

Effects of Spent Dyebath Recycling on Pollution and Cost of Production in a Cotton Textile Industry

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Abstract : Textile manufacturing industry uses a substantial amount of chemicals not only in the production processes but also in manufacturing the raw materials. Dyes are the most significant raw material which provides colour to the fabric and yarn. Dyes are produced by using a large amount of chemicals both organic and inorganic in nature. Dyes are further classified as Reactive or Vat Dyes which are mostly used in cotton textiles. In the process of application of dyes to the cotton fiber, yarn or fabric, several auxiliary chemicals are also used in the solution called dyebath to improve the absorption of dyes. There is a very little absorption of dyes and auxiliary chemicals and a residual amount of all these substances is released as the spent dye bath effluent. Because of the wide variety of chemicals used in cotton textile dyes, there is always a risk of harmful effects which may not be apparent immediately but may have an irreversible impact in the long term. Colour imparted by the dyes to the water also has an adverse effect on its public acceptability and the potability. This study has been conducted with an objective to assess the feasibility of reuse of the spent dye bath. Studies have been conducted in two independent industries manufacturing dyed cotton yarn and dyed cotton fabric respectively. These have been referred as Unit-I and Unit-II. The studies included assessment of reduction in pollution levels and the economic benefits of such reuse. The study conclusively establishes that the reuse of spent dyebath results in prevention of pollution, reduction in pollution loads and cost of effluent treatment & production. This pollution prevention technique presents a good preposition for pollution prevention in cotton textile industry.

Keywords : dyes, dyebath, reuse, toxic, pollution, costs

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