Registration Record of Aluminum Association Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys

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Incorporated
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FOREWORD

Listed herein are designations and chemical composition limits for some wrought unalloyed aluminum and for wrought aluminum alloys registered with The Aluminum Association. This list does not include all alloys registered with The Aluminum Association. A complete list of registered designations is contained in the "Registration Record of International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys." These lists are maintained by the Technical Committee on Product Standards of The Aluminum Association. Additions may be made as required, and alloys will be deleted when no longer in commercial use (see table of inactive alloys). In considering requests for additions, the following criteria apply:

1. The aluminum or aluminum alloy shall be offered for sale currently and shall have been sold within the 12 months immediately preceding the date of registration request, in both cases in commercial quantities.

2. The complete chemical composition limits must be disclosed and judged to be reasonable and technically correct by the Technical Committee on Product Standards of The Aluminum Association.

3. The composition must be significantly different from that of any aluminum or aluminum alloy for which a numerical designation has already been assigned.

4. Composition limits changes:

   4.1 Composition limits changes, including the net of changes made sequentially, shall be restricted to the extent allowed by the alloy modification rules of ANSI H35.1 or for national variations, those allowed by the national variation rules. Also, no change shall be permitted if it affects the validity of any registered alloy, modification or national variation.

   4.2 The limits of non-experimental compositions may be changed only by formal ballot of the Technical Committee on Product Standards.

   4.3 Composition limit change proposals for experimental ("X") aluminum or aluminum alloys are subject to review for 30 days by the Technical Committee on Product Standards of The Aluminum Association. However, the registrant has the final authority to change the composition, as desired, provided the change complies with the rules of 4.1 above. Changes proposed by those other than the registrant are acceptable only with the approval of the registrant.

5. A composition shall not be designated as experimental ("X") for more than five years. During the period that an alloy is designated as experimental, the registrant shall confirm to the Technical Committee on Product Standards of The Aluminum Association at intervals not exceeding two years the reason(s) the experimental designation is still required.

   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. Any proposed change to the composition limits accompanying reactivation shall be subject to approval in accordance with 4.2 above.

In addition to the above criteria, registration of an alloy by The Aluminum Association Technical Committee requires that the proposed chemical composition limits must be judged to be technically correct by formal ballot of the Technical Committee on Product Standards. The Aluminum Association Technical Committee registration shall not be applied to any alloy designated as experimental (with prefix "X").

The numerical designations of these compositions were assigned in conformance with the system adopted by The Aluminum Association in 1954 and approved by the American Standards Association (now American National Standards Institute Incorporated) as an American Standard in 1957 (see Aluminum Standards and Data, or American National Standard Alloy and Temper Designation Systems for Aluminum ANSI H35.1-1990).

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

CHEMICAL COMPOSITION LIMITS (1,2)

Only composition limits which are identical to those listed herein or are registered with The Aluminum Association should be designated as "AA" alloys.

NATURAL IMPURITY LIMITS FOR WROUGHT UNALLOYED ALUMINUM

Registered Designation	Date Registered	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ga	V		Ti	OTHERS (27) Each	OTHERS (27) Total (3)	Aluminum min
1035	1973-08-22	0.35	0.6	0.10	0.05	0.05	....	....	0.10	....	0.05	....	0.03	0.03	....	99.35 (4)
1040	1973-08-22	0.30	0.50	0.10	0.05	0.05	....	....	0.10	....	0.05	....	0.03	0.03	....	99.40 (4)
1045	1973-08-22	0.30	0.45	0.10	0.05	0.05	....	....	0.05	....	0.05	....	0.03	0.03	....	99.45 (4)
1050	1954-07-01	0.25	0.40	0.05	0.05	0.05	....	....	0.05	....	0.05	....	0.03	0.03	....	99.50 (4)
1060	1954-07-01	0.25	0.35	0.05	0.03	0.03	....	....	0.05	....	0.05	....	0.03	0.03	....	99.60 (4)
1065	1973-08-22	0.25	0.30	0.05	0.03	0.03	....	....	0.05	....	0.05	....	0.03	0.03	....	99.65 (4)
1070	1954-07-01	0.20	0.25	0.04	0.03	0.03	....	....	0.04	....	0.05	....	0.03	0.03	....	99.70 (4)
1080	1954-07-01	0.15	0.15	0.03	0.02	0.02	....	....	0.03	0.03	0.05	....	0.03	0.02	....	99.80 (4)
1085	1954-07-01	0.10	0.12	0.03	0.02	0.02	....	....	0.03	0.03	0.05	....	0.02	0.01	....	99.85 (4)
1090	1954-07-01	0.07	0.07	0.02	0.01	0.01	....	....	0.03	0.03	0.05	....	0.01	0.01	....	99.90 (4)

REGISTERED COMPOSITIONS

Registered Designation	Date Registered	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ga	V		Ti	OTHERS (27) Each	OTHERS (27) Total (3)	Aluminum min
1100	1954-07-01	0.95 Si + Fe		0.05-0.20	0.05	....	....	....	0.10	....	....	(6)	....	0.05	0.15	99.00 (4)
1200	1966-09-23	1.00 Si + Fe		0.05	0.05	....	....	....	0.10	....	....	....	0.05	0.05	0.15	99.00 (4)
1230 (20)	1954-07-01	0.70 Si + Fe		0.10	0.05	0.05	....	....	0.10	....	0.05	....	0.03	0.03	....	99.30 (4)
1135	1957-04-23	0.60 Si + Fe		0.05-0.20	0.04	0.05	....	....	0.10	....	0.05	....	0.03	0.03	...	99.35 (4)
1235	1954-07-01	0.65 Si + Fe		0.05	0.05	0.05	....	....	0.10	....	0.05	....	0.06	0.03	....	99.35 (4)
1435	1958-03-05	0.15	0.30-0.50	0.02	0.05	0.05	....	....	0.10	....	0.05	....	0.03	0.03	....	99.35 (4)
1145	1954-07-01	0.55 Si + Fe		0.05	0.05	0.05	....	....	0.05	....	0.05	....	0.03	0.03	....	99.45 (4)
1345	1956-10-08	0.30	0.40	0.10	0.05	0.05	....	....	0.05	....	0.05	....	0.03	0.03	....	99.45 (4)
1350 (18)	1975-01-24	0.10	0.40	0.05	0.01	....	0.01	....	0.05	0.03	....	0.05B,0.02V + Ti	....	0.03	0.10	99.50 (4)
1170	1958-01-16	0.30 Si + Fe		0.03	0.03	0.02	0.03	....	0.04	....	0.05	....	0.03	0.03	....	99.70 (4)
1175 (20)	1954-07-01	0.15 Si + Fe		0.10	0.02	0.02	....	....	0.04	0.03	0.05	....	0.02	0.02	....	99.75 (4)
1180	1954-07-01	0.09	0.09	0.01	0.02	0.02	....	....	0.03	0.03	0.05	....	0.02	0.02	....	99.80 (4)
1185	1954-07-01	0.15 Si + Fe		0.01	0.02	0.02	....	....	0.03	0.03	0.05	....	0.02	0.01	....	99.85 (4)
1285	1954-07-01	0.08 (7)	0.08 (7)	0.02	0.01	0.01	....	....	0.03	0.03	0.05	....	0.02	0.01	....	99.85 (4)
1188	1954-07-01	0.06	0.06	0.005	0.01	0.01	....	....	0.03	0.03	0.05	(6)	0.01	0.01	....	99.88 (4)
1199	1956-03-12	0.006	0.006	0.006	0.002	0.006	....	....	0.006	0.005	0.005	....	0.002	0.002	....	99.99 (5)
2008	1987-07-01	0.50-0.8	0.40	0.7-1.1	0.30	0.25-0.50	0.10	....	0.25	....	0.05	....	0.10	0.05	0.15	Remainder
2009	1990-01-24	0.25	0.05	3.2-4.4	....	1.0-1.6	....	....	0.10	....	....	(31)	....	0.05	0.15	Remainder
2010	1990-09-21	0.50	0.50	0.7-1.3	0.10-0.40	0.40-1.0	0.15	....	0.30	....	....	....	....	0.05	0.15	Remainder
2011	1954-07-01	0.40	0.7	5.0-6.0	....	....	....	....	0.30	....	....	(8)	....	0.05	0.15	Remainder
+ 2111	1993-07-07	0.40	0.7	5.0-6.0	....	....	....	....	0.30	....	....	(46)	....	0.05	0.15	Remainder
+ 2012	1993-06-23	0.40	0.7	4.0-5.5	....	....	....	....	0.30	....	....	(45)	....	0.05	0.15	Remainder
2014	1954-07-01	0.50-1.2	0.7	3.9-5.0	0.40-1.2	0.20-0.8	0.10	....	0.25	....	....	(9)	0.15	0.05	0.15	Remainder
2214	1954-07-01	0.50-1.2	0.30	3.9-5.0	0.40-1.2	0.20-0.8	0.10	....	0.25	....	....	(9)	0.15	0.05	0.15	Remainder
2017	1954-07-01	0.20-0.8	0.7	3.5-4.5	0.40-1.0	0.40-0.8	0.10	....	0.25	....	....	(9)	0.15	0.05	0.15	Remainder
2117	1954-07-01	0.8	0.7	2.2-3.0	0.20	0.20-0.50	0.10	....	0.25	....	....	....	....	0.05	0.15	Remainder

See footnotes on pages 8 & 9.

REGISTERED COMPOSITIONS (Cont.)

Registered Designation	Date Registered	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ga	V		Ti	OTHERS (27) Each	OTHERS (27) Total (3)	Aluminum min
2018	1954-07-01	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	Remainder
2218	1954-07-01	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	Remainder
2618	1954-07-01	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	Remainder
2219 (10)	1954-08-13	0.20	0.30	5.8-6.8	0.20-0.40	0.02	....	....	0.10	....	0.05-0.15	0.10-0.25 Zr	0.02-0.10	0.05	0.15	Remainder
2319	1958-06-05	0.20	0.30	5.8-6.8	0.20-0.40	0.02	....	....	0.10	....	0.05-0.15	0.10-0.25 Zr (6)	0.10-0.20	0.05	0.15	Remainder
2419	1972-10-12	0.15	0.18	5.8-6.8	0.20-0.40	0.02	....	....	0.10	....	0.05-0.15	0.10-0.25 Zr	0.02-0.10	0.05	0.15	Remainder
2519	1984-12-13	0.25 (22)	0.30 (22)	5.3-6.4	0.10-0.50	0.05-0.40	....	....	0.10	....	0.05-0.15	0.10-0.25 Zr	0.02-0.10	0.05	0.15	Remainder
2024	1954-07-01	0.50	0.50	3.8-4.9	0.30-0.9	1.2-1.8	0.10	....	0.25	....	....	(9)	0.15	0.05	0.15	Remainder
2124	1970-10-02	0.20	0.30	3.8-4.9	0.30-0.9	1.2-1.8	0.10	....	0.25	....	....	(9)	0.15	0.05	0.15	Remainder
2224	1978-05-04	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	Remainder
2324	1978-05-04	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	Remainder
2025	1954-07-01	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	Remainder
2034	1983-01-18	0.10	0.12	4.2-4.8	0.8-1.3	1.3-1.9	0.05	....	0.20	....	....	0.08-0.15 Zr	0.15	0.05	0.15	Remainder
2036	1970-08-13	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	Remainder
2037	1977-06-01	0.50	0.50	1.4-2.2	0.10-0.40	0.30-0.8	0.10	....	0.25	....	0.05	....	0.15	0.05	0.15	Remainder
2038	1980-09-23	0.50-1.3	0.6	0.8-1.8	0.10-0.40	0.40-1.0	0.20	....	0.50	0.05	0.05	....	0.15	0.05	0.15	Remainder
2048	1972-08-02	0.15	0.20	2.8-3.8	0.20-0.6	1.2-1.8	....	....	0.25	....	....	....	0.10	0.05	0.15	Remainder
X2080	1990-03-28	0.10	0.20	3.3-4.1	0.25	1.5-2.2	....	....	0.10	....	....	0.08-0.25 Zr (32)	....	0.05	0.15	Remainder
2090	1984-08-06	0.10	0.12	2.4-3.0	0.05	0.25	0.05	....	0.10	....	....	0.08-0.15 Zr (23)	0.15	0.05	0.15	Remainder
2091	1988-01-15	0.20	0.30	1.8-2.5	0.10	1.1-1.9	0.10	....	0.25	....	....	0.04-0.16 Zr (29)	0.10	0.05	0.15	Remainder
*++ 2094	1990-06-04	0.12	0.15	4.4-5.2	0.25	0.25-0.8	....	....	0.25	....	....	0.04-0.18 Zr (33)	0.10	0.05	0.15	Remainder
*++ 2095	1990-06-04	0.12	0.15	3.9-4.6	0.25	0.25-0.8	....	....	0.25	....	....	0.04-0.18 Zr (34)	0.10	0.05	0.15	Remainder
+ 2195	1992-11-20	0.12	0.15	3.7-4.3	0.25	0.25-0.8	....	....	0.25	....	....	0.08-0.16 Zr (42)	0.10	0.05	0.15	Remainder
+ X2096	1993-04-29	0.12	0.15	2.3-3.0	0.25	0.25-0.8	....	....	0.25	....	....	0.04-0.18 Zr (43)	0.10	0.05	0.15	Remainder
+ 2097	1993-06-30	0.12	0.15	2.5-3.1	0.10-0.6	0.35	....	....	0.35	....	....	0.08-0.16 Zr (44)	0.15	0.05	0.15	Remainder
+ 2197	1993-09-21	0.10	0.10	2.5-3.1	0.10-0.50	0.25	....	....	0.05	....	....	0.08-0.15 Zr (47)	0.12	0.05	0.15	Remainder
3002	1961-07-03	0.08	0.10	0.15	0.05-0.25	0.05-0.20	....	....	0.05	....	0.05	....	0.03	0.03	0.10	Remainder
3102	1972-03-01	0.40	0.7	0.10	0.05-0.40	....	....	....	0.30	....	....	....	0.10	0.05	0.15	Remainder
3003	1954-07-01	0.6	0.7	0.05-0.20	1.0-1.5	....	....	....	0.10	....	....	....	....	0.05	0.15	Remainder
3303	1974-05-31	0.6	0.7	0.05-0.20	1.0-1.5	....	....	....	0.30	....	....	....	....	0.05	0.15	Remainder
3004	1954-07-01	0.30	0.7	0.25	1.0-1.5	0.8-1.3	....	....	0.25	....	....	....	....	0.05	0.15	Remainder
3104	1978-08-30	0.6	0.8	0.05-0.25	0.8-1.4	0.8-1.3	....	....	0.25	0.05	0.05	....	0.10	0.05	0.15	Remainder
+ 3204	1991-07-11	0.30	0.7	0.10-0.25	0.8-1.5	0.8-1.5	....	....	0.25	....	....	....	....	0.05	0.15	Remainder
3005	1954-07-01	0.6	0.7	0.30	1.0-1.5	0.20-0.6	0.10	....	0.25	....	....	....	0.10	0.05	0.15	Remainder
3105	1960-05-27	0.6	0.7	0.30	0.30-0.8	0.20-0.8	0.20	....	0.40	....	....	....	0.10	0.05	0.15	Remainder
3006	1973-08-24	0.50	0.7	0.10-0.30	0.50-0.8	0.30-0.6	0.20	....	0.15-0.40	....	....	....	0.10	0.05	0.15	Remainder
3007	1976-03-17	0.50	0.7	0.05-0.30	0.30-0.8	0.6	0.20	....	0.40	....	....	....	0.10	0.05	0.15	Remainder
3107	1977-11-11	0.6	0.7	0.05-0.15	0.40-0.9	....	....	....	0.20	....	....	....	0.10	0.05	0.15	Remainder
3307	1986-08-02	0.6	0.8	0.30	0.50-0.9	0.30	0.20	....	0.40	....	....	....	0.10	0.05	0.15	Remainder
3009	1978-03-03	1.0-1.8	0.7	0.10	1.2-1.8	0.10	0.05	0.05	0.05	....	....	0.10 Zr	0.10	0.05	0.15	Remainder
3010	1978-08-25	0.10	0.20	0.03	0.20-0.9	....	0.05-0.40	....	0.05	....	0.05	....	0.05	0.03	0.10	Remainder
3011	1978-08-25	0.40	0.7	0.05-0.20	0.8-1.2	....	0.10-0.40	....	0.10	....	....	0.10-0.30 Zr	0.10	0.05	0.15	Remainder
3015	1986-08-20	0.6	0.8	0.30	0.50-0.9	0.20-0.7	0.10	....	0.25	....	....	....	0.10	0.05	0.15	Remainder
3016	1986-08-20	0.6	0.8	0.30	0.50-0.9	0.50-0.8	0.10	....	0.25	....	....	....	0.10	0.05	0.15	Remainder
4004 (20)	1971-10-05	9.0-10.5	0.8	0.25	0.10	1.0-2.0	....	....	0.20	....	....	....	....	0.05	0.15	Remainder
4104	1974-02-26	9.0-10.5	0.8	0.25	0.10	1.0-2.0	....	....	0.20	....	....	0.02-0.20 Bi	....	0.05	0.15	Remainder
4008	1985-05-15	6.5-7.5	0.09	0.05	0.05	0.30-0.45	....	....	0.05	....	....	(6)	0.04-0.15	0.05	0.15	Remainder
4009	1987-05-26	4.5-5.5	0.20	1.0-1.5	0.10	0.45-0.6	....	....	0.10	....	....	(6)	0.20	0.05	0.15	Remainder

See footnotes on pages 8 & 9.