

## Clean Agent Fire Extinguishing Systems

These systems contain electrically nonconducting, volatile, or gaseous fire extinguishing agents that don't leave a residue upon evaporation (per NFPA 2001 paragraph 1-3.1). They are effective for total flooding protection against hazards involving liquid flammable materials, electrical equipment, and ordinary solid combustibles in occupancy arrangements which produce only surface burning. In general, these agents are not effective or appropriate for hazards which produce deep-seated burning or for those which involve chemicals containing their own oxygen (such as cellulose nitrate), metal hydrides, or reactive metals (such as sodium, magnesium or uranium).

Clean Agent systems are similar in many respects to Halon 1301 and carbon dioxide systems. Discharge of the agent by total flooding or local application may create atmospheric hazards to personnel. Toxic thermal decomposition products can be minimized by fast fire detection coupled with rapid agent discharge. Personnel should not remain in the area following system discharge. Table A-1-5.1.1 of NFPA 2001 provides information on toxicological and physiological effects covered in this equipment classification. The No Observed Adverse Effect Level (NOAEL) is the highest concentration at which no adverse physiological or toxicological effect has been observed. The Lowest Observed Adverse Effect Level (LOAEL) is the lowest concentration at which an adverse physiological or toxicological effect has been observed.

Systems can only be FM Approved under this classification if they use agents having a component Approval. The system Approvals specifically reference the relevant agent Approval. Individual agent listings appear under the category Clean Extinguishing Agents.

Compatible FM Approvals controls must be used. (See AUTOMATIC RELEASES FOR EXTINGUISHING SYSTEMS AND OTHER FIRE PROTECTION EQUIPMENT under ELECTRICAL SIGNALING.)

Application of this equipment should be subject to the limitations specified and subject to FM Global's acceptance of plans prior to installation. Required design concentrations vary from agent to agent and depending upon maximum design parameters, the concentration may vary among system manufacturers. The design concentrations listed by the system manufacturers are generally accepted in electrical/electronic hazards, i.e. computer, telecommunication areas, provided that Class A ordinary combustibles are kept to a minimum, thereby minimizing the potential for a deep seated Class A fire.

System charging and recharging shall be done only by the manufacturer or a FM Approved representative.

The Clean Agent systems FM Approved under this classification have been addressed by NFPA 2001, Standard on Clean Agent Extinguishing Systems, 1994 Edition and must be listed in the United States Environmental Protection Agency (EPA) Significant New Alternatives Policy (SNAP) as an acceptable substitute to Halon 1301.

Jurisdictions *outside* the United States may *not* recognize NFPA and EPA sanction of certain clean agents. Local and national governmental regulations should be consulted *prior* to agent selection.

\*Alternative to Halon 1211 and Halon 1301.

## Kidde Fire Systems® ECS Fire Suppression System with HFC-227ea Agent

System Designation:	Kidde Fire Systems® ECS Fire Suppression System with HFC-227ea Agent
System Type:	Engineered, Unbalanced Systems Designed for Total Flooding Applications
Agent Identification:	HFC-227ea
Minimum and Maximum Agent Storage Temperatures:	Balanced System: 32 to 130°F (0 to 54°C) Unbalanced System: 60 to 80 °F (16 to 27°C)
Types of Nozzles Available:	180°, 360°
Minimum and Maximum Nozzle Heights:	1 to 16 feet (0.3 to 4.9 meters)
Maximum Area of Coverage for Nozzle Type:	180°: 44 x 40 ft. (13.3 x 12 m), 48.3 ft (14.7 m) maximum discharge radius  360°: 44 x 40 ft. (13.3 x 12 m), 29.7 ft. (9.1 m) maximum discharge radius
Minimum Design Concentrations for Hazard Class:	Class A: 6.25% Class B: 8.7% (and per table in DIOM)
Flow Calculation Software:	Kidde Fire Systems® Clean Agent Flow Calculation Program, Version 4.00

Design, Installation, Operation, and Maintenance Manuals:	<p>Kidde Fire Systems® ECS Fire Suppression System with HFC-227ea Agent: Design, Installation, Operation and Maintenance Manual, P/N 06-236115-001, October 2014</p> <p>Kidde Fire Systems® ECS Fire Suppression System Flow Calculation Software User's Guide for use with FM-200® Agent, Applies to Software Version 4B, part number 06-236272-001, Rev. AD, March 2013</p> <p>Supplement to Kidde Fire Systems® ECS Fire Suppression System with HFC-227ea Agent: Design, Installation, Operation, and Maintenance Manual Rev BA, 06-236115-001, Placement Supervision 06-236115-003, Rev. AB, July 2016</p> <p>Supplement to Kidde Fire Systems® ECS Fire Suppression System with HFC-227ea Agent: Design, Installation, Operation, and Maintenance Manual Rev BA, 06-236115-001, Stainless Steel Nozzles 06-236115-004 Rev. AA May 2016</p>
Limitations or Exceptions to Approval:	As described in the system manuals
Approved Filling Stations:	<p>Kidde-Fenwal, Inc. 400 Main Street Ashland, MA 01721</p> <p>Healey Fire Protection, Inc. 134 Northpoint Dr. Orion, MI 48359 United States</p> <p>Control Fire Systems, Ltd Building A 63 Advance Road Toronto, Ontario M8Z 2S6 Canada</p> <p>Onity Industrial, S.A. de C.V. Prolongacion Galeana No. 52 Col. Miguel Hidalgo Tlalnepantla, Edo De Mexico CP 54060 Mexico</p> <p>UTC Fire &amp; Security Singapore Pte. Ltd. 28 Teban Gardens Crescent Singapore 608926</p> <p>Kidde Brasil Ltda Rua Irecema Lucas 755 Distrito Industrial 13.280-00 Vinhedo SP Brazil</p>

<b>Company Name:</b>	Kidde-Fenwal Inc
<b>Company Address:</b>	400 Main St, Ashland, Massachusetts 01721, USA
<b>Company Website:</b>	<a href="http://www.kidde-fenwal.com">http://www.kidde-fenwal.com</a>
<b>New/Updated Product Listing:</b>	Yes
<b>Listing Country:</b>	United States of America
<b>Agent Type:</b>	HFC-227
<b>Certification Type:</b>	FM Approved

