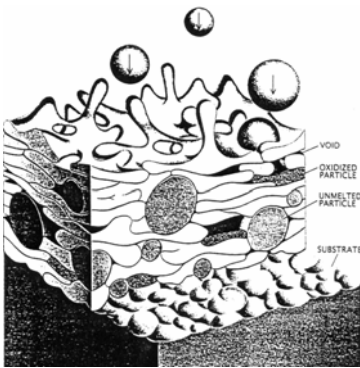


To Galvanise or Metal Spray? The same by definition!

The dictionary definition of galvanise is “to coat (iron or steel) with zinc”. Hot dipped galvanising is a well-established process used to protect steel from corrosion by applying a layer of zinc. Steelwork is immersed briefly in molten zinc with layers, usually of an even thickness, dense and metallurgically bonded to the steel. Thickness is typically .002-.006 in (50 – 150 μ). There is however, another process that can be used to coat steel with zinc.

Metal spraying using Arc spray or Flame spray is an alternative method of coating with zinc (or many other materials) to hot dipped galvanising. All methods of metal spraying involve the projection of small molten particles onto a prepared surface, where they adhere and form a continuous coating. To create the molten particles, a heat source, a spray material and an atomisation/projection method are required. The small molten particles are projected onto the surface to be coated. Upon contact, the particles flatten onto the surface, freeze and mechanically bond, firstly onto the roughened substrate and then onto each other as the coating thickness is increased.



As the heat energy in the molten particles is small, relative to the size of the sprayed component, the process imparts very little heat to the substrate. Unlike the galvanising process, as the temperature increase of the coated parts is minimal (rarely above 100°C), heat distortion is not normally experienced. This is a major advantage over hot-dipped galvanising.

Thermal spraying has proved itself to be extremely effective in its 90 years existence, in all manner of applications, ranging from engineering coatings in gas turbines to corrosion protection on park benches. It is particularly used to apply corrosion protection to large structures such as offshore oil platforms, bridges and construction steelwork. As a protective system for structural steelwork it is unsurpassed, being the only system recommended by International and European Standards EN ISO 14713, as giving greater than 20 years to first maintenance in very aggressive environments. Such environments include the marine splash zone (category Im2), as well as all other categories.

Metallisation

Thermal spray equipment and consumables

Hot dip galvanising steel is limited to corrosion protection using zinc, whereas metal spraying can also use, amongst other materials, aluminium and its alloys, which is much more resistant to corrosion in areas typically exposed to salt such as oil platforms and road bridges. Nusteel Structures has been a customer of Metallisation for over 25 years and chooses the Flamespray process to protect its customers' bridges and gantries from corrosion. Nusteel is one of the leading suppliers of steel bridge and sign gantry structures in the UK. Surface coating and finishing is undertaken at Nusteel's purpose built manufacturing facility in Hythe, where quality assurance procedures aim for zero defects.

All of Nusteel's structures must be sealed and coated to the recommended highway specification Item 159. Surfaces are first grit blasted to SA3 cleanliness and then sprayed with 100µm of aluminium using Metallisation's MK73 Flame spray system, as per the client specification. The aluminium coating is over coated, predominantly for aesthetic purposes, with a painting system including an aluminium-epoxy sealer, zinc phosphate primer, a high build MIO undercoat and a final polyurethane topcoat. The aluminium coating should guarantee a protective, maintenance free surface well in excess of 20 years, in a difficult access environment, such as over a motorway, railway or river.



Simon Slinn, Quality Assurance Manager at Nusteel Structures says: "We use Metallisation equipment because our clients' specify that all surfaces must be Arc sprayed or Flame sprayed as part of a Highways (Difficult Access) or Rail Track Paint system. Due to the size of bridges and gantries it is not generally possible to galvanise the structure. The addition of the metal spray used in conjunction with paint systems, affords a greater level of protection to the steel substrate from corrosion. The Metallisation equipment is easy to use and very reliable, something that is important to us at Nusteel."

Darren kirkepatrick

Metallisation

Thermal spray equipment and consumables

Historically, bridges have also been coated with zinc. In the early 1960's, the Forth Road Suspension Bridge in the UK was coated with zinc and a paint system. The structural steelwork of the 1,006m central span bridge remains with little sign of corrosion today.



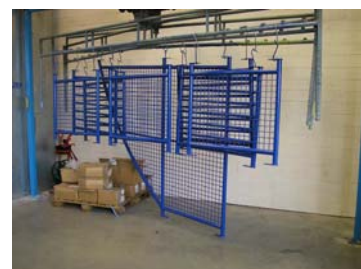
On a smaller but equally important scale, SMP Playgrounds recently opted for a second Metallisation Arcspray system to protect playground equipment from corrosion and to create an excellent base for the powder coated finish. SMP has been designing, manufacturing and building playgrounds throughout the world for 40 years. For SMP the safety of the finished surface is critical, as is the long-term protection against corrosion provided by the zinc metal spraying process.

The European Standard for children's playground equipment EN1176 states that the equipment must be protected from corrosion and no toxic paints are to be used. SMP has a strict process in place, which starts with the equipment being grit blasted to a cleanliness of SA2.5. The Metallisation Arc140/S250 system is then used to manually



apply 100microns of zinc. The 250-amp energiser allows the operator to apply the coating in a controlled method to small profiles. Unlike galvanizing, the equipment can be treated at SMP's site and does not have to be transported to a galvanising bath. Also, the low heat during spraying eliminates the risk of thermal distortion or of thermal metallurgical degradation. To ensure that the coating is as smooth as possible with minimal porosity, SMP has honed the Metallisation equipment and spraying process, using 2mm wire.

SMP opted for the metal spraying process as opposed to galvanising due to the suitability of the finish. All SMP equipment is powder coated so the slightly roughened finish, given by metal spraying, is a positive bonus to help bond the powder coating.



Darren kirkepatrick



Another of Metallisation's customers to have benefited from metal spraying as opposed to galvanising is DON-BUR. The DON-BUR Group designs, develops and manufactures a complete range of lorry trailers and rigid vehicle bodies. DON-BUR always used galvanising as its anti corrosion protection system until it tried metal spraying. DON-BUR now uses the Arc 140GP system to spray zinc onto the rear frames of curtainside trailers, an area very prone to corrosion. Since switching to metal spraying DON-BUR has benefited in many ways. The changeover has dramatically reduced the lead times and work in progress, as the frames no longer need to be sent to the galvanisers, which saves on shipping costs.

Once fabricated, the frames are sprayed, as the next direct process, and are ready for assembly within a much shorter time frame. The ownership of the process, and the quality of the coating, is now directly in the control of Don-Bur. This has further reduced the time and effort required to dress galvanised frames in preparation for painting. They no longer have to grind off drips, etch prime before painting or re-drill holes. Further advantages are that the weight is reduced because the metal spraying does not fill the hollow sections. Finally, as the metal spraying process is cold, they have a wider scope for product development, as the effect of heat distortion through galvanising is no longer an issue.

Finally, to prove its effectiveness, metal spraying is also used to repair and restore corrosion protection on damaged areas of welded or corroded galvanised steel. So the next time you consider galvanising as a method of corrosion protection, remember that there is another process other than the one that immediately springs to mind. Metallisation provides the full range of metal spraying, Flame spray, Arc spray, Plasma spray and High Velocity Oxygen Fuel (HVOF). For more information please visit www.metallisation.com or call 01384 252 464.

I certify that this appears to be a true copy of
the document produced by me on 28th January 2014
Signature *Darren Kirkpatrick*
Name Darren Kirkpatrick
Position: Area Sales Manager
Metallisation