



## The Impact of Testing Changes in NFPA 10 What needs to be replaced and what does not

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What was the Technical Committee on Portable Fire Extinguishers thinking when they added “4.4.1 Dry chemical stored pressure extinguishers manufactured prior to October 1984 shall be removed from service at the next 6-year maintenance interval or the next hydrotest interval, whichever comes first” to the newest edition of [NFPA 10, Portable Fire Extinguishers](#)?

The committee is bringing the standard into line with the UL on the 1984 changes to UL 299, *Dry Chemical Fire Extinguishers* and UL 711, *Rating and Fire Testing of Fire Extinguishers*. One must comply with both of the UL documents since both are required for listing of a dry chemical extinguisher.

It is important to note the requirement of paragraph 4.4.1 is not an immediate replacement of all extinguishers that were made prior to 1984. It applies only to stored pressure dry chemical extinguishers and it applies to those extinguishers as they come due for their 6-year maintenance or 12-year hydrostatic test thus, the lessened economic impact (plus these extinguishers currently have more than 20 years of service life).

This article provides additional information on the impact of the UL standards changes to the fire extinguisher and to the end user, which explains the reasons for the committee’s action in making this change to the 2007 edition of NFPA 10.

### (1) Hose Requirement

The 1984 edition of UL 299 required any extinguisher rated 2A or higher or 20-B or higher to be equipped with a discharge hose.

Before this change, almost all 5-pound extinguishers and many of the 10-pound extinguishers were equipped with a “fixed nozzle” on the outlet of the extinguisher valve – no hoses. These extinguishers, rated 2A to 4A and 10B to 60B are the ones used to comply with the installation requirements now contained in Chapter 6. To properly use these extinguishers, the user must keep it in the upright position, apply the dry chemical to the base of the fire, and then sweep the discharge back and forth.

The requirement for the addition of a hose to these extinguishers came out of the “novice fire tests” sponsored by Underwriters Laboratories and Fire Equipment Manufacturers Association. The film footage of these tests shows that persons who had never used a fire extinguisher before often used both hands to operate these extinguishers. That is to say, they often turned the extinguisher cylinder in a horizontal position while squeezing the handle and lever to open the valve. Sometimes they even inverted the extinguisher. The result of this action is only a partial discharge of the extinguisher contents, or possibly only the expellant gas and therefore no extinguishment of the fire. The addition of a hose also makes it much easier to direct the discharge at the base of the flames and to sweep the discharge from side to side.

The requirement to add a hose to an extinguisher makes it more likely to be used in an upright position. In fact, it is almost impossible to do otherwise since one hand opens the valve and the other hand, which holds the hose, directs the discharge stream to the fire.

It is important to note that field modification of an extinguisher is generally not allowed since this modification may not have been evaluated to comply with the test requirements in the applicable Underwriters Laboratories Extinguisher Standards, and the extinguisher may not operate as intended. Thus, one cannot simply remove a fixed nozzle from an extinguisher and replace it with a hose and nozzle.

### (2) Minimum Discharge Time

This requirement is found in the 1984 edition of UL 711. It requires a minimum 13-second discharge duration for an extinguisher rated 2A or higher. The 13-second minimum requirement was also the result of recommendations from the novice fire tests mentioned in the explanation for the hose requirement mentioned in number (1).

Before 1984, almost all of the 2A rated dry chemical extinguishers had discharge durations of only 8 to 10 seconds. The novice fire tests clearly showed that longer discharge duration resulted in an increased likelihood of extinguishment. The revision to UL 711 mandated a 50 percent to 60 percent



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increase in the minimum discharge duration for a 2A-rated dry chemical extinguisher.

Again, it is not allowed to modify extinguishers with a nozzle/hose that gives different or longer discharge duration. This modification would not have been evaluated to comply with the test requirements in the applicable Underwriters Laboratories Extinguisher Standards, and the extinguisher may not operate as intended.

### **(3) Pull Pins**

A revision to the extinguisher standards, including UL 299 required a maximum 30 pounds of force to remove a safety pin or pull pin from an extinguisher. This again came from the novice testing where some individuals could not physically remove the pin and actuate the extinguisher. The UL extinguisher standards also included a design requirement so the pin is visible from the front of the extinguisher unless noted by the operating instructions.

### **(4) Operating Instructions/Marking**

The extinguisher standards, including the UL 299 revision of 1984 mandated the use of pictographic operating instructions and use code symbols on all but class D extinguishers and wheeled extinguishers.

These requirements also came out of the novice fire tests, which showed many individuals taking too long to read and understand the written operating instructions. Further, the novice tests actually developed the pictographic operating instructions and tested them on novice operators for effectiveness. The details of how many instructions per pictogram came from the test program. A sample of a pre-1984 extinguisher nameplate is attached so you can get an appreciation for the improvements that were made.

The novice fire test was also the impetus to make the use code symbols for the various classes of fires more understandable. These new pictographic use code symbols were also mandated in 1984 as well as a uniform method of applying A, B, and C symbols to extinguishers with ABC or BC only ratings. The result was a uniform, consistent set of easily understood symbols that made the extinguisher more user friendly.

### **(5) Service Manuals**

The extinguisher standards, including UL 299, for the first time mandated that extinguisher manufacturers have a service manual for their products. In addition, the 1984 edition of UL 299 requires a reference to the service/maintenance manual on the extinguisher nameplate. This helps to insure proper continued maintenance of the extinguisher while it is in service, and may actually help with enforcement of paragraph 4.4.2 of NFPA 10-2007.

Remember, this is not an immediate "pull from service" directive. The extinguishers are to be removed from service at their next 6 year maintenance teardown interval or 12 year hydrostatic test interval, whichever comes first.

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