Thermaguard™ TIC 400

Inorganic Insulation for Elevated Temperatures

Technical Data Sheet rev 06.17 (EN, EU)

Product Description

Thermaguard™ TIC 400 is a new technology waterbased, single component, inorganic polymeric siloxane matrix, Thermal Insulation Coating (TIC). The insulation coating is formulated to provide a seamless, hydrophobic, weather resistant insulation film. The insulation coating is an inorganic & ultra-low VOC coating. Offering hydrophobicity (moisture resistance), operating temperatures from -60 to 400°C range & exceptional weathering resistance.

Thermaguard™ TIC 400 acts as a thermal barrier, which can improve energy efficiency, prevent Corrosion Under Insulation (CUI) occurring, reduce condensation build up & provide personal protection according to ISO 13732-1 (SafeTouch™ properties). Protecting interior temperatures against cold, warm & humid weather conditions. Elimination of external cladding results in a maintenance friendly insulation system for quick inspections.

Thermaguard™ TIC 400 has Ultra-High-Build (UHB) capabilities up to 20000 microns DFT in a single multi-pass application. Application at such thicknesses allows use of Thermaguard™ TIC 400 liquid insulation to partly or completely replace use of traditional insulation material systems.

Intended Applications

Can be applied direct (DTM) or to suitably primed to carbon steel, stainless, aluminum and alloy substrates. Such applications include petrochemical, chemical plants, offshore, power, refining, and generic processing; pipework, steam lines, pressure valves, stacks, chimneys, tanks, heat exchangers, storage facilities and commercial constructions, manufacturing facilities, floating equipment, vessels, barges, roofing etc.

Technical Information

Product chemistry
A waterbased, single component, ambient curing, ultra-high-build inorganic polymeric siloxane matrix.

Colour
White and Light Grey
If specific colors are required for safety or aesthetics, please consult Performance Polymers bv.

Theoretical spreading rate
0.76 m^2/l at 1000µm DFT
0.08 m^2/l at 10000µm DFT

Typical film thickness
10000µm DFT per coat
Total thickness of Thermaguard™ TIC 400 will depend on expected service temperatures.

Specific gravity
Approx. 0.74 g/cm^3

Volume solids
76% ± 2%

VOC
Approx. <1 g/l

Thermal conductivity (λ)
<0.07 W m^{-1} K^{-1}
(per independent lab evaluation)

Temperature resistance
-60 to 400°C

Application methods
Diaphragm airless, hopper gun & trowel
Please consult Application Guideline.

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Surface Preparation

Primed carbon steel (recommended)

Prime with one coat, Thermaguard™ CUI 650, per Technical Data Sheet (TDS) for that material.
In maintenance coating situations, Thermaguard™ CUI 650 may be applied over tightly adhering rust.

Unprimed carbon steel

Thermaguard™ TIC 400 Liquid Insulation may be applied direct to carbon steel surfaces which have been dry abrasive blasted to Sa 2 ½, Near White metal or better, with an anchor profile (R_z) of 75 to 100 microns. Blasted surfaces should be free of salt contamination and flash rust inhibitors should not be used. All sharp edges and rough welds should be rounded off prior to start of abrasive blasting. Apply Thermaguard™ TIC 400 before any visible flash rusting of the prepared surface occurs.

Stainless steel, aluminum, cupronickel and similar alloys

Abrasive sweep using a nonmetallic, chloride-free abrasive (aluminum oxide or garnet are recommended), to achieve an anchor profile of 25 to 50 microns. All sharp edges and rough welds should be rounded off prior to start of abrasive blast preparation.

System Specifications

Ambient temperature application:

2-coat system for carbon steel, (recommended)

1. Thermaguard™ CUI 650 – 125 to 150µm DFT
2. Thermaguard™ TIC 400 – 10000 to 20000µm DFT

Single-coat system for carbon steel DTM, stainless steel, aluminum and alloys

1. Thermaguard™ TIC 400 – 10000 to 20000µm DFT

For ambient temperature application on small diameter pipe or complex shapes, Thermaguard™ TIC 400 may be applied as two coats, 5000 microns DFT per coat, with appropriate dry time between coats.

Hot surface application (substrate temperatures 50 to 220° C):

1. Thermaguard™ TIC 400 – 300 to 500µm DFT
2. Thermaguard™ TIC 400 – 2500 to 5000µm DFT
3. Thermaguard™ TIC 400 – 2500 to 5000µm DFT
4. Thermaguard™ TIC 400 – 2500 to 5000µm DFT (if needed)

During application to hot substrates, use a mist coat application to reduce possibility of defects and to build film evenly.

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Application Conditions

Ambient temperature and material temperature of the Thermaguard TIC 400 during application should be between 10 and 50°C. Substrate temperature should be above 10°C and below 220°C. Substrate temperature must remain 3°C above dew point and relative humidity must remain between 35% and 85% during entire application and dry time. Sufficient air movement over the newly insulated surface improves curing and speeds drying.

Application Equipment

Do not apply Thermaguard™ TIC 400 with piston-pump airless equipment

Double diaphragm pump airless

Pressure: 106 psi / 7 bar
Tip size: #10 to #12
Filters: remove all filters

Hopper/conventional air spray

Atomizing pressure at the tip: 50 psi
Tip size: #4 to 8# orifice

Trowel application

For spot repairs, touch up and for areas less than 1 m^2.

Notes

For further information, please consult the Thermaguard™ TIC 400 Application Guideline.

Mixing

Thermaguard™ TIC 400 is a single component waterbased product. Open only the number of pails which will be immediately used. Immediately re-seal any unneeded pails of Thermaguard™ TIC 400. Mix Thermaguard™ TIC 400 with a mechanical agitator, using slow or reverse speed and a plastic or nonreactive metal squirrel cage mixer as shown in the Application Guideline.

Thinning and Cleanup

Do not thin for application temperatures from 10 to 50°C when applying with pump system, conventional hopper application thinning up to 5% volume can assist application. Clean up with ambient temperature tap water. Dispose of cleanup water in accordance with all local environmental regulations.

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Drying and Recoat Times

(5000 microns DFT)

Temperature (°C)	Touch dry	Overcoating time	Dry to handle
10	6 - 8 hours	24 - 32 hours	36 hours
23	6 - 4 hours	16 - 24 hours	24 hours
38	4 - 2 hours	8 - 16 hours	16 hours
125	N/A	15 - 30 minutes	N/A

(10000 microns DFT)

Temperature (°C)	Touch dry	Overcoating time	Dry to handle
10	10 - 16 hours	24 - 32 hours	48 hours
23	4 - 6 hours	16 - 24 hours	24 - 32 hours
38	2 - 3 hours	6 - 8 hours	24 - 26 hours
125	N/A	30 minutes	N/A

Notes: drying times can vary with different environmental conditions. Thermaguard™ TIC 400 should be applied within the information supplied to ensure drying & overcoating times are not affected. Thermaguard™ TIC 400 has unlimited overcoat time over clean surfaces even after exposure to elevated temperatures.

Packaging

Single component Material
20 liter Pails, 15.6 kg per pail

Storage & shelf life

Thermaguard™ TIC 400 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.

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.

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