

Resimac Ltd

Engineered Polymer Solutions

530 HA 100 **Hot Steel Corrosion Coating**

Resichem 530 HA100 – Fluid epoxy

Product characteristics....

- Single pack heat activated epoxy novalac
- Activated at temperatures in excess of 100°C
- Applied by spray to hot surfaces
 - Pipework, process vessels, reactors etc
- Dry temperature resistance of 240°C

Chemical composition of the product....

- Low functionality epoxy novalac, 2.15
- Polyamine curatives blended with the novalac
- Hazard Class 8

Application details

- Apply to mechanically abraded, hydroblasted or abrasive blast surfaces
- 2 x 250microns (10mil) is the system recommendation
- Applied by airless spray, product heated to 70°C
- Typical equipment GRACO EXTREME, 3000psi pressure +

Resichem 530 HA100 – Fluid epoxy

Test Data....(In house)

Corrosion Resistance

Tested to ASTM B117

Minimum 1000 hours salt spray resistance.

Cure Times

Cure times are dependent on the cure temperature as indicated in the table below.

Temp Touch dry Light loading

100°C 50 mins 2 hours

110°C 35 mins 70 mins

120°C 25 mins 50 mins

130°C 15 mins 30 mins

140°C 7 mins 15 mins

150°C 3 mins 7 mins

Adhesion

Tensile Shear to ASTM D1002 on abrasive blasted mild steel with 75 micron profile and cured at 120°C.
197 kg/cm² (2800 psi)

Hardness

Shore D to ASTM D2240

20°C 90

100°C 86

150°C 80

200°C 72

Mechanical Properties

Adhesion

Tensile Shear to ASTM

D1002 on abrasive blasted mild steel with 75 micron profile and cured at 120°C.
197 kg/cm² (2800 psi)

Resichem 530 HA100 – Fluid epoxy

Test Data.... (Doosan Babcock/ Chevron

- Chevron Texaco looking at HA100 for subsea pipeline, high temp riser protection
- Product applied on site at DOOSAN BABCOCK in prep for bend tests
- 2 x 350 microns applied, cured at 150°C



Resichem 530 HA100 – Fluid epoxy

Test Data.... (Doosan Babcock)

- Product tested on test rig, PASSED bend test set at 20%



Resichem 530 HA100 – Fluid epoxy

Test Data.... (Doosan Babcock)

- Follow on testing approved by Chevron
- Samples at ELEMENT – product passed all tests
- Cathodic disbondment testing 28 days - 20°C, ISO 21809
- Peel test ISO 21809, Water Immersion Test



Resichem 530 HA100 – Fluid epoxy

Test Data....Plascoat Systems – Corrib Pipeline- Shell

- On site trial performed by COATSOL
- System used is HA100 with flame sprayed PP from PLASCOAT
- HA100 used as the primer layer
- PP Flock sprayed onto wet film
- Heated to 150°C to cure HA100 and to fuse the PP
- Cathodic Disbondment test performed at PLASCOAT Labs

Test Results

Test Sample	Required Performance	Test Result
Sample 1	≤7 mm	<1 mm
Sample 2	≤7 mm	<1 mm
Sample 3	≤7 mm	<1 mm

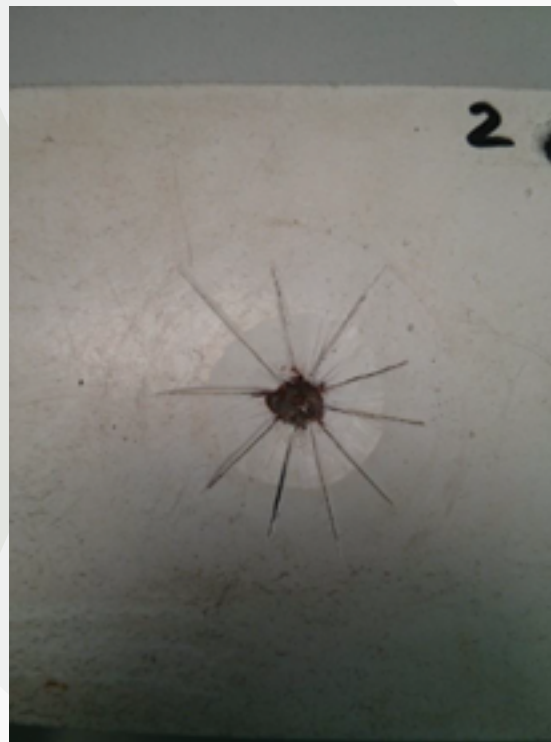
Conclusion

When tested in accordance with ISO21809 Part 1, Resimac HA100 has been found to have an average radius of Cathodic Disbondment of <1mm. This result exceeds the requirements for the standard.

Resichem 530 HA100 – Fluid epoxy

Test Data....Plascoat Systems – Corrib Pipeline- Shell

- Photos of CD testing for Corrib Pipeline



Resichem 530 HA100 – Fluid epoxy

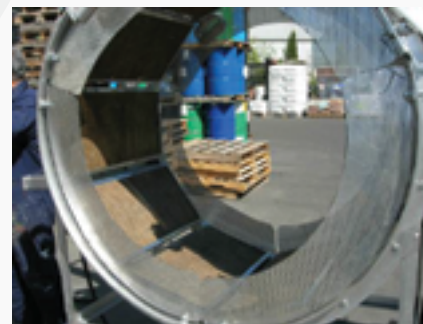
Test Data....Plascoat Systems– Corrib Pipeline- Shell

Cathodic Disbondment	28 days @ 90°C CAN/CSA-Z245.20	<5mm radial
Adhesion after hot water soak 28 days @ 80°C	CAN/CSA-Z245.20	Class 1
Peel Strength @ 23°C (over Novalac)	ISO 2180-39: Annex D	>12 N/mm
Peel Strength @ 90°C (over Novalac)	ISO 21809-3: Annex D	>5 N/mm
Hardness @ 25°C	ASTM D-2240 Shore D	>60
Flexibility @ 0°C	CAN/CSA-Z245.20	No cracks @ 3°C PDD
Impact resistance @ 23°C	DIN 30670	>20 Joules
Tensile Elongation (at break) of topcoat @ 25°C (after flame spraying)	ASTM D-638	10%
Taber Abrasion topcoat	ASTM D-4060/84, H18 500Gm load 1000 cycles 55 mg weight loss	

Resichem 530 HA100 – Fluid epoxy

Field Qualification...Plascoat Systems – Coatsol – South America

- On site trial performed by COATSOL
- System used is HA100 with flame sprayed PP from PLASCOAT
- HA100 used as the primer layer
- PP Flock sprayed onto wet film
- Heated to 150°C to cure HA100 and to fuse the PP
- Cathodic Disbondment test being performed at PLASCOAT Labs



Resichem 530 HA100 – Fluid epoxy

Test Data.... BSRRamco – External Pipecoating

- Pipe coating mill looking to use HA100/ HA80 as external pipe coating
- Use as part of a 3 layer system PP
- Use as a primer for insulation

Seawater Immersion Test in accordance with ISO 20340 using the method described in ISO 2812- 2 (to include full test report). Two versions of the product to be tested. Details to be discussed:

- HA70
- HA100

Please note that if a document/test is not referenced in this offer then it is not applicable to Tata Steel's scope of work and will not be a contractual requirement of any Order placed.

Resichem 530 HA100 – Fluid epoxy

Advantages over existing coating systems

- Single pack heat activated epoxy novalac
- High temperature resistance up to 240°C
- Compatible with a range of existing 2/3 layer systems
- Excellent CD resistance
- Simple to apply for pipe mills of in field coating
- High build coating, 200-300 microns per coat
- Fast curing at elevated temperatures
- Based on existing epoxy coating technology
- Cured coating has good flexibility on blast cleaned surfaces
- Will fuse with 3 layer systems for increased inter layer adhesion