



Performance Evaluation of Minnesota's HMA Crack Sealing Program



**Terra Pavement Conference
February 9, 2012**

Your Destination... Our Priority





Objectives

- **NTPEP CS Field Evaluation**
- **LRRB Investigation 822-
Recommended Practices for
Crack Sealing HMA Pavement**
- **MnDOT Performance Based
Testing**
- **TPF 5-225 Field Validation Study**





AASHTO-NTPEP U.S. 169 Crack Sealant Field Evaluation

- National Evaluation
- MnDOT – Lead State
- State DOT's - QPL
- Evaluation Method





Hot Poured Joint and Crack Sealers - Windows Internet Explorer

http://www.dot.state.mn.us/products/Crack-Joint%20Materials/hpjcsource.html

File Edit View Favorites Tools Help

Hot Poured Elastic Type - Spec 3723

Specifications Qualification Process Contact Information		
Product Name	Manufacturer	Manufacturer Website
Beram 195	McAsphalt, Inc.	http://www.mcasphalt.com
Deery 3723	Crafco	http://www.deeryamerican.com
Roadsaver 515MN	Crafco	http://www.crafco.com
Durafill Crackmaster 3405	P & T Products	http://www.p-tproductsinc.com
Sealtight 3405	W. R. Meadows	http://www.wrmeadows.com
Elastoflex 63	Maxwell Products	http://maxwellproducts.com
Nuvo 3405	Maxwell Products	http://maxwellproducts.com

Hot Poured, Extra Low Modulus, Elastic Type - Spec 3725

Specifications Qualification Process Contact Information		
Product Name	Manufacturer	Manufacturer Website
Beram 3060 LM	McAsphalt, Inc.	http://www.mcasphalt.com
Deery 101 ELT	Crafco	http://www.deeryamerican.com
Roadsaver 522	Crafco	http://www.crafco.com
Durafill 3725	P & T Products	http://www.p-tproductsinc.com
Sealtight 3405 MLR	W. R. Meadows	http://www.wrmeadows.com
Elastoflex 72	Maxwell Products	http://maxwellproducts.com

start | Inbox - McGraw, Jim ... | 2012 Pavement Conf ... | 2331 rout and seal.d... | Hot Poured Joint and Cr... | 3:21 PM

<http://www.dot.state.mn.us/products/Crack-Joint%20Materials/hpjcsource.html>





LRRB Investigation 822



- 12 Sealants
- 7 Manufacturers
- 4 Contractors
- Document contractors sealing practices
- Crack Sealant Selection Process





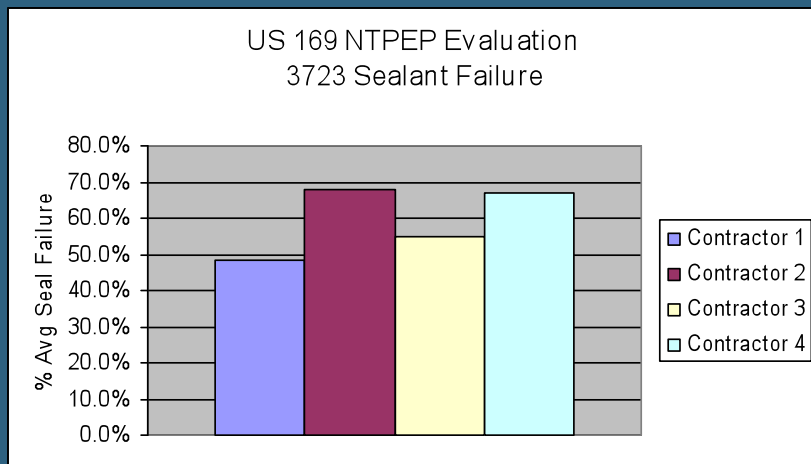
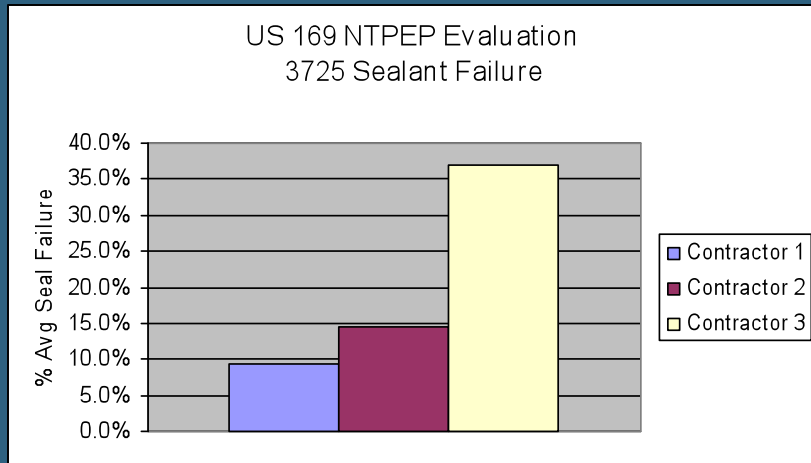
Contractor Practices

Contract or	Rout Cleaning	Hot Air Lance	Rout Filling
1	cleaned pavement and routs - leaf blower	Good HAL technique	Pour Pot - double-fill
2	compressed air	No HAL used	applicator wand and V-squeegee
3	compressed air	Charring- high flame temperature and poor operator technique	applicator wand and V-squeegee, tissue paper
4	wire brush and compressed air	Good HAL technique	applicator wand and V-squeegee



Contractor's Performance

- Contractor 1-best-non standard practices
- 3725 significantly better
- Differences seen in the care taken by different contractors





Route Inspection





Hot Air Lance



Temperature Control





Inv 822 Conclusions

- **Contractors practices do not provide for acceptable field performance of crack sealants**
- **No uniformity exists between contractors**
- **Training for contractors and inspectors is needed**





Inv 822 Conclusions

- **Increased enforcement of sealing specification or issuing a warranty specification is needed**
- **3725 in rout and seal- transverse cracks**
- **3723 –longitudinal cracks and joints**



Crack Sealant Selection



- **CS-PG Development**
- **Crack Sealant Consortium**
- **DOT/Provinces**
- **6 tests**
- **Test Parameters**





Performance-Based CS Tests

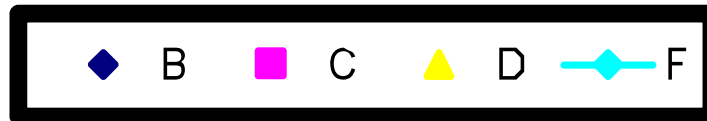
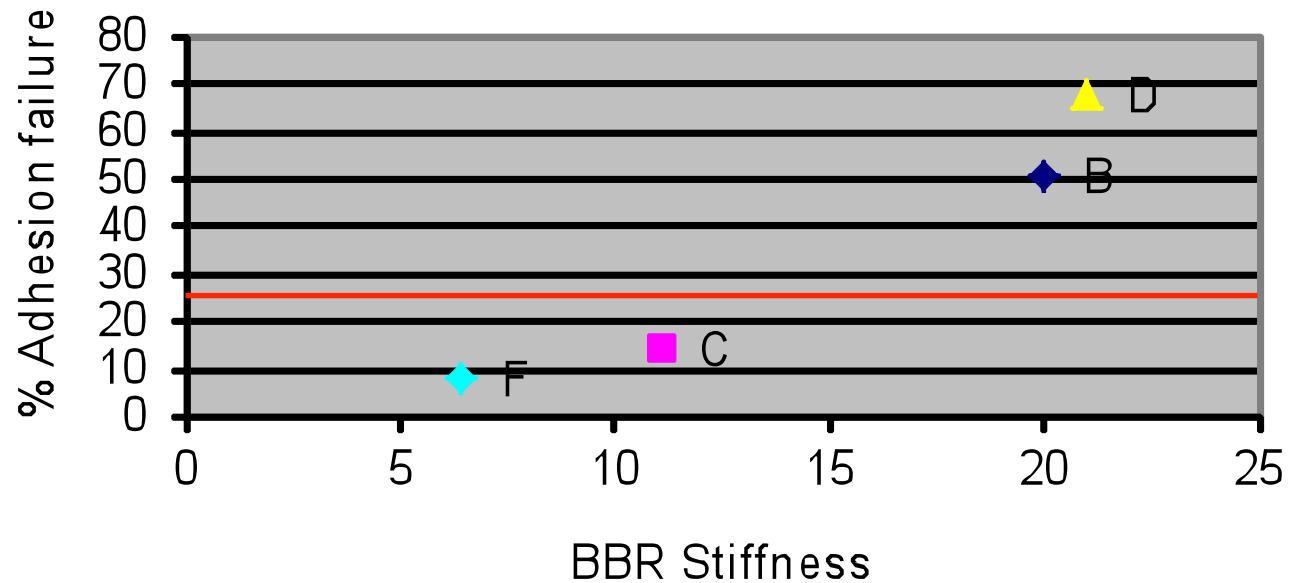
Test	Purpose
Viscosity	Application Temperatures
Dynamic Shear- MSCT	Hi PG- Pullouts & Tracking
Bending Beam	Low Temp Stiffness/ Cohesion
DTT-Extensibility	Crack Opening/ Tensile Strength
DTT-Adhesion	Bond Adhesion/Low PG
Accelerated Aging	Simulate field aging



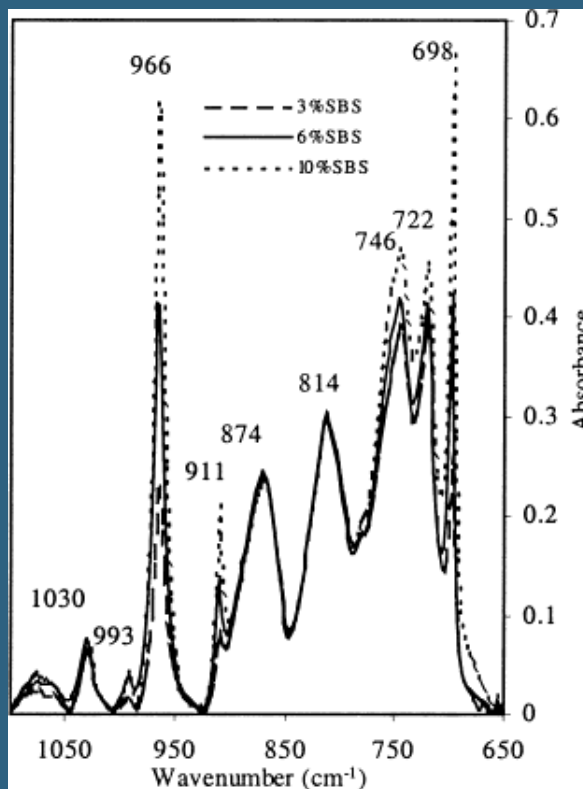


MnDOT Performance Based Testing

CS-BBR Stiffness vs Field Adhesion Loss



Chemical Analysis



- Sealant B, C & F – Type IV
- Polymer content
 - B-6.8%
 - C-12.8%
 - F-11.8%
- Filler content
 - B-17%
 - C-14%
 - F-12%





TPF 5 (225) Phase II Field Validation

- **Test Site Monitoring**
 - **Field rating**
 - 5 times over 4 yrs.
 - **Collect samples for testing**
 - **Crack Movement**
 - **Fine Tune Parameters**





Questions?



Your Destination...Our Priority

