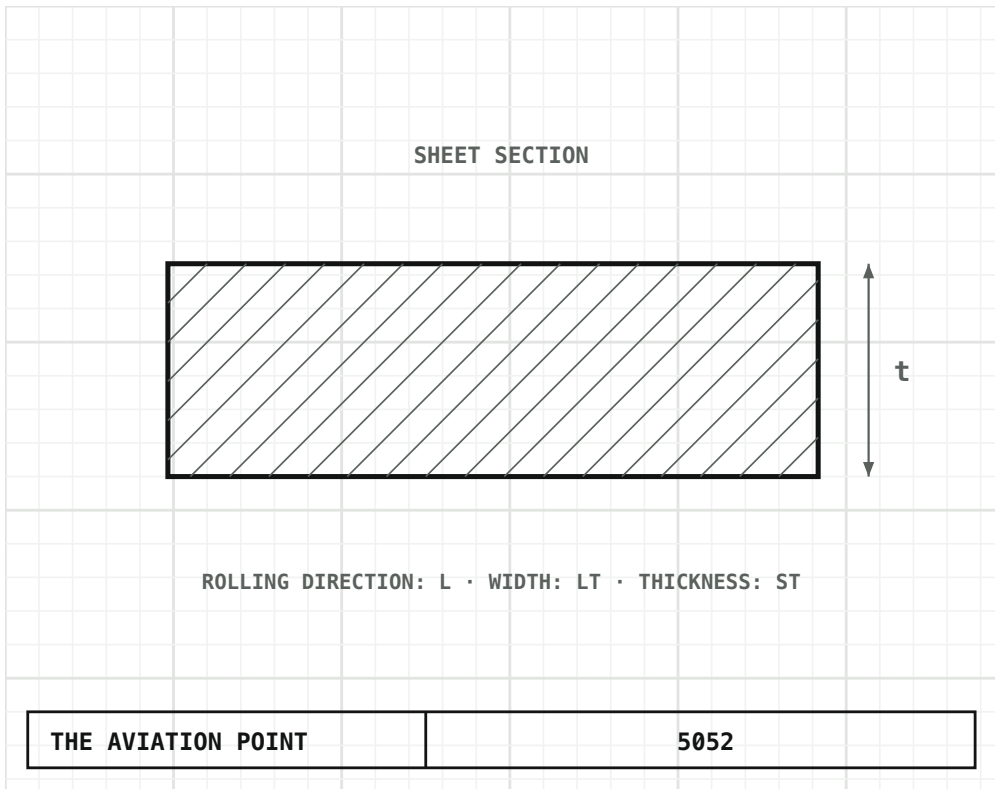
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The Aviation Point

5052 — wrought aluminum alloy

The workable non heat-treatable alloy: good corrosion resistance, easy to bend, readily welded.



Schematic

Designation

Item	Value
Designation	5052
Class	Aluminum
Type	wrought aluminum alloy

Composition

Element	Limit
Si	0.25
Fe	0.40
Cu	0.10
Mn	0.10
Mg	2.2-2.8
Cr	0.15–0.35
Zn	0.10
Al	Remainder

A single number is a maximum. Other elements: 0.05 each, 0.15 total, except where the Teal Sheets say otherwise. Source: Aluminum Association Teal Sheets (Aug 2018).

Specifications and forms

Specification	Form
AMS 4015, AMS 4016, AMS 4017	Sheet and plate
AMS-QQ-A-250/8	Sheet and plate

Specifications as listed by MIL-HDBK-5J. Federal QQ-A specifications passed to SAE as AMS-QQ-A. Check the current revision.

Properties

Property	Value	Source
Density	0.097 lb/in³ (2.68 g/cm³)	Teal Sheets
Brinell hardness, O / H36	47 / 73	AC 43.13-1B Table 4-5
Arc welding	A (O and H tempers)	MIL-HDBK-5J Table 3.1.3.4(a)
Spot welding	B (O), A (H32 to H38)	MIL-HDBK-5J Table 3.1.3.4(a)
E / Ec	10.1 / 10.2 × 10³ ksi	MIL-HDBK-5J Table 3.5.1.0(b1)

Density is the Aluminum Association nominal figure.

Design allowables, 5052 sheet and plate (S basis)

Property, ksi	O	H32	H34	H36	H38
Ftu, L	25	31	34	37	39
Ftu, LT	—	31	34	37	39
Fty, L	9.5	23	26	29	32
Fty, LT	—	22	25	29	32
Fcy, L	—	22	25	—	—
Fcy, LT	—	23	26	—	—
Fsu	16	19	20	22	23
Fbru, e/D = 1.5	—	50	54	59	62
Fbru, e/D = 2.0	—	65	71	78	82

Reference data. The aircraft manufacturer's documentation (SRM / IPC) takes precedence.

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Property, ksi	O	H32	H34	H36	H38
Fbry, e/D = 1.5	—	32	37	41	44
Fbry, e/D = 2.0	—	37	41	46	51

Thickness: O 0.006–3.000 in; H32 0.017–2.000; H34 0.009–1.000; H36 0.006–0.162; H38 0.006–0.128. MIL-HDBK-5J Table 3.5.1.0(b1), p. 3-220. H36 and H38 Fty L are from Aluminum Standards and Data, 1982. Dashes: not listed.

Bend radii (AC 43.13-1B Table 4-6)

Alloy and temper	0.016"	0.032"	0.064"	0.128"	0.182"	0.258"
5052-O	0	0	0 – 1t	0 – 1t	0 – 1t	0 – 1t
5052-H32	0	0	½t – 1t	½t – 1½t	½t – 1½t	½t – 1½t
5052-H34	0	0	½t – 1½t	1½t – 2½t	1½t – 2½t	2t – 3t
5052-H36	0 – 1t	½t – 1½t	1t – 2t	1½t – 3t	2t – 4t	2t – 4t
5052-H38	½t – 1½t	1t – 2t	1½t – 3t	2t – 4t	3t – 5t	4t – 6t

Recommended radii for 90-degree bends, as multiples of sheet thickness t. Alclad sheet may go slightly tighter than bare (Table 4-6 note 1). The drawing or SRM governs.

Minimum bend radius, inches (AMT Handbook Chart 204)

Alloy and temper	0.020"	0.032"	0.040"	0.063"	0.125"	0.190"
5052-O, 6061-O, 5052-H32	.03	.03	.06	.06	.12	.19
7178-O, 2024-O, 5052-H34, 6061-T4, 7075-O	.03	.03	.06	.09	.25	.38

Selected thicknesses from FAA-H-8083-31B Chart 204, p. 4-61. Chart 204 and AC Table 4-6 do not agree everywhere: where they differ, use the larger radius or the SRM.

Forms and thicknesses in stock

Distributor sheet	Listed	Thickness, in
5052H-32 Aluminum Sheet For Fuel Tanks	0.032"–0.050" · full/half sheets	.032, .040, .050

As distributors list them, not a statement of what a specification allows.

Weight by thickness

Thickness, in	mm	lb/ft²	kg/m²
0.016	0.41	0.223	1.09
0.020	0.51	0.279	1.36
0.025	0.64	0.349	1.70
0.032	0.81	0.447	2.18
0.040	1.02	0.559	2.73
0.050	1.27	0.698	3.41
0.063	1.60	0.880	4.30
0.071	1.80	0.992	4.84
0.080	2.03	1.117	5.45
0.090	2.29	1.257	6.14
0.100	2.54	1.397	6.82
0.125	3.17	1.746	8.52

Computed for density 0.097 by our sheet weight calculator. Kilograms and millimetres converted.

Notes

- **Not a source of design allowables.** Values are for reference. MMPDS and the SRM govern a repair.
- **Not a substitution approval.** A different alloy or temper needs approved data.
- **Not a substitute for 2024 or 6061 in structure** without approved data.

SOURCES · FAA AC 43.13-1B CHG 1, Chapters 4 and 7 · FAA-H-8083-31B, AMT Handbook — Airframe, Volume 1, Chapter 4 · MIL-HDBK-5J, Chapter 3 · Aluminum Association, International Alloy Designations, rev. Aug 2018 · MMPDS · Distributor listings

SCAN · OPEN THIS DATA SHEET
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Reference data. The aircraft manufacturer's documentation (SRM / IPC) takes precedence.