



Thermaguard™ CUI 650

Application guide

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1. Product description:

Thermaguard™ CUI 650 is a single component Inert Multi Polymeric Matrix, low VOC, high-build primer, ambient curing and is specifically formulated for Corrosion under Insulation (CUI). Thermaguard™ CUI 650 withstands high temperature dry/wet thermal cycling, has superior corrosion resistance to harsh environments and provides an exceptionally hard film at ambient temperatures. The product has the ability to be applied to hot substrates up to 260°C, eliminating the need for costly shutdowns.

2. Storage & shelf life:

Store all coating materials in a dry place as close to room temperature as possible. Ideal storage temperature should be between 15° to 27°C. Keep cans sealed and out of the direct sun when not in use. Warm up cold material to room temperature before using.

Shelf life - 1 year unopened.

3. Surface preparations:

Thermaguard™ CUI 650 will depend on high quality surface preparations to ensure optimum long term performance. To achieve optimum performance, the substrate to be coating should be clean, dry and free from any contamination. All oil, dirt, grease, dust, foreign material and loose rust must be removed prior to coating by chemical cleaning. Prior to application the surface must be inspected and treated in accordance of ISO 8504:2000 & SSPC- SP1.

All welding, weld spatter, removal of sharp edges, degreasing and treatment of welds should be complete before surface preparations are undertaken.

4. Abrasive blast cleaning:

The substrate to be coated should be blasted with a suitable abrasive grit media which provides a surface which is to a standard of Sa 2 ½ or higher (ISO 8501-1) for optimum performance. Lower standards are likely to results in decreased service life.

Surface profile should be between 30 - 50µm.

5. Hand & power tool cleaning:

Where abrasive blast cleaning cannot be carried out, power tool cleaning can be used as a substrate preparation for Thermaguard™ CUI 650. All mill scale must be removed and the surface preparation must be cleaned to a minimum of St 2 or 3 (ISO 8501-1). Hand or power tool cleaning is likely to provide a lower level of performance than abrasive blast cleaning.

6. Stainless steel cleaning:

Surface should be clean, dry and free from any contamination. As a guide the surface should be degreased with an alkaline detergent, jet washed with low pressure water cleaning equipment (LPWC) to a standard which equals or is higher than Wa 1 (8501), followed by abrasive sweeping with non-metallic and chloride free media with an angular profile of approximately 50µm (Rz). Adhesion will depend on quality of blasted profile.

7. Mixing:

Thermaguard™ CUI 650 should be mixed until uniformly consistent. Due to the heavy bodied nature of the product settling of the fillers overtime can occur. No spilling of the coating should occur during mixing; the product is rendered invalid if such an event should occur. The settled fillers must be reincorporated back into the master mixture to achieve a homogeneous coating, this is essential to obtaining product performance. A mixing paddle can be used to help reincorporate any settled fillers followed by using a slow speed power mixer, either an air motor or explosion proof electric motor. The coating should be then mixed until it's uniformly consistent, without the incorporation of air. The product reacts with moisture. Therefore, the lid must be kept on during use and once opened the coating should be used.

8. Application:

- **Thermaguard CUI 650** – onsite maintenance (brushing, rolling & spraying)
- **Thermaguard CUI 650 OEM** – spray shop application

Surface temperature must be a minimum of 3°C, above the dew point. Do not apply to substrates at temperatures below 10°C. This should be tested in accordance with ISO 8502-4. All equipment should be in full working order to ensure correct application of coating. The spray data stated below is a guideline, it is not strictly for following exact values and this is due to the variation of equipment which can be used. However, through extensive testing these are the recommended values to follow as a guide. Therefore, spray guns should be checked periodically for any faults and it is recommended to perform trial areas to check coating is applied evenly with no defects occurring during application.

9. Airless spray application:

Pump size; 30:1 (minimum)

Pressure at nozzle; 160 - 200 Bar/ 2321 - 2901 psi

Tip size; 15 - 21 thou. (Angles dependant on substrate diameter, recommended below 50°)

Filters (mesh): remove all filters

Hose length and diameter can influence pressure and correct application of coating; hence this must be closely monitored.

10. Air spray application:

Air nozzle; 2.0 - 2.2mm

Fluid pressure; 30 psi

Atomization pressure; Adjust until an even spray fan is obtained.

Air spray is the preferred application for intricate and small areas where maximum control is necessary. This will minimise over application of coating and provide long term performance.

Thinner is recommended for air spray application to help provide an even film build, minimise dry spray and allow full wet passes. The spray fan width and fluid pressure should be adjusted to provide an even spray pattern, this should be checked with a test sample, ensuring no dry spray has occurred during test application. When spraying intricate substrate shapes spraying is recommended from multiple angles to ensure correct film build.

11. Brush and roller application:

Substrates which cannot be coated via an aerosol method, brushing or rolling may be used. Use a china bristle brush with a wooden handle for brush application and a phenolic core roller for roller application. Ensure that the surface is correctly wetted out and that the film build is monitored closely to help maintain high performance of the coating. Thinning of the coating may be required when applying to hot substrates. Wet out the surface with the brush or roller on the first pass, after drying, add additional even layers without clumping or streaking the heavy bodied fillers in Thermaguard™ CUI 650.

Always work the brush or roller in one direction with short strokes. Exceptional care should be taken during brush application to assure even film thickness by not overloading brushes or rollers. Maintain brush & roller cleanliness by frequently cleaning in Thermaguard™ X21, S100 & S200 solvent(s). Do not allow cured material to build up to ensure optimal spreading & minimised streaking. Apply additional layers as needed to achieve the specified DFT. A smooth, uniform finish is not to be expected when brushing and rolling Thermaguard™ CUI 650 at elevated temperatures.

12. Thinning of coating:

When applying coating by airless application, thinning is not usually required but if thinning is required then up to 3% may be used. DFT must be closely monitored along with altered dry times to ensure performance levels are maintained. When applying via air spray application, thinning is recommended, volumes are dependent on substrate temperatures. If the substrate temperature is below +60°C then Thermaguard™ X21 should be used, +60 to 150°C Thermaguard™ S100 should be used and from +150 to 260°C Thermaguard S200 should be used. The maximum temperature Thermaguard™ CUI 650 can be applied up to +260°C. Volumes of thinner needed vary with temperature, up to a maximum of 10% for elevated temperature.

Thinner safety information:

Thinning/cleaning product	CAS no.	Flash point (°C)	Auto ignition temperature (°C)
Thermaguard™ X21	1330-20-07	25	>432
Thermaguard™ S100	64742-94-6	50	>400
Thermaguard™ S200	64742-94-5	65	>443

Summary of thinning:

Thermaguard™ X21: temperatures up to +60°C.

Thermaguard™ S100: temperatures from +60 to 150°C (All methods of application).

Thermaguard™ S200: temperatures from +150 to 260°C (Air spray, brush & roller application).

13. Spray technique:

When applying Thermaguard™ CUI 650 proper spray technique is essential for providing the maximum performance of the coating. Even multiple passes should be applied, overlapping 50% on each pass. This should be in succession with avoiding dry spray, excessive reaching and arcing. For intricate areas I.E obscure shapes; bolts, flanges and valve pumps etc. apply a single spray coat followed by using a brush (wood handled china bristle brush) to coat the areas the spray application did not cover. Excessive film build must be avoided at all times.

14. Hot application:

Thermaguard™ CUI 650 can be applied to substrates with a temperature maximum up to 260°C with the addition of appropriate thinner selection and volume.

When applying at elevated temperatures a mist coat application procedure should be adopted, this prevents any solvent entrapment and bubbling/pinholes occurring during application. Thin passes should be performed with periodic waiting in-between each pass to allow any solvent to evaporate. This should be applied alongside a test panel (ambient temperature) which allows you to monitor DFT/WFT film build.

The time between each pass is reduced as temperature increases, again close monitoring is required. Solvents should be used with this method, the required volumes depends on the substrate temperature. Up to 10% of thinner can be used.

15. Application of topcoats:

Thermaguard™ CUI 650 can be topcoated for identification purposes (safety colours) as well as to provide an aesthetical finish. It should be topcoated with Thermaguard™ TC 1200, this range of topcoat colours have superior stability up to temperatures of 650°C. Thermaguard™ CUI 650 should not be topcoated for use under insulation (CUI environment). Please check TDS, MSDS and application guideline of the Thermaguard™ TC 1200 range.

16. Application as a sealer coat:

Thermaguard™ CUI 650 can be used as a sealer coat over TSA (thermal sprayed aluminium). Thinning maybe required to aid wetting. However, close monitoring for defects is necessary; a test patch is therefore recommended. Thermaguard™ CUI 650 can also be used as a sealer coat over other coatings.

17. Film thickness measurements:

Wet film thickness (WFT) measurements should be performed according to ISO 2808, method 1A. If the temperature does not permit WFT to be calculated then a test panel as stated above (hot application) should be used as guidance to achieving the correct film thickness. WFT should be taken periodically to ensure correct film thickness throughout application. Dry film thickness (DFT) measurements should be performed according to ISO 2808 (Method 7C). Film thicknesses should be within 5% of the stated values to ensure maximum protection of the substrate.

18. Colour:

When in service colour change can occur at elevated temperatures, this has no effect on anticorrosive properties. For identification or aesthetical purposes, use of a topcoat colour is needed; Thermaguard™ TC 1200 is specifically formulated as a top coat for the Thermaguard™ CUI 650.

19. Inspection and repair:

If the coating is damaged in any way then the substrate should be spot blasted to a minimum of Sa 2 ½ or prepared by power tool cleaning to SSPP-SP11. Thermaguard™ CUI 650 should be applied with a full coat.

20. Further information:

If any additional information is required regarding technical properties of the Thermaguard™ CUI 650 then Performance Polymers should be contacted directly.

21. Health and safety:

Thermaguard™ CUI 650 is for professional use only. All applicators and operators must be trained in the use of industrial coating applications. Furthermore they must be professionally trained in mixing/thinning of industrial coatings as well as being up to date on all health and safety procedures within an industrial environment. All documentation (TDS, MSDS and application guideline) should be read prior to use of the product. Use of any other thinners or cleaning agents other than Performance Polymers approved products will render the product invalid for use and can cause risk to personal, especially when applying to hot substrates. Use product in well-ventilated area. Do not inhale spray mist or vapour. Avoid skin and eye contact. Skin spillage should be removed with a suitable cleanser and water. If eye contact occurs flush with plenty of water and seek medical advice immediately. Please consult MSDS for in-depth health and safety information on use of the product.

22. Disclaimer:

The information of the products displayed herein is to the best of knowledge of Performance Polymers, but we have no control over the substrates quality of preparation or any other factors which may affect the performance of this product. All testing has been under strict laboratory conditions; therefore, onsite performance can vary with application in different conditions. The information in this guideline isn't to be extensive; any use without conformation from Performance Polymers is doing so at their own risk. Any deviation of performance on site isn't liable to Performance Polymers. The performance of this product carries no warranty. The documentation of this product should be thoroughly read before use.