

# WEARTECH® SHS™ 8000HV

Hardfacing - Severe Abrasion, Thermal Spray Powder

## Application Process

High Velocity Oxy-Fuel  
Thermal Spraying (THSP-HVOF)

## Material Chemistry (wt%)

Chromium	< 22%
Boron	< 6%
Molybdenum	< 5%
Niobium	< 5%
Carbon	< 2%
Manganese	< 1%
Silicon	< 1%
Iron	Balance

## Microhardness (HVO .3)

1,000 kg/mm<sup>2</sup> typical

## Wear Resistance

ASTM G65-04 Procedure B  
Typical mass loss 0.07 g

## Bond Strength

ASTM C633-01  
10 ksi (69 MPa)

## Coating Description

SHS8000HV is a glass forming iron based alloy that forms a nanocomposite comprised of a mixed amorphous and nanoscale microstructure when sprayed as a coating. SHS8000HV features exceptionally high wear resistance exceeding chrome plating, and approaching CerMets and carbides.

## Key Performance Characteristics

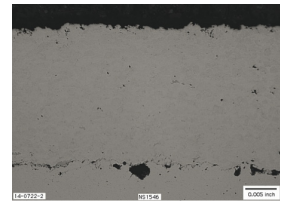
- Excels in high abrasion, erosion environments, both wet and dry
- Very good metal to metal (two body) wear resistance
- Superior bond strength without necessity of bond coat
- Can be finished to very high surface specifications

SHS8000HV coatings exhibit excellent wear resistance and superior bond strength. Superior bond strength values signify that this material has exceptional adhesion and cohesion. This also highlights the material's extremely low residual stress (even at high thicknesses) inherent in this coating type. The probability of "pull-out" of individual particles during wear, erosion and other service conditions is extremely low. Low coating permeability results in a corrosion resistant barrier. Low oxide content contributes to high bond strength due to the very limited presence of internal voids and other defects. These characteristics provide predictable coating performance across a broad variety of service environments.

## Industrial Uses

Power Generation  
Pulp & Paper

## Coating Microstructure



Optical micrograph at 100X of a typical SHS8000HV coating on a mild steel substrate.

## CUSTOMER ASSISTANCE POLICY

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# WEARTECH® SHS® 8000HV

## Severe Abrasion

### KEY FEATURES

- Excels in high abrasion, erosion environments, both wet and dry
- Very good metal to metal (two body) wear resistance
- Superior bond strength without necessity of bond coat
- Can be finished to very high surface specifications

### TYPICAL APPLICATIONS

- Oil & Gas
- Power Generation
- Mining
- Pulp & Paper

### DIAMETERS / PACKAGING

Size Micron (µm)	10 lb (4.5 kg) Bottle	25 lb (11.3 kg) Pail
+15/-53	ED035732	ED035733

### MECHANICAL PROPERTIES

Vicker's Hardness (HV0.3)	Wear Resistance	Bond Strength ksi (MPa)
1000	ASTM G65-04 Procedure B 0.07 g mass loss	ASTM C633-01 Glue Failure 10 (69)

### DEPOSIT COMPOSITION

	%Fe	%C	%Cr	%B	%Mo	%Mn	%Si
Requirements	Balance	<4	<25	<5	<6	<3	<2

### TYPICAL OPERATING PROCEDURES

Feeder Speed (rpm)	Gas Flow (cfh)	Powder Feed Rate lb/hr (g/min)	Spray Distance in (mm)	Deposit Rate (mil/pass)
270 (6 pitch screw)	21	10 (75.6)	14 (356)	0.2-0.4
Fuel Flow Rate gal/hr (l/min)	Fuel Pressure (psi)	Oxygen Flow Rate (cfh)	Oxygen Pressure (psi)	Combustion (psi)
6 (0.45)	120	1900	135	100

\* This procedure was developed on a TAFE JP5000. Changes in equipment, materials, and substrates may change optimum procedures. Listed procedures should only be used as a starting point.

#### IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m<sup>3</sup> maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE MATERIAL SAFETY DATA SHEET (MSDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

*Material Safety Data Sheets (MSDS) and Certificates of Conformance are available on our website at [www.lincolnelectric.com](http://www.lincolnelectric.com)*

#### TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

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