

## AI-1706L

### Specifications

**DIN** 8555 MF 20-GF-300-CTZ

### Description and Applications

**AI-1706L** is a low carbon Cobalt based MIG welding wire which provides excellent resistance to the single or combined effects of wear due to mechanical and chemical degradation over a wide temperature range. Due to the low carbon content **AI-1706L** lends itself very well to semi-automatic and automatic welding processes by reducing the occurrence of lateral cracking in the deposit.

**AI-1706L** is a tough; impact and corrosion resistant alloy, which does not readily heat, check under pressure at elevated temperatures and has excellent anti-galling properties. It resists chipping, spalling and oxidation at red heat while maintaining reasonable ductility and good high temperature hardness. The alloy has a low coefficient of friction and even after prolonged exposure to temperatures over 1000°C will recover full room temperature hardness.

**AI-1706L** is virtually unaffected by most common corrosive chemicals as well as atmospheric corrosion. When heated in air, the alloy begins to tarnish at 400°C, but no appreciable oxidation takes place until it is heated to temperatures above 750°C. Due to the formation of a tightly adherent scale after the initial heating cycle, subsequent oxidation, up to 1000°C is negligible. At temperatures above 1000°C, oxidation is more noticeable but not appreciably affected by the presence of moisture. Decarburization is negligible below 1000°C. However, molten salts and alkali carbonates and hydrides are somewhat corrosive, especially if allowed to collect and remain on the surface.

**Applications include:** diesel engine exhaust valves and seats; steam control valves; hot work shearing parts; edger rolls; hot trim dies; swaging mandrels; hot shear blades; cams; steam turbine parts; plastic extruder screws; scrapers; pit points; pump parts; components in hot zinc baths.

**AI-1706L** is considered to be readily machineable with selected Tungsten Carbide Tools. It has a slightly lower hardness than AI 1706.

### Typical Weldmetal Analysis

C	Mn	Si	Cr	Fe	W	Co
0.8	1.5	1.0	28.5	3.0	4.5	Bal

**AI-1706L** is a quaternary alloy consisting nominally of 28.5% Chromium, 4.5% Tungsten and 0.8% Carbon. It essentially consists of  $M_7C_3$  and  $M_6C$  type carbides in an alloyed austenitic matrix of cobalt, chromium and tungsten.



### Mechanical Properties of Weldmetal

	As Welded
Hardness	37-40HRc as welded
Metal-to-metal wear resistance	Excellent
Thermal Shock resistance	Excellent
High temperature resistance	Excellent
Melting Point	1278oC
Tensile Strength	832MPa
Plastic Deformation	5% in 2 inches
Machineability	Good with carbide tipped tools
<b>Shielding Gas</b>	<b>Argon 98% + 2% Oxygen or Argon 100%</b>

### Hot Hardness

Temp (°C)	20	100	200	300	400	500	600	700	800	900
Hardness DPH <sub>300</sub>	410	390	356	345	334	301	235	155	138	95
Hardness HRc	37	39	34	33	34	29	20	18		

### Welding Instructions

For reduced levels of dilution and an improved weldability, we recommend using a pulsed MIG mode.

### Welding Parameters

Diameter (mm)	Current type	Amps
1.2	DC(+)	150-220
1.6	DC(+)	180-300

Diameter (mm)	Pulsed Arc Welding	Spray Transfer
1.2	22V/150A	28V/220A
1.6	25V/180A	30V/250A

### Welding Positions

(1G, 1F) Downhand/flat position, (2F) Horizontal position, (2G) Horizontal vertical position

### Disclaimer

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