



भारतीय प्रौद्योगिकी संस्थान दिल्ली INDIAN INSTITUTE OF TECHNOLOGY DELHI

Department of Materials Science & Engineering

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Dr. Suresh Neelakantan

Associate Professor

Test Report

31 January 2024

Mr. Ankur
M/s. PRA Panels Pvt., Ltd.,
Near Udyog Bhavan, 1st Floor,
PRA House, Telibandha,
Raipur, Chhattisgarh.

Ref: No.: Your Email dated 21/09/2023

Sample Received: 14/11/2023, Testing Dates: 15th Nov. to 17th Jan 2024

Product Detail: Paint Coated ACP Sample

Test No.	Colour	Sample Type	Size and Qty of Sample
Test-01	Blue	ACP	1 x 1 Size, 2 Pieces

Subject: - Report on the testing of paint coated ACP sample

Dear Sir,

Find herewith the test report for the testing of paint coated ACP Sample. Further details along with photographs are enclosed.

Results:

TEST 01 - BLUE				
#	Description	Standard Test	Acceptable Value Unit	Result
A. Physical Properties				
1.	Panel thickness of ACM	Visual Check/Measurement as per QAP	mm	3 mm
2.	Panel weight (ACM)	Visual Check/Measurement as per QAP	Kg/m ²	4.23 Kg/m ²
3.	Panel Density	D 1505	g/cm ³	1.376
4.	Polyethylene Core Density	Visual	g/cm ³	1.052
5.	Bond Integrity (peel strength)	D 903	N/mm	6.49 N /25mm
6.	Tensile Strength	D 882	MPa	41.9
7.	Yield Strength	D 882	MPa	36.9
8.	Elongation	D 882	%	15.0%
9.	Flexural Strength	D 790	MPa	116.2
10.	Water Absorption	D 570	%	0%
11.	Thermal expansion	D 696	Mm/M/°C	0
B. Properties of Aluminum Skin				
1.	Skin Thickness	Visual Check/Measurement as per QAP	mm	0.28 mm



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2.	Tensile Strength	D882	MPa	170.9
3.	Yield Strength	D882	MPa	150
4.	Elongation	D882	$A_{50} \geq 2\%$	5.85%
5.	Elastic Modulus	D882	> 68000 MPa	72500 MPa
C.	Paint Finish and Test Properties			
1.	Coating Type	Using FTIR (instrument) or chemical method	LUMIFLON – Fluoro Ethylene Alkyl Vinyl Ether PVDF Kynar 500 (70:30) – Polyvinylidenefluorid	FEVE
2.	D.F.T. (Dry Film Thickness) of paint	ASTM D 1400 or ECCA T1	23.75 Micron to 45 Micron	34.3 μm
3.	Specular Gloss	ASTM D523 or ECCA T2	Solid Colors 25-40% Metallic colors 20-35%	60%
4.	Formability (T-Bend)	D 4145	Visual	T – No damage
5.	Reverse Impact, 27 Joules	D 2794	Visual	No damage
6A	Cross Hatch	D3359	Visual	No damage
6B	Cross Hatch after 120 °C	D3359	Visual	No damage
7.	Hardness- Pencil	D 3363	Visual	2H
8.	Impact test	ASTM D 2794	Visual	9.1 KJ/m ²
9.	Chemical resistance : 10% HCL. 15 min	AAMA 2605	Visual	No damage visible
10.	Chemical resistance : 10% H ₂ SO ₄ 18 hrs	AAMA 2605	Visual	No damage visible
11.	Chemical resistance : 10% NaOH : 1hrs	AAMA 2605	Visual	No damage visible
12.	Chemical resistance : 10% HNO ₃ 30min	AAMA 2605	Visual	No damage visible
13.	Chemical resistance : Detergent : 24 hrs	AAMA 2605	Visual	No damage visible
14.	Colour Change(1000 h)	D 2244	AE	0.81 Units
15.	% Loss in gloss (1000h)	D 523	%	5.4%
16.	Chalking (1000h)	D 4214	Visual	No Chalking
17.	Salt Spray (1000h)	B 117	Visual	2.1% Gloss loss
18.	Humidity (1000h)	D 2247	Visual	4.9% Gloss loss
19.	Mortar Pat Test	AAMA 2605	Visual	No damage visible

All results reported here pertain only to the samples submitted to us.

(Dr. Suresh Neelakantan)

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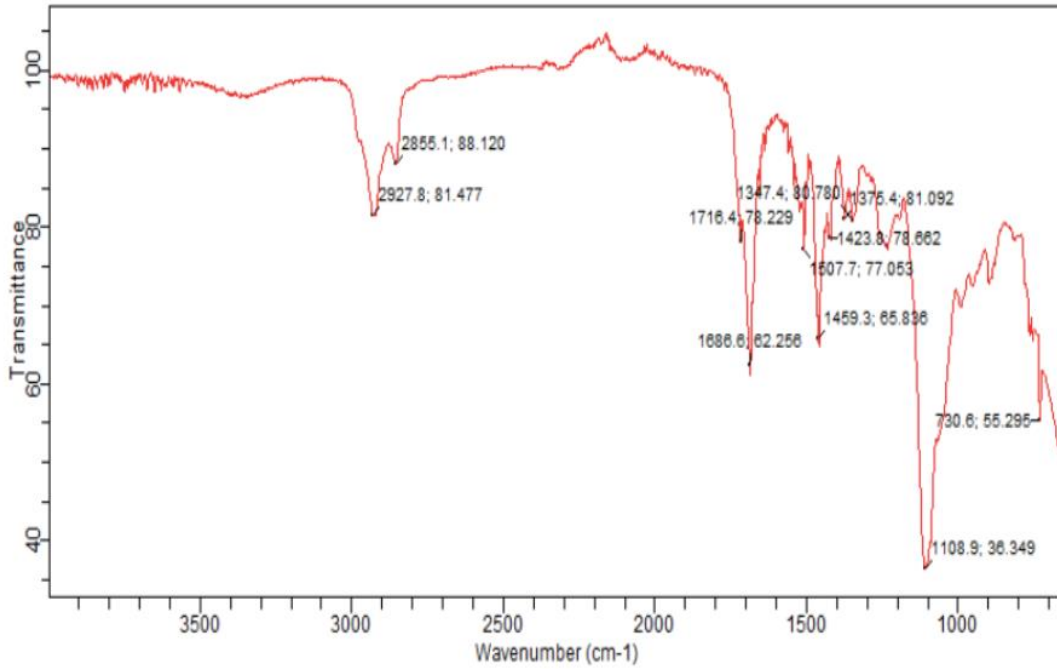
(Dr. Jayant Jain)

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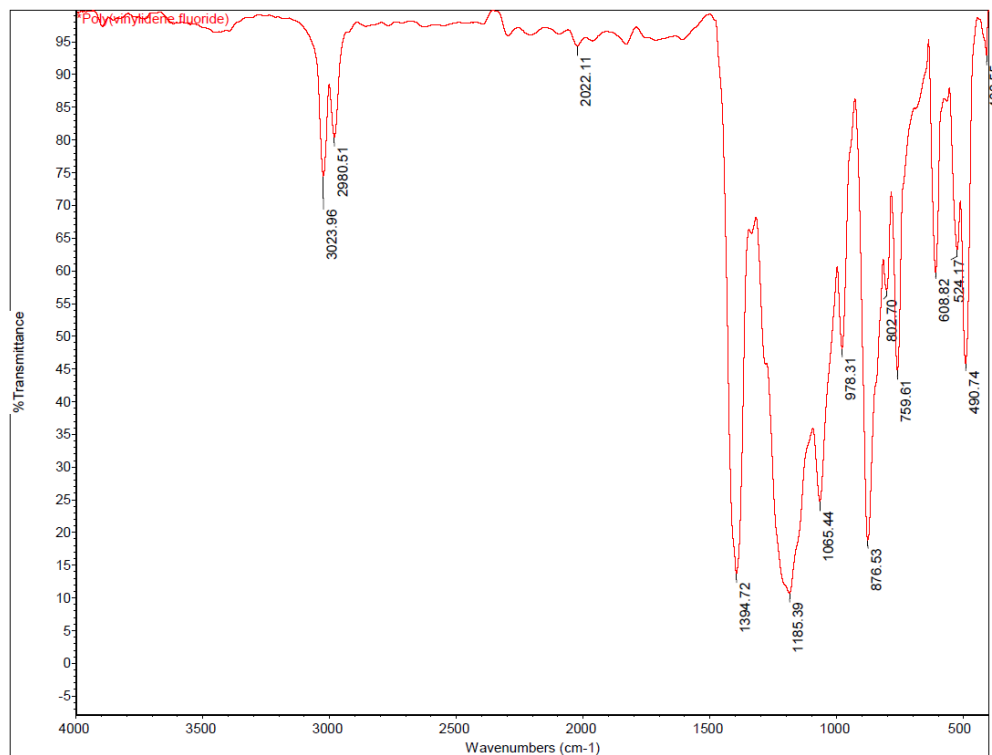


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Standard FTIR Graph of Fluoroethylene vinyl ether fluoropolymer (FEVE)



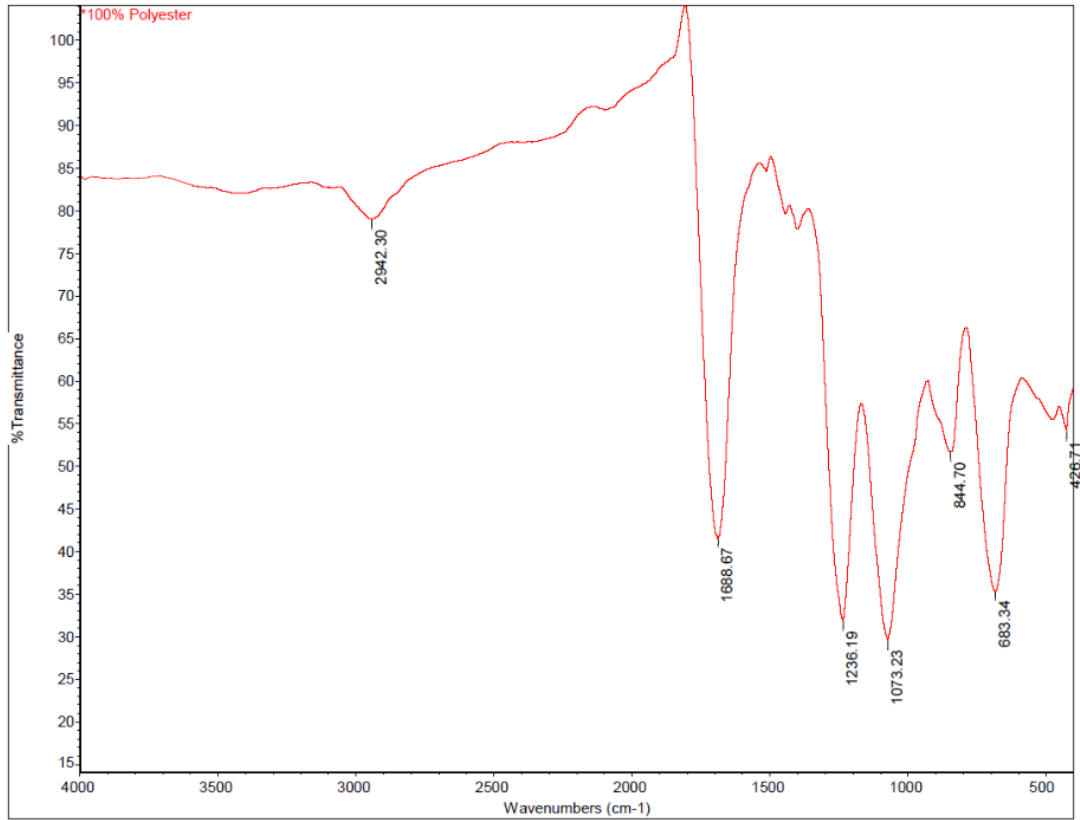
Standard FTIR Graph of polyvinylidene difluoride (PVDF)





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Standard FTIR Graph of Polyester

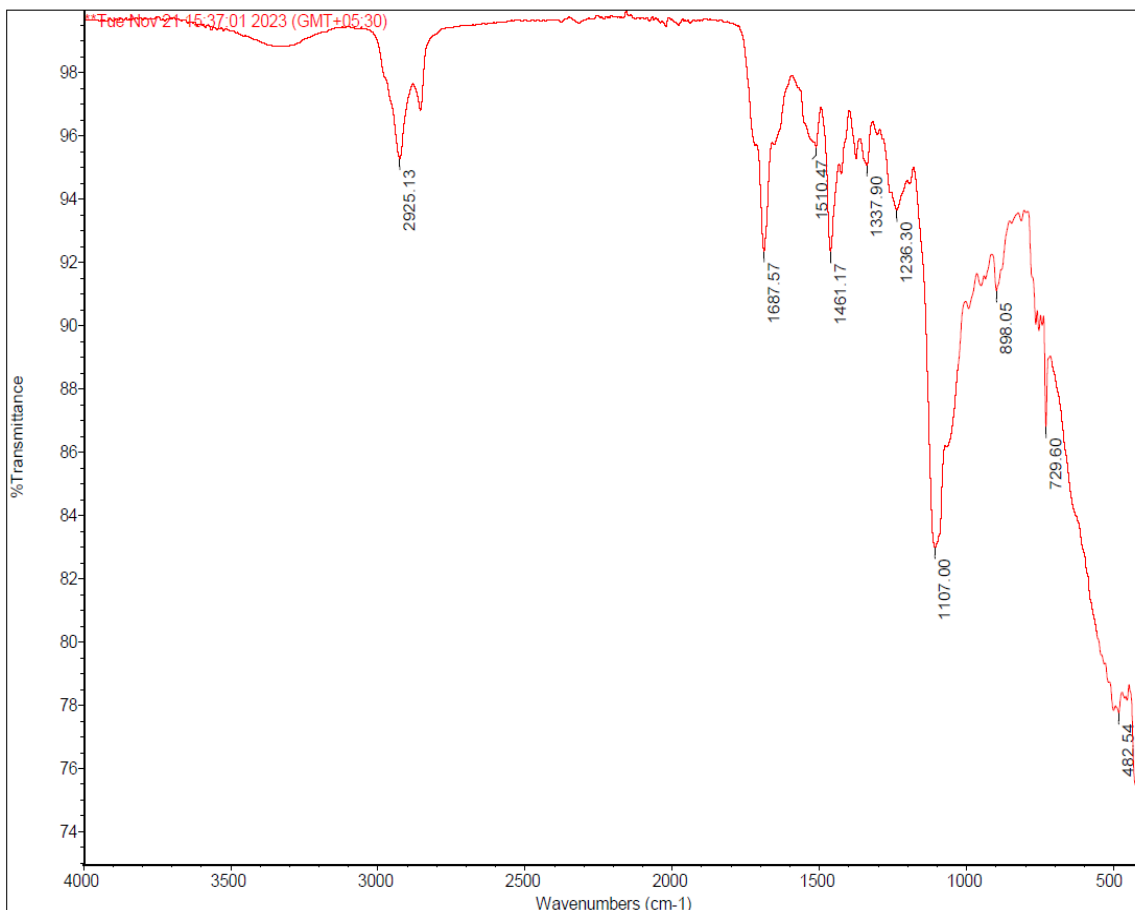




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Test -01- PRA Panels- Blue



Conclusion: The sample shows a high peak at 1107 cm^{-1} which indicates C-F stretch. There are hardly any intense, broad peaks below 1050 cm^{-1} , and low intensity peaks are seen at 1337, 1461 and 1510 cm^{-1} , indicating cross-linking. Finally, there is a low intensity peak at 2925 cm^{-1} . The combination of these peaks indicates that the coating is FEVE-based.

Hence, the PRA Panels - Blue ACP Coating FTIR spectrum matches FEVE.

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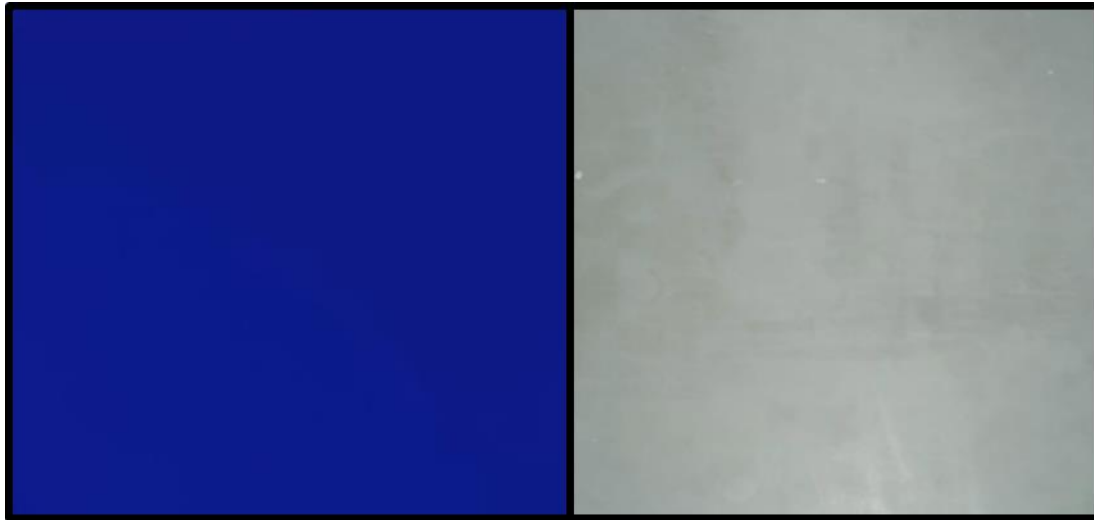
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Photograph of the Received Sample: -

Test-01 : PRA Panels - Blue



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—END OF THE REPORT—