

Duaplate® S3 Weld Overlay



Overview

Duaplate S3 is a chromium-tungsten carbide weld overlay used in the Fixed Plant industry. The manufacturing process of Duaplate, along with the microstructure and chemical composition, give S3 its superior properties. S3 performs well in high abrasion and high impact wear applications. Large sheets or custom shapes of Duaplate S3 are available and can be formed into complex shapes.

Manufacture

Duaplate is manufactured by welding an abrasion resistant material to a mild steel base. A chromium-tungsten rich powder is fused to the base plate, creating a bi-metallic material with high abrasion resistance whilst still retaining ductility allowing forming and welding. Multiple overlay and backing plate thickness options are available.

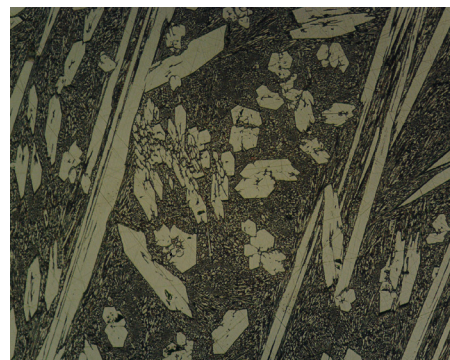
Composition

Extra alloying elements help to give Duaplate S3 its superior properties. Typical chemical composition is given below:

Carbon	4.4%–7.5%
Silicon	< 0.9%
Manganese	1.0%–1.6%
Chromium	23%–35%
Tungsten	2%–7%
Iron	Balance



Duaplate Manufacturing Process



Duaplate S3 Microstructure

Microstructure

An S3 microstructure consists of fine, primary M_7C_3 carbides surrounded by a eutectic mixture of carbides and austenitic matrix material. The very hard primary carbides form as hexagonal nodules and help to prevent wear of the hardfacing material. The austenitic matrix material provides mechanical support to the primary carbides whilst also helping to absorb impact.

Typical Properties

Bulk Hardness	700 HV ₃₀
Carbide Hardness	1100–1600 HV _{0.3}
Volume Fraction of Carbides	> 37%
Density	7850 kg/m ³



Duaplate S3 Application



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