



Certificate of Conformity

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Product designation

Thorn Security, FM-200®, engineered gaseous 'total flooding', fire extinguishing system

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

Agent/distributor

Tyco Fire Protection Products
567 Somerville Road, SUNSHINE, VIC, AUSTRALIA, 3020

Registrant

Tyco Safety Products
Burlingham House, Hewett Road, Gapton Hall Industrial Estate, GREAT YARMOUTH, NORFOLK, UNITED KINGDOM, NR31 0NN

Producer

Tyco Safety Products
Burlingham House, Hewett Road, Gapton Hall Industrial Estate, GREAT YARMOUTH, NORFOLK, UNITED KINGDOM, NR31 0NN

Conformance criteria and evaluation

The Thorn Security, FM-200®, engineered gaseous 'total flooding', fire extinguishing system has been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. Australian Standard AS 4214-2002, 'Gaseous fire extinguishing systems'.
2. 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.

- i. If designed to achieve a concentration of 9% or more, it shall *not* be able to automatically discharge while the enclosure is occupied.
- ii. The system shall not be installed in an enclosure that has significant non-closeable openings.
- iii. The FM-200® storage containers shall not be transported or handled in situations where the temperature will be less than minus 20°C or more than 50°C.

(Limitations/conditions of conformance continue)

Issued by

David Whittaker
Executive Officer – ActivFire Scheme



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- iv. The fill ratio of the storage containers shall not exceed 1.15 kg/litre or be less than 0.50 kg/litre.
- v. The temperature of the area housing the installed storage containers shall be maintained in the range 16°C to 27°C.
- vi. The system shall not be installed where the non-fire enclosure temperature will be less than 0°C or more than 55°C.
- vii. The FM-200® concentration achieved in the enclosure shall be not less than 7.5% for any risk.
- viii. Maximum coverage radius shall be 8.7 m for a 360° nozzle, and 10.05 m for a 180° nozzle.
- ix. Maximum coverage area for either nozzle shall be 95.0 m².
- x. Nozzles shall be installed at not more than 300 mm below the ceiling soffit.
- xi. Maximum enclosure height shall be 4.87 m for a 360° and for 180° nozzles.
- xii. 180° nozzles shall be mounted adjacent to a wall and located to cover the entire area.
- xiii. Minimum height of protected void spaces shall be 300 mm.

Producer's description

The Thorn Security, FM-200®, engineered gaseous 'total flooding', fire extinguishing system is of the fixed central-storage automatic and/or manual type. Automatic operation is usually by means of smoke or heat detectors in conjunction with a suitable CIE panel or single-hazard system-releasing panel. This system is intended to extinguish fires of Classes 'A', 'B', and 'C' that occur in enclosures which are suitable for gaseous total-flooding type fire protection. Provided that appropriate 'Ex' rated ancillary devices, as covered by this listing, are fitted, this extinguishing system can be installed in hazardous locations. The system covered by this listing includes carbon steel agent-storage containers (custom pre-charged with FM-200® and Nitrogen), container-restraint and -support brackets, manifold-support brackets, container-mounted piston-type agent release valves, stackable and side-mount type release actuators, flexible discharge bend assemblies, carbon steel pre-fabricated storage-system manifolds with inbuilt check valves, wrought-aluminium and brass agent nozzles (supplied custom pre-drilled), pressure switches for monitoring and interlocking, a manual pull station, a remote manual/pneumatic actuator, and various instruction and warning signs.

The FM-200® (HFC-227ea, Heptafluoropropane) agent is manufactured only by Great Lakes Chemical Corporation, U.S.A. Authorised FM-200® stockists/re-fillers are usually located within reasonable distance from installed systems. FM-200® extinguishes fire by a combination of physical and chemical means. It does not significantly deplete the oxygen content in the enclosure, and tests have shown it to be less toxic than Halon 1301. It is stored in the Thorn System as a liquefied gas that is super-pressurised with Nitrogen to 24.8 bar at 20°C. Liquid FM-200® is colourless and odourless, has a vapour pressure of 405.4 kPa abs. at 21°C, an S.G. of 1.48, a boiling point of -16.4°C, and is non-combustible. Gaseous FM-200® has an Ozone Depleting Potential of 'zero' and an Atmospheric Lifetime estimated at 31 to 41 years. The Occupational Exposure Limit (Cardiac Sensitisation) values for FM-200® are NOAEL 9% and LOAEL >10.5%. The design concentration required for Thorn FM-200® systems is 7.5%, but may be considerably higher for flammable liquids and flammable gases (e.g., 13.5% for Methanol, and 17.2% for Hydrogen (AS 4214-2002)). In Australia, FM-200® installations having design concentration above 9% must have a discharge-inhibiting arrangement, and those above 10.5% must have a lock-off valve, or serviceable self-contained breathing apparatus readily available to anyone wanting to enter the enclosure.

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Technical specification

The following details are a representative extract of the technical specification for the Thorn Security, FM-200®, engineered gaseous 'total flooding', fire extinguishing system and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

1. FM-200® container details

Characteristic	Nominal capacity (kg)											
	4.5	8	16	32	40	52	67	80	106	147	180	343
Thorn Part No. 303-205	026T	015	016	017	030	018	031	032	019	020	021	022
Max. FM-200® Capacity (kg)	4.5	8.0	16.0	32.0	40.0	52.0	67.0	80.0	106.0	147.0	180.0	343.0
Diameter (mm)	178	254	254	254	227.2	406	265	276	406	406	406	610
Ht. to Valve Outlet (kg)	280	304	502	833	1352	596	1526	1685	1021	1354	1634	1466
Valve outlet size (mm)	25	25	25	25	50	50	50	50	50	50	50	89
Tare Weight (kg)	7.7	14.8	18.4	26.1	52.2	49.1	81.6	95.3	71.8	89.9	105.8	207

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

Description	Part No.
4.5 litre FM-200 container assembly	303-205-026
8 litre FM-200 container assembly	303-205-015
16 litre FM-200 container assembly	303-205-016
32 litre FM-200 container assembly	303-205-017
40 litre FM-200 container assembly	303-205-030
52 litre FM-200 container assembly	303-205-018
67 litre FM-200 container assembly	303-205-031
80 litre FM-200 container assembly	303-205-032
106 litre FM-200 container assembly	303-205-019
147 litre FM-200 container assembly	303-205-020
180 litre FM-200 container assembly	303-205-021
343 litre FM-200 container assembly	303-205-022
25 mm container valve (spare part)	302-205-001
50 mm container valve (spare part)	302-205-003
75 mm container valve (spare part)	302-205-002
Electrical actuator - UL	304-205-001 TU
Burst Disc; Thread 25 mm Valve (1"): M14 x 1.25	300-094-080
Burst Disc; Thread 50 mm Valve (2"): M18 x 1.00	300-094-085
Burst Disc; Thread 75 mm Valve (3"): 0.9375 16 UN	300-015-330
Side-mounted electrical act. - flameproof (with Schraeder/swivel-nut assy.) ATEX	304-205-002
Local manual actuator	304-205-003
Remote manual actuator (Mechanical)	304-205-005
Electrical actuator - standard	304-205-001 T
Side-mounted electrical actuator - flameproof (with Schraeder/swivel-nut assy.) UL	304.205.008
Pneumatic actuator	304-205-004
Pressure switch - standard (70 bar)	305-205-005
Pressure switch - standard (250 bar)	305-205-002
Pressure switch - flameproof	305-205-003
Solenoid Adaptor	300-205-550
Supervisory pressure switch (container pressure)	305-205-001
Pressure trip	305-202-002
10 mm NPT nozzle (brass)	310-205-028
15 mm NPT nozzle (brass)	310-205-029
20 mm NPT nozzle (brass)	310-205-030
25 mm NPT nozzle (brass)	310-205-031
32 mm NPT nozzle (brass)	310-205-032
40 mm NPT nozzle (brass)	310-205-033
50 mm NPT nozzle (brass)	310-205-034
10 mm x 180° NPT nozzle (aluminium)	310-205-022
10 mm x 360° NPT nozzle (aluminium)	310-205-023
15 mm x 180° NPT nozzle (aluminium)	310-205-011
15 mm x 360° NPT nozzle (aluminium)	310-205-015
20 mm x 180° NPT nozzle (aluminium)	310-205-024

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Description	Part No.
20 mm x 360° NPT nozzle (aluminium)	310-205-025
25 mm x 180° NPT nozzle (aluminium)	310-205-012
25 mm x 360° NPT nozzle (aluminium)	310-205-016
32 mm x 180° NPT nozzle (aluminium)	310-205-026
32 mm x 360° NPT nozzle (aluminium)	310-205-027
40 mm x 180° NPT nozzle (aluminium)	310-205-013
40 mm x 360° NPT nozzle (aluminium)	310-205-017
50 mm x 180° NPT nozzle (aluminium)	310-205-014
50 mm x 360° NPT nozzle (aluminium)	310-205-018
<i>All nozzles are available with BSP threads as an alternative to NPT</i>	
Liquid Level Measuring device; 106 L	300.015.127
Liquid Level Measuring device; 147 L; 180 L and 343 L	300.015.128
Street Elbow	309.013.008
Container bracket, 8; 16; 32 litre sizes	311-205-013
Container bracket, 52; 106; 147; 180 litre sizes	311-205-014
Container bracket, 40 litre size	311-205-016
Container bracket, 67 litre size	311-205-017
Container bracket, 80 litre size	311-205-018
Container bracket, 343 litre size	311-205-019
T528 manual release unit	526-001-018
32 mm manifold check valve	302-205-008
50 mm manifold check valve	302-205-009
65 mm 2 port manifold including check valves	307-205-012
65 mm 3 port manifold including check valves	307-205-013
65 mm 4 port manifold including check valves	307-205-014
80 mm 2 port manifold including check valves	307-205-001
80 mm 3 port manifold including check valves	307-205-002
80 mm 4 port manifold including check valves	307-205-003
80 mm 5 port manifold including check valves	307-205-011
100 mm 2 port manifold including check valves	307-205-004
100 mm 3 port manifold including check valves	307-205-005
100 mm 4 port manifold including check valves	307-205-006
100 mm 5 port manifold including check valves	307-205-007
100 mm 6 port manifold including check valves	307-205-008
150 mm 3 port manifold including check valves	307-205-009
150 mm 4 port manifold including check valves	307-205-010
150 mm 5 port manifold including check valves	307-205-015
150 mm 6 port manifold including check valves	307-205-016
150 mm 7 port manifold including check valves	307-205-017
150 mm 8 port manifold including check valves	307-205-018
150 mm 9 port manifold including check valves	307-205-019
150 mm 10 port manifold including check valves	307-205-020
65 mm manifold bracket	311-205-015
100 mm manifold (2 inlets) 343L	307-205-021
100 mm manifold (3 inlets) 343L	307-205-022
100 mm manifold (4 inlets) 343L	307-205-023
150 mm manifold (2 inlets) 343L	307-205-024
150 mm manifold (3 inlets) 343L	307-205-025
150 mm manifold (4 inlets) 343L	307-205-026
150 mm manifold (5 inlets) 343L	307-205-027
150 mm manifold (6 inlets) 343L	307-205-028
150 mm manifold (7 inlets) 343L	307-205-029
150 mm manifold (8 inlets) 343L	307-205-030
150 mm manifold (9 inlets) 343L	307-205-031
150 mm manifold (10 inlets) 343L	307-205-032
80 mm manifold bracket	311-205-010
100 mm manifold bracket	311-205-011
150 mm manifold bracket	311-205-012
Flexible pilot hose, ¼" BSP swivel x 710 long	306-205-003
75 mm (3") discharge hose/check valve assembly	306-205-005

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Description	Part No.
75 mm (3") valve discharge hose	306-205-006
Male adaptor, brass, 1/4" BSPT x 1/4" BSPP	309-013-005
Male tee, brass, 1/4" BSPP x 1/4" BSPT branch	309-013-003
Male elbow, brass, 1/4" BSPT x 1/4" BSPP	309-013-004
Pressure switch, manual reset type, 4 bar rising	304-205-007
32 mm discharge hose	306-205-001
50 mm discharge hose	306-205-002
Manual release notice	314-205-003
Door notice	314-205-001
Door caution plate	314-205-002
Design, Installation, Commissioning, Servicing & Maintenance Manual (Engineered and Pre-engineered Thorn FM-200 Systems), Issue 06, Date 3/04	14A-03
Installation Guide, Dated 17 May 2002	14A-07T
Tyco Electronic Product Group FM-200™ Flow Calculation Software, Version 3	315-205-001
User manual, Tyco Electronic Product Group FM-200™ Flow Calculation Software, Version 3	14a-flow