0.15-0.25	...	0.05	0.15	Rem.
6091	1992	USA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.15	...	0.25	0.15	...	...	...	...	...	...	...	...	...	0.05-0.50 O	0.05	0.15	Rem.
6092	1992	USA	0.40-0.8	0.30	0.7-1.0	0.15	0.8-1.2	0.15	...	0.25	0.15	...	...	...	...	...	...	...	...	...	0.05-0.50 O	0.05	0.15	Rem.
+ 6099	2016	USA	0.8-1.2	0.7	0.10-0.7	0.10-0.40	0.7-1.2	0.04-0.35	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7003	1975	JAPAN	0.30	0.35	0.20	0.30	0.50-1.0	0.20	...	5.0-6.5	0.20	...	...	...	...	...	...	...	...	0.05-0.25	...	0.05	0.15	Rem.
7004	1964	USA	0.25	0.35	0.05	0.20-0.7	1.0-2.0	0.05	...	3.8-4.6	0.05	...	...	...	...	...	...	...	...	0.10-0.20	...	0.05	0.15	Rem.
7204	2005	JAPAN	0.30	0.35	0.20	0.20-0.7	1.0-2.0	0.30	...	4.0-5.0	0.20	...	...	...	...	...	...	...	0.10	0.25	...	0.05	0.15	Rem.
7005	1962	USA	0.35	0.40	0.10	0.20-0.7	1.0-1.8	0.06-0.20	...	4.0-5.0	0.01-0.06	...	...	...	...	...	...	...	...	0.08-0.20	...	0.05	0.15	Rem.
7108 <sup>15</sup>	1983	USA	0.10	0.10	0.05	0.05	0.7-1.4	...	...	4.5-5.5	0.05	...	...	...	...	...	...	...	...	0.12-0.25	...	0.05	0.15	Rem.
7108A	1987	NORWAY	0.20	0.30	0.05	0.05	0.7-1.5	0.04	...	4.8-5.8	0.03	...	...	...	0.03	...	...	...	...	0.15-0.25	...	0.05	0.15	Rem.
7009	1974	GERMANY	0.20	0.20	0.6-1.3	0.10	2.1-2.9	0.10-0.25	...	5.5-6.5	0.20	0.25-0.40	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7010	1975	UK	0.12	0.15	1.5-2.0	0.10	2.1-2.6	0.05	0.05	5.7-6.7	0.06	...	...	...	...	...	...	...	...	0.10-0.16	...	0.05	0.15	Rem.
7012	1975	ITALY	0.15	0.25	0.8-1.2	0.08-0.15	1.8-2.2	0.04	...	5.8-6.5	0.02-0.08	...	...	...	...	...	...	...	...	0.10-0.18	...	0.05	0.15	Rem.
7014	1977	UK	0.50	0.50	0.30-0.7	0.30-0.7	2.2-3.2	...	0.10	5.2-6.2	...	...	...	...	...	...	...	...	...	0.20 Zr+Ti	...	0.05	0.15	Rem.
7015	1977	SPAIN	0.20	0.30	0.06-0.15	0.10	1.3-2.1	0.15	...	4.6-5.2	0.10	...	...	...	...	...	...	...	...	0.10-0.20	...	0.05	0.15	Rem.
7016	1972	USA	0.10	0.12	0.45-1.0	0.03	0.8-1.4	...	...	4.0-5.0	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	0.10	Rem.
7116	1975	USA	0.15	0.30	0.50-1.1	0.05	0.8-1.4	...	...	4.2-5.2	0.05	...	...	...	0.03	...	...	...	0.05	...	...	0.05	0.15	Rem.
7017	1978	UK	0.35	0.45	0.20	0.05-0.50	2.0-3.0	0.35	0.10	4.0-5.2	0.15	...	...	...	...	...	...	...	...	0.10-0.25	0.15 min Mn+Cr	0.05	0.15	Rem.
7018	1978	UK	0.35	0.45	0.20	0.15-0.50	0.7-1.5	0.20	0.10	4.5-5.5	0.15	...	...	...	...	...	...	...	...	0.10-0.25	...	0.05	0.15	Rem.
7019	1978	UK	0.35	0.45	0.20	0.15-0.50	1.5-2.5	0.20	0.10	3.5-4.5	0.15	...	...	...	...	...	...	...	...	0.10-0.25	...	0.05	0.15	Rem.
7019A	1983	ARGENTINA	0.30	0.40	0.10	0.10-0.6	1.5-2.5	0.05-0.35	...	3.0-5.0	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7020	1972	EAA	0.35	0.40	0.20	0.05-0.50	1.0-1.4	0.10-0.35	...	4.0-5.0	...	...	...	...	...	...	...	...	...	0.08-0.20	0.08-0.25 Zr+Ti	0.05	0.15	Rem.
7021	1976	USA	0.25	0.40	0.25	0.10	1.2-1.8	0.05	...	5.0-6.0	0.10	...	...	...	...	...	...	...	...	0.08-0.18	...	0.05	0.15	Rem.

See footnotes on page 18.



**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr		OTHERS <sup>13</sup>		Al	
No. <sup>17</sup>	Date	By																				Each	Total <sup>13</sup>		Minimum
7022	1979	EAA	0.50	0.50	0.50-1.0	0.10-0.40	2.6-3.7	0.10-0.30	...	4.3-5.2	...	...	...	...	...	...	...	...	...	...	...	0.20 Zr+Ti	0.05	0.15	Rem.
7122	2000	SWITZERLAND	0.25	0.35	0.50-1.0	0.10	2.6-3.7	0.10	...	4.3-5.2	0.15	...	...	...	...	...	...	...	...	...	0.10-0.25	...	0.05	0.15	Rem.
7023	1983	ARGENTINA	0.50	0.50	0.50-1.0	0.10-0.6	2.0-3.0	0.05-0.35	...	4.0-6.0	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7024	1983	ARGENTINA	0.30	0.40	0.10	0.10-0.6	0.50-1.0	0.05-0.35	...	3.0-5.0	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7025	1983	ARGENTINA	0.30	0.40	0.10	0.10-0.6	0.8-1.5	0.05-0.35	...	3.0-5.0	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7026	1983	ITALY	0.08	0.12	0.6-0.9	0.05-0.20	1.5-1.9	...	...	4.6-5.2	0.05	...	...	...	...	...	...	...	...	...	0.09-0.14	...	0.03	0.10	Rem.
7028	1987	SPAIN	0.35	0.50	0.10-0.30	0.15-0.6	1.5-2.3	0.20	...	4.5-5.2	0.05	...	...	...	...	...	...	...	...	...	...	0.08-0.25 Zr+Ti	0.05	0.15	Rem.
7029	1975	USA	0.10	0.12	0.50-0.9	0.03	1.3-2.0	...	...	4.2-5.2	0.05	...	...	...	...	...	...	...	0.05	...	...	...	0.03	0.10	Rem.
7129	1977	USA	0.15	0.30	0.50-0.9	0.10	1.3-2.0	0.10	...	4.2-5.2	0.05	...	...	...	0.03	...	...	...	0.05	...	...	...	0.05	0.15	Rem.
7229	1988	USA	0.06	0.08	0.50-0.9	0.03	1.3-2.0	...	...	4.2-5.2	0.05	...	...	...	...	...	...	...	0.05	...	...	...	0.03	0.10	Rem.
7030	1987	NORWAY	0.20	0.30	0.20-0.40	0.05	1.0-1.5	0.04	...	4.8-5.9	0.03	...	...	...	0.03	...	...	...	...	...	0.03	...	0.05	0.15	Rem.
7031	1988	USA	0.30	0.8-1.4	0.10	0.10-0.40	0.10	...	...	0.8-1.8	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7032	1995	USA	0.10	0.12	1.7-2.3	0.05	1.5-2.5	0.15-0.25	...	5.5-6.5	0.10	...	...	0.01	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7033	1996	USA	0.15	0.30	0.7-1.3	0.10	1.3-2.2	0.20	...	4.6-5.6	0.10	...	...	...	0.03	...	...	...	0.05	0.08-0.15	...	...	0.05	0.15	Rem.
7034	1999	UK	0.10	0.12	0.8-1.2	0.25	2.0-3.0	0.20	...	11.0-12.0	...	...	...	...	...	...	...	...	...	...	0.08-0.30	...	0.05	0.15	Rem.
7035	2003	SWITZERLAND	0.15	0.25	0.05-0.30	0.10	2.5-3.5	0.05	...	4.3-5.5	0.02-0.05	...	...	...	...	...	...	...	...	...	0.08-0.20	...	0.05	0.15	Rem.
7035A	2008	FRANCE	0.15	0.25	0.05-0.30	0.10	2.5-3.5	0.05	...	4.3-5.5	0.02-0.05	...	...	...	...	...	...	...	...	...	0.04-0.20	...	0.05	0.15	Rem.
7036	2004	USA	0.12	0.15	1.9-2.5	0.05	1.8-2.5	0.08-0.13	...	8.4-9.4	0.10	...	...	...	...	...	...	...	...	...	0.10-0.20	...	0.05	0.15	Rem.
7136	2004	USA	0.12	0.15	1.9-2.5	0.05	1.8-2.5	0.05	...	8.4-9.4	0.10	...	...	...	...	...	...	...	...	...	0.10-0.20	...	0.05	0.15	Rem.
7037	2006	GERMANY	0.10	0.10	0.6-1.1	0.50	1.3-2.1	0.04	...	7.8-9.0	0.10	...	...	...	...	...	...	...	...	...	0.06-0.25	...	0.05	0.15	Rem.
7039	1962	USA	0.30	0.40	0.10	0.10-0.40	2.3-3.3	0.15-0.25	...	3.5-4.5	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7040	1996	FRANCE	0.10	0.13	1.5-2.3	0.04	1.7-2.4	0.04	...	5.7-6.7	0.06	...	...	...	...	...	...	...	...	...	0.05-0.12	...	0.05	0.15	Rem.
7140	2005	FRANCE	0.10	0.13	1.3-2.3	0.04	1.5-2.4	0.04	...	6.2-7.0	0.06	...	...	...	...	...	...	...	...	...	0.05-0.12	...	0.05	0.15	Rem.
7041	2008	FRANCE	0.15	0.25	0.40-0.9	0.04	1.5-2.3	0.04	...	5.7-6.7	0.06	...	...	...	...	...	...	...	...	...	0.05-0.12	...	0.05	0.15	Rem.
7042	2009	USA	0.20	0.20	1.3-1.9	0.20-0.40	2.0-2.8	0.05	...	6.5-7.9	...	...	...	...	...	...	...	...	...	...	0.11-0.20	0.18-.050 Sc	0.05	0.15	Rem.
7046	1973	USA	0.20	0.40	0.25	0.30	1.0-1.6	0.20	...	6.6-7.6	0.06	...	...	...	...	...	...	...	...	...	0.10-0.18	...	0.05	0.15	Rem.
7046A	1999	NORWAY	0.20	0.40	0.35	0.30	0.8-1.6	0.20	...	6.1-7.3	0.06	...	...	...	...	...	...	...	...	...	0.10-0.25	...	0.05	0.15	Rem.
7047	2010	USA	0.12	0.15	0.04	0.04	1.3-1.8	0.05	...	7.0-8.0	0.08	0.25-0.50	...	...	...	...	...	...	...	...	0.07-0.13	...	0.05	0.15	Rem.
7049	1968	USA	0.25	0.35	1.2-1.9	0.20	2.0-2.9	0.10-0.22	...	7.2-8.2	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7049A	1972	FRANCE	0.40	0.50	1.2-1.9	0.50	2.1-3.1	0.05-0.25	...	7.2-8.4	...	...	...	...	...	...	...	...	...	...	...	0.25 Zr+Ti	0.05	0.15	Rem.
7149	1975	USA	0.15	0.20	1.2-1.9	0.20	2.0-2.9	0.10-0.22	...	7.2-8.2	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7249	1992	USA	0.10	0.12	1.3-1.9	0.10	2.0-2.4	0.12-0.18	...	7.5-8.2	0.06	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr		OTHERS <sup>13</sup>		AI	
No. <sup>17</sup>	Date	By																				Each	Total <sup>15</sup>		Minimum
7349	1994	FRANCE	0.12	0.15	1.4-2.1	0.20	1.8-2.7	0.10-0.22	...	7.5-8.7	...	...	...	...	...	...	...	...	...	...	...	0.25 Zr+Ti	0.05	0.15	Rem.
7449	1994	FRANCE	0.12	0.15	1.4-2.1	0.20	1.8-2.7	...	...	7.5-8.7	...	...	...	...	...	...	...	...	...	...	...	0.25 Zr+Ti	0.05	0.15	Rem.
7050	1971	USA	0.12	0.15	2.0-2.6	0.10	1.9-2.6	0.04	...	5.7-6.7	0.06	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
7050A	1996	FRANCE	0.12	0.15	1.7-2.4	0.04	1.7-2.6	0.04	0.03	5.7-6.9	0.06	...	...	...	...	...	...	...	...	...	0.05-0.12	...	0.05	0.15	Rem.
7150	1978	USA	0.12	0.15	1.9-2.5	0.10	2.0-2.7	0.04	...	5.9-6.9	0.06	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
7055	1991	USA	0.10	0.15	2.0-2.6	0.05	1.8-2.3	0.04	...	7.6-8.4	0.06	...	...	...	...	...	...	...	...	...	0.08-0.25	...	0.05	0.15	Rem.
7155	2008	USA	0.25	0.25	2.0-2.6	0.10	1.8-2.3	0.05	...	7.6-8.4	0.10	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
7255	2009	USA	0.06	0.09	2.0-2.6	0.05	1.8-2.3	0.04	...	7.6-8.4	0.06	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
7056	2004	FRANCE	0.10	0.12	1.2-1.9	0.20	1.5-2.3	...	...	8.5-9.7	0.08	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
7060	1986	FRANCE	0.15	0.20	1.8-2.6	0.20	1.3-2.1	0.15-0.25	...	6.1-7.5	0.05	...	...	...	...	...	...	...	...	...	0.05	...	0.05	0.15	Rem.
+ 7160	2017	USA	0.10	0.10	1.9-2.5	0.05	1.0-2.0	...	...	6.7-7.3	0.06	...	...	...	...	...	...	...	...	...	0.04-0.15	...	0.05	0.15	Rem.
7064	1985	USA	0.12	0.15	1.8-2.4	...	1.9-2.9	0.06-0.25	...	6.8-8.0	...	...	...	...	...	...	...	...	...	...	0.10-0.50	0.10-0.40 Co, 0.05-0.30 O	0.05	0.15	Rem.
7065	2012	USA	0.06	0.08	1.9-2.3	0.04	1.5-1.8	0.04	...	7.1-8.3	0.06	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
7068	1996	USA	0.12	0.15	1.6-2.4	0.10	2.2-3.0	0.05	...	7.3-8.3	0.10	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
7168	2002	USA	0.10	0.12	1.6-2.4	0.05	2.0-2.8	0.04	...	7.8-8.8	0.10	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
7072 <sup>15</sup>	1954	USA	...	...	0.10	0.10	0.10	...	...	0.8-1.3	...	...	...	...	...	...	...	...	...	...	...	0.7 Si+Fe	0.05	0.15	Rem.
7075	1954	USA	0.40	0.50	1.2-2.0	0.30	2.1-2.9	0.18-0.28	...	5.1-6.1	0.20	...	...	...	...	...	...	...	...	...	...	<sup>10</sup>	0.05	0.15	Rem.
7175	1957	USA	0.15	0.20	1.2-2.0	0.10	2.1-2.9	0.18-0.28	...	5.1-6.1	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7475	1969	USA	0.10	0.12	1.2-1.9	0.06	1.9-2.6	0.18-0.25	...	5.2-6.2	0.06	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7076	1954	USA	0.40	0.6	0.30-1.0	0.30-0.8	1.2-2.0	...	...	7.0-8.0	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7178 <sup>8</sup>	1954	USA	0.40	0.50	1.6-2.4	0.30	2.4-3.1	0.18-0.28	...	6.3-7.3	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
7278	1981	NORWAY	0.15	0.20	1.6-2.2	0.02	2.5-3.2	0.17-0.25	...	6.6-7.4	0.03	...	...	...	0.03	...	...	...	...	0.05	...	...	0.03	0.10	Rem.
7278A	1991	SWITZERLAND	0.12	0.15	1.3-2.1	0.25	2.3-3.2	0.05	...	6.4-7.4	0.05	...	...	...	...	...	...	...	...	...	0.05-0.25	...	0.05	0.15	Rem.
7081	2005	GERMANY	0.12	0.15	1.2-1.8	0.25	1.8-2.2	0.04	...	6.9-7.5	0.06	...	...	...	...	...	...	...	...	...	0.06-0.15	...	0.05	0.15	Rem.
7181	2009	GERMANY	0.08	0.10	1.2-1.9	0.15	1.7-2.2	0.04	...	6.7-7.9	0.06	...	...	...	...	...	...	...	...	...	0.08-0.18	...	0.05	0.15	Rem.
7085	2002	USA	0.06	0.08	1.3-2.0	0.04	1.2-1.8	0.04	...	7.0-8.0	0.06	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
7185	2010	USA	0.25	0.25	1.3-2.0	0.10	1.2-1.8	0.10	...	7.0-8.2	0.06	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
7090	1980	USA	0.12	0.15	0.6-1.3	...	2.0-3.0	...	...	7.3-8.7	...	...	...	...	...	...	...	...	...	...	...	1.0-1.9 Co, 0.20-0.50 O	0.05	0.15	Rem.
7093	1990	USA	0.12	0.15	1.1-1.9	...	2.0-3.0	...	0.04-0.16	8.3-9.7	...	...	...	...	...	...	...	...	...	...	0.08-0.20	0.05-0.50 O	0.05	0.15	Rem.
7095	2005	USA	0.10	0.12	2.0-2.8	0.05	1.4-2.0	...	...	8.6-9.8	0.06	...	...	...	...	...	...	...	...	...	0.08-0.15	...	0.05	0.15	Rem.
+ 7097	2015	USA	0.12	0.15	0.8-1.6	0.04	1.6-2.6	0.04	...	7.4-8.4	0.06	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
7099	2011	USA	0.12	0.15	1.4-2.1	0.04	1.6-2.3	0.04	...	7.4-8.4	0.06	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
7199	2014	USA	0.10	0.12	1.4-2.1	0.04	1.6-2.3	0.04	...	7.4-8.4	0.06	...	...	...	...	...	...	...	...	...	0.05-0.15	...	0.05	0.15	Rem.
8005	1976	ITALY	0.20-0.50	0.40-0.8	0.05	...	0.05	...	...	0.05	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**  
**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al
No. <sup>17</sup>	Date	By																			Each	Total <sup>13</sup>	
8006	1978	USA	0.40	1.2-2.0	0.30	0.30-1.0	0.10	...	...	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8007	1978	USA	0.40	1.2-2.0	0.10	0.30-1.0	0.10	...	...	0.8-1.8	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8008	1979	SPAIN	0.6	0.9-1.6	0.20	0.50-1.0	...	...	...	0.10	0.10	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8010	1988	USA	0.40	0.35-0.7	0.10-0.30	0.10-0.8	0.10-0.50	0.20	...	0.40	0.10	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8011	1970	USA	0.50-0.9	0.6-1.0	0.10	0.20	0.05	0.05	...	0.10	0.08	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8011A	1979	GERMANY	0.40-0.8	0.50-1.0	0.10	0.10	0.10	0.10	...	0.10	0.05	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8111	1979	USA	0.30-1.1	0.40-1.0	0.10	0.10	0.05	0.05	...	0.10	0.08	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8211	1990	NETHERLANDS	0.40-0.8	0.50-1.0	0.10	0.05-0.20	0.10	0.15	...	0.10	0.05	...	...	...	...	...	...	...	...	...	0.06	0.15	Rem.
8112 <sup>b</sup>	1954	USA	1.0	1.0	0.40	0.6	0.7	0.20	...	1.0	0.20	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8014	1983	USA	0.30	1.2-1.6	0.20	0.20-0.6	0.10	...	...	0.10	0.10	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8015	1988	USA	0.30	0.8-1.4	0.10	0.10-0.40	0.10	...	...	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8016	1989	NORWAY	0.20	0.7-1.1	0.10	0.10-0.30	0.10	...	...	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8017	1983	USA	0.10	0.55-0.8	0.10-0.20	...	0.01-0.05	...	...	0.05	...	...	0.04	...	...	0.003	...	...	...	...	0.03	0.10	Rem.
8018	1989	UK	0.50-0.9	0.6-1.0	0.30-0.6	0.30	...	...	...	...	0.006-0.06	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8019	1990	USA	0.20	7.3-9.3	...	0.05	...	...	...	0.05	0.05	...	...	...	...	...	...	...	...	3.5-4.5 Ce, 0.05-0.50 O	0.05	0.15	Rem.
8021	1992	JAPAN	0.15	1.2-1.7	0.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8021A	1992	UK	0.20	1.2-1.7	0.05	0.03	0.02	...	...	0.05	0.05	...	...	...	...	...	...	...	...	...	0.02	0.15	Rem.
8021B	1996	EAA	0.40	1.1-1.7	0.05	0.03	0.01	0.03	...	0.05	0.05	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
8022	1991	USA	1.2-1.4	6.2-6.8	...	0.10	...	0.10	...	0.25	0.10	...	...	...	...	...	...	0.40-0.8	...	0.05-0.20 O	0.05	0.15	Rem.
8023	1997	BRAZIL	0.20	1.3-1.6	0.10-0.40	0.30-0.6	0.005	0.02	...	...	0.05-0.10	...	0.01-0.02	...	...	...	...	...	...	...	0.05	0.15	Rem.
8024	1999	UK	0.10	0.12	...	...	...	...	...	...	...	...	...	...	...	3.4-4.2	...	...	0.08-0.25	...	0.05	0.15	Rem.
8025	2000	SKAN ALUMINIUM	0.05-0.15	0.06-0.25	0.20	0.03-0.10	0.05	0.18	...	0.50	0.005-0.02	...	...	...	...	...	...	...	0.02-0.20	...	0.05	0.15	Rem.
8026	2007	GERMANY	0.6	0.6-1.2	0.30	0.40-1.0	0.20-0.6	0.20	...	0.25	0.10	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8030	1975	USA	0.10	0.30-0.8	0.15-0.30	...	0.05	...	...	0.05	...	...	0.001-0.04	...	...	...	...	...	...	...	0.03	0.10	Rem.
8130	1976	USA	0.15	0.40-1.0	0.05-0.15	...	...	...	...	0.10	...	...	...	...	...	...	...	...	...	1.0 Si+Fe	0.03	0.10	Rem.
8040	1962	USA	...	...	0.20	0.05	...	...	...	0.20	...	...	...	...	...	...	...	...	0.10-0.30	1.0 Si+Fe	0.05	0.15	Rem.
8050	1988	EAA	0.15-0.30	1.1-1.2	0.05	0.45-0.55	0.05	0.05	...	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8150	1998	AUSTRALIA	0.30	0.9-1.3	...	0.20-0.7	...	...	...	...	0.05	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8076	1972	USA	0.10	0.6-0.9	0.04	...	0.08-0.22	...	...	0.05	...	...	0.04	...	...	...	...	...	...	...	0.03	0.10	Rem.
8076A	2005	GERMANY	0.10	0.40-0.8	0.04	0.02	0.06-0.25	0.02	...	0.05	0.02	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.

See footnotes on page 18.

**CHEMICAL COMPOSITION LIMITS<sup>1,2</sup>**

**REGISTERED COMPOSITION—Continued**

Only composition limits which are identical to those listed herein for a registered designation are applicable to that designation.

Registered International Designation			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al	
No. <sup>17</sup>	Date	By																			Each	Total <sup>9</sup>		Minimum
8176	1976	USA	0.03-0.15	0.40-1.0	...	...	...	...	...	0.10	...	...	...	...	0.03	...	...	...	...	...	...	0.05	0.15	Rem.
8077	1975	USA	0.10	0.10-0.40	0.05	...	0.10-0.30	...	...	0.05	...	...	0.05	...	...	...	...	...	...	0.02-0.08	...	0.03	0.10	Rem.
8177	1981	USA	0.10	0.25-0.45	0.04	...	0.04-0.12	...	...	0.05	...	...	0.04	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
8079	1969	USA	0.05-0.30	0.7-1.3	0.05	...	...	...	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
8090	1984	EAA	0.20	0.30	1.0-1.6	0.10	0.6-1.3	0.10	...	0.25	0.10	...	...	...	...	2.2-2.7	...	...	...	0.04-0.16	...	0.05	0.15	Rem.
8091	1985	UK	0.30	0.50	1.6-2.2	0.10	0.50-1.2	0.10	...	0.25	0.10	...	...	...	...	2.4-2.8	...	...	...	0.08-0.16	...	0.05	0.15	Rem.
8093	1990	FRANCE	0.10	0.10	1.0-1.6	0.10	0.9-1.6	0.10	...	0.25	0.10	...	...	...	...	1.9-2.6	...	...	...	0.04-0.14	...	0.05	0.15	Rem.

See footnotes on page 18.

## FOOTNOTES

1. Composition in weight percent maximum unless shown as a range or a minimum. Standard limits for alloying elements and impurities are expressed to the following places:
 

Less than 0.001 percent .....	0.000X
0.001 but less than 0.01 percent .....	0.00X
0.01 but less than 0.10 percent .....	
Unalloyed aluminum made by a refining process .....	0.0XX
Alloys and unalloyed aluminum not made by a refining process .....	0.0X
0.10 through 0.55 percent .....	0.XX
(It is customary to express limits of 0.30 percent through 0.55 percent as 0.X0 or 0.X5).	
Over 0.55 percent .....	0.X, X.X, etc.
(except that combined Si +Fe limits for 1xxx designations must be expressed as 0.XX or 1.XX).	
2. Except for "Aluminum" and "Others," analysis is required for elements for which specific limits are shown. For purposes of determining conformance to these limits, an observed value or calculated value obtained from analysis is rounded off to the nearest unit in the last right hand place of digits used in expressing the specified limit, in accordance with the following:
 

When the digit next beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained.

When the digit next beyond the last place to be retained is greater than 5, increase by 1 the digit in the last place retained.

When the digit next beyond the last place to be retained is 5, and there are no digits beyond this 5, or only zeros, increase by 1 the digit in the last place retained if it is odd, leave the digit unchanged if it is even. Increase by 1 the digit in the last place retained if there are non-zero digits beyond this 5.
3. The sum of those "Others" metallic elements 0.010 or more each, expressed to the second decimal before determining the sum.
4. The aluminum content for unalloyed aluminum not made by a refining process is the difference between 100.00 percent and the sum of all other analyzed metallic elements together with silicon present in amounts of 0.010 percent or more each, expressed to the second decimal before determining the sum. For alloys and unalloyed aluminum not made by a refining process, when the specified maximum limit is 0.XX, an observed value or a calculated value greater than 0.005 but less than 0.010% is rounded off and shown as "less than 0.01".
5. The aluminum content for unalloyed aluminum made by a refining process is the difference between 100.00 percent and the sum of all other metallic elements together with silicon present in amounts of 0.0010 percent or more each, expressed to the third decimal before determining the sum, which is rounded to the second decimal before subtracting. For unalloyed aluminum made by a refining process, when the specified maximum limit is 0.0XX, an observed value or a calculated value greater than 0.0005 but less than 0.0010% is rounded off and shown as "less than 0.001".
6. 0.0003 max Be for welding electrode, welding rod and filler wire.
7. A Zr+Ti limit of 0.20 percent maximum may be used with this alloy designation for extruded and forged products only, but only when the supplier or producer and the purchaser have mutually so agreed. Agreement may be indicated, for example, by reference to a standard, by letter, by order note, or other means which allow the Zr+Ti limit.
8. This designation is considered the original alloy. See Recommendation footnote 5.
9. 45-65% of Mg.
10. A Zr +Ti limit of 0.25 percent maximum may be used with this alloy designation for extruded and forged products only, but only when the supplier or producer and the purchaser have mutually so agreed. Agreement may be indicated, for example, by reference to a standard, by letter, by order note, or other means which allow the Zr +Ti limit.
11. Formerly designated EC.
12. Inactive alloys can be reactivated with their previously assigned designation and registered chemical composition limits. An inactive experimental alloy can only be reactivated with the removal of the experimental alloy status.
13. "Others" includes listed elements for which no specific limit is shown as well as unlisted metallic elements. The producer may analyze samples for trace elements not specified in the registration or specification. However, such analysis is not required and may not cover all metallic "other" elements. Should any analysis by the producer or the purchaser establish that an "others" element exceeds the limit of "Each" or that the aggregate of several "others" elements exceeds the limit of Total, the material shall be considered non-conforming.
14. Alloy 5056A redesignated 5019.
15. Cladding is a main use.
16. 0.0005 max Be for welding electrode, welding rod and filler wire.
17. Various organizations include a prefix to these registered designations that do not change the registered composition and should be considered equivalent to those listed in this document. Examples of such equivalent designations are the AW-xxxx used in European EN standards and the A9xxxx designations used in the Unified Numbering System.
18. Designation listed for informational purposes only. Alloy 6064 is considered the original alloy for this alloy family.
19. This alloy designation was previously deactivated but has been reassigned to a new composition which is listed in the "Chemical Composition Limits" table. The designation remains in the "Previously Assigned but Presently Inactive Alloy Designation" list for historical purposes only.
20. Prior to 2009, the nominal density of alloys having a combination of elements may not have been calculated according to the current Aluminum and Aluminum Alloy Density Calculation Procedure appearing on Pages 2-13 and 2-14 of Aluminum Standards and Data. However, the nominal density of alloys published prior to 2009 shall not be revised.
21. Not a modification of original alloy 2016. The designation remains in the Previously Assigned but Presently Inactive Alloy Designation list for historical purposes.
  - + Designation added since previous issue.
  - \* "X" removed from designation since previous issue.

## CALCULATED NOMINAL DENSITIES FOR ACTIVE WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS

Density is dependent upon composition and nominal density is determined by computation rather than by a weight method. The values shown below have been computed in accordance with the Aluminum and Aluminum Alloy Density Calculation Procedure appearing on pages 2-13 and 2-14 of Aluminum Standards and Data.<sup>20</sup> These calculated densities are nominal values and should not be specified as engineering requirements but may be used in calculating nominal values for weight per unit length, weight per unit area, covering area, etc.

Limiting the expression of nominal density to the number of decimal places indicated is based on the fact that composition variations are discernible from one cast to another for most alloys. The expression of nominal density to more decimal places than allowed by the following implies higher precision than is justified and should not be used.

1. Alloys listed below which have a minimum aluminum content of 99.35% or greater have nominal density values which are rounded in the US customary system (lbs/in<sup>3</sup>) to the nearest multiple of 0.0005 and in the metric system [(kg/m<sup>3</sup>) x 10<sup>3</sup>] to the nearest multiple of 0.005.

2. Alloys listed below which have a minimum aluminum content of less than 99.35% have nominal density values which are rounded in the US customary system (lbs/in<sup>3</sup>) to the nearest multiple of 0.001 and in the metric system [(kg/m<sup>3</sup>) x 10<sup>3</sup>] to the nearest multiple of 0.01.

The US customary (lbs/in<sup>3</sup>) unit values are derived from metric values and subsequently rounded and are not to be back-converted to metric values.

Designation	Density		Designation	Density	
	lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>		lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>
1050	0.0975	2.705	1285	0.0975	2.700
1050A	0.0975	2.705	1385	0.0975	2.700
1060	0.0975	2.705	1188	0.0975	2.700
1065	0.0975	2.700	1190	0.0975	2.700
1070	0.0975	2.700	1290	0.0975	2.700
1070A	0.0975	2.700	1193	0.0975	2.700
1080	0.0975	2.700	1198	0.0975	2.700
1080A	0.0975	2.700	1199	0.0975	2.700
1085	0.0975	2.700	2001	0.102	2.82
1090	0.0975	2.700	2002	0.099	2.73
1098	0.0975	2.700	2004	0.102	2.82
1100	0.098	2.71	2005	0.102	2.83
1100A	0.098	2.71	2006	0.099	2.74
1200	0.098	2.70	2007	0.102	2.82
1200A	0.098	2.71	2007A	0.102	2.81
1300	0.098	2.71	2007B	0.102	2.81
1110	0.098	2.70	2008	0.098	2.72
1120	0.098	2.71	2009	0.099	2.75
1230	0.098	2.70	2010	0.098	2.72
1230A	0.098	2.70	2011	0.102	2.83
1235	0.0975	2.705	2011A	0.102	2.82
1435	0.0980	2.710	2111	0.102	2.83
1145	0.0975	2.700	2111A	0.102	2.83
1345	0.0975	2.705	2111B	0.102	2.83
1445	0.0975	2.700	2012	0.102	2.82
1150	0.0975	2.705	2013	0.099	2.73
1350	0.0975	2.705	2014	0.101	2.80
1350A	0.0975	2.700	2014A	0.101	2.80
1450	0.0975	2.705	2214	0.101	2.80
1370	0.0975	2.700			
1275	0.0975	2.705			
			2015	0.102	2.83
1185	0.0975	2.700			

**CALCULATED NOMINAL DENSITIES FOR ACTIVE  
WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS (continued)**

Designation	Density		Designation	Density	
	lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>		lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>
2016	0.101	2.79	2045	0.102	2.82
2017	0.101	2.79	2050	0.098	2.70
2017A	0.101	2.79	2055	0.097	2.70
2117	0.099	2.75	2056	0.100	2.78
2018	0.102	2.82	2060	0.098	2.72
2218	0.101	2.81	2065	0.097	2.70
2618	0.100	2.76	2070	0.097	2.68
2618A	0.100	2.77			
2219	0.103	2.84			
2319	0.103	2.84	+ 2071	0.097	2.69
2419	0.102	2.84	+ 2073	0.096	2.66
2519	0.102	2.82	+ 2074	0.097	2.70
2021	0.103	2.84	+ 2075	0.098	2.71
2022	0.101	2.80			
+ 2122	0.101	2.80	2076	0.095	2.64
2023	0.100	2.77	+ 2081	0.098	2.71
2024	0.100	2.78	+ 2085	0.095	2.63
2024A	0.100	2.77			
2124	0.100	2.78	2090	0.093	2.59
+ 2124A	0.100	2.78	2091	0.093	2.58
2224	0.100	2.77			
2224A	0.100	2.78	2094	0.098	2.72
2324	0.100	2.77			
2424	0.100	2.77	2095	0.098	2.70
2524	0.100	2.78	2195	0.098	2.71
2624	0.100	2.77	2295	0.097	2.70
2724	0.100	2.78	+ 2395	0.097	2.69
2824	0.100	2.77			
2025	0.101	2.81	2196	0.095	2.63
2026	0.100	2.77	2296	0.095	2.63
2027	0.101	2.79			
2028	0.102	2.83	2097	0.096	2.65
2028A	0.101	2.80	2197	0.095	2.64
2028B	0.102	2.81	2297	0.096	2.65
2028C	0.102	2.82	2397	0.096	2.65
2029	0.100	2.77			
2030	0.102	2.81	2098	0.097	2.70
2031	0.100	2.77	2198	0.097	2.69
2032	0.100	2.76			
+ 2033	0.100	2.77	2099	0.095	2.63
2034	0.101	2.79	2199	0.095	2.64
2036	0.100	2.75			
2037	0.099	2.74	+ 3001	0.098	2.73
2038	0.099	2.73			
2039	0.101	2.81	3002	0.098	2.70
2139	0.102	2.81	3102	0.098	2.71
2040	0.102	2.81			
2041	0.103	2.84	3003	0.099	2.73
+ 2042	0.101	2.80	3103	0.099	2.73
+ 2043	0.095	2.63	3103A	0.098	2.72
2044	0.102	2.81	3103B	0.098	2.73
			3203	0.098	2.73
			3403	0.099	2.73
			3004	0.098	2.72
			3004A	0.098	2.71
			3104	0.098	2.72
			3204	0.098	2.71
			3304	0.098	2.72
			3005	0.098	2.73
			3005A	0.099	2.73
			3105	0.098	2.72
			3105A	0.098	2.71
			3105B	0.098	2.72

**CALCULATED NOMINAL DENSITIES FOR ACTIVE  
WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS (continued)**

Designation	Density		Designation	Density	
	lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>		lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>
3007	0.098	2.72	4043A	0.097	2.69
3107	0.098	2.72	4143	0.097	2.69
3207	0.098	2.71	4343	0.097	2.68
3207A	0.098	2.72	4643	0.097	2.69
3307	0.098	2.72	4943	0.097	2.68
3009	0.099	2.73	4044	0.097	2.67
3010	0.098	2.72	4045	0.096	2.67
3110	0.098	2.72	4145	0.099	2.74
3011	0.099	2.73	4145A	0.099	2.74
3012	0.098	2.72	4046	0.096	2.66
3012A	0.098	2.72	4047	0.096	2.66
3013	0.099	2.74	4047A	0.096	2.66
3014	0.099	2.75	4147	0.096	2.66
3015	0.098	2.72	+ 4060	0.097	2.69
3016	0.098	2.72	5005	0.098	2.70
3017	0.099	2.73	5005A	0.097	2.69
3019	0.099	2.73	5205	0.097	2.70
3020	0.099	2.73	5305	0.097	2.69
3021	0.098	2.72	5505	0.097	2.69
3025	0.098	2.72	5605	0.097	2.69
3026	0.098	2.72	5006	0.098	2.71
3030	0.098	2.72	5106	0.098	2.71
3130	0.098	2.71	5010	0.098	2.71
3065	0.098	2.73	5110	0.097	2.69
4004	0.096	2.65	5110A	0.098	2.70
4104	0.096	2.65	5210	0.097	2.69
4006	0.098	2.71	5310	0.097	2.69
4007	0.099	2.74	5016	0.097	2.70
4008	0.096	2.67	5017	0.097	2.69
4009	0.097	2.70	5018	0.096	2.67
4010	0.096	2.67	5018A	0.097	2.67
4013	0.098	2.71	+ 5018B	0.097	2.68
4014	0.097	2.70	5019	0.096	2.65
4015	0.098	2.71	5019A	0.096	2.65
4015A	0.098	2.71	5119	0.096	2.65
4115	0.098	2.72	5119A	0.096	2.65
4016	0.099	2.73	5021	0.097	2.68
4017	0.098	2.72	5022	0.096	2.66
4018	0.096	2.67	5023	0.095	2.64
4019	0.099	2.74	5024	0.096	2.65
4020	0.098	2.71	5026	0.097	2.69
4021	0.097	2.69	5027	0.096	2.65
+ 4025	0.098	2.72	5028	0.097	2.67
4026	0.099	2.73	5040	0.098	2.72
4032	0.097	2.68	5140	0.098	2.71
4043	0.097	2.69	5041	0.097	2.67
			5042	0.096	2.67
			5043	0.098	2.72
			5049	0.097	2.70
			5149	0.097	2.69
			5249	0.097	2.70
			5349	0.097	2.70



**CALCULATED NOMINAL DENSITIES FOR ACTIVE  
WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS (continued)**

Designation	Density		Designation	Density	
	lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>		lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>
5449	0.097	2.70	5086	0.096	2.66
5449A	0.098	2.70	5186	0.096	2.66
5050	0.097	2.69	5087	0.096	2.66
5050A	0.097	2.69	5187	0.096	2.66
5050C	0.097	2.70	5088	0.096	2.65
5150	0.097	2.68	6101	0.097	2.70
5051	0.097	2.69	6101A	0.097	2.69
5051A	0.097	2.69	6101B	0.097	2.70
5151	0.097	2.68	6201	0.097	2.69
5251	0.097	2.69	6201A	0.097	2.69
5251A	0.097	2.69	6401	0.097	2.69
5351	0.097	2.68	6501	0.098	2.70
5451	0.097	2.68	6002	0.097	2.70
5052	0.097	2.68	6003	0.097	2.70
5252	0.096	2.67	6103	0.098	2.70
5352	0.097	2.67	6005	0.097	2.70
5154	0.096	2.66	6005A	0.098	2.70
5154A	0.096	2.67	6005B	0.097	2.70
5154B	0.096	2.67	6005C	0.098	2.70
5154C	0.096	2.66	6105	0.097	2.70
5254	0.096	2.66	6205	0.098	2.71
5354	0.097	2.69	6305	0.097	2.70
5454	0.097	2.69	6006	0.098	2.70
5554	0.097	2.69	6106	0.098	2.70
5654	0.096	2.66	6206	0.098	2.71
5654A	0.096	2.66	6306	0.097	2.70
5754	0.097	2.67	6008	0.098	2.70
5854	0.097	2.67	6009	0.098	2.71
5954	0.096	2.66	6010	0.098	2.71
5056	0.095	2.64	6110	0.098	2.71
5356	0.096	2.64	6110A	0.098	2.71
5356A	0.096	2.64	6011	0.099	2.73
5456	0.096	2.66	6111	0.098	2.71
5456A	0.096	2.66	6012	0.099	2.74
5456B	0.096	2.66	6012A	0.099	2.74
5556	0.096	2.66	6013	0.098	2.71
5556A	0.096	2.65	6113	0.098	2.71
5556B	0.096	2.65	6014	0.098	2.70
5556C	0.096	2.66	6015	0.097	2.69
5257	0.097	2.70	6016	0.098	2.70
5457	0.097	2.69	6016A	0.098	2.70
5557	0.097	2.70	6116	0.097	2.70
5657	0.097	2.69	6018	0.099	2.74
5058	0.097	2.67	6019	0.098	2.71
5059	0.096	2.66	6020	0.099	2.73
5070	0.097	2.68	6021	0.098	2.72
5180	0.097	2.70	6022	0.097	2.69
5180A	0.097	2.70	6023	0.099	2.73
5082	0.096	2.65	6024	0.098	2.72
5182	0.096	2.65	6025	0.097	2.70
5083	0.096	2.66	6026	0.099	2.74
5183	0.096	2.66			
5183A	0.096	2.66			
5283	0.096	2.65			
5283A	0.096	2.65			
5283B	0.096	2.66			
5383	0.096	2.66			
5483	0.096	2.66			

**CALCULATED NOMINAL DENSITIES FOR ACTIVE  
WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS (continued)**

Designation	Density		Designation	Density	
	lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>		lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>
6027	0.097	2.70	6082A	0.098	2.70
6028	0.099	2.74	6182	0.098	2.71
6031	0.098	2.70	+ 6086	0.098	2.71
6032	0.097	2.70	6091	0.097	2.70
6033	0.099	2.73	6092	0.098	2.70
6040	0.099	2.73	+ 6099	0.098	2.71
6041	0.099	2.73	7003	0.101	2.80
6042	0.098	2.72	7004	0.100	2.77
6043	0.098	2.72	7204	0.100	2.78
+ 6050	0.099	2.74	7005	0.100	2.77
6151	0.098	2.71	7108	0.100	2.78
6351	0.098	2.71	7108A	0.101	2.78
6351A	0.098	2.71	7009	0.101	2.80
6451	0.098	2.70	7010	0.102	2.82
6951	0.098	2.70	7012	0.101	2.81
6053	0.097	2.69	7014	0.101	2.79
6055	0.098	2.72	7015	0.100	2.77
6056	0.098	2.72	7016	0.100	2.78
6156	0.098	2.72	7116	0.101	2.78
6060	0.097	2.70	7017	0.100	2.76
6160	0.097	2.70	7018	0.101	2.79
6260	0.098	2.70	7019	0.100	2.76
6360	0.098	2.70	7019A	0.100	2.75
6460	0.097	2.70	7020	0.100	2.78
6460B	0.097	2.70	7021	0.101	2.78
6560	0.098	2.70	7022	0.100	2.77
6660	0.098	2.70	7122	0.100	2.76
6061	0.098	2.70	7023	0.100	2.78
6061A	0.098	2.70	7024	0.100	2.77
+ 6061B	0.097	2.70	7025	0.100	2.77
6261	0.098	2.70	7026	0.100	2.78
6361	0.097	2.70	7028	0.100	2.77
6162	0.097	2.70	7029	0.100	2.77
6262	0.098	2.72	7129	0.100	2.78
6262A	0.098	2.72	7229	0.100	2.77
6063	0.097	2.70	7030	0.101	2.79
6063A	0.097	2.70	7031	0.099	2.74
6463	0.097	2.69	7032	0.102	2.82
6463A	0.097	2.69	7033	0.101	2.79
6763	0.097	2.69	7034	0.105	2.90
6963	0.097	2.70	7035	0.099	2.75
6064	0.098	2.72	7035A	0.099	2.75
6064A	0.098	2.72	7036	0.104	2.88
6065	0.098	2.72	7136	0.104	2.88
6066	0.098	2.72	7037	0.103	2.85
6068	0.099	2.73	7039	0.099	2.74
6069	0.098	2.70			
6070	0.098	2.71			
6081	0.097	2.70			
6181	0.097	2.69			
6181A	0.098	2.70			
6082	0.098	2.70			

**CALCULATED NOMINAL DENSITIES FOR ACTIVE  
WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS (continued)**

Designation	Density		Designation	Density	
	lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>		lbs/in. <sup>3</sup>	(kg/m <sup>3</sup> ) x 10 <sup>3</sup>
7040	0.102	2.82	8010	0.098	2.72
7140	0.102	2.83	8011	0.098	2.71
7041	0.101	2.80	8011A	0.098	2.71
7042	0.102	2.84	8111	0.098	2.71
7046	0.102	2.82	8211	0.098	2.72
7046A	0.102	2.81	8112	0.098	2.72
7047	0.102	2.82	8014	0.099	2.73
7049	0.103	2.84	8015	0.098	2.72
7049A	0.103	2.84	8016	0.098	2.72
7149	0.103	2.84	8017	0.098	2.71
7249	0.103	2.84	8018	0.098	2.72
7349	0.103	2.85	8019	0.106	2.92
7449	0.103	2.85	8021	0.098	2.73
7050	0.102	2.83	8021A	0.098	2.72
7050A	0.102	2.82	8021B	0.098	2.72
7150	0.102	2.83	8022	0.102	2.83
7055	0.103	2.86	8023	0.099	2.74
7155	0.104	2.87	8024	0.088	2.43
7255	0.103	2.86	8025	0.098	2.71
7056	0.104	2.87	8026	0.099	2.73
7060	0.103	2.85	8030	0.098	2.71
+ 7160	0.103	2.85	8130	0.098	2.71
7064	0.103	2.85	8040	0.098	2.71
7065	0.103	2.86	8050	0.099	2.73
7068	0.103	2.85	8150	0.098	2.73
7168	0.103	2.86	8076	0.098	2.71
7072	0.098	2.72	8076A	0.098	2.71
7075	0.101	2.81	8176	0.098	2.71
7175	0.101	2.80	8077	0.098	2.70
7475	0.101	2.81	8177	0.098	2.70
7076	0.102	2.84	8079	0.098	2.72
7178	0.102	2.83	8090	0.092	2.54
7278	0.102	2.83	8091	0.092	2.54
7278A	0.102	2.82	8093	0.092	2.55
7081	0.102	2.83			
7181	0.102	2.84			
7085	0.103	2.85			
7185	0.103	2.85			
7090	0.103	2.85			
7093	0.103	2.86			
7095	0.104	2.89			
+ 7097	0.102	2.84			
7099	0.103	2.85			
7199	0.103	2.85			
8005	0.098	2.71			
8006	0.099	2.74			
8007	0.100	2.76			
8008	0.099	2.74			

**PREVIOUSLY ASSIGNED BUT PRESENTLY INACTIVE ALLOY DESIGNATIONS**<sup>19</sup>

<u>DESIGNATION</u>	<u>DATE RECLASSIFIED</u>	<u>DESIGNATION</u>	<u>DATE RECLASSIFIED</u>
1030	1988-05-23	4543	1997-02-03
1035	2005-04-13	4245	1968-08-19
1040	2005-04-13	(Redesignated 4048)	
1045	2005-04-13	4048	2005-04-13
1130	1966-09-09	X5002	1963-06-03
1330	1964-12-18	5004	1967-04-26
1135	1997-02-03	5105	1960-04-28
1335	1966-09-09	5405	1966-07-12
1245	1966-09-09	5007	1968-05-13
1250	1988-05-23	5008	1968-05-13
1055	1988-05-23	5009	1968-05-13
1160	1958-04-22	5011	1967-04-26
(Superseded by 1060)		X5012	1970-06-30
1260	2005-04-13	5013	1996-10-02
1360	1965-12-09	5014	1997-11-28
1165	1966-07-12	X5015	1968-08-19
1170	1997-02-03	X5020	1977-08-04
1270	1966-07-12	X5220	1962-01-11
1075	1988-05-23	5025	2005-06-02
1175	1997-02-03	5034	1973-08-09
1180	1997-02-03	5039	1975-11-24
1187	1958-09-10	5250	2005-04-13
(Superseded by 1188)		5050B	1996-03-15
1095	1988-05-23	5152	1963-06-03
1197	1958-09-10	X5452	1971-06-17
(Superseded by 1199)		5552	1997-02-03
1099	1965-12-09	5652	2005-04-13
2003	1997-11-28	5053	1968-08-19
X2316 <sup>21</sup>	1965-03-31	X5153	1967-04-26
X2119	1966-03-07	5854 <sup>19</sup>	1996-10-02
2020	1974-11-01	X5055	1956-10-19
2225	1966-07-12	5155	1971-07-14
2048	2005-04-13	5056A <sup>14</sup>	1992-02-21
2053	1983-11-09	5357	2005-04-13
2080	2005-06-02	5757	1963-05-14
X2096	2000-12-08	5857	1963-06-10
3303	1997-02-03	5957	1963-06-03
3205	1965-11-05	X5080	1963-10-22
3006	2005-04-13	5280	1996-10-02
3008	1996-03-15	X5084	1965-04-27
3018	1998-01-16	X5184	1965-04-27
4001	1965-11-05	X5085	1977-08-04
4101	1965-11-05	X5090	1977-07-18
4002	1981-05-29	5091	2000-04-26
X4003	1975-01-27	6001	1955-07-08
X4005	1977-06-01	6301	2005-04-13
4011	2005-06-02	6004	2005-04-13
4012	1965-11-05		

See footnotes on page 18.

**PREVIOUSLY ASSIGNED BUT PRESENTLY INACTIVE ALLOY DESIGNATIONS**<sup>19</sup>

<u>DESIGNATION</u>	<u>DATE RECLASSIFIED</u>	<u>DESIGNATION</u>	<u>DATE RECLASSIFIED</u>
6007	2005-04-13	X8003	1964-12-18
6017	1997-02-03	8004	1996-10-02
X6030	2001-01-25	8009	2000-06-19
6051	1963-12-12	8212	1967-04-26
X6251	1965-03-31	8013	1971-11-01
6253	2002-05-22	8020	2005-04-13
6460A	2011-01-03	8276	1996-10-02
X6161	1963-06-03	8280 <sup>8</sup>	2005-04-13
6062	1964-09-04	X8380	1964-12-18
X6163	1964-12-18	X8480	1964-12-18
6263	1955-07-12	8081	1997-02-03
6363	1964-12-18	X8090A	1989-01-13
6563	1967-04-26	X8092	1991-10-24
6663	1967-04-26	X8192	1991-10-24
6863	1996-10-02		
X6064 <sup>18</sup>	1965-03-31		
X6067	1974-11-01		
6071	1966-07-12		
6090	1992-06-01		
7001	1997-02-03		
7002	1966-07-12		
7104	1988-05-23		
X7006	1963-09-10		
X7106	1980-04-16		
X7007	1972-02-16		
7008	2005-04-13		
7109	1996-03-15		
7011	1999-06-17		
7013	1997-02-03		
7027	1996-06-26		
X7038	1967-04-26		
7139	1966-09-09		
7146	1997-02-03		
7250	2014-10-16		
7051	1996-10-02		
7070	1988-05-23		
X7272	1965-03-31		
7472	1997-02-03		
X7275	1963-06-03		
7277 <sup>8</sup>	2000-11-06		
7079	1989-03-22		
7179	1989-06-06		
X7279	1963-06-03		
X7080	1971-01-04		
7091	1997-02-03		
8001	1997-02-03		
X8002	1964-12-18		

## REGISTERED CHEMICAL COMPOSITION LIMITS OF INACTIVE ORIGINAL ALLOYS<sup>1,2</sup>

Registered International Designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr		OTHERS <sup>13</sup>		Al Minimum
No. <sup>17</sup>	By																				Each	Total <sup>13</sup>	
1030	USA	0.35	0.6	0.10	0.05	0.05	...	...	0.10	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.30 <sup>4</sup>
1035	USA	0.35	0.6	0.10	0.05	0.05	...	...	0.10	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.35 <sup>4</sup>
1040	USA	0.30	0.50	0.10	0.05	0.05	...	...	0.10	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.40 <sup>4</sup>
1045	USA	0.30	0.45	0.10	0.05	0.05	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.45 <sup>4</sup>
1055	USA	0.25	0.40	0.05	0.05	0.05	...	...	0.05	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.55 <sup>4</sup>
1075	USA	0.20	0.20	0.04	0.03	0.03	...	...	0.04	0.03	...	...	...	...	...	...	...	0.05	...	...	0.03	...	99.75 <sup>4</sup>
1095	USA	0.030	0.040	0.010	0.010	0.010	...	...	0.010	0.005	...	...	...	...	...	...	...	...	...	...	0.005	...	99.95 <sup>5</sup>
1099	USA	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	99.99 <sup>5</sup>
2003	EAA	0.30	0.30	4.0-5.0	0.30-0.8	0.02	...	...	0.10	0.15	...	...	...	...	...	...	...	0.05-0.20	0.10-0.25	0.05-0.20 Cd	0.05	0.15	Rem.
2020	USA	0.40	0.40	4.0-5.0	0.30-0.8	0.03	...	...	0.25	0.10	...	...	...	...	0.9-1.7	...	...	...	...	0.10-0.35 Cd	0.05	0.15	Rem.
2048	USA	0.15	0.20	2.8-3.8	0.20-0.6	1.2-1.8	...	...	0.25	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2053	SWITZERLAND	0.30	0.50	1.2-1.8	0.20	0.20-0.50	...	...	0.10	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
2080	USA	0.10	0.20	3.3-4.1	0.25	1.5-2.2	...	...	0.10	...	...	...	...	...	...	...	...	...	0.08-0.25	0.005 Be, 0.05-0.50 O	0.05	0.15	Rem.
X2096	USA	0.12	0.15	2.3-3.0	0.25	0.25-0.8	...	...	0.25	0.10	0.25-0.6	...	...	...	1.3-1.9	...	...	...	0.04-0.18	...	0.05	0.15	Rem.
3006	USA	0.50	0.7	0.10-0.30	0.50-0.8	0.30-0.6	0.20	...	0.15-0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
3008	GERMANY	0.40	0.7	0.10	1.2-1.8	0.01	0.05	0.05	0.05	0.10	...	...	...	...	...	...	...	...	0.10-0.50	...	0.05	0.15	Rem.
3018	FRANCE	0.30	0.15-0.25	0.10-0.30	1.1-1.4	0.8-1.4	0.10	...	0.25	0.10	...	...	...	...	...	0.01	...	...	...	...	0.05	0.15	Rem.
4001	USA	1.5-2.5	0.8	0.20	0.10	0.05	...	...	0.10	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4002	USA	3.5-4.5	0.35	0.05-0.15	0.03	0.05-0.15	...	...	0.15	0.02	...	...	...	...	...	...	...	...	...	0.8-1.4 Cd	0.05	0.15	Rem.
X4003	USA	6.8-8.2	0.8	0.25	0.10	2.0-3.0	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
X4005	USA	9.5-11.0	0.8	0.25	0.10	0.20-1.0	...	...	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
4011	USA	6.5-7.5	0.20	0.20	0.10	0.45-0.7	...	...	0.10	0.04-0.20	...	...	...	...	...	...	...	...	...	0.04-0.07 Be	0.05	0.15	Rem.
4012	USA	11.0-13.0	0.8	1.0-2.0	0.5-0.9	0.45-1.0	...	...	1.0	...	...	...	...	...	...	...	...	...	...	...	...	...	Rem.
4048	USA	9.3-10.7	0.8	3.3-4.7	0.07	0.07	0.07	...	9.3-10.7	...	...	...	...	...	...	...	...	...	...	6	0.05	0.15	Rem.
X5002	USA	0.10	0.15	0.10-0.20	...	0.9-1.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5004	USA	0.40	0.7	0.40	0.30	0.7-1.4	0.10	...	1.0	0.15	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5007	USA	0.006	0.006	0.006	0.001	0.40-0.6	0.001	0.001	0.003	0.002	...	...	...	...	...	...	...	...	...	...	0.002	...	99.35
5008	USA	0.006	0.006	0.006	0.001	0.9-1.1	0.001	0.001	0.003	0.002	...	...	...	...	...	...	...	...	...	...	0.002	...	98.85
5009	USA	0.006	0.006	0.006	0.001	1.8-2.2	0.001	0.001	0.003	0.002	...	...	...	...	...	...	...	...	...	...	0.002	...	97.75
5011	USA	0.6	0.7	0.20	0.40-0.8	0.6-1.0	0.10	...	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
X5012	USA	0.08	0.10	0.10	0.05	1.6-2.1	...	...	0.03	0.03	...	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.
5013	FRANCE	0.20	0.25	0.03	0.30-0.50	3.2-3.8	0.03	0.03	0.10	0.10	...	...	...	...	...	0.003	...	...	0.05	...	0.05	0.15	Rem.
5014	EAA	0.40	0.40	0.20	0.20-0.9	4.0-5.5	0.20	...	0.7-1.5	0.20	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
X5015	USA	...	...	0.03-0.10	0.03-0.15	0.50-1.0	...	...	...	0.02	...	...	...	...	...	...	...	...	...	0.03 Si+Fe	0.01	0.02	Rem.
X5020	USA	0.30	0.7	1.3-1.9	0.10-0.50	2.4-3.2	0.20	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5025	USA	0.25	0.25	0.10	0.20	4.5-6.0	0.20	...	0.25	0.05-0.20	...	...	...	...	...	...	...	...	0.10-0.25	0.0008 Be, 0.05-0.55 Sc	0.05	0.15	Rem.
5034	USA	0.40	0.40-0.9	0.40	0.20-0.50	0.6-1.1	0.10	...	0.40	0.10	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.
5039	USA	0.10	0.40	0.03	0.30-0.50	3.3-4.3	0.10-0.20	...	2.4-3.2	0.10	...	...	...	...	...	...	...	...	...	0.0008 Be	0.05	0.10	Rem.
5053	USA	...	...	0.03-0.10	0.03-0.10	3.1-3.9	...	...	...	0.02	...	...	...	...	...	...	...	...	...	0.03 Si+Fe	0.01	0.02	Rem.

++ See footnotes on page 18.

**REGISTERED CHEMICAL COMPOSITION LIMITS OF INACTIVE ORIGINAL ALLOYS<sup>1,2</sup>**

Registered International Designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>		Al Minimum			
No. <sup>17</sup>	By																			Each	Total <sup>13</sup>				
X5055	USA	0.30	0.7	0.25	0.30-0.8	4.0-5.0	0.25	...	0.25	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.		
X5080	USA	...	...	0.10	0.20-0.7	3.5-4.5	0.05-0.20	...	1.7-2.8	0.20	...	...	...	...	...	...	...	...	...	...	0.35 Si + Fe	0.05	0.15	Rem.	
X5084	USA	0.40	0.40	...	0.9	5.0 (Nom.)	0.10 (Nom.)	...	2.0 (Nom.)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Rem.	
X5085	USA	0.30	0.40	0.15	0.20	5.8-6.8	0.20	...	0.20	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
X5090	USA	0.50	0.50	0.25	0.35	6.0-8.0	0.05-0.30	...	0.20	0.02	...	0.001-0.05	...	...	...	...	...	...	...	...	0.001-0.02 Be	0.05	0.15	Rem.	
5091	USA	0.20	0.30	...	...	3.7-4.2	...	...	...	...	...	...	...	...	1.2-1.4	...	...	...	...	...	1.0-1.3 C, 0.20-0.7 O	0.05	0.15	Rem.	
6001	USA	0.35-0.7	0.6	0.10	0.03	0.35-0.7	0.03	...	0.10	...	...	...	...	...	...	...	...	...	...	...	...	0.03	0.10	Rem.	
6004	USA	0.30-0.6	0.10-0.30	0.10	0.20-0.6	0.40-0.7	...	...	0.05	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
6007	USA	0.9-1.4	0.7	0.20	0.05-0.25	0.6-0.9	0.05-0.25	...	0.25	0.15	...	...	...	...	...	...	...	...	0.05-0.20	...	...	0.05	0.15	Rem.	
6017	USA	0.55-0.7	0.15-0.30	0.05-0.20	0.10	0.45-0.6	0.10	...	0.05	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
X6030	USA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.35	...	0.25	0.15	...	...	...	...	...	...	0.05-0.50	...	...	...	0.05-0.50 In	0.05	0.15	Rem.	
6051	USA	0.6-1.2	1.0	0.15	0.20	0.45-0.8	...	...	0.25	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
6062	USA	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.14	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
X6067	USA	0.9-1.8	0.7	0.9-2.0	0.40-1.2	0.7-1.5	0.20	...	0.25	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
6071	USA	1.1-1.9	0.50	0.15-0.40	0.40-1.0	0.8-1.4	0.10	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
6090	USA	0.40-0.8	0.7	0.30-0.9	0.15	0.8-1.2	0.15	...	0.25	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05-0.7 O	0.05	0.15	Rem.
7001	USA	0.35	0.40	1.6-2.6	0.20	2.6-3.4	0.18-0.35	...	6.8-8.0	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7002	USA	0.20	0.40	0.50-1.0	0.05-0.30	2.0-3.0	0.10-0.30	...	3.0-4.0	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
X7006	USA	...	...	0.10	0.50	1.7-2.8	0.30	...	3.7-4.8	0.15	...	...	...	...	...	...	...	...	...	...	...	0.35 Si+Fe	0.05	0.15	Rem.
X7007	USA	...	...	0.25	0.40	1.4-2.2	0.05-0.25	...	6.0-7.0	0.01-0.06	...	...	...	...	...	...	...	...	0.05-0.25	...	0.40 Si+Fe	0.05	0.15	Rem.	
7008	USA	0.10	0.10	0.05	0.05	0.7-1.4	0.12-0.25	...	4.5-5.5	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.10	Rem.	
7011	USA	0.15	0.20	0.05	0.10-0.30	1.0-1.6	0.05-0.20	...	4.0-5.5	0.05	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7013	USA	0.6	0.7	0.10	1.0-1.5	...	...	...	1.5-2.0	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7027	SWITZERLAND	0.25	0.40	0.10-0.30	0.10-0.40	0.7-1.1	...	...	3.5-4.5	0.10	...	...	...	...	...	...	...	...	0.05-0.30	...	...	0.05	0.15	Rem.	
X7038	USA	0.20	0.35	0.10	0.10-0.35	3.0-4.0	0.05-0.25	...	4.0-5.0	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7051	FRANCE	0.35	0.45	0.15	0.10-0.45	1.7-2.5	0.05-0.25	...	3.0-4.0	0.15	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7070	USA	0.15	0.25	0.05	...	...	...	...	1.3-1.8	...	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7277	USA	0.50	0.7	0.8-1.7	...	1.7-2.3	0.18-0.35	...	3.7-4.3	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7079	USA	0.30	0.40	0.40-0.8	0.10-0.30	2.9-3.7	0.10-0.25	...	3.8-4.8	0.10	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
X7080	USA	0.30	0.40	0.50-1.5	0.10-0.7	1.5-3.0	0.12	...	5.0-7.0	0.20	...	...	...	...	...	...	...	...	...	...	...	0.05	0.15	Rem.	
7091	USA	0.12	0.15	1.1-1.8	...	2.0-3.0	...	...	5.8-7.1	...	...	...	...	...	...	...	...	...	...	...	...	0.20-0.6 Co, 0.20-0.50 O	0.05	0.15	Rem.
8001	USA	0.17	0.45-0.7	0.15	...	...	...	0.9-1.3	0.05	...	...	0.001	...	...	0.008	...	...	...	...	...	0.003 Cd, 0.001 Co	0.05	0.15	Rem.	
X8002	USA	0.25	1.2-1.6	0.05	...	...	...	1.2-1.6	...	...	...	0.001	...	...	0.008	...	...	...	...	...	0.003 Cd, 0.001 Co	0.05	0.15	Rem.	
X8003	USA	0.02	1.2-1.6	...	...	...	...	1.2-1.6	...	...	...	0.001	...	...	0.008	...	...	...	...	...	0.003 Cd, 0.001 Co	...	0.03	Rem.	
8004	FRANCE	0.15	0.15	0.03	0.02	0.02	...	...	0.03	0.30-0.7	...	...	...	...	...	...	...	...	...	...	...	0.02	0.15	Rem.	
8009	USA	1.7-1.9	8.4-8.9	...	0.10	...	0.10	...	0.25	0.10	...	...	...	...	...	...	...	1.1-1.5	...	...	0.30 O	0.05	0.15	Rem.	

See footnotes on page 18.

**REGISTERED CHEMICAL COMPOSITION LIMITS OF INACTIVE ORIGINAL ALLOYS<sup>1,2</sup>**

Registered International Designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	B	Bi	Ga	Li	Pb	Sn	V	Zr	OTHERS <sup>13</sup>	Al		
No. <sup>17</sup>	By																				Each	Total <sup>13</sup>	Minimum
8013	USA	...	...	...	...	...	0.20-0.50	...	...	0.10	...	...	...	...	...	...	...	...	...	0.25 Si+Fe	0.03	0.10	Rem.
8020	USA	0.10	0.10	0.005	0.005	...	...	...	0.005	...	...	...	0.10-0.50	...	...	...	0.10-0.25	0.05	...	...	0.03	0.10	Rem.
8280	USA	1.0-2.0	0.7	0.7-1.3	0.10	...	...	0.20-0.7	0.05	0.10	...	...	...	...	...	...	5.5-7.0	...	...	...	0.05	0.15	Rem.
8081	USA	0.7	0.7	0.7-1.3	0.10	...	...	...	0.05	0.10	...	...	...	...	...	...	18.0-22.0	...	...	...	0.05	0.15	Rem.
X8092	USA	0.10	0.15	0.50-0.8	0.05	0.9-1.4	0.05	...	0.10	0.15	...	...	...	...	2.1-2.7	...	...	...	0.08-0.15	...	0.05	0.15	Rem.

See footnotes on page 18.



**CROSS REFERENCE OF INTERNATIONAL DESIGNATIONS**

**DECLARATION OF ACCORD (DOA) TO ISO\***

DOA DESIGNATION	FORMER ISO DESIGNATION	DOA DESIGNATION	FORMER ISO DESIGNATION	DOA DESIGNATION	FORMER ISO DESIGNATION
1050A	Al99.5	3105	AlMn0.5Mg0.5	6101	E-AlMgSi
1350	E-Al99.5	4043	AlSi5	6101A	E-AlMgSi(A)
1060	Al99.6	4043A	AlSi5(A)	6005	AlSiMg
1070A	Al99.7	4047	AlSi12	6005A	AlSiMg(A)
1370	E-Al99.7	4047A	AlSi12(A)	6351	AlSi1Mg0.5Mn
1080A	Al99.8(A)	5005	AlMg1(B)	6060	AlMgSi
1100	Al99.0Cu	5019	AlMg5	6061	AlMg1SiCu
1200	Al99.0	5050	AlMg1.5(C)	6262	AlMg1SiPb
2011	AlCu6BiPb	5251	AlMg2	6063	AlMg0.7Si
2014	AlCu4SiMg	5052	AlMg2.5	6063A	AlMg0.7Si(A)
2014A	AlCu4SiMg(A)	5154	AlMg3.5	6181	AlSi1Mg0.8
2017	AlCu4MgSi	5154A	AlMg3.5(A)	6082	AlSi1MgMn
2017A	AlCu4MgSi(A)	5454	AlMg3Mn	7005	AlZn4.5Mg1.5Mn
2117	AlCu2.5Mg	5554	AlMg3Mn(A)	7010	AlZn6MgCu
2219	AlCu6Mn	5754	AlMg3	7020	AlZn4.5Mg1
2024	AlCu4Mg1	5056	AlMg5Cr	7049A	AlZn8MgCu
2030	AlCu4PbMg	5356	AlMg5Cr(A)	7050	AlZn6CuMgZr
3003	AlMn1Cu	5456	AlMg5Mn1	7075	AlZn5.5MgCu
3103	AlMn1	5083	AlMg4.5Mn0.7	7475	AlZn5.5MgCu(A)
3004	AlMn1Mg1	5183	AlMg4.5Mn0.7(A)	7178	AlZn7MgCu
3005	AlMn1Mg0.5	5086	AlMg4		

\*Source: ISO 209-1.

NOTE: This table is included for informational purposes only. ISO 209-1 has been withdrawn and replaced by ISO 209 which references the Teal Sheets as the normative reference and the source for international alloy designations.

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**RECOMMENDATION**  
INTERNATIONAL DESIGNATION SYSTEM  
FOR WROUGHT ALUMINUM AND WROUGHT ALUMINUM ALLOYS

15 December 1970  
Revised June 2014

This Recommendation is based on the numerical designation system for wrought aluminum and wrought aluminum alloys which was adopted in the U.S.A. in 1954, and became its national standard in 1957. This Recommendation was officially adopted by the International Signatories of the Declaration of Accord on December 15, 1970.

Designations, registered in accordance with this Recommendation, may be used by any country. For use, see Appendixes A, B, and C.

A numerical designation assigned in conformance with this Recommendation should only be used to indicate an aluminum or an aluminum alloy having chemical composition limits identical to those registered with the Signatories to the Declaration of Accord on an International Alloy Designation System for Wrought Aluminum and Wrought Aluminum Alloys.

1. Scope

This recommendation describes a four-digit numerical system for designating wrought aluminum and wrought aluminum alloys.

2. Alloy Groups <sup>1, 2, 3, 6</sup>

The first of the four digits in the designation indicates the alloy group as follows:

Aluminum, 99.00 percent and greater.....	1xxx
Aluminum alloys grouped by major alloying elements	
Copper.....	2xxx
Manganese.....	3xxx
Silicon.....	4xxx
Magnesium.....	5xxx
Magnesium and Silicon.....	6xxx
Zinc.....	7xxx
Other elements.....	8xxx
Unused series.....	9xxx

3. 1xxx Group

The designation assigned shall be in the 1xxx group whenever the minimum aluminum content is specified as 99.00 percent and greater. In the 1xxx group, the last two of the four digits in the designation indicate the minimum aluminum percentage<sup>4</sup>. These digits are the same as the two digits to the right of the decimal point in minimum aluminum percentage when it is expressed to the nearest 0.01 percent. The second digit in the alloy designation indicates alloy modifications in impurity limits or alloying elements. If the second digit in the designation is zero, it indicates unalloyed aluminum having natural impurity limits; integers 1 through 9, which are assigned consecutively as needed, indicate special control of one or more individual impurities or alloying elements.

4. 2xxx-8xxx Groups

The alloy designation in the 2xxx through 8xxx groups is determined by the alloying element (Mg<sub>2</sub>Si for 6xxx alloys) present in the greatest mean percentage. If the greatest mean percentage is common to more than one alloying element, choice of group shall be in order of group sequence Cu, Mn, Si, Mg, Mg<sub>2</sub>Si, Zn or Others. In the 2xxx through 8xxx alloy groups the last two of the four digits in the designation have no special significance but serve only to identify the different aluminum alloys in the group. The second digit in the alloy designation indicates the original alloy<sup>5</sup> and alloy modifications; integers 1 through 9, which are assigned consecutively, indicate alloy modifications.

5. Modifications

A modification of the original alloy <sup>5</sup> is limited to any one or a combination of the following:

- (a) Change of not more than the following amounts in the arithmetic mean of the limits for an individual alloying element or combination of elements expressed as an alloying element or both:

<u>Arithmetic Mean of Limits for Alloying Elements in Original Alloy</u>	<u>Maximum Change</u>
Up through 1.0 percent	0.15
Over 1.0 through 2.0 percent	0.20
Over 2.0 through 3.0 percent	0.25
Over 3.0 through 4.0 percent	0.30
Over 4.0 through 5.0 percent	0.35
Over 5.0 through 6.0 percent	0.40
Over 6.0 percent	0.50

To determine compliance when maximum and minimum limits are specified for a combination of two or more elements in one alloy composition, the arithmetic mean of such combination is compared to the sum of the mean values of the same individual elements, or any combination thereof, in another alloy composition.

- (b) Addition or deletion of not more than one alloying element with limits having an arithmetic mean of not more than 0.30 percent, or addition or deletion of not more than one combination of elements expressed as an alloying element with limits having a combined arithmetic mean of not more than 0.40 percent.
- (c) Substitution of one alloying element for another element serving the same purpose.
- (d) Change in limits for impurities expressed singly or as a combination.
- (e) Change in limits for grain refining elements.
- (f) Maximum iron or silicon limits of 0.12 percent and 0.10 percent, or less, respectively, reflecting high purity base metal.

An alloy shall not be registered as a modification if it meets the requirements for a variation.

6. Variations

Variations of wrought aluminum and wrought aluminum alloys registered in accordance with this Recommendation are identified by a serial letter after the numerical designation. The serial letters are assigned in alphabetical sequence starting with A for the first variation registered, but omitting I, O, and Q.

A variation has composition limits which are similar but not identical to a modification or an original alloy, with differences such as:

- (a) Change of not more than the following amounts in the arithmetic mean of the limits for an individual alloying element or combination of elements expressed as an alloying element or both:

<u>Arithmetic Mean of Limits for Alloying Elements in Original Alloy or Modification</u>	<u>Maximum Change</u>
Up through 1.0 percent	0.15
Over 1.0 through 2.0 percent	0.20
Over 2.0 through 3.0 percent	0.25
Over 3.0 through 4.0 percent	0.30
Over 4.0 through 5.0 percent	0.35
Over 5.0 through 6.0 percent	0.40
Over 6.0 percent	0.50

To determine compliance when maximum and minimum limits are specified for a combination of two or more elements in one alloy composition, the arithmetic mean of such combination is compared to the sum of the mean values of the same individual elements, or any combination thereof, in another alloy composition.

- (b) Substitution of one alloying element for another element serving the same purpose.
- (c) Change in limits of impurities expressed singly or as a combination except for low iron. Iron maximum of 0.12 percent or less, reflecting high purity base metal, should be considered an alloy modification. See 5(f).
- (d) Change in limits on grain refining elements.
- (e) Inclusion of a minimum limit for iron or silicon or both, without a change in the maximum limit.

An alloy shall not be registered as a new alloy or alloy modification if it meets the requirements for a variation.

See footnotes on page 32