Metallisation
Thermal spray equipment and consumables

THE ALUMINIUM SPRAYING OF STUD WELDING FASTENERS

Application Data Sheet LE-EP-001

INTRODUCTION

To assist with attachment and produce a stronger weld, aluminium is being used as a fluxing agent on welding fasteners.

There are generally two methods of applying the aluminium to the fastener end. In some cases a small hole will be drilled in the centre of the fastener end then an aluminium ball of the same size inserted, being fixed into place under a press.

By using the Metallisation Flamespray Process, it is possible to apply a thin coating of aluminium over the total area to be welded giving all over fluxing and less change of debris inclusion into the weld area.

In some cases, it is necessary to retard the welding process.

If the Metallisation Process is being used it is possible to achieve this by spraying a thin coating of zinc on top of the aluminium

EQUIPMENT

Metallisation Mark 73 Flamespray System

MATERIALS

Bond Coat

Metallisation 01E 99.5% pure Aluminium Wire has excellent corrosion resistance and electrical conductivity characteristics Main Deposit

METHOD

Cleaning

(a) Degrease by solvent vapour process, if material available

(b) Check all surfaces are free from contamination and debris

Preparation

(a) The fasteners should be packed tightly in rows into a steel tray approximately 15cm square leaving only the area to be sprayed exposed. The tray may hold up to 1,000 fasteners dependent on their diameter.

(b) Thoroughly inspect for contamination prior to blasting

(c) Thoroughly blast the area to be sprayed with clean n° 30-36 grade aluminium oxide grit.

(d) Ensure that areas to be treated are thoroughly blasted

(e) After blasting turn tray over to remove any unwanted grit from between the fasteners.

APPLICATION OF SPRAYED COATING

Masking

(a) The fasteners are to be left in the steel tray for the spraying process. It may be necessary in some cases to apply masking tape to the outside edges of the tray to protect fasteners from overspray.

(b) Check thoroughly area to be sprayed for contamination

(c) **IMPORTANT:** Area to be sprayed should not come into contact with hands or other form of contamination. Delays between blasting and spraying should not exceed 2 hours.

Spraying

(a) The Flamespray Pistol should be set up in accordance with the Metallisation Manual for spraying 01E Aluminium Wire.

(b) The Flamespray Pistol should be held so that the spraystream is at a 90° to the surface being coated and traversed at an even speed to give a uniform deposit of the specified thickness (typically 25μm-50μm) ensuring all fastener ends are completely covered.

(h) Spray Parameters Fine Spray 01E Aluminium Wire, 2mm diameter

(i) Range: 10cm

(ii) Nozzle Air Pressure: 3.47 bar (50 psi)

(iii) Oxygen Pressure: 2.08 bar (30 psi)

(iv) Propane Pressure: 1.38 bar (20 psi)

Flowmeter Settings

Gas	Oxygen
1.5	1.5

Note: If Zinc is required on top of the aluminium to retard the weld, it should be sprayed immediately after aluminium spraying is completed.

De-Masking

(a) Remove all masking tape

(b) Remove all overspray taking care to prevent coating damage

(c) Remove all traces of sprayshield with solvent

Finish Grind

(a) Grinding Wheel Type N° 46 Grit Blue V Grade

(b) Wet Grind to finished diameter, take light cuts using feed and speed in accordance with grinding machine manufacturer's instructions

Inspection

(a) Check dimensions

(b) Check all specified areas are coated with aluminium

(c) Finished component is ready for packing

- REFERENCE TECHNICAL BULLETIN N°S :-

1.1.8 Metallisation type IV Flowmeters

2.2.1 Metallisation Wire 01E Aluminium

2.2.2 Metallisation Wire 02E Zinc