Bauaufsichtlich anerkannte Prüf-, Überwachungs- und Zertifizierungsstelle
Prüfstelle für Feuerlöschmittel und -geräte
DIN EN ISO/IEC 17025: D-PL-17819-01-00
DIN EN ISO/IEC 17065: D-ZE-17819-01-00
DIN EN ISO/IEC 17020: D-IS-17819-01-00
ZLS-GS-0066
Notified Body no. 0767

MPA Dresden

CERTIFICATE OF CONFORMITY – WATER BASED FIRE EXTINGUISHING MEDIA

Certificate of conformity reference number: **KB 243/15**

Test specification:	**Test procedure LM 01-01, test of water based fire extinguishing media, Nov. 29, 2011 except for clause 4.11 – package and marking, see the note below**
Test report no.:	**20150761**
Requested by:	**Flamark d.o.o., Ante Topića Mimare 40, 10090 Zabgreb, CROATIA**
Manufacturer:	**Flamark d.o.o., Ante Topića Mimare 40, 10090 Zabgreb, CROATIA**
Product name:	**MABO**
Type of fire extinguishing medium:	**Liquid fire extinguishing medium (readymade solution)**
Test fire performance:	**Proof with portable EN 3 fire extinguishers: 21 A and 144 B according to EN 3-7 with 6 litres fire extinguishing medium**
Freezing point:	**- 11,3°C**
Notes:	**1. The fire extinguishing medium is to use undiluted.** **2. The information according to clause 4.11 of LM 01-01 for marking shall be stated on the packing or on the storage container.**

Conformity to the above mentioned test specification is attested. All applicable requirements have been met.

This certificate of conformity is valid solely for fire extinguishing media which correspond to the submitted test samples and to the confirmed documents.

Certificates of conformity of fire extinguishers are solely valid in conjunction with the fire extinguishing medium the type test of the fire extinguisher has been done with.

This certificate of conformity does not include surveillance.

16th November 2015

Grad. Eng. Jürgen Dittrich
Laboratory Manager

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MPA Dresden

Test report

No. 20150761

Applicant:	Flamark d.o.o. Ante Topića Mimare 40 10090 Zagreb CROATIA
Manufacturer:	Flamark d.o.o. Ante Topića Mimare 40 10090 Zagreb CROATIA
Application date:	2015-05-13
Subject of application:	Test of a premixed liquid fire extinguishing medium for suitability as fire extinguishing medium on use with fire extinguishers
Name of the fire extinguishing medium:	**MABO**
Basis of the examination:	Test procedure instruction LM 01-01 of MPA Dresden GmbH dated 29th November 2011 for test of water based fire extinguishing media (following to EN 1568 and EN 3-7)
Receipt of sample:	2015-06-24
Test laboratory:	MPA Dresden GmbH Official laboratory for fire extinguishing media and fire extinguishers Fuchsmühlenweg 6F 09599 Freiberg GERMANY

This test report comprises 10 pages, including 1 annex.

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General information:

Only equipment and materials detailed in this report have been subjected to the tests. Test results apply to the tested samples only.

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Publications of test reports and information on tests for publicity purposes need the written approval of the laboratory in every isolated case.

Every page of this report is stamped with the seal of the laboratory.

Summary:

The liquid fire extinguishing medium **MABO** (premixed water based solution) has been tested relating to its chemical / physical characteristics and to its extinguishing efficiency in order to examine the suitability for fire extinguishing purposes.

The liquid extinguishing medium **MABO** is suitable for application with fire extinguishers against fires of materials of the fire class A according to EN 2.

The proof of the extinguishing effectiveness has been performed with portable stored pressure fire extinguishers (6 litres).

Test fire rating in accordance with EN 3-7 : 2004 + A1 : 2007:	**21 A and 144 B**
Application concentration:	undiluted application
Freezing point of the medium (measured on the sample):	- 11,3° C

Special information:

The marking label of the extinguishing medium for packing containers is to furnish with the required information (see on page 9, clause 5 of this test report).

16th November 2015

Grad. Eng. Dittrich
Laboratory Manager

Grad.-Eng. Romberg
Official

1. General

The liquid fire-fighting agent **MABO** is a premixed solution ready for use and it is not to dilute further more.

The suitability as a fire extinguishing medium of the product has been examined in accordance with the test procedure instruction LM 01-01 of MPA Dresden GmbH for examination of water based fire extinguishing media, dated 29th November 2011, following to the respective requirements of the norms EN 1568 and EN 3-7.

2. Chemical composition

A notice of the manufacturer about the chemical composition of the fire extinguishing medium is not available to the test laboratory.

3. Submitted documents

/1/ Material safety Data Sheet, 2013-10-03, 5 pages

4. Test results

4.1 Laboratory tests – characteristic values (clauses 4.2 to 4.8 of the test procedure instruction)

Characteristic value		Requirement EN 1568	Manufacturer specification	Sample measurement	Requirement fulfilled (yes/no)
pH-value	(20°C)	7,8 – 8,2	–	7,7	Yes
Density g/cm³	(20°C)	1,1 – 1,14	–	1,12	3)
Viscosity mm^2/s	(20°C) (0°C) (-10°C)	– – –	– – –	1,70 2,90 4,73	3)
Refraction index	n^D_{20}	–	–	1,3723	3)
Freezing point	°C 3)	–	–	- 11,3	3)
Sediment before aging after aging	Vol %	 ≤ 0,25 ≤ 1,00	 – –	 0 0	 Yes Yes
Sample dispersible through 180 µm - sieve	(yes/no)	Yes	–	Yes	Yes
Resistance to aging (T_1 = - 25°C; 23°C; 60°C; 23°C 2))		No formation of layers	–	No formation of layers	Yes
Infrared spectrogram		–	–	Annex 1	3)

4.2 Tests in conjunction with a fire extinguisher (clause 4.10 of the procedure instruction)

4.2.1 Details of the fire extinguisher

Type:	6 litres stored pressure fire extinguisher with grip lever armature and Multiplast foam nozzle with diameter 2x 2,8 mm
Nominal Charge:	6 litres (it corresponds with 6,72 kg)
Fire extinguishing medium:	6 liters MABO
Pressure storing:	12 bar N_2 at 20°C in the fire extinguisher container
Specification:	EN 3

1) The lower application temperature has to be at least 5°C more than the freezing point

2) T_1 = freezing point minus 10 °C, if the fire extinguishing medium is declared as freeze resistant.
T_1 = the lower application temperature, if the fire extinguishing medium is not declared as freeze resistant and it has a lower application temperature.

3) No assessment is given because the test norm specifies no requirement for this characteristic value.

4.2.2 Duration of operation, minimum duration (clause 7.1.1 of EN 3-7)

Sample no.		1	2	3
Measured duration of operation	(s)	55,6	56,4	55,1
Minimum required duration of operation (tables 3 to 8)		15		
Compliance with clause 7.1.1	(yes/no)	Yes		

4.2.3 Duration of operation, spread of measurements (clause 7.1.2 of EN 3-7)

Deviation of measured time from average discharge				
Average discharge duration	(s)	55,7		
Sample no.		1	2	3
Deviation of the measured value from the average	(%)	0,2	1,3	1,1
Maximum permissible deviation	(%)	≤ 15		
Compliance with clause 7.1.2	(yes/no)	Yes		

4.2.4 Residual charge (clause 7.2 of EN 3-7)

Sample no.		1	2	3
Determined residual charge	(kg)	0,13	0,04	0,06
Residue as a percentage of the nominal charge *)				
Actual	(%)	1,9	0,6	0,9
Maximum permissible residue	(%)	≤ 10		
Compliance with clause 7.2	(yes/no)	Yes		

*) Nominal charge (kg) for water based fire extinguishers: 6l x 1,12 kg/l = 6,72 kg.

4.2.5 Commencement of discharge (clause 7.3 of EN 3-7)

Sample no.		1	2	3
Measured space of time	(s)	< 1	< 1	< 1
Maximum permissible space of time	(s)	≤ 4		
Compliance with clause 7.3	(yes/no)	Yes		

4.2.6 Effective range of operating temperature (clause 7.4 of EN 3-7)

Temperature cycling		Cycle A		Cycle B	
Sample no.		1	2	3	4
Temperature of start of cycle	(°C)	T_{min}: - 5	T_{min}: - 5	T_{max}: 60	T_{max}: 60
Temperature at and of cycle	(°C)	T_{max}: 60	T_{max}: 60	T_{min}: - 5	T_{min}: - 5
Commencement of discharge after opening control valve					
Measured space of time	(s)	< 1	< 1	< 1	< 1
Maximum permissible space of time	(s)	≤ 10			
Duration of operation					
Measured duration of operation	(s)	55,1	56,4	53,8	63,6
Maximum permissible duration of operation [1]	(s)	≤ 111,4			
Minimum required duration of operation	(s)	≥ 6			
Residual charge					
Determined residual charge	(kg)	0,01	0,02	0,06	0,04
Residue as a percentage of nominal charge [2]		0,1	0,3	0,9	0,6
Maximum permissible residue [3]	(%)	≤ 10			
Compliance with clause 7.4	(yes/no)	Yes			

1) The duration of operation must not be more than twice the value established at 20 °C (except CO_2 fire extinguishers).

2) Nominal charge (kg) for water based fire extinguishers see page 5.

3) 15 % for BC-fire extinguishing powder, 10 % for all other fire extinguishing media.

4.2.7 Class A fire rating (clause 15.2 of EN 3-7)

Test no.		1	2	3
Fire size as per I.2.1 of annex I		21 A		
Moisture of test fire wood: measured average	(%)	15	15	–
Permissible average moisture of fire wood	(%)	10 to 15		
Measured temperature inside test room before ignition	(°C)	12	12	–
Permissible temperature inside test room before ignition	(°C)	0 to 30		
Measured air speed inside test room before ignition	(ms^{-1})	0	0	–
Maximum permissible air speed before ignition	(ms^{-1})	≤ 0,2		
Test fire extinguished	(yes/no)	Yes	Yes	–
Measured time to extinguish test fire	(min:s)	1:55	2:06	–
Maximum permissible extinguishing time [1)]	(min)	7		
Measured O_2 concentration throughout test inside test room	(Vol%)	20,5	20,5	–
Minimum required O_2 concentration throughout test	(Vol%)	≥ 19		
Achieved test fire rating – fire class A		21 A		
Minimum required test fire rating – fire class A [2)]		8 A		
Compliance with clause 15.2	(yes/no)	Yes		

1) Time to extinguish: < 5 min up to 21 A; < 7 min greater than 21 A.
2) As per tables 3 and 4 of clause 6.4.2 of EN 3-7.

4.2.8 Class B fire rating (clause 15.3 of EN 3-7)

Test no.		1	2	3
Fire size as per I.3.1 of annex I		144 B		
Fire test carried out	(indoors / outdoors)	Outdoors		
Measured ambient temperature	(°C)	11	11	–
Permissible ambient temperature	(°C)	0 to 30		
Measured wind speed	(ms^{-1})	1,5	1,5	–
Maximum permissible wind speed	(ms^{-1})	≤ 3		
Test fire extinguished	(yes/no)	Yes	Yes	–
Measured time to extinguish test fire	(s)	98	78	–
Measured reminder of heptane after extinction	(mm)	> 5	> 5	–
Minimum required reminder of heptane after extinction	(mm)	≥ 5		
Achieved test fire rating – fire class B		144 B		
Minimum required test fire rating – fire class B *)		113 B		
Compliance with clause 15.3	(yes/no)	Yes		

*) As per tables 5 to 8 of clause 6.4.3 of EN 3-7.

5. Requirements for marking (clause 4.11 of the procedure instruction)

The marking of the storage containers has to comprise at least the following details and this information has to be permanently marked and legible:

- The words "fire extinguishing medium"
- Trade name
- Storage temperature range - 5 °C to 60 °C
- Required warning information: (e.g. health protection, water protection)
- Filling date
- Manufacturer/distributor

A label draft for marking of the packaging or transport container has not been submitted.

Note the information on page 2 of this test report.

Annex 1: Infrared spectrogram of the fire extinguishing medium MABO (clause 4.9 of the test procedure instruction)