

HEALTH AND SAFETY HAZARDS CAUSED BY TEXTILE INDUSTRY

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ABSTRACT

The textile production industry is one of the earliest and most technologically difficult of all industries. The basic strength of this industry flows from its brilliant production base of a wide range of fibres/yarns from natural fibres like yarn, jute, silk, and wool to artificial/man-made fibres like polyester, nylon, and acrylic. Many chemicals used in the textile industry origin ambience and health trouble. Among the many chemicals in textile wastewater, dyes are considered vital pollutants. Textile effluent is a origin of significant amount of ambience degradation and human illnesses. About 40 % of globally used colorants contain organically bound chlorine, a known carcinogen. Chemicals disappear into the air we breathe or absorbed through our skin; they show up as allergic reactions and may origin harm to children even before birth. Due to this chemical pollution, the normal performance of cells is disturbed and this, in turn, may origin alteration in the physiology and biochemical mechanisms of animals resulting in impairment of important functions like respiration, osmoregulation, reproduction, and even transience. Intense metals, there in textile industry effluent, are not recyclable hence, they accrue in primary organs in the body and over time begin to make bitter, leading to various symptoms of diseases. Thus, untreated or incompletely treated textile effluent can be harmful to both aquatic and terrestrial life by adversely affecting the natural ecosystem and causing long-term health effects. ambience hazards and health trouble related with chemicals used in textile industry are discussed in this chapter.

KEY WORDS: Dyes, Effluent, ambience, hazards, health trouble

INTRODUCTION

The textile industry consists of a number of units engaged in spinning, weaving, dyeing, printing, finishing and a number of other processes that are required to convert fibre into a finished fabric or garment. There are numerous safety and health issues associated with the textile industry. This article aims at studying each of these issues in relation to the US and Indian textile industries in detail, along with the potential solutions for these problems. Every environment in which a working activity is performed, presents higher or lower mishap hazards. The textile industry is characterized by the presence of a wide typology of machines and equipment, which automatic or manual transport systems connecting the various machines and department, with dwell and storing areas therefore the maximum attention must be paid by the operator, who has to comply scrupulously with the procedures and the active and passive safety systems with which modern machines are largely equipped. Often the distraction or the excess of confidence with the machines are the occasions for accident hazards. The hazards can also be increased by the environment conditions of certain departments, by the kind of organization and by the existing work places.

LITERATURE REVIEW:

[**padmini D.S et al.,2010**]. The hazards happening in the textile industries and mechanical hazards, physical hazards, chemical hazards, Ergonomic hazards and physiological hazards. Exposure of cotton diseases called bysinosis. The symptoms are chest tautness, defiance problem, asthma and annoyance in the respiratory track. The study tells about the accumulation of workers, improper condition of the piece of equipment, ergonomic crisis faced by the worker, grime problems, deprived lighting, ventilation and unaware of personal protective equipment not given OHS in these industries.

[**Nazia Mlik et al.,2010**]. Education is the fundamental right that helps the growth of nation. The education help the worker to get knowledge about medical rights, legal and social behaviour. The people are uneducated most of them do not know OHS at work place. The Company ignorant and lack of OHS a few of them are training, housekeeping, mishap prevention, hospital provision, security signs.

[**Hafiz Danish Ashraf et al .,2009**]. To control the noise level in the company premises and outside the company necessary action must be taken that noise regulation must be adopted.

[**Ahmad HO et al.,2001**]. To maintain the quality and production, the health of worker is necessary. The most significant Hazard in working is noise. To maintain the quality and production ,the health of the worker is necessary.

[**James MG et al.,2009**]. The Main cause of noise problem in the weaving and spinning industry is due to the poor design, overload and old machinery.

[**Iqbal SM et al., 2007**]. In industries is noise is a big problem that affects the human peace and increase the stress

[**Tiwari meenaxi et al.,2012**]. The musculoskeletal disorders are caused by continuous work , stealing high weight, doing job without suitable procedures.

OBJECTIVE OF THE STUDY

The main objective of the study can be organised due to the Reasons :

1. Measure work environment issues such that sound, warmth, illumination humidity.
2. To find out the Hazards in the Textile and know about the accurate control measure.
3. To identify the effects of different occupational exposures and accidents on human health.
4. Detect unsafe working condition in the Textile industries.

MAJOR SAFETY AND HEALTH ISSUES

The process of making fabric and garments from fibre involves a variety of processes, which include spinning, weaving, dyeing, printing, finishing. There are several safety and health issues associated with the textile industry.

The main safety and health issues in the textile industry can be classified as exposure to:

1. Cotton dust
2. Chemicals
3. Noise
4. Ergonomic issues

Exposure to cotton dust:

The workers engaged in the processing and spinning of cotton are exposed to cotton dust and other particles which lead to a respiratory disorder called Byssinosis, commonly known as brown lung. The symptoms of this disease include tightening of the chest, coughing, wheezing and dumpiness of inhalation. Also there is an increase in the incidence of chronic bronchitis and acute respiratory illness.

Exposure to chemicals:

Especially those engaged in the activities of dyeing, printing and finishing, are exposed to chemicals. These chemicals containing Benzedrine, ocular brighteners, solvents and fixatives, crease-resistance agents release formaldehyde. Flame retardants have organ phosphorus and organ bromine compounds. Antimicrobial agents which are used in textile operations are also detrimental to health.

Exposure to formaldehyde can cause:

- Cancer of nose, lung, brain and blood (leukemia), which can be fatal in the long run.
- Respiratory difficulty and eczema.
- Contact of the chemicals and dyes with skin can cause contact dermatitis and inhalation can lead to several serious health effects.

Other cancers which are notably high in textile workers are of the:

- Oral cavity
- Throat
- Gastrointestinal tract
- Thyroid
- Testis
- Non-Hodgkin's Lymphoma

Exposure to noise:

High levels of noise from ill maintained machinery in the long run, is known to damage the eardrum and cause hearing loss.

Other problems like exhaustion, skiving, aggravation, anxiety, reduction in efficiency, changes in pulse rate and blood pressure as well as sleep disorders have also been noted on account of continuous exposure to noise.

Ergonomic issues:

In most developing countries most of these units have a working environment that is unsafe and unhealthy for the workers.

Workers in these units features a number of problems such as:

- Unsuitable furniture
- Improper ventilation and lighting
- Lack of competent safety measures in case of emergencies
- Musculoskeletal disorders on account of poor ergonomic conditions

ACTION OF EFFULENT FROM TEXTILE INDUSTRY

Effluent treatment methods can be classified into physical, chemical and biological methods. Exclusive treatment by one of these three methods has proved to be insufficient in removing color and other effluent from textile industry wastewater. While several dyes are tricky to biodegrade few, particularly the hydrolyzed reactive and certain acidic dyes are not readily absorbed by active sludge; hence they escape treatment. Combination of a variety of effluent treatment methods can remove more than 85% of unwanted matter.

The resulting effluent is usually high in color. A complimentary treatment process is needed to remove color and if possible residual impurity. The textile industry has been condemned to be the world's nastiest environment polluters. It requires huge amounts of Chemicals and Water at every step of the textile manufacturing and finishing process. Water is needed to convey the chemicals into the fabric and to wash it at the beginning and end of every step. It becomes filled of chemical additives and is then barred as wastewater. which in twist pollutes the environment. A limited resource is thus becoming scarce. Water pollution is indeed a serious problem in most countries. The textile industry continues to look for an economical solution to decolorize the nearly 200 billion liters of colored effluent produced annually. Nations, states, industries are spending billions in cash on research to reduce pollution and on construction of effluent treatment plants. The public concern for industrial air and water pollution is leading to considerable restrictions on all industrial

activities polluting the environment. Governments have proposed laws limiting the amount and kind of waste that can be dumped as such. Considering the adverse effect on environment and health of people due to the effluent being thrown out of the Textile Dye Industry we need to wake up to the serious problem and make every effort to reduce pollution and construct effluent treatment plants at the sites churning out billions of liters of waste water.

MEASUREMENT OF THE PROBLEM

When performing a Process, the Risk Priority Number (RPN) is a calculation to sort the risks from highest to lowest. The RPN is calculated by multiplying the three scoring columns: Severity, Occurrence and Detection.

$$\text{RPN} = \text{Severity} \times \text{Occurrence} \times \text{Detection}$$

Table 1 shows the average performance of various types of protection in respect to the different frequency values.

Type of ear protection	Frequency Hz						
	125	250	500	1000	2000	4000	8000
Cotton staple	4	5	5	9	19	17	14
Shaped inserts	6	6	7	9	21	27	13
Selectone K insert	7	8	6	10	21	31	28
Insert of cotton and wax	8	10	12	16	27	32	31
Feather wool	6	8	11	15	19	26	35
E:A:R: polymer foam inserts	26	27	29	30	33	44	44
Earplug V-51 R inserts	20	19	19	22	27	29	30
Preformed silicone inserts	18	17	23	21	30	42	39
Malleable inserts	24	25	26	26	35	42	40
Shaped inserts in resilient material	27	27	28	30	35	45	40
Casings (foam seal)	8	14	23	31	32	36	31
Casings (fluid seal)	20	18	23	31	35	38	31
Casings (liquid seal)	19	24	32	41	38	42	32
Anti-noise helmets	15	20	24	33	40	53	50

Table 1

Conditions to overcome the problems of these workers

It is compulsory for employers in the textile industry to protect their workers from over exposure to cotton dust and its detrimental effects.

- Employers are required to measure the quantity of respirable cotton dust once in 6 months or whenever they notice any increase in the level of dust. (Guidelines are available from the occupational health and safety department of the government)
- It is the duty of the management to offer respirators to the employees.
- Regular servicing of machinery to reduce noise levels, providing earplugs.
- Providing masks and gloves to handle chemicals.
- Ensure suitable lighting and ventilation.
- Provision of shift system and rotation of duties so that no single worker is exposed to a particular job only.
- Proper padded stools with backrest and well aligned tables to avoid musculoskeletal strain.
- Ensure proper fire safety measures – with provision of fire extinguishers, regular fire-drills, availability of first aid kits etc.
- Regular medical examination for early detection of diseases and provision for treatment and management.

CONCLUSION

The presented study has demonstrated the hazards and risk involved in the textile industries. The technology development are continuing to enhance the range of fabrics produced by the textile industry and to increase its output. It is most important, however, that these developments is to be guided also by the imperative of enhancing the health, safety and well-begin of the workers. The main hazards are sound, grime, flames and electrical hazards is found by calculated RPN number ,comparing to other hazards the maximum RPN is found to be harmful to the workers. so Immediate action must be taken to control these hazard to save workers health and promote safety to worker.

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