



Corrosion protective coatings

ESACOTE AC 509



DISCLAIMER

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New binder for WB corrosion protection

ESACOTE AC 509

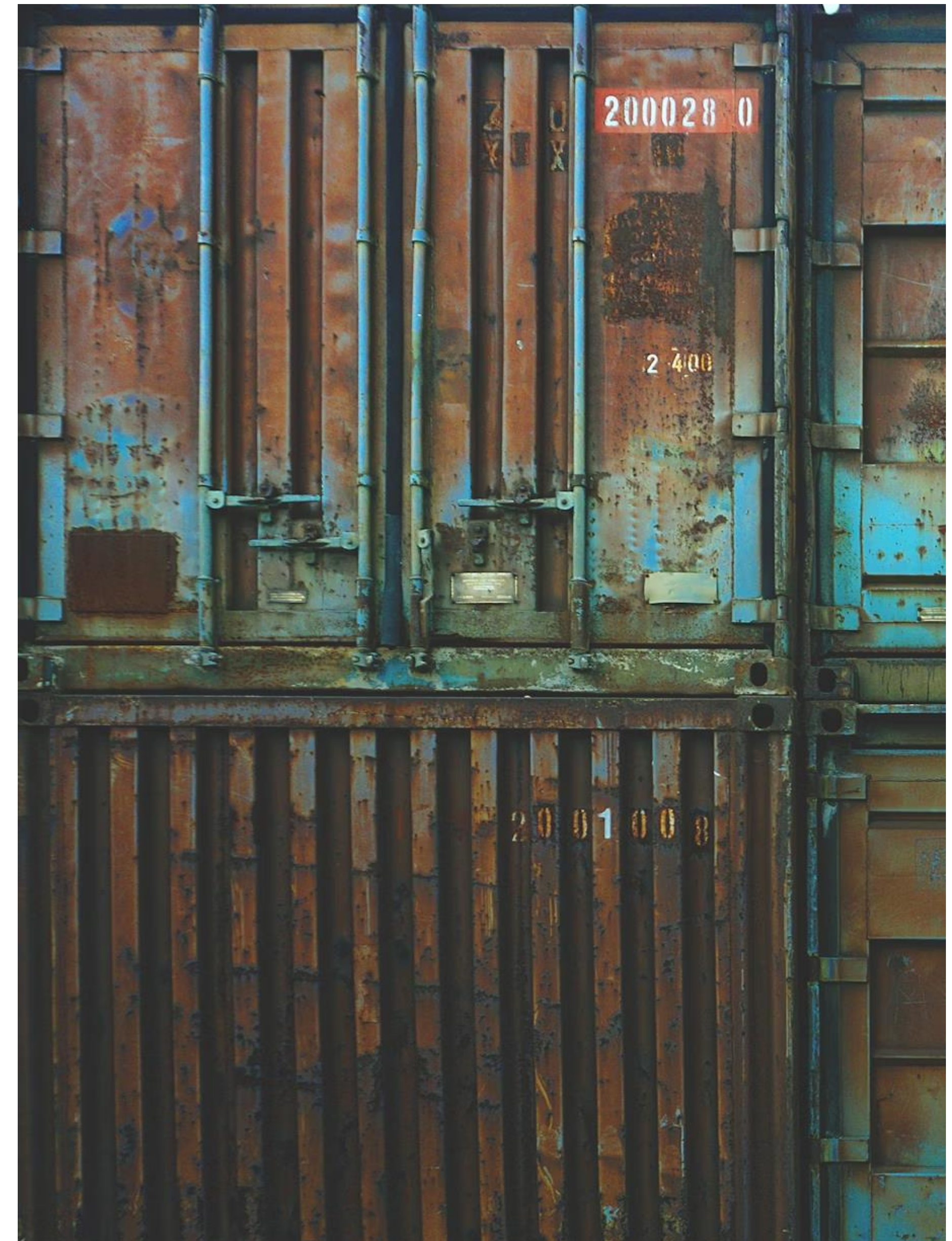
Product properties

| | |
|--|--------------|
| Appearance at 25 °C: | milky liquid |
| pH: | 7,5-8,5 |
| (at 25°C on supplied product, ASTM E 70): | |
| Viscosity (mPa.s): (Brookfield RVT @ 25 °C, 50 rpm spindle 2) | <1000 |
| Solid content, %: | 42.0-44.0 |

Typical values*

| | |
|---------------------------------------|------------------------|
| Solvent content, %: | 0% |
| Minimal film forming temperature, °C: | ~25 |
| Koenig hardness (sec): | ~65 |
| Film aspect: | transparent and glossy |

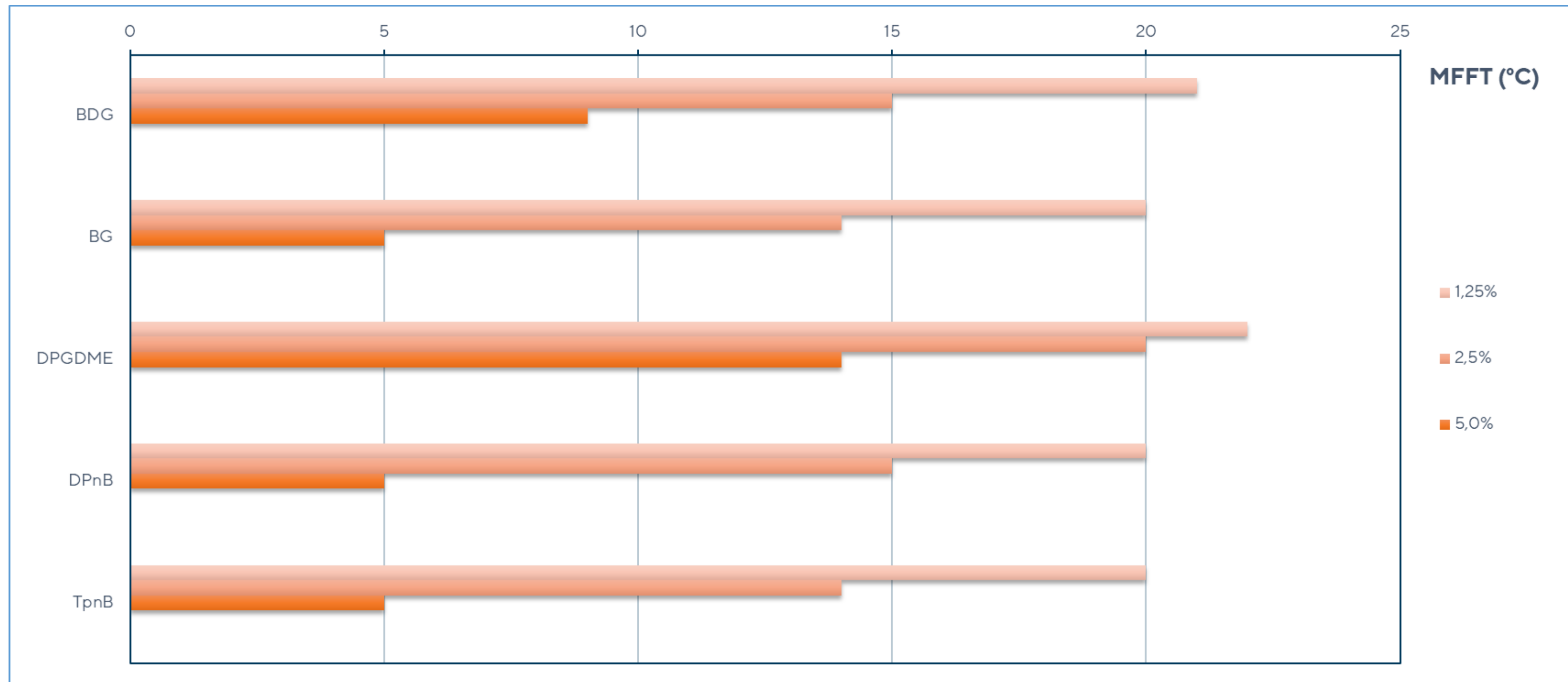
**These values provide general information and are not part of the product specification*





MFFT evaluation

| | 0,0% | 1,25% | 2,5% | 5,0% |
|--------|------|-------|------|------|
| BDG | 25 | 21 | 15 | 9 |
| BG | 25 | 20 | 14 | 5 |
| DPGDME | 25 | 22 | 20 | 14 |
| DPnB | 25 | 20 | 15 | 5 |
| TpnB | 25 | 20 | 14 | 5 |



MFFT evaluation has been performed on pure binder.

Suggested additives

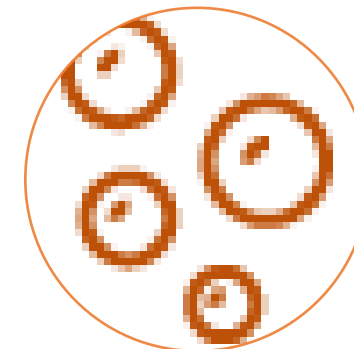
- Butyl glycol
- Butyl diglycol
- DPnB
- TPnB
- DPGDME

Coalescing agents



- Disperbyk 2080
- Tegodisperse 750 W
- Edaplan 490

Dispersing agents



- Ascotran H 10
- AB Rust NFC
- Asconium A 142 DA
- Asconium 500
- Emarust LC 1
- Emarust CL 8
- Nubirox 106

Anti flash rust & anticorrosive agents



- Viscolam PS 010 AIR
- Viscolam PS 102 AIR
- Viscolam PS 170 AIR
- Viscolam PS 202 AIR

Rheology modifiers



Please note that all the listed additives have been tested and proven to be compatible and stable with ESACOTE® AC 509 .

However, not all possible combinations guarantee formulation stability. Therefore, compatibility and stability assessments must be conducted on the final formulation.



White DTM starting formulation #1

| | | Trade name | % w/w |
|--|-------------------------------|--|------------|
| STEP 1: ADD IN ORDER WITH GOOD AGITATION IN MILL BASE TANK | | | |
| A1 | Water | DEMI WATER | 7.14 |
| B1 | Dispersing agent (BYK) | DISPERBYK 2080 | 0.90 |
| C1 | Neutralizer (ANGUS) | AMP 90 | 0.02 |
| D1 | Defoamer(BYK) | BYK 024 | 0.09 |
| E1 | Titanium dioxide (KRONOS) | KRONOS 2190 | 13.62 |
| STEP 2: DISPERSE WITH HIGH SHEAR FOR 10-15' AND ADD UNDER CONSTANT STIRRING | | | |
| F1 | Binder | ESACOTE® AC 509 | 68.70 |
| G1 | Defoamer (BYK) | BYK 024 | 0.14 |
| H1 | Wetting agent (BYK) | BYK 349 | 0.45 |
| I1 | Corrosion inhibitor (ASCOTEC) | ASCONIUM 142 DA | 1.73 |
| I2 | Neutralizer (ANGUS) | AMP 90 | 0.13 |
| I3 | Water | DEMI WATER | 1.73 |
| L1 | Coalescing agent (DOW) | BDG | 2.10 |
| L2 | Water | DEMI WATER | 2.10 |
| M1 | Anti flash rust (ASCOTEC) | ASCOTRAN H-10 | 0.45 |
| N1 | Thickener | VISCOLAM® PS 102 (diluted in water 1:1) | 0.70 |
| Total | | | 100 |

WHITE PASTE

Dose A1 and under stirring add a mix of B1,C1,D1,E1.

Solid Content ≈80%.

Pigment grinding below 10 microns (time 20-30' at 1000-2000 rpm)

On top of white paste, under stirring, add F1, G1,H1, a mix of I1, I2 and I3, a mix of L1 and L2, M1 and N1

After adding all the ingredients, mix for 15' at 1000 rpm

Solid Content ≈ 45.5%.

White DTM starting formulation #1

| PAINT DATA | |
|--------------------------|------------------------|
| PVC | 10.1% |
| PVC/cPVC | 0.18 |
| Gloss (60°) | 85 GU |
| TEST CONDITIONS | |
| Substrate | Cold Rolled Steel Q-36 |
| Test duration (ISO 9227) | 720h |
| Application | 1 layer |
| DFT | 50 μ |
| Dry adhesion | 4B |

Salt Spray Test

168h



336h



720h



White DTM starting formulation #1

| PAINT DATA | |
|--------------------------|------------------------|
| PVC | 10.1% |
| PVC/cPVC | 0.18 |
| Gloss (60°) | |
| TEST CONDITIONS | |
| Substrate | Cold Rolled Steel Q-36 |
| Test duration (ISO 9227) | 720h |
| Application | 1 layer |
| DFT | 100 μ |
| Dry adhesion | 4B |

Salt Spray Test

168h



336h



720h



White DTM starting formulation #1

| PAINT DATA | |
|--------------------------|------------------------|
| PVC | 10.1% |
| PVC/cPVC | 0.18 |
| Gloss (60°) | 79 GU |
| TEST CONDITIONS | |
| Substrate | Cold Rolled Steel Q-36 |
| Test duration (ISO 9227) | 720h |
| Application | 2 layers |
| DFT | 80 + 80 μ |
| Dry adhesion | 5B |

Salt Spray Test

168h



336h



720h



White DTM starting formulation #2

| | | Trade name | % w/w |
|--|----------------------------------|--|------------|
| STEP 1: ADD IN ORDER WITH GOOD AGITATION IN MILL BASE TANK | | | |
| A1 | Water | WATER | 7.00 |
| B1 | Dispersing agent (EVONIK) | TEGODISPERSE 750 W | 1.05 |
| C1 | Defoamer (BYK) | BYK 024 | 0.30 |
| D1 | Neutralizer (ANGUS) | AMP 90 | 0.20 |
| E1 | Titanium dioxide (KRONOS) | KRONOS 2190 | 17.50 |
| DISPERSE WITH HIGH SHEAR FOR 10-15' AND ADD: | | | |
| F1 | Anticorrosive additive (ASCOTEC) | ASCONIUM 500 | 1.0 |
| LET DOWN: MIX UNDER CONSTANT STIRRING: | | | |
| G1 | Binder | ESACOTE® AC 509 | 55.81 |
| H1 | Water | WATER | 13.41 |
| I1 | Defoamer (BYK) | BYK 024 | 0.15 |
| L1 | Coalescing agent (DOW) | DOWANOL DPnB | 2.33 |
| M1 | Anti flash rust (ASCOTEC) | ASCOTRAN H-10 | 0.50 |
| ADD MILL BASE WITH HIGH SHEAR FOR 5-10' - ADJUST VISCOSITY: | | | |
| N1 | Thickener | VISCOLAM® PS 102 (diluted in water 1:1) | 0.75 |
| Total | | | 100 |



White DTM starting formulation #2

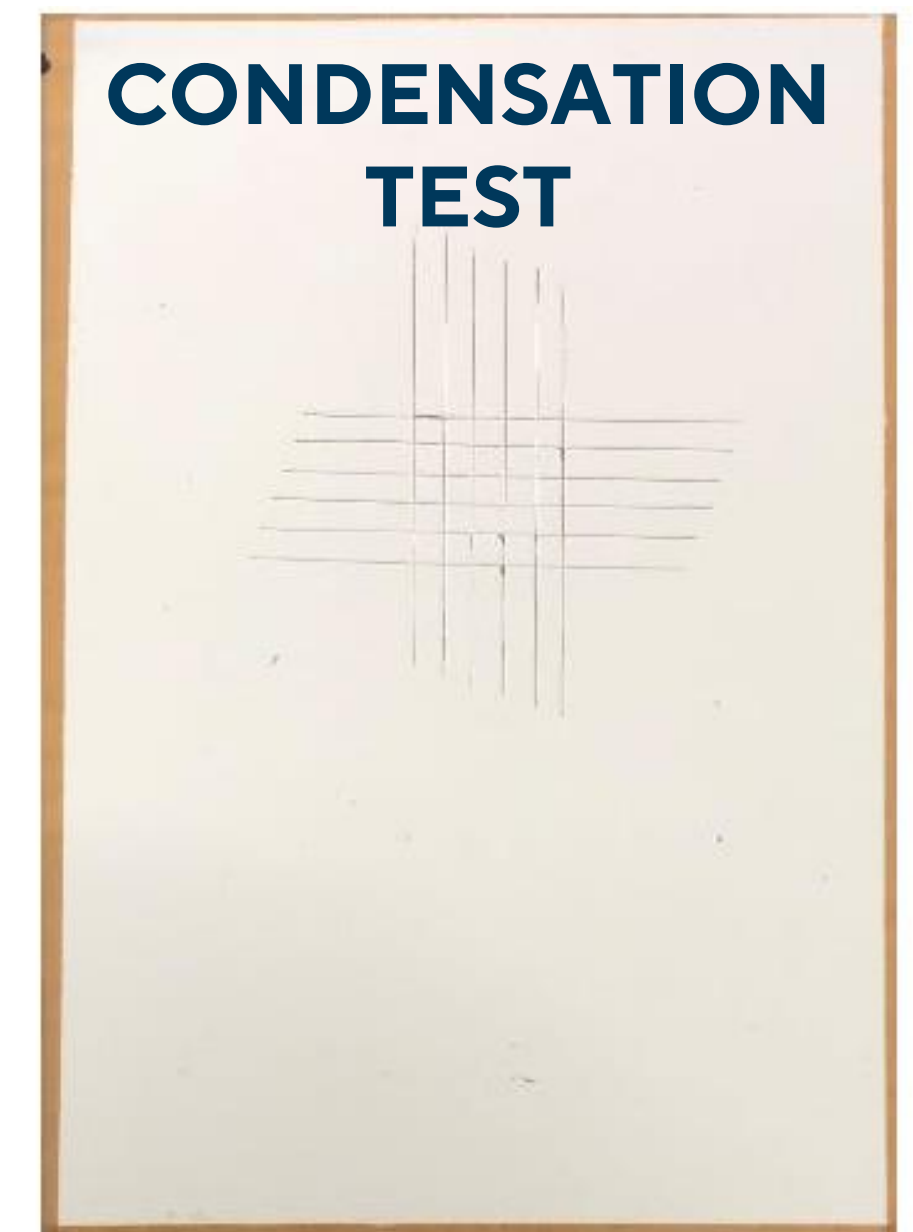
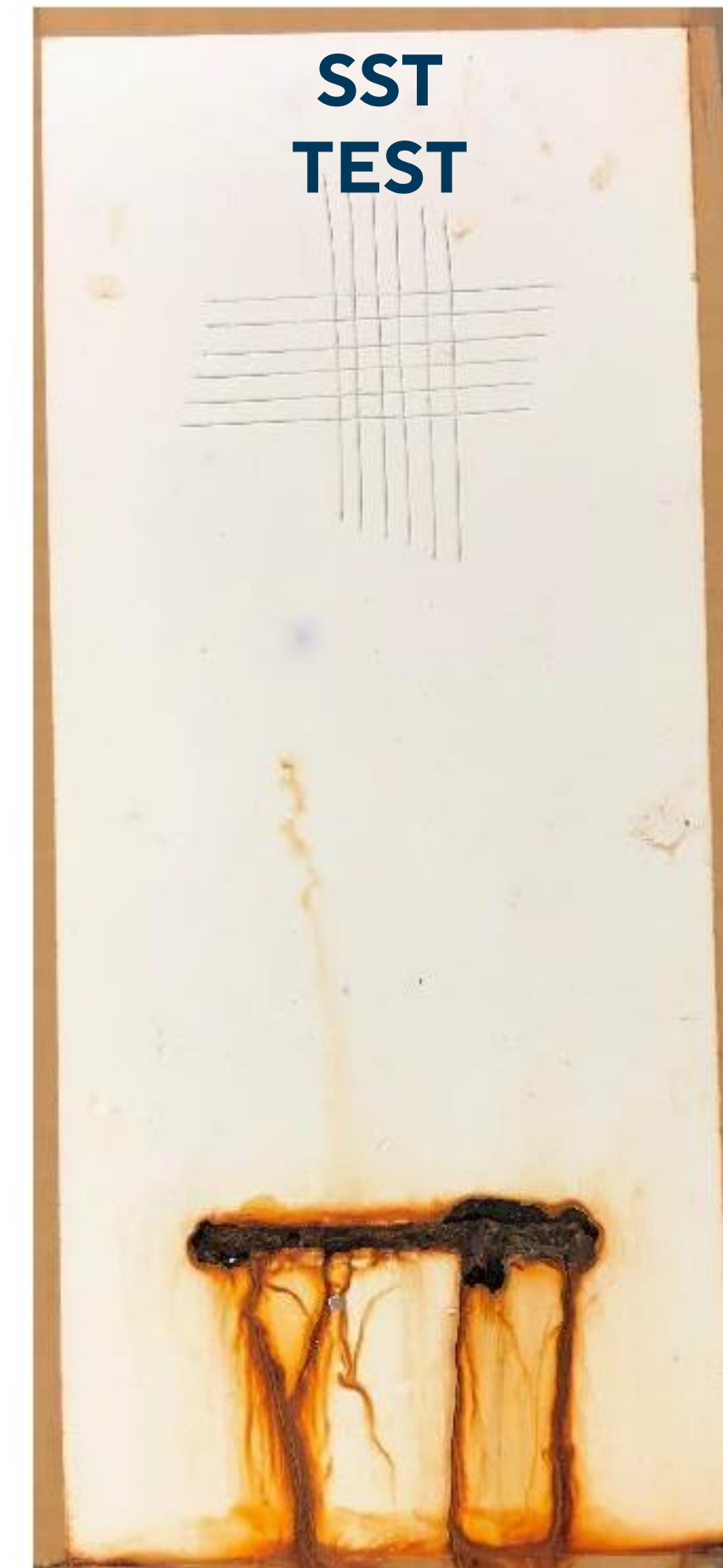
| PAINT DATA | |
|--------------------------------------|-------------------------|
| PVC | 15,7% |
| PVC/cPVC | 0.28 |
| Gloss (60°) | 75 |
| SALT SPRAY TEST RESULTS (ISO-9227) | |
| Blistering (ISO 4628-2) | 0 (S0) |
| Rusting (ISO 4628-3) | Ri0 |
| Corrosion at scribe (ISO 12944) | <1.5mm |
| Adhesion after 7 days (ISO 2409) | 0 |
| CONDENSATION TEST RESULTS (ISO-6270) | |
| Blistering (ISO 4628-2) | 0 (S0) |
| Rusting (ISO 4628-3) | Ri0 |
| Adhesion after 7 days (ISO 2409) | 0 |
| TEST CONDITIONS | |
| Substrate | Sandblasted steel SA2,5 |
| Test duration (ISO 9227) | 720 h |
| Test duration (ISO 6270) | 480 h |
| Application | 1 layer |
| DFT | 90 μ |

CORROSION CLASSES:

- **C3 – VERY HIGH:** urban or light industrial with moderate SO₂ level or process are of high humidity more than 25 years
- **C4 – HIGH:** medium to high corrosion environment for mostly land based structure between 12 and 25 years
- **C5 – MEDIUM:** high to severe conditions environment in land based and coastal structure between 7 and 15 years

White DTM starting formulation #3

| | | Trade name | % w/w |
|--|----------------------------------|--|------------|
| STEP 1: ADD IN ORDER WITH GOOD AGITATION IN MILL BASE TANK | | | |
| A1 | Water | WATER | 7.00 |
| B1 | Dispersing agent (EVONIK) | TEGODISPERSE 750 W | 1.05 |
| C1 | Defoamer (BYK) | BYK 024 | 0.30 |
| D1 | Neutralizer (ANGUS) | AMP 90 | 0.20 |
| E1 | Titanium dioxide (KRONOS) | KRONOS 2190 | 17.50 |
| DISPERSE WITH HIGH SHEAR FOR 10-15' AND ADD: | | | |
| F1 | Anticorrosive additive (ASCOTEC) | ASCONIUM 142 DA | 2.5 |
| LET DOWN: MIX UNDER CONSTANT STIRRING: | | | |
| G1 | Binder | ESACOTE® AC 509 | 55.81 |
| H1 | Water | WATER | 11.91 |
| I1 | Defoamer (BYK) | BYK 024 | 0.15 |
| L1 | Coalescing agent (DOW) | DOWANOL DPnB | 2.33 |
| M1 | Anti flash rust (ASCOTEC) | ASCOTRAN H-10 | 0.50 |
| ADD MILL BASE WITH HIGH SHEAR FOR 5-10' - ADJUST VISCOSITY: | | | |
| N1 | Thickener | VISCOLAM® PS 102 (diluted in water 1:1) | 0.75 |
| Total | | | 100 |



White DTM starting formulation #3

| PAINT DATA | |
|--------------------------------------|-------------------------|
| PVC | 15,7% |
| PVC/cPVC | 0.28 |
| Gloss (60°) | 75 |
| SALT SPRAY TEST RESULTS (ISO-9227) | |
| Blistering (ISO 4628-2) | 0 (S0) |
| Rusting (ISO 4628-3) | Ri0 |
| Corrosion at scribe (ISO 12944) | <1.5mm |
| Adhesion after 7 days (ISO 2409) | 0 |
| CONDENSATION TEST RESULTS (ISO-6270) | |
| Blistering (ISO 4628-2) | 0 (S0) |
| Rusting (ISO 4628-3) | Ri0 |
| Adhesion after 7 days (ISO 2409) | 0 |
| TEST CONDITIONS | |
| Substrate | Sandblasted steel SA2,5 |
| Test duration (ISO 9227) | 720 h |
| Test duration (ISO 6270) | 480 h |
| Application | 1 layer |
| DFT | 90 μ |

CORROSION CLASSES:

- **C3 – VERY HIGH:** urban or light industrial with moderate SO₂ level or process area of high humidity more than 25 years
- **C4 – HIGH:** medium to high corrosion environment for mostly land based structure between 12 and 25 years
- **C5 – MEDIUM:** high to severe conditions environment in land based and coastal structure between 7 and 15 years

White DTM starting formulation #4

| | | Trade name | % w/w |
|---|-----------------------------|-------------------------|------------|
| STEP 1: ADD IN ORDER WITH GOOD AGITATION IN MILL BASE TANK | | | |
| A1 | TiO ₂ dispersion | WHITE PASTE 490 | 21,80 |
| B1 | Binder | ESACOTE AC® 509 | 69,39 |
| C1 | Water | WATER | 0,38 |
| D1 | Defoamer (BYK) | BYK 024 | 0,14 |
| E1 | Wetting agent (BYK) | BYK 349 | 0,35 |
| F1 | Coalescing agent (DOW) | Dowanol DPnB | 2,12 |
| G1 | Water | WATER | 4,10 |
| H1 | Thickener | VISCOLAM® PS 102 | 0,72 |
| I1 | Anti flash rust (Labema) | AB RUST NFC | 1,00 |
| Total | | | 100 |

| TEST CONDITIONS | |
|---------------------------------|--------------|
| Substrate | Q Panel S-36 |
| Test duration (ISO 9227) | 540h |
| Application | 1 layer |
| DFT | 85 μ |

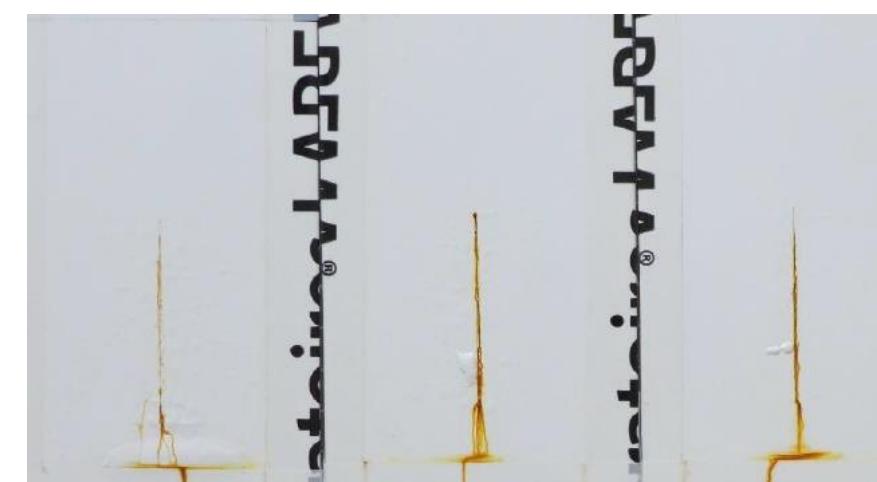
0 hours



74 hours



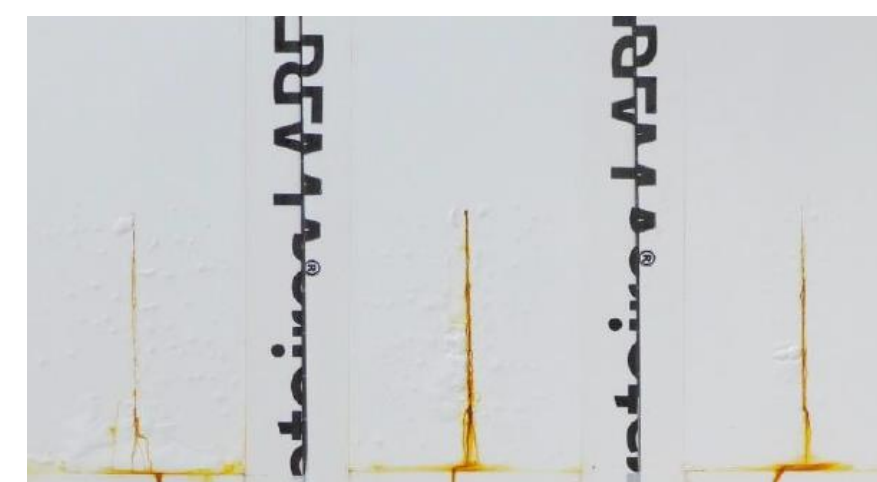
168 hours



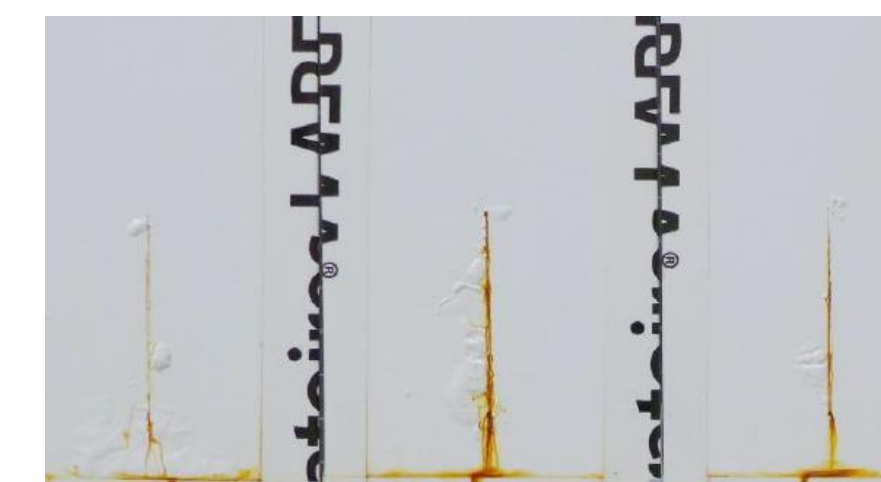
239 hours



332 hours



470 hours



White DTM starting formulation #4

CROSS-CUT ADHESION TEST - EN ISO 2409



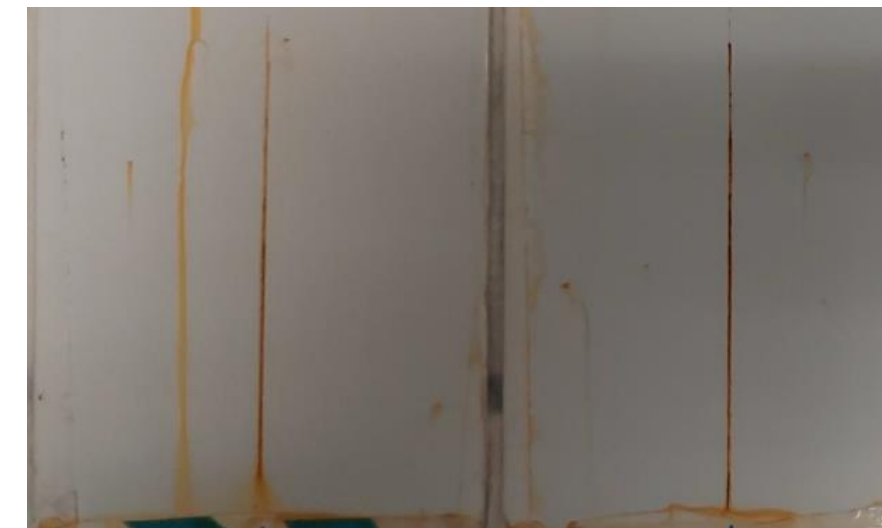
There is no defect on the grid made on the upper part, and the removal of the paint film extends less on either side of the damage on the lower part compared to the other paints.

White DTM starting formulation #5

| | | Trade name | % w/w |
|---|--|-------------------------|------------|
| STEP 1: ADD IN ORDER WITH GOOD AGITATION IN MILL BASE TANK | | | |
| A1 | TiO ₂ dispersion | WHITE PASTE | 22,00 |
| B1 | Anticorrosive pig. (Ferro) | Nubirox 106 | 10,00 |
| C1 | Talc (Imerys) | Steashield 10 | 3,00 |
| D1 | Coalescing agent (DOW) | BDG | 2,50 |
| E1 | Binder | ESACOTE® AC 509 | 60,10 |
| F1 | Thickener | VISCOLAM® PS 102 | 0,70 |
| G1 | Defoaming agent (BYK) | BYK 024 | 0,20 |
| H1 | Wetting agent (BYK) | BYK 349 | 0,50 |
| I1 | Corrosion inhibitor & Anti flash rust (Labema) | EMARUST CL 8 | 1,00 |
| Total | | | 100 |

| TEST CONDITIONS | |
|---------------------------------|---------|
| Substrate | Iron |
| Test duration (ISO 9227) | 750h |
| Application | 1 layer |
| DFT | 50 μ |

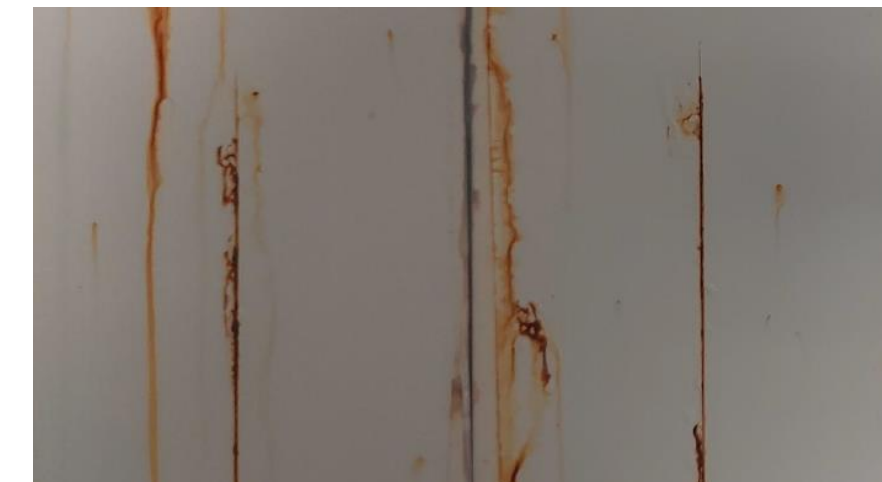
48 hours



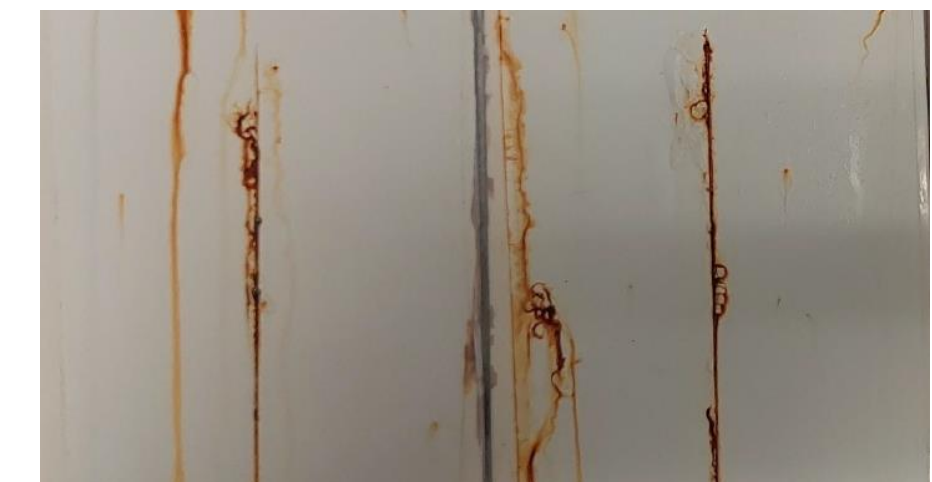
168 hours



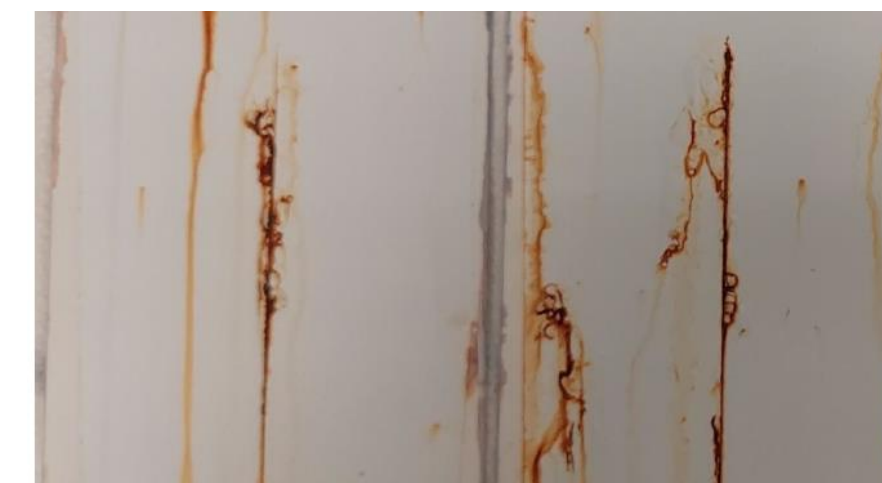
336 hours



504 hours



672 hours



750 hours

