

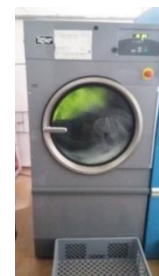


Functionalization of garments by laundry processing

Current trends of sustainability in textile production and development, need of a fluent resources availability with simultaneous reduction of energies, water and chemicals consumption incl. decreasing environmental impacts enabling transition to circular economy require innovative solutions not only in textile production but also in its interconnection with optimum maintenance (laundry) conditions. For these reasons InoTEX in cooperation with its partners deals intensively with development of optimized technologies using reliable auxiliary chemicals verified in long-term end-use testing and offers its solutions incl. the application service.

Activities of the project **CleanProtect** (MPO-TRIO, FV40146; 06/2019-05/2022) in cooperation of participants InoTEX, Prádelna LOTOS, and National Health Inst. Prague were aimed to development, verification and optimization of ready made garments functionalization by laundry processing incl. regeneration of the functional effects after determined no. of maintenance cycles.

The finishing technologies verified in conditions of the industrial laundry are determined for functionalization of protective clothing for work in industry, workshops, food processing and gastro-service, in laboratories, health-care service, for textile products used in care and accommodation facilities and home textiles (bedlinen, towels, drapes).



Technologies of textile products functionalization by laundry processing and regimes for the functional effects regeneration were determined for following barrier finishing incl. their combined effects using chemical products available from InoTEX spol. s r.o. company, Dvůr Králové n. L.:

- **Flameproof** (TEXAFLAM DFR – wash-stable, TEXAFLAM CU – dry cleaning stable). These finishes are determined for clothing from cotton and Co/PES blends up to PES content max 65%. The synthetic fibres content results in a significant reduction of strength loss and material damage during a long-term use and washing. It contributes to service life prolongation of the finished clothing, which protective effect can be renewed by the laundry processing. To check the proper maintenance regime a simple electronic flexible sensor is available for detection of the protective effect loss caused by a faulty maintenance by washing instead of the pre-scribed dry cleaning process (result of the project FLEXPRINT TE01020022).
- **Anti-stain–DW(O)R** (wash-stable waterproof) finishing based on FC6 or F-free products (encapsulated paraffin) for cellulosic, synthetic and blends **TEXAFOB FC**, **TEXAFOB ARK**, which composition meets eco-strategies aimed to reduction of fluorocarbons use. The finishing is performed mainly as a prevention of soiling of textiles with coloured and greasy stains during work in industry and food processing which leads to mitigation of maintenance regimes intensity: less frequent washing and improvement of the maintenance efficiency: shorter and less frequent cycles, lower temperatures, washing without use of aggressive chemicals – these consequences also contribute to a significant prolongation of the garments service life when used as a PPE and result in cutting of water and energies consumption.
- **Antimicrobial** based on Zn pyrithione or Ag (provided by INOTEX) complying with the biocidal legislation requirements. These finishes are determined for cellulosic and synthetic fibres and their blends.

In conditions of the industrial laundry the finishing is usually performed in following processing steps: wetting of the goods in a bath with active components in a separate drum washing machine, centrifugation of the excessive bath (and its collecting for a repeated use), drying in an industrial dryer and high temperature processing in a fixing chamber for ensuring finishing effects stability in repeated washing. Some finishes can be thermofixed by mangling or ironing.

The application of the described finishing systems during the maintenance regimes and the replacement of cotton constructions with Co/PES blends with better mechanical parameters enable to prolong the service-life of the functional garments which brings a purchasing cost reduction – this is advantageous mainly for companies working in leasing regimes and their customers. „Dematerialization” by lowered textile substrates consumption and reduction of textile waste volume are significant ways to increase of sustainability and saving of energy.

This also facilitates conveniently a newly prepared duty of textile municipal waste sorting from January 2025.

More info: www.inotex.cz; martinkova@inotex.cz, info@inotex.cz .