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Evaluation of VCI film manufactured by Desi Chemical, Turkey

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Project #: EC 25-056-1124

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Background:

This report aims to evaluate the corrosion protection and mechanical properties of the VCI film produced by Desi and supplied by Deyap, Turkey. The mechanical performance of this sample will be compared to that of EcoCortec's VpCI-126 film.

Sample Received:

Sample received 13.08.2025., somewhat wrinkled

- Desi VCI film, 110 µm, blue film
- VpCI-126 film, #63196, 100 µm

Method:

- Razor Blade Test, E-001*
- VIA Test, E-002*
- VIA NACE – NACE TM0208
- Thickness – ASTM D6988
- Tensile strength at Break – ASTM D882-02
- Elongation at Break – ASTM D882-02
- Yield Strength – ASTM D882-02
- Tear Strength – ASTM D1922
- Impact puncture – ASTM D3420
- Static and Kinetic Coefficients of Friction – ASTM D1894

**Cortec Method*

Materials:

1. VIA NACE Test Kit (testing jars/apparatus, steel plugs, 400grit sandpaper)
2. VIA Test Kit
3. Razor Blade Test Kit
4. Glycerol (lot #230567-2198)
5. Methanol, ACS grade (lot #24B144038)
6. 0.005% NaCl
7. Water bath set for 50°C
8. Oakland Instrument MT-1528
9. Elmendorf Tearing Tester

Procedure:

The tests were conducted according to standard procedures for each test.

Results:

The following results were found:

Table 1: Razor Blade Test- Carbon Steel Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
Desi VCI Film	Fail	Fail	Fail	Fail
Control	Fail	--	--	Fail

Table 2: Razor Blade Test- Copper Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
Desi VCI Film	Pass	Pass	Pass	Pass
Control	Fail	--	--	Fail

Table 3: VIA Test results

Sample	Plug #1	Plug #2	Plug #3	End Result
Desi VCI Film	Grade 2	Grade 1	Grade 2	Fail
Control	Grade 0	--	--	Fail

Table 4: VIA NACE Test results

Sample	Plug #1	Plug #2	Plug #3	End Result
Desi VCI Film	Grade 0	Grade 0	Grade 0	Fail
Control	Grade 0	--	--	Fail

Table 5: Mechanical Properties

Properties		Test method	Units	VpCI-126 #63196	Desi VCI Film
Thickness	MD	ASTM D6988	µm	102	114
	CD			100	110
Tensile Strength at Break	MD	ASTM D882	MPa	22,210	20,012
	CD			24,901	20,750
Percent Elongation at break	MD	ASTM D882	%	662,40	676,63
	CD			860,90	917,09
Yield Strength	MD	ASTM D882	MPa	12,06	12,25
	CD			9,74	10,66
Tear Strength	MD	ASTM D1922	mN	8266,56	3976,32
	CD			17422,56	9522,24
Impact Elmendorf		ASTM D3420	mN	20928,00	20509,44
			J	1,80	1,77
Coefficients of Friction	IN	ASTM D1894	Static	0,25	0,06
			Kinetic	0,25	0,05
	OUT		Static	0,30	0,05
			Kinetic	0,26	0,04

Photos:

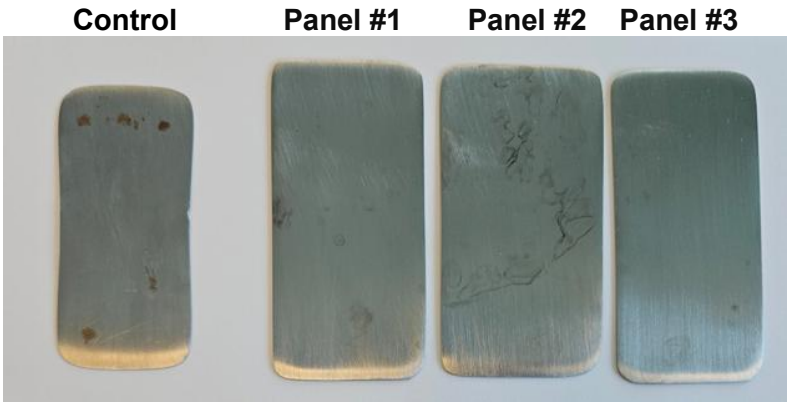


Figure 1: Razor Blade Test- Carbon Steel Panels result of Desi VCI film

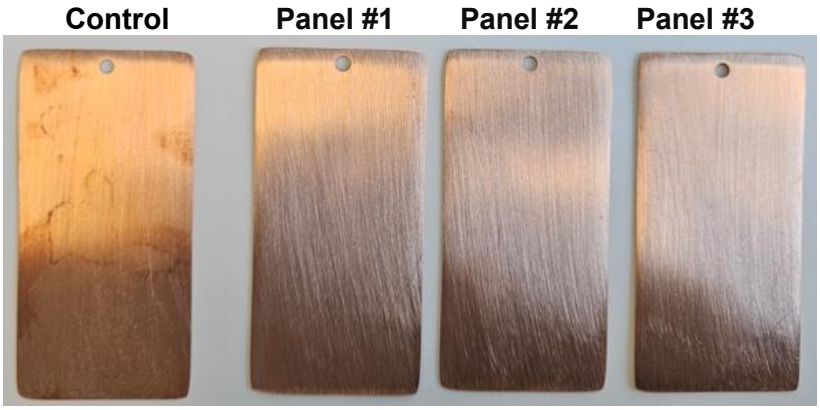


Figure 2: Razor Blade Test- Copper Panels result of Desi VCI film

At least 2 out of 3 panels must pass for the test to have a satisfactory effect.
a. Pass = No visible signs of corrosion.
b. Fail = Visible signs of corrosion.
c. Only one panel may have corrosion.

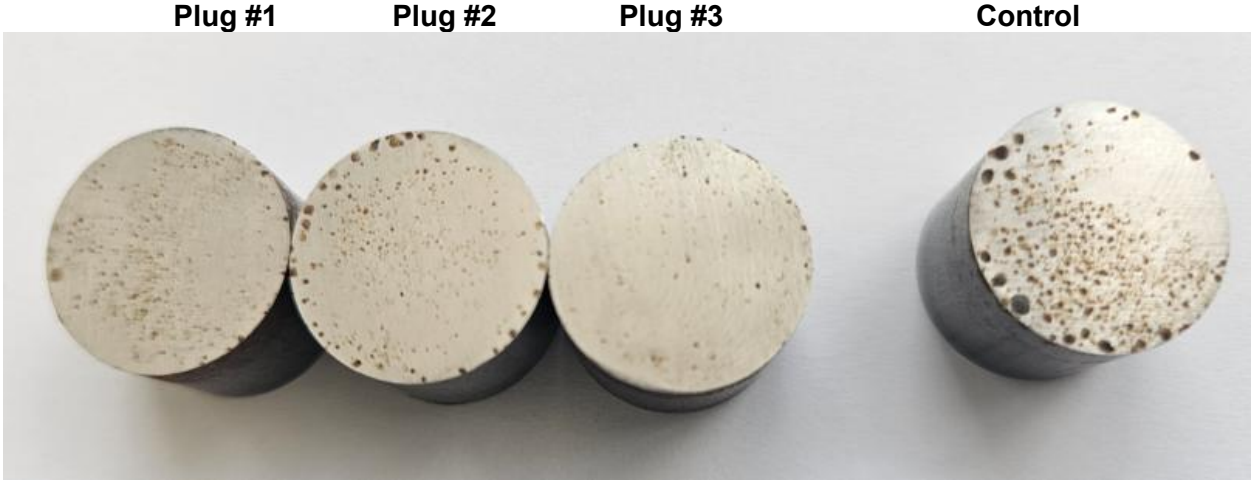
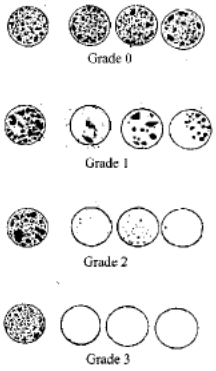


Figure 3: VIA Test result of Desi VCI film

VIA Test Grades (Grade 2 or 3 are passing)
All three plugs must be grade 2 or better to pass the test.

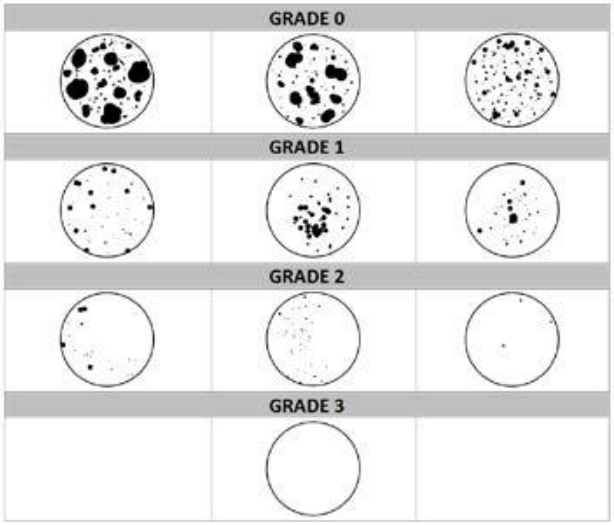


Grade 0:	Blind test No corrosion inhibiting effect
Grade 1:	Blind test Minute corrosion inhibiting effect
Grade 2:	Blind test Medium corrosion inhibiting effect
Grade 3:	Blind test Good corrosion inhibiting effect

Plug#1 **Plug #2** **Plug #3** **Control**

Figure 4: VIA NACE Test result of Desi VCI film

VIA NACE Test Grades (Grade 2 or 3 are passing)
All three plugs must be grade 2 or better to pass the test.



Interpretations:

VCI film produced by Desi does not provide vapor phase corrosion protection according to the NACE VIA test and Cortec VIA test. The results of the Razor Blade testing show that Desi VCI film provides good contact corrosion protection for copper. However, the Razor Blade test performed on carbon steel panels did not meet the requested criteria.
Mechanical properties of the supplied Desi VCI film and EcoCortec's VpCI-126 film (#63196) were evaluated. The results indicate that EcoCortec VpCI-126 film demonstrates better mechanical performance compared to Desi VCI film, considering that the Desi film is slightly thicker. Desi's film and EcoCortec's film produced notably different results when the coefficient of friction was measured. Desi's film has significantly lower coefficient of friction values compared to EcoCortec's VpCI-126 film.