

UL STANDARDS AND PERFORMANCE REQUIREMENTS FOR NEW EXTINGUISHING AGENTS

William M. Carey
Underwriters Laboratories, Inc.

INTRODUCTION

UL is committed to assisting both agent and equipment manufacturers in the development of new requirements for the rapid implementation of alternative clean agents for fire protection applications.

UL has Listed Fire ~~Protection~~ equipment containing both Halon 1211 and Halon 1301 intended for use in ~~fire~~ suppression systems and portable fire extinguisher applications since their introduction in the 1960's.

To provide uniformity in applying requirements, UL has developed specific product performance Standards for Halon fire protection equipment. These Standards contain minimum design, construction, performance and marking requirements. They were prepared following the appropriate requirements contained in the National Fire Protection Associations (NFPA) Standard for Portable Fire Extinguishers, ANSVNFPA 10 and the NFPA Standards for Halon 1301 and Halon 1211 Fire Extinguishing Systems, ANSI/NFPA 12A and 12B. The NFPA Standards contain design, installation and maintenance requirements which are based upon the assumption that only listed equipment is used to satisfy installation requirements.

PORTABLE FIRE EXTINGUISHERS:

GENERAL

Design, performance, installation and maintenance requirements for halogenated agent type portable ~~fire~~ extinguishers **are** contained in the following *American* National Standards:

- (1) Rating and ~~Fire~~ Testing of Fire Extinguishers, ANSI/UL 711,
- (2) Halogenated Agent Fire Extinguishers, ANSVUL 1093 and
- (3) Installation of Portable Fire Extinguishers, ANSI/NFPA 10.

ANSI/UL 711

UL 711 describes **minimum** performance requirements and test methods for the classification and rating of portable fire extinguishers. With the exception of water type extinguishers, which were used as a basis **for** establishing the Class A rating system, **all** portable fire extinguishers **are** required **to** comply with the same minimum fire extinguishment and performance requirements to be eligible for a fire extinguisher classification and rating. Therefore, it does not appear that any revisions to this Standard will be required to address fire test methods for portable ~~fire~~ extinguishers containing new extinguishing agents.

ANSI/UL 1093

UL 1093 contains minimum design, construction, performance and marking requirements as well as ~~inspection~~ and maintenance requirements for halogenated agent ~~type~~ portable fire extinguishers. It covers **both** small portable types as well as larger wheeled ~~type~~ fire extinguishers. Many of the requirements in this Standard **are** performance and safety related and **are** applied to all types of ~~fire~~ extinguishers independent of the extinguishing agent. Other requirements, such as maximum filling density, cylinder service pressure, ~~pressure~~ gauge markings and other special ~~marking~~ and warning requirements **are** agent specific. These types of requirements will need to be developed for new extinguishing agents based upon the properties of these agents.

ANSI/NFPA 10

NFPA 10 contains minimum requirements for the installation and maintenance of portable ~~fire~~ extinguishers. This Standard identifies ~~fire~~ hazards in general by ~~fire~~ type and relative level **of**

fire risk and specifies what minimum UL 711 classification and rating the portable fire extinguisher must have to protect the hazard. The Standard does not identify protection requirements by agent type. It does, however, contain warnings and cautions which are agent specific such as avoiding the use of water based agent extinguishers on energized electrical equipment, requiring the use of bicarbonate based dry chemical agents on grease and commercial cooking equipment fires and recommending the use of clean agent ~~fire~~ extinguishers on delicate electronic equipment.

EXTINGUISHING SYSTEMS:

GENERAL

Design, performance and installation and maintenance requirements for halogenated agent ~~fire~~ extinguishing systems are contained in the following American National Standards:

1. Halogenated Agent Extinguishing System Units, ANSI/UL 1058.
2. Installation of Halon 1301 ~~Fire~~ Extinguishing Systems, ANSI/NFPA 12A.
3. Installation ~~of~~ Halon 1211 Fire Extinguishing System, ANSI/NFPA 12B.

NFPA is currently developing a new Standard titled Clean Agent ~~Fire~~ Extinguishing Systems, NFPA 2001, to address new alternative clean agents.

ANSI/UL 1058

The UL 1058 standard contains minimum design, construction, performance and marking requirements for halon fire suppression systems. It also requires the manufacturer to prepare a detailed design manual for engineered type systems and an installation and maintenance manual for both engineered and pre-engineered type systems. These manuals are referenced as part of the UL Listing and contain specific limitations on the hazards that can be protected, design methods and limitations for engineered ~~type~~ systems and specific volumes, nozzle area coverages and piping limitations for pre-engineered type systems. In addition, the manufacturer's installation and maintenance manual contains ~~the~~ instructions necessary for proper installation and maintenance including the periodic testing and recharging of these systems.

As part of our investigation of alternative clean agents, additional performance tests not specified in **UL 1058** will need to be included. Fire extinguishing tests to determine the **minimum** concentration **required** to extinguish Class A and/or Class B fires will need to be conducted with each new alternative clean agent. In the case of Halon **1301** for **total** flooding applications, minimum **design** concentrations for various **Class B** flammable liquids **as well as** surface and deep-seated Class A fires have **been** previously developed. This data is in the NFPA Standard and includes an appropriate design factor.

Except for nozzle area coverage tests, **UL 1058** does not **require** the conduct of either Class A or Class B fire tests for Halon **1301** total flooding fire extinguishing systems. Although some preliminary data **on** extinguishing concentrations are being proposed for the new NFPA Standard for Clean Agent **Fire** Extinguishing Systems, NFPA **2001**, currently under development, this data still needs to be verified and appropriate **minimum** design concentrations established for each alternative clean agent.

Another important area which will **need** to be developed for these new agents is special cautions, warnings, servicing and maintenance requirements which are different from those established for Halon **1301** and Halon **121.1**. It is assumed that the agent and equipment **manufacturers** will be able **to** propose appropriate information for these new agents.

ANSI/NFPA 12A AND 12B

These **Standards** were developed by the same NFPA Technical Committee and were intended to **track or harmonize** with each other. NFPA 12A was originally developed to cover both total flooding **and** local application type Halon **1301** fire extinguishing systems but is being revised to delete local application **type** systems. This revision will be presented at the NFPA Annual Meeting in New Orleans next week. NFPA **12B** covers **both** total flooding and local application Halon **121.1** fire extinguishing systems but with specific emphasis **on** the **use** of Halon **121.1** in **local** application **type** systems. With the increased emphasis **on** the implementation of new alternative clean agents and equipment, it is anticipated that these **Standards** will need to be maintained and revised to include additional guidance related to essential uses and current industry practice regarding the recycling/reuse of these agents.

CURRENTLY DEVELOPING NFPA 2001

This new Standard for Clean Agent Extinguishing Systems, **NFPA 2001**, is currently under development and was discussed earlier in this session. The committee has attempted to include all currently identified alternative clean agents provided the agent manufacturer submitted information and data on agent characteristics including ODP, toxicity, physical properties and fire extinguishing concentrations. It will be necessary for the NFPA 2001 committee to verify not only the test data but also the test methods and protocols used in developing this information.

SUMMARY

With the introduction and field use of alternative extinguishing agents, UL will review the Standard for Halogenated Agent Extinguishing System Units, ANSI/UL 1058 and the Standard for Halogenated Agent ~~Fire~~ Extinguishers, ANSI/UL 1093 to determine how they will need to be revised to properly address these alternative clean agents. In addition to verifying appropriate fire performance, UL intends to conduct appropriate tests to provide assurance that ~~fire~~ protection equipment containing these new extinguishing agents can be properly installed, maintained and serviced with a similar level of performance and safety as existing Halon equipment.

UL encourages submitters of new products, such as portable ~~fire~~ extinguishers and fire extinguishing systems containing alternative clean agents, to submit pertinent information to the appropriate NFPA committee so that installation, use and maintenance ~~requirements~~ for these products can be appropriately addressed in a nationally recognized Standard. However, in the interim period prior to formal recognition in the applicable **NFPA** Standard, UL is receptive to conducting investigations and promulgating certification of these products as long as an appropriate and comprehensive investigation can be conducted to address all safety considerations.