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FIRE AND FLAMMABILITY BULLETIN

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GUEST EDITORIAL

A simple method of reducing upholstery fires caused by cigarettes

One of the best kept secrets in the upholstery industry is that clean cellulosic fabrics do not ignite from cigarettes. It is generally thought that the cigarette ignition resistance of cellulosic fabrics decreases with increasing fabric weight. However, even such heavy cotton fabrics as 'Haitian cotton' will not be ignited by cigarettes if rinsed in deionized or low-hardness water.

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Only cellulosic fabrics which contain certain compounds — primarily alkali metal ions such as potassium, sodium or calcium — support smouldering ignition. Such ions are naturally found in raw cotton, which is used in many upholstery fabrics, or in residues of dye assistants, softeners, detergents etc.

The effect on many compounds on smouldering in general has been discussed. Detailed studies have shown how an increase in alkali metal ion concentration decreases the cigarette ignition resistance of fabrics, and have established the minimum concentration necessary to cause cigarette ignition and continued smouldering of fabric/foam combinations. Smoulder promoters used to be added to cigarette tobacco to keep cigarettes burning while not puffed, but modern genetic fertilization practices have obviated the need for such additives. However, the smouldering rate and ash appearance of cigarette paper is modified by addition of substances such as sodium or potassium nitrate. Other tobacco smouldering promoters and inhibitors have been studied experimentally.

A simple test could be carried out by furniture and fabric manufacturers: a sample of a cellulosic upholstery fabric is rinsed in deionized or soft water, allowed to dry thoroughly, and used in a fabric/foam mockup. A similar mockup is made from unrinsed fabric, and its reaction to ignited cigarettes observed. If there is considerably less smouldering of the rinsed mockup, a modification of the finishing process would be indicated.

There appear to be several, thus far overlooked, opportunities: for upholstered furniture manufacturers, to have a much wider selection of cigarette ignition resistant fabrics (e.g. UFAC class 1 as compared to class 2) with little or no added cost; for fabric manufacturers, to increase cigarette ignition resistance (which might be a merchandising advantage as well as a way of reducing fire deaths caused by cigarettes); and for finishing manufacturers, to offer new products, such as dye assistants or softeners, that cause less smouldering so they would not have to be completely rinsed out. Another market opportunity lies in smoulder inhibitors, to be perhaps used in the backcoating of raw cotton fabrics which are not wet finished and for which rinsing and drying would be a costly production step. Boric acid/borax smoulder inhibitors are, of course, widely used in cotton batting for both cigarette and flame ignition resistance, and others are available. Again, for upholstery cleaning materials suppliers, there could be a demand for products with a lower smoulder-promoting tendency, and for counteracting rinses.

John Krasny

Note: John Krasny, consultant, was formerly a research officer at the Center for Fire Research (now the Building and Fire Research Laboratory), part of the US National Institute of Standards and Technology, and an associate editor of *FFB*. His address is: 4419 Westbrook Lane, Kensington, MD 208895, USA.

NEWS

EUROPE

Heat release rate governs industrial sprinkler design

The Swedish National Testing and Research Institute (SP) at Boras has introduced a new technology for the design of reliable and cost-effective industrial sprinkler systems. It features a very large calorimeter for measuring rates of heat release (RHR) up to 10 MW. This enables the burning behaviour of goods stored in racks to be monitored at full scale.

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