

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



1525 Wilson Boulevard, Arlington, VA 22209  
[www.aluminum.org](http://www.aluminum.org)

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Alro S.A, Romania

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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).

Since the International Designation System for Wrought Aluminum and Wrought Aluminum Alloys is based on USA's national standard "*American National Standard Alloy and Temper Designation System for Aluminum ANSI H35.1*," the system limits introduction of experimental alloy compositions to USA registrations. An experimental alloy registered by USA under this system is indicated by the prefix "X" and is subject to the following rules:

1. A composition shall not be designated as experimental ("X") for more than five years.
2. During its experimental status, the registering organization may request changes in the composition limit of the alloy, provided that it does not invalidate any assigned designation.
3. The "X" is dropped when the alloy is no longer experimental.
4. An experimental composition that is inactivated shall retain the prefix "X" for the duration of its inactive status. If reactivated, the "X" shall be removed.

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.<br>1525 Wilson Boulevard<br>Suite 600<br>Arlington, VA 22209<br><u>USA</u><br><a href="http://www.aluminum.org">www.aluminum.org</a>                                               | USA          | Associação Brasileira do Alumínio—ABAL<br>Rua Humberto I, n° 220 - 4° Andar<br>Vila Mariana - CEP: 04018-030<br>São Paulo-SP<br><u>BRAZIL</u><br><a href="http://www.abal.org.br">www.abal.org.br</a>                | BRAZIL      |
| AFA Association Française de l'Aluminium<br>17, rue de l'amiral Hamelin<br>75783 Paris<br>Cedex 16<br><u>FRANCE</u><br><a href="http://www.aluminium-info.com">www.aluminium-info.com</a>                        | FRANCE       | Association for the Dutch<br>Metallurgic Industry (VNMI)<br>P.O. Box 190<br>NL-2700 AD Zoetermeer<br><u>NETHERLANDS</u><br><a href="http://www.vnmi.nl">www.vnmi.nl</a>                                              | NETHERLANDS |
| All-Russian Institute of Aviation Materials (VIAM)<br>17 Radio Ulitza<br>105005 Moscow<br><u>RUSSIA</u><br><a href="http://www.viam.ru">www.viam.ru</a>                                                          | RUSSIA       | Assomet - Associazione Nazionale<br>Industrie Metalli non Ferrosi<br>Via dei Missaglia, 97<br>I-20142 Milano<br><u>ITALY</u><br><a href="http://www.assomet.it">www.assomet.it</a>                                   | ITALY       |
| Alro S.A.<br>116 Pitesti Street<br>Slatina, Olt County<br>230048<br><u>ROMANIA</u><br><a href="http://www.alro.ro">www.alro.ro</a>                                                                               | ROMANIA      | Australian Aluminium Council Limited<br>Level 1, Dickson Square<br>P.O. Box 63<br>Dickson, Canberra ACT 2602<br><u>AUSTRALIA</u><br><a href="http://www.aluminium.org.au">www.aluminium.org.au</a>                   | AUSTRALIA   |
| Aluminium Association of Canada<br>1010 Sherbrooke Street West, Suite 1600<br>Montreal, Quebec H3A 2R7<br><u>CANADA</u><br><a href="http://www.aac.aluminium.qc.ca">www.aac.aluminium.qc.ca</a>                  | CANADA       | Austrian Non-Ferrous Metals Federation<br>Wiedner Hauptstraße 63<br>1045 Vienna<br><u>AUSTRIA</u><br><a href="http://www.nemetall.at">www.nemetall.at</a>                                                            | AUSTRIA     |
| Aluminium Center Belgium<br>Z.I. Research Park 310<br>B-1731 Zellik<br><u>BELGIUM</u><br><a href="http://www.aluminiumcenter.be">www.aluminiumcenter.be</a>                                                      | BELGIUM      | Centro Nacional de Investigaciones<br>Metalúrgicas (CENIM)<br>Avenida Gregorio del Amo, 8<br>Ciudad Universitaria<br>28040 Madrid<br><u>SPAIN</u><br><a href="http://www.cenim.csic.es">www.cenim.csic.es</a>        | SPAIN       |
| Aluminium Federation Limited<br>National Metalforming Centre<br>47 Birmingham Road<br>West Bromwich, West Midlands<br>B70 6PY<br><u>UNITED KINGDOM</u><br><a href="http://www.alfed.org.uk">www.alfed.org.uk</a> | UK           | China Nonferrous Metals Techno-Economic<br>Research Institute<br>No. 31 Suzhou Street<br>Haidian District<br>Beijing, 100080<br><u>PEOPLES REPUBLIC OF CHINA</u><br><a href="http://www.cnsmq.com">www.cnsmq.com</a> | CHINA       |
| Aluminium Federation of South Africa<br>P. O. Box 423<br>Isando, 1600<br><u>REPUBLIC OF SOUTH AFRICA</u><br><a href="http://www.afsa.org.za">www.afsa.org.za</a>                                                 | SOUTH AFRICA | European Aluminium Association<br>Avenue de Broqueville, 12<br>B-1150 Brussels<br><u>BELGIUM</u><br><a href="http://www.aluminium.org">www.aluminium.org</a>                                                         | EAA         |
| Aluminium – Verband Schweiz<br>Hallenstrasse 15<br>Postfach 71<br>CH-8024 Zurich<br><u>SWITZERLAND</u><br><a href="http://www.alu.ch">www.alu.ch</a>                                                             | SWITZERLAND  |                                                                                                                                                                                                                      |             |

## Signatories (Continued)

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

# 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 |      |         |       |       |       |      |      |     |     |       |       |     |     |     |      |     |     |     |      |     |     |       | OTHERS <sup>13</sup> |                    | Al                 |
|--------------------------------------|------|---------|-------|-------|-------|------|------|-----|-----|-------|-------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-------|----------------------|--------------------|--------------------|
|                                      |      |         |       |       |       |      |      |     |     |       |       |     |     |     |      |     |     |     |      |     |     |       | Each                 | Total <sup>9</sup> |                    |
| No. <sup>17</sup>                    | Date | By      | Si    | Fe    | Cu    | Mn   | Mg   | Cr  | Ni  | Zn    | Ti    | Ag  | B   | Bi  | Ga   | Li  | Pb  | Sn  | V    | Zr  |     |       |                      |                    |                    |
| 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 |
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| No. <sup>17</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Date | By |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |   |    |  | Each                 | Total <sup>9</sup> |    |
| Data from Table 1, randomised rows 1 to 15, 16 to 30, 31 to 45, 46 to 60, 61 to 75, 76 to 90, 91 to 105, 106 to 120, 121 to 135, 136 to 150, 151 to 165, 166 to 180, 181 to 195, 196 to 210, 211 to 225, 226 to 240, 241 to 255, 256 to 270, 271 to 285, 286 to 300, 301 to 315, 316 to 330, 331 to 345, 346 to 360, 361 to 375, 376 to 390, 391 to 405, 406 to 420, 421 to 435, 436 to 450, 451 to 465, 466 to 480, 481 to 495, 496 to 510, 511 to 525, 526 to 540, 541 to 555, 556 to 570, 571 to 585, 586 to 600, 601 to 615, 616 to 630, 631 to 645, 646 to 660, 661 to 675, 676 to 690, 691 to 705, 706 to 720, 721 to 735, 736 to 750, 751 to 765, 766 to 780, 781 to 795, 796 to 810, 811 to 825, 826 to 840, 841 to 855, 856 to 870, 871 to 885, 886 to 900, 901 to 915, 916 to 930, 931 to 945, 946 to 960, 961 to 975, 976 to 990, 991 to 1005, 1006 to 1020, 1021 to 1035, 1036 to 1050, 1051 to 1065, 1066 to 1080, 1081 to 1095, 1096 to 1110, 1111 to 1125, 1126 to 1140, 1141 to 1155, 1156 to 1170, 1171 to 1185, 1186 to 1200, 1201 to 1215, 1216 to 1230, 1231 to 1245, 1246 to 1260, 1261 to 1275, 1276 to 1290, 1291 to 1305, 1306 to 1320, 1321 to 1335, 1336 to 1350, 1351 to 1365, 1366 to 1380, 1381 to 1395, 1396 to 1410, 1411 to 1425, 1426 to 1440, 1441 to 1455, 1456 to 1470, 1471 to 1485, 1486 to 1500, 1501 to 1515, 1516 to 1530, 1531 to 1545, 1546 to 1560, 1561 to 1575, 1576 to 1590, 1591 to 1605, 1606 to 1620, 1621 to 1635, 1636 to 1650, 1651 to 1665, 1666 to 1680, 1681 to 1695, 1696 to 1710, 1711 to 1725, 1726 to 1740, 1741 to 1755, 1756 to 1770, 1771 to 1785, 1786 to 1800, 1801 to 1815, 1816 to 1830, 1831 to 1845, 1846 to 1860, 1861 to 1875, 1876 to 1890, 1891 to 1905, 1906 to 1920, 1921 to 1935, 1936 to 1950, 1951 to 1965, 1966 to 1980, 1981 to 1995, 1996 to 2010, 2011 to 2025, 2026 to 2040, 2041 to 2055, 2056 to 2070, 2071 to 2085, 2086 to 2100, 2101 to 2115, 2116 to 2130, 2131 to 2145, 2146 to 2160, 2161 to 2175, 2176 to 2190, 2191 to 2205, 2206 to 2220, 2221 to 2235, 2236 to 2250, 2251 to 2265, 2266 to 2280, 2281 to 2295, 2296 to 2310, 2311 to 2325, 2326 to 2340, 2341 to 2355, 2356 to 2370, 2371 to 2385, 2386 to 2400, 2401 to 2415, 2416 to 2430, 2431 to 2445, 2446 to 2460, 2461 to 2475, 2476 to 2490, 2491 to 2505, 2506 to 2520, 2521 to 2535, 2536 to 2550, 2551 to 2565, 2566 to 2580, 2581 to 2595, 2596 to 2610, 2611 to 2625, 2626 to 2640, 2641 to 2655, 2656 to 2670, 2671 to 2685, 2686 to 2700, 2701 to 2715, 2716 to 2730, 2731 to 2745, 2746 to 2760, 2761 to 2775, 2776 to 2790, 2791 to 2805, 2806 to 2820, 2821 to 2835, 2836 to 2850, 2851 to 2865, 2866 to 2880, 2881 to 2895, 2896 to 2910, 2911 to 2925, 2926 to 2940, 2941 to 2955, 2956 to 2970, 2971 to 2985, 2986 to 3000, 3001 to 3015, 3016 to 3030, 3031 to 3045, 3046 to 3060, 3061 to 3075, 3076 to 3090, 3091 to 3105, 3106 to 3120, 3121 to 3135, 3136 to 3150, 3151 to 3165, 3166 to 3180, 3181 to 3195, 3196 to 3210, 3211 to 3225, 3226 to 3240, 3241 to 3255, 3256 to 3270, 3271 to 3285, 3286 to 3300, 3301 to 3315, 3316 to 3330, 3331 to 3345, 3346 to 3360, 3361 to 3375, 3376 to 3390, 3391 to 3405, 3406 to 3420, 3421 to 3435, 3436 to 3450, 3451 to 3465, 3466 to 3480, 3481 to 3495, 3496 to 3510, 3511 to 3525, 3526 to 3540, 3541 to 3555, 3556 to 3570, 3571 to 3585, 3586 to 3600, 3601 to 3615, 3616 to 3630, 3631 to 3645, 3646 to 3660, 3661 to 3675, 3676 to 3690, 3691 to 3705, 3706 to 3720, 3721 to 3735, 3736 to 3750, 3751 to 3765, 3766 to 3780, 3781 to 3795, 3796 to 3810, 3811 to 3825, 3826 to 3840, 3841 to 3855, 3856 to 3870, 3871 to 3885, 3886 to 3900, 3901 to 3915, 3916 to 3930, 3931 to 3945, 3946 to 3960, 3961 to 3975, 3976 to 3990, 3991 to 4005, 4006 to 4020, 4021 to 4035, 4036 to 4050, 4051 to 4065, 4066 to 4080, 4081 to 4095, 4096 to 4110, 4111 to 4125, 4126 to 4140, 4141 to 4155, 4156 to 4170, 4171 to 4185, 4186 to 4200, 4201 to 4215, 4216 to 4230, 4231 to 4245, 4246 to 4260, 4261 to 4275, 4276 to 4290, 4291 to 4305, 4306 to 4320, 4321 to 4335, 4336 to 4350, 4351 to 4365, 4366 to 4380, 4381 to 4395, 4396 to 4410, 4411 to 4425, 4426 to 4440, 4441 to 4455, 4456 to 4470, 4471 to 4485, 4486 to 4500, 4501 to 4515, 4516 to 4530, 4531 to 4545, 4546 to 4560, 4561 to 4575, 4576 to 4590, 4591 to 4605, 4606 to 4620, 4621 to 4635, 4636 to 4650, 4651 to 4665, 4666 to 4680, 4681 to 4695, 4696 to 4710, 4711 to 4725, 4726 to 4740, 4741 to 4755, 4756 to 4770, 4771 to 4785, 4786 to 4800, 4801 to 4815, 4816 to 4830, 4831 to 4845, 4846 to 4860, 4861 to 4875, 4876 to 4890, 4891 to 4905, 4906 to 4920, 4921 to 4935, 4936 to 4950, 4951 to 4965, 4966 to 4980, 4981 to 4995, 4996 to 5010, 5011 to 5025, 5026 to 5040, 5041 to 5055, 5056 to 5070, 5071 to 5085, 5086 to 5100, 5101 to 5115, 5116 to 5130, 5131 to 5145, 5146 to 5160, 5161 to 5175, 5176 to 5190, 5191 to 5205, 5206 to 5220, 5221 to 5235, 5236 to 5250, 5251 to 5265, 5266 to 5280, 5281 to 5295, 5296 to 5310, 5311 to 5325, 5326 to 5340, 5341 to 5355, 5356 to 5370, 5371 to 5385, 5386 to 5400, 5401 to 5415, 5416 to 5430, 5431 to 5445, 5446 to 5460, 5461 to 5475, 5476 to 5490, 5491 to 5505, 5506 to 5520, 5521 to 5535, 5536 to 5550, 5551 to 5565, 5566 to 5580, 5581 to 5595, 5596 to 5610, 5611 to 5625, 5626 to 5640, 5641 to 5655, 5656 to 5670, 5671 to 5685, 5686 to 5700, 5701 to 5715, 5716 to 5730, 5731 to 5745, 5746 to 5760, 5761 to 5775, 5776 to 5790, 5791 to 5805, 5806 to 5820, 5821 to 5835, 5836 to 5850, 5851 to 5865, 5866 to 5880, 5881 to 5895, 5896 to 5910, 5911 to 5925, 5926 to 5940, 5941 to 5955, 5956 to 5970, 5971 to 5985, 5986 to 6000, 6001 to 6015, 6016 to 6030, 6031 to 6045, 6046 to 6060, 6061 to 6075, 6076 to 6090, 6091 to 6105, 6106 to 6120, 6121 to 6135, 6136 to 6150, 6151 to 6165, 6166 to 6180, 6181 to 6195, 6196 to 6210, 6211 to 6225, 6226 to 6240, 6241 to 6255, 6256 to 6270, 6271 to 6285, 6286 to 6300, 6301 to 6315, 6316 to 6330, 6331 to 6345, 6346 to 6360, 6361 to 6375, 6376 to 6390, 6391 to 6405, 6406 to 6420, 6421 to 6435, 6436 to 6450, 6451 to 6465, 6466 to 6480, 6481 to 6495, 6496 to 6510, 6511 to 6525, 6526 to 6540, 6541 to 6555, 6556 to 6570, 6571 to 6585, 6586 to 6600, 6601 to 6615, 6616 to 6630, 6631 to 6645, 6646 to 6660, 6661 to 6675, 6676 to 6690, 6691 to 6705, 6706 to 6720, 6721 to 6735, 6736 to 6750, 6751 to 6765, 6766 to 6780, 6781 to 6795, 6796 to 6810, 6811 to 6825, 6826 to 6840, 6841 to 6855, 6856 to 6870, 6871 to 6885, 6886 to 6900, 6901 to 6915, 6916 to 6930, 6931 to 6945, 6946 to 6960, 6961 to 6975, 6976 to 6990, 6991 to 7005, 7006 to 7020, 7021 to 7035, 7036 to 7050, 7051 to 7065, 7066 to 7080, 7081 to 7095, 7096 to 7110, 7111 to 7125, 7126 to 7140, 7141 to 7155, 7156 to 7170, 7171 to 7185, 7186 to 7200, 7201 to 7215, 7216 to 7230, 7231 to 7245, 7246 to 7260, 7261 to 7275, 7276 to 7290, 7291 to 7305, 7306 to 7320, 7321 to 7335, 7336 to 7350, 7351 to 7365, 7366 to 7380, 7381 to 7395, 7396 to 7410, 7411 to 7425, 7426 to 7440, 7441 to 7455, 7456 to 7470, 7471 to 7485, 7486 to 7500, 7501 to 7515, 7516 to 7530, 7531 to 7545, 7546 to 7560, 7561 to 7575, 7576 to 7590, 7591 to 7605, 7606 to 7620, 7621 to 7635, 7636 to 7650, 7651 to 7665, 7666 to 7680, 7681 to 7695, 7696 to 7710, 7711 to 7725, 7726 to 7740, 7741 to 7755, 7756 to 7770, 7771 to 7785, 7786 to 7800, 7801 to 7815, 7816 to 7830, 7831 to 7845, 7846 to 7860, 7861 to 7875, 7876 to 7890, 7891 to 7905, 7906 to 7920, 7921 to 7935, 7936 to 7950, 7951 to 7965, 7966 to 7980, 7981 to 7995, 7996 to 8010, 8011 to 8025, 8026 to 8040, 8041 to 8055, 8056 to 8070, 8071 to 8085, 8086 to 8100, 8101 to 8115, 8116 to 8130, 8131 to 8145, 8146 to 8160, 8161 to 8175, 8176 to 8190, 8191 to 8205, 8206 to 8220, 8221 to 8235, 8236 to 8250, 8251 to 8265, 8266 to 8280, 8281 to 8295, 8296 to 8310, 8311 to 8325, 8326 to 8340, 8341 to 8355, 8356 to 8370, 8371 to 8385, 8386 to 8400, 8401 to 8415, 8416 to 8430, 8431 to 8445, 8446 to 8460, 8461 to 8475, 8476 to 8490, 8491 to 8505, 8506 to 8520, 8521 to 8535, 8536 to 8550, 8551 to 8565, 8566 to 8580, 8581 to 8595, 8596 to 8610, 8611 to 8625, 8626 to 8640, 8641 to 8655, 8656 to 8670, 8671 to 8685, 8686 to 8700, 8701 to 8715, 8716 to 8730, 8731 to 8745, 8746 to 8760, 8761 to 8775, 8776 to 8790, 8791 to 8805, 8806 to 8820, 8821 to 8835, 8836 to 8850, 8851 to 8865, 8866 to 8880, 8881 to 8895, 8896 to 8910, 8911 to 8925, 8926 to 8940, 8941 to 8955, 8956 to 8970, 8971 to 8985, 8986 to 9000, 9001 to 9015, 9016 to 9030, 9031 to 9045, 9046 to 9060, 9061 to 9075, 9076 to 9090, 9091 to 9105, 9106 to 9120, 9121 to 9135, 9136 to 9150, 9151 to 9165, 9166 to 9180, 9181 to 9195, 9196 to 9210, 9211 to 9225, 9226 to 9240, 9241 to 9255, 9256 to 9270, 9271 to 9285, 9286 to 9300, 9301 to 9315, 9316 to 9330, 9331 to 9345, 9346 to 9360, 9361 to 9375, 9376 to 9390, 9391 to 9405, 9406 to 9420, 9421 to 9435, 9436 to 9450, 9451 to 9465, 9466 to 9480, 9481 to 9495, 9496 to 9510, 9511 to 9525, 9526 to 9540, 9541 to 9555, 9556 to 9570, 9571 to 9585, 9586 to 9600, 9601 to 9615, 9616 to 9630, 9631 to 9645, 9646 to 9660, 9661 to 9675, 9676 to 9690, 9691 to 9705, 9706 to 9720, 9721 to 9735, 9736 to 9750, 9751 to 9765, 9766 to 9780, 9781 to 9795, 9796 to 9810, 9811 to 9825, 9826 to 9840, 9841 to 9855, 9856 to 9870, 9871 to 9885, 9886 to 9900, 9901 to 9915, 9916 to 9930, 9931 to 9945, 9946 to 9960, 9961 to 9975, 9976 to 9990, 9991 to 10005, 10006 to 10020, 10021 to 10035, 10036 to 10050, 10051 to 10065, 10066 to 10080, 10081 to 10095, 10096 to 10110, 10111 to 10125, 10126 to 10140, 10141 to 10155, 10156 to 10170, 10171 to 10185, 10186 to 10200, 10201 to 10215, 10216 to 10230, 10231 to 10245, 10246 to 10260, 10261 to 10275, 10276 to 10290, 10291 to 10305, 10306 to 10320, 10321 to 10335, 10336 to 10350, 10351 to 10365, 10366 to 10380, 10381 to 10395, 10396 to 10410, 10411 to 10425, 10426 to 10440, 10441 to 10455, 10456 to 10470, 10471 to 10485, 10486 to 10500, 10501 to 10515, 10516 to 10530, 10531 to 10545, 10546 to 10560, 10561 to 10575, 10576 to 10590, 10591 to 10605, 10606 to 10620, 10621 to 10635, 10636 to 10650, 10651 to 10665, 10666 to 10680, 10681 to 10695, 10696 to 10710, 10711 to 10725, 10726 to 10740, 10741 to 10755, 10756 to 10770, 10771 to 10785, 10786 to 10800, 10801 to 10815, 10816 to 10830, 10831 to 10845, 10846 to 10860, 10861 to 10875, 10876 to 10890, 10891 to 10905, 10906 to 10920, 10921 to 10935, 10936 to 10950, 10951 to 10965, 10966 to 10980, 10981 to 11000, 11001 to 11015, 11016 to 11030, 11031 to 11045, 11046 to 11060, 11061 to 11075, 11076 to 11090, 11091 to 11105, 11106 to 11120, 11121 to 11135, 11136 to 11150, 11151 to 11165, 11166 to 11180, 11181 to 11195, 11196 to 11210, 11211 to 11225, 11226 to 11240, 11241 to 11255, 11256 to 11270, 11271 to 11285, 11286 to 11300, 11301 to 11315, 11316 to 11330, 11331 to 11345, 11346 to 11360, 11361 to 11375, 11376 to 11390, 11391 to 11405, 11406 to 11420, 11421 to 11435, 11436 to 11450, 11451 to 11465, 11466 to 11480, 11481 to 11495, 11496 to 11510, 11511 to 11525, 11526 to 11540, 11541 to 11555, 11556 to 11570, 11571 to 11585, 11586 to 11600, 11601 to 11615, 11616 to 11630, 11631 to 11645, 11646 to 11660, 11661 to 11675, 11676 to 11690, 11691 to 11705, 11706 to 11720, 11721 to 11735, 11736 to 11750, 11751 to 11765, 11766 to 11780, 11781 to 11795, 11796 to 11810, 11811 to 11825, 11826 to 11840, 11841 to 11855, 11856 to 11870, 11871 to 11885, 11886 to 11900, 11901 to 11915, 11916 to 11930, 11931 to 11945, 11946 to 11960, 11961 to 11975, 11976 to 11990, 11991 to 12005, 12006 to 12020, 12021 to 12035, 12036 to 12050, 12051 to 12065, 12066 to 12080, 12081 to 12095, 12096 to 12110, 12111 to 12125, 12126 to 12140, 12141 to 12155, 12156 to 12170, 12171 to 12185, 12186 to 12200, 12201 to 12215, 12216 to 12230, 12231 to 12245, 12246 to 12260, 12261 to 12275, 12276 to 12290, 12291 to 12305, 12306 to 12320, 12321 to 12335, 12336 to 12350, 12351 to 12365, 12366 to 12380, 12381 to 12395, 12396 to 12410, 12411 to 12425, 12426 to 12440, 12441 to 12455, 12456 to 12470, 12471 to 12485, 12486 to 12500, 12501 to 12515, 12516 to 12530, 12531 to 12545, 12546 to 12560, 12561 to 12575, 12576 to 12590, 12591 to 12605, 12606 to 12620, 12621 to 12635, 12636 to 12650, 12651 to 12665, 12666 to 12680, 12681 to 12695, 12696 to 12710, 12711 to 12725, 12726 to 12740, 12741 to 12755, 12756 to 12770, 12771 to 12785, 12786 to 12800, 12801 to 12815, 12816 to 12830, 12831 to 12845, 12846 to 12860, 12861 to 12875, 12876 to 12890, 12891 to 12905, 12906 to 12920, 12921 to 12935, 12936 to 12950, 12951 to 12965, 12966 to 12980, 12981 to 13000, 13001 to 13015, 13016 to 13030, 13031 to 13045, 13046 to 13060, 13061 to 13075, 13076 to 13090, 13091 to 13105, 13106 to 13120, 13121 to 13135, 13136 to 13150, 13151 to 13165, 13166 to 13180, 13181 to 13195, 13196 to 13210, 13211 to 13225, 13226 to 13240, 13241 to 13255, 13256 to 13270, 13271 to 13285, 13286 to 13300, 13301 to 13315, 13316 to 13330, 13331 to 13345, 13346 to 13360, 13361 to 13375, 13376 to 13390, 13391 to 13405, 13406 to 13420, 13421 to 13435, 13436 to 13450, 13451 to 13465, 13466 to 13480, 13481 to 13495, 13496 to 13510, 13511 to 13525, 13526 to 13540, 13541 to 13555, 13556 to 13570, 13571 to 13585, 13586 to 13600, 13601 to 13615, 13616 to 13630, 13631 to 13645, 13646 to 13660, 13661 to 13675, 13676 to 13690, 13691 to 13705, 13706 to 13720, 13721 to 13735, 13736 to 13750, 13751 to 13765, 13766 to 13780, 13781 to 13795, 13796 to 13810, 13811 to 13825, 13826 to 13840, 13841 to 13855, 13856 to 13870, 13871 to 13885, 13886 to 13900, 13901 to 13915, 13916 to 13930, 13931 to 13945, 13946 to 13960, 13961 to 13975, 13976 to 13990, 13991 to 14005, 14006 to 14020, 14021 to 14035, 14036 to 14050, 14051 to 14065, 14066 to 14080, 14081 to 14095, 14096 to 14110, 14111 to 14125, 14126 to 14140, 14141 to 14155, 14156 to 14170, 14171 to 14185, 14186 to 14200, 14201 to 14215, 14216 to 14230, 14231 to 14245, 14246 to 14260, 14261 to 14275, 14276 to 14290, 14291 to 14305, 14306 to 14320, 14321 to 14335, 14336 to 14350, 14351 to 14365, 14366 to 14380, 14381 to 14395, 14396 to 14410, 14411 to 14425, 14426 to 14440, 14441 to 14455, 14456 to 14470, 14471 to 14485, 14486 to 14500, 14501 to 14515, 14516 to 14530, 14531 to 14545, 14546 to 14560, 1456 |      |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |   |    |  |                      |                    |    |

See footnotes on page 15.

# 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.

| Association<br>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> |                    |
| Association of<br>Aircraft<br>Manufacturers | 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               |
| 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      | ...      | ... | ...  | ...      | ...   | ...  | ...      | ...       | ...       | <sup>7</sup> | 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.               |
| 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      | ...      | ... | ...  | ...      | ...   | ...  | ...      | ...       | ...       | ...          | <sup>7</sup> | 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.               |

See footnotes on page 15.

# 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.                                  | Date | By          |          |         |         |           |           |      |         |           |           |           |     |           |      |         |           |           |           |           |              | Each                 | Total <sup>9</sup> | Minimum |
| 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.    |
| 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      | ...       | ... | ...       | ...  | ...     | ...       | ...       | ...       | ...       | 7            | 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.    |
| 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.    |
| 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.    |
| 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.    |

See footnotes on page 15.

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 |
| 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.    |
| 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.    |
| 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.    |
| 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.    |
| 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                                 | 1961 | 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.    |
| 3107                                 | 1961 | SPAIN     | 0.6      | 0.7  | 0.05-0.15 | 0.40-0.9  | ...       | ...  | ... | 0.20      | 0.10 | ...       | ... | ... | ...  | ...     | ...  | ... | ...  | ...       | ...                     | 0.05                 | 0.15               | Rem.    |

See footnotes on page 15.

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.                                  | Date | By          |          |           |           |           |           |           |          |           |           |     |     |           |     |     |     |     |      |           |              | Each                 | Total <sup>9</sup> | Minimum |
| 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 | ... | ... | ...       | ... | ... | ... | ... | ...  | ...       | <sup>6</sup> | 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      | ... | ... | ...       | ... | ... | ... | ... | ...  | ...       | <sup>6</sup> | 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      | ... | ... | ...       | ... | ... | ... | ... | ...  | ...       | <sup>6</sup> | 0.05                 | 0.15               | Rem.    |
| 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                                 | 1993 | 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      | ... | ... | ...       | ... | ... | ... | ... | ...  | ...       | <sup>6</sup> | 0.05                 | 0.15               | Rem.    |

See footnotes on page 15.

# 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.

| No.                | Date | By      | 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      |
|--------------------|------|---------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|------|----------|------|-------|-----|-------|---------|-----|-----|------|-----|-----|------|--------------------------------|----------------------|--------------------|---------|
|                    |      |         |                                      |           |           |           |           |           |      |          |      |       |     |       |         |     |     |      |     |     |      |                                | Each                 | Total <sup>9</sup> | Minimum |
| 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.    |
| 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  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 0.05                 | 0.15               | Rem.    |
| 4043A              | 1976 | EAA     |                                      | 4.5-6.0   | 0.6       | 0.30      | 0.15      | 0.20      | ...  | ...      | 0.10 | 0.15  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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 | ...   | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 0.05                 | 0.15               | Rem.    |
| 4047               | 1964 | USA     |                                      | 11.0-13.0 | 0.8       | 0.30      | 0.15      | 0.10      | ...  | ...      | 0.20 | ...   | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 0.05                 | 0.15               | Rem.    |
| 4047A              | 1976 | EAA     |                                      | 11.0-13.0 | 0.6       | 0.30      | 0.15      | 0.10      | ...  | ...      | 0.20 | 0.15  | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 0.05                 | 0.15               | Rem.    |
| 4147               | 1989 | USA     |                                      | 11.0-13.0 | 0.8       | 0.25      | 0.10      | 0.10-0.50 | ...  | ...      | 0.20 | ...   | ... | ...   | ...     | ... | ... | ...  | ... | ... | ...  | ...                            | 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.    |
| 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.    |
| 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              | 1988 | 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               | 1993 | 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              | 2003 | 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>18</sup>   | 0.05                 | 0.15               | Rem.    |
| 502                | 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.    |

See footnotes on page 15.