

Duroxite® 300

General Product Description

Duroxite® 300 is an iron-based steel alloy overlay deposited on a mild steel backing plate. It is designed for extremely severe sliding wear for both dry and wet (slurry) abrasive environments. It works well at ambient or elevated temperatures up to 1100°F (600°C). The product is available in single and double layers.

Duroxite® 300 consists of specially formulated abrasive materials employing a uniform glass-forming melt chemistry that allows high undercooling to be achieved. The overlay contains a unique high volume of ultra-fine tungsten-niobium-molybdenum-rich complex borocarbides with a grain size refined down to 500 nm. The borocarbides are completely wetted in a ductile matrix preventing premature pull-out delamination, crack nucleation and bridging. This results in a product with significantly improved service life that maintains high toughness in severe sliding wear applications. Duroxite® 300 is an excellent alternative to tungsten carbide overlay.

Key Benefits

- Extreme wear resistance in dry and wet abrasive environments with a high degree of toughness.
- Cost effective alternative to tungsten carbide with equivalent service life and better impact resistance.
- Overlay thickness is reduced compared to traditional overlays resulting in a lighter weight product while increasing service life.
- Absorbs 25% more impact energy than the traditional chromium overlay plate as measured by the continuous high impact lab test.
- Has uniform through-thickness hardness of 67 to 70 HRC for single and multiple-layer overlay. Maintains a high hardness of approximately 60 HRC after exposure to high temperatures up to 1100°F (600°C).
- Maintains a consistent wear resistance from surface down to 75% of the overlay.

Typical Applications

Duroxite® 300 is suitable for use in the mining, cement, oil sands, steel production, power generation, agriculture, oil and gas and construction. Below are some typical applications:

Mining	Crusher rolls, Skip liners, Slurry pipes, Slurry pumps, Conveyor chains, Excavator bucket liners
Cement	Fan blades, Deflector blades, Cranker crushers
Oil sands	Surge bins, Feed chutes, Slurry pipes, Slurry pumps
Steel	Ore chutes
Power	Screw augers, Wear liner plates, Ash handling equipment liners
Agriculture	Grain shredding hammers, Sugar mill knives, Row crop sweeps
Oil and Gas	Fracking blender pumps
Construction	Snow plow shoes, Demolition tools

For more information on applications see the Duroxite® Product brochure.

Standard Dimensions

Standard overlay thicknesses	
Single pass	Double passes
Metric unit	Metric unit
3 mm on 6 mm	6 mm on 6 mm
—	6 mm on 8 mm
—	6 mm on 10 mm
—	6 mm on 12 mm

Other plate sizes and custom thicknesses can be produced upon request.

Standard plate sizes

Metric unit	Imperial unit
1.2 m x 2.4 m	4' x 8'
1.5 m x 3.0 m	5' x 10'
1.8 m x 3.0 m	6' x 10'

Other plate sizes and custom thicknesses can be produced upon request.

Mechanical Properties

			ASTM G65 – Procedure A weight loss ²⁾		Slurry jet erosion weight loss ⁴⁾	
Number of overlay passes	Typical surface hardness ¹⁾ (HRC)	Typical surface hardness ¹⁾ (HV)	Surface (g max)	75 % depth of overlay ³⁾ (g max)	20° Impingement angle (g typical)	45° Impingement angle (g typical)
Single pass	67 - 70	925 - 1075	0.10	0.10	0.0329	0.0591
Double passes	67 - 70	925 - 1075	0.10	0.10	0.0329	0.0591

¹⁾ Surface hardness is measured on machined flat surface just below overlay surface.

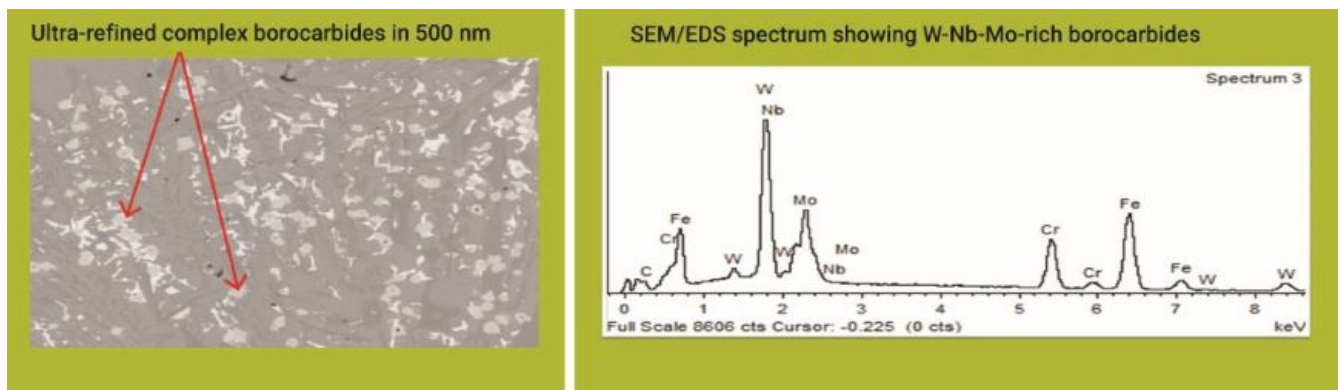
²⁾ ASTM G65 is a standard test measuring sliding abrasion resistance using a dry sand/rubber wheel apparatus. ASTM G65-Procedure A is the most severe test method.

³⁾ ASTM G65 wear test is conducted at 75% depth of the overlay materials to ensure consistently good wear resistance from the top surface through to the depth of 75% of the overlay.

⁴⁾ Duroxite 300 outperforms typical CCO in an SJE test. Typical CCO loses 0.0689 g at 20° and 0.0995 g at 45° impingement angles in the same test. For more information about Duroxite® 300 and its performance in a Slurry Jet Erosion Test, please see the Duroxite® Brochure – The Latest in Overlay Technology available at ssab.com.

Microstructure

Duroxite® 300 overlay contains an ultra-fine complex borocarbide phase down to approximately 500 nm in a ductile matrix. The typical volume fraction of borocarbides is maintained between 60 to 70% to form a uniform hard matrix. The SEM (Scanning Electron Microscopy) / EDS (Energy Dispersive Spectrometry) analysis of the Duroxite® 300 overlay confirms that the refined borocarbides are tungsten-niobium-molybdenum-rich borocarbides, and chromium-rich borocarbides dispersed in an iron-based matrix. The ultra-fine borocarbides are approximately 200 times finer than the traditional chromium carbides.



Tolerances

More details are given in SSAB's brochure Duroxite® Guarantees or at www.ssab.com.

Thickness

Tolerances according to Duroxite® Thickness Guarantee.

Duroxite® overall and overlay thickness tolerances can be guaranteed within $\pm 10\%$ of specified thickness.

Flatness

Plate flatness tolerance can be guaranteed as shown below over 1.5 m (5') plate length for plate dimensions less than or equal to 1.5 m (5') x 3.0 m (10').

Standard overlay thicknesses	Plate flatness tolerance guaranteed over 1.5m (5'), Metric unit
Metric unit	1.5 m x 3.0 m
5 mm on 8 mm	12 mm
6 mm on 6 mm	12 mm
10 mm on 10 mm	6 mm

For custom sizes, please consult your local sales representative or Hardox Wearparts center for flatness guarantees.

Delivery Conditions

Duroxite® 300 is supplied in an as-welded condition.

Fabrication and Other Recommendations

Welding, cutting, forming and machining

Recommendations can be found in the Duroxite® Product brochure, or consult your local technical support representative.

Bendability for Duroxite® overlay plate are according to Duroxite® Bending Guarantees.

Safety precautions

When welding or cutting Duroxite® products, gases and harmful fumes are produced that are chemically complex and difficult to classify. The major toxic component in the fumes is hexavalent chromium. The proper exhaust ventilation equipment and fume-extraction torches are recommended, as well as suitable protective clothing and respiratory protection for operators.