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## **Analysis of Expansion Joint for the Presence of Wax**

A Report to: Emseal, LLC  
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Report No.: 10-05-2662-1-6  
3 Pages, 2 Appendices

Date: February 16, 2010

## 1.0 INTRODUCTION

An expansion joint, identified as DSM, was submitted for characterization using Fourier transform infrared (FTIR) spectroscopy and differential scanning calorimetry (DSC) in an attempt to determine the presence of wax.

The sample was received, logged in and assigned sample number 10-05-A0047.

## 2.0 EXPERIMENTAL AND RESULTS

All raw data are referenced in Lab Book No. 12263.

### 2.1 FTIR

The analysis was carried out using a Nicolet 6700 Fourier transform infrared (FTIR) spectrometer (MII #A16201, calibration valid until 2010-03-30) and a Smart Orbit single reflection horizontal (HATR) accessory (Asset #16211), equipped with a diamond internal reflectance element. A computer-aided search was carried out on the generated spectrum.

Copies of the infrared spectrum and computer-aided search are shown in Appendix A. The infrared spectrum is shown in the full wavelength range of  $4000\text{ cm}^{-1}$  to  $500\text{ cm}^{-1}$ .

Spectrum #1 represents the sample and is generically identified (Search #1) as an acrylic based composition. The spectrum does not show any evidence of additional absorbance bands at  $2915\text{ cm}^{-1}$ ,  $2848\text{ cm}^{-1}$ ,  $1463\text{ cm}^{-1}$ ,  $729\text{ cm}^{-1}$  and  $719\text{ cm}^{-1}$  that could possibly be associated with the presence of wax.

### 2.2 DSC

Differential scanning calorimetry was carried out using a TA Instruments DSC Q1000 Differential Scanning Calorimeter (MII #A15228, calibration valid until 2010-02-07).

A portion of the sample was cut, accurately weighed and crimped into an aluminum pan for analysis. The sample was heated from ambient to 300°F at 18°F/min in a nitrogen atmosphere flowing at 50cc/min.

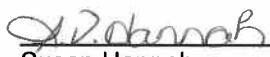
A copy of the DSC scan is attached in Appendix B.

Scan #1 represents the DSM sample. The DSC scan does not show any indication of low temperature melting endotherms that could possibly indicate the presence of wax.


### 3.0 CONCLUSIONS

Using both FTIR and DSC analyses wax was not detected in the submitted sample DSM.

Reported by:

  
\_\_\_\_\_  
Susan Hannah  
Technologist  
Polymer Characterization

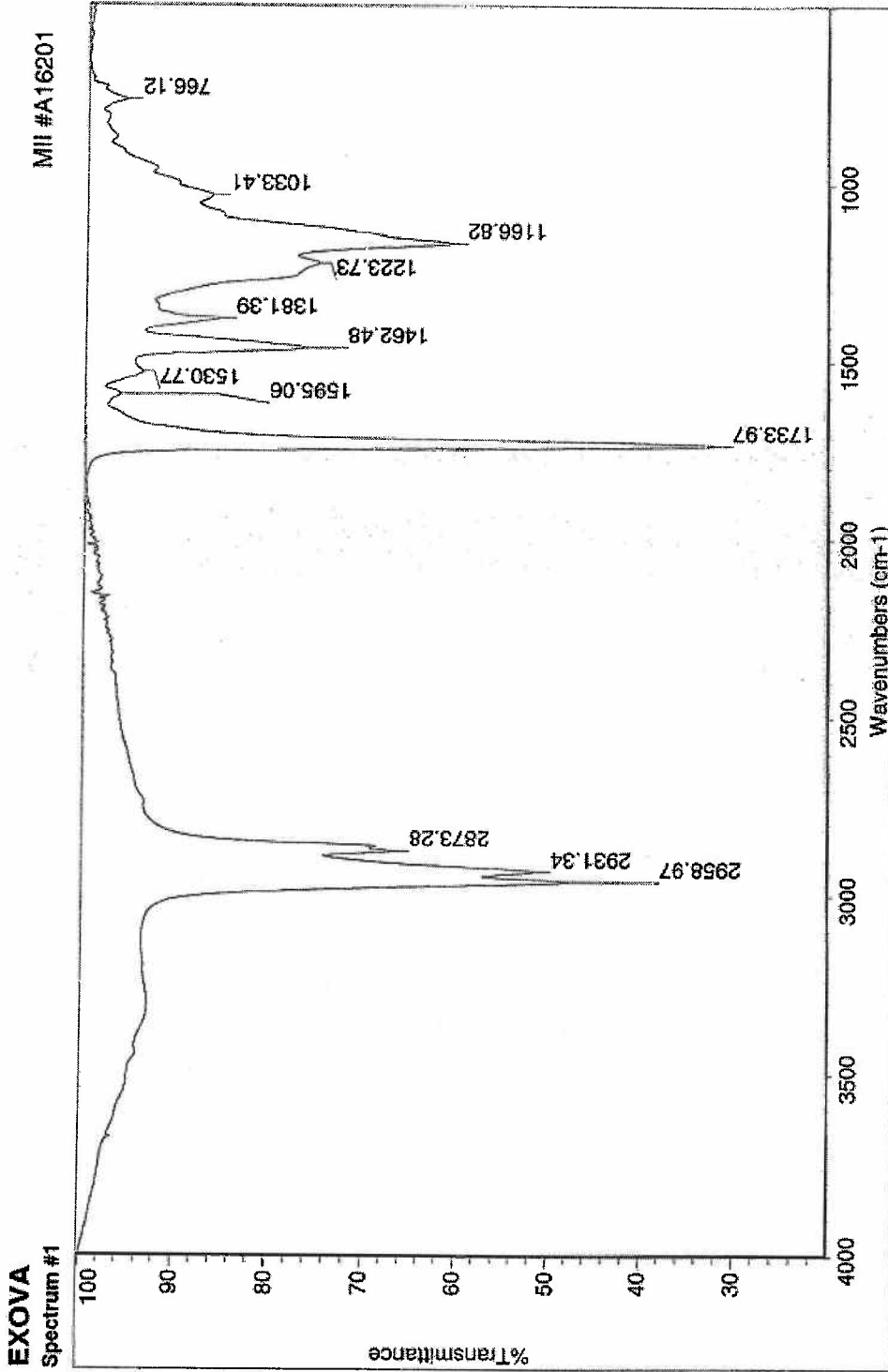
Reviewed and Authorized by:

  
\_\_\_\_\_  
Bryan Wickson, B.Sc. Eng.  
Manager  
Polymer Characterization

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**Appendix A**

FTIR Spectrum and Computer-Aided Search  
(2 pages)



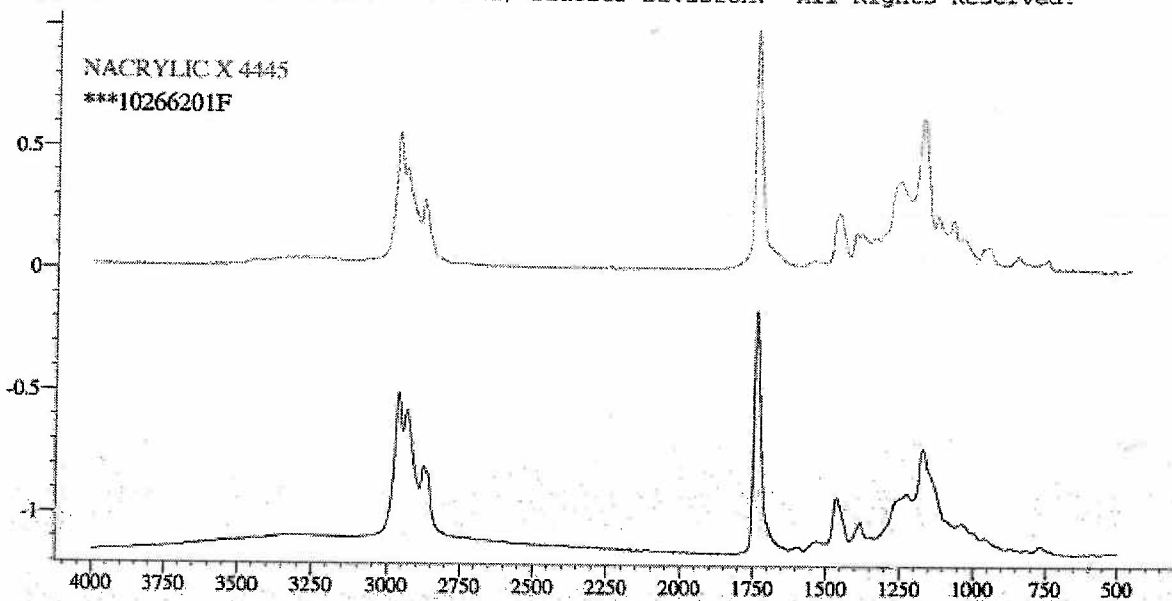
Filename: \*\*\*10266201F  
Collection time: Tue Jan 19 11:00:19 2010 (GMT-05:00)

Operator: al dawah  
Date: 2010-01-19

Comments: 10-05-A0047 DSM

Search #1

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Name(s):	NACRYLIC X 4445
Technique:	FILM
Comments:	Chemical Description= SELF REACTIVE ACRYLIC COPOLYMER
Content:	Solids Content= 45%
Solution Data:	pH= 3.0
Source Of Sample:	NATIONAL STARCH AND CHEMICAL CORPORATION
Viscosity Data:	(Brookfield)= 100 CPS
Weight:	8.5 LBS

**Appendix B**

DSC Scan  
(1 page)

File: C:\TA\Data\2010\DSC\WF110266201F.001  
Operator: S.V.HANNAH  
Run Date: 19-Jan-2010 15:28  
Instrument: DSC Q1000 V9.8 Build 296

Sample: DSM  
Size: 5.4040 mg  
Method: HEATING 10°C/MIN  
Comment: 10-05-A0047, HEATING 10°C/MIN, N2 @ 50CC/MIN

DSC

