DUROXITE®

DUROXITE® 101

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General Product Description

Duroxite® 101 is manufactured by depositing a chromium-rich carbide overlay on Hardox® 450 backing plate. The hardfacing overlay is suitable for severe abrasive wear and impact applications. With its optimum carbide concentration, consistently good wear resistance from top surface through 75% depth of overlay, and Hardox® backing plate, Duroxite® 101 provides a better combination of wear and impact resistance compared to the traditional mild steel backing overlay plate.

Key Benefits

- Designed to better withstand plastic deformation due to its high yield strength flexing back after impact
- Stronger support due to high hardness of Hardox® and better bonding between overlay and base steel
- When overlay wears off Hardox® 450 backing plate will wear at a lower rate than mild steel providing a greater safety margin
- Better performance for impact situations than Duroxite® 100 at elevated temperatures up to 350° C (660° F), but impact resistance is best at room temperature

Typical Applications

Duroxite® 101 is widely used in the mining, cement and power generation industries. Some specific applications include:

Mining	Loader bucket liners, bucket lip and side shrouds, jaw shrouds
Cement	Heel pads and dewatering conveyors
Power	Coal discharger chutes

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

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Standard Dimensions

Standard overlay thicknesses		Standard plate sizes	
Metric unit	**Imperial unit**	**Metric unit**	**Imperial unit**
6 mm on 6 mm	1/4'' on 1/4''	0.6 m x 1.15 m 1.2 m x 2.4 m 1.4 m x 3.0 m 1.5 m x 3.0 m 1.8 m x 3.0 m	23'' x 45'' 4' x 8' 4.6' x 10' 5' x 10' 6' x 10'
10 mm on 10 mm	3/8'' on 3/8''		
12 mm on 12 mm	1/2'' on 1/2'		
6 mm on 20 mm	1/4'' on 3/4''		
6 mm on 25 mm	1/4'' on 1''		
6 mm on 32 mm	1/4'' on 1-1/4''		

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

Mechanical Properties

Surface Hardness

Number of overlay passes	Typical surface hardness [1]
Multiple passes	59 to 62 HRC (675 to 750 HV)

[1] Overlay surface hardness is measured flat on the machine just below its surface.

Wear Properties

Number of overlay passes	ASTM G65 – Procedure A weight loss [2]	
	Surface	75% depth of overlay [3]
Multiple passes	0.18 g maximum	0.18 g maximum

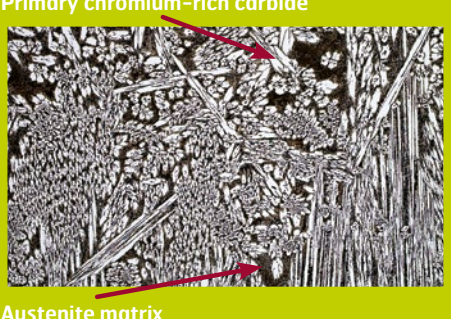
[2] ASTM G65 is a standard test measuring sliding abrasion resistance using a dry sand / rubber wheel apparatus. ASTM G65 – Procedure A is the most severe test method.

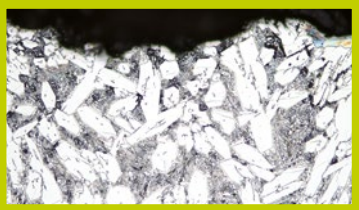
[3] ASTM G65 wear test is conducted at the 75% depth of the overlay materials to ensure consistently good wear resistance from top surface through to the depth of 75% of the overlay.

Microstructure

The typical overlay microstructure of Duroxite® 101 is composed of a high proportion of extremely hard primary M_7C_3 chromium-rich carbides with a typical hardness of 1700 HK[4]) dispersed evenly in a ductile eutectic austenite matrix. The volume fraction of primary carbides is maintained between 30 to 50 % to provide a good combination of wear resistance and homogenous bonding.

[4] HK is the Knoop microhardness which is primarily used for very brittle materials.





Microstructure at damaged surface in impact test (Hardox® 450 backing)

Microstructure at damaged surface in impact test (mild steel backing)

Under lab impact testing, the microstructure of the damaged surface of Duroxite® 101 exhibits some plastic deformation, but the primary carbides are not worn significantly. It shows better impact resistance with the Hardox® 450 backing plate compared to mild steel.

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Tolerances

Thickness

Overall and overlay thickness tolerances can be guaranteed within ±10% of specified thickness.

Flatness

Plate flatness tolerance can be guaranteed within ±3 mm (±1/8") over 1.5 m (5') plate length for plate dimensions equal to or less than 1.5 m (5') x 3.0 m (10'). For plates greater than 1.5 m (5') wide by 3.0 m (10') long, the following flatness guarantees apply.

Standard overlay thicknesses		Flatness tolerance over 1.5 m (5') plate length Metric unit (Imperial unit)			
Metric unit	Imperial unit	1.8 m x 3.0 m (6' x 10')		2.4 m x 3.0 m (8' x 10')	
		Metric unit	Imperial unit	Metric unit	Imperial unit
5 mm on 8 mm	3/16" on 5/16"	32 mm	1-1/4"	41 mm	1-1/2"
6 mm on 6 mm	1/4" on 1/4"	32 mm	1-1/4"	41 mm	1-1/2"
10 mm on 10 mm	3/8" on 3/8"	19 mm	3/4"	25 mm	1"
12 mm on 12 mm	1/2" on 1/2"	12 mm	1/2"	12 mm	1/2"

Delivery Conditions

Duroxite® 101 is normally supplied in an as-welded condition, but can also be supplied in a ground condition upon request.

Fabrication and Other Recommendations

Welding, cutting, forming and machining

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

Safety precautions

When welding or cutting Duroxite® products, smoke is produced containing harmful fumes and gases that are chemically highly complex and difficult to easily classify. The major toxic component in the fumes and gases produced in the process 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.