

# Technical Data

## HAI ARC SPRAY COPPER WIRE HA 405

Product Code: 10405  
 Technical Data Sheet

Revision: # 003  
 Dated: 09/12/12

### 1. INTRODUCTION

HA 405 is a high purity copper wire for the arc spray process. Additionally, HA 405 is the wire of choice for Arc Spraying film capacitors, end caps, and other electronic components.

HA 405 is designed to operate in all Arc Spray devices, such as HAI's ARCote 9140, 9140U, 9140UW, TAFA 8830/8835, 9000, 9935, and Sulzer Metco SmartArc arc spray systems.

### 2. CHEMICAL COMPOSITION

**Table 1:**

Element	Cu	Si	Mn	Sn	Al	P	Pb	TAO*
Max Weight %	Cu	0.50	0.50	1.00	0.01	0.15	0.02	0.50
Min Weight %	BAL.	--	--	--	--	--	--	--

\*Designates Total All Other impurities

### 3. PHYSICAL PROPERTIES

#### 3.1. Wire Physical Properties

Wire Size(s) diameter	1/16", 0.078", 1/8"	1.6 mm, 2mm, 3.2mm
Spool Size	OD 12"x 4" wide"; Bore ID 2"	Ø300x100 mm; Bore Ø50 mm
Spool Weight	25 lb. each	11.4 kg each
Length of Wire per lb. (1/16")	84 feet	11.5 m per 1 kg

#### 3.2. Coating Physical Properties

Micro Hardness R <sub>b</sub>	37	--
Porosity	< 2 % (as sprayed)	< 2 % (as sprayed)
Melting Point	1980°F	1082°C
Bond Strength	1450 psi @ 0.02" thick	10 MPa @ 0.5 mm thick
Deposit Efficiency	Approx. 70-80%	Approx. 70-80%

### 4. SPECIFICATIONS

MIL-R-19631A, MIL-W-6712C Type II

# Technical Data

## HAI ARC SPRAY COPPER WIRE HA 405

Product Code: 10405  
 Technical Data Sheet

Revision: # 003  
 Dated: 09/12/12

### 5. USEFUL SPRAY DATA

Spray Rate	11 lbs./hour/100 amps	5 kgs./hour/100 amps
Coverage	0.9 oz./ft. <sup>2</sup> /0.001	1.10 kg/m <sup>2</sup> /100 microns
Coating Density	7.54 gm./cc	--
Coating Weight	0.039 lbs/ft <sup>2</sup> /mil	--

### 6. Spray Parameters

	Metallic Substrates	Low MP Substrates
Atomizing Air Pressure: Primary Air	50 PSI	50 PSI
Atomizing Air Pressure: Secondary Air	40 PSI	40 PSI
Arc Load Voltage	29 Volts	29 Volts
Ampere	150 Amps	150 Amps
Standoff Distance	3-5 inch	27-30 inch
Transverse speed	250 inch/min	250 inch/min
Coating thickness/Pass-mils	2-3 mils	1-2 mils

### 7. APPLICATION

#### 7.1. Service Environment

Special care is required to maintain a clean surface prior to arc spraying. Coatings sprayed with HA 405 will bond fairly well without a bond coat. However, in some instances a Ni Al 95/5 (HA 775) layer maybe required for self-bonding to the surface of the part.

#### 7.2. Overheating

Although the Arc spray process is considered a "Cool" process, please take special care not to overheat or burn the surface(s) of the part of component. HA 405 is a Copper based product and dust overspray can burn and smolder.

#### SPECIAL SAFETY INSTRUCTIONS

Copper based alloys are highly sensitive to air and oxygen and as such special care is required to make sure the material does not burn or smolder in the dust collector or dust collection barrels.

Please consult your local Fire & Safety Official for instructions on how to handle Copper and Copper based dusts.