

Test Report No. 7191203965-MEC19/02-RAH
dated 15 Mar 2019



PSB Singapore

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SUBJECT

Testing of portable fire extinguisher submitted by Asiatic Fire System Pte Ltd.

TESTED FOR

Asiatic Fire System Pte Ltd
65 Joo Koon Circle
Singapore 629078

PERIOD OF TEST

01-Oct-2018 to 15-Mar-2019

METHOD OF TEST

SS EN 3-7:2012 - "Characteristics, performance requirements and test methods"

SS EN 3-8:2012 – "Additional requirements to SS EN 3-7 for the construction, resistance to pressure and mechanical tests for extinguishers with maximum allowable pressure equal to or lower than 30bar, - Prototype testing

IDENTIFICATION OF EXTINGUISHER

Type : "KILLFIRE" brand, model "KF-9EN"

Manufacturer : Asiatic Fire System Pte Ltd

Fire extinguisher medium : Fomtec AFFF 6% A, (Foam)

Nominal charge of extinguisher : 9 Litre

Method of pressure storing : Stored pressure type

The test was conducted at TÜV SÜD PSB's fire laboratory located at No. 10, Tuas Avenue 10, Singapore 639134 except for clause 14.1 of SS EN 3-7 and clause 6.3.3 of SS EN 3-8 which was conducted at No.1 Science Park Drive, Singapore 118221.



LA-2007-0380-A LA-2007-0384-G
LA-2007-0381-F LA-2007-0385-E
LA-2007-0382-B LA-2007-0386-C
LA-2007-0383-G LA-2010-0464-D

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

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CONCLUSION OF TEST

Conformity of submitted samples with all applicable clauses of SS EN 3-7 and SS EN 3-8 (yes/no)	Yes
Operation temperature range	5°C to 60°C
Checked working pressure	T_{\min} 11.3 bar / T_{\max} 13.8 bar
Dielectric suitability (applicable only for water based extinguisher)	No
Fire Class(es) intended for	A / B
Fire ratings achieved	13A / 183B

SUPPLEMENTARY INFORMATION

Quantity of samples provided	32 pieces
Date of submission	28-Sep-2018 and 13-Feb-2019

CONFORMITY OF INFORMATION

The extinguisher submitted can be identified from the detailed documentation supplied by the manufacturer comprising:

Annex 1 : Photograph of fire extinguisher label as submitted

Annex 2 : List of document non-included in this report

Annex 3 : Photograph of submitted samples (1 no. of photo)

REPORT

This report comprises 21 pages, including 3 annexes

Only material detailed in this report have been subjected to tests

The summary and checks and tests are given on page 3 to 4

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Rafiq
Engineer

Tan Kim Heng
Assisant Vice President
(Fire Property)
Mechanical



SUMMARY OF CHECK AND TESTS

Item	SS EN 3-7 clause	Description	Applicable (Yes/No)	Conformity (Yes/No)
0a	3.2	Total weight of fire extinguisher	Yes	Yes
0b	3.15	Pressure at operating temperature, PT_{max} / PT_{min}	Yes	Yes
1	4.2	Control of discharge	Yes	Yes
2	4.3	Operating position	Yes	Yes
3	4.4	Hose assembly	Yes	Yes
4	4.5	Propellant	Yes	Yes
5	4.6	Means of checking pressure for stored pressure extinguisher	Yes	Yes
6	6.1	Nominal charge	Yes	Yes
7	6.2	Filling tolerance	Yes	Yes
8	6.3	Design of filling opening, except CO ₂ fire extinguishers	Yes	Yes
9	7.1.1	Duration of operation , minimum charge	Yes	Yes
10	7.1.2	Duration of operation, spread of measurement	Yes	Yes
11	7.2	Residue charge	Yes	Yes
12	7.3	Commencement of charge	Yes	Yes
13	7.4	Temperature cycling	Yes	Yes
14	8.1	Retention of propellant	Yes	Yes
15	8.2	Leakage acceptance level	Yes	Yes
16	9.2	Dielectric test for water based fire extinguishers	No	-
17	10.1	General requirement for use of extinguishers	Yes	Yes
18a	10.2	Operating force for CO ₂ extinguishers	No	-
18b	10.2	Operating force for other extinguishers- 1 st device	Yes	Yes
18c	10.2	Operating force for other extinguishers- 2 nd device	No	-
19	10.3	Safety devices	Yes	Yes
20	10.4	Filter for water based extinguishers	Yes	Yes
21a	10.5	Hose and coupling systems,for CO ₂ extinguishers	No	-
21b	10.5	Hose and coupling systems,for other extinguishers	Yes	Yes
22a	10.6	Control valve, for CO ₂ extinguishers	No	-
22b	10.6	Control valve, for 1 and 2kg powder extinguishers	No	-
22c	10.6	Control valve, for other extinguishers	Yes	Yes



SUMMARY OF CHECK AND TESTS (continued)

Item	SS EN 3-7 clause	Description	Applicable (Yes/No)	Conformity (Yes/No)
23	11.1.1	Pressure gauge	Yes	Yes
24	11.1.2	Pressure gauge scale	Yes	Yes
25	11.1.3	Pressure gauge error after cycling	Yes	Yes
26	11.1.4	Compatibility of pressure gauge materials	Yes	Yes
27	11.2	Pressure indicator	No	-
28	12.1	Hose / Horn for CO ₂ extinguishers	No	-
29	12.2	Horn resistance to static load	No	-
30	12.3	Security of horn / hose fixing	No	-
31	12.4	Horn resistance to temperature	No	-
32	13	Mounting bracket	Yes	Yes
33	14.1	Resistance to external corrosion	Yes	Yes
34	14.2	Resistance to internal corrosion	Yes	Yes
35	15.2	Class A fire rating	Yes	Yes
36	15.3	Class B fire rating	Yes	Yes
37	15.3	Class B polar solvent	No	-
38	15.4	Class F fire rating	No	-
39	16.1	Extinguisher identification, color	Yes	Yes
40	16.2	Marking	Yes	Yes

Item	SS EN 3-8 clause	Description	Applicable (Yes/No)	Conformity (Yes/No)
41	6.3.2	Burst test under pressure	Yes	Yes
42	6.3.3	Mechanical strength crushing test	Yes	Yes
43	6.3.4	Pressure test, bodies fitting and assemblies	Yes	Yes
44	6.3.5	Pressure test – pressure gauge and pressure indicators	Yes	Yes
45	6.3.6	Macroscopic examination of the body	Yes	Yes
46	6.4	Overfilled pressure test	No	-
47	6.5	Resistance to impact	Yes	Yes
48	9.2	Marking on body	Yes	Yes
49	9.3	Marking on extinguisher	Yes	Yes

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0a. Total weight of fire extinguisher (EN 3-7:2004+A1:2007, clause 3.2)

Actual weight	(kg)	14.0
Required weight	(kg)	≤ 20
Conformity to clause 3.2 (yes/no) : Yes		

0b. Pressure at operating temperature, PT_{max} / PT_{min} (EN 3-7:2004+A1:2007, clause 3.15)

Declared operating temperature	(°C)	5 to 60	
Declared by manufacturer PT_{max}	(bar)	14	-
Test temperature	(°C)	T_{max}	T_{min}
		60	5
Measured pressure	(bar)	13.8	11.3
Conformity to clause 3.15 (yes/no) : Yes			

1. Control of discharge (EN 3-7:2004+A1:2007, clause 4.2)

Provision of device to interrupt discharge	(yes/no)	Yes
Self closing device	(yes/no)	Yes
Conformity to clause 4.2 (yes/no) : Yes		

2. Operating position (EN 3-7:2004+A1:2007, clause 4.3)

Operation without inversion	(yes/no)	Yes
Operating device location conform to requirements	(yes/no)	Yes
Conformity to clause 4.3 (yes/no) : Yes		

3. Hose assembly (EN 3-7:2004+A1:2007, clause 4.4)

Nominal charge	(l)	9
Requirement for hose	(yes/no)	Yes
Length of actual flexible hose fitted (≥ 400 / ≥ 250)	(mm)	545
Conformity to clause 4.4 (yes/no) : Yes		

4. Propellants (EN 3-7:2004+A1:2007, clause 4.5)

Type of propellant (to be checked by documentation)	Nitrogen	
Tracer for leakage detection	(yes / no)	No
Conformity to clause 4.5 (yes/no) : Yes		

5. Means of checking pressure for stored pressure extinguishers
(EN 3-7:2004+A1:2007, clause 4.6)

Means for checking the pressure available	(yes/no/not applicable)	Yes
Type of pressure check	(pressure gauge/indicator/connection)	Pressure gauge
Conformity to clause 4.6 (yes/no) : Yes		

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6. Nominal charges (EN 3-7:2004+A1:2007, clause 6.1)

Actual nominal charge of the extinguisher	(l)	9
Conformity to clause 6.1 (yes/no) : Yes		

7. Filling tolerances (EN 3-7:2004+A1:2007, clause 6.2)

Sample	1	2	3	4
Measured charge (litre)	9.00	8.99	8.97	9.00
Deviation from nominal (%)	0	-0.2	-0.3	0
Maximum allowable tolerance (%)	+0, - 5			
Conformity to clause 6.2 (yes/no): Yes				

8. Design of filling opening, excluding CO₂ fire extinguishers (EN 3-7:2004+A1:2007, clause 6.3)

Provision to vent pressure	(yes/no)	Yes
Pressure released within one third of complete disassembly	(yes/no)	Yes
Measured diameter of filling opening	(mm)	27.3
Minimum required diameter	(mm)	≥ 25
Conformity to clause 6.3 (yes/no): Yes		

9. Duration of operation, minimum duration (EN 3-7:2004+A1:2007, clause 7.1.1)

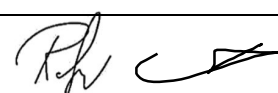
Sample	1	2	3
Measured duration of operation (s)	43.6	48.6	49.0
Required duration of operation (s)	≥ 15		
Conformity to clause 7.1.1 (yes/no): Yes			

10. Duration of operation, spread of measurement (EN 3-7:2004+A1:2007, clause 7.1.2)

Deviation of measured time from average discharge duration			
Average discharge duration (s): 47.1			
Sample	1	2	3
Actual Deviation (%)	-7.4	+3.2	+4.2
Required Deviation (%)	≤ 15		
Conformity to clause 7.1.2 (yes/no): Yes			

11. Residue charge (EN 3-7:2004+A1:2007, clause 7.2)

Nominal charge of fire extinguisher: 9 litre			
Sample	1	2	3
Determined residue charge (kg)	0.15	0.35	0.41
Residue as a percentage of nominal charge			
Actual residue (%)	1.7	3.8	4.6
Maximum permissible residue (%)	≤ 10		
Conformity to clause 7.2 (yes/no): Yes			





12. Commencement of discharge (EN 3-7:2004+A1:2007, clause 7.3)

Sample	1	2	3
Commencement of discharge measured (%)	< 1	< 1	< 1
Commencement of discharge required (%)	≤ 4		
Conformity to clause 7.3 (yes/no): Yes			

13. Effective range of operating temperature (EN 3-7:2004+A1:2007, clause 7.4)

Temperature cycling	Cycle A		Cycle B	
Sample	1	2	3	4
Temperature at start of cycle (°C)	T _{min} :5	T _{min} :5	T _{max} :60	T _{max} :60
Temperature at end of cycle (°C)	T _{max} :60	T _{max} :60	T _{min} :5	T _{min} :5
Commencement of discharge, actual (s)	< 1	< 1	< 1	< 1
Commencement of discharge, required (s)	≤ 10			
Duration of operation, actual (s)	45.3	43.8	46.9	56.0
Maximum duration of operation, required (s)	94.2 ^a			
Minimum duration of operation,required (s)	≥ 6			
Duration of operation of CO ₂ , actual (s)	Not applicable		Not appllicable	
Maximum duration of operation for CO ₂ , required (s)	Not applicable ^b		Not applicable ^c	
Residue charge, actual (%)	0.6	0.5	1.5	1.5
Residue charge, required (%)	≤ 10 ^d			
Conformity to clause 7.4(yes/no): Yes				

^a : The maximum duration of operation shall be not more than twice the value established at a temperature of 20°C for all extinguishers except CO₂.

^b : For CO₂ tested at T_{max}, the duration of operation shall be less or equal than the duration measured at 20°C

^c : For CO₂ tested at T_{min}, the duration of operation shall be less or equal to 2.5 times than the duration measured at 20°C

^d : Maximum 15% for BC powder, maximum 10% for all other agents

14. Verification of retention of propellant (EN 3-7:2004+A1:2007, clause 8.1)

Periodic verification of propellant possible	(yes/no)	Yes
Verification method	(by weighing / by pressure)	By pressure
Verification device	(connection / gauge / indicator)	Gauge
Conformity to clause 8.1 (yes/no) : Yes		

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15. Leakage acceptance level (EN 3-7:2004+A1:2007, Clause 8.2)

Sample	1	2
Stored pressure extinguisher		
Actual leakage ^a (%)	0	0
Required rate of leakage (%/year)	≤ 6	
Extinguisher and/or gas cartridges checked by weighing	Not applicable	
Actual leakage ^b (%)	-	-
Required rate of leakage (% wt /year)	≤ 5	
Gas cartridge extinguishers:	Not applicable	
Actual leakage ^c (%)	-	-
Required rate of leakage (cm ³ /min/kg/l)	≤ 5	
Conformity to clause 8.2 (Yes/No) :Yes		

^a : For stored pressure extinguishers, ≤6% of the expanded free gas volume at 20°C

^b : For propellant cartridges and CO₂ extinguishers, ≤5% of the nominal charge

^c : For gas cartridge extinguishers, gas leakage of ≤5 cm³/(minute or Kg or litre of charge of the extinguisher)

16. Dielectric test, for water based extinguishers (EN 3-7:2004+A1:2007, clause 9.2)
– Not applicable

17. General requirement for use of extinguishers (EN 3-7:2004+A1:2007, clause 10.1)

Capable to use the extinguisher without mounting, removal or modifying of any component except for the safety device (yes/no)	Yes
Conformity to clause 10.1 (yes/no) : Yes	

18. a) Operating for CO₂ extinguisher (EN 3-7:2004+A1:2007, clause 10.2) – Not applicable

18. b) Operating force for other extinguisher (EN 3-7:2004+A1:2007, clause 10.2)

1st Device

Activation without repetition of action (yes/no): Yes					
Force for activated the extinguisher Sample		at T _{min} 5°C		at T _{max} 60°C	
		1	2	3	4
Measure force to activate finger trigger	(N)	Not applicable		Not applicable	
Maximum permissible force to activate finger trigger	(N)	≤ 100			
Measured force to activate squeeze grip trigger	(N)	38.9	46.2	32.1	21.7
Maximum permissible force to activate squeeze grip trigger	(N)	≤ 200			
Measured force to screw down hand wheel ^a	(N)	Not applicable		Not applicable	
Maximum permissible force to screw down hand wheel ^a	(N)	≤ 100			
Measured energy to strike knob	(N)	Not applicable		Not applicable	
Maximum permissible energy to strike knob	(N)	≤ 2			
Conformity to clause 10.2 (yes/no): Yes					

^a Measured at outside the wheel. Maximum of 360° rotation to full open position





18. c) Operating force for other extinguisher (EN 3-7:2004:A+1:2007, clause 10.2) 2nd device
– Not applicable

19. Safety devices (EN3-7:2004+A12007, clause 10.3)

Release of safety device distinct from operating mechanism (yes/no): Yes					
Removal of safety device can be seen (yes/no): Yes					
Force to release safety device at temperature	at T _{min} 5°C		at 20°C	at T _{max} 60°C	
Sample	1	2	3	4	5
Measured force (N)	21	22	38	99	23
Pemissible force (N)	20 to 100				
Unaided attempt to initiate discharge without release of safety device					
Sample			1	2	
Deformation or damage of operating mechanism in case of double force (yes/no)			No	No	
Conformity to clause10.3 (yes/no): Yes					

20. Filter for water based extinguishers (EN 3-7:2004+A1:2007, clause 10.4)

Filter position upstream of smallest orifice	(yes/no)	yes
Area of each filter orifice smaller than smallest area of the discharge passage	(yes/no)	yes
Area of smallest orifice in discharge passage	(mm ²)	0.5
Total area of orifices	(mm ²)	94.5
Total filter area 8 times larger than the smallest orifice area	(yes/no)	yes
Filter accessible for maintenance	(yes/no)	yes
Conformity to clause 10.4 (yes/no) : Yes		

21. a) Hose and coupling systems, for CO₂ extinguisher (EN 3-7:2004+A1:2007, clause 10.5)
Not applicable

21. b) Hose and coupling systems, for other extinguisher (EN 3-7:2004+A1:2007, clause 10.5)

Burst pressure of hose (bar) at T _{min} , 20°C and T _{max} (°C)					
Sample	1	2	3	4	5
Measured test temperature (°C)	20	60	60	5	5
Required test temperature (°C)	20 ± 5	T _{max} 60± 2		T _{min} 5± 2	
Measured burst pressure (bar)	80	70	70	85	85
Minimum required burst pressure (bar)	41 [≥ 3 x P(T _{max})]	28 [≥ 2 x P(T _{max})]			
Functional throughout operating temperature range (yes/no) : Yes					
Coupling system design and fitted in a way that they cannot damage the hose (yes/no) : Yes					
Conformity to clause 10.5 (yes/no) : Yes					

22. a) Control valve, for CO₂ extinguishers (EN 3-7:2004+A1:2007, clause 10.6.1, 10.6.4)
– Not applicable

22. b) Control valve, for 1 and 2 kg powder extinguisher (EN 3-7:2004+A1:2007, clause 10.6.1, 10.6.3)
– Not applicable

22. c) Control valve, for other extinguishers (EN 3-7:2004+A1:2007, clause 10.6.1 and 10.6.2)

Equipped with self-closing discharge valve (yes/no): Yes		
Sample	1	2
Initial pressure before discharge (P ₁) (bar)	11.4	11.5
Average duration of operation of extinguisher (T ₂) (s)	47.1	
Measured discharge duration (T ₁) (s)	2.63	2.70
Actual ratio of T ₁ – T ₂ (%)	5.6	5.7
Permissible ratio of T ₁ – T ₂ (%)	5 to 15	
Remaining pressure (P ₂) measured within 10s of completion of partial discharge (bar)	7.2	7.3
Remaining pressure (P ₃) measured after 5 min of completion of partial discharge (bar)	7.2	7.3
Actual ratio of P ₃ – P ₁ (%)	63.2	63.5
Permissible ratio P ₃ – P ₁ (%)	≥ 50	
Actual ratio of P ₃ – P ₂ (%)	100	100
Permissible ratio P ₃ – P ₂ (%)	≥ 80	
Conformity to clause 10.6.1 & 10.6.2 (yes/no) : Yes		

23. Pressure gauge (EN 3-7:2004+A1:2007, clause 11.1.1)

Pressure gauge present (yes/no)	Yes
Capable of being checked on good working order with an external pressure (yes/no/not applicable)	Yes
Conformity to clause 11.1.1 (yes/no): Yes	

24. Pressure gauge (EN 3-7:2004+A1:2007, clause 11.1.2)

Calibrated scale in bars (yes/no)	Yes
Zero zone (yes/no)	Yes
End stop on zero zone (yes/no)	No
End stop at negative pressure side of zero zone (yes/no)	NA
Pointer contact end stop (yes/no)	NA
Green zone between operating pressure (yes/no)	Yes
Tolerance of -15% for pressure at T_{min} (yes/no)	Yes
Tolerance of +6% for pressure at T_{max} (yes/no)	Yes
Pressure round off to full or half bar (yes/no)	Yes
Side zones of green zone colored red (yes/no)	Yes
Operating pressure at 20°C indicated (yes/no)	Yes
Scale length $\geq 1.5 \times$ length from zero to high pressure end of green zone (yes/no)	Yes
Pointer radially into green zone with length of between 50% and 8% of green zone height (yes/no)	Yes
Position of pointer clearly visible at ends of green zone and at operating pressure at 20°C (yes/no)	Yes
Conformity to 11.1.2 (yes/no): Yes	





25. Pressure gauge error after cycling (EN 3-7:2004+A1:2007, clause 11.1.3)

Sample	Initial			After 1000 cycles		
	1	2	3	1	2	3
Beginning of green zone (bar)	9.8	9.9	9.7	10.0	10.1	9.8
Error ≤ 1 bar (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes
End of green zone (bar)	14.4	14.4	14.7	14.6	14.5	14.8
Error $\pm 6\%$ (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes
Operating pressure at 20°C (bar)	12.0					
Indication at 20°C (bar)	12.1	12.1	12.1	12.2	12.2	12.1
Error ± 0.5 bar (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes
Conformity to clause 11.1.3: (yes/no): Yes						

26. Compatibility of pressure gauge materials (EN 3-7:2004+A1:2007, clause 11.1.4)

Gauge material compatible with extinguishing medium and propellant (yes/no): Yes
Conformity to clause 11.2 (yes/no): Yes

27. Pressure Indicator (EN 3-7:2004+A1:2007, clause 11.2) – **Not applicable**

28. Horn resistance to static load (EN 3-7:2004+A1:2007, clause 12.1) – **Not applicable**

29. Horn resistance to static load (EN 3-7:2004+A1:2007, clause 12.2) – **Not applicable**

30. Security of horn / hose fixing (EN 3-7:2004+A1:2007, clause 12.3) – **Not applicable**

31. Horn resistance to temperature (EN 3-7:2004+A1:2007, clause 12.4) – **Not applicable**

32. Mounting bracket (EN 3-7:2004+A1:2007, clause 13)

Easy removal extinguisher from bracket (yes/no)	Yes
Method of removal is obvious (yes/no)	Yes
Capable of supporting twice the total mass of extinguisher without permanent damage (yes/no)	Yes
Conformity to clause 13 (yes/no) : Yes	

33. Resistance to external corrosion (EN 3-7:204A1+2007, clause 14.1)

Observations after the salt spray test as per H.1 of Annex H:		
Sample	1	2
Operating force for CO ₂ extinguisher clause 10.2 (yes/not applicable)	Not applicable	
Measured force to activate operating device (N)	-	-
Maximum permissible force to activate operating device (N)	≤ 200	
Operating force for other extinguishers clause 10.2 (yes/not applicable)	Not applicable	
Measured force to activate finger trigger (N)	Not applicable	
Maximum permissible force to activate finger trigger (N)	≤ 100	
Measured force to squeeze grip lever (N)	43.0	43.3
Maximum permissible force to squeeze grip lever (N)	≤ 200	
Measured force to screw down hand wheel (N)	Not applicable	
Maximum permissible force to screw down hand wheel (N)	≤ 100	
Measure energy to strike knob (J)	Not applicable	
Maximum permissible energy to strike knob (J)	≤ 2	
Force to release safety device – clause 10.3		
Measured force to release safety device (N)	98.0	74.6
Permissible force to release safety device (N)	20 to 100	
Duration of operation – clause 7.1.2:		
Measured duration of operation (s)	44.1	47.3
Average discharge duration (see item 10) (s)	47.1	
Deviation of measured value from the average (%)	-6.4	+0.4
Maximum permissible deviation (%)	± 25	
Pressure gauge or pressure indicator indicates no pressure after pressure release (yes/no/not applicable)	Yes	Yes
Burst pressure of hose – clause 10.5 ⁽¹⁾ (yes/no)	Not applicable	
Measured burst pressure (bar)	-	-
Minimum required burst pressure (bar)	-	
Burst pressure of hose – clause 10.5 ⁽²⁾ (yes/no)	Yes	
Measured burst pressure (bar)	80	80
Minimum required burst pressure (bar)	21	
Corrosion of metal likely to impair the operation or safety of the fire extinguisher (yes/no)	No	
Conformity to Clause 14.1 (yes/no) : Yes		

⁽¹⁾CO₂ extinguishers: $\geq 1.5 \times P(T_{max})$; $P(T_{max})$ see item 21

⁽²⁾Other extinguishers: $\geq 3 \times P(T_{max})$; $P(T_{max})$ see item 21





34. Resistance to internal corrosion (EN 3-7:2004+A1:2007, Clause 14.2)

Observations after the salt spray test as per H.2 of Annex H:			
Sample		1	2
Evidence of corrosion	(yes/no)	No	No
Detachment of protective coating	(yes/no)	No	No
Cracking of protective coating	(yes/no)	No	No
Bubbling of protective coating	(yes/no)	No	No
Change of colour of agent ^a	(yes/no)	No	No
Conformity to clause 14.2 (yes/no): Yes			

^a Except for change resulting from thermal cycling

35. Class A fire rating (EN 3-7:2004+A1:2007, clause 15.2)

Test No		1	2	3
Fire size		13A		
Moisture content of wood:				
Measured average	(%)	15	15	-
Permissible average	(%)	10 to 15		
Measured ambient condition within test room	(°C)	29	29	-
Permissible temperature within the test room before ignition	(°C)	0 to 30		
Measured oxygen concentration throughout test	(%)	19.8	19.8	-
Minimum required oxygen concerntration throughout	(%)	≥ 19		
Test fire extinguished	(yes/no)	Yes	Yes	-
Measured time to extinguished test fire	(min:s)	2:59	2:31	-
Maximum permissible extinguishing time ⁽¹⁾	(min)	≤ 5		
Achieved test fire rating – Class A	-	13A		
Minimum required fire rating ^(a)	-	13A		
Conformity to clause 15.2 (yes/no):Yes				

^(a) As per tables 3 or 4 of clause 6.4.2

⁽¹⁾ ≤ 5 min for fires ≤ 21A & ≤ 7 min for fires ≥ 27A



36. Class B fire rating (EN 3-7:2004+A1:2007 clause 15.3)

Test No	1	2	3
Fire size	183B		
Fire test carried out (In door / Out door)	outdoor		
Measured ambient temperature (°C)	29	29	-
Permissible ambient temperature (°C)	0 to 30		
Measured wind speed (if outdoor) (m/s)	<3	<3	-
Maximum permissible wind speed (m/s)	≤ 3		
Test fire extinguished (yes/no)	Yes	Yes	-
Measure time to extinguished test fire (min:s)	0:22	0:19	-
Measured depth of heptane after extinction (mm)	>5	>5	-
Minimum required reminder of heptane after extinction (mm)	≥ 5		
Achieved test fire rating – Class B	-	183B	
Minimum required test fire rating – Class B ^a	-	183B	
Conformity to clause 15.3 (yes/no): Yes			

^(a) As per table 5,6,7,or 8 of clause 6.4.3

37. Class B – Polar solvent fire test (EN 3-7:2004+A1:2007,15.3) - **Not applicable**

38. Class F fire rating (EN 3-7:2004+A1:2007,clause 15.4) – **Not applicable**

39. Fire extinguisher identification,colour (EN 3-7:2004+A1:2007, clause 16.1)

Colour of extinguisher body red RAL 3000	(yes/no)	Yes
Colour coded for extinguishant	(yes/no)	Yes
Coded area ≤ 10% of body surface area	(yes/no)	Yes
National regulation for colour code extinguishant applicable	(yes/no)	Yes
Conformity to Clause 16.1 (yes/no) : Yes		

40. Marking (EN 3-7:2004+A1:2007, clause 16.2)

Conformity to Clause 16.2 (yes/no) : Yes
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41. Prototype testing, burst test under pressure (EN 3-8:2006, Clause 6.3.2)

Sample	1	2	3	4	5
Marked applied (yes/no)	Yes	Yes	Yes	Yes	Yes
Pressure at maximum operating temperature, $P_{T_{max}}$ (bar)	13.8				
Bursting pressure (P_r)					
Measured (bar)	95	100	95	100	95
Required ⁽¹⁾ (bar)	≥ 55				
- fragmentation (yes/no)	No	No	No	No	No
- main break showing sign of brittleness (yes/no)	No	No	No	No	No
- material defect shown (yes/no)	No	No	No	No	No
- break originates in marking area, brazed joint, weld of body (yes/no)	No	No	No	No	No
Conformity to clause 6.3.2 (yes/no) : Yes					

⁽¹⁾ The bursting pressure P_r shall not be less than 2.7 times the maximum allowable pressure PS subjected to a minimum of 55bar

42. Mechanical strength crushing test (EN 3-8:2006, Clause 6.3.3)

Diameter of body	(mm)	180				
Longitudinal weld	(yes/no)	No				
Traverse weld	(yes/no)	Yes				
Actual angle to the support	(°)	45°				
Required angle to the support	(°)	45°				
Sample		1	2	3	4	5
Duration of crushing procedure						
Actual	(s)	30	30	30	30	30
Required	(s)	30 to 60				
Deformation after crushing procedure						
Actual	(mm)	18.0	18.0	18.0	18.0	18.0
Required ^a	(mm)	18 ± 1.8				
Pressure test						
Actual	(bar)	20	20	20	20	20
Required ^b	(bar)	≥ 20				
Cracks or leaks	(yes/no)	No	No	No	No	No
Conformity to clause 6.3.3 (yes/no): Yes						

^a $10 \pm 1\%$ of cylinder external diameter

^b $1.43 \times P(T_{max})$ or 20 bar minimum



43. Pressure test – bodies, fittings and assemblies (EN 3-8:2006, Clause 6.3.4)

Pressure at maximum operating temperature $P(T_{\max})$: 13.8					
Sample	1	2	3	4	5
Applied pressure (bar)	30	30	30	30	30
Required pressure ⁽¹⁾ (bar)	≥ 20				
Test pressure duration					
Measured duration (s)	30				
Required duration (s)	≥ 30				
Measured increase in body volume (%)	0	0	0	0	0
Permitted increase in volume (%)	≤ 1				
Fitting shall remain tight and show no dangerous defect (yes/no)	Yes	Yes	Yes	Yes	Yes
Test on assembly					
Assembly shall remain tight and show no dangerous defect (yes/no)	Yes	Yes	Yes	Yes	Yes
Conformity to clause 6.3.4 (yes/no): Yes					

⁽¹⁾ $1.43 \times P(T_{max})$ or 20 bar minimum

44. Pressure test – pressure gauges and pressure indicators (EN 3-8:2006, clause 6.3.5)

Sample	1	2	3	4	5
Pressure at maximum operating temperature $P(T_{max})$ (bar)	13.8				
Test pressure (bar)	35	35	35	35	35
Actual test pressure (bar)	35	35	35	35	35
Required test pressure ⁽¹⁾ (bar)	≥ 34.5				
Visible leak (yes/no)	No	No	No	No	No
Ejection of any component (yes/no)	No	No	No	No	No
Conformity to clause 6.3.5 (yes/no): Yes					

⁽¹⁾ $\geq 2.5 \times P(T_{max})$

45. Macroscopic examination of the body (EN 3-8:2006, clause 6.3.6)

Sample	1	2	3	4	5
Complete fusion (yes/no)	Yes	Yes	Yes	Yes	Yes
Visible defects (yes/no)	No	No	No	No	No
Microscopic examination required (yes/no)	No	No	No	No	No
Conformity to clause 6.3.6 (yes/no): Yes					

46. Overfill pressure test, for water based cartridge only (EN 3-8:2006, Clause 6.4)
– Not applicable





47. Resistance to impact (EN 3-8:2006, Clause 6.5)

Sample		1	2	3	4
Actual test temperature	°C	+5		+60	
Required test temperature	°C	$TS_{min} 5 \pm 2$		$TS_{max} 60 \pm 2$	
Orientation of sample [Vertical (V) / Horizontal (H)]		V	H	V	H
Evidence of bursting , breakage or ejection of components. No dangerous leaks are acceptable	(yes/no)	No	No	No	No
Conformity to clause 6.5 (yes/no): Yes					

48. Marking – body (EN 3-8:2006, Clause 9.2)

Mark of the body manufacturer as registered for identification	(yes/no)	Yes
Serial or batch number	(yes/no)	Yes
Year of manufacture	(yes/no)	Yes
Test pressure in bar, with letters PT before and followed by "BAR" or "bar"	(yes/no)	Yes
Conformity to clause (yes/no): Yes		

49. Marking - extinguisher (EN3-8:2006, clause 9.3)

Mark of the body manufacturer as registered,for identification	(yes/no)	Yes
serial or batch number	(yes/no)	Yes
year of manufacture	(yes/no)	Yes
working pressure at 20°C	(yes/no)	Yes
capacity/size of gas cartridge (gas cartridge only)	(yes/no)	NA
identification of propellant gas	(yes/no)	Yes
operating temperature range of the extinguisher assembly	(yes/no)	Yes
test pressure in bar, with letters PT before and followed by "BAR" or "bar"	(yes/no)	Yes
Conformity to clause 9.3 (yes/no): Yes		

Ph *CD*



Annex 1: Photograph of fire extinguisher label as submitted



Handwritten signature



Annex 3: List of document not included in this report, but registered by the laboratory

- Assembly drawing for Model KF-9EN, dated Oct-2018
- Dip tube drawing for Model KF-9EN, dated Nov-2018
- Nitrogen MSDS dated Aug-2018
- Fomtec AFFF 6% A safety data sheet
- Fomtec AFFF 6% A certificate



PH *CS*

Annex 4: Photograph of portable fire extinguisher as submitted (label as per annex 2)



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