

ALUMINUM ALLOY CHARACTERISTICS

| Alloy | | Gen'l. Availability | | | | Typical Characteristics* | | | | | | | Specified Mechanical Properties | | | | | | |
|---------------------------|----------------|---------------------|------------|------------|---------------------|--------------------------|----------------------|------------------|---------------|-------------|-------------|--------------------------------|---|-------|---|------------------|-----------------|-------|-------|
| | | Temper | Flat Sheet | Coil Sheet | Cut to Length Sheet | Plate | Corrosion Resistance | Cold Workability | Machinability | Brazability | Weldability | | Where range is shown, property varies with specific width and/or thickness dimensions | | | | | | |
| | | | | | | | | | | | Gas | Arc Resistance, spot and steam | Tensile Strength - Ksi | | Elongation in 2" or 4 times diameter -percent minimum | | | | |
| | | | | | | | | | | | | | Ultimate | Yield | Sheet | Plate | | | |
| Minimum | Maximum | Minimum | Maximum | Sheet | Plate | | | | | | | | | | | | | | |
| Non-Heat Treatable Alloys | 1100 | O | x | x | x | - | A | A | D | A | A | A | B | 11 | 15.5 | 3.5 ¹ | - | 15-30 | - |
| | | H14 | X | X | X | - | A | A | C | A | A | A | A | - | 16 | 21 | 14 ¹ | - | 3-9 |
| | 3003 | O | X | X | X | - | A | A | D | A | A | A | B | 14 | 19 | 5 ¹ | - | 14-25 | - |
| | | H14 | X | X | X | - | A | A | B | C | A | A | A | - | 20 | 26 | 17 ¹ | - | 1-7 |
| | 5052 | O | X | X | X | - | A | A | D | C | A | A | B | 25 | 31 | 9.5 ¹ | - | 15-20 | - |
| | | H32 | X | X | X | X | A | B | C | C | C | A | A | - | 31 | 38 | 23 ¹ | - | 4-9 |
| H34 | X | X | X | X | - | A | B | C | C | A | A | A | - | 34 | 41 | 26 ¹ | - | 3-7 | - |
| Heat-Treatable Alloys | Bare 2024 | O ³ | X | - | - | X | C | B | D | D | D | C | B | - | 32 | - | 14 | 12 | 12 |
| | | T3 | X | - | - | - | C | C | B | D | D | C | A | 63-64 | - | 42 | - | 10-15 | - |
| | | T351 | - | - | - | X | C | C | B | D | D | C | A | 56-64 | - | 40-41 | - | - | 4-12 |
| | | T42 ² | - | - | - | - | C | C | B | D | D | C | A | 58-62 | - | 38 | - | 12-15 | 4-12 |
| | Alclad 2024 | O ³ | X | X | - | X | A | B | D | D | D | C | B | - | 30-32 | - | 14 | 10-12 | 12 |
| | | T3 | X | - | - | - | A | D | B | D | D | C | A | 58-63 | - | 39-40 | - | 10-15 | - |
| | 6061 | T351 | - | - | - | X | A | D | B | D | D | C | A | 56-63 | - | 40-41 | - | - | 4-8 |
| | | T42 ² | - | - | - | - | A | D | B | D | D | C | A | 55-61 | - | 34-38 | - | 10-15 | 4-12 |
| | | O ³¹ | X | X | - | X | A | A | C | D | A | A | A | B | - | 22 | 12 | 12 | 10-18 |
| | | T4 | X | - | - | - | A | A | C | D | A | A | A | A | 30 | - | 16 | - | 10-16 |
| | Bare 7075 | T6 | X | - | - | - | A | C | C | C | A | A | A | A | 42 | - | 35 | - | 4-10 |
| | | T651 | - | - | - | X | A | C | C | C | A | A | A | A | 40-42 | - | 35 | - | 6-10 |
| T42 ² | | - | - | - | - | A | C | C | A | A | A | A | A | 30 | - | 14 | - | 10-16 | |
| Alclad 7075 | O ¹ | X | - | - | - | C | D | D | D | D | D | B | - | 40 | - | 21 | 10 | - | |
| | T6 | X | - | - | - | C | D | B | D | D | D | B | 76-77 | - | 65-66 | - | 7-8 | - | |
| Alclad 7075 | T651 | - | - | - | X | C | D | B | D | D | D | B | 67-77 | - | 53-66 | - | - | 2-8 | |
| | O ¹ | X | X | - | - | A | B | C | D | D | D | B | - | 36-39 | - | 20-21 | 9-10 | - | |
| T6 | X | - | - | - | - | A | D | B | D | D | D | B | 68-75 | - | 58-64 | - | 5-8 | - | |

Ratings A, B, C, D are relative in decreasing order of merit. weldability and brazability ratings are specifically defined as:

- A** - Generally weldable by all commercial procedures and methods.
- B** - Weldable with special technique or specific applications which justify preliminary trials or testing to develop welding procedure and weld performance.
- C** - Limited weldability because of crack sensitivity or loss on resistance to corrosion, and all mechanical properties.
- D** - No commonly used welding methods have so far been developed.

- 1** - These yield strengths not determined unless specifically requested.
- 2** - Although sheet and plate are not sold in this temper, material heat treated from any temper by the user should attain the mechanical properties applicable to this temper.
- 3** - Annealed (0 temper) material shall, upon heat treatment, be capable of developing the mechanical properties applicable to T 42 temper material.
- 4** - Annealed (0 temper) material shall, upon heat treatment and aging, be capable of developing the mechanical properties applicable to T 67 temper material.

APPROXIMATE MINIMUM RADII FOR 90° COLD BEND

Where range is shown, use smaller radius with extreme caution.

| ALLOY | TEMPER | RADII ¹ For Various Thicknesses Expresses in Terms of Thickness "t" | | | | | | | | |
|--------|------------------|--|-------------|-------------|-------------|-----------|---------------|---------------|---------------|--|
| | | 1/64 Inch | 1/32 Inch | 1/16 Inch | 1/8 Inch | 3/16 Inch | 1/4 Inch | 3/8 Inch | 1/2 Inch | |
| 1100 | -O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1t-2t | |
| | -H12 | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 0-1t | 1t-3t | |
| | -H14 | 0 | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 2t-3t | |
| | -H16 | 0 | 0 | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2-1/2t-3-1/2t | 3t-4t | |
| | -H18 | 0-1t | 1/2-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 2t-4t | 3t-5t | 3t-6t | |
| Alclad | -O | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 1-1/2t-3t | 3t-5t | |
| | -T3 | 1t-2t | 1-1/2t-3t | 2t-4t | 3t-5t | 4t-6t | 4t-6t | 5t-7t | 5-1/2t-8t | |
| | -T4 | 1t-2t | 1-1/2t-3t | 2t-4t | 3t-5t | 4t-6t | 4t-6t | 5t-7t | 5-1/2t-8t | |
| | -T6 | 2t-4t | 3t-5t | 3t-5t | 4t-6t | 5t-7t | 6t-10t | 7t-10t | 8t-11t | |
| 2024 | -O ² | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 1-1/2t-3t | 3t-5t | |
| | -T323 | 1-1/2t-3t | 2t-4t | 3t-5t | 4t-6t | 4t-6t | 5t-7t | 6t-8t | 6t-9t | |
| | -36 ² | 2t-4t | 3t-5t | 4t-6t | 5t-7t | 5t-7t | 6t-10t | 7t-10t | 8t-11t | |
| | -T42 | 1-1/2t-3t | 2t-4t | 3t-5t | 4t-6t | 4t-6t | 5t-7t | 6t-8t | 6t-9t | |
| | -T81 | 3-1/2t-5t | 4-1/2t-6t | 5t-7t | 6-1/2t-8t | 7t-9t | 8t-10t | 9t-11t | 9t-12t | |
| | -T86 | 4t-5-1/2t | 5t-7t | 6t-8t | 7t-10t | 8t-11t | 10t-13t | 10t-13t | 1t-2t | |
| 3003 | -O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1t-2t | |
| | -H12 | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 0-1t | 1t-3t | |
| | -H14 | 0 | 0 | 0 | 0-1t | 0-1t | 1/2t-1-1/2t | 1t-2-1/2t | 1-1/2t-3t | |
| | -H16 | 0-1t | 0t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 1-1/2t-4t | 3t-5t | |
| | -H18 | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 3t-5t | 4t-6t | 4t-7t | 5t-8t | |
| 5052 | -O | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 1/2t-1-1/2t | 1t-2t | |
| | -H32 | 0 | 0 | 0 | 0-1t | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-2-1/2t | |
| | -H34 | 0 | 0 | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-3t | 2-1/2t-3-1/2t | |
| | -H36 | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 2t-4t | 2-1/2t-5t | 3t-5-1/2t | |
| | -H38 | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 3t-5t | 4t-6t | 4t-7t | 5t-8t | |
| 6061 | -O | 0 | 0 | 0 | 0 | 0-1t | 0-1t | 1/2t-2t | 1t-1-1/2t | |
| | -T4 ² | 0-1t | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 2-1/2t-4t | 3t-5t | |
| | -T6 ² | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2t-4t | 3-1/2t-5-1/2t | 4t-6t | 4t-6t | |
| 7075 | -O | 0 | 0 | 0-1t | 1/2t-1-1/2t | 1t-2t | 1-1/2t-3t | 2-1/2t-4t | 3t-5t | |
| | -T6 ² | 2t-4t | 3t-5t | 4t-6t | 5t-7t | 5t-7t | 6t-10t | 7t-11t | 7t-12t | |

1. Minimum permissible radius over which sheet or plate may be bent varies with nature of forming operation, type of forming equipment, and design and conditions of tools. Minimum working radius for a given material or hardest alloy and temper for a given radius can be ascertained only by actual trial under contemplated conditions of fabrication. Where range is shown, use a smaller radius with extreme caution.

2. Alclad sheet can be bent over slightly smaller radii than the corresponding tempers of the uncoated alloy.

3. Immediately after quenching, this alloy can be formed over appreciable smaller radii. 4217661360076962