

## Sherardizing - Case Studies

### What is Sherardizing?

Sherardizing is a thermal diffusion coating process providing uniform thickness and corrosion protection. Steel components are placed inside a retort, together with an inert media and zinc powder. The mixture is rotated at 4 rpm and heated to around 400°C (750°F) for approximately two hours. During this process the zinc powder vaporises and diffuses into the component surface, forming a zinc alloy layer. Coating thicknesses are available in the ranges 15 – 40 Microns (0.0006 – 0.0016 inches) and 30 – 60 Microns (0.0012 – 0.0024 inches), based on ISO EN 13811 standard coating thickness requirements.

### Passivation

Components which have been Sherardized are also passivated. Passivation renders the Sherardized coating less reactive and prevents 'white rust' (zinc oxide film) or the premature formation of harmful zinc salts on the surface. The passivation treatment produces a film of stabilised zinc salts on the Sherardized coating which will not allow moisture or condensate to react with the zinc. Bodycote favour the use of a zinc phosphate passivation process because it protects both the zinc and the iron constituents of the coating.

### Cable Hangers for the Mass Transit system in Hong Kong

Reliable corrosion protection is required in damp tunnel environments, particularly in humid countries. Sherardizing was specified to protect some 78,000 cable hangers used to support signalling and telecommunication cables along the walls of the Mass Transit Railway in Hong Kong.

Originally, the cable hangers were galvanized. However, due to the continuous expansion and contraction of the cables which sit on the hangers, cables were experiencing wear against the rough galvanized surface. As a solution to this problem, Sherardizing of the cable hangers provides a smooth, corrosion resistant surface, protecting both the cable hangers and cables from wear.

Since 1985 Bodycote have supplied Westinghouse Brake and Signal with these quality Sherardized components and, owing to the increasing recognition of the benefits of Sherardizing, have recently supplied a further quantity to Singapore.



Reasons for specifying Sherardizing:

- Long-term corrosion protection
- Damage and wear resistant coating
- Uniform, smooth coating even over irregular-shaped components

### Pivot pins for airport terminal buildings at Kansai International Airport, Japan

The terminal building at Kansai International Airport, built by Watson Steel Ltd. of Bolton, UK, consists of a wing-shaped structure which, due to expansion and contraction throughout the day, requires to be pivoted at axis points to allow for movement.

The fulcrum pins, which were designed to allow for this movement, required reliable wear and corrosion resistance. Sherardizing was specified as the process which delivered all the necessary properties; the coating not only gave the corrosion protection required, but also withstood the abrasion resulting from the fulcrum pin movement. Bodycote Sherardized 40 tonnes of fulcrum pins and washers for the project.

Reasons for specifying Sherardizing:

- Long-term corrosion protection
- Damage and wear resistance on moving parts
- Uniformity of coating on components for functionality
- Suitability for post paint treatments
- Many similar successful applications



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### Quality

Quality is an advantage to be expected of a well established process developed over half a century by a leading provider of metallurgical services. Bodycote places great importance on close consultation between its staff and customers to ensure that there is a complete understanding of the anticipated performance of Sherardizing and the extent to which it will prolong the working life of a product. Bodycote facilities hold numerous national accreditations and customer approvals and our Sherardizing is carried out in accordance with the specified quality standard for Sherardizing, ISO EN 13811.

### Fasteners for Barcelona Fish Sculpture

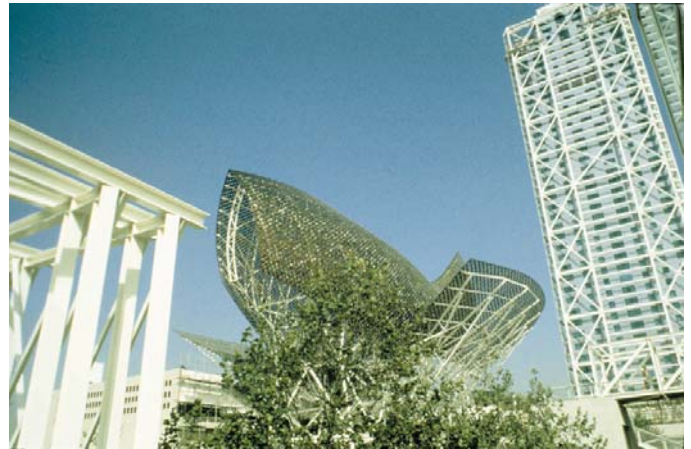
American architect Frank Gehry specified the use of Sherardizing for components used in the Barcelona Fish Sculpture. 200 tonnes of Sherardized fasteners and bolts were used for the Fish Sculpture and also for the steel construction of the neighbouring Hotel Vila Olimpica.

The uniform thickness of the Sherardized layer helped the construction workers to assemble the girder fabrications efficiently.



Reasons for specifying Sherardizing:

- Long-term corrosion protection
- Uniformity of coating
- Ability to accept post treatments and paints without further surface preparation



### Hinge pins for roof support systems in mining applications

Sherardizing has helped to shape the history of safe roof support systems for British coal mines since the late 1970's. During this time, Bodycote assisted with testing by the UK mining industry to establish the best corrosion resistant coating. Bodycote supplied a variety of components using different coatings processes, to ascertain the most suitable coating for hinge pins used in the mine roof support systems.

The Sherardized components withstand the aggressive conditions and abrasion from the coal dust filled atmospheres and are installed in a coal mine in the North East of England under the North Sea, where conditions are particularly wet and acidic.

Conclusions from these tests established British Coal's specification for roof support system corrosion protection from 1980 onwards. To this day, Sherardizing is firmly established as the preferred corrosion protection for hinge pins in mine roof support Systems, and has been a key element of exports to the USA, Australia, South Africa and China.

Reasons for specifying Sherardizing:

- Long-term corrosion protection
- Uniformity of coating for functionality of the product
- Abrasion resistance
- Proven effectiveness



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