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Praxair and TAFE Arc Spray Babbitt Wire 04T

Material Review:

Made exclusively for arc spraying, Babbitt is a special high-grade tin based (lead free) Babbitt wire. Particularly applicable in spraying the dense coatings required for high speed and heavy duty bearings. Arc Spray 04T Babbitt wire can be sprayed with any Praxair and TAFE Arc Spray gun.

Arc Spray 04T Babbitt wire meets Department of Defense Specification MIL-W-6712C, Table II, Babbitt (tin base).

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:

Recommended for application on heavy-duty or high-speed bearings.

One of the conventional ways to apply Babbitt to bearings is puddling. This is accomplished by building appropriate dams around the area of the bearing and then pouring molten Babbitt and working it to an approximate shape.

A second method of applying Babbitt has been to use a conventional oxygen gas metallizing gun to spray a single Babbitt wire. This requires considerable art and cannot be done successfully by many operators.

The Praxair and TAFE Arc Spray system produces an extremely dense Babbitt deposit, which has proved highly successful as a bearing surface. Coatings compare favorably relative to bearing loads achieved with puddling techniques.

With puddling techniques all the old material must be removed and the surfaces cleaned to receive the new material. However, with the Praxair and TAFE Arc Spray system, the old bearing must only be baked to remove all oil and grease, and the old surface is then cleaned with a lathe tool prior to applying the new Praxair and TAFE Babbitt coating. Thereby, also reducing the total cost of material applied.

In some cases, Praxair and TAFE has found the best way to apply the Praxair and TAFE Babbitt system is to first coat the machined old Babbitt with Praxair and TAFE BondArc® (0.003" - 0.005"). The BondArc gives a superior bond and leaves a coarse substrate, which greatly improves the bonding of the Babbitt. After BondArc, apply Babbitt to the required thickness.

Composition (approx.)	
Tin	90.0 percent
Antimony	7.0 percent
Copper	3.0 percent
Lead	(Trace impurity only)
Coating Physical Properties	
Wire Size	2.0 mm
Deposit Efficiency	71 Percent*
Melting Point	695°F(369°C)(approx.)
Bond Strength	2,870 psi (19.8 MPa)
Coating Texture	Variable** (see next page)
Microhardness	R _{15T} 32-35
Coating Density	6.67 gm/cc (91%)***
Coating Weight	0.035 lbs/ft ² /mil
Shrink	Negligible
Spraying	
Spray Rate	50 lbs/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.	66 ft. (2 mm)
Density	0.26778 lbs/in ³

Note: When spraying Babbitt care should be taken to decrease the tension on the wire feed rollers.

* 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:

These are starting parameters only. Optimum parameters will vary depending on application, utilities, environment, spray rate and equipment.

	Coating Type					
	Standard 8830/35	ArcJet 8830/35	Standard 8850	ArcJet 8850	Standard 9000	ArcJet 9000
Atomizing Air Pressure:Primary Secondary	60 ^c ---	50 ^c 40	60-75 ^c	60 ^c 60	60-75 ^c ---	60 ^c 60
Nozzle Cap	Green	*	Green	Green	Green	Green
Nozzle/Positioner (Cross=†)	Long †	**	Long †	Long †	Long †	Long †
Arc Load Volts ^a	21-23	21-23	22-24	22-24	22-24	22-24
Amps ^b	50-300	50-300	50-300	50-300	50-300	50-300
Standoff Inches	3-5	3-5	3-5	3-5	3-5	3-5
Coating Thickness/Pass-mils	2-10	2-10	2-10	2-10	2-10	2-10
Coating Texture-microinches aa	150-250	100-200	150-250	100-200	150-250	100-200

^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.

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, 8850 or 9000 systems.

* P/N 450729 8830/8835 Arc Jet Air Cap
 ** P/N 620074 Arc Jet Modified Short Cross (8830 & 8835)

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 hand prints.

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 50psig 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:

Finish machine by conventional techniques.

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.

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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