NANSULATE ADVANCED INDUSTRIAL PRODUCTS

CASE STUDY

Nansulate Translucent High Heat

Industrial Nanotech Distributor:
Kolorgen Ltd.

Customer
Erenko Tekstil

Location
Istanbul, Turkey

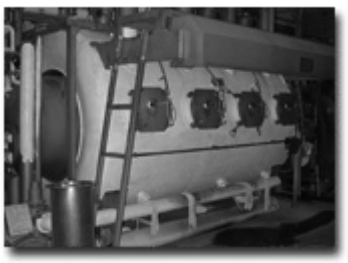
Product
Nansulate Translucent High Heat

ISSUE:

Minimize oscillation of the reaction temperature for dyeing machine to improve reproducibility (color consistency). Insulate to decrease amount of energy used in equipment process.

SOLUTION:

Nansulate Translucent High Heat was used to insulate the dyeing machine. Monitoring a process that takes place at 60 C for a 60 minute reaction time; the steam-based heat-exchanger of the un-insulated machine needed 24 heat-on cycles, whereas Nansulate machine's heat-exchanger only needed 2 heat-on cycles. Nansulate also improved reproducibility - helping to keep the color of the fabric indentical.



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Importance of Temperature Stability in Reactive Dyeing Process

In reactive dyeing of cotton, there are 5 important process parameters.
(temperature, pH(acidity/alkalinity), salt concentration, bath ratio, reaction time)
For right-first-time dyeings, and reproducable quality, all of these 5 parameters should be the same, every time.

Parameters like bath ratio, pH, salt concentration and reaction time is nowadays closely monitored and faultlessy administered with the use of computerized controllers.
Reaction temperature is closely related to heat losses, as a result the reaction temperature oscillates below and above the reaction set temperature. This oscillation of temperature causes variability in dyeing so that reproducibility is quite low. For reproducibility to be acceptable, dyeing machine and piping and circulation assembly should have proper insulation.

In pipes and certain other parts, conventional insulation is possible. The problem area is the insulation of dyeing machine itself. It has large areas for heat loss, also it needs to be kept at a certain temperature for a defined duration. Therefore, it may be possible to have better reproducability by dyeing machine insulation.

We have closely monitored a dyeing process which takes place at 60 C for a 60 minute reaction time; the steam-based heat-exchanger of the un-insulated machine needed 24 heat-on cycles, whereas Nansulate machine's heat-exchanger only needed 2 heat-on cycles.

This proves that by proper insulation, heat losses are minimized, it also shows that oscillation of temperature is decreased.

With a Nansulated dyeing machine, we have observed that the colour of fabric was surprisingly identical to one another, whereas in un-insulated machine, there is always a small difference in colour.

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