

From: Robert Lewis
To: Christopher Bajwa] NMSS
Date: Mon, Apr 8, 2002 9:47 AM
Subject: Re: Fire Test info

Thanks, Chris.

This reference is the modal study (1987). I have copies if you need it. In what we've been producing, we've been careful to state the test - considering the combination of temperature, duration, and location - encompasses the great fraction of fires, but we've been careful not to say that 1475 covers the flame temperature.

>>> Christopher Bajwa 04/08/02 09:40AM >>>
Rob,

Found this in a report on the net...provides a pretty good explanation:

Engulfing Fire. The crash and puncture tests are followed by a 1,475-degree-Fahrenheit fire that must engulf the test cask for 30 minutes. After the 30-minute period, any combustion of cask materials must be allowed to continue until stopping by itself, and no artificial cooling is permitted.

Major variables in determining the total thermal effect on a cask are flame temperature, flame distance from the cask, fire duration, and the percentage of the cask surface that is surrounded by flames. According to the Lawrence Livermore report, the 1,475- degree hypothetical engulfing fire required by NRC regulations is equivalent to a real engulfing fire of 1,700 degrees F, because of the shielding effects of the transport vehicle, ground, or whatever else the cask might be resting on. In the NRC test fire, the cask must be suspended in the engulfing fire by test supports that minimize interference with heat transfer.

NRC's fire test has been criticized for specifying a flame temperature below that of many motor fuel fires. For example, a gasoline tanker fire can reach 1,900 degrees F. (See Endnote 10.) However, the Lawrence Livermore report concluded that few actual fires would exceed the combination of factors temperature, duration, flame distance, and degree of engulfement required by the NRC hypothetical fire requirements.

This is the reference:

Fischer, Larry E., et al. Shipping Container Response to Severe Highway and Railway Accident Conditions. Prepared for NRC by Lawrence Livermore National Laboratory. NUREG/CR- 4289, UCID-20733, Vol. 1. P. 7-25.

CC: Chester Poslusny; Earl Easton; Jack Guttman; John Cook; Kimberly Gruss

A/11