ADDENDUM TO 2018 TAN SHEETS

Tempers for Aluminum and Aluminum Alloy Products Metric Edition **April 21, 2022**

New and Revised Registrations Since Publication of 2018 Tan Sheets

Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or 5.65 $\sqrt{A}$	
2043-T85	Universal Alloy	02/07/2019	Extrusion	1.00	6.30	*Min[6]	525	485	6	-	*Tentative
				6.30	12.50	*Min[6]	540	505	7	-	Cross-sectional area less than or equal to 15000 mm2 and circle size less than or equal to 410 mm.
				12.50	25.00	*Min[6]	550	515	-	6	Solution heat treated and cold worked in the range 3-6% and artificially aged.
				25.00	60.00	*Min[6]	565	540	-	6	Stress Corrosion Resistance For ST specimens taken from section thicknesses 20 mm 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 08/04/17 Revised 02/01/2019	Plate	12.50	165.00	Min[9]	345	235	-	15	Solution heat treated and cold worked 3-4.5%.
2081-T84	Kaiser	11/16/2018	Plate	25.00	50.00	*Min[6]	525	505	-	7	*Tentative
						*Min[9]	525	485	-	6	Solution heat treated and cold worked 2-5%.
				50.00	76.00	*Min[6]	510	490	-	5	
						*Min[9]	515	470	-	5	
						*Min[10]	495	425	-	2	
				76.00	100.00	*Min[6]	505	485	-	5	
						*Min[9]	510	460	-	3	
						*Min[10]	490	425	-	2	
2297-T87	McCook Metals Constellium	06/21/2000 Revised 06/03/2004 Revised 01/12/2022	Plate	40.00	50.00	Min[6]	440	400	-	9	Stress Corrosion Resistance 30 days at 310 MPa when tested in the ST direction per ASTM G47 in the thickness range of 80.00-130.00 mm. Product outside this thickness rage will continue to exhibit capability of 30 days at 205 MPa.
						Min[9]	455	415	-	7	
						Min[10]	450	395	-	2	

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

FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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.

ADDENDUM TO 2018 TAN SHEETS

Tempers for Aluminum and Aluminum Alloy Products Metric Edition **April 21, 2022**

New and Revised Registrations Since Publication of 2018 Tan Sheets

Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or 5.65 $\sqrt{A}$	
				50.00	60.00	Min[6]	435	395	-	8	Exfoliation Corrosion Resistance
						Min[9]	440	400	-	6	See footnote 15.b.
						Min[10]	440	385	-	2	
											Fracture Toughness[14] – Min K_{Ic}
				60.00	80.00	Min[6]	425	395	-	8	For thicknesses over 40.00 thru 80.00 mm
						Min[9]	440	400	-	6	L-T direction 35 MPa √m
						Min[10]	425	380	-	2	T-L direction 30 MPa √m
											S-L direction 22 MPa √m
				80.00	100.00	Min[6]	430	395	-	4	For thicknesses over 80.00 thru 100.00 mm
						Min[9]	430	395	-	3	L-T direction 34 MPa √m
						Min[10]	405	370	-	1.5	T-L direction 30 MPa √m
											S-L direction 22 MPa √m
				100.00	125.00	Min[6]	420	385	-	4	For thicknesses over 100.00 thru 125.00 mm
						Min[9]	420	385	-	3	L-T direction 33 MPa √m
						Min[10]	400	360	-	1.5	T-L direction 29 MPa √m
											S-L direction 20 MPa √m
				125.00	160.00	Min[6]	415	380	-	4	For thicknesses over 125.00 thru 160.00 mm
						Min[9]	415	380	-	3	L-T direction 32 MPa √m
						Min[10]	395	360	-	1.5	T-L direction 27 MPa √m
											S-L direction 20 MPa √m
2397-T87	Alcoa	02/12/2003 Revised 08/17/2005 Revised 08/02/2018	Plate	80.00	100.00	Min[6]	425	395	-	4	Stress Corrosion Resistance
						Min[9]	425	395	-	4	See footnote 4.b.
						Min[10]	415	370	-	1.5	
	Arconic										Exfoliation Corrosion Resistance
											See footnote 15.b.
											Fracture Toughness[14] – Min K_{Ic}
											For thickness over 80.00 thru 100.00
											L-T direction 34 MPa √m
											T-L direction 30 MPa √m
											S-L direction 22 MPa √m

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

FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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.

ADDENDUM TO 2018 TAN SHEETS

Tempers for Aluminum and Aluminum Alloy Products Metric Edition **April 21, 2022**

New and Revised Registrations Since Publication of 2018 Tan Sheets

Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or 5.65 $\sqrt{A}$	
6061-T651	Constellium	09/09/2019	Plate	152.00	203.00	*Min[9]	290	250	-	8	*Tentative
				203.00	254.00	*Min[9]	280	235	-	7	
				254.00	305.00	*Min[9]	275	220	-	7	
7048-T6511	Kaiser	04/08/2020	Extrusion	1.00	3.20	Min[6]	465	435	10	-	
7055-T76511	Alcoa	01/15/2001 Revised 06/20/2007 Revised 08/14/2020	Extruded Rod, Bar & Profiles	-	6.30	Min[6]	615	585	7	-	Exfoliation Corrosion Resistance See footnote 15.b.
	Revised Arconic			6.30	12.50	Min[6]	620	585	9	-	For thickness up thru 12.50 mm Cross Sectional Area 7700 square mm max. and Circle Size 250 mm max.
				12.50	80.0	Min[6]	625	595	-	8	For thickness 12.50 – 80.0 mm Cross Sectional Area 17000 square mm max. and Circle Size 390 mm max. Longitudinal Compressive Yield Strength: 600 MPa
7160-T7351	Constellium	11/08/2018 Revised 02/06/2020	Plate	25.00	40.00	Min[6]	510	460	-	11	Stress Corrosion Resistance See footnote 4e.
						Min[9]	510	450	-	10	
				40.00	50.00	Min[6]	505	460	-	11	Fracture Toughness[14] – Min K_{IC} or K_Q For thicknesses 25.00 thru 80.00 mm L-T direction 44 MPa√m T-L direction 37 MPa√m
						Min[9]	505	450	-	10	
				50.00	80.00	Min[6]	495	450	-	10	
						Min[9]	505	440	-	9	For thicknesses 50.00 thru 80.00 mm L-T direction 49 MPa√m T-L direction 36 MPa√m S-L direction 38 MPa√m
						Min[10]	485	405	-	5	
				80.00	100.00	Min[6]	490	440	-	10	
						Min[9]	495	435	-	8	For thicknesses 80.00 thru 100.00 mm L-T direction 42 MPa√m T-L direction 33 MPa√m S-L direction 37 MPa√m
						Min[10]	485	400	-	4	

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

FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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.

ADDENDUM TO 2018 TAN SHEETS

Tempers for Aluminum and Aluminum Alloy Products Metric Edition **April 21, 2022**

New and Revised Registrations Since Publication of 2018 Tan Sheets

Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or 5.65 $\sqrt{A}$	
				100.00	120.00	Min[6]	485	440	-	10	For thicknesses 100.00 thru 120.00 mm
						Min[9]	495	425	-	7	L-T direction 40 MPa√m
						Min[10]	475	400	-	4	T-L direction 30 MPa√m
											S-L direction 34 MPa√m
				120.00	150.00	Min[6]	485	435	-	10	
						Min[9]	490	420	-	6	For thicknesses 120.00 thru 150.00 mm
						Min[10]	470	400	-	3	L-T direction 31 MPa√m
											T-L direction 27 MPa√m
											S-L direction 29 MPa√m
7160-T7451	Constellium	11/02/2018	Plate	25.00	40.00	*Min[6]	530	490	-	12	*Tentative
						*Min[9]	525	475	-	11	Stress Corrosion Resistance
											See footnote 4b.
				40.00	50.00	*Min[6]	530	490	-	12	
						*Min[9]	525	475	-	10	Fracture Toughness[14] – Min K_{IC} or K_Q
						*Min[10]	505	440	-	5	For thicknesses 25.00 thru 40.00 mm
											L-T direction 37 MPa√m
				50.00	80.000	*Min[6]	515	475	-	11	T-L direction 32 MPa√m
						*Min[9]	515	470	-	10	
						*Min[10]	505	440	-	5	For thicknesses 40.00 thru 50.00 mm
											L-T direction 37 MPa√m
				80.00	100.00	*Min[6]	505	470	-	11	T-L direction 32 MPa√m
						*Min[9]	515	460	-	9	
						*Min[10]	495	425	-	4	For thicknesses 50.00 thru 80.00 mm
											L-T direction 35 MPa√m
				100.00	120.00	*Min[6]	495	460	-	10	T-L direction 30 MPa√m
						*Min[9]	510	455	-	8	S-L direction 31 MPa√m
						*Min[10]	485	420	-	3	
											For thicknesses 80.00 thru 100.00 mm
				120.00	150.00	*Min[6]	495	455	-	9	L-T direction 33 MPa√m
						*Min[9]	505	450	-	5	T-L direction 27 MPa√m
						*Min[10]	475	420	-	2	S-L direction 30 MPa√m

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

FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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.

New and Revised Registrations Since Publication of 2018 Tan Sheets

Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or 5.65 $\sqrt{A}$	
											For thicknesses 100.00 thru 120.00 mm L-T direction 31 MPa√m T-L direction 26 MPa√m S-L direction 29 MPa√m For thicknesses 120.00 thru 150.00 mm L-T direction 29 MPa√m T-L direction 24 MPa√m S-L direction 27 MPa√m
7160-T7651	Constellium	12/05/2017 Revised 12/19/2018	Plate	25.00	40.00	Min[6]	545	510	-	11	Stress Corrosion Resistance
						Min[9]	540	495	-	11	See footnote 4a.
				40.00	50.00	Min[6]	540	510	-	10	Fracture Toughness[14] – Min K_{IC} or K_Q
						Min[9]	540	495	-	10	For thicknesses 25.00 thru 50.00 mm
						Min[10]	515	455	-	5	L-T direction 37 MPa√m
											T-L direction 32 MPa√m
				50.00	80.000	Min[6]	525	495	-	10	
						Min[9]	530	490	-	10	For thicknesses 50.00 thru 80.00 mm
						Min[10]	510	450	-	4	L-T direction 35 MPa√m
											T-L direction 30 MPa√m
				80.00	100.00	Min[6]	515	495	-	10	S-L direction 32 MPa√m
						Min[9]	530	485	-	9	
						Min[10]	505	440	-	4	For thicknesses 80.00 thru 100.00 mm
											L-T direction 32 MPa√m
				100.00	120.00	Min[6]	510	490	-	10	T-L direction 29 MPa√m
						Min[9]	525	475	-	8	S-L direction 31 MPa√m
						Min[10]	505	440	-	4	
				120.00	150.00	Min[6]	510	485	-	9	For thicknesses 100.00 thru 120.00 mm
						Min[9]	515	470	-	7	L-T direction 27 MPa√m
						Min[10]	495	435	-	4	T-L direction 26 MPa√m
											S-L direction 29 MPa√m

Unless specified below, for all referenced footnotes refer to the Yellow and/or Tan Sheets as applicable.
FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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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New and Revised Registrations Since Publication of 2018 Tan Sheets

Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or 5.65 $\sqrt{A}$	
											For thicknesses 120.00 thru 150.00 mm L-T direction 24 MPa√m T-L direction 25 MPa√m S-L direction 26 MPa√m
7085-T711	Alcoa Revised Arconic	10/25/2011 Revised 08/02/2018	Plate	12.50	40.00	Min[9]	550	510	-	10	Solution heat treated, stretched 1.5 to 3%, and overaged for ballistic performance. Over 12.50 thru 80.00 plate meets armor plate requirements of MIL-DTL-32375 (MR) Class I Type A. Exfoliation Corrosion Resistance See footnote 15.b.
				40.00	50.00	Min[9]	540	505	-	10	
				50.00	80.00	Min[9]	530	495	-	9	
				80.00	100.00	Min[9]	525	485	-	6	
7085-T721	Alcoa Revised Arconic	10/27/2011 Revised 08/02/2018	Plate	12.50	40.00	Min[9]	470	415	-	10	Solution heat treated, stretched 1.5 to 3%, and overaged for blast performance. Over 12.50 thru 80.00 plate meets armor plate requirements of MIL-DTL-32375 (MR) Class I Type B. Exfoliation Corrosion Resistance See footnote 15.b.
				40.00	50.00	Min[9]	460	405	-	10	
				50.00	80.00	Min[9]	460	400	-	10	
				80.00	100.00	Min[9]	455	395	-	9	
7099-T731	Kaiser	03/13/2020	Plate	50.00	80.00	*Min[9]	470	400	-	10	*Tentative Solution heat treated, stretched 1.5 to 3%, and artificially aged to meet armor plate requirements. Developed to meet armor plate requirements of MILDTL-32375 (Revision B Amendment 2). Exfoliation Corrosion Resistance See footnote 15.b.

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

FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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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Tempers for Aluminum and Aluminum Alloy Products Metric Edition **April 21, 2022**

New and Revised Registrations Since Publication of 2018 Tan Sheets											
Registered			Product	Thickness, mm		Tensile Strength, MPa			Elongation Percent in[21]		Remarks[2]
Alloy Temper	By	Date		Over	Thru	Basis[1]	Ult.	Yield	50 mm	5D or $5.65\sqrt{A}$	
A206-T4	Eck Industries	09/14/2020	Sand Casting	-	-	Min	350	215	9	-	Properties are from separate standard cast coupons.
A206-T7	Eck Industries	09/14/2020	Sand Casting	-	-	Min	345	240	2	-	Properties are from separate standard cast coupons.
E357-T6	Eck Industries	02/17/2017	Sand Casting	-	-	Min	276	234	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.
FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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.

ADDENDUM TO 2018 TAN SHEETS

Tempers for Aluminum and Aluminum Alloy Products Metric Edition **April 21, 2022**

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 Registrations		
Alloy Temper	**Product**	**Date Deactivated**
Alclad 2024-O[2]	Sheet & Plate	04/11/2018
Alclad 2024-T351[2]	Plate	04/11/2018
Alclad 2024-T42[2]	Sheet & Plate	04/11/2018
1 ½% Alclad 2024-O[2]	Sheet & Plate	04/11/2018
1 ½% Alclad 2024-T351[2]	Plate	04/11/2018
1 ½% Alclad 2024-T42[2]	Sheet & Plate	04/11/2018

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

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FN 4.b. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: b. 240 MPa.

FN 4.e. Material shall be capable of passing the stress corrosion cracking test described in ASTM G47 when stressed to: e. 310 MPa.

FN 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.