

# THERMAL SPRAY TECHNOLOGY FROM THE WORLD LEADER

OFFSHORE / ONSHORE

CIVIL ENGINEERING  
STRUCTURES

PETROCHEMICAL

MARINE

WIND ENERGY



**BARRIER**

THERMAL SPRAY COATING FOR  
CORROSION CONTROL

# BARRIER

The Barrier Group was founded in 1975, and is now one of the world's leading specialist coatings and linings contractors, with an international reputation for high quality, effective and professional solutions.

The Group has offices in several countries worldwide, and considerable corrosion protection experience in offshore, petrochemical, marine and other industrial markets. This expertise is reinforced by proven project management capability and maintenance skills and a first class safety record. An on-going commitment to quality and high level customer service also enables the Group to remain at the forefront of developments in application techniques and advanced coating technologies.

Thermal Spray Coatings, which provide unequalled protection and corrosion control, are a classic example of this commitment. We are the world's largest single source applicator of such metal coatings to structural steelwork, with full capability to apply advanced engineered products designed to meet rigorous wear, abrasion, temperature and mechanical resistance requirements. What's more, our understanding of Thermal Spray technology is complemented by expert technical advice, specification writing and feasibility study services.

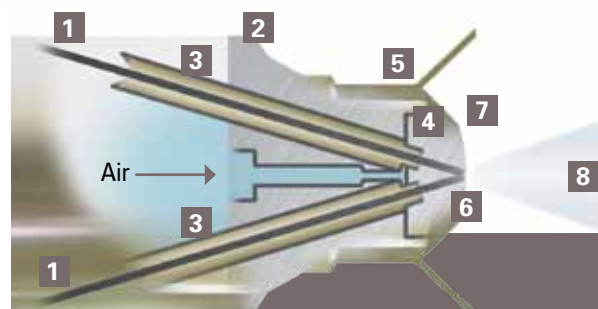


## WHAT ARE THERMAL SPRAY COATINGS?

Thermal metal spray coatings have an established commercial track record in the corrosion protection field. The application process involves melting of wire (zinc or aluminium) or powder through specialist equipment and then, with the use of compressed air, applying the molten metal on to a suitable prepared surface. Arc Spray and Gas Flame are the two main types of wire application used today.

## ARC SPRAY

A pair of wires is electrically charged, and an arc is struck across the tips when they are brought together through a pistol. Compressed air is blown across the arc to atomise and propel the automatically-fed metal wire particles on to the work piece. This method produces superior adhesion of the coating.



- |                 |            |                 |
|-----------------|------------|-----------------|
| 1. Wire         | 4. Nozzle  | 7. ARC zone     |
| 2. Block        | 5. Shroud  | 8. Spray stream |
| 3. Contact tube | 6. Air cap |                 |

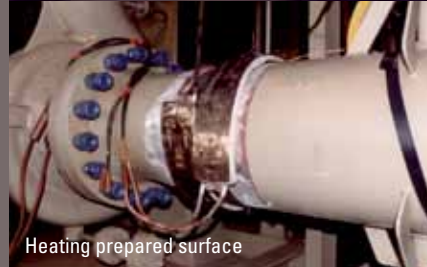




Surface before mechanical preparation



Surface after mechanical preparation



Heating prepared surface



Spray application



Finished product

## SPRAYING ONTO A MECHANICALLY PREPARED SUBSTRATE

Surface preparation is key to the adhesion of the aluminium to the substrate. This would normally be gritblasted to Swedish Standard Sa2.5, and heated to above 30°C.

It is not always possible to gritblast, due to surrounding equipment etc. The alternative is to spray with Barriercoate PTSA™ using a powder spray gun, onto steel at approx. 70°C. Adhesion levels easily meet those required of the NORSOK specification. Heating of the steelwork or pipework can be by gas flame, heater pads, or electrical induction.

## WHERE ARE THERMAL COATINGS USED?

The process is used in many industries, from highly sophisticated coatings for medical implants and aircraft engine parts, through to corrosion control, with proven performance, low maintenance and greater economy, in areas such as:

- Offshore structures
- Pipelines, valves and fittings
- Structural steelwork
- Road and rail transport
- Tanks and vessels
- Street furniture and countless other areas.

## OUR END-TO-END SERVICE

Barrier offers a comprehensive end-to-end service for thermal spray coating projects, including:

- Feasibility studies
- Process plans
- Technical advice
- Specification writing
- Back-up technical support and
- Application.

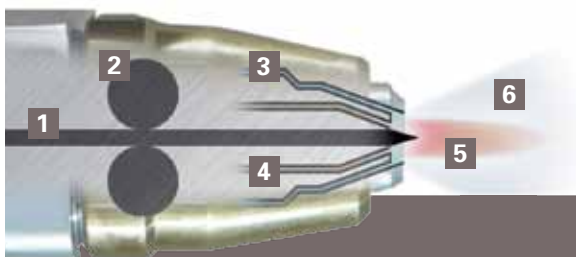
## SEALING

Thermal metal spray coatings are usually sealed with an appropriate sealant to close any open pores and reduce exposure of the metal. Silicone based materials are generally used for high temperature structures such as flare stacks and epoxy or vinyl sealers for ambient temperature applications. A final colour topcoat allows a range of aesthetic finishes to be achieved.



## GAS FLAME

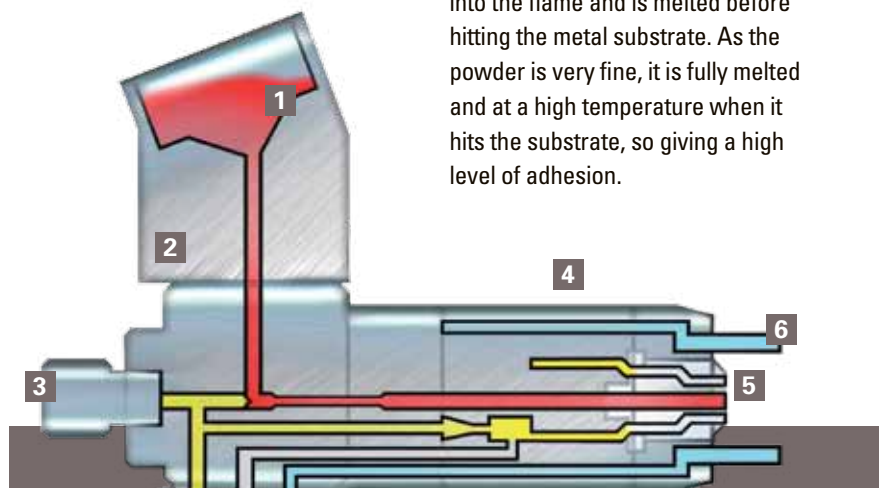
In this method the continuously moving wire passes through a pistol and is melted by a conical jet of burning gas (propane or acetylene mixed with oxygen). The molten wire atomises and is propelled onto the substrate.



- 1. Wire
- 2. Wire feed rollers
- 3. Compressed air
- 4. Mixed fuel gas & oxygen
- 5. Flame
- 6. Spray stream

## POWDER SPRAY

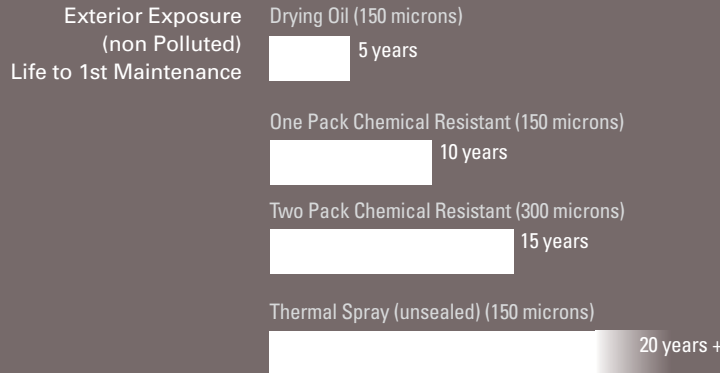
Powdered aluminium is metered into the flame and is melted before hitting the metal substrate. As the powder is very fine, it is fully melted and at a high temperature when it hits the substrate, so giving a high level of adhesion.



- 1. Alloy powder
- 2. Mounting
- 3. Powder injector
- 4. Spray unit
- 5. Flame nozzle
- 6. Compressed air focussing nozzle

## LIFE EXPECTANCY OF THERMAL COATINGS

Quality of surface preparation and the performance characteristics of the coating in contact with the steel both affect the life expectancy and aesthetic appearance of the metal structure.



Zinc and aluminium are not only inherently resistant to the aggressiveness of the external environment, they also impact exceptionally high active protection to the steel. In fact, when Thermal metal coating is compared to high performance paints over a 25-30 year life span, it is more cost-effective in terms of maintenance, as the graph, based on a British Standard Code of Practice for corrosion control, shows. The commercial advantages are underlined when the ability of Thermal spraying to deposit coatings over large areas at specified thicknesses are taken into account.

## CORROSION PROTECTION

There are many reasons why metals corrode, eg, the type of metal, and the environment and temperature it is subject to. In electrochemical corrosion it is known that when two metals are electrically connected in an electrolyte, current flows between them and protects the more cathodic of the two. The galvanic series in sea water shows this reaction and makes clear that thermally sprayed aluminium and zinc will galvanically protect mild steel from corrosion.

## OTHER BARRIER GROUP SERVICES

Surface treatment and application of:

- Glass flake coatings and linings
- Solvent free and other specialist coatings
- Intumescent fire protection
- Floor / deck coatings.

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