Fire Hazard Associated with Decorative Lights

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Two types of decorative lights are commercially available, both with a maximum input voltage rating of 120 V: (a) temporary-use, seasonal lights and accessories which are portable and not permanently connected to a power source and (b) portable flexible lighting products provided with a power supply cord with a fused attachment plug and intended for outline and decorative lighting use (usually called “rope lights”). “Rope lights” are often installed as part of a permanent decorative display, while the former type of decorative lights tend to have short display periods only.

Fire statistics show that Christmas tree fires cause a significant amount of fire losses in the United States each year. Moreover, analysis of such fires indicates that the decorative lights associated with the trees, usually seasonal lights and accessories, are often to blame for the fire losses. This has led to recommendations from a large number of organizations that all tree lights should be listed, and Underwriters Laboratories has issued UL 588 for that purpose. The experience with “rope lights” is more recent and the loss record is less clear. However, Underwriters Laboratories is developing UL 2388 to provide guidance on their safety.

There are two critical properties that contribute to the high fire hazard associated with decorative lights: the fire performance of the lights and their temperature rating. The fact that lower fire performance of any material will result in a higher fire hazard associated with the products from which the material is made from does not require additional clarification. The effect the temperature rating of an electrical material has on fire hazard is less obvious, but results from material thermal degradation often resulting from heat generated internally by the conductor. A degraded material can no longer properly perform its insulation function and is often a weak spot leading to ignitions.

This work assesses information available on fire losses, and discusses ways in which such losses can be decreased, including compliance with Underwriters Laboratories listing requirements.