

International Hazard Datasheets on Occupation



Paint and lacquer manufacturing worker


Who is a paint & lacquer manufacturing worker?






A paint and lacquer manufacturing worker operates and controls equipment and installations that make and mix organic substances, solvents and pigments to produce lacquers and synthetic paints according to formulas and work order specifications.





What is dangerous about this job?

- Exposure to vapours of solvents, paints and lacquers can cause irritation and damage to eyes and mucous membranes, to the respiratory and digestive tracts, and to the skin. Exposure to organic substances (toluene, n-hexane, methylalcohol etc.) may cause damage to the nervous system.
- Skin exposure through contact with solvents and various components of paints, esp. with aromatic hydrocarbons and organic halogen compounds can cause dermatitis. Hazard of dermatitis or eczema when working with pigments that contain chrome and cobalt, or due to contact with azo-dyes and aniline dyes.
- Exposure to pigment dust (PM10) during grinding and mixing, while preparing the paints.
- Exposure to organic substances may cause allergic reactions such as irritation of the respiratory tract and of the eyes and the skin.
- Hazard of explosion, due to presence of extremely fine organic dust in the air during grinding or mixing of organic pigments while preparing paints.
- Discomfort and physiological problems related to the use of malodorous organic substances throughout the manufacturing process of the dyes and the lacquers, and from the finished products.

Hazards related to this job

Specific preventive measures can be seen by clicking on the respective  in the third column of the table.

Accident hazards 	<ul style="list-style-type: none"> • Slips and falls on the level on slippery floors 	
	<ul style="list-style-type: none"> • Injuries caused by falling packages of paint, lacquer, and solvents during transportation, or during storage and unloading 	
	<ul style="list-style-type: none"> • Capture of clothes in the grinding and mixing equipment while preparing dyes 	
	<ul style="list-style-type: none"> • Hazard of inflammation and fire due to flammable dyes, solvents and other paint components 	
	<ul style="list-style-type: none"> • Splashes of solvents into the eyes can cause eye irritation or damage 	
	<ul style="list-style-type: none"> • Damage to eyes from penetration of particles while grinding pigments 	
	<ul style="list-style-type: none"> • Electric shock or electrocution caused by defective electrical equipment 	

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	<ul style="list-style-type: none"> Hazard of explosion, due to presence of extremely fine organic dust in the air during grinding or mixing of organic pigments while preparing paints 		
	<ul style="list-style-type: none"> Injuries and fractures (including hernia) caused by overexertion during lifting, pushing or pulling throughout the manufacturing process 		5
Physical hazards 	<ul style="list-style-type: none"> Exposure to excessive noise levels in grinding of pigments 		6
	<ul style="list-style-type: none"> Exposure to high temperature and heat-stress in the lacquer preparation 		7
Chemical hazards 	<ul style="list-style-type: none"> Exposure to vapours of solvents, paints, and lacquers can cause irritation and damage to eyes and mucous membranes, to the respiratory and digestive tracts, and to the skin. Exposure to organic substances (toluene, n-hexane, methyl-alcohol etc.) may damage the nervous system 		7 8
	<ul style="list-style-type: none"> Exposure to VOC in storage areas and/or during the cleaning of the manufacturing installations 		7
	<ul style="list-style-type: none"> Exposure to various components of paints, esp. toluene, and methyl-diisocyanate, may cause irritation of eyes and the respiratory tract 		8
	<ul style="list-style-type: none"> Skin exposure through contact with solvents and various components of paints, esp. aromatic hydrocarbons and organic halogen compounds, can cause dermatitis. Hazard of dermatitis or eczema when working with pigments that contain chrome and cobalt, or due to contact with azo-dyes and aniline dyes 		9
	<ul style="list-style-type: none"> Exposure to pigment dust (PM10) during grinding and mixing, while preparing the paints 		8
	<ul style="list-style-type: none"> Exposure to organic substances may cause allergic reactions such as irritation of the respiratory tract and of eyes and skin 		7 8 9 10
	<ul style="list-style-type: none"> No biological hazards specific for paint & lacquer manufacturing workers have been identified 		
Biological hazards 			
	Ergonomic, psychosocial and organizational factors 	<ul style="list-style-type: none"> Back pains and other musculoskeletal problems caused by overexertion and awkward postures while lifting and moving containers of paints, lacquers, solvents and other heavy loads 	5
		<ul style="list-style-type: none"> Musculoskeletal problems related to fixed working postures, such as prolonged standing, during the manufacturing of dyes and lacquers 	
	<ul style="list-style-type: none"> Discomfort and physiological problems related to the use of malodorous organic substances during the manufacturing process of dyes and lacquers, 		

and from finished products

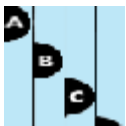
Preventive measures

- 1 Wear safety shoes with non-skid soles.
- 2 Use appropriate headgear and avoid wearing loose-fitting cloths during work with moving machinery.
- 3 Wear appropriate eye protection; consult safety supervisor or supplier.
- 4 Call a qualified electrician to examine and repair faulty or suspect electric equipment.
- 5 Learn and use safe lifting and moving techniques for heavy or awkward loads; use mechanical aids for the lifting of heavy loads.
- 6 Wear appropriate ear protection; consult a safety supervisor or a supplier.
- 7 Install effective exhaust ventilation and air conditioning to prevent air contamination and heat stress; if necessary, use odor neutralizing chemicals.
- 8 Install effective exhaust ventilation to prevent air contamination; if necessary, use respiratory protection.
- 9 Protect the skin of the hands (with barrier cream, or chemical-resistant gloves) when in contact with solvents and cleaning agents; use specific soaps for cleaning the skin of the hands, at the end of the work shift.
- 10 Get medical aid if skin rashes develop; consult an allergy specialist on how to deal with sensitivity to solvents, metals, etc.

Specialized information

Synonyms Paint and lacquer manufacturer; paint mixer worker.

Definitions and/or description



Paint manufacturing worker: Controls equipment to make dyes from coal tar derivatives: Measures coal tar derivatives, using balance scale or graduated container, dumps them and required amounts of sodium salt of nitrous acid with hydrochloric acid into vat of water, and starts agitator to make chromogen (dye-forming substance). Adds ice to chromogen to maintain temperature at prescribed level. Dips litmus paper into chromogen to determine its acidity. Adds required amounts of auxochromes (salt-forming materials) to chromogen to strike (form) dye. Tests acidity of dye, using pH meter, and corrects variances from standard by adding specified acid or alkali to dye [DOT].

Lacquer manufacturing worker: Operates jar-type grinding mill and mixing machine to produce lacquers and synthetic paints according to formulas and work order specifications: Starts jar mill and portable mixer to grind and mix ingredients. Places ingredients, such as gums, pigments, and thinners in mill. Dumps coloring and lacquer ingredients according to specifications into portable mixing kettle and places kettle under mixer. Takes sample from batch and strains it into can. Uses spray gun to spray test panel. Heats prepared mixture with steam coil, causing wax to rise to top of solution, and then settle to bottom to be drawn off into clean tank. Adds required color for tinting batch to meet plant specifications [TINTER (paint & varnish)], [DOT].

Related and specific occupations

Laboratory technician; paint and lacquer chemist; paint and lacquer manufacturing engineer; pigment manufacturing worker; solvent manufacturer.

Tasks

Adding; adjusting; blending; cleaning; controlling; cooling; crushing; diluting; dispersing; dissolving; draining; evaporating; examining extracting; feeding; filling; filtering; fixing; heating; grinding; guarding; inflaming; inspecting; lifting; lowering loading; maintaining; manufacturing; marking; measuring; mixing; moving; operating; packing; positioning; observing; opening; painting pouring; preparing removing; repairing; selecting; spraying; storing; supervising; supplying; taking; testing; transporting; treating; unloading; washing; weighing.

Primary equipment used

Boilers; crushers; grinders; measuring-vessels; mills; mixers; mixing and stirring devices; paint-tanks; pH-meter; scales.

Workplaces where the occupation is common

Paint and lacquer manufacturing plants.

Notes



1. The Environmental Protection Agency (EPA) document entitled Air Pollution Engineering Manual (AP-42) describes paint manufacturing operations as: "... the dispersion of a colored oil or pigment in a vehicle, usually an oil or resin, followed by the addition of an organic solvent for viscosity adjustment. Only the physical processes of weighing, mixing [dispersing], grinding, tinting, thinning and packaging take place. No chemical reactions are involved."

2. Constituents used in the manufacturing process are pigments, solvents, vegetable oils, plastic resins (alkyds, acrylics, and vinyl), petroleum thinners (naphtha), nonmetallic minerals and earths (calcium carbonate, talc, silica, clay) as extenders or fillers, and other organic and inorganic additive chemicals.

3. Any spill, which has the potential to emit volatile organic compounds, shall be cleaned up immediately.

4. There was not enough evidence to determine whether working in paint manufacture also increased cancer risk (5).

5. Occupational solvent exposure may increase the risk of connective tissue disease (CTD) (6).

References



1. ILO Encyclopaedia of Occupational Health and Safety, 3rd Ed., Geneva, 1983.

2. ILO Encyclopaedia of Occupational Health and Safety, 4th Ed., Geneva, 1998,

3. Kirk-Othmer, Encyclopedia of Chemical Technology, 4th Ed., 1992.

4. U.S. Dept. of Labor: Dictionary of Titles (DOT), 4th. Ed., 2 Vol., 1991.

5. "Occupational Exposures in Paint Manufacturing and Painting", IARC Vol. 47, 1989

6. Lacey, JV, et al: "Petroleum distillate solvents as risk factors for undifferentiated connective tissue disease (UCTD)", Department of Epidemiology, University of Michigan School of Public Health, Ann Arbor 48109-2029, USA.
