

Application of Versiline CUI 56990

Introduction

Versiline CUI 56990 is a single-pack inert multi-polymeric matrix (IMPM) specialty coating system designed to provide corrosion protection of hot process equipment piping etc. The coating film is fibre reinforced and MIO pigmented to provide excellent crack resistance and corrosion protection over a wide range of temperatures, from -196°C to 650°C.

Safety

Use adequate personal safety equipment and follow sound procedures. Apply only in well ventilated areas. Observe safety labels on packaging and paint containers and consult Hempel's Safety Data Sheets for the products to be applied. For application on hot substrate be especially aware of the risk of fire or explosion.

Scope

Additional to the general skills of the training applicator there are some certain aspects to be aware of in order to obtain the best result. This Guideline covers special issues to be aware of when applying Versiline CUI 56990.

Surface preparation

Additional guidance can be found in Hempel technical guideline "Surface preparation new building".

Soluble salts

Water soluble salts shall be removed if the concentration is above 50 mg/m².

For application on hot surfaces, it is impossible to check for salt levels. In such cases clean very thoroughly with high pressure fresh water.

Overcoating Inorganic Zinc Silicate

For surfaces applied with intact inorganic zinc-containing coatings such as zinc silicates all zinc salts and other contaminants shall be removed by a suitable method. The degree of cure of the zinc silicate shall be minimum rating 4-5 when tested in accordance with ASTM D4752.

Old Steel

All existing coating materials are to be completely removed where required. Refer to Hempel Technical Guideline "Surface preparation Repair"

For overlap onto other coating products please consult your local Hempel representative. Compatibility between Versiline CUI 56990 and other coatings should be validated by a suitable field adhesion trial such as ISO 16276-2. Minimum acceptance criteria shall be rating 0-2.

It should be noted that existing coating materials may have different maximum temperature resistance than Versiline CUI 56990. Where the temperature resistance of these materials is insufficient then they should be completely removed.

Application

Mixing

Versiline CUI 56990 is a single component product and therefore has an unlimited pot life. The product is heavily pigmented and tends to settle during storage.

In case of settling the paint needs to be mixed properly before use to a uniform consistency. The best way to do this is to shake the product using a mechanical shaker.

If a mechanical shaker is not available pour the paint into a larger mixing bucket. Be sure that all paint, both the liquid part and the heavy settled part is poured/scrapped from the Versiline CUI 56990 cans into the mixing bucket. The paint shall then be stirred mechanically. The paint must appear homogeneous and free of lumps.

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Avoid incorporating of air into the paint by over-agitation.

Application

Additional guidance can be found in Hempel technical guidelines “Spray application” and “Brush and Roller”.

Versiline CUI 56990 should preferably be applied by airless spray equipment. Stripe coating and minor repairs **can** be applied by brush / roller.

During application, mixing should be carried out from time to time to secure a uniform consistency of the paint. Leaving the can open for longer time does not influence the curing properties of Versiline CUI 56990, however in order to avoid solvent evaporation it is recommendable to cover the can or mixing bucket.

It is very important to use nozzles of the correct size, i.e., not too big. Select small nozzles for spray application of complicated structures, while bigger nozzles may be used for regular surfaces.

A proper, uniform distance of the spray gun to the surface, 30-50 cm, should be maintained. The paint layer must be applied homogeneously and as close to the specification as possible. The consumption of paint must be controlled, and heavy layers must be avoided because of the risk of sagging, cracking and solvent retention.

The finished coating must appear as a homogeneous film with a smooth surface and irregularities such as dust, dry spray, abrasives, must be remedied.

All places difficult to cover properly by spray application (e.g., edges, bolt-holes, brackets, pipe hangers and other fittings etc) should be stripe coated twice by brushing immediately before the spray application. The first stripe coat is applied before the first full coat and second stripe coat before second full coat. The second stripe coat with brush can be replaced with spray application with a small narrow nozzle, but any imperfections within the steel will still require brush application. For very hot surfaces, stripe coating by brushing is to be avoided.

It is very important to use nozzles of the correct size, i.e., not too big. Select small nozzles for spray application of complicated structures, while bigger nozzles may be used for regular surfaces

Overcoating procedure

When overcoating zinc silicates with Versiline CUI 56990 a mist coat application approach might be necessary in order to reduce the risk of cissing or popping due to the porous nature of the zinc silicates.

When overcoating Versiline CUI 56990 with itself it may under certain application conditions exhibit zinc silicate behaviour resulting in cissing or popping and subsequent pin holes in the coating surface. If cissing or popping are observed during application, preventive measures are

- Ensure that the specified WFT is strictly observed, particularly during application of the first coat.
- Application should be carried out in multiple thin passes
- Thin the second coat of Versiline CUI 56990 by no more than 10-15%. Ensure that the WFT is strictly observed. Drying times may need to be adjusted accordingly

Overcoating intervals

Surface temperature:	20°C/68°F	200°C/392°F
Minimum	6 hours	15 minutes
Maximum	Extended	Not relevant

Versiline CUI 56990 should never be overcoated with chemically curing products such as epoxies, polyurethanes or humidity curing silicones. If specific colours are required Versiline CUI 56990 can be overcoated with Hempel's Silicone Aluminium 56910, Hempel's Silicone Acrylic 56940, or Hempel's Silicone Topcoat 56900.

Hot substrate

Versiline CUI 56990 can be applied on hot surfaces up to 200°C/392°F by spray application only. For more details see Hempel's Technical Guideline “application on hot substrate”.

Drying & curing

The transformation of Versiline CUI 56990 from liquid coating to dry film is based on 2 processes. Physical drying through solvent evaporation and chemical curing through crosslinking reaction forming covalent bonds.

Versiline CUI 56990 dries physically at ambient temperatures into a continuous coating that delivers barrier protection. The product can achieve hard dry in 2 hours and can be overcoated as quickly as 6 hours at 20°C. At higher temperatures, above 200°C (392°F), cross-link

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formation imparts thermal resistance to the coating, allowing continuous temperature exposures up to 650°C without cracking or degradation. The product exhibits thermoplastic softening before this irreversible cross-link formation. Care should be taken e.g. when installing thermal insulation. Exposure at 200°C for 24 hours will generate permanent hardness, such that the coating no longer exhibits thermoplasticity even when the temperature is subsequently lowered.

For processes where temperature does not exceed 200°C and where coating hardness is critical, Hempaprime CUI 275 epoxy coating is a cost-efficient alternative that provides equally outstanding corrosion protection.

Dry film thickness control can be carried out as soon as the surface is sufficiently hard, and this may depend upon climatic conditions. The measurement must be carried out using a suitable electromagnetic dry film thickness gauge calibrated with shims placed on a smooth steel substrate appropriate to the gauge probe type being used.

Holiday detection

Due to the nature of Versiline CUI 56990 Hempel does not recommend holiday detection using electrical methods such as ISO 29601, NACE SP0188, and ASTM D 5162. Instead Hempel recommends thorough quality control and inspection throughout the application process. In particular measurements of film thickness and visual inspection after 1 week.

Adhesion

Pull-off test is not recommended to evaluate adhesion of coating products of the type inert multipolymeric matrix. Instead Hempel recommends X-cut according to ASTM 3359 Method A or ISO 16276-2.

This document is intended for professional use and provides generic advice in respect of the subject matter only. It is not intended to be used as a comprehensive guide. The buyer/applicator should always read the relevant Product Data Sheet ("PDS") and Safety Data Sheet ("SDS") relating to the Products ordered which are available for download on www.hempel.com. If in doubt, please contact your local Hempel representative for further advice. To the extent relevant, the disclaimer set out in the relevant PDS(s) applies to this document.