

AI-0350B

Specifications

AWS/ASME ENiCr-B

Description and Applications

AI-0350B is a premium, nickel-base alloy, as it has chromium boride crystals, (hardness DPH 4100) which are created through a proprietary two-stage exothermic process. The alloy is used for hard-surfacing parts to resist wear, heat, corrosion and galling. It had greater ductility and better impact resistance and workability than **AI-0360B** and displays excellent machinability.

Deposits of **AI-0350B** should not be applied to base metals which will subsequently be hardened or tempered. The deposits also cannot be hot or cold worked; however, they can be hot-formed while in the plastic condition (between solidus and liquidus temperature). It has little tendency to warp annealed work to which it is applied.

Hard surfacing of components in the petroleum industry, such as sucker rod couplings, centrifugal pump parts, heat exchanger tubes, wear rings, etc. Also used for hard surfacing camshafts (lobes), glass plungers, cement industry gate and globe valve components, dragline rollers and metalworking (forming and drawing) dies.

Base Metals that can be Overlaid

All steels having less than 0.25% carbon, and gray cast iron; Meehanite, malleable, ingot and wrought iron, nickel, Monel alloy 400, Inconel alloy 600, Nichrome, Chromel and most high-temperature alloys can be overlaid without special precautions. Steel having more than 0.25% carbon can also be overlaid, but requires controlled slow cooling after fusion, in suitable insulation such as Sil-O-Cel, mica, etc.

Typical Weldmetal Analysis

C	Si	Cr	Ni	Fe	B
0.65	3.75	11.50	Bal	4.25	2.50

Mechanical Properties of Weldmetal

	As Welded
Tensile Strength:	60,000 psi
Density:	8.14g/cc
Melting Range:	Solidus 950°C Liquidus 1065°C
Coefficient of Friction:	0.10 (6-micro" surface)
Thermal Expansion:	50-650°C 8.4×10^{-6}
Heat Treatability:	None
Temperature °C*:	25 315 425 540 650
Hardness HRC:	50 46 45 41 38

* These hardnesses also apply to Sprayweld deposits and castings. Deposits by electric arc, TIG (GTAW) and PTA processes have lower hardnesses, depending on extent of base metal dilution.



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Welding Instructions

Shielding Gas: Argon 100% or Oxy-Acetylene
Gas Rate 15-18 l/min

Machining is readily done with carbide tipped tools such as Carboloy 883 or Kennametal CNMA K68. (The more costly cubic boron nitride tools, such as BZN compacts or Kennametal CNMA 433KC-210, work even better.) The tool should have slight lead and rake angles, and a radius of 1/32". Feed about 0.003 IPR, with depth of cut about 0.015", at 15 to 45 SFM. It is recommended that the last 0.005" be removed by grinding. A near-frictionless mirror finish is possible.

Grinding should be done wet, whenever possible. Due to the abrasive resistant qualities of the alloy, considerable pressure is required to remove stock, resulting in high surface temperature which may produce surface checks. In general, economical grinding of this alloy can best be done by taking light fast cuts with a green silicon carbide wheel; roughly dressed for roughing, medium dressed for finishing.

Lapping should be done dry. Silicon carbide, boron carbide and diamond dust will do a good cutting job provided they are embedded in a cast-iron or steel wheel. Used loose they will cut the nickel matrix before the chromium borides and carbides, giving the surface an etched appearance. Apply with steady pressure and avoid overheating.

Available Sizes

4.0, 5.0 & 6.4mm Diameter

Available Forms: Sprayweld Powder, Plasma Transferred Arc (PTA) Powder, Bare Rods, MIG Wire, Castings & Ingot

Disclaimer

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