

ALLOY 4643 WELD DATA SHEET

TYPICAL APPLICATIONS

- Welding Filler Wire

GENERAL INFORMATION

- Heat treatable
- Principle alloying elements: Silicon, Magnesium
- Applicable specifications: ANSI/AWS A5.10 (ER & R), AMS 4189 (Chemistry Only)

TYPICAL PROPERTIES

Melting range: 1065 - 1175°F
Density: .097 lbs./cu. in.

Resistance to corrosion: B (Gen) A (SCC)
Anodize Color: Gray

CHEMISTRY

| <u>SILICON</u> | <u>IRON</u> | <u>COPPER</u> | <u>MANGANESE</u> | <u>MAGNESIUM</u> | <u>CHROMIUM</u> | <u>ZINC</u> | <u>TITANIUM</u> | <u>BERYLLIUM</u> | <u>OTHERS</u> | | <u>ALUM</u> |
|----------------|-------------|---------------|------------------|------------------|-----------------|-------------|-----------------|------------------|---------------|--------------|-------------|
| | | | | | | | | | <u>EACH</u> | <u>TOTAL</u> | <u>REM</u> |
| 3.6-4.6 | 0.8 | 0.10 | 0.05 | 0.10-0.30 | --- | 0.10 | 0.15 | 0.0003 | 0.05 | 0.15 | |

NOTE: SINGLE VALUES ARE MAXIMUM UNLESS OTHERWISE NOTED.

ALLOY CHARACTERISTICS

A PRIMARY USE FOR ALLOY 4643 IS IN THE WELDING OF HEAVY SECTIONS OF CERTAIN ALUMINUM ALLOYS WHEN MULTIPLE WELD PASSES ARE USED AND DILUTION OF THE BASE METAL INTO THE PUDDLE IS NEGLIGIBLE. POST WELD SOLUTION HEAT TREATMENT AND ARTIFICIAL AGING MAY DEVELOP 90% OF THE TENSILE STRENGTH OF THE UNWELDED BASE METAL IN ALLOYS 6061, 6063, 6070, AND 6071. THIS ALLOY COULD ALSO OFFER ADVANTAGES IN BRAZING TYPE APPLICATIONS ON THIN SECTIONS WHERE DILUTION RATIOS ARE LOW.

WELDS MADE WITH ALLOY 4043 OR 4643 FILLER METAL SHOULD HAVE APPROXIMATELY EQUAL PERFORMANCE IN THE AS-WELDED CONDITION.

ALLOY 4643 IS VERY SIMILAR IN WELDABILITY TO 4043. THE WELD CRACKING CHARACTERISTICS, FLOW, PRE-CLEANING AND MACHINE SETTINGS ARE THE SAME FOR THIS ALLOY AS FOR 4043. THE CORROSION RESISTANCE IS VERY GOOD AND EQUALS OR EXCEEDS ALLOY 4043 IN THE WELD ZONE AND HEAT AFFECTED REGIONS.

AlcoTec Wire Corporation

Typical Semiautomatic GMA Procedures for Fillet and Lap Welding Aluminum

| Wire Dia <u>Inches</u> | DC(EP) ³ Range | | Base ¹ Thickness <u>Inches</u> | DC(EP) Suggested | | Wire Feed <u>IPM</u> | Argon Gas Flow <u>CFH</u> | Approximate Consumption ² <u>Lbs/100Ft</u> |
|---------------------------|------------------------------|--------------|---|---------------------|--------------|----------------------------|---------------------------------|---|
| | <u>Amps</u> | <u>Volts</u> | | <u>Amps</u> | <u>Volts</u> | | | |
| .030 | 100-130 | 18-22 | .094 | 100 | 22 | 500 | 30 | 0.75 |
| | 125-150 | 20-24 | .125 | 120 | 22 | 600 | 30 | 1 |
| .035 | 85-120 | 20-23 | .094 | 110 | 22 | 480 | 30 | 0.75 |
| | 125-150 | 20-24 | .125 | 130 | 22 | 566 | 30 | 1 |
| | 170-190 | 21-26 | .250 | 170 | 23 | 740 | 35 | 4 |
| .047 | 125-150 | 20-24 | .125 | 150 | 23 | 360 | 30 | 1 |
| | 180-210 | 22-26 | .187 | 180 | 23 | 410 | 30 | 2.3 |
| | 170-240 | 24-28 | .250 | 190 | 24 | 470 | 40 | 4 |
| .062 | 190-260 | 21-26 | .250 | 200 | 23 | 265 | 50 | 4 |
| | 240-300 | 22-27 | .375 | 230 | 24 | 300 | 50 | 9 |
| | 260-310 | 22-27 | .500 | 260 | 26 | 340 | 60 | 16 |
| | 280-320 | 24-28 | .750 | 280 | 27 | 385 | 65 | 36 |
| | 290-340 | 26-30 | 1.000 | 300 | 28 | 420 | 70 | 64 |
| .094 | 280-360 | 26-30 | .750 | 320 | 29 | 170 | 60 | 36 |
| | 300-400 | 26-32 | 1.000 | 330 | 30 | 180 | 80 | 64 |

1. Metal thickness of 3/4" or greater for fillet welds sometimes employs a double vee bevel of 50 deg or greater included vee with 3/32 to 1/8 inch land thickness on the abutting member.
2. Electrode consumption given for weld on one side only and based on leg length equal to plate thickness.
3. For 5XXX series electrodes use a welding current in the high side of the range given and an arc voltage in the lower portion of the range. 1XXX, 2XXX, and 4XXX series electrodes would use the lower currents and higher arc voltages.

THIS INFORMATION IS BASED ON DATA DEVELOPED UNDER LABORATORY CONDITIONS AND IS DESIGNED AS A GUIDELINE ONLY. INDIVIDUAL CONDITIONS, WELDING EQUIPMENT AND ENVIRONMENT CAN AFFECT SUGGESTED SETTINGS.

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