



Member of Cortec® Corporation Group



Bele Bartoka 29, 31300 Beli Manastir, Croatia
Phone: (385) 31/705-011 E-mail: info@ecocortec.hr
www.ecocortec.hr

Comparison of VpCI-126 BLUE PCR film and VpCI-126 BLUE film for Mercamer OY

From: EcoCortec Laboratory
Bele Bartoka 29
31 300 Beli Manastir
Croatia

cc: Boris A. Miksic
Ivana Radić Boršić

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Results reported by:

Antonia Đurin

Antonia Đurin
Technical Service Engineer

Results approved by:

Snježana Mikolić

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Quality Control Manager

Background:

Increasing demand for environmentally acceptable products prompted development of VpCI film with post-consumer recycled content (PCR). Cortec Corporation distributor Mercamer Oy, requested comparison testing of VpCI-126 PCR and VpCI-126 with the goal to evaluate film corrosion inhibiting properties and mechanical properties.

Sample Received:

Following film was produced at EcoCortec:
VpCI-126 BLUE PCR BOR film, 120 µm, Batch#60760
VpCI-126 BLUE BOR film, 120 µm, Batch#60760

Method:

- VIA Test, E-002*
- Razor Blade Test, E-001*
- SO₂ test, E-003*
- Tensile Strength/Elongation, ASTM D882-02, E-004
- % Elongation at Break, ASTM D 882A, E-004
- Elmendorf Tear Test, ASTM D1922-06, E-007
- Puncture Resistance, ASTM-D3420, E-008
- Static and Kinetic Coefficients of Friction, ASTM D1894, E-005

*Cortec Method

Materials:

1. VIA test kit
2. Razor blade test kit
3. SO₂ test kit
4. Glycerol (lot #160621)
5. VpCI-126 film, 120µm (batch #60760)
6. VpCI-126 PCR film, 120µm (batch #60760)
7. Methanol, ACS grade (lot #160397)
8. 1.0 N sulfuric acid (H₂SO₄), (lot #160397)
9. Sodium thiosulfate (Na₂S₂O₃·5H₂O), (lot #158926)
10. Ammonium chloride (NH₄Cl), (lot #161364)
11. Sodium sulfate (Na₂SO₄), (lot #161194)
12. Oven set for 40°C (oven #1)
13. Oven set for 50°C (oven #2)
14. Instron Model No. 4443 (lot #C8657)
15. Thwing-Albert (lot #0312)
16. Plain polyethylene film (control film)

Procedure:

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

Results:

The following results were found:

Razor Blade Test- Carbon Steel Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
VpCI-126 film	Pass	Pass	Pass	Pass
VpCI-126 PCR film	Pass	Pass	Pass	Pass
Control	Fail	--	--	Fail

Razor Blade Test- Copper Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
VpCI-126 film	Pass	Pass	Pass	Pass
VpCI-126 PCR film	Pass	Pass	Pass	Pass
Control	Fail	--	--	Fail

VIA Test

Sample	Plug #1	Plug #2	Plug #3	End Result
VpCI-126 film	Grade 3	Grade 3	Grade 3	Grade 3
VpCI-126 PCR film	Grade 3	Grade 3	Grade 3	Grade 3
Control	Grade 0	--	--	Fail

SO₂ Test- Carbon Steel Panels

Sample	Panel #1	Panel #2	Panel #3	End Result
VpCI-126 film	Grade 3	Grade 3	Grade 3	Pass
VpCI-126 PCR film	Grade 3	Grade 3	Grade 3	Pass
Control	Fail	--	--	Fail

Note: Grade 3 and 4 are passing

Mechanical Properties

Mechanical Properties					
Property		Test Method	Units	VpCI-126 BLUE	VpCI-126 BLUE PCR
Thickness		ASTM D6988	µm	125	129
Breaking Factor	MD	ASTM D882-02	N/m	2779,92	2937,01
	CD			2321,92	2691,60
Tensile Strength at Break	MD	ASTM D882-02	MPa	22,10	22,34
	CD			18,76	21,19
Elongation at Break	MD	ASTM D882-02	%	635,2	675,4
	CD			769,8	857,2
Tear Strength	MD	ASTM D1922	mN	6906,24	5807,52
	CD			17265,60	17474,88
Impact Puncture		ASTM D3420-0495 B	N	17631,84	17684,16
			J	1,52	1,52
BUR	0,637 x LF/Die Diameter			2,52	2,52

Photos from VIA Testing:

VpCI-126 Film



Control Plug#1 Plug #2 Plug #3

VpCI-126 PCR Film



Control Plug#1 Plug #2 Plug #3

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



Grade 0



Grade 1



Grade 2



Grade 3

Interpretations:

VpCI-126 BLUE PCR film provides equal vapor phase and contact corrosion protection compared to VpCI-126 BLUE film. Mechanical analyzes show that physical properties of both formulations are similar and that the properties of the film are not impaired by the addition of post-consumer recycled content.