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Testing of foam concentrate according to ICAO-requirements, level C (1 appendix)

The department of Fire Research at SP Swedish National Testing and Research Institute has on your request performed tests of foam concentrate according to ICAO-requirements, Doc 9137-AN/898, Chapter 8.1.5, level C. The fire test, level C, was performed according to the revised ICAO Test Protocol dated July 2013.

Designation of foam concentrate:	AFFF 3% ICAO
Type of foam concentrate:	AFFF
Samples:	IBC 1000 L. The sample has been send to SP from Dafo Fomtec AB. Batch No. 142190B.
Manufactured by:	Dafo Fomtec AB
Date of arrival at SP:	May 23, 2014
Date of fire tests:	May 27, 2014
Date of chemical - physical tests:	June, 2014

Total results

The foam concentrate denoted AFFF 3% ICAO fulfil the requirements stated in the ICAO-requirements, level C, when tested with 3% admixture as low expansion foam.

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Appendix

Test conditions and test results

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Appendix 1

Test conditions and test results**Physical properties**

The physical properties were measured by SP Chemistry, Materials and Surfaces.

According to the customer the Lowest Use Temperature (LUT) is -1 °C.

Results of the physical properties

Parameter	Results	Requirements
pH-value	6,3	6,0 – 9,5
Sediment, vol %	<0,1	< 0,25
Viscosity, 20 °C	1,9 cSt	-
Viscosity, -1 °C	3,5 cSt	< 200 cSt
Refractive index	1,351	-

Expansion and drainage of foam

Test conditions: Ambient temperature: 21 °C

Premix temperature: 20 °C

Parameter	Results
Expansion ratio	8,6
Drainage 25 %, min:s	3:49
Drainage 50 %, min:s	6:12

Comments to the results of expansion and drainage of foam

No requirements are specified in the standard. The results are judged to be normal for this type of foam concentrate.

Appendix 1

Extinguishing tests according to ICAO-requirements , level C

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

<i>Designation</i>	Unit	AFFF 3% ICAO
Date of test	y-m-d	2014-05-27
Admixture	%	3
Type of water		Fresh water
Foam nozzle UNI86	L min ⁻¹	11,4
Fire tray	m ²	7,32
Application rate	L m ⁻² min ⁻¹	1,6
Air temp.	°C	19
Fuel temp.	°C	17
Water temp.	°C	18
Foam solution temp.	°C	18
Wind speed	m/s	< 1
<i>Extinction</i>		
Type of fuel		Jet A1
Preburn time	min	1
Start foam application	min:s	00:00
90 % control	min:s	00:50
99 % extinguished	min:s	01:37
Extinguished	min:s	01:43
Stop foam application	min:s	02:00
<i>Burnback</i>		
Waiting period	min	2
Start burnback	min:s	00:00
Sustained fire in the tray	min:s	09:39
Burnback, > 25%	min:s	16:20

Requirements for extinguishing time and burnback time

At the 60 seconds time, minute flames (flickers) visible between the foam blanket and the inner edge of the tray are acceptable:

- If they don't spread in a cumulative length exceeding 25% of the circumference of the inner edge of the tray and:
- They are totally extinguished during the second minute of foam application.

Time to burnback: ≥ 5 minutes for 25% of the surface

Comments to the fire test results

At 60 seconds minute flames (flickers) were visible between the foam blanket and the inner edge of the tray with a cumulative length of about 1,5 m. The minute flames (flickers) decreased and the flames were totally extinguished at 1:43. The requirements are judged to be fulfilled.