



**INSTITUTE OF CHEMICAL TECHNOLOGY**

**रसायन तंत्रज्ञान संस्था**

Deemed to be University under Section-3 of UGC Act 1956

Elite Status & Centre of Excellence - Government of Maharashtra



ICT/PSE/PAMNo. 4888

Date: February 4, 2019.

Dr. P. A. Mahanwar  
Professor and Head,  
Department of Polymer and Surface Engineering,

To,  
M/s Dooall Corporation ( India) Pvt. Ltd.,  
J67 MIDC Talaja,  
Dist : Raigad, Maharashtra 410208

Subject: Test Report

Respected Sir,

This is with reference to you letter dated October 23 , 2018 regarding the Testing of your coating system Modpoxy ST sample ( 1 No.) . The sample submitted is examined and report is enclosed.

Thanking you,

Yours sincerely,

(Dr. P. A. Mahanwar)

Prof. P.A. Mahanwar

Professor of Polymer Technology

Head, Department of Polymer and Surface Engineering

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Date: February 4, 2019.

**TEST REPORT**

The sample of "Modpoxy ST ( Nano Modified, surface Tolerent, high build epoxy) (1 No)" drawn and supplied by M/s M/s Dooall Corporation ( India) Pvt. Ltd., J67 MIDC Taloja, Dist : Raigad, Maharashtra 410208 is analyzed for its various properties and observations are as follows:

**Sample Identification** : Modpoxy ST ( Nano Modified, surface Tolerent, high build epoxy) .  
**Test Panel preparation** : Two coats of Modpoxy with 150 micron per coat) .  
**DFT of test panels** : 300-310 microns microns

**1. Test Parameter: Pull off Adhesion (-Pre Exposure)**

**Test Method followed** : ISO 4624 Pull Off Adhesion (Pre Exposure)  
**Date of Testing** : 15-1-19  
**Panel ID** : 10F  
**Observations** :  
**Pull Off Value** : 5.1 MPa  
**Failure Mode** : 0% A/B, 0-10% B, 90-100% C  
**ISO 12944 Sect 6.3 Requirement** : No adhesion break to the substrate (0% A/B) allowed (unless the pull of values are 5.0 MPa or more)

**2. Test Parameter : Water Condensation**

3.

**Test Method followed** : ISO 6270 Water Condensation  
**Date of Testing** : Start Date:15-12-18  
 End Date: 27-1-12019  
 Duration – 1000 hours

Test Panel ID	10D	11D	12D	ISO 12944-6 Sect 6.4 Requirements	System meets ISO 12944-6 Requirements
Assessment after test					
ISO 4628-2 Blistering	0(S0)	0(S0)	0(S0)	0(S0)	Yes
ISO 4628-3 Rusting	Ri 0	Ri 0	Ri0	Ri 0	Yes
ISO 4628-4 Cracking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4628-5 Flaking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4624 Pull Off Value	5.8 MPa	5.1 MPa	6.4 MPa		
ISO 4624 Failure Mode	0%A/B 100%C	0%A/B 0-15%B/C 85-100%C	0%A/B 0- 5% B/C 95-100% C	0% A/B (Unless Pull Off Value is 5MPa or more	Yes

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4. Test Parameter : Salt Fog  
Test Method followed : ISO 7253 Salt Fog  
Date of Testing : Start Date:3-11-19  
End Date:27-1-19  
Duration ~2000 hours

Test Panel ID	10E	11E	12E	ISO 12944-6 Sect.6.4 Requirements	System meets ISO 12944-6 Requirements
Assessment after test					
ISO4628-2 Blistering	0 (S0)	0 (S0)	0 (S0)	0(S0)	Yes
ISO 4628-3 Rusting	Ri 0	Ri 0	Ri 0	Ri 0	Yes
ISO 4628-4 Cracking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4628-5 Flaking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4624 Pull Off Value	6.3 MPa	6.8 MPa	6.4 MPa		
ISO 4624 Failure Mode	0% A/B 0-60% B 20-60% B/C 10-70% Y	0% A/B 0-50% B 0-60 B/C 20-95% Y	0-5% A/B 0-40% B 5-30% B/C 40-95% Y	0% A/B (Unless Pull Off Value is 5MPa or more)	yes
ISO 7253 A 2 Corrosion	0 mm	0 mm	0mm	< 1mm	yes

5. Test Parameter : Chemical Resistance  
Test Method followed : ISO 2812-1 Chemical Resistance  
Chemical Used : 10% Sodium Hydroxide (NaOH)  
Date of Testing : Start Date: 19-1-19  
End Date:27-1-19  
Duration:168 hours

Test Panel ID	10A	11A	12A	ISO 12944-6 Sect.6.4 Requirements	System meets ISO 12944-6 Requirements
Assessment after test					
ISO 4628-2 Blistering	0 (S0)	0 (S0)	0 (S0)	0 (S0)	YES
ISO 4628-3 Rusting	Ri 0	Ri 0	Ri 0	Ri 0	Yes
ISO 4628-4 Cracking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	
ISO 4628-5 Flaking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	
ISO 4624 Pull Off Value	3.5 MPa	5.8 MPa	4.6 MPa	0% A/B (Unless Pull Value is 5MPa or more)	
ISO 4624 Failure Mode	0% A/B 100% C	0% A/B 100% C	0% A/B 100% C		yes

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5. **Test Parameter** : **Chemical Resistance**  
 Test Method followed : ISO 2812-1 Chemical Resistance  
 Chemical Used : 10% Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>)  
 Date of Testing : Start Date: 19-1-19  
 End Date: 27-1-19  
 Duration: 168 hours

Test Panel ID	10B	11B	12B	ISO 12944-6 Sect.6.4 Requirements*	System meets ISO 12944-6 Requirements
Assessment after test					
ISO 4628-2 Blistering	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4628-3 Rusting	Ri 0	Ri 0	Ri 0	Ri 0	yes
ISO 4628-4 Cracking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4628-5 Flaking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4624 pull off value	4.8 MPa	5.9 MPa	4.8 MPa		
ISO 4624 Failure Mode	0% A/B 0-5% B/C 95-100% C	0% A/B 0-20% B/C 80-100% C	0% A/B 0-10% B/C 90-100% C	0% A/B (Unless Pull Off Value is 5MPa Or More)	Yes

6. **Test Parameter** : **Chemical Resistance**  
 Test Method followed : ISO 2812-1 Chemical Resistance  
 Chemical Used : Mineral Spirits  
 Date of Testing : Start Date: 19-1-19  
 End Date: 27-1-19  
 Duration: 168 hours

Test Panel ID	10C	11C	12C	ISO 12944-6 Sect.6.4 Requirements*	System meets ISO 12944-6 Requirements
Assessment after test					
ISO 4628-2 Blistering	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4628-3 Rusting	Ri 0	Ri 0	Ri 0	Ri 0	Yes
ISO 4628-4 Cracking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4628-5 Flaking	0 (S0)	0 (S0)	0 (S0)	0 (S0)	Yes
ISO 4624 Pull Off Value	6.3 MPa	7.4MPa	5.5 MPa		
ISO 4624 Failure Mode	0% A/B 10-30% B/C 70-90% C	0%A/B 10-95%B/C 5-90%C	0%A/B 10-90%B/C 10-80%C 0-10%Y	0% A/B (Unless Pull Off Value is 5MPa Or More)	yes

\*Note:  
 ISO 12944-6 section 6.1: "Only one of the three test panels shall be allowed not to completely comply with the requirements specified in 6.3 and 6.4."

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 GSTIN : 27AAATH4951JZG956



7. Test Parameter	:	Adhesion :
Test Method followed	:	ISO 4624 Adhesion
Observations	:	
Adhesive	:	2 Component epoxy,
Adhesive Cure Time	:	24 hours,
Tester	:	DeFelskoPosiTest, Cutting Tool:24mm hole saw,

Reported results are the average of 6 pulls for the condensation and salt spray tests and the average of three pulls for the chemical resistance tests.

Failures	:	
A/B	:	Adhesive break at the substrate
B	:	Cohesive break within the 1 <sup>st</sup> coat,
B/C	:	Adhesive break between the 1 <sup>st</sup> and 2 <sup>nd</sup> coats,
C	:	Cohesive break within the 2 <sup>nd</sup> coat.
Y	:	Cohesive break within the adhesive

(Dr. P. A. Mahanwar)

**Note:** \* The above observations are valid only for the material supplied and the material from corresponding batches.

- One sealed sample was supplied where the sampling carried out by the party.
- The report should NOT be used for advertisement or any legal matter.

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