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Praxair and TAFE TAFALLOY® 02A Zinc/Aluminum Wire

Material Review:

Made exclusively for arc spraying primarily as an anti-corrosion coating. Additional functions are for galvanizing and general oxidation resistance. TAFALLOY 02A is pure metal, and is not contaminated in the arc spray process.

TAFALLOY 02A Zinc/Aluminum alloy wire 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:

Traditionally zinc or aluminum have been used for corrosion protection, both in atmospheric and marine environments. For long term anti-corrosive applications, zinc must be covered with protective 5-8 mil layer of an approved sealer in all but mild rural applications. Typically a phosphate primer is sprayed directly on a freshly sprayed zinc surface followed by either a vinyl copolymer or a coal tar epoxy, the latter for severest environments.

TAFALLOY 02A is an alloy of 85 percent zinc and 15 percent aluminum. The data included in this bulletin indicate that it is superior to zinc or aluminum for some corrosion protection applications - combining the advantages of both. Best performance can be obtained with 02A in atmospheric applications. In an ideal situation on a flat plate, zinc does as well; however, this is not usually the case in the field where pockets and crevices exist and residual moisture and contaminants remain for long periods of time. Under such circumstances the natural ability of the 02A to be more corrosion resistant in such an environment is a significant advantage. In addition, 02A resists corrosion better after scratches and dings than pure zinc.

It is difficult to apply generalized rules of thumb, however, recognizing this, we make the following generalizations:

- a) TAFALLOY 02A should be considered for all atmospheric corrosion applications where zinc or aluminum are being utilized.
- b) For immersion in fresh water under high acidity use sealed aluminum only.
- c) Generally, for rural atmospheres (humid and dry) and mild urban atmospheres, coatings without sealers can be recommended. However, for all industrial, marine and submerged applications, a sealer must be used. The purpose of the sealer is to fill the pores and prevent penetration of the environment to the base. Prior to sealer application a wash primer must be used.

TAFALLOY 02A, sprayed as a coating, is much purer than that achieved in the hot dip galvanizing process as it does not pick up the iron that occurs with immersion in molten zinc. Arc sprayed 02A is competitive in cost with plating or painting on all size elements but especially on larger elements when time and handling or location problems impose restrictions on the use of the traditional plating process. On smaller parts, arc sprayed 02A provides better protection when they can be finished by tumbling.

Composition:	
Zinc	85 Percent
Aluminum	15 Percent
Coating Physical Properties	
Wire Size	2.0 mm
Deposit Efficiency	70 Percent**
Melting Point	440°C(approx.)
Bond Strength	3,680 psi blasted steel surface (25.4 MPa) 350-1000 psi blasted plastic surface(2.4-6.9 MPa)
Coating Texture	Variable*** (see next page)
Hardness	R _{15T} 85 (R _B 73) Converted from Knoop ₁₀₀
Coating Density	4.97 gm/cm ³ (91%)****
Coating Weight	0.0484 lbs/ft ² /mil = .593 Kg/m ² /100 microns
Shrink	0.002 in/in (cm/cm)
Spraying:	
Spray Rate	21 lbs/hr/100 amps = 9.5 Kg/hr/100 amps
Coverage (wire consumption)	0.8 oz/ft ² /mil (approx.)* (.98 kg/m ² /100 microns)
Spray Pattern**** (approximate 8" standoff)	Cross Nozzle/Positioner - 1 1/4" (3.2 cm) vertical height x 2" (5 cm) width Slot Nozzle/Positioner - 2 1/4" (5.7 cm) vertical height x 1 1/4" (3.2 cm) width
Length of wire per lb	83 ft (2 mm)

* For grit blasted steel, depends on substrate material and deposit efficiency

** 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

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

Spraying Procedures:

Coating Type				
	Normal 8830/35	ArcJet 8830/35	ArcJet 9000	9000
Atomizing Air Pressure:Primary Secondary	60 ^c ---	50 40	50 35	60-75 ^c ---
Nozzle Cap	Green	*	Green	Green
Nozzle/Positioner (Cross=C;Slot=S)	Long C	**	Long C	Long C
Arc Load Volts ^a	20-21	20-21	21-22	21-22
Amps ^b	50-300	50-300	50-300	50-300
Standoff Inches	3-10	3-10	3-10	3-10
Coating Thickness/Pass-mils	2-10	2-10	2-10	2-10
Coating Texture-microinches Ra	200-350	100-200	100-200	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)

^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.

Finishing:

Most anti-corrosive coatings of sprayed zinc (as with aluminum) are put into service without additional machining.

Precautions:

Zinc fumes are toxic. TAFALOY 02A produces less fume than pure zinc. While spraying, all personnel should be made aware of the need for complete respiratory protection.

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 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 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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