



A REVIEW ON OCCUPATIONAL HEALTH AND SAFETY OF WORKER IN LEATHER INDUSTRIES

¹K. Devadharshini, ²P. Dhanalakshmi, ³Dr.R.I.Sathya

¹B.Sc. Textiles And Fashion Design, ²Guest Faculty, ³Senior professor.,

¹Department Of Home Science

The Gandhigram Rural Institute (DTBU), Dindigul, Tamil Nadu

ABSTRACT

Leather manufacturing company workers faced so many health issues. This study explores to investigate the health issues faced by workers in a leather manufacturing company, that workers in the leather manufacturing company experience a range of health issues, with body ache, joint pain, and headache being the most common problems reported. Other health issues identified include teeth problems, irritation in feet, urinary tract discomfort, giddiness, eye irritation, chest irritation, stomach discomfort, and other symptoms and they should have stronger regulations with regular enforcement, regular health surveillance, and worker and employer education are necessary for reducing these exposures and improving the health outcomes of the tannery workers.

Index Terms: Leather industry, Health issues, Safety, Tannery Workers

1. INTRODUCTION

Occupational health and safety in work life has still alarming statistics around the world. Despite the fact that leather business seems being affected by mechanization, human power has important role for it. Workers in tanning processes frequently encounter physical and chemical risks. Therefore, the determination of employee consciousness and the arrangement of trainings for it are important for this sector. Leather Industry occupies a place of prominence in the Indian economy in view of its massive potential for employment, growth and exports. There has been increasing emphasis on its planned development, aimed at optimum utilization of available raw materials for maximizing the returns, particularly from exports. Leather industry has been one of the traditional industries operating in India and is especially located in certain states. For many adults the work environment is the most demanding environment in terms of physical, chemical, ergonomic or psychological stresses and physical workload. When work is associated with health hazards, it may cause occupational disease, is one of the multiple causes of other disease or may aggravate existing ill-health of non-occupational origin. [Dubey et al,2019]

2. LEATHER INDUSTRY

The leather industry utilises hides and skins, which, if the industry did not exist to process them, would create an enormous waste disposal problem, with the attendant health hazards. Leather is a renewable resource – if leather was not produced, it would have to be replaced by largely synthetic materials derived from non-renewable resources. Leather is used in a wide range of products from children's shoes, where it is most important for foot health, to oil seals in aircraft. Leather makes a contribution to the quality of everyday life and has done so for centuries. Virtually everyone wears or uses one or more leather products

on a regular basis. The primary sources of raw material for the tanning industry are hides and skins from animals that have been accepted as fit for processing for human consumption at approved slaughterhouses, where the handling and treatment of cattle fully meets the appropriate animal welfare and hygiene requirements. The tanning industry understands that the quality and value of leather that tanners produce depends very largely on the quality of the hides and skins that they source. The industry recognises that the quality of the hides and skins they receive generally reflects the health, welfare and husbandry conditions, which have applied during the life of the animal. Therefore, the quality, efficiency and profitability of tanners' operations depend significantly upon the quality and consistency of the raw materials that they source. [(*Leather* | *ICT Leather*, 2024.)]

3. OCCUPATIONAL HAZARDS IN LEATHER TANNERIES:

A source, situation, or act with the potential to harm in terms of human injury or ill health, or a combination of these. In other words, it can be anything present in a company with the potential to harm a worker [(Král et al., 2021.)]. The various production processes in tanning industry pose many hazards to the health of its Employees. Toxic chemicals such as hydrogen sulphide, chromium, bleaching agents, disinfectants, Dyes and physical and biological agents like anthrax are a few elements that affect workers in the industry. The repercussions vary from minor irritation while working to serious and disabling Chronic diseases. For most workers, the degree and types of exposure depend upon their specific occupation and Work area within the tannery. For example, the unloading of a hide -processing drum may result in Simultaneous contact with the chemical substances within the drum, by inhalation and dermal Contact, and with the chemical dusts generated while recharging the drums. In the case of a Tannery, which incorporates all the processes of leather production, beamhouse workers may also Be exposed to the organic vapours generated in the finishing department; however, their exposure to these agents may be lower than that of those employed within the finishing area. Workers in the Buffing area are exposed to leather dust and to its burden of tanning chemicals, while those Working in the hide receiving and sorting area are exposed to hide dust. Buffing area workers may Also be exposed to solvent vapours from the finishing area; due to the proximity of the hide sorting area to the beamhouse, hide sorters may also be exposed to beamhouse contaminants. [Mittal et al,2008]

3.1 Chemical Hazard

The working conditions of the wet processing steps are also watery, evaporation heat is due to high concentrations of chemicals and powders in the drying process steps, especially in finishing applications due to liquid chemicals with low evaporation temperature and airborne liquid particles as a result of pressure sprays. [Gülbaş et al,2019]

1.Dusts:

Dusts of vegetable tanning materials, lime, and leather are generated in many operations carried out in tanneries. It is known that the main exposures to these dusts occur around rotating drums and shaving and buffing machines. There is no threshold limit value (TLV) laid down for leather Dust. Concentration of the dust varying between 4 and 24 million particle s/cubic foot was found. [Mittal et al,2008]

2.Toxic Gases:

Risk of exposure to hydrogen sulphide (H₂S) gas is reported especially during cleaning out of Tanning pits if strict precautions are not undertaken. The main source of this chemical asphyxiant Gas is the decomposition and degradation of sulphur containing protein of tanned waste. The gas Remains dissolved in tan pits and is released in high concentration into the atmosphere if this tan Liquor is stirred. [Mittal et al,2008]

3.CHEMICALS:

Following are some of the hazardous chemicals used in tanneries: naphthol; acrolein; amino resins; Ammonia; arsenic compounds; bleaching powder; borax; chlorine; chlorophenols; chromium ; formaldehyde; formic acid; glutaraldehyde; Hydrochloric acid; mercury (ammoniated); milk of lime; naphthalene derivatives; nickel sulphate; Organic dyes (this includes a variety of dyes based on benzidine, o-toluidine, o-dianisidine, and Other intermediates); oxalic acid; p-nitrophenol; phenol derivatives; sodium acid fluoride; sodium Hydroxide; sulphuric acid; tricresol phosphate; vegetable tannins; and zinc chloride.[Mittal et al,2008]. The use of chemicals provides many benefits to the business life, and it causes harmful effects on the organism due to misuse. Chemical substances are explosive, flammable, irritating, corrosive, poisonous, oxidizing and dangerous. [Gülbaş et al,2019]

3.3 Accidents

Accidents are one of the leading causes of disability in leather tannery workers. Slips and falls on Wet and greasy floors are common, so are knife cuts while trimming hides. In addition, the Machines used to process the hides are capable of crushing and inflicting bruises, abrasions and Fatal injuries by drowning and scalds are reported in tanneries. This is due to wet, greasy and slippery floor, and unfenced pits and vats. The risk is further increased due to poor illumination of Workrooms. Finger injuries are common, especially when fleshing and dehairing operations are Carried out manually using sharp, long knives. [Mittal et al,2008]

3.5 Hazards of Untreated Effluents

The liquid wastes from tanneries have high pH level and alkalinity. It also contains toxic chemicals Like chromium, arsenic and lime. It was noticed that tannery waste could cause choking of Corporation sewers, and is toxic for fish and aquatic life. Bathers may get anthrax if the tanning Waste is discharged into rivers without appropriate treatment. In India, the tanning industry is identified as hazardous.

3.6 Respiratory Effects:

The most common morbidity as a result of dust exposure is reported to be chronic bronchitis due to multiple and continuous exposures to leather dust, hide dust, chemical vapours, fumes and toxic gases. Irritation of upper respiratory tract is common on acute exposure to these hazards, and sometimes may result into occupational asthma. Acute respiratory toxicity can occur on exposure to high concentration of gases in the work environment. [Mittal et al,2008]

3.7 Skin Disorders

The employees who work in tanneries are to be affected by their exposure to lot of hazardous materials and processes during tanning. Skin disorders such as eczema and allergic contact dermatitis have been diagnosed among leather tanners exposed to preservatives applied to the hides The leather tanning and finishing process has been shown to have the highest incidence of dermatoses of any working group in the United States. Irritations of the mucous membranes of the throat and nose, and perforations of the nasal septum may also occur after inhaling chromic acid fumes liberated during the chrome-tanning process. [Toihidul Islam,2007]

3.8 Cancers

Tannery workers are likely to be exposed to numerous known or suspected occupational carcinogens including hexavalent chromium salts, benzidine -based azo dyes, organic solvents (e.g., benzene and formaldehyde), pentachlorophenol, N-nitroso compounds, arsenic, dimethylformamide and airborne leather dusts. [Mittal et al,2008]

4. SAFETY MEASURES

4.1 Proper sitting of a machine

A good machine foundation contributes to its lifespan. Particular care needs to be paid to levelling when installing multi-roller machines. This reduces the accelerated wear of cylinders and bearings as well as keeps maintenance costs low. It ensures good product quality (e.g. no chatter marks on shaved leather). When installing the machine, take care that at least one meter (three feet) is available around the machine. This allows space for maintenance, easy handling of material in process and daily cleaning and removal of waste. [(Král et al., 2021.)]

4.2 Active safety devices

Cylinder, multi-roller and splitting machines as well as presses should be provided with active safety devices (e.g. dynamic guards operated by pneumatic, ultrasonic, optical or electrical means). Active guards are designed and installed in such a way that they immediately stop or reverse the process when actuated, which prevents workers' hands/fingers and other body parts from getting drawn into and trapped in the machine.

4.3 Passive guards

Passive protection are guards, fences or covers which serve as a barrier to prevent workers coming into contact with moving machine parts such as prime movers, belts, open gears, transmission parts and other moving parts of a machine (e.g. rotating drum or paddle). Ensure that these are properly fixed on the floor or on the machine itself. Increase the effectiveness of the passive safety guard by painting it in a signalling colour (e.g. yellow). Make sure that passive guards are put back in place after removal for maintenance and cleaning. [(Král et al., 2021.)]

4.4 Operation controls

All switches and buttons on a machine should be clearly marked with colours and labels in the local language. Imported machines often have labels in the language of country of origin and an operator may know the meaning of each button due to long work experience on a particular machine. However, in an emergency, other workers may not be able to take adequate action. Remember to request the machine supplier to translate labels in to the local language. If not possible, label all control buttons and switches on the machine in the local language. Make sure that an emergency OFF button is within the reach of the operator(s). Ensure that operators and assistants have a correct work position on the machine (e.g. provide platform of adequate height and proper material).

4.5 Electrical installations:

Electricity is one of the notorious reasons for accidents in workplaces. Every year people are killed by electric shocks and many hundreds are injured; electricity faults are a frequent cause of fires. Tanneries and effluent treatment plants have highly corrosive conditions (e.g. high levels of humidity, presence of corrosive chemicals in liquid and gaseous form). These affect electrical installations all over a tannery but particularly on and around machines. Earthing wires corrode quickly and snap. Water from paddles, drums, fleshing and shamming machines splash on switch boxes and starters which can cause short-circuits. Inadequate electrical cabling and wiring can cause a fire and it is a high safety risk to workers (e.g. electrical shocks, burns, injuries from falls triggered by a minor electrical shocks). Additionally, it can result in a waste of electricity and damage machines. [(Král et al., 2021.)]

5. CONCLUSION:

This study and reviews a number of tannery-related dangers, including mechanical hazards, particulate matter, noise levels, and hazardous gasses. Potential remedies or corrective actions are also suggested. In and around leather processing sectors, such as tanneries, effluent treatment plants, and storage facilities, the current analysis would offer a clean, hygienic, and process-safe environment for safety features. Through the study other health issues identified include teeth problems, irritation in feet, irritation in the urinary

tract, giddiness, irritation in the eyes, irritation in the chest, irritation in the stomach, stomach ache, itching in the stomach, ulcers, watery eyes, itching in the eyes, swelling in the eyes, fever, swelling in the legs, vomiting, throat infection, tuberculosis (TB), kidney disorders, and diarrhea. Intervention and prevention include implementing ergonomic improvements, providing health and safety training programs, conducting regular health screenings, promoting the use of personal protective equipment, and fostering a culture of health and well-being within the organization. By implementing these recommendations, the leather manufacturing company can prioritize the health and well-being of its workers, reduce the occurrence of health issues, and create a more productive and sustainable work environment.

REFERENCE:

- [1]T, T. a. M., & Jegadeeswari, S. (2024). A study on health issues of leather industry workers. *E3S Web of Conferences*, 491, 01022. <https://doi.org/10.1051/e3sconf/202449101022>
- [2].Mittal, A., Gupta, R. K., & Centre for Education and Communication. (2008). *Comprehensive intervention in occupational health and safety in leather industry*. Centre for Education and Communication.
- [3].Sivakumar, V. (2021). Analysis of Process Safety and Occupational Health in Leather Process Industry: A Holistic approach. In *JALCA* (Vol. 116, pp. 428–429).
- [4].Dubey, I., & Shrivastava, M. (2019). Health problems of the leather industry workers. *International Journal of Current Microbiology and Applied Sciences*, 8(07), 2089–2107. <https://doi.org/10.20546/ijcmas.2019.807.252>
- [5]. Král, I., Niedźwiedz, N., United Nations Industrial Development Organization, Buljan, J., Hannak, J., & Sahasranaman, A. (n.d.). *Occupational safety and health aspects of leather manufacturing* (H. Beachcroft-Shaw, Ed.; 2nd edition).
- [6].*Leather | ICT Leather*. (n.d.). <https://leather-council.org/introduction-to-leather/>
- [7]. Gülbaş , H. E., & Karakuzu, T. (2019). DETERMINATION OF CHEMICAL AND PHYSICAL RISK FACTORS IN LEATHER INDUSTRY IN TERMS OF OCCUPATIONAL HEALTH AND SAFETY. *NWSA Academic Journals*, 14(3), 154–168. <https://doi.org/10.12739/nwsa.2019.14.3.1a0438>
- [8]. Tohidul Islam, M. (2007, January). *Skin-diseases-in-Tannery*.