AI-0799

Description and Applications

AI-0799 is an alloy comprising a macroscopic heterogenous deposit consisting of cast tungsten carbide particles in matrix of Ni, Cr, B, and Si. The matrix comprises a nickel base solid solution with a fine boride dispersion and a small number of carbides in an interdendritic network.

AI-0799 provides the ultimate in wear resistance to high stress, fine particle abrasion on components operating at high pressures, with some temperature and corrosion.

AI-0799 is applied by the Oxy-Acetylene process as the lower application temperature results in less disolution of the Carbides than an arc process.

A major advantage of **AI-0799** (apart from its excellent abrasion resistance) is that once it is applied to a component and that component is removed from service **AI-0799** can be re-applied over the top of the remaining deposit to touch up areas of wear, thus significantly reducing the cost of re-surfacing. This is a major benefit over other types of hardfacing where, in most cases, the old material has to be completely removed.

AI-0799 has been successfully used in the following Industries (amongst many):

INDUSTRY	APPLICATIONS
Oil Drilling	Stabilizers, Drill Collars, Pipe Joints
Brick & Tile	Augers, Mixers, Knives, Scrapers
Mining	Scrapers, Blades, Teeth
Sugar	Hammers, Knives
Dredging	Teeth, Scrapers
Cement	Pump Flights, Screws
Foundry	Sand Muller Blades, Augers
Glass	Archimedes Sand Screws

Typical Weldmetal Analysis

C	Si	Cr	Ni	Fe	Wc	B
0.16	1.10	4.00	Bal	0.80	65.00	0.80

Mechanical Properties of Weldmetal

	As Welded
Fused Tungsten Carbide	2,400 HV
Density	16.0 g/cm^3
Matrix Material	470 HV
Density	8.0 g/cm^3

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Welding Procedure

The surface to be welded should be clean and free from dirt, grease, oil, fats or other foreign matter. The ideal preparation is to grit blast prior to welding but this is not essential. Use a larger torch tip than would be recommended for the same diameter mild steel with a slightly excess acetylene flame. Method of application is similar to brazing as the matrix alloy has a low melting temperature of approx. 1,050°C. i.e. maintain a temperature just sufficient to enable good wetting and rapid cooling of the deposit.

The weld deposit should not be re-melted to improve the surface finish or puddled during application because the higher density carbides (which are twice the density of the matrix) will sink to the bottom of the deposit leaving the softer matrix material exposed at the surface. This will result in excessive wear rates.

AI-0799 may be multi-layered using the same techniques.

Deposits of **AI-0799** are not machinable or forgeable but may be ground with black silicon carbide wheels. They may be applied to most types of steels and stainless steels but limited success has been achieved in surfacing high alloy cast irons or Hadfield-type manganese steels.

Available Sizes:

ALLOYS INTERNATIONAL PART NUMBER :	ROD DIAMETER:	TUNGSTEN CARBIDE GRAIN SIZE:
AI 0799W05-13/C	5.0 mm	0.25 - 0.70 mm
AI 0799W10-13/C	5.0 mm	0.70 - 1.20 mm
AI 0799W05-14/C	6.0 mm	0.25 - 0.70 mm
AI 0799W10-14/C	6.0 mm	0.70 - 1.20 mm
AI 0799W15-14/C	6.0 mm	1.00 - 2.00 mm
AI 0799W10-15/C	8.0 mm	0.70 - 1.20 mm
AI 0799W15-15/C	8.0 mm	1.00 - 2.00 mm

Available Forms:

Rods (500 mm length) in packets of 5 kg.

Continuous coils of approx. 15 kg each. (Part No. with /C Suffix)

Disclaimer

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