Corrosion Under Insulation (CUI)

Thermaguard™ CUI 300 Coating

(Inorganic Solvent Free CUI Coating)

Thermaguard™ CUI 300 is a unique inorganic single component, ambient curing polysiloxane coating formulated specifically to provide corrosion protection to under insulation environments where wet & dry cycling can occur. Novel technology that offers solvent-free (100% solids), ultra-low VOC for demanding environmental regulations, and safety aspects during hot application. The coating conforms to the NACE SP0198-2010 classification for Corrosion Under Insulation (CUI) in both cryogenic & elevated temperature applications.

Through specific formulation technology Thermaguard™ CUI 300 can withstand temperatures from -196 to 300ºC, fully curing at ambient conditions eliminating the need for heat curing prior to service. Thermaguard™ CUI 300 has exceptional resistance to thermal cycling, hot saline water immersion & chemical exposure throughout its operating temperature range.

Thermaguard™ CUI 300 can be used in both OEM (shop application) & maintenance work due to having surface tolerance to rusted steels, which have been marginally prepared (St 2/3). Additionally, the product can be applied in service to hot equipment operating up to 300ºC, removing the need for plant shut down periods. For Under Insulation applications where severe corrosive environments can occur such as saltwater immersion & acid exposure in elevated temperatures. Such facilities include petrochemical, chemical plants, offshore, power, refining, and generic processing; pipework, vessels, tanks, heat exchangers, stacks, chimneys, steam lines, etc. operating within -196 to 300ºC temperature range.

Intended Applications

For Under Insulation applications where severe corrosive environments can occur such as salt water immersion & acid exposure in elevated temperatures. Such facilities include, petrochemical, chemical plants, offshore, power, refining, and generic processing; pipework, vessels, tanks, heat exchangers, stacks, chimneys, steam lines, etc. operating within -196 to 300ºC temperature range.

System Specifications

Thermaguard™ CUI 300 in a 2-coat application for CUI or exposed corrosion protection as a direct to metal (DTM) coating system.

Carbon or stainless steel ambient spray, brush or roller (10 to 50ºC) application:

100 - 150µm DFT

Application of Thermaguard™ CUI 300 by airless or air spray are the preferred application methods when applied over Sa 2½ prepared carbon steel or abrasively swept stainless steel (Rz >30µm). New build applications should adopt a stripe coating method to ensure edges have adequate film build.

Maintenance application 2 or 3 coat system (St 2/3), brush & roller (10 to 50ºC) application:

75 - 125µm DFT

At higher temperature applications, further coats maybe necessary to build the film to a total 250 - 300µm DFT.

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Technical Information

Product chemistry:	A single component, ambient curing, pure inorganic polysiloxane. Conforms to the NACE SP0198-2010 classification.
Color:	RAL 3016 and RAL 7035
Specific gravity:	Approx. 2.16 g/ml
Theoretical spreading rate:	10m^2/l at 100µm DFT
Volume solids:	100%
VOC :	Less than 1g /L
Flashpoint (ISO 1523):	N/A
Auto ignition temperature:	N/A
Temperature resistance:	-196 °C to 300°C
Application methods:	Airless, air spray and brush & roller

Surface Preparation

Intended for insulated steel surfaces, both carbon & stainless. Substrates must be clean, dry and free from any contamination. All oil, dirt, grease, dust, foreign material and loose rust must be removed prior to coating.

Insulated or exterior exposed carbon steel

Abrasive blast clean to Sa 2½ (ISO 8501-1:2007) or SSPC-SP10. The resulting surface profile (Rz) should be 30 - 50µm. All sharp edges & rough welds should be rounded off.

Thermaguard™ CUI 300 has surface tolerance to maintenance work applications where tight adhering or flash rusted steel surfaces are present & blasting is not possible. In such circumstances proceed with the following pretreatment; remove all loose adhering rust & rust scale and follow St 2/3 surface preparation prior to application.

Insulated or exterior exposed stainless steel

Abrasive sweep clean using a non-metallic & chloride free abrasive (aluminum oxide or garnet). The resulting surface profile (Rz) should be 30 - 50µm. All sharp edges & rough welds should be rounded off.

Substrate Temperature & Conditions

Ambient substrate temperature application should remain between 10 to 50°C and remain 3°C above the dew point and relative humidity should be 35 - 85% during application. For various temperature applications thinning is:

- Thermaguard™ X21; 10 to 60°C
- Thermaguard™ S100; 60 to 150°C
- Thermaguard™ S200; 150 to 260°C

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Application

Airless

Pump: 30:1 or higher, Tip size: 0.015 - 0.023 inch
Pressure: 2321- 2901 psi/160 - 200 bar
Thinning:
- Thermaguard™ X21, 10 to 60ºC (0 - 3%)
- Thermaguard™ S100, 50 to 150ºC (5 - 10%)
- Remove all mesh filters

Air spray (conventional)

Pressure: 30 psi / 2.1 bar
Nozzle orifice: 1.8 - 2.2mm
Thinning:
- Thermaguard™ X21, 10 to 60ºC (4 - 8%)
- Thermaguard™ S100, 60 to 150ºC (6 - 10%)
- Thermaguard™ S200, 150 to 260ºC (8 - 12%)

Brush/roller

Thinning:
- Thermaguard™ X21, 10 to 60ºC (0 - 3%)
- Thermaguard™ S100, 60 to 150ºC (0 - 10%)
- Thermaguard™ S200, 150 to 260ºC (6 - 12%)

For elevated temperature application, be sure that brush bristle and roller nap are tolerant of the substrate temperatures.

Mixing

Thermaguard™ CUI 300 is a single component product, settling can occur during transport & storage. The material should always be mixed using a mechanical agitation ensuring all settled-out pigments are dispersed until a uniform consistency is reached.

Reactivity

Thermaguard™ CUI 300 is reactive with moisture, skinning can occur once opened. To prevent skinning keep covered at all times.

Reducer

Thermaguard™ X21 (10 to 60ºC application)
Thermaguard™ S100 (60 to 150ºC application)
Thermaguard™ S200 (150 to 260ºC application)

Clean up

Use Thermaguard™ X21 for cleaning after product use. Ensuring all material is flushed from application equipment.

Packaging

Single component material 5 litter can, 10.80 kg per can

Notes: Please see application guide for further instructions on product use.

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Coating & Curing Schedule

DFT	*Theoretical spreading rate*
100	10 m^2/l
150	6.67 m^2/l

Film thickness information

DFT/WFT	Minimum (µm)	Maximum (µm)
Dry film thickness	*100*	*150*
Wet film thickness	*100*	*150*

Drying & recoating information

Temperature (°C)	Touch dry	Overcoating time (min)	Dry to handle
3	2 hours	10 - 18 hours	38 hours
10	1 hour	4 hours	30 hours
23	0.5 hours	2 hours	24 hours
38	0.25 hour	1 hour	16 hours
130	N/A	N/A	N/A

Notes: The drying times can vary upon different environmental conditions. The coating should be applied within the information supplied to ensure drying & overcoating times are not affected. The product is fully cured from ambient conditions & does **not** require heating to obtain mechanical & corrosion protection. Unlimited overcoat time even after exposure to elevated temperatures; consult Performance Polymers for surface preparation.

Additional Information

Safety precautions

This product is for use only by professional applicators in accordance with information in this Technical Data Sheet (TDS) and the applicable Material Safety Data Sheet (MSDS). Refer to the product MSDS before using this material. All usage of this product must be kept in compliance with local, health, safety & environmental conditions & regulations.

Storage & shelf life

Material should be stored in a dry, shaded environment away from heat & ignition sources. Do not allow material to freeze. Shelf life is minimum 12 months at 23°C.