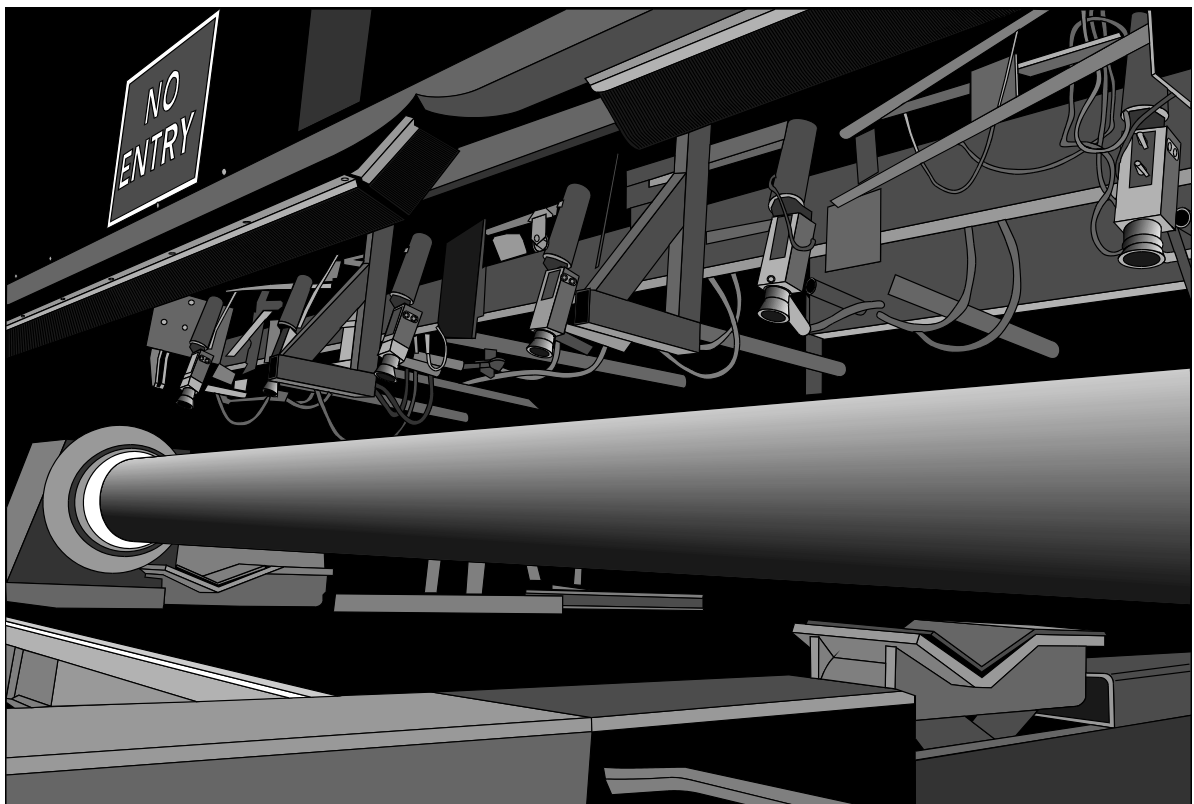


Zinc Spraying Of Ductile Iron Pipes

Application Data Sheet HE-AC-001



Introduction

Over the last 40 years in Europe, the ductile iron pipe has progressively replaced the grey iron pipe.

The manufacturers of ductile iron pipe world-wide are now looking to give their customers a 50 year guaranteed life on their pipes.

One of the main factors which will determine the life of ductile iron pipe is its ability to resist corrosion. To guard against risk of failure from exterior corrosion the manufacturers have introduced a metal sprayed zinc coating in immediate contact with the outside surface of the pipe. This is then being supplemented by bituminous paint and a polyethylene sleeving.

Zinc coatings of up to 200g/m² are now being applied, which are well within the European norm, only asking for a minimum of 130g/m² of zinc. Reference BS EN 545 – 2006. Other coatings of zinc/aluminium alloys are also commonly applied.

Equipment

Metallisation 528E-ACD Arcspray System. 700A, 1000A and 1500A energisers are used.

Materials

Metallisation 02E Zinc 99.99% minimum purity wire

Metallisation 01E Aluminium 99.5% minimum purity wire (sprayed and alloyed with the zinc)

Preparation

For most anti-corrosion applications using the zinc spraying process, it is normal to gritblast the components surface prior to applying the zinc. This is to produce the ideal receptive surface for a sprayed zinc coating.

The surface preparation on ductile pipes is completely different. During the spinning process it is required to produce friction between the molten iron and the mould surface thus starting the formation of an iron pipe within the cooled moulding tool.

To achieve this friction the surface of the moulding tool is covered with a totally random overlapping pattern of 1.5mm radius dimples. The dimples in the moulding tool produce a pattern of pimples over the pipe's surface. This, along with the temperature of the pipe being between 300°- 400°C as it arrives for spraying from the annealing furnace, gives the required surface to obtain a very good bond between the pipe surface and the arcsprayed zinc coating.

Application

The zinc is normally applied automatically, either by traversing a multiple of arcspray heads over a rotating pipe held by cones at both ends, or, by conveying a rotating pipe past a multiple of fixed arcspray heads.

The minimum coating thickness of 130g/m² is determined by traverse and rotating speed of the pipe along with the amount and throughput rate of arcspray heads being used. The best capture levels of zinc sprayed coatings are up to 55-60% for pipes between 80-300mm diameter and 60-65% for pipes above 300mm diameter.

Spraying Parameters 02E Zinc

- i. Range: 100mm (4"). Spreader can be used to spread spray stream.
- ii. Nozzle Air Pressure: 5.5 bar (80 psi)
- iii. Voltage: 21-23 when spraying
- iv. Amperage: 600-1500 Amps dependant on required deposit thickness
- v. Typical Zinc Throughput at 600 Amps = 63 Kg/Hr

Note: Parameters may differ in accordance with type and length of power cables and hoses being used.

👉 Reference Technical Bulletins:

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|-----|-------|-----------------------------|
| No. | 2.2.2 | Metallisation Wire 02E Zinc |
| No. | 3.2.4 | Efficiency and Coverage |