

SINGAPORE STANDARD

# **Code of practice for Halon 1301 fire protection systems**

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The Building and Construction Industry Practice Committee appointed by the Standards Council consists of the following members:

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SINGAPORE STANDARD  
CODE OF PRACTICE FOR HALON 1301 FIRE PROTECTION SYSTEMS

FOREWORD

This Code of Practice was prepared by the Technical Committee under the direction of the Building and Construction Industry Practice Committee.

This Code represents a standard of good practice for Halon 1301 systems with particular emphasis on fire precautions necessary to safeguard against injury and risk of life as well as protection of property.

This Code helps to establish a broad standard for engineers, architects, contractors and owners to comply with. However, due attention must be given to the requirements of relevant statutory regulations or by-laws of the Regulatory Authorities or other Government Departments.

In preparing this Code, reference was made to the following documents:

- 1 (a) The Building Control Act, 1973
- (b) The Building Control (Administration) Regulations, 1979
- (c) Building Control Division Code on Fire Precautions for Buildings, 1982
  
- 2 (a) Singapore Standard CP 5 : 1977 Code of Practice for Wiring of Electrical Equipment of Buildings
- (b) Singapore Standard CP 6 : 1978 Code of Practice for Building Drawing
- (c) Singapore Standard CP 10 : 1980 Code of Practice for The Installation and Servicing of Electrical Fire Alarm Systems
- (d) Singapore Standard CP 13 : 1980 Code of Practice for Mechanical Ventilation and Air-conditioning in Buildings
- (e) Singapore Standard CP 19 : 1981 Code of Practice for the Installation and Maintenance of Emergency Evacuation Lighting and Power Supply Systems in Buildings
  
- 3 (a) The Public Utilities Act
- (b) The Electricity Regulations, 1975
- (c) The Public Utilities (Electricity Supply) Regulations, 1975
  
- 4 (a) BS 21 : 1985 Specification for Pipe Threads for Tubes and Fittings where Pressure-tight Joints are made on the Threads (metric dimensions)
- (b) BS 381C : 1980 Colours for Specific Purposes

- (c) BS 1387 : 1985 Steel Tubes and Tubulars Suitable for Screwing to BS 21 Pipe Threads
- (d) BS 3116 Automatic Fire Alarm Systems in Buildings Part 4 : 1974 Control and Indicating Equipment
- (e) BS 4547 : 1972 Classification of Fires
- (f) BS 5054 Transportable Gas Containers
- (g) BS 5306 Fire Extinguishing Installations and Equipment on Premises  
Part 5 : Section 5.1 : 1982 Halon 1301 Total Flooding Systems
  
- (h) BS 6266 : 1982 Code of Practice for Fire Protection for Electronic Data Processing Installations
  
- 5 (a) NFPA 12A – 1987 Halon 1301 Systems
- (b) NFPA 68 – 1978 Guide for Explosion Venting
- (c) NFPA 69 – 1978 Explosion Prevention Systems
- (d) NFPA 70E – 1983 Employee Electrical Safety (*For Classification of Hazardous Locations*)
- (e) NFPA 72E – 1984 Automatic Fire Detectors
- (f) NFPA 77 – 1978 Recommended Practice on Static Electricity
- (g) NFPA 408 – 1984 Aircraft Extinguishers (*For Classification of Fires*)
  
- 6. The Loss Prevention Council (or Fire Offices' Committee, U.K.) Recommendation for the Protection of Computer Installations against Fire
  
- 7. United States Military Specification for Halon 1301 Specification MIL-M-12218C
  
- 8 (a) ASTM A106 – 86 Specification for Seamless Carbon Steel Pipe for High Temperature Service
- (b) ASTM B88M – 86 Specification for Seamless Copper Water Tube (Metric)
  
- 9. (a) ANSI B16.3 Malleable Iron Threaded Fittings
- (b) ANSI B16.5 Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys
- (c) ANSI B16.9 Factory-made Wrought Steel Buttwelding Fittings
  
- 10. ASME Unfired Pressure Vessel Code, Section VIII
  
- 11. Toxicology References
  - (a) Paulet, G. "Etude toxicologique et physiopathologique du mono-bromo-trifluoromethane (CF<sub>3</sub>Br)." Arch. Mal. Prof. Med. Trav. Secur. Soc. 23:341-348 (Chem. Abstr. 60:738e). (1962).
  - (b) Van Stee, E.W., and K.C. Back. "Short-term inhalation exposure to bromotrifluoromethane." Tox. & Appl. Pharm. 15:164-174 (1969).



- (c) Clark, D.G. "The toxicity of bromotrifluoromethane (FE 1301) in animals and man." Ind. Hyg. Res. Lab. Imperial Chemical Industries, Alderley Park, Cheshire, Eng. (1970).
- (d) Du Pont Haskell Laboratory, unpublished data (1966), (1969), (1973), (1976) & (1978).
- (e) Trochimowicz, H.J.; A. Azar; J.B. Terrill; and L.S. Mullin: "Blood Levels of Fluorocarbon Related to Cardiac Sensitization." Part II. Am. Ind. Hyg. Assoc. J. 35:632-639 (1974).
- (f) Trochimowicz, H.J., et.al. "The effect of myocardial infarction on the cardiac sensitization potential of certain halocarbons." J. Occup. Med. 18(1): 26-30, 1978.
- (g) The Hine Laboratories, Inc. "Clinical toxicologic studies on Freon FE 1301, Report No. 1, San Francisco, Cal. (unpublished) (1968).
- (h) Stewart, Richard D.; Newton, Paul E.; Wu, Anthony, Hake, Carl L.; and Krivanek, Neil D.; "Human Exposure to Halon 1301" Medical College of Wisconsin, Milwaukee (unpublished) (1978).

12. Flame Extinguishment and Inerting References

- (a) Booth, K., Melia, B. J. and Hirst, R., "A Method for Critical Concentration Measurements for the Flame Extinguishment of Liquid Surface and Gaseous Diffusion Flames Using a Laborator 'Cup Burner' Apparatus and Halons 1211 and 1301 as Extinguishants," June 24, 1976.
- (b) Ford, C. L., "An Overview of Halon 1301 Systems," in Halogenated Fire Suppressants, ACS Symposium, Series No. 16 (1975) pp. 1-63.
- (c) Dalzell, W. G., "A Determination of the Flammability Envelope of Four Ternary Fuel-Air-Halon 1301 Systems," Fenwal Inc., Report DSR-624, October 7, 1975.
- (d) Coll, John P., "Inerting Characteristics of Halon 1301 and 1211 with Various Combustibles," Fenwal Inc., Report PSR 661, July 16, 1976.
- (e) Riley, J. F. and Olson, K. R., "Determination of Halon 1301/1211 Threshold Extinguishment Concentrations using the Cup Burner Method," Ansul Report AL-530-A, July 1, 1976.
- (f) Bajpia, S. N., "Extinction of Diffusion Flames by Halons," FMRC Serial No. 22545, Report No. 76-T-59, July 1976.
- (g) Data on file at NFPA.

Acknowledgement is made for the use of information from the above references.

**NOTE**

1. Singapore Standards are subject to periodical review to keep abreast of technological changes and new technical developments. The revisions of Singapore Standards are announced through the issue either of amendment slips or of revised editions.
2. Compliance with a Singapore Standard does not exempt users from legal obligations.

**1. SCOPE**

**1.1** This Code of Practice provides minimum requirements in the design, construction, installation, testing, commissioning, maintenance and operation of Automatic Halon 1301 Fire Suppression Systems in buildings. It does not confer immunity from statutory requirements in Government by-laws or from relevant regulations of any Government Department.