

Research Paper :

Launderings effect of FR treated fabric on dimensional parameters

MAMTA RANA, K. KHAMBRA AND NIRMAL YADAV

Received : July, 2010; Revised : August, 2010 Accepted : September, 2010

ABSTRACT

The choice of flame retardant systems for any particular application depends on how the material decomposes in a fire, as well as the materials' physical property. Brominated flame retardants, because they act in the flame, can be used in just about every application. To achieve the objective of the study, 100% white mercerized cotton fabric, Zirconium dioxide as flame retardant (FR) chemical (12% and 15%) and two binders namely, SLN and PVA (5% each) and (2.5% each) were selected on review basis and used separately and in combination. Recipe was made on the weight of the fabric for making suspension of FR finish. To apply flame retardant finish, pad-dry-cure method on padding mangle was used with 1 dip 1 nip, 2 dip 1 nip and 3 dip 1 nip systems. After application of FR finish, launderings were done 5, 10 and 15 times. Constructional parameters were assessed of treated and washed fabrics. Results interpreted that after launderings, 5 per cent PVA binder gave the best results with 15 per cent concentration of finish as compared to 5 per cent SLN binder and 12 per cent finish concentration.

See end of the article for authors' affiliations

Correspondence to:

NIRMAL YADAV

Department of Clothing and Textiles, I.C. College of Home Science, C.C.S. Haryana Agriculture University, HISAR (HARYANA) INDIA

Rana, Mamta, Khambra, K. and Yadav, N. (2010). Launderings effect of FR treated fabric on dimensional parameters, *Asian J. Home Sci.*, 5 (2) : 275-278.

Key words : FR chemical, Binders, Padding mangle, Dip and nip, Launderings

Flame retardant chemicals have been used since Roman times when they prevented siege towers from catching fire. In textile industry, brominated flame retardants were first used in cellulose nitrate which is extremely inflammable. In the early 1970's, the increasing use of flammable materials such as synthetic fibres in sofas and curtains led to the wider use of flame retardants. Flame retardants are able to contribute greatly to reducing the risk of fires providing safety in the home and in public places (Moghaddam and Saedi, 2000).

The stability of bromine in a typical flame retardant molecule means that the molecule can offer the highest activity as a flame active retardant, while also being cost effective (WHO, 2000). The main types of flame retardants are based on compounds containing: Halogens (Bromine and chlorine), phosphorous, nitrogen, minerals (based on aluminum and magnesium) and others (Edward and Manjiri, 2004).

METHODOLOGY

To conduct the experiment, 100% pure white mercerized cotton fabric ; having GSM 220 g was selected. Flame retardant chemical named, Zirconium dioxide and two binders' namely, Polyvinyl alcohol (PVA) and Silicon Liquid Nitrile (SLN) were selected on review basis.

Applications of FR finish with varying treatments/dips:

For 1st application of finish, on the weight of the fabric, 12 per cent Zirconium dioxide and 5 per cent SLN binder were mixed in (MLR 1:40) water. Fabric was dipped in that suspension for five minutes and rolled out using pad dry cure method in instrument named padding mangle at room temperature and 50 Pascal pressure. Fabric was dried in sun light on grass horizontally. This is known as 1 dip 1 nip (dipped once in suspension and squeezed once through padding rollers). Further, application for 2 dip 1 nip was dip the fabric twice in suspension and once pass through the padding mangle. Similarly for 3 dip 1 nip accordingly dip thrice and squeezed once. For 2nd application of finish, instead of SLN binder 5 per cent PVA binder was used with same concentration of FR chemical. For 3rd application of finish, 15 per cent Zirconium dioxide and 5 per cent SLN binder was mixed in water. For 4th application of finish, instead of SLN binder 5 per cent PVA binder was used with 15 per cent application of finish. For 5th application of finish, 12 per cent Zirconium dioxide on the weight of the fabric and both binders *i.e.* 2.5 per cent each were used in combination. For 6th application of finish instead of 12 per cent finish, 15 per cent finish was used and rest of the procedure was same.