

WEARTECH® SHS™ 9500U

Severe Abrasion, Flux-Cored (FCAW-S) Wire

Application Process

FCAW-S/GMAW-C

Weld Overlay for Hardfacing

Material Chemistry (wt%)

Chromium	< 10%
Niobium	< 9%
Boron	< 6%
Manganese	< 5%
Carbon	< 3%
Silicon	< 2%
Iron	Balance

Rockwell C (HRC) Hardness

58 - 62 HRC Typical

Wear Resistance

ASTM G65-04 Procedure A

Typical 0.22 g mass loss

Weld Deposit Properties

Density (g/cm³) 7.59

Impact Resistance

Drop Impact Testing:

Passed multiple impacts
at 165 ft-lbs

Overlay Description

SHS9500U is an iron based steel alloy featuring medium hardness, high toughness and high wear resistance.

Key Performance Characteristics

- 58 - 62 HRC single and double pass weld deposits
- Minimal cracking when applied to plain carbon and alloy steels
- Cost effective: contains no tungsten, molybdenum or nickel
- High resistance to abrasion and galling

SHS9500U features a unique uniform glass-forming melt chemistry that allows high undercooling to be achieved during welding. This results in considerable refinement of the crystalline microstructure down to a near nanoscale (400 nm length scale) range.

Minimal Cracking

Thermal expansion (CTE) matches engineering grade steels over a wide temperature range. When applied to plain carbon and alloy steels, SHS9500U can be welded without significant preheat (i.e. 600° F) and produce an as-welded bead with minimal cracking.

Wear Resistance

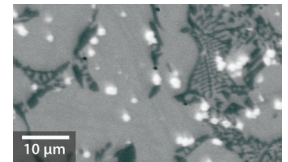
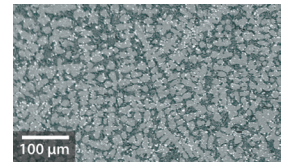
In ASTM G65-04 dry sand/rubber wheel abrasion tests, SHS9500U provides maximum wear resistance of typical mass loss of 0.22 g which results in high abrasion and galling resistance, especially in applications where metal-to-metal friction is likely.

Industrial Uses

Mining

Oil & Gas

Structure



400 nm length, near
nanoscale microstructures

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WEARTECH® SHS® 9500U

Severe Abrasion

KEY FEATURES

- Minimal cracking when applied to plain carbon and alloy steels
- Lower cost while maintaining near nanoscale (submicron) microstructure
- High resistance to abrasion and galling
- Limited to 2 layers max

TYPICAL APPLICATIONS

- Wearplate
- Crusher Rolls
- Ore Chutes
- Screw Augers

Diameter in (mm)	33 lb (15 kg) Spool PLW	55 lb (25 kg) Coil
0.045 (1.1)	W9500-120X15 (ED035749*)	
1/16 (1.6)	-	
3/32 (2.4)		ED035746*
7/64 (2.8)		ED035745*

* EDO numbers have been discontinued and replaced by the Wearthech part numbers for the cross selling program.

MECHANICAL PROPERTIES⁽¹⁾

Rockwell Hardness (R _c)	Wear Resistance
58-62	ASTM G65-04 Procedure A, 0.22 g mass loss

DEPOSIT COMPOSITION⁽¹⁾

%Fe	%C	%Cr	%B	%Nb	%Mn	%Si
Balance	<3	<10	<6	<9	<5	<2

TYPICAL OPERATING PROCEDURES

Diameter, Polarity ESO - in (mm)	Current (Amps)	Voltage (Volts)	Wire Feed Speed m/min (ipm)	Shielding Gas	Flow Rate (cfh)
0.045 in (1.1mm), DC+ ½ - ¾ (15) GMAW-C ¾ - 1 (20) FCAW-S	~135	24	7.0 (275)	75 Ar - 25 CO ₂	35 - 45
1/16 in (1.6mm), DC+ ½ - ¾ (15) GMAW-C ¾ - 1 (20) FCAW-S	~220	24	7.0 (275)	75 Ar - 25 CO ₂	45 - 60
3/32 in (2.4mm), DC+ ¾ - 1 (20) GMAW-C ¾ - 1.25 (25) FCAW-S	~375	25	7.0 (275)	75 Ar - 25 CO ₂	55 - 70
7/64 in (2.8mm), DC+ ¾ - 1 (20) GMAW-C 1 - 1¾ (40) FCAW-S	~450	26	5.7 (225)	75 Ar - 25 CO ₂	60 - 80

⁽¹⁾ Composition and properties depend upon dilution. Single layer deposit properties depend upon base metal and/or build-up material.

<p>IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED</p> <p>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/m³ maximum exposure guideline for general welding fume.</p> <p>BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.</p>
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Material Safety Data Sheets (MSDS) and Certificates of Conformance are available on our website at 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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