

RAIL BRIDGE IN WINTER

During refurbishment of a UK rail bridge in winter, heavy snow, extended cold periods and a continuous flow of water from melting ice in concrete above the bridge beams made it impossible to use an ordinary coating system. Preparatory blasting work in many areas was beginning to show significant re-rusting because of the delays in coating. The contractors, with expensive scaffolding and other infrastructure in place, were anxious to avoid any further delays and sought a solution using Alocit.



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Successful trial application

An area was chosen and a trial application arranged. On the day of the application, the substrate was at freezing point and, although some coating was applied to this area, as it was below the recommended minimum temperature (4°C/38°F) another, slightly warmer substrate area was chosen for the full trial application, two on a vertical surface and one on a horizontal plane.

Great test results

After curing, DFT tests showed film thickness to be as specified and pull-off testing showed glue-line separation at 500, 750 and 900 psi, with no failure in the coating. Testing on the freezing substrate also gave a reading of 900 psi before the glue holding the dolly to the paint surface gave way.

A very surface-tolerant coating, Alocit can be applied to areas with a certain amount of re-rusting, but some areas were so badly affected, it was decided to pressure wash before application. Many areas were too bad for this to be effective, so it was decided to flash blast and rinse with water to remove blast debris before applying the first coat.

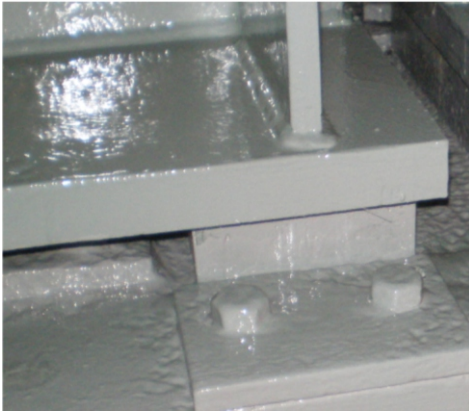
Freezing conditions

On the day full application was due to begin, heavy snow had fallen with ambient temperatures well below freezing (-4°C/25°F), but spraying was able to commence using an in-line heating block. The extremely icy conditions reduced the affect of dripping



Top: the rail bridge was severely affected by the freezing conditions
Above left: the condition of the blasted substrate awaiting coating
Above right: manually applying the test coating to a freezing, wet substrate
Below: spray-applying the first coat of Alocit





water, allowing large areas to be sprayed without difficulty. Remaining wet areas and stripe coating were accomplished using brushes.

The green second coat was applied without any problems, producing a hard-wearing attractive finish for the bridge beams. Final testing showed optimum film thickness was achieved, with pull-off tests showing adhesion in excess of 2000 psi with all separations occurring through glue-line failure.



Above left: detail of first coat

Above: finished coat in green

Below: testing the finished coating, results shown in panel below



Specification and inspection data

Paint System

2 x 300 micron/12 mil index coating system using 28.15 Grey RAL 7004 as a base coat with 28.15 Green 14c39 (British Racing Green) as top coat, giving final DFT Of 600 microns/24 mil. Stripe coat all edges, welds and bolted areas. An index system uses separate colors for each coat to ensure proper coverage.

Preparation Specification

Abrasive blast to SA 2.5/SP10 to give a blast profile of 90-95 microns/3.5-4 mil, rinse down with water where needed on wet areas to clean off blast dust

Ambient temperatures

Minus 5°C/23°F - 12°C/53°F

Substrate temperatures

5°C/41°F - 20°C/68°F (raised using hot air blowers)

Material temperatures

In mixed form in batches of 30kgs (5 gal): 10°C/50°F to 15°C/59°F
At spray tip via heating block set at 20°C/68°F

Equipment data

Graco 68.1 airless spray pump fitted with 3/8 inch spray line with 1/4 inch whip end

XTR Graco spray gun with 4-21 thou spray tip

Graco In-line paint heater block

Film Thickness/Adhesion Testing

Average DFT - 615 microns

Adhesion - range between 1600 psi and 2000 psi with all separations in the glue line.



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