SUPERIOR PRODUCTS
EUROPE

-PROJECT REPORT-

RUST GRIP® & SUPER THERM®

ON GASOLINE TANK

Superior Products Europe nv/sa
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EUROPE

Table of Contents

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1. COMPANIES INVOLVED

Client: **Turkmenbashy Oil Processing Complex** Turkmenbashy Turkmenistan	
Distributor Rust Grip® and Super Therm® in Turkmenistan: **Superior Products Vostok, LLC** bldg. 2 11/7 Sormovskiy proezd Moscow, 109444 Russia Represented by: Ruslan Khabibulin	SUPERIOR PRODUCTS VOSTOK
Applicator and coordinator: **VERATON Management LLP** Bld.4-5,6 Shluzovaya Embankment Moscow, 115114 Russia Represented by: Meredov Azat	
Supervision and report by: **Superior Products Europe nv** Kampweg 123 B-2990 Wuustwezel Belgium http://www.specoating.com Represented by: Stefan Rutten	SUPERIOR PRODUCTS EUROPE
Rust Grip® & Super Therm® are produced by: **Superior Products International II** 10835 W. 78 th Street Shawnee, KS 66214 U.S.A. Website: http://www.spicoatings.com	SUPERIOR PRODUCTS INTERNATIONAL, II, INC. MADE IN USA

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2. PROJECT DESCRIPTION & GOAL

In order to reduce evaporation and losses of gasoline from sealed roof storage tanks, a test project was set up by Veraton LLC. The purpose of this pilot test application was to verify the heat accumulation by sun radiation and to show the difference to normal white or aluminum tinted coatings by applying a layer of Super Therm® on the outside surface.

Therefore one gasoline tank, nr.314, was selected by Turkemenbashy Oil Processing Complex.

Superior Products Vostok supported the products and Superior Products Europe was present for training and supervision.

Rust Grip® was applied as primer and Super Therm® as topcoat at the outside walls and roof of the empty storage tank. The inside walls and floor were treated with Rust Grip® to prevent further corrosion by encapsulating the rust. PPG's Amercoat 240 was applied over Rust Grip® on the floor up to +/-1m height of the walls to give additional protection to Rust Grip® against permanent water immersion.

After completion and a curing time of 2 weeks, temperature registration was done to compare the difference to other gasoline tanks.

Aluminum tinted tanks

White coated storage tanks

Super Therm® finished tank

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3. GENERAL INFORMATION

All corrosion protection and insulation protection is performed by the products produced by Superior Products International II, Inc., except for part of the inside lining of the bottom floor.

Rust Grip® is designed to penetrate deep into the pores of any rough surface to make the initial anchor lock. Then, as it absorbs the atmospheric humidity as part of its curing process, it expands and swells into the pores to seal off air and moisture and finally sets up to a 6780psi surface tensile strength within three weeks. The total of all metal surfaces for both interior and exterior from bottom to top, exterior to interior was primed with Rust Grip®. A minimum layer of 125µ DFT was applied outside and inside, except the inside floor received 200µ DFT Rust Grip®.

Super Therm® is coated on the exterior to prevent the metal during summer months from heating. Super Therm® blocks heat load into the metal which is the most important insulation effect that can be achieved. Super Therm® blocks the "initial" heat load from happening into the surface of the substrate and provides full insulation over the complete metal skin, including the support beams.

To achieve a good temperature comparison between the different storage gasoline tanks, we should be aware of the fact that the prescribed thickness of minimum 250µ DFT Super Therm® is respected.

The pilot project began just before winter-time 2012 and was followed up during the visits of SPE for demo and check-up's during:

- 08 – 17 October 2012
- 24 – 30 November 2012
- 19 – 24 December 2012

The coating system on exterior walls and roof consists of Rust Grip® and Super Therm®.

The coating system on interior walls, floor and roof consisted of Rust Grip®. The floor and 1m height of the walls were additionally protected with Amercoat 240 to seal the Rust Grip® against permanent water immersion.

Tank Data

Tank number: 314
Height of tank: 12 m
Diameter inside: 19.54 m
Area floor: 300 m²
Area walls: 737 m²
Total outside surface area: 1111 m²
Total inside surface area: 1381 m²

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4. PILOT PROJECT LOCATION

Turkmenbashy, Turkmenistan

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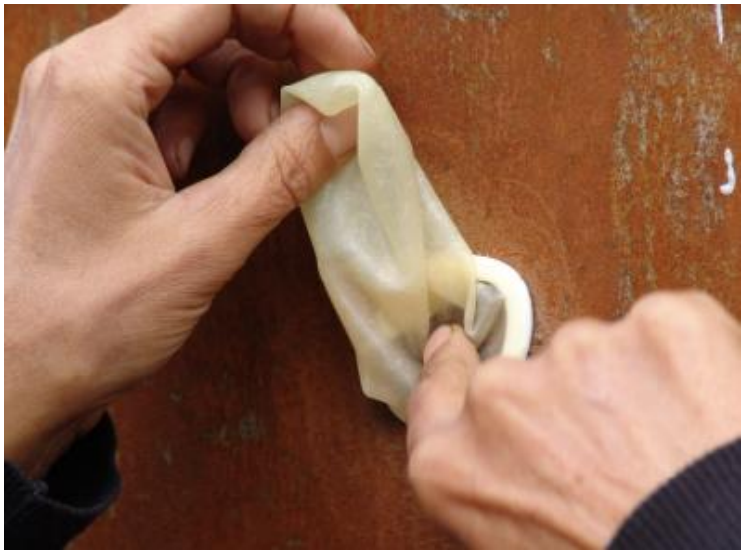
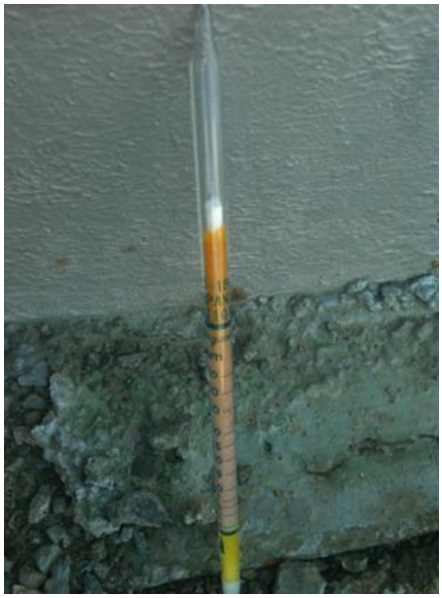
5. DESCRIPTION OF TEST APPLICATION

5.1 OUTSIDE SURFACE APPLICATION

Soluble salt concentrations were taken because the tank is located near the Caspian See and might influence the adhesion of the coating system.





First readings exceeded the max. allowed level. (60 ppm)

We did not have Chlor-rid available to neutralize these salts and could not ship directly. We decided to check the concentration again after the power wash cleaning. The tank was showing very light corrosion on outside surface but the existing used paint contains fish oil as a base for anti-corrosion. This will cause problems for the Rust Grip® to enter into the pores and lock down. See below pictures.

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The coating could easily be scratched off to show the oily film on the metal surface.

The existing old paint had to be removed completely. High water pressure was not sufficient to remove the old coating so it was decided to remove the coating by wet sand blasting. Fresh water was used.

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Removing of the old coating and mill scale by water sand blasting.

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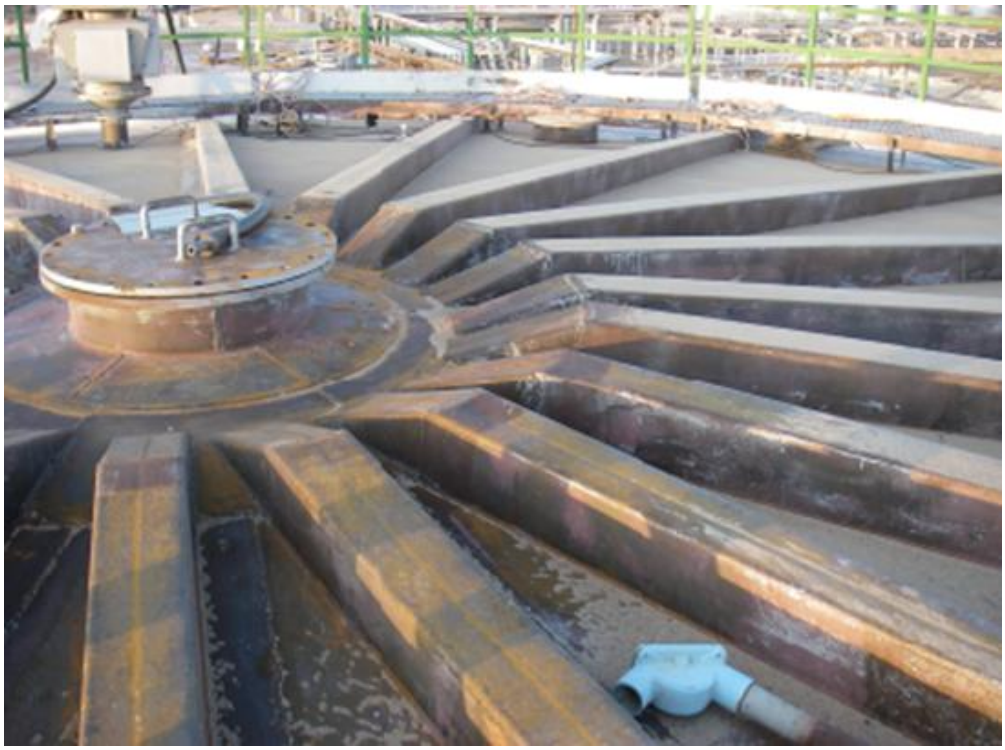
After removing the previous aluminum based coating, the tank was allowed to get flash rust.



Detail on top of the roof after wet sand blast.

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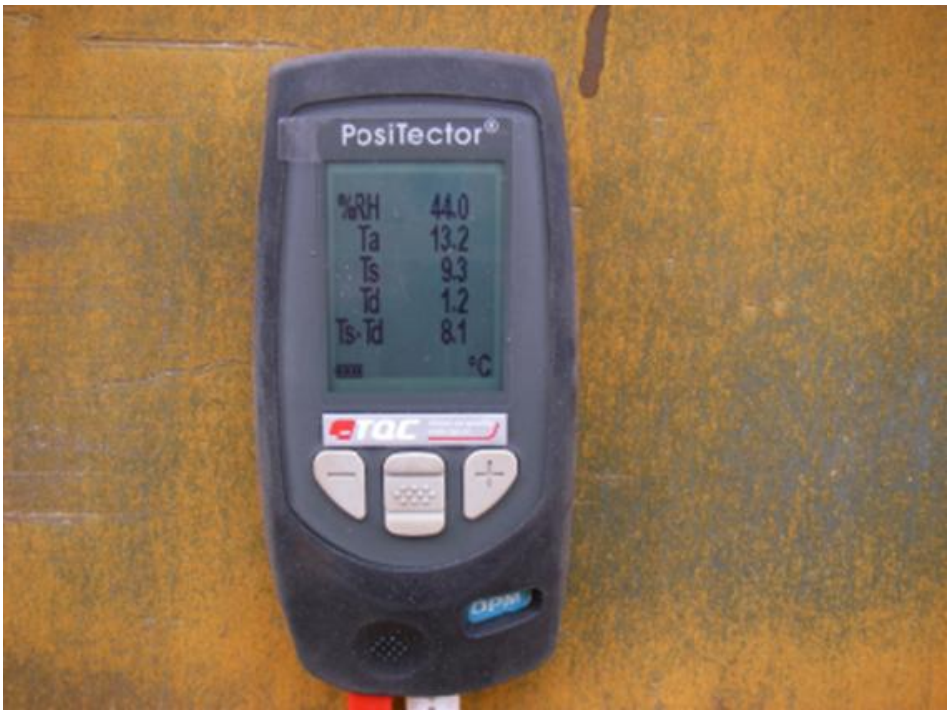
Walls ready for application of Rust Grip® primer.

Soluble salt concentration was measured again. Concentration was dropped to 15 ppm.
Dew point was controlled prior to application. Average of 8°C was registered above the dew point.



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Rust Grip® was applied by roller.
No Acetone was available but the surface was dry and clean.

Application of first layer Rust Grip® at 125µ WFT by roller.

The second coat Rust Grip® must be applied when the first coat is still a little tacky to touch, and not completely dry. We could recoat after about 1½ hours. When colder and less RH, we must wait longer. The second coat Rust Grip® was also applied by roller at same thickness of 125µ WFT.

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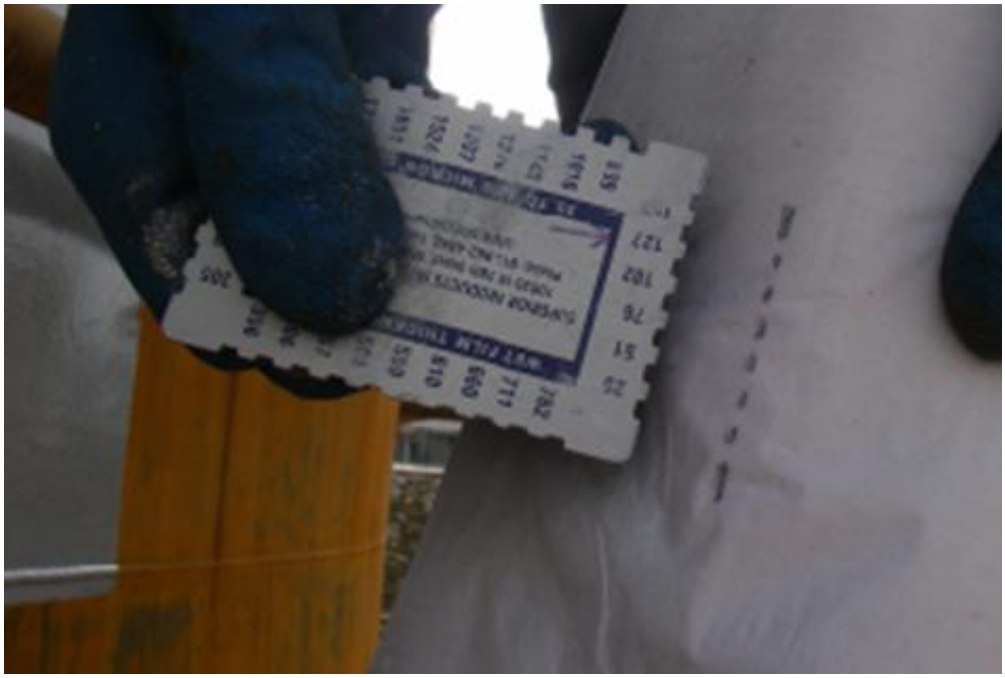
The wet film thickness was checked frequently with a wet film gauge.



Total consumption for the outside surface area were 16 pails of 5 gallon, which gives an average consumption of 69.5 m²/5 gallon Rust Grip®. Average DFT was minimum 125µ.

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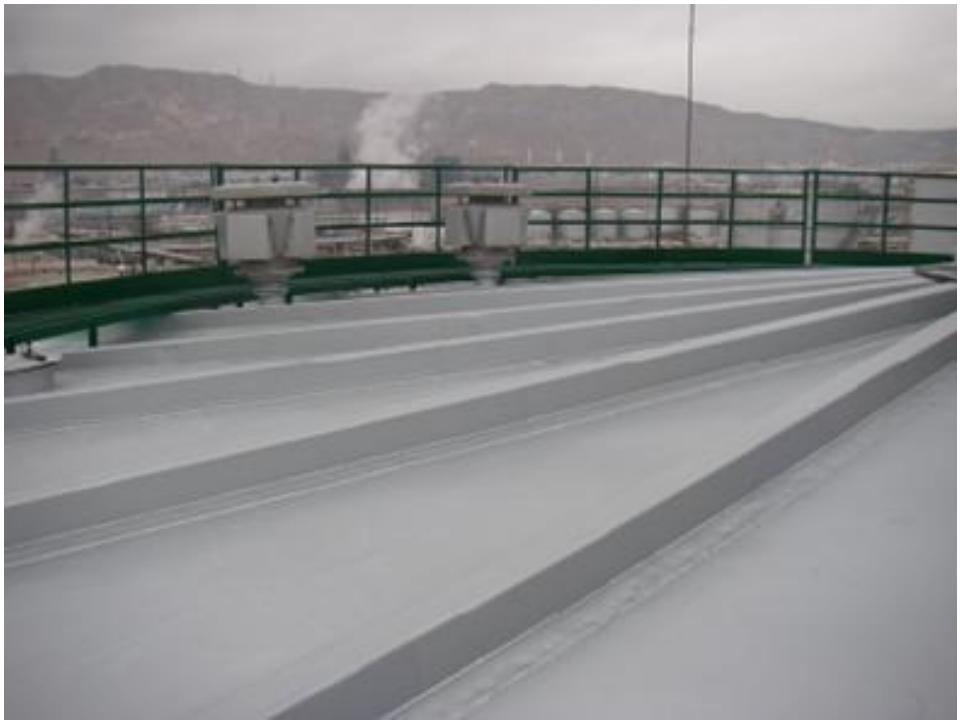
Tank finished with Rust Grip®



Only a couple small spots did have +/- 100 µ DFT and were provided with an additional layer after sanding a little.

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After curing, when the weather was dry and the temperature was at least +5°C above the dew point, (3 weeks later) the application of Super Therm® was started. Super Therm® was mixed before application, no water was added.

A Graco Mark V airless machine was used, tip size 0.031 inch. All filters removed.

Application was done by access ropes.

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In total 2 coats Super Therm® were applied at 200µ WFT each. Spread rate of 90m²/ 5 gallon Super Therm® each coat. Total DFT of 250µ should be obtained after curing. (this could not be controlled by SPE after finishing)

Total consumption for the outside surface area were 25 pails Super Therm® of 5 gallon, which gives an average consumption of 44.4 m²/5 gallon Super Therm®.

Finished tank with Super Therm®

5.2 INSIDE APPLICATION

Inside the tank, no sand blast of the metal was performed, only a mechanical wire brush on the walls to remove the flake rust. The scale rust on the bottom floor was removed by needle gun tool.

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Flake rust corrosion profile on the walls before wire brush.

Cleaning by wire brush.

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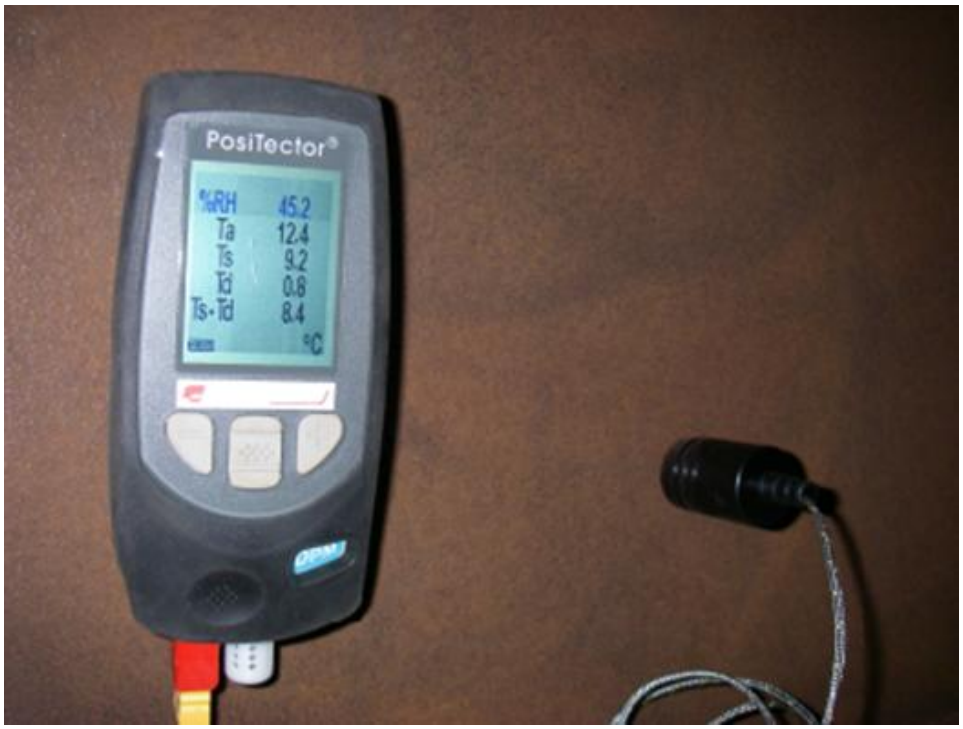
Control of the surface profile inside, average less than 4 mils after removal of flake rust by wire brushing.



Control of the dew point at inside walls, safe to application of Rust Grip®.

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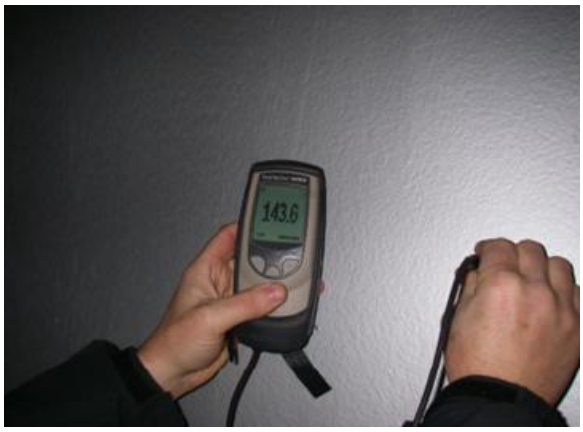
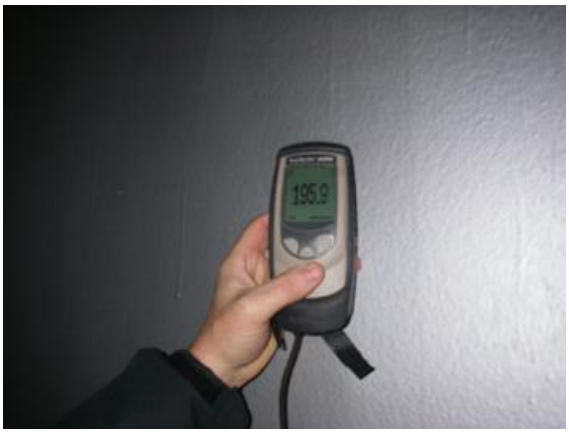
2 coats Rust Grip® were applied by roller, each coat minimum at 125µ WFT on the wall and ceiling. Inside consumption on the side walls and roof of 15 pails of 5 gallon of Rust Grip® were counted, which gives an average consumption of 990m²/15 pails = 66 m²/5 gallon Rust Grip®.





Minimum DFT of 125 µ was easily obtained on all spots.

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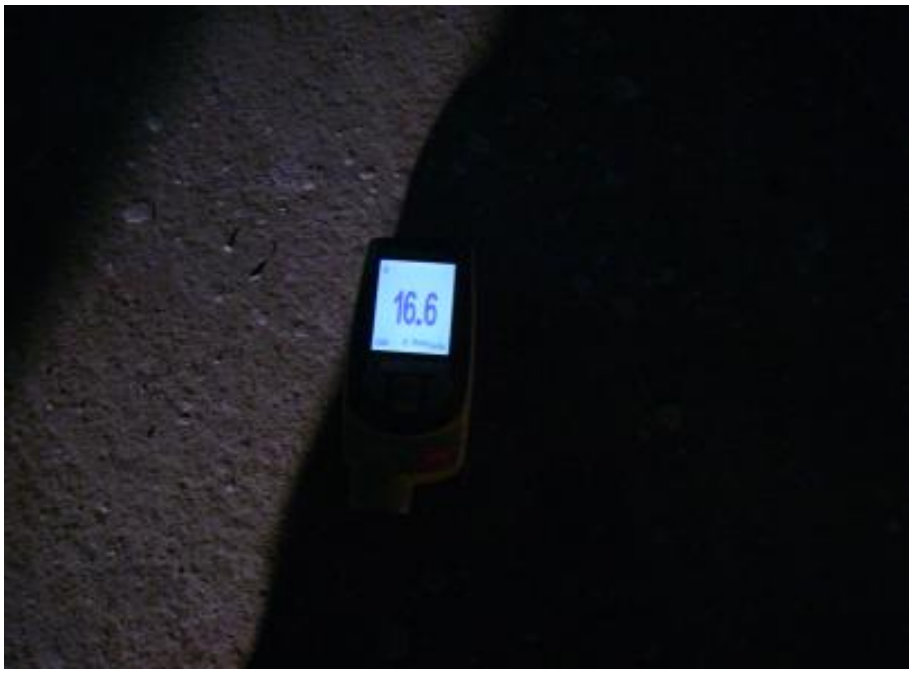
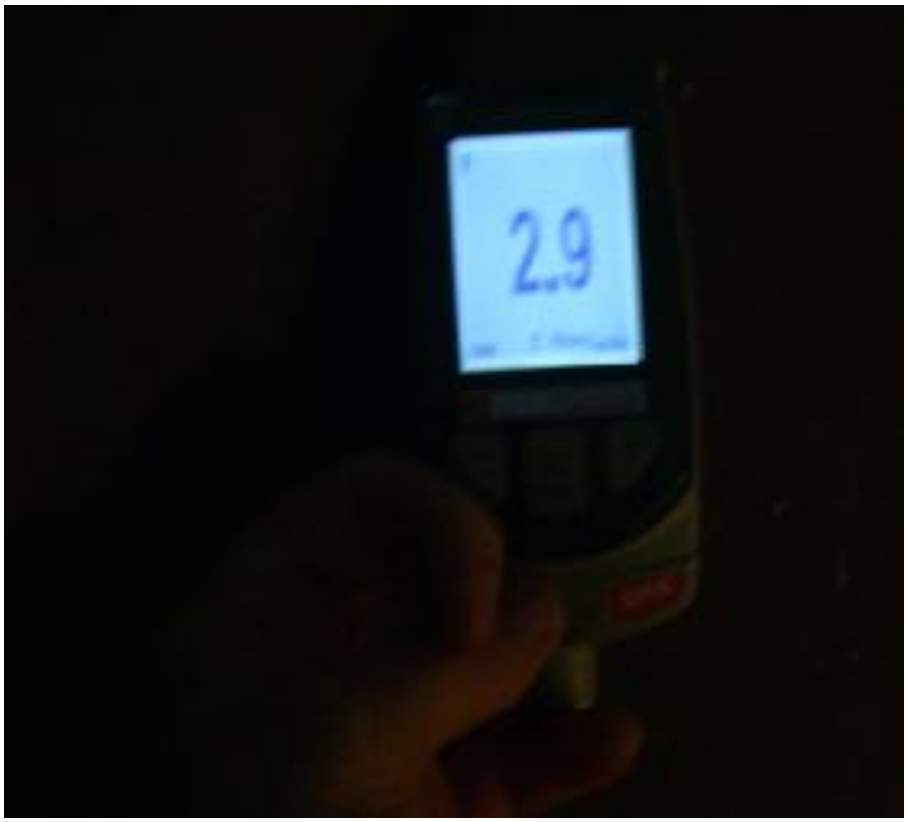


Surface profile before removing the scale rust. Up to 16.6 mils or 420 micron.



Surface profile after removing the scale rust by needle gun.(+/- 75 micron)

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10 pails Rust Grip® were left to do the bottom floor and 1m height of the walls. On the bottom floor 3 thick layers of minimum 125µ WFT were applied, wet in wet, prior to the application of the epoxy coating Amercoat 240.

Total consumption for the bottom floor and 1m height area were 9 pails of 5 gallon Rust Grip®, which gives an average consumption of 391m²/ 9 pails = 43.44m²/ 5 gallon Rust Grip®. This will result in a minimum DFT of 200µ.

Consumption and thickness of the Amercoat 240 epoxy coating is….

6. CONSUMPTION OF SUPER THERM® AND RUST GRIP®

For the application of the tank as described, the consumption of SPI products was:

for the outside: - 16 pails Rust Grip®
- 25 pails Super Therm®

for the inside: - 15 + 9 = 24 pails Rust Grip®

7. WEATHER CONDITIONS AND INFLUENCES

Due to rain and bad weather conditions during this season we had several delays. Rust Grip® and Super Therm® can only be applied on complete dry surfaces. Extra attention was given to measure the dew point. Also, as Super Therm® is water based, during freezing nights some heating was generated in the local stock room to prevent the goods from freezing.

8. TEMPERATURE OBSERVATIONS

Temperature readings were made in January 2013
Outside conditions : sunny , 15°C

Temperature registered on the aluminum painted tank:	27 °C
Temperature registered on the ordinary white painted tank:	23 °C
Temperature registered on the Super Therm® coated tank:	15 °C

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9. CONCLUSION

From the temperature registrations at the outside, we conclude a difference between the Super Therm® coated tank of 45% to the aluminum coated tank. We have a difference of 35% between the Super Therm® tank and the ordinary white coated tank.

Feb-13

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