LABORATORY DATA PACKAGE COVER SHEET

FROM 3019JFPD

Fire Protection Analytical Services

EX15157	**07NK08150**
FILE NUMBER	PROJECT NUMBER
Craig Thames **3019CFPD**	**Baums Castorine**
PROJECT HANDLER SECTION	CLIENT
05/11/07 – 08/24/07	**UL NBK 5B-16**
TEST DATE(S)	TEST LOCATION
0882191-001	**GOHR**
SAMPLE TICKET(S)	CCN

	THIS PACKAGE INCLUDES:		EARLY ENGINEERING DATA REMOVAL* SIGN-OFF	DATE
	WORK ORDER(S)			
x	EQUIPMENT / CAL. RECORD			
x	DATA SHEET(S)			
x	CHART(S) / GRAPH(S)			
	VIDEO TAPE(S)			
	PHOTOS / SLIDES			
	COMPUTER DISC(S)			
	COMPUTER HARD COPY DATA			
	"A"/"B"/"D" CHARGE SHEET			
	EPA SHEET			
	MATERIALS CHARGE SHEET			

*ADDITIONAL INFORMATION

Testing to NFPA 18 – 2006 Edition

UNIT LEADER REVIEW

Frank Calabrese	*F. Calabrese*	**09/21/07**
PRINT NAME	Signature	DATE

PROJECT HANDLER REVIEW

Craig S. Thames	**Craig S. Thames**	**2008-10-31**
PRINT NAME	Signature	DATE

THIS SHEET IS PART OF THE INFORMATION ASSOCIATED WITH THIS PROJECT,

AND IS TO BE PLACED IN FILE.

Latest Revision: January 29, 2007

Project No.	07NK08150	File	EX15157		
Tested by:	Andrey Kuznetsov		*Andrey Kuznetsov*	Date	09/19/07
	Printed Name		Signature		
Reviewed by:	Frank Calabrese		*Frank Calabrese*	Date	09/19/07
	Printed Name		Signature		
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT**				

Pour Point

NFPA 18 CHAPTER 5.2.1 AND ASTM D 97

Method

Testing of the pour point effects of wetting agent was performed per NFPA 18 Section 5.2.1 and ASTM D 97.

SAMPLE: BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT

SAMPLE	POUR POINT TEMPERATURE (C)
1	**- 8**

COMMENTS:

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
51F65DAS	Espec Chamber W/ Fluke NetDaq	-35°C - 150°C 10 – 98% RH	08/06/07	11/09/06-11/30/07

Project No.	07NK08150	File	EX15157		
Tested by:	Andrey Kuznetsov		*Andrey Kuznetsov*	Date	09/19/07
	Printed Name		Signature		
Reviewed by:	Frank Calabrese		*Frank Calabrese*	Date	09/19/07
	Printed Name		Signature		
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT**				

SEPARATION

NFPA 18 CHAPTER 5.2.3

Method

Testing of the separation of the wetting agent was performed per NFPA 18 Section 5.2.3. Criteria: Wetting agents shall not separate at temperatures of 0°C and 48.9°C (32°F and 120°F). No visible separation, stratification, or precipitation shall occur during the course of the test.

SAMPLE:

SAMPLE	Temperature °C	SEPARATION
1.	0	NONE
2.	49	NONE

COMMENTS: Sample 2 was tested at a temperature 51ºC

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
45F51TR	CHEST FREEZER W/ HONEYWELL TRULINE RECORDER	0°F - 101°F	06/02/07-07/02/07 07/13/07-08/13/07	05/19/07-05/31/08

Project No.	07NK08150	File	EX15157		
Tested by:	Andrey Kuznetsov		*Andrey Kuznetsov*	Date	09/20/07
	Printed Name		Signature		
Reviewed by:	Frank Calabrese		*Frank Calabrese*	Date	09/20/07
	Printed Name		Signature		
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF at 0.4% Concentration**				

SEPARATION ON STANDING

NFPA 18 CHAPTER 5.3.2

Method

Testing of the separation of wetting agent solution, in concentrations specified for use by the manufacturer, was performed per NFPA 18 Section 5.3.2. Wetting agents solution shall not separate at temperatures of 0°C and 48.9°C (32°F and 120°F), and 18°C ± 2.7°C. No visible separation, stratification, or precipitation shall occur during the course of the test.

SAMPLE: NOVACOOL UEF at 0.4% Concentration

SAMPLE	°C	SEPARATION
1.	0	NONE
2.	51	NONE
3.	18	NONE

COMMENTS: Sample 2 was tested at temperature 51°C

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
45F51TR	CHEST FREEZER W/ HONEYWELL TRULINE RECORDER	0°F - 101°F	06/02/07-07/02/07 07/13/07-08/13/07	05/19/07-05/31/08
50F65TR	Honeywell Truline Recorder w/ Webber Chamber	-		05/18/07-05/31/08

Project No.	07NK08150	File	EX15157		
Tested by:	Andrey Kuznetsov		*Andrey Kuznetsov*	Date	09/20/07
	Printed Name		Signature		
Reviewed by:	Frank Calabrese		*Frank Calabrese*	Date	09/20/07
	Printed Name		Signature		
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF at 3.0% Concentration**				

SEPARATION ON STANDING

NFPA 18 CHAPTER 5.3.2

Method

Testing of the separation of wetting agent solution, in concentrations specified for use by the manufacturer, was performed per NFPA 18 Section 5.3.2. Wetting agents solution shall not separate at temperatures of 0°C and 48.9°C (32°F and 120°F), and 18°C ± 2.7°C. No visible separation, stratification, or precipitation shall occur during the course of the test.

SAMPLE: NOVACOOL UEF at 3.0% Concentration

SAMPLE	ºC	SEPARATION
1.	0	NONE
2.	51	NONE
3.	18	NONE

COMMENTS: Sample 2 was tested at temperature 51ºC

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
45F51TR	CHEST FREEZER W/ HONEYWELL TRULINE RECORDER	0°F - 101°F	06/02/07-07/02/07 07/13/07-08/13/07	05/19/07-05/31/08
50F65TR	Honeywell Truline Recorder w/ Webber Chamber	-		05/18/07-05/31/08

Project No.	07NK08150	File #	EX15157		
Tested by:	Andrey Kuznetsov	*Andrey Kuznetsov*		Date	09/20/07
	(printed name)	(signature)			
Reviewed by:	Frank Calabrese	*Frank Calabrese*		Date	09/20/07
	(printed name)	(signature)			
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT AT 0.4% CONCENTRATION**				

SURFACE TENSION – WETTING AGENTS – IMPACT OF LOW TEMPERATURE

Method

Testing Conducted per ASTM D1331 with a du Nuoy type Tensiometer and NFPA 18 Section 5.2.4 and 5.3.1

P= Apparent Surface Tension
D= Density of lower phase = 1.0 d= Density upper phase = 0.0
F= Correction Factor
True Surface Tension = P X F
* NFPA 18 Impact of Low Temperature on Surface Tansion

SAMPLE: BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT 0.4% (22.2° C)

Concentration (%)	Average Apparent Surface Tension Dynes/cm (P)	P/(D-d)	Correction Factor (F)	Average True Surface Tension Dynes/cm (P X F)
0.4	27.1	27.1	0.883	**23.9**

SAMPLE: IMPACT OF LOW TEMPERATURE (Negative 18°C) ON SURFACE TENSION OF WETTING AGENT

Concentration (%)	Average Apparent Surface Tension Dynes/cm (P)	P/(D-d)	Correction Factor (F)	Average True Surface Tension Dynes/cm (P X F)
0.4	27.2	27.2	0.883	**24.0**

COMMENTS: **PASS** – Criteria: 23.9±5 Dynes/cm. Test performed Per NFPA 18 Chapter 5.2.4 Impact of Low Temperature on Surface Tension. Surface Tension of wetting agent solution prepared from wetting agents stored at Negative 18C (0°F) shall not vary more than 5 dynes/cm from the initial measurement.

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
51F65DAS	Espec Chamber W/ Fluke NetDaq	-35°C - 150°C 10 – 98% RH	08/08/07	11/09/06-11/30/07
306N0008	Cole-Parmer Tensiometer	0 - 90 Dynes per Cm.	08/08/07	Prior to Use
67F65DTM	OMEGA DP462 Digital Temp. Meter	0 – 1315 Deg. C	08/08/07	02/05/07-02/28/08

Project No.	07NK08150	File #	EX15157		
Tested by:	Andrey Kuznetsov	*Andrey Kuznetsov*		Date	09/20/07
	(printed name)	(signature)			
Reviewed by:	Frank Calabrese	*Frank Calabrese*		Date	09/20/07
	(printed name)	(signature)			
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT AT 3.0% CONCENTRATION**				

SURFACE TENSION – WETTING AGENTS – IMPACT OF LOW TEMPERATURE

Method

Testing Conducted per ASTM D1331 with a du Nuoy type Tensiometer and NFPA 18 Section 5.2.4 and 5.3.1

P= Apparent Surface Tension
D= Density of lower phase = 1.0 d= Density upper phase = 0.0
F= Correction Factor
True Surface Tension = P X F
* NFPA 18 Impact of Low Temperature on Surface Tansion

SAMPLE: BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT 3.0% (22.2° C)

Concentration (%)	Average Apparent Surface Tension Dynes/cm (P)	P/(D-d)	Correction Factor (F)	Average True Surface Tension Dynes/cm (P X F)
3.0	28.5	28.5	0.885	**25.2**

SAMPLE: IMPACT OF LOW TEMPERATURE (Negative 18°C) ON SURFACE TENSION OF WETTING AGENT

Concentration (%)	Average Apparent Surface Tension Dynes/cm (P)	P/(D-d)	Correction Factor (F)	Average True Surface Tension Dynes/cm (P X F)
3.0	28.5	28.5	0.885	**25.2**

COMMENTS: **PASS** – Criteria: 25.2±5 Dynes/cm. Test performed Per NFPA 18 Chapter 5.2.4 Impact of Low Temperature on Surface Tension. Surface Tension of wetting agent solution prepared from wetting agents stored at Negative 18C (0°F) shall not vary more than 5 dynes/cm from the initial measurement.

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
51F65DAS	Espec Chamber W/ Fluke NetDaq	-35°C - 150°C 10 – 98% RH	08/08/07	11/09/06-11/30/07
306N0008	Cole-Parmer Tensiometer	0 - 90 Dynes per Cm.	08/08/07	Prior to Use
67F65DTM	OMEGA DP462 Digital Temp. Meter	0 – 1315 Deg. C	08/08/07	02/05/07-02/28/08

Project No.	07NK08150	File #	EX15157		
Tested by:	Andrey Kuznetsov	*Andrey Kuznetsov*		Date	09/20/07
	(printed name)	(signature)			
Reviewed by:	Frank Calabrese	*Frank Calabrese*		Date	09/20/07
	(printed name)	(signature)			
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT**				

pH Test – Oakton Instruments pH 11 Meter
Testing Conducted per LPG for Department 3019JFPD and NFPA 18 Section 5.2.5

SAMPLE : BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT

Run #	pH	Average
1.	6.97	**6.97**
2.	6.97	
3.	6.98	

Comments:All pH measurments were taken at 16°C

DESCRIPTION OF pH TEST

Method

The pH test is conducted by a Oakton pH11 meter from Oakton Instruments. The meter is calibrated by three buffer solutions, pH 7.01 @25°C, 4.01 @25°C and 10.00 @25°C. The electrode is rinsed by the sample solution, and immersed into the sample. The probe is stirred gently to reach a stable reading and the result is recorded. Sampling methods and instrument settings used in obtaining the pH results are to be identical for follow-up testing to those used in obtaining the original data of the material referenced in this Procedure.

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	SPECIMEN NO(S). or GRADE	TEST DATE	Calibration
198562	Oakton pH11 Meter Model 35614-80	1,2,3	08/24/07	Prior to Test

Project No.	07NK08150	File	EX15157		
Tested by:	Andrey Kuznetsov		*Andrey Kuznetsov*	Date	09/05/07
	Printed Name		Signature		
Reviewed by:	Frank Calabrese		*Frank Calabrese*	Date	09/05/07
	Printed Name		Signature		
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT**				

VISCOSITY - BROOKFIELD

NFPA 18 SECTION 5.2.6

METHOD

The viscosity of the wetting agent was performed per NFPA 18 Section 5.2.6, using a Brookfield Viscometer Model LVDVE.

RESULTS

Temperature (°C)	Spindle #	RPM	% Torque	Viscosity (cps)
49.0	61	100	40.8	**24.48**
2.0	61	60	71.3	**71.27**
21.0	61	100	65.9	**39.52**

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
51F65DAS	Espec Chamber W/ Fluke NetDaq	-35°C - 150°C 10 – 98% RH	08/06/07-08/08/07	11/09/06-11/30/07
E6502602	Brookfield DV-E Viscometer Model LVDVE	1 – 2M cP	08/06/07-08/08/07	07/24/07–09/24/07
67F65DTM	OMEGA DP462 Digital Temp. Meter	0 – 1315 Deg. C	08/06/07-08/08/07	02/05/07-02/28/08

Project No.	07NK08150	File	EX15157		
Tested by:	Andrey Kuznetsov		*Andrey Kuznetsov*	Date	09/19/07
	Printed Name		Signature		
Reviewed by:	Frank Calabrese		*Frank Calabrese*	Date	09/19/07
	Printed Name		Signature		
Material Designation	**BAUMS CASTORINE – NOVACOOL UEF WETTING AGENT**				

MISCIBILITY

NFPA 18 CHAPTER 5.2.2

Method

Testing of the miscibility of the wetting agent was performed per NFPA 18 Section 5.2.2.Criteria: The wetting agent shall be miscible in water at the manufacturer's minimum and maximum use concentrations, at under 100 revolutions. The speed of the stirrer motor shall be 60-rpm ± 10 rpm. An adjustable speed drill was used as stirrer motor; the speed was adjusted by the use of a light reflecting strip and a stopwatch.

SAMPLE: NOVACOOL UEF WETTING AGENT AT 0.4% Concentration

SAMPLE	AGENT ºC	WATER ºC	RPM (stirrer)	MISCIBILITY (revolutions)
1.	21	21	60	10
2.	4	4	60	10
3.	4	21	60	10
4.	21	4	60	10

SAMPLE: NOVACOOL UEF WETTING AGENT AT 3.0% Concentration

SAMPLE	AGENT ºC	WATER ºC	RPM (stirrer)	MISCIBILITY (revolutions)
1.	21	21	60	10
2.	4	4	60	10
3.	4	21	60	10
4.	21	4	60	20

COMMENTS: MISCIBLE

TEST EQUIPMENT RECORD

SERIAL NUMBER	EQUIPMENT DESCRIPTION	FUNCTIONAL RANGE	TEST DATES	CALIBRATION DATE (Last/Next)
51F65DAS	Espec Chamber W/ Fluke NetDaq	-35°C - 150°C 10 – 98% RH	08/09/07	11/09/06-11/30/07
132F01SW	STOPWATCH	0 - 9 Hours	08/09/07	03/05/07-03/31/08

The corrosion test has been moved to an unevaluated factor for this category.

M. Tennenbaum 2008-11-07

The corrosion test has been moved to an unevaluated factor for this category.

M. Tennenbaum 2008-11-07