

INFLUENCE OF FLAME RETARDANT FINISHING ON FLAMMABILITY OF VARIOUS CELLULOSE FIBRES

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This research presents the investigation of the influence of flame retardant concentration on the flammability properties of various kinds of cellulose fibres. The industrial flame retardant Aflamit®KWB (Thor GmbH, Germany) reagent and the yarns of three kinds of cellulose fibres (cotton, flax and peat) of linear density 200 ± 10 tex have been chosen for investigation. The various concentration of flame retardant reagent was used for all kinds of yarns. The basic concentration of Aflamit®KWB was chosen according to the Thor GmbH standard recommended for the application. Also, the concentration was used 2, 3, 4, 6, 8 and 16 times lower than the basic concentration. The horizontal tests of yarn's flammability (time of burning) and vertical tests of flame spread (speed of spread) were carried out. The results obtained have been compared with the results of flame retardant metaaramide yarns Nomex (DuPont, USA) and with results obtained earlier by co-author of present investigations [1, 2].

The investigation shows that even when the concentration is 4 times lower than basic, it provides similar flammability properties to the analogous properties of Nomex yarns. The differences between properties of various kinds of cellulose yarns were investigated as well. The best results of flammability properties have been obtained for cotton yarns and the lowest - for flax yarns. The reason for these differences can be explained by composition of various kinds of cellulose fibres.

The influence of concentration of flame retardant reagent on the strength of yarns was investigated too. The research shows, that concentration has a negative influence on the strength of yarns – when concentration increases the strength decreases.

The results of investigation show that concentration of flame retardant reagent can be used in much lower levels than is recommended by the producer. Also the lower level of concentration supports the higher strength of yarns. The lower concentration can be recommended for textile goods which are not necessary to wash.

References

- 1) Salmeia K. A., Jovic M. , Ragaišienė A., Rukuižienė Ž., Milašius R. , Mikučionienė D., Gaan S. *Polymers*, 2016, 8, 293; doi:10.3390/polym8080293
- 2) Mikučionienė D., Milašiūtė L., Milašius R. *Autex RJ*, 2014, Vol.14, No.4, p. 226-232.