



Certificate of Conformity

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Product designation

Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems

(Refer to the Schedule/enclosures for further specified details)

Agent/distributor

Fire Protection Technologies Pty Ltd
Unit 1 / 251 Ferntree Gully Road, MT WAVERLEY, VIC, AUSTRALIA, 3149

Registrant

Fike® Corporation
704 SW 10th Street, BLUE SPRINGS, MISSOURI, UNITED STATES, 64015

Producer

Fike® Corporation
704 SW 10th Street, BLUE SPRINGS, MISSOURI, UNITED STATES, 64015

Conformance criteria and evaluation

The Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems have been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. SSL Appraisal Specification FAS-102, Version 1.0, 'Gaseous Extinguishing Systems'.

Limitations/conditions of conformance

Limitations/conditions of conformance, where identified on this certificate, are derived from qualifications from evaluation(s) for conformity and/or other related technical documentation. All details with respect to design, assembly and installation instructions and restrictions should be checked against the producer's current technical manual/data sheets and the requirements of the Authority having Jurisdiction.

Specified limitations/conditions, determined from the evaluation for conformity, include the following.

1. The design and installation of Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems shall only be undertaken by organisations accredited by Fike U.S.A. or the nominated distributor. Where the system is to be designed by organisations that have not undertaken formal training, all design criteria and documentation shall be submitted for analysis and review.

(Limitations/conditions of conformance continue)

This certification is issued within the scope of CSIRO Verification Services – Rules governing ActivFire Scheme and is valid only for the product(s) as submitted for evaluation and verification of conformity, subject to the following conditions.

- Reference to details, limitations and requirements, where documented as a schedule/enclosure with this certificate.
- The Registrant is responsible for their attestation of conformity and ensuring that on-going production complies with the conformance criteria defined in this certificate.
- This certificate will not be valid if any changes or modifications are made to the product which have not been notified and validated by CSIRO Verification Services.
- This certificate is subject to periodical re-validation upon verification that all requirements, as determined by the conformity assessment body, continue to be satisfactorily met by the Registrant.
- This certificate may only be reproduced in its published form, without modification and inclusive of all schedules/enclosures.
- Any changes, errors or omissions, must be submitted in writing and if necessary or requested, substantiated with relevant evidence.
- Any representations, such as advertising or other marketing related activities or articles shall reflect the correct contents of this certificate and conform with all relevant trade practices and consumer protection legislation and regulations.
- Any terms or conditions of use as applicable to content and documentation as published or accessed through web sites administered by the CSIRO Verification Services.

Issued by

David Whittaker
Executive Officer – ActivFire Scheme



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2. System design and installation shall be fully in accordance with the practices prescribed in the Fike Design, Installation, Operation, and Maintenance Manuals, Parts Nos. 06-200 and 06-202, for the pre-engineered and engineered systems respectively. In particular, the maximum nozzle coverage areas, volumes, and enclosure dimensions prescribed in the above manuals shall not be exceeded.
3. HFC-227ea is a known anaesthetising and cardiac-sensitising substance, when inhaled. People with lung or heart dysfunction (e.g. emphysema or coronary artery disease, respectively) should not be exposed to extinguishing concentrations of HFC-227ea, as the effects on their immediate health are uncertain.
Such people should therefore not be exposed to normal extinguishing concentrations of HFC-227ea for more than one (1) or two (2) minutes, and should not undertake any physical exertion during such exposure.
4. Specified conditions include the following:
 - i. that there is no future objection to the use of HFC-227ea by the Commonwealth of Australia or State environmental or OH & S authorities.
 - ii. that HFC-227ea cylinder filling is done using procedures, equipment, and facilities equivalent to those of National Fire & Security, Lidcombe, NSW, Australia.
 - iii. that systems are designed, commissioned, and maintained in accordance with the findings of SSL report XL1092/R1.
 - iv. that commissioning tests, where required, shall be carried out on Fike Series 70 HFC-227ea installations to confirm the following:-
 - that the non-fire post-discharge HFC-227ea concentration will not exceed 10.5% v/v.
 - that the design concentration will be reached in not more than 30 seconds after initiation of discharge.
 - that a time delay of 20 to 30 seconds is provided to allow occupant evacuation before discharge commences.
 - v. that all fire and evacuation alarms, interlocks and signage complies with the relevant Australian installation design standards.
 - vi. that all Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems installed from the issue date of SSL report XL1092/R1, are modified to conform with Underwriters Laboratories Inc. and Factory Mutual Research Corporation equipment test requirements and Standards Australia design, installation and commissioning standards, should the future release of such documents necessitate changes to these Fike HFC-227ea systems.

Producer's description

The Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems and methods of actuation are typical of most gaseous total-flood type fire-suppression systems. Upon a signal from a fire detection system, or by manual operation, a valve or valves is/are opened, gas is released from the storage cylinder(s) and is reticulated via a pipework system and nozzles into a protected enclosure.

The storage cylinder valve is a less-common type employing a pre-scored rupture disc which is actuated by an electrically-ignited pyrotechnic device containing "smokeless gunpowder" and described as a "Gas Cartridge Actuator" (GCA). Fike Gas Cartridge Actuators must be handled and installed only by persons trained to do so by Fike U.S.A. or the nominated distributor.

The HFC-227ea agent is a pure hydrofluorocarbon compound known as "heptafluoropropane". Two trade names have been established for the chemical Heptafluoropropane, HFC-227ea; FM-200® and FE-227™. FM-200® is manufactured in the U.S.A. by Great Lakes Chemical Corporation. FE-227™ is manufactured in the U.S.A. by DuPont. The Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems, designed using the Fike Flow Calibration Software Program, have approval from Underwriters Laboratories (UL) and Factory Mutual Research Corporation (FMRC) to operate with gas from either supplier.

The HFC-227ea principle of suppression is physical cooling with some chemical cooling effects. These are respectively due to evaporation of the droplets of liquid agent discharged by the nozzles, and the thermochemical dissociation of some of the HFC-227ea that contacts the fire.

Like all gaseous agents, HFC-227ea can be used on all classes of fires, although care needs to be taken with Class C fires, and special provisions need to be made for deep-seated fires in Class A combustibles.

Technical specification

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The following details are a representative extract of the technical specification for the Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

Based on the Fike Series 70 HFC-227ea systems product manual, and Australian Standard AS 4214-1995, the design objectives of Fike Series 70 HFC-227ea systems should be as follows:

Typical design concentrations

Electrical control & distribution cubicles	550 grams/m ³ (7.0% HFC-227ea at 20°C)
Computer rooms	550 grams/m ³ (7.0% HFC-227ea at 20°C)

NOTE:

No system in an occupied area shall exceed 855 grams/m³ (10.5% v/v HFC-227ea at 20°C).

Maximum time to reach design concentration	30 seconds
Maximum duration of agent discharge	10 seconds
Minimum duration of agent discharge	6 seconds
Holding performance	Minimum of 80% of design concentration at 10 minutes after commencement of discharge.

Supplementary information

The components that have been evaluated and form part of the listed system include the following.

(a) Gas storage cylinders and valve assemblies

Part num. 70-089	Cylindrical, horizontal/upright, 35 lb., 15.61 litres
Part num. 70-022	Cylindrical, horizontal/upright, 60 lb., 26.10 litres
Part num. 70-088	Cylindrical, upright, 100 lb., 40.53 litres
Part num. 70-041	Spherical, inverted, 125 lb., 51.47 litres
Part num. 70-077	Spherical, inverted, 215 lb., 90.67 litres
Part num. 70-087	Cylindrical, upright, 215 lb., 87.14 litres
Part num. 70-086	Cylindrical, upright, 375 lb, 152.00 litres
Part num. 70-083	Cylindrical, upright, 650 lb, 263.47 litres
Part num. 70-090	Cylindrical, upright, 1000 lb, 406.44 litres
Note: listing of these containers covers use in engineered and pre-engineered systems	
Part num. 70-098	Cylindrical, horizontal or upright, 20 lb. nom. size, 8.65 litres WC
Note: Listing of this container does not cover pre-engineered system use	
Victorian Government approved maximum working pressure is 3.45 MPa at 65°C.	
Part num. 70-1651	Fike gas cartridge actuator
Part num. 85-023	Fike container reload kit
Part num. 85-023	Fike container reload kit
Part num. 85-023	Fike container reload kit

(b) Liquid level indicators and pressure gauges/switches

Fike liquid level indicators	
Part num. 02-2394-11	125 lb. spherical inverted container
Part num. 02-2394-15	215 lb. cylindrical upright and spherical inverted containers
Part num. 02-2394-22	100 lb. cylindrical upright container
Part num. 02-2394-24	375 lb. cylindrical upright container
Part num. 02-2394-38	650 lb. cylindrical upright container
Part num. 02-2394-44	1000 lb. cylindrical upright container
Part num. 70-1351	Fike liquid level plug
Part num. 02-1382.	Fike low pressure switch (Klixon Part num. 20ps022ea320r272k)
Fike Part num. 02-1395	Tee for low pressure switch
Part num. 02-3594	Fike pressure gauge, FM-200®

(c) Cylinder mounting accessories

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Part num. 70-1197	Fike floor-mounting kit	125 lb. spherical inverted container
Part num. 70-1198	Fike floor-mounting kit	215 lb. spherical inverted container
Part num. 70-1119	Fike backing plates (set of 2)	125 lb. and 215 lb. spherical containers
Part num. 70-1539	Fike container bracket	20 lb. cylinders
Part num. 70-1372	Fike container bracket	35 lb. cylinders
Part num. 70-1070	Fike container bracket	60 lb. cylinders
Part num. 70-1177	Fike container bracket	125 lb. spherical inverted cylinders
Part num. 70-1178	Fike container bracket	215 lb. spherical inverted cylinders
Part num. 70-1345	Fike mounting strap	100 lb. cylinders (2 req'd.)
Part num. 70-1384	Fike mounting strap	1000 lb. cylinders (2 req'd.)
Part num. 70-1310	Fike mounting strap	215, 375 lb. cylinders (1 req'd.) and 650 lb. cylinders (2 req'd.)

(d) Agent reticulation/distribution components

Part num. 02-2980	Fike checkvalve, 25 NS	
Part num. 02-2981	Fike checkvalve, 50 NS	
Part num. 02-2937	Fike checkvalve, 80 NS	
Part num. 02-1388	Fike grooved nipple, 65 NS	
Part num. 02-2106	Fike grooved nipple, 80 NS	
Part num. 02-1376	Victaulic coupling, 65 NS	
Part num. 02-1987	Victaulic coupling, 80 NS	
Fike discharge nozzles, (engineered systems only)		
Parts nos. 80-052-0625 to -1250	3/8" NPT x 360°, (0.0368 to 0.1473 in2)	
Parts nos. 80-053-0625 to -1590	1/2" NPT x 360°, (0.0368 to 0.2383 in2)	
Parts nos. 80-054-0820 to -2090	3/4" NPT x 360°, (0.0634 to 0.4117 in2)	
Parts nos. 80-055-1065 to -2660	1" NPT x 360°, (0.1069 to 0.6669 in2)	
Parts nos. 80-056-1405 to -3480	1 1/4" NPT x 360°, (0.1860 to 1.1414 in2)	
Parts nos. 80-057-1695 to -4130	1 1/2" NPT x 360°, (0.2708 to 1.6076 in2)	
Parts nos. 80-058-2130 to -5312	2" NPT x 360°, (0.4276 to 2.6594 in2)	
Parts nos. 80-060-0625 to -1285	3/8" NPT x 180°, (0.0337 to 0.1427 in2)	
Parts nos. 80-061-0625 to -1660	1/2" NPT x 180°, (0.0337 to 0.2381 in2)	
Parts nos. 80-062-0890 to -2210	3/4" NPT x 180°, (0.0684 to 0.4220 in2)	
Parts nos. 80-063-1130 to -2812	1" NPT x 180°, (0.1103 to 0.6831 in2)	
Parts nos. 80-064-1470 to -3680	1 1/4" NPT x 180°, (0.1867 to 1.1700 in2)	
Parts nos. 80-065-1770 to -4219	1 1/2" NPT x 180°, (0.2707 to 1.5378 in2)	
Parts nos. 80-066-2210 to -5469	2" NPT x 180°, (0.4220 to 2.5840 in2)	
Fike discharge nozzles (pre-engineered systems only)		
Part num. 80-1113	1" NPT x 180°	
Part num. 80-1114	1" NPT x 360°	
Part num. 80-1115	1 1/2" NPT x 180°	
Part num. 80-1116	1 1/2" NPT x 360°	
Part num. 80-1117	2" NPT x 180°	
Part num. 80-1118	2" NPT x 360°	
Part num. 80-067	Fike nozzle screen assembly, 15 NS	
Part num. 80-068	Fike nozzle screen assembly, 40 NS	

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(e) System control/actuation accessories

Part num. 20-007	Fike manual pull station, break glass type
Part num. 10-1638	Fike manual release switch (dual-action type)
Part num. 10-1639	Fike system abort switch (dead-man type)
Part num. 10-1640	Fike main-reserve switch
Part num. 10-1643	Fike combination switch, manual release/system abort
Part num. 10-1644	Fike combination switch, manual release/main-reserve
Part num. 10-1646	Fike combination switch, system abort/main-reserve
Part num. 10-1647	Fike combination switch, system abort/remote reset
Part num. 10-1649	Fike combination switch, manual release/system abort/main-reserve
Part num. 10-1832	Fike agent release module
Part num. 10-2136	Fike interface firing module

(f) Manuals and design software

Part num. 06-200	Installation instructions manual, Fike's FM-200® pre-engineered clean agent extinguishing system units
Part num. 06-215	Installation instructions manual, Fike's FE-227 pre-engineered clean agent extinguishing system units
Part num. 06-202	Design, installation & maintenance manual, Fike's FM-200® engineered clean agent extinguishing system
Part num. 06-109	Operation instructions for Interface Firing Module (IFM) user's manual for FM-200® flow calculation program version fik1.34, Oct. 1995 Fike Series 70 FM-200® flow calculation software program, version fik1.34, Oct. 1995
	Fike Series 70 FE-227™ flow calculation software program, version fik3.0

(g) Piping requirements

Agent distribution piping of Fike, Series 70 HFC-227ea, engineered balanced/unbalanced, pre-engineered balanced, total-flooding, gaseous fire extinguishing systems shall satisfy the requirements of Section 6 of AS 4214.1-1995 and Section 6 of AS 4214.4-1995. The piping shall be designed for a maximum working pressure of 3.86 MPa at 55°C. Steel pipe and fittings shall be galvanised inside and outside in accordance with AS 1650.

Piping of all retrofitted systems shall be hydrostatically tested at 4.825 Mpa maintained for not less than 120 seconds, and shall not leak during the test. All test liquid shall be thoroughly purged from the piping at conclusion of testing.