CSIRO Verification Services
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https://activfire.csiro.au

Certificate of Conformity

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Product designation

AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression system

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

Agent/distributor

AFEX Fire Suppression Systems
6031 Oak Forest Dr, RALEIGH, NC, UNITED STATES, 27616

Registrant

AFEX Fire Suppression Systems
6031 Oak Forest Dr, RALEIGH, NC, UNITED STATES, 27616

Producer

AFEX Fire Suppression Systems
6031 Oak Forest Dr, RALEIGH, NC, UNITED STATES, 27616

Conformance criteria and evaluation

The AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression system has been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. Approval Standard FM Class Number 5320, 'FM Global Property Loss Prevention Data Sheet 7-40, Heavy Duty Mobile Equipment'.
2. FM Global Property Loss Prevention Data Sheet FM DS 7-40, 'Heavy Duty Mobile Equipment'.
3. Factory Mutual - Evaluation and approval, 'FM approval'.
4. Underwriters Laboratories Standard UL 1254, Edition 3, 4 February 2005, 'Standard for Pre-Engineered Dry Chemical Extinguishing System Units'.
5. Underwriters Laboratories Standard UL 299, 'Standard for Dry Chemical Fire Extinguishers'.

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. System operating temperature range is -40 °C to 60 °C.

ii. The ABC dry chemical is not suitable for combating fires involving their own oxygen supply, combustible metals, or deep seating or burrowing fire in ordinary combustible, where the dry chemical cannot reach the point of combustion.

Issued by

Kai Loh
Executive Officer – ActivFire Scheme

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.

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This certificate remains the property of CSIRO and may be subject to amendment, suspension or withdrawal at any time.
The validity and authenticity of this certificate can be verified by the certification register located at https://activfire.csiro.au

Producer's description

The AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression system is a pre-engineered fixed nozzle installation for protection of heavy vehicles and equipment. Mining, Off-Road, Forestry and Construction equipment operating in harsh outdoor environments can be subjected at any time to the threat of fire, which may spread rapidly through the equipment endangering life and resulting in damage to major capital equipment and loss of production. The installation of a fire detection and suppression system is essential to minimize the risk to both operator and equipment.

The AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression system can be configured to provide protection for many applications. AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression systems are suitable for, but not limited to, the following equipment and industries:

i. Surface Mining Equipment
ii. Underground Mining equipment
iii. Forestry Equipment
iv. Industrial
v. Road Transport

The dry chemicals in AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression system is stored in special tanks. They are available in four sizes: 9.07 kg, 13.6 kg, 27.22 kg and 56.8kg. The distribution of dry chemical is designed in the way that each assembly consists of dry chemical agent, the container, gas tube, outlet assembly, cap and bursting disc. The agent tank is not pressurised, with introduction of nitrogen gas for pressurization only at the time of actuation. The chemicals are delivered from the container through a hydraulic hose / tube network and fixed-orifice spray nozzles onto the fire-prone surfaces / areas. The spray nozzles are located and aimed such that they provide direct droplet impingement and full coverage of selected fire hazards in the risk area protected.

Technical specification

The following details are a representative extract of the technical specification for the AFEX, 2000 Series, pre-engineered, dry chemical, multipurpose fire suppression system and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

Variant	Description
A2020	20 lb, 2 to 4 nozzles, 432 to 864 ft^3
A2030	30 lb, 4 to 6 nozzles, 486 to 1296 ft^3
A2060	60 lb, 6 to 12 nozzles, 1296 to 2592 ft^3
A2125	120 lb, 12 to 24 nozzles, 2592 to 5184 ft^3

Schedule of components

The following is a schedule of validated components of the certified/listed system.

Description	Part num.
REFILL KITS	
A2020-1	A207250
A2030-1	A207252
A2030-2	A207254
A2030-3	A207256
A2030-4	A207258
M2020-1	A207261
M2030-1	A207272
M2030-2	A207274
M2030-3	A207276
M2030-4	A207278
FIRING MECHANISM	
Firing Mechanism Assembly	A116000
Cartridge Seat Washer	A110070
3/4" Jam Nut	A706700
Push Knob	A915035
Safety Pin	A915040
Dust Cover	A915060
AGENT TANKS	
30 lb. Dry Chemical Agent Tank Assembly	A200505
20 lb. Dry Chemical Agent Tank Assembly	A200720
60 lb. Dry Chemical Agent Tank Assembly	A202000

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Description	Part num.
125 lb. Dry Chemical Agent Tank Assembly	A200507
15 Gallon Liquid agent Tank Assembly	A200511
Gas Tube Assembly, 30 lb. Agent Tank	A200522
Gas Tube Assembly, 60 lb. Agent Tank	A200523
Gas Tube Assembly, 20 lb. Agent Tank	A200722
Gas Tube Assembly, 125 lb. Agent Tank	A200525
Gas Tube Assembly, 15 Gallon Liquid agent Tank	A200508
Agent Tank Cap	A200530
Flat Washer, Agent Tank Cap	A200536
“O” Ring, Agent Tank Cap	A200538
20 and 30 lb. Dry Chemical Agent Tank Outlet Assembly	A200540
Agent Tank Outlet Nipple	A200550
Bursting Disc for 30 lb. and 20 lb. Agent Containers	A200563
1.5” Bursting Disc for 125 lb. Agent Tank	A200568
3/4” Bursting Disc for 15 Gallon Liquid agent Tank	A200565
3/4” Bursting Disc (male/male)	A200566
3/4” Bursting Disc (male/female)	A200567
A:B:C Dry Chemical (per lb.)	A200570
Liquid agent (Per Gallon)	A200515
AGENT TANK BRACKET ASSEMBLIES	
Vertical Mount Bracket Assembly (for 20 & 30 lb. Agent Tanks)	A210000
Vertical Mount Bracket, Less Straps (for 20 & 30 lb. Agent Tanks)	A210010
Horizontal Mount Bracket Assembly (for 20 & 30 lb. Agent Tanks)	A211000
Horizontal Mount Bracket, Less Straps (for 20 & 30 lb. Agent Tanks)	A211010
Agent Tank Strap (for 20 & 30 lb. Agent Tanks)	A210020
Vertical Mount Bracket Assembly (for 60 lb. Agent Tank)	A213500
Vertical Mount Bracket, Less Straps (for 60 lb. Agent Tank)	A213510
Horizontal Mount Bracket Assembly (for 60 lb. Agent Tank)	A213000
Horizontal Mount Bracket, Less Straps (for 60 lb. Agent Tank)	A213010
Agent Tank Strap (for 60 lb. Agent Tank)	A213040
Mounting Ring (for 125 lb. Dry Chemical Agent Tank & 15 Gallon Liquid agent Tank)	A200509
3/8” x 1 3/4” Bolt	A810407
3/8” Serrated Flange Lock Nut	A840450
3/8” Flat Washer	A860400
U-BOLT BRACKETS	
4” U-Bolt Bracket	A220500
6” U-Bolt Bracket	A221000
12” U-Bolt Bracket	A225000
OTHER MOUNTING BRACKETS	
Slave Actuator Bracket (for 10 oz. Pressurizing Cartridge)	A230000
Slave Actuator Bracket (for 15 oz. Pressurizing Cartridge)	A235000
Strap (for 15 oz. Slave Actuator)	A235020
Remote Actuator Bracket, for Lever Assembly	A240000
Remote Actuator “S” Bracket	A245000
Firing Mechanism “U” Bracket	A246000
Firing Mechanism ”U” Bracket Extension	A246500
Circuit Monitor Panel Mounting Bracket	A725010
NITROGEN CARTRIDGES	
10 oz. Pressurizing Cartridge	A310000
1 oz. Actuating Cartridge	A320000
25 oz. Pressurizing Cartridge	A330000
15 oz. Pressurizing Cartridge	A350000
2 oz. Actuating Cartridge	A360000
Gauge Guard, 25 oz. Pressurizing Cartridge	A330080
0 - 3000 psi Pressure Gauge, 1/4” NPT	A330085
TUBE & TUBE FITTINGS	
1/2” O.D. Stainless Steel Tubing	A401000
3/4” O.D. Stainless Steel Tubing	A402000
3/4” Tube x 3/4” MIP Tube Connector	A511000
1/2” Tube x 1/2” MIP Tube Connector	A511500
1/2” Tube x 1/2” FIP Tube Connector	A512000
1/2” Tube x 90° x 1/2” MIP Tube Connector	A513000
3/4” Tube Fitting Nut	A511010
3/4” Tube Fitting Ferrule	A511020
1/2” Tube Fitting Nut	A511510

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Description	Part num.
1/2” Tube Fitting Ferrule	A511520
PIPE COUPLINGS	
3/4” Coupling	A515000
1/2” Coupling	A516000
1/4” Coupling	A516510
1.5” Coupling	A516550
PIPE TEES	
3/4” x 3/4” x 3/4” Tee	A521000
1/2” x 1/2” x 3/4” Tee	A522500
Four Way Tee	A523000
1/4” Male Branch Tee	A523510
Five Way Tee, 1.5” to 4 x 3/4”	A523009
Five Way Tee, 3/4” to 4 x 1/2”	A523010
PIPE ELBOWS	
1/4” Female Elbow	A532110
1/4” Street Elbow	A532120
3/4” Street Elbow	A535000
1/2” Street Elbow	A535500
PIPE NIPPLES	
3/4” x Close Nipple	A200550
1/4” x 2.5” Nipple	A545000
1/4” x 1.5” Nipple	A546110
1/4” x Close Nipple	A546000
NOZZLES	
Cone Spray Nozzle	A551000
Liquid agent Nozzle	A551700
1/4” Hose & Hose Fittings	
1/4” Hose (per foot)	A601000P
Fitting, 1/4” Hose x 1/4” JIC Swivel	A604400P
Adapter - Straight - 1/4” MIP x 37° Flare (1/4”)	A604600P
Adapter, 90°, 1/4” MIP x 37° Flare (1/4”)	A604800P
-1/2” HOSE & FITTINGS	
1/2” Hose (per foot)	A602000P
Fitting, 1/2” Hose x 1/2” MIP	A602200P
Fitting, 1/2” Hose x 1/2” JIC Swivel	A602400P
Adapter - Straight - 1/2” MIP x 37° Flare (1/2”)	A602600P
3/4” Hose & Fittings	
3/4” Hose (per foot)	A603000P
Fitting, 3/4” Hose x 3/4” MIP	A603200P
Fitting, 3/4” Hose x 3/4” JIC Swivel	A603400P
Adapter - Straight 3/4” MIP x 37° Flare (3/4”)	A603600P
Adapter - Straight 3/4” F - NPTF x 3/4” M-JIC	A603600P
1.5” Hose & Fittings	
1.5” Hose (per foot)	A609000
Fitting, 1.5” Hose x 1.5” MIP	A609200
Fitting, 1.5” Hose x 1.5” JIC Swivel	A609400
Adapter - Straight - 1.5” MIP x 37° Flare (1.5”)	A609600
ELECTRICAL	
Sensor Assembly	A700100
Deutsch 2 Wire Plug Completer Package	A700655
Deutsch 2 Wire Receptacle Completer Package	A700660
Sensor 4 Wire Receptacle Completer Package	A700710
High Temperature Trunk Wire	A704000
Manual Switch	A731000
Pressure Switch, SPDT, 24 Vdc	A708500
Engine Shutdown Package	A708553
Electric Actuator, 5.0A (Discontinued Jan 1, 2011)	A709000
Electric Actuator, 1.2A	A709500
Electric Actuator Wiring Harness for PN A709000	A709100
Circuit Monitor Panel	A725000
Digital Control Unit	A729000
Linear Detection Wire	A703000
HARDWARE	
1/2” Tube Clamp	A801000
3/4” Tube Clamp	A802000

Description	Part num.
3/4” Hose Clamp	A802300
5/16” x 1.75” x 3” U-Bolt (for U-Bolt Brackets)	A804000
3/8” x 4” x 5” U-Bolt (For Pressurizing Nitrogen Cartridge)	A805000
Weld Block	A806000
Grommet, 5/8” ID	A807000
Grommet, 1.5” ID	A808000
Fender Washer, 3/8” x 2.5”	A809000
5/16” x 3” Hex Head Capscrew	A810312
3/8” x 1.25” Hex Head Capscrew	A810405
3/8” x 1.75” Hex Head Capscrew	A810407
3/8” Nut	A840400
5/16” Serrated Flange Lock Nut	A850350
3/8” Serrated Flange Lock Nut	A850450
5/16” Flat Washer	A860300
3/8” Flat Washer	A860400
1/4” Lock Washer	A870200
5/16” Lock Washer	A870300
3/8” Lock Washer	A870400
3/8” x 3/4” Bolt with captured washer for Mounting Rings	A880100
SLAVE & REMOTE ACTUATORS	
Slave Actuator	A910500
Remote Actuator	A915500
Remote Actuator Assembly Package	A981550
Remote Actuator Assembly Package (for 2 oz. Actuation Cartridge)	A981350
Slave Actuator Assembly Package (for 10 oz. Pressurizing Cartridge)	A981650
Slave Actuator Assembly Package (for 15 oz. Pressurizing Cartridge)	A981750
TOOLS	
1/2” Tube Bender	A983000
3/4” Tube bender	A983100
Crimp tool for Sensor Connectors (DEUTSCH HDT48-00)	A984200
Wedgelock Removal Tool for Sensors	A984300
Test Horn Assembly	A708910
MANUALS	
AFEX 2000 Series & W Series Systems Installation, Operation, Maintenance & Service Manual, August 2012	A100000
A729000 Control Unit Operation Manual, July 2012	A729050

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Supplementary information

Schedule of relevant articles

The following schedule is an extract of articles significant and/or related as evidence of conformity.

Reference		Title / description	Date issued (or date validated)	Source
Ident. type	**Ident.**			
Report:	MF0024/R1	Technical verification of conformity of the AFEX, 2000 Series, dry powder vehicle, pre-engineered, multipurpose fire suppression system to the requirements specified by the reference criteria of FM Class Number 5320 FM DS 7-40 Factory Mutual - Evaluation, surveillance and approval UL 1254, Edition 3, 4 February 2005 UL 299, April 2009	26-Feb-2013	CSIRO, Materials Science and Engineering, Fire Systems, AU
Certificate of Compliance	3044360	AFEX 2000 Series Mobile Equipment Fire Suppression Systems	17-Sep-2012	FM Approvals, MA, USA
Approval Report	3028429	AFEX 2000 Series 20 & 30 lb (nominal capacities) Pre-engineered Dry Chemical Vehicle Fire Extinguishing Systems	17-Sep-2012	
	3028429	AFEX 2000 Series 125 lb Nominal Capacity Pre-engineered Dry Chemical Vehicle Fire Extinguishing Systems	14-Sep-2009	
Manual	PN A100000	AFEX FIRE SUPPRESSION SYSTEMS 2000 SERIES & W SERIES SYSTEMS Installation, Operation, Maintenance & Service Manual (A100000 Installation Operation Maintenance & Service Manual - April 2018 (English) (digital).pdf)	24-Apr-2018	AFEX Fire Suppression Systems, NC, US