

ADDENDUM TO 2018 TAN SHEETS

Tempers For Aluminum And Aluminum Alloy Products Metric Edition

April 18, 2019

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 √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 mm ² 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	<u>Stress Corrosion Resistance</u> For ST specimens taken from section thicknesses 20 mm and greater, See footnote 4b. <u>Exfoliation Corrosion Resistance</u> See footnote 15b. Note: ASTM G85 Annex A2 Dry-Bottom MASTMAASIS Method for 2 weeks
2050 T34	Constellium	01/25/16 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 Solution heat treated and cold worked 2-5%.
						*Min ⁹	525	485	-	6	
				50.00	76.00	*Min ⁶	510	490	-	5	
						*Min ⁹	515	470	-	5	
76.00	100.00	*Min ¹⁰	495	425	-	2					
		*Min ⁶	505	485	-	5					
	Alcoa	02/12/2003 Revised 08/17/2005	Plate	80.00	100.00	Min ⁶	425	395	-	4	<u>Stress Corrosion Resistance</u> See footnote 4.b.
						Min ⁹	425	395	-	4	
						Min ¹⁰	415	370	-	1.5	

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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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 √A	
	Revised Arconic	Revised 08/02/2018									<u>Exfoliation Corrosion Resistance</u> See footnote 15.b. <u>Fracture Toughness¹⁴</u> – 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
7160-T7351	Constellium	11/08/2018	Plate	25.00	40.00	*Min ⁶ *Min ⁹	515 510	460 450	- -	11 10	*Tentative <u>Stress Corrosion Resistance</u> See footnote 4e. <u>Fracture Toughness¹⁴</u> – Min K _{IC} or K _Q For thicknesses 50.00 thru 80.00 mm L-T direction 48 MPa√m T-L direction 38 MPa√m S-L direction 40 MPa√m For thicknesses 80.00 thru 100.00 mm L-T direction 41 MPa√m T-L direction 33 MPa√m S-L direction 40 MPa√m For thicknesses 100.00 thru 120.00 mm L-T direction 37 MPa√m T-L direction 33 MPa√m S-L direction 35 MPa√m For thicknesses 120.00 thru 150.00 mm L-T direction 34 MPa√m T-L direction 31 MPa√m S-L direction 33 MPa√m
				40.00	50.00	*Min ⁶ *Min ⁹	510 510	460 450	- -	11 10	
				50.00	80.000	*Min ⁶ *Min ⁹ *Min ¹⁰	505 510 495	455 440 415	- - -	10 9 5	
				80.00	100.00	*Min ⁶ *Min ⁹ *Min ¹⁰	495 505 490	450 435 405	- - -	10 8 4	
				100.00	120.00	*Min ⁶ *Min ⁹ *Min ¹⁰	490 495 485	440 425 400	- - -	10 7 4	
				120.00	150.00	*Min ⁶ *Min ⁹ *Min ¹⁰	485 490 475	435 420 400	- - -	10 6 3	
7160-T7451	Constellium	11/02/2018	Plate	25.00	40.00	*Min ⁶ *Min ⁹	530 525	490 475	- -	12 11	*Tentative

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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.

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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 √A	
				40.00	50.00	*Min ⁶	530	490	-	12	<u>Stress Corrosion Resistance</u> See footnote 4b. <u>Fracture Toughness¹⁴</u> – Min K _{IC} or K _Q For thicknesses 25.00 thru 40.00 mm L-T direction 37 MPavm T-L direction 32 MPavm For thicknesses 40.00 thru 50.00 mm L-T direction 37 MPavm T-L direction 32 MPavm For thicknesses 50.00 thru 80.00 mm L-T direction 35 MPavm T-L direction 30 MPavm S-L direction 31 MPavm For thicknesses 80.00 thru 100.00 mm L-T direction 33 MPavm T-L direction 27 MPavm S-L direction 30 MPavm For thicknesses 100.00 thru 120.00 mm L-T direction 31 MPavm T-L direction 26 MPavm S-L direction 29 MPavm
						*Min ⁹	525	475	-	10	
						*Min ¹⁰	505	440	-	5	
				50.00	80.000	*Min ⁶	515	475	-	11	
						*Min ⁹	515	470	-	10	
						*Min ¹⁰	505	440	-	5	
				80.00	100.00	*Min ⁶	505	470	-	11	
						*Min ⁹	515	460	-	9	
						*Min ¹⁰	495	425	-	4	
				100.00	120.00	*Min ⁶	495	460	-	10	
						*Min ⁹	510	455	-	8	
						*Min ¹⁰	485	420	-	3	
				120.00	150.00	*Min ⁶	495	455	-	9	
						*Min ⁹	505	450	-	5	
						*Min ¹⁰	475	420	-	2	

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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.

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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 √A	
											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	<u>Stress Corrosion Resistance</u> See footnote 4a.
						Min ⁹	540	495	-	11	
				40.00	50.00	Min ⁶	540	510	-	10	Fracture Toughness ¹⁴ – Min K _{IC} or K _Q For thicknesses 25.00 thru 50.00 mm L-T direction 37 MPa/m T-L direction 32 MPa/m
						Min ⁹	540	495	-	10	
				50.00	80.00	Min ¹⁰	515	455	-	5	
						Min ⁶	525	495	-	10	
80.00	100.00	Min ⁹	530	490	-	10	For thicknesses 50.00 thru 80.00 mm L-T direction 35 MPa/m T-L direction 30 MPa/m S-L direction 32 MPa/m				
		Min ¹⁰	510	450	-	4					
100.00	120.00	Min ⁶	515	495	-	10	For thicknesses 80.00 thru 100.00 mm L-T direction 32 MPa/m T-L direction 29 MPa/m S-L direction 31 MPa/m				
		Min ⁹	530	485	-	9					
120.00	150.00	Min ¹⁰	505	440	-	4					
		Min ⁶	510	490	-	10					
		Min ⁹	525	475	-	8	For thicknesses 100.00 thru 120.00 mm L-T direction 27 MPa/m T-L direction 26 MPa/m S-L direction 29 MPa/m				
		Min ¹⁰	505	440	-	4					
											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

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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Alloy Temper	By	Date		Over	Thru	Basis ¹	Ult.	Yield	50 mm	5D or 5.65 √A	
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 <u>Exfoliation Corrosion Resistance</u> 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 <u>Exfoliation Corrosion Resistance</u> 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	

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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.

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Tentative Removed				Project Number
Alloy Temper	Product	By	Revised Date	
2397-T87	Plate	Arconic	08/02/2018	PN18-63
7085-T711	Plate	Arconic	08/02/2018	PN18-64
7085-T721	Plate	Arconic	08/02/2018	PN18-65
7160-T7651	Plate	Constellium	12/19/2018	PN18-67
2050-T34	Plate	Constellium	02/01/2019	PN18-71

Deactivated Registrations			Project Number
Alloy Temper	Product	Date Deactivated	
Alclad 2024-O ²	Sheet & Plate	04/11/2018	PS17-111
Alclad 2024-T351 ²	Plate	04/11/2018	PS17-111
Alclad 2024-T42 ²	Sheet & Plate	04/11/2018	PS17-111
1 ½% Alclad 2024-O ²	Sheet & Plate	04/11/2018	PS17-111
1 ½% Alclad 2024-T351 ²	Plate	04/11/2018	PS17-111
1 ½% Alclad 2024-T42 ²	Sheet & Plate	04/11/2018	PS17-111

**Deactivation is limited to specific gauge range(s) for the product indicated

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