

MULTIMET[®] alloy

Welding

MULTIMET[®] alloy is readily welded by Gas Tungsten Arc Welding (GTAW), Gas Metal Arc Welding (GMAW), Shielded Metal Arc Welding (SMAW), and resistance welding techniques. Submerged Arc Welding (SAW) is not recommended as this process is characterized by high heat input to the base metal and slow cooling of the weld. These factors can increase weld restraint and promote cracking.

Base Metal Preparation

The welding surface and adjacent regions should be thoroughly cleaned with an appropriate solvent prior to any welding operation. All greases, oils, cutting oils, crayon marks, machining solutions, corrosion products, paint, scale, dye penetrant solutions, and other foreign matter should be completely removed. It is preferable, but not necessary, that the alloy be in the solution- annealed condition when welded.

Filler Metal Selection

MULTIMET[®] filler wire (AMS 5794) is recommended for joining MULTIMET[®] alloy by Gas Tungsten Arc or Gas Metal Arc welding. Coated electrodes of MULTIMET[®] alloy (AMS 5795) are also available for Shielded Metal Arc welding. For dissimilar metal joining of MULTIMET[®] alloy to nickel-, cobalt-, or iron- base materials, MULTIMET[®] filler wire, HAYNES 556[®] alloy (AWS A5.9 ER3556, AMS 5831), HASTELLOY S alloy (AMS 5838) or HASTELLOY W alloy (AMS 5786, 5787) welding products may all be considered, depending upon the particular case. Please [click here](#) or see the [Haynes Welding SmartGuide](#) for more information.

Preheating, Interpass Temperatures, and Postweld Heat Treatment

Preheat is not required. Preheat is generally specified as room temperature (typical shop conditions). Interpass temperature should be maintained below 200°F (93°C). Auxiliary cooling methods may be used between weld passes, as needed, providing that such methods do not introduce contaminants. Postweld heat treatment is not generally required for MULTIMET[®] alloy. For further information, please consult the [click here](#).

Nominal Welding Parameters

Details for GTAW, GMAW and SMAW welding are given Nominal welding parameters are provided as a guide for performing typical operations and are based upon welding conditions used in our laboratories.

Welded Tensile Data

Welding Method and Material	Condition	Test Temperature		Ultimate Tensile Strength		Yield Strength		Elongation
		°F	°C	ksi	MPa	ksi	MPa	%
SMAW, Sheet, 0.125 in	As-Welded	RT	RT	116.0	800	60.9	420	27
SMAW, Plate, 0.375 in		RT	RT	105.1	725	65.6	452	28
SMAW, Plate, 0.500 in		RT	RT	102.6	707	49.8	343	44
GTAW, Sheet, 0.125 in	As-Welded	RT	RT	108.2	746	60.5	417	22
GTAW, Plate, 0.250 in		RT	RT	111.4	768	65.0	448	21

GTAW, Plate, 0.375 in		RT	RT	105.9	730	60.4	416	19
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