ADDENDUM TO 2018 EDITION OF YELLOW SHEETS
Tempers for Aluminum and Aluminum Alloy Products

April 21, 2022

New and Revised Registrations Since Publication of 2018 Edition of Yellow Sheets

Registered			Product	Thickness in.	Tensile Strength, ksi			Elongation Percent in 2 in. or 4D	Remarks[2]
Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
2043-T85	Universal Alloy	02/07/2019	Extrusion	0.040-0.249	*Min[6]	76.0	70.0	6	*Tentative
				0.250-0.499	*Min[6]	78.0	73.0	7	Cross-sectional area less than or equal to 23 in2 and circle size less than or equal to 16 in.
				0.500-0.999	*Min[6]	80.0	75.0	7	
				1.000-2.500	*Min[6]	82.0	78.0	7	Solution heat treated and cold worked in the range 3-6% and artificially aged. Stress Corrosion Resistance For ST specimens taken from section thicknesses 0.75 in and greater, See footnote 4b. Exfoliation Corrosion Resistance See footnote 15b. Note: ASTM G85 Annex A2 Dry-Bottom MASTMAASIS Method for 2 weeks.
2050-T34	Constellium	01/25/2016 Revised 08/04/2017 Revised 02/01/2019	Plate	0.500-6.500	Min[9]	50.0	34.0	17	Solution heat treated and cold worked 3-4.5%.
2081-T84	Kaiser	11/16/2018	Plate	1.000-2.000	*Min[6] *Min[9]	76.0 76.0	73.0 70.0	8 7	*Tentative Solution heat treated and cold worked 2-5%.
				2.001-3.000	*Min[6] *Min[9] *Min[10]	74.0 75.0 72.0	71.0 68.0 62.0	6 6 2	

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
				3.001-4.000	*Min[6] *Min[9] *Min[10]	73.0 74.0 71.0	70.0 67.0 62.0	6 4 2	
2297-T87	McCook Metals Constellium	06/21/2000 Revised 06/03/2004 Revised 01/12/2022	Plate	1.500-2.000	Min[6] Min[9] Min[10]	64.0 66.0 65.0	58.0 60.0 57.0	10 8 2	Stress Corrosion Resistance 30 days at 45 ksi when tested in the ST direction per ASTM G47 in the thickness range of 3.001-5.100 inches. Product outside this thickness rage will continue to exhibit capability of 30 days at 30 ksi. Exfoliation Corrosion Resistance See footnote 15.b. Fracture Toughness [14] – Min K_{Ic} For thicknesses 1.500-3.000 inches L-T direction 32 ksi √in. T-L direction 27 ksi √in. S-L direction 20 ksi √in. For thicknesses 3.001-4.000 inches L-T direction 31 ksi √in. T-L direction 27 ksi √in. S-L direction 20 ksi √in. For thicknesses 4.001-5.000 inches L-T direction 30 ksi √in. T-L direction 26 ksi √in. S-L direction 18 ksi √in.
				2.001-2.500	Min[6] Min[9] Min[10]	63.0 64.0 64.0	57.0 58.0 56.0	9 7 2	
				2.501-3.000	Min[6] Min[9] Min[10]	62.0 64.0 62.0	57.0 58.0 55.0	9 7 2	
				3.001-4.000	Min[6] Min[9] Min[10]	62.0 62.0 59.0	57.0 57.0 54.0	5 4 1.5	
				4.001-5.000	Min[6] Min[9] Min[10]	61.0 61.0 58.0	56.0 56.0 52.0	5 4 1.5	
				5.001-6.000	Min[6] Min[9] Min[10]	60.0 60.0 57.0	55.0 55.0 52.0	5 4 1.5	

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Registered			Product	Thickness in.	Tensile Strength, ksi			Elongation Percent in 2 in. or 4D	Remarks[2]
Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
									For thicknesses 5.001-6.000 inches L-T direction 29 ksi √in. T-L direction 25 ksi √in. S-L direction 18 ksi √in.
2397-T87	Alcoa Revised Arconic	02/12/2003 Revised 08/17/2005 Revised 08/02/2018	Plate	3.001-4.000	Min[6] Min[9] Min[10]	62.0 62.0 60.0	57.0 57.0 54.0	5 4 1.5	Stress Corrosion Resistance See footnote 4.b. Exfoliation Corrosion Resistance See footnote 15.b. Fracture Toughness[14] – Min K_{Ic} For thickness 3.001-4.000 L-T direction 31 ksi √in. T-L direction 27 ksi √in. S-L direction 20 ksi √in.
6061-T651	Constellium	09/09/2019	Plate	6.001-8.000 8.001-10.000 10.001-12.000	Min[9] Min[9] Min[9]	42.0 41.0 40.0	36.0 34.0 32.0	9 8 8	*Tentative
7048-T6511	Kaiser	04/08/2020	Extrusion	0.040 – 0.125	Min[6]	67.0	63.0	10	
7055-T76511	Alcoa Revised Arconic	01/15/2001 Revised 06/20/2007 Revised 08/14/2020	Extruded Rod, Bar & Profile	Up thru 0.249 0.250 – 0.499 0.500 – 3.000	Min[6] Min[6] Min[6]	89.0 90.0 91.0	85.0 85.0 86.0	7 9 9	Exfoliation Corrosion Resistance See footnote 15. b.

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Registered			Product	Thickness in.	Tensile Strength, ksi			Elongation Percent in 2 in. or 4D	Remarks[2]
Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
									For thickness up thru 0.499 Inch Cross Sectional Area 12 in.^{2} and Circle Size 10 in. max. For thickness 0.500 – 3.000 Inch Cross Sectional Area 26.3 in.^{2} and Circle Size 15.3 in. max. Longitudinal Compressive Yield Strength: 87.0 ksi
7160-T7351	Constellium	11/08/2018 Revised 02/06/2020	Plate	1.000-1.500	Min[6]	74.0	67.0	13	Stress Corrosion Resistance
					Min[9]	74.0	65.0	11	See footnote 4e.
				1.501-2.000	Min[6]	73.0	67.0	13	Fracture Toughness[14] – Min K_{IC} or K_Q
					Min[9]	73.0	65.0	11	For thicknesses 1.000-2.000 inches
									L-T direction 40 ksi√in
				2.001-3.000	Min[6]	72.0	65.0	12	T-L direction 34 ksi√in
					Min[9]	73.0	64.0	10	
					Min[10]	70.0	59.0	6	For thicknesses 2.001-3.000 inches
									L-T direction 45 ksi√in
				3.001-4.000	Min[6]	71.0	64.0	12	T-L direction 33 ksi√in
					Min[9]	72.0	63.0	9	S-L direction 35 ksi√in
					Min[10]	70.0	58.0	5	
									For thicknesses 3.001-4.000 inches
				4.001-5.000	Min[6]	70.0	64.0	11	L-T direction 38 ksi√in
					Min[9]	72.0	62.0	8	T-L direction 30 ksi√in
					Min[10]	69.0	58.0	4	S-L direction 34 ksi√in
				5.001-6.000	Min[6]	70.0	63.0	11	
					Min[9]	71.0	61.0	7	

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Registered			Product	Thickness in.	Tensile Strength, ksi			Elongation Percent in 2 in. or 4D	Remarks[2]
Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
					Min[10]	68.0	58.0	3	For thicknesses 4.001-5.000 inches L-T direction 36 ksi√in T-L direction 27 ksi√in S-L direction 31 ksi√in For thicknesses 5.001-6.000 inches L-T direction 28 ksi√in T-L direction 25 ksi√in S-L direction 26 ksi√in
P 7160-T7451	Constellium	11/02/2018	Plate	1.000-1.500	*Min[6]	77.0	71.0	14	*Tentative
1					*Min[9]	76.0	69.0	13	Stress Corrosion Resistance See footnote 4b.
				1.501-2.000	*Min[6]	77.0	71.0	14	
					*Min[9]	76.0	69.0	12	Fracture Toughness[14] – Min K_{IC} or K_Q
					*Min[10]	73.0	64.0	6	For thicknesses 1.000-1.500 inches
				2.001-3.000	*Min[6]	75.0	69.0	13	L-T direction 34 ksi√in
					*Min[9]	75.0	68.0	11	T-L direction 29 ksi√in
					*Min[10]	73.0	64.0	6	For thicknesses 1.501-2.000 inches
				3.001-4.000	*Min[6]	73.0	68.0	13	L-T direction 34 ksi√in T-L direction 29 ksi√in
					*Min[9]	75.0	67.0	10	
					*Min[10]	72.0	62.0	4	For thicknesses 2.001-3.000 inches
				4.001-5.000	*Min[6]	72.0	67.0	11	L-T direction 32 ksi√in
					*Min[9]	74.0	66.0	9	T-L direction 27 ksi√in
					*Min[10]	70.0	61.0	3	S-L direction 28 ksi√in
				5.001-6.000	*Min[6]	72.0	66.0	10	For thicknesses 3.001-4.000 inches L-T direction 30 ksi√in
					*Min[9]	73.0	65.0	6	T-L direction 25 ksi√in
					*Min[10]	69.0	61.0	2	S-L direction 27 ksi√in

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
									For thicknesses 4.001-5.000 inches L-T direction 28 ksi√in T-L direction 24 ksi√in S-L direction 26 ksi√in For thicknesses 5.001-6.000 inches L-T direction 26 ksi√in T-L direction 22 ksi√in S-L direction 25 ksi√in
7160-T7651	Constellium	12/05/2017 Revised 12/19/2018	Plate	1.000-1.500	Min[6] Min[9]	79.0 78.0	74.0 72.0	13 13	Stress Corrosion Resistance See footnote 4a.
				1.501-2.000	Min[6] Min[9] Min[10]	78.0 78.0 75.0	74.0 72.0 66.0	12 12 6	Fracture Toughness[14] – Min K_{IC} or K_Q For thicknesses 1.000-2.000 inches L-T direction 34 ksi√in T-L direction 29 ksi√in
				2.001-3.000	Min[6] Min[9] Min[10]	76.0 77.0 74.0	72.0 71.0 65.0	12 11 5	For thicknesses 2.001-3.000 inches L-T direction 32 ksi√in T-L direction 27 ksi√in S-L direction 29 ksi√in
				3.001-4.000	Min[6] Min[9] Min[10]	75.0 77.0 73.0	72.0 70.0 64.0	12 10 4	For thicknesses 3.001-4.000 inches L-T direction 29 ksi√in T-L direction 26 ksi√in S-L direction 28 ksi√in
				4.001-5.000	Min[6] Min[9] Min[10]	74.0 76.0 73.0	71.0 69.0 64.0	11 9 4	
7085-T711	Alcoa Revised Arconic	10/25/2011 Revised 08/02/2018	Plate	0.500-1.500 1.501-2.000	Min[9] Min[9]	80.0 78.0	74.0 73.0	11 11	Solution heat treated, stretched 1.5 to 3%, and overaged for ballistic performance.

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Registered			Product	Thickness in.	Tensile Strength, ksi			Elongation Percent in 2 in. or 4D	Remarks[2]
Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
				2.001-3.000 3.001-4.000	Min[9] Min[9]	77.0 76.0	72.0 70.0	10 7	0.500-3.000 in. plate meets armor plate requirements of MIL-DTL-32375 (MR) Class I Type A. Exfoliation Corrosion Resistance See footnote 15.b.
7085-T721	Alcoa Revised Arconic	10/27/2011 Revised 08/02/2018	Plate	0.500-1.500 1.501-2.000 2.001-3.000 3.001-4.000	Min[9] Min[9] Min[9] Min[9]	68.0 67.0 67.0 66.0	60.0 59.0 58.0 57.0	12 12 11 10	Solution heat treated, stretched 1.5 to 3%, and overaged for ballistic performance. 0.500-3.000 in. plate meets armor plate requirements of MIL-DTL-32375 (MR) Class I Type B. Exfoliation Corrosion Resistance See footnote 15.b.
7099-T731	Kaiser	03/13/2020	Plate	2.000-3.000	*Min[9]	68.0	58.0	12	*Tentative Solution heat treated, stretched 1.5 to 3%, and artificially aged to meet armor plate requirements. Developed to meet armor plate requirements of MIL-DTL-32375 (Revision B Amendment 2). Exfoliation Corrosion Resistance See footnote 15.b.
A206-T4	Eck Industries	09/14/2020	Sand Casting	-	Min	51.0	31.0	9	Properties are from separate standard cast coupons.
A206-T7	Eck Industries	09/14/2020	Sand Casting	-	Min	50.0	35.0	2	Properties are from separate standard cast coupons.

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4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Alloy Temper	By	Date			Basis[1]	Ult.	Yield		
E357-T61	Eck Industries	02/17/2017	Sand Casting	-	Min	40.0	34.0	1	Values represent properties obtained from separately cast bars and are derived from ASTM B-26, Standard Specification for Aluminum-Alloy Sand Castings.

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.

4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.

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Tentative Removed			
Alloy Temper	**Product**	**By**	**Revised Date**
2397-T87	Plate	Arconic	08/02/2018
7085-T711	Plate	Arconic	08/02/2018
7085-T721	Plate	Arconic	08/02/2018
7160-T7351	Plate	Constellium	02/06/2020
7160-T7651	Plate	Constellium	12/19/2018
2050-T34	Plate	Constellium	02/01/2019

Deactivated Tempers		
Alloy /Temper	**Product**	**Date Deactivated**
Alclad 2024-O[2]	Sheet & Plate	08/11/2018
Alclad 2024-T351[2]	Plate	08/11/2018
Alclad 2024-T42[2]	Sheet & Plate	08/11/2018
1 ½% Alclad 2024-O[2]	Sheet & Plate	08/11/2018
1 ½% Alclad 2024-T351[2]	Plate	08/11/2018
1 ½% Alclad 2024-T42[2]	Sheet & Plate	08/11/2018

[++] Deactivation is limited to specific gauge range(s) for the product indicated

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4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 35 ksi.

4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 45 ksi.

15. b. Material shall be capable of demonstrating exfoliation corrosion resistance. Exfoliation corrosion resistance shall be determined in accordance with ASTM G34 and material shall not exhibit exfoliation corrosion greater than that illustrated by Photo EB, Figure 2. The applicable sample plane for testing is indicated by one of the following locations: b. At the T/10 plane.