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## Stretch Film Evaluation

**To:** Customer

**From:** Cortec Corporation Laboratories  
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**cc:** Boris Miksic  
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**Project #:** 13-209-1125

**Results reported by:** *Brian Benduha*  
Brian Benduha  
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**Approved by:** *M. Kharshan*  
Margarita Kharshan  
Vice President of R&D

**Date:** October 3, 2013



**Purpose:** To test the three submitted stretch films to determine the corrosion protection. The pieces labeled "Fleetwood" are supposed to be the exact same film except that Fleetwood #1 contains printed letters and is supposed to contain VCI. The third sample of stretch film labeled as "JDL" was provided by another distributor.

**Sample Received:** 1) Fleetwood #1, Stretch Film  
2) Fleetwood #2, Stretch Film  
3) JDL, Stretch Film

**Method:** 1) VIA Test CC-027  
2) Razor Blade Test CC-004\*  
3) FTIR analysis  
\*Cortec Laboratory is not accredited for the test marked

**Materials:** 1) VIA test kit  
2) Razor blade test kit  
3) Paragon 1000 FTIR

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

**Results:**

**Razor Blade Test- Carbon Steel Panels**

Sample	Panel #1	Panel #2	Panel #3	End Result
Fleetwood #1, Stretch Film	Fail	Fail	Fail	Fail
Fleetwood #2, Stretch Film	Fail	Fail	Fail	Fail
JDL, Stretch Film	Fail	Fail	Fail	Fail
Control	Fail	-	-	-

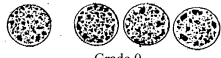



**VIA Test**

Sample	Plug #1	Plug #2	Plug #3	End Result
Fleetwood #1, Stretch Film	Grade 1	Grade 0	Grade 0	Fail
Fleetwood #2, Stretch Film	Grade 1	Grade 0	Grade 0	Fail
JDL, Stretch Film	Grade 1	Grade 0	Grade 0	Fail
Control	Grade 0	-	-	-

The VIA grading system is attached to the end of the report

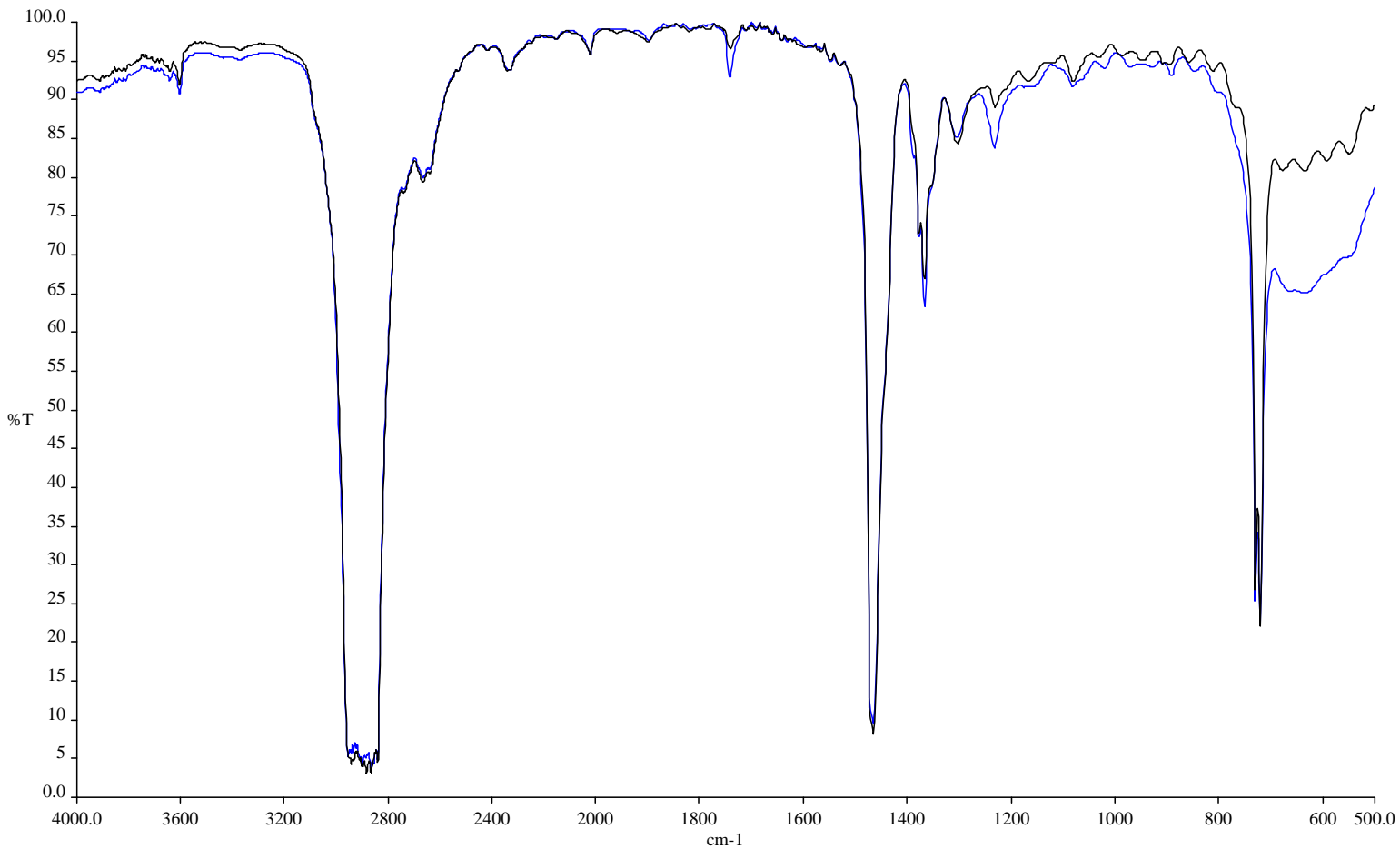
**Interpretations:** All three stretch films failed the razor blade and VIA testing with poor results. FTIR spectra didn't show any corrosion inhibitor in Fleetwood films. The results of FTIR spectra for JDL film showed that this film contains a very small quantity of corrosion inhibitor, probably sodium benzoate.

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	

### FTIR Analysis

Fleetwood Stretch Film #1 and #2 show the same spectrum



# FTIR Analysis

The spectrum for JDL stretch film is similar to Fleetwood's except for two small peaks that appear to be benzene.

