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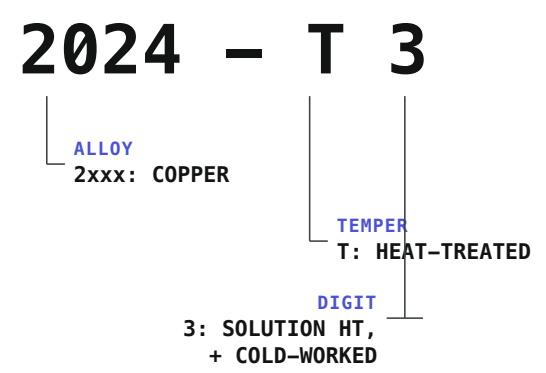
Aluminum Temper Designations Chart

The letter after the alloy number says how the metal was hardened: O is annealed, H is strain-hardened, T is heat-treated.

REFERENCE DRAWING — NOT APPROVED DATA · THE SRM ALWAYS GOVERNS

DECODER

THE MARKING, PIECE BY PIECE



O ANNEALED · H STRAIN-HARDENED · T HEAT-TREATED

PARTS

PART	WHAT IT DOES
Marked sheet	Alloy and temper printed along it

KEY DATA

LETTERS
O annealed, H strain-hardened, T heat-treated.

T3 AND T6
T3: solution heat-treated and cold-worked.
T6: heat-treated and aged.

CHART
Decodes each temper and lists the pairs found on aircraft (AC 43.13-1B Table 4-4).

NOTES
1. Dimensions in inches. Do not scale: the SRM sets the values.
2. For reference. The applicable manual always governs.

REVISIONS

REV	DESCRIPTION	YEAR
A	First issue	2026

The Aviation Point.	Structural repair reference		
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DO NOT SCALE DRAWING			

Reading a marking such as 2024-T3

Part	Example	What it tells you
`Alloy number`	2024	The commercial code number. It identifies the composition of the alloy (AC 43.13-1B 4-4; Handbook p. 4-30).
`Letter suffix`	-T3	The temper: how the metal was hardened or softened. The letter and digits are the “basic temper designations and subdivisions.”
`Alclad`	Alclad 2024-T3	An aluminum alloy with a protective cladding of aluminum to improve corrosion resistance (Handbook p. 4-30).

The four basic temper letters

Letter	Meaning (AC Table 4-4)	Alloys
F	As fabricated. No mechanical property limits. For castings: as cast.	Wrought and cast
O	Annealed, recrystallized: the softest temper of wrought products.	Both groups
H	Strain-hardened: hardened by cold work, not by a heat treatment.	Non heat-treatable alloys
T	The tempers for heat-treatable alloys, T1 to T10 in Table 4-4: solution heat-treated, aged, cold-worked, or a combination.	Heat-treatable alloys

H tempers — non heat-treatable alloys (1100, 3003, 5052)

Temper	Meaning (AC Table 4-4)
-H1	Strain-hardened only, to get the strength wanted, with no extra thermal treatment.
-H12, -H14, -H16, -H18	H1 at one-quarter hard, half-hard, three-quarters hard and full-hard.
-H2	Strain-hardened more than needed, then reduced to the strength wanted by partial annealing.
-H22, -H24, -H26, -H28	H2 at one-quarter, half, three-quarters and full-hard.
-H3	Strain-hardened, then stabilized by low-temperature heating. Strength falls a little and ductility rises.
-H32, -H34, -H36, -H38	H3 at one-quarter, half, three-quarters and full-hard.
-H112	As fabricated, with specified mechanical property limits.

T tempers — stress-relieved and T7 variants

Temper	Meaning (AC Table 4-4)
-T351, -T451, -T3510, -T3511, -T4510, -T4511	Solution heat-treated, then stress-relieved by stretching to a permanent set of 1 to 3 percent, depending on the product.
-T651, -T851, -T6510, -T8510, -T6511, -T8511	Solution heat-treated, stress-relieved by stretching 1 to 3 percent, then artificially aged.
-T652	Solution heat-treated, compressed to a permanent set, then artificially aged.
-T7351, -T76 (not in AC Table 4-4)	Not defined in Table 4-4. The Handbook names them for 7075: T7351 has excellent stress-corrosion resistance and better fracture toughness than T6; T76 is often used to improve exfoliation corrosion resistance. The T7 family is the “solution heat-treated and stabilized” group in the Aluminum Association (ANSI H35.1) system; the standard itself was not consulted here.

Educational reference only, not approved data. Always consult the applicable SRM, AMM, or AC 43.13-1B and your certifying authority.

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T tempers — heat-treatable alloys (2014, 2024, 6061, 7075)

Temper	Meaning (AC Table 4-4)
-T1	Cooled from a hot shaping process (extrusion, casting) and naturally aged to a stable condition.
-T2	Annealed (castings only).
-T3	Solution heat-treated, then cold-worked by flattening or straightening.
-T36	Solution heat-treated, then cold-worked by a 6 percent reduction.
-T4	Solution heat-treated.
-T42	Solution heat-treated by the user regardless of prior temper (2014 and 2024 only).
-T5	Artificially aged only (castings only).
-T6	Solution heat-treated, then artificially aged.
-T62	Solution heat-treated and aged by the user regardless of prior temper (2014 and 2024 only).
-T8	Solution heat-treated, cold-worked, then artificially aged.
"-T/4" (as printed)	Solution heat-treated, cold-worked by flattening or straightening, then artificially aged. The AC prints the designation as "-T/4", which looks like a misprint. This definition matches T81 in the Aluminum Association system; that identification is not from the AC.
-T86	Solution heat-treated, cold-worked by a 6 percent reduction, then artificially aged.
-T9	Solution heat-treated, artificially aged, then cold-worked.
-T10	Cooled from a hot shaping process, artificially aged, then cold-worked.

Common aircraft alloy and temper pairs

Alloy-temper	Group	What the sources use it for
1100	Non heat-treatable	Fuel and oil tanks, cowlings, wingtip repair; where strength is not important. Weldable.
3003	Non heat-treatable	Like 1100 but stronger and harder.
5052-O, -H32, -H34, -H36, -H38	Non heat-treatable	Fuel, hydraulic and oil lines; good workability, corrosion resistance and fatigue strength.
2024-O, -T3, -T6 (bare or Alclad)	Heat-treatable	Structures, airfoil and fuselage skins, extrusions, fittings.
2024-T4	Heat-treatable	DD rivets: too hard to drive once aged, so they are kept refrigerated (or re-heat-treated) until driven.
2117-T4	Heat-treatable	AD rivets, the most used repair rivet; driven as received.
2017-T4	Heat-treatable	Rivets (limited use now). Above 3/16 in, keep refrigerated until driven.
6061-O, -T4, -T6	Heat-treatable	Weldable, easily extruded; hydraulic and pneumatic tubing.
7075-O, -T6	Heat-treatable	Stronger than 2024 but lower fracture toughness; tension use where fatigue is not critical. T6 avoided in corrosive environments.
7075-T7351, -T76	Heat-treatable	Better stress-corrosion (T7351) and exfoliation (T76) resistance than T6.

MAIN SOURCES · FAA AC 43.13-1B CHG 1, Chapter 4, par. 4-2 to 4-4 and Table 4-4 · FAA AC 43.13-1B CHG 1, Chapter 4, Table 4-6 and par. 4-16, 4-57d · FAA-H-8083-31, AMT Handbook — Airframe, Volume 1, Chapter 4, pp. 4-30, 4-31, 4-32 and 4-43 · ANSI H35.1 / Aluminum Association temper designation system

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