REPORT
issued by an Accredited Testing Laboratory

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Test of foam concentrate according to IMO MSC/Circ.670
(1 appendix)

The department of Fire Technology at SP Swedish National Testing and Research Institute has on your request performed tests of foam concentrate according to IMO MSC/Circ.670.

Designation of foam concentrate:	Fomtec LS EXP
Type of foam concentrate:	Synthetic High Expansion Foam
Samples:	8 x 25 L cans, batch No 113511
Manufactured by:	Dafo Fomtec AB
Date of arrival at SP:	September 8, 2011
Date of fire test:	October 4, 2011

Total results

The foam concentrate denoted Fomtec LS EXP fulfil the technical requirements stated in the IMO document MSC/Circ.670 when tested with 2,4 % admixture as high expansion foam on petroleum fire.

SP Technical Research Institute of Sweden
Fire Technology - Fire Dynamics

Performed by
Magnus Bobert

Examined by
Tommy Hertzberg

Appendix

Test results

Appendix 1

Test results according to IMO MSC/Circ.670

The freezing and thawing procedures were performed as below. Before this test the pH-value, sediment, density and viscosity was determined.

Date	Storage temp. °C	At approx. time
Wednesday, 2011-09-21	-10	9:00, i.e. 24 h
Thursday, 2011-09-22	Room temp. (15-25)	9:00, i.e. 24h
Friday, 2011-09-23	-10	9:00, i.e. 24 h
Saturday, 2011-09-24	Room temp. (15-25)	9:00, i.e. 24h
Sunday, 2011-09-25	-10	9:00, i.e. 24 h
Monday, 2011-09-26	Room temp. (15-25)	9:00, i.e. 24h
Tuesday, 2011-09-27	-10	9:00, i.e. 24h
Wednesday, 2011-09-28	Room temp. (15-25)	9:00, i.e. 24 h
Thursday, 2011-09-29	Ready	9:00

After this freezing and thawing procedure the foam concentrate was examined for possible signs of stratification and visual signs of sediment or heterogeneity. The foam concentrate was then stored at +60 °C for 7 days before it was examined again.

Test results

Visual examination after freezing / thawing and heating procedure

Parameter	Result	Requirements
Signs of stratification or heterogeneity	No visual sign	No visual sign
Sediment	No visual sign	No visual sign

Comments to the visual examination after freezing / thawing and heating procedure

The requirements for the visual examination after freezing / thawing and heating procedure are judged to be fulfilled in accordance to the standard.

Physical properties - as supplied from the manufacturer

Parameter	Fomtec LS EXP	Requirements
pH-value	6,8	6.0 - 9.5
Sediment, vol %	<0,1	< 0.25
Viscosity, + 20 °C, cSt	31,0	< 200
Viscosity, 5 °C (LUT), cSt	60,2	< 200
Density, g/cm^3	1,034	No requirements
Refractive index, + 20 °C	1,367 (not included in the standard)	No requirements

Comments to results of physical analysis

The requirements for the physical properties are judged to be fulfilled in accordance to the standard.

Expansion and drainage of foam

Sea water has been prepared by tap water and additives as specified in the standard.

Test conditions: Ambient temperature: 18 °C-21°C

Premix temperature: 18 °C-20°C

The premix time was less than two minute.

Parameter	Conditioned for 7 days at +60 °C	As supplied by the manufacturer
Expansion ratio	855	921
Drainage 25 %, min:s	11:54	13:48
Drainage 50 %, min:s	21:16	23:18

Comments to results of Expansion and drainage of foam

The requirements for the Expansion and drainage of foam are judged to be fulfilled in accordance to the standard.

Extinguishing test according to the IMO document MSC/Circ. 670

Before the extinguishing test was performed, the foam concentrate was stored for 7 days at +60 °C and then stored at room temperature until the date for fire test.

Sea water has been prepared by tap water and additives as specified in the standard.

The fire test was conducted indoors in the fire hall of SP.

The premix time was less than two minute.

Designation	**Unit**	**Fomtec LS EXP**
Type of foam, expansion grade		High
Date of test	y-m-d	2011-10-04
Admixture	%	2,4
Type of water		Sea water
Foam generator	L min^{-1}	6.1
Air temp.	°C	19
Fuel temp.	°C	17
Water temp.	°C	18
Foam solution temp.	°C	20
Wind speed	m/s	< 1
Extinction		
Type of fuel		Heptane
Preburn time	min	1
Start foam application	min:s	00:00
90 % control	min:s	00:38
99 % extinguished	min:s	00:50
Extinguished	min:s	**00:55**
Stop fan and foam application	min:s	02:00

Comments to the fire tests

The requirements for the test fire performance are fulfilled in accordance to the standard.