

# ROD & BAR ALLOY 6040

## ALLOY DESCRIPTION

6040 is a RoHS compliant, lead-free alternative to 6262. The alloy offers very good machinability along with good corrosion resistance. It also has excellent coating acceptance (anodize response). It can be used in place of 6262. Physical and mechanical properties are equivalent to 6262.

## TYPICAL MECHANICAL PROPERTIES

| Temper   | Tensile (.500" Dia. Specimen) |     |       |     |                    | Hardness<br>Rockwell "B"<br>100 kg<br>1/16" Ball | Shear                      |     | Fatigue*                          |     |
|----------|-------------------------------|-----|-------|-----|--------------------|--|----------------------------|-----|-----------------------------------|-----|
|          | Ultimate                      |     | Yield |     | Elongation/4D<br>% |  | Ultimate Shearing Strength |     | Endurance Limit – R.R. Moore Type |     |
|          | KSI                           | MPa | KSI   | MPa |                    |  | KSI                        | MPa | KSI                               | MPa |
| T6, T651 | 47.0                          | 324 | 43.0  | 296 | 15                 |  |                            |     |                                   |     |
| T8       | 47.0                          | 324 | 44.0  | 303 | 14                 | 62   | 30                         | 207 |                                   |     |

\*5 x 10E4 cycles of reversed stress

## COMPARATIVE CHARACTERISTICS

| Temper   | Corrosion Resistance |                     | Cold Workability <sup>3</sup> | Machinability <sup>3</sup> | Anodize Response <sup>3</sup> | Brazeability <sup>4</sup> | Weldability <sup>4</sup> |     |      |
|----------|----------------------|---------------------|-------------------------------|----------------------------|-------------------------------|---------------------------|--------------------------|-----|------|
|          | General <sup>1</sup> | Stress <sup>2</sup> |                               |                            |                               |                           | Gas                      | Arc | Spot |
| T6, T651 | B                    | A                   | C                             | B                          | A                             |                           |                          |     |      |
| T8       | B                    | A                   | D                             | B                          | A                             |                           |                          |     |      |

- Ratings A through E are relative ratings in decreasing order of merit, based on exposures to sodium chloride solution by intermittent spraying or immersion. Alloys with A and B ratings can be used in industrial and seacoast atmospheres without protection. Alloys with C, D and E ratings generally should be protected at least on faying surfaces.
- Stress-corrosion cracking ratings are based on service experience and on laboratory tests of specimens exposed to the 3.5% sodium chloride alternate immersion test.  
 A= No known instance of failure in service or in laboratory tests.  
 B= No known instance of failure in service; limited failures in laboratory tests of short transverse specimens.  
 C= Service failures with sustained tension stress acting in short transverse direction relative to grain structure; limited failures in laboratory tests of long transverse specimens.  
 D= Limited service failures with sustained longitudinal or long transverse areas.
- Ratings A through D for Workability (cold), A through E for Machinability and A through C for Anodize Response, are relative ratings in decreasing order of merit.
- Ratings A through D for Weldability and Brazeability are relative ratings defined as follows:  
 A= Generally weldable by all commercial procedures and methods.  
 B= Weldable with special techniques or for specific applications that justify preliminary trials or testing to develop welding procedure and weld performance.  
 C= Limited weldability because of crack sensitivity or loss in resistance to corrosion and mechanical properties.  
 D= No commonly used welding methods have been developed.

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## CHEMICAL COMPOSITION LIMITS

|          |      |      |      |      |      |      |      |      | Others <sup>1</sup> |       |
|----------|------|------|------|------|------|------|------|------|---------------------|-------|
| Weight % | Si   | Fe   | Cu   | Mn   | Mg   | Cr   | Zn   | Ti   | Each                | Total |
| Minimum  | 0.40 |      | 0.20 |      | 0.80 |      |      |      |                     |       |
| Maximum  | 0.80 | 0.70 | 0.80 | 0.15 | 1.20 | 0.15 | 0.25 | 0.15 | 0.05                | 0.15  |

<sup>1</sup> Also contains 0.30 - 1.20 wt. % each of Sn and 0.15 - 0.70 % Bi