



Member of Cortec® Corporation Group

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

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Results reported by:

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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 (Na₂S₂O₃x5H₂O), (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

zor Blado Tost- Carbon Stool Panols

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

Property		Test Method	Units	VpCI-126 BLUE	VpCI-126 BLUE PCR
Thickness		ASTM D6988	μm	125	129
Breaking	MD	ASTM D882-02	N/m	2779,92	2937,01
Factor	CD	A311VI D002-02	IN/111	2321,92	2691,60
Tensile	MD			22,10	22,34
Strength at Break	CD	ASTM D882-02	MPa	18,76	21,19
Elongation	MD		%	635,2	675,4
at Break	CD	ASTM D882-02	70	769,8	857,2
Tear	MD	ASTM D1922	mN	6906,24	5807,52
Strength	CD	ASTIVI D 1922	IIIIN	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:



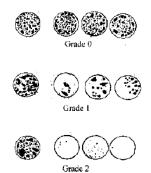
VpCI-126 PCR Film

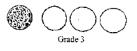


Control Plug#1 Plug #2 Plug #3

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





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.