Technical Data
Bulletin

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Praxair and TAFA Arc Spray Nickel-Copper Alloy Wire - 70T

Material Review:

Made exclusively for arc spraying. This alloy is used where it is necessary to provide load bearing, corrosion-resistant surfaces, particularly in seawater and caustic environments. 70T produces dense coatings which are easily machinable.

Arc Spray 70T can be sprayed with any Praxair and TAFA arc spray gun.

Arc Spray 70T wire meets Department of Defense Specification MIL-W-6712B, Table II, Nickel-Copper.

CAUTION: All Praxair and TAFA 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 TAFA certified wires.

Application Review:

Due to its corrosion-resistance characteristics, 70T provides protection for machine elements where the hardness is sufficient for steam valve components, shafts (propeller, tail, crank, etc.), pump plungers, seal rings, hydraulic pumps, etc. Especially ideal where immersion in sea water would present difficulties for the softer metals. Highly suitable, as well, for bores and low shrink applications.

Composition:	
Nickel	67
Carbon	0.25 Max.
Sulphur	Trace
Iron	2 Max.
Manganese	1.5 Max.
Silicon	0.25 Max.
Aluminum	0.10 Max.
Copper	27
Coating Physical Properties	
Wire Size	1/16" (1.6 mm)
Deposit Efficiency	70 Percent*
Melting Point	2400°F (1315°C) (approx.)
Tensile Bond Strength	4310 psi (29.7 MPa)
Hardness	80-84 R_b
Coating Texture	Variable** (see next page)
Coating Density	7.67 gm/cc***
Coating Weight	0.040 lbs/ft^2/mil
Shrink	0.002 (approx.)
Spraying (inert chamber with argon):	
Spray Rate	10 lbs/hr/100 amps (4.5 kg/hr/100 amps)
Coverage (wire consumption)	0.8 oz/ft^2/0.001" (0.98 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	84 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.

*** For higher hardness increase air pressure to 60 psi or higher do this only in final passes where wear will occur.

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

Spraying Procedure:

Coating Type				
	Normal 8830/8835	Arc Jet 8830/8835	Arc Jet 9000	9000
Atomizing Air Pressure: Primary	50[c]	50[c]	60[c]	60[c]
Secondary	---	40[c]	60[c]	---
Nozzle Cap	Blue	*	Green	Green
Nozzle/Positioner	Short Cross	**	Long Cross	Long Cross
Arc Load Volts[a]	30-32	30-32	31-33	31-33
Amps[b]	100-200	100-200	100-200	100-200
Standoff Inches	3-5	3-5	3-4	3-5
Coating Thickness/Pass-mils	5	5	5	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 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 Arc Jet Air Cap
**	P/N 620074	Arc Jet 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 TAFA's 75B® Wire as a Bond Coat:

In most applications Praxair and TAFA'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:

The coating should be finished by grinding or machined at low speed with carbide tools.

Hazards:

Observe normal spraying practices, respiratory protection and proper air flow pattern advised. See AWS Publication AWS C2.1-73, "Recommended Safe Practices for Thermal Spraying" on general spray practices 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 TAFA Instruction Manual.

A Material Safety Data Sheet will be sent with each initial purchase and updated as required.

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 TAFA warrants only that the wires are free of defects in material and workmanship. No other warranty is expressed or implied.

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TAFA is constantly improving its products, therefore specifications are subject to change without notice

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