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Praxair and TAFE Arc Spray High Carbon Steel Wire - 39T

Material Review:

Made exclusively for arc spraying, 39T is an economical material used where hardness is of paramount importance. The **28% improvement in micro hardness** is developed because the carbon content is about twenty points higher than 38T.

Praxair and TAFE's 39T steel is a low shrink material; it requires grooves at edges where the coating is over 0.030 inch thick. The coating has porosity about the same as 38T. The hardness with a small amount of porosity gives high wear resistance in lubricated service.

Arc Spray 39T Steel can be sprayed with any Praxair and TAFE Arc Spray gun.

CAUTION: All Praxair and TAFE wires have been optimized for arc spraying. Use of alternate wires usually cause problems such as excessive tip wear, spitting and feeding problems. We only recommend Praxair and TAFE certified wires.

Application Review:

This is one of the most economical materials for normal reclamation of worn or mismachined bearing and seating surfaces for slow or high speed running, shafts, press fits, ball bearing housings, valve stems, pistons, crankshaft bearings, seal rings, pump plungers, piston cylinder lines, match plates, etc. 39T produces harder coatings than 38T with the same parameters due to the higher starting carbon content.

Used where a low shrink steel is required. Can be used for casting defects and repair of castings such as heads and engine blocks. Use it instead of 60T where color match with substrate is required.

Composition:	
Carbon	1.0 Nominal
Chromium	1.5 Nominal
Silicon	.25 Nominal
Manganese	.35 Nominal
Iron	Balance
Coating Physical Properties	
Wire Size	1/16" (1.6 mm)
Deposit Efficiency	80 Percent*
Melting Point	2500°F (1373°C) (approx.)
Bond Strength	6204 psi (43 MPa) blasted surface
Coating Texture	Variable** (see next page)
Coating Finish	Excellent
Superficial Hardness	HRC 23 Standard (converted from H15N) HRC 28 ArcJet (converted from H15N)
Micro Hardness	HRC 47 Standard (converted from DPH ₃₀₀) HRC 43 ArcJet® (converted from DPH ₃₀₀)
Coating Density	6.78 gm/cc***
Coating Weight	0.035 lbs/ft ² /mil
Shrink	0.0014 in/in (cm/cm)
Spraying:	
Spray Rate	10 lbs/hr/100 amps (4.5 kg/hr/100 amps)
Coverage (wire consumption)	0.9 oz/ft ² /0.001" (1.10 kg/m ² /100 microns)
Spray Pattern****(approximate 8" standoff)	Cross Nozzle/Positioner - 1" (2.5 cm) vertical height x 1-3/4" (4.4 cm) width Slot Nozzle/Positioner - 2" (5 cm) vertical height x 1" (2.5 cm) width
Length of wire per lb	96 ft. (1/16")

* Depends on air pressure, standoff, nozzle cap and target size.

** 6" standoff, 40 psi - 8830, depends on air pressure - fine with high psi, average with medium psi, and rough with low psi.

*** Depends on atomizing air pressure, standoff, amperage.

**** Higher air pressures, smaller wire (1/16"), and lower amperage with red nozzle cap gives smallest diameter pattern.

Spraying Procedures:

Coating Type				
	Normal 8830/8835	Arc Jet 8830/8835	Arc Jet 9000	9000
Atomizing Air Pressure:Primary Secondary	50 ^c ---	50 40	60 60	60 ^c ---
Nozzle Cap	Blue	*	Green	Green
Nozzle/Positioner (Cross=C; Slot=S)	Short C	**	Long C	Long C
Arc Load Volts ^a	29-30	29-30	30-32	30-32
Amps ^b	50-300	50-300	50-300	50-300
Standoff Inches	5-7	3-5	3-5	5-7
Coating Thickness/Pass-mils	3-5	3-5	3-5	
Coating Texture-microinches aa	200-350	150-250	150-250	200-350

Using excessive voltage reduces quality of coating. Voltage should be adjusted to give minimum noise and smooth arc operation. Excessive voltage causes larger particles and poor spray pattern. Too low a voltage will cause popping.

Be sure not to overheat substrate even if this means stopping to allow cooling. Use air jet cooling if greater coating application speed is required. Note that on some applications where preheating is tolerable, preheating work to 300°F can improve bond and deposit efficiency.

NOTE: Standard air caps and positioners can be used in 8830 or 9000 systems.

- * P/N 450729 8830 ArcJet Air Cap
- ** P/N 620074 ArcJet Modified Short Cross (8830 & 9000)

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- a When using power lead extensions other than the normal 12 foot furnished, the voltage must be increased by approximately 3.4 volts per 50 foot extension; i.e. add 3.4 volts to the recommended voltage setting for a given wire if the extension is increased to a 50 foot length.
 - b Can vary between 50-300 depending on size of workpiece and traverse speed.
 - c For finer finish, raise air pressure at point of finish.

Use of PRAXAIR and TAFE's 75B® Wire as a Bond Coat:

In most applications PRAXAIR and TAFE's 75B BondArc® wire eliminates the need for surface roughening. The following section outlines steps to be followed when using this material.

Note again that the 75B coating does not self bond on many non-ferrous materials and normal surface preparation must be used.

Clean the surface to a white virgin metal by grit blasting, grinding or polishing clean surface with emery cloth.

It must be a clean white metal surface free of grease, oil and handprints.

DO NOT HANDLE AFTER THE SURFACE HAS BEEN PREPARED.

1. Use short nozzle/positioner and blue nozzle cap.
2. Set spray pressure air at 50-60 psig (do this while air is "ON" or flowing).
3. Run at 150 amps at 30 load volts.
4. Gun distance from work 3 to 4 inches.
5. Move gun over surface uniformly to give coverage over complete surface.
6. Continue buildup with selected material using 50 psig spray pressure on console (this 50 psig is for general metallizing; for coarser coatings decrease 5 psig; for finer coatings increase 5 to 10 psig, depending on the finish required).

Finishing:

Deposit thicknesses of up to 0.080 inch must be finished by turning, but can be machined or ground.

Hazards:

Observe normal spraying practices, respiratory protection and proper air flow patterns advised. For general spray practices, see AWS Publications AWS C2.1-73, "Recommended Safe Practices for Thermal Spraying," and AWS TSS-85, "Thermal Spraying, Practice Theory and Application." Thermal spraying is a completely safe process when performed in accordance with proper safety measures. Become familiar with local safety regulations before starting spray operations. DO NOT operate your spraying equipment or use the spray material supplied before you have thoroughly read the PRAXAIR and TAFE Instruction Manual. A Material Safety Data Sheet will be sent with each initial purchase and updated as required.

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DISREGARDING THESE INSTRUCTIONS MAY BE DANGEROUS TO YOUR HEALTH.

The Information provided herein is believed to be accurate and reliable; however, results may vary with workpiece preparation and operator technique. PRAXAIR and TAFE warrants only that the wires are free of defects in material and workmanship. No other warranty is expressed or implied.



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