

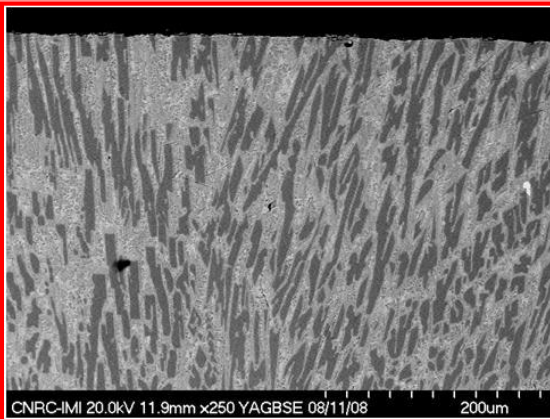
SYNTHEZITE-A GMAW OVERLAYS



SYNTHEZITE-A cored wire is the result of R&D efforts to produce by welding slurry erosion resistant overlays. The wear characteristics of these weld overlays are particularly appreciated in industries that cannot tolerate nickel or chromium in their industrial processes.

SYNTHEZITE-A is formulated to produce upon welding boride-rich (mainly Fe₂B) overlays. Fe₂B is a ceramic material known for its high chemical stability, high hardness, high hot hardness, high temperature oxidation resistance up to 850 °C and corrosion resistance to acids.

SYNTHEZITE-A overlays contain fine Fe₂B elongated crystals aligned mainly perpendicularly to the wearing surface. This particular overlay microstructure is responsible for the outstanding slurry erosion resistance at low and high impingement angles.



This microstructure represents a two-pass overlay.

SYNTHEZITE-A weld overlay is characterized by:

- fine elongated boride crystals (in dark) aligned mainly perpendicularly to the wearing surface,
- boride crystals embedded in a hardened steel containing 15 wt.% molybdenum.

Scanning electron micrograph of the cross-section of a SYNTHEZITE-A GMAW overlay

THE HARD FACTS : SYNTHEZITE-A GMAW OVERLAYS COMPARED TO COMMONLY USED CHROMIUM CARBIDE OVERLAYS

OVERLAY	ABRASION ASTM G65-A (mm ³)	Slurry erosion* α: 30° (mm ³)	Slurry erosion* α: 90° (mm ³)	Dry erosion T: 25°C α:25° (m-m ³ /kg)	Dry erosion T: 25°C α:90° (mm ³ /kg)	Dry erosion T:300°C α:25° (mm ³ /kg)	Dry erosion T:300°C α:90° (mm ³ /kg)
SYNTHEZITE-A OVERLAY	8	0,1	0,1	4	8	15	30
Cr carbide OVERLAY**	25	1	2	32	24	71	38

* Parameters for slurry jet erosion: 10 wt. % Ottawa sand in tap water, test duration: 2 hours , jet velocity: 13 m/s . ** A typical chromium carbide product was subjected to the same tests.

For detailed information on overlay testing methods, consult the paper entitled:
Erosion and Abrasion Resistance of Boride and Carbide-Based Weld Overlays

Deposition Parameters of SYNTHEZITE-A Overlays

Thick **SYNTHEZITE-A** overlays are obtained with the GMAW (MIG) process. GMAW parameters that lead to optimal slurry erosion resistance are the following:

GMAW welding (*DCEP*) with oscillator

Gas : 98% Ar - 2% O₂

Wire diameter : 1,6 mm

Voltage : 25 V

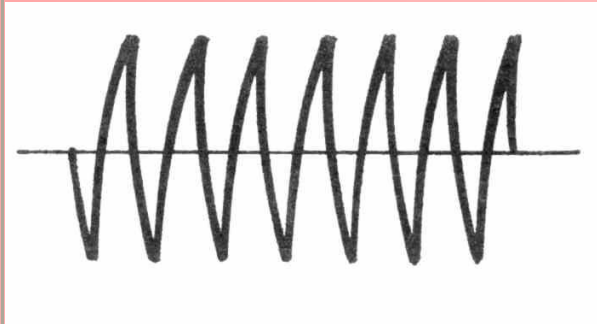
Wire feed rate : 150 inches / min

Tip-to-work distance : 3/4 inch

Travel speed : 5 ½ inches / min

Oscillation amplitude : 13/16 inch

Oscillation speed : 52 cycles/min



SYNTHEZITE-A Inc.
106 -75, Blvd De Mortagne,
Boucherville (Québec), J4B 6Y4, CANADA

Tel:(450) 641-5227
FAX: (450) 641-5392

Sales: Peter@synthesarc.com
Technical support: Serge@synthesarc.com