

AI-0799SP70

Description and Applications

AI-0799SP70 is an alloy specially developed and released in 1998 after successful field trials to combat the combined effects of fine particle abrasion and erosion as experienced in the mineral sands industry and other areas where wet slurries are pumped. The unique qualities of this product lie in the high concentration (70% by weight) and sizing of cast tungsten carbide grains. A carefully blended mix of Coarse, Medium and Fine carbides work together to offer good impact resistance and large particle abrasion resistance from the coarse carbides, a hard matrix and protection from fine particle abrasion from the fine carbides and a balance between the two offered by the medium carbides.

The carefully controlled manufacturing process ensures the carbides are evenly cooled and thus remain solid balls rather than hollow spheres. This results in particles having a fine non-accicular (needle like) structure and a hardness of 3,300HV_{0.1} average, up to a high of 3,600HV_{0.1} and highest wear resistance from the carbides in a matrix of Ni, Cr, Si, B. The matrix comprises a nickel base solid solution with a fine boride dispersion and a small number of carbides in an interdendritic (branch like) network.

AI-0799SP70 provides the ultimate in wear resistance to fine particle abrasion combined with some impact. It is applied by the Oxy-Acetylene process. The lower application temperature results in less dissolution of the Carbides than an arc process.

Applications include: can be re-applied over the top of an existing 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.

Typical Weldmetal Analysis

C	Si	Cr	Ni	Fe	Wc	B
1.16	1.60	4.00	Bal	0.80	70.00	0.80

Mechanical Properties of Weldmetal

		As Welded
Cast Tungsten Carbide		3,100-3,600HV _{0.1} (3,600HV _{0.1} average)
	Density	16.2 g/cc
Matrix Material		470 HV
	Density	8.0 g/cc

Welding Procedure:

The surface to be welded should be clean and free from dirt, grease, oil and mill scale. The ideal preparation is to grit blast prior to welding but this is not essential. Use a No.24 (or larger) torch tip with a slightly excess acetylene flame. The method of application is similar to brazing. The matrix alloy has a melting temperature of approx. 1,050°C. Maintain a temperature just sufficient to enable good wetting and rapid cooling of the deposit without overheating the carbides.



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-0799SP70 may be multi-layered using the same techniques.

Deposits of **AI-0799SP70** 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:

6mm diameter rods (500 mm length) in packets of 5 kg

Continuous coils of approx. 15 kg each in 6mm diameter (Part No. with /C Suffix)

Disclaimer

All figures in this datasheet should be considered indicative only. No guarantee is made as to their accuracy.

All figures subject to change without notice. Batch analysis is available for all products sold. Should you require any further information, please contact us at sales@alloysint.com.au

