

International Hazard Datasheets on Occupation



Electroplater

What is a Hazard Datasheet on Occupation?

This datasheet is one of the International Datasheets on Occupations. It is intended for those professionally concerned with health and safety at work: occupational physicians and nurses, safety engineers, hygienists, education and Information specialists, inspectors, employers' representatives, workers' representatives, safety officers and other competent persons.

This datasheet lists, in a standard format, different hazards to which electroplaters may be exposed in the course of their normal work. This datasheet is a source of information rather than advice. With the knowledge of what causes injuries and diseases, it is easier to design and implement suitable measures towards prevention.

This datasheet consists of four pages:

- Page 1: Information on the most relevant hazards related to the occupation.
- Page 2: A more detailed and systematized presentation on the **different hazards** related to the job with indicators for preventive measures (marked as numbered shields and explained on the third page).
- Page 3: Suggestions for **preventive measures** for selected hazards.
- Page 4: **Specialized information**, relevant primarily to occupational safety and health professionals and including information such as a brief job description, a list of tasks, notes and references.

Who is an electroplater?

A skilled worker who finishes the surface of metallic articles by electroplating for decorative or engineering purposes

What is dangerous about this job?

- Electroplaters are exposed to a multitude of hazardous chemicals, which may cause poisoning, chemical burns, damage to the respiratory system, allergies, etc. Electroplaters may be injured by falls on wet floors, may suffer cuts and pricks from sharp tools or jigs, and burns from hot liquids. Other common hazards include electric shock, fire and explosions, injuries caused by falling bodies, eye damage by flying particles, entanglement in moving machinery, high noise levels, etc.

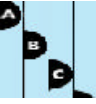


Hazards related to this job

| | | |
|---|---|-----|
| Accident hazards  | <ul style="list-style-type: none"> Falls on floors made slippery by aqueous solutions or solvents | 1 |
| | <ul style="list-style-type: none"> Blows by falling heavy articles, including from overhead conveyers | 1 |
| | <ul style="list-style-type: none"> Electric shock caused by contact with faulty electrical equipment, cables, etc. | 2 |
| | <ul style="list-style-type: none"> Burns by splashes of hot plating baths, solvents and other liquids, by steam or hot vapors, by contact with hot surfaces (e.g., annealing ovens), etc. | 3 4 |
| | <ul style="list-style-type: none"> Cuts and pricks by sharp tools, sharp edges of articles to be plated, dendritic deposits on jigs, etc. | |
| | <ul style="list-style-type: none"> Injuries (especially of eyes) caused by flying particles, in particular in rotating brush- cleaning or wheel grinding | 5 |
| | <ul style="list-style-type: none"> Fire and explosions due to the presence of flammable solvents used in surface cleaning, metal dust (e.g., aluminum), or hydrogen evolved in the plating processes | |
| | <ul style="list-style-type: none"> Vigorous chemical reactions caused by uncontrolled mixing of chemicals (e.g., if water is mixed with concentrated sulfuric acid) | 4 |
| | <ul style="list-style-type: none"> Acute poisoning by various chemicals used in plating and surface preparation (for a list, see Note 1); a particular hazard is caused by the possible release of an extremely poisonous gas - hydrogen cyanide - if acids are added to various alkaline plating solutions or electrolytic degreasing baths which contain cyanide salts | 4 6 |
| | <ul style="list-style-type: none"> Poisoning by phosgene, which may be formed if chlorinated solvents or their vapors are heated in contact with a hot surface or a flame, or if a worker smokes in the presence of such solvents | 6 |
| | <ul style="list-style-type: none"> Chemical burns by corrosive liquids | 4 |
| <ul style="list-style-type: none"> Damage to eyes by splashes of liquids, in particular if metal articles fall into the plating baths from a jig | 5 | |
| Physical hazards  | <ul style="list-style-type: none"> Exposure to excessive noise levels from mechanical equipment, in particular in barrel-plating or cleaning operation | |
| | <ul style="list-style-type: none"> Exposure to adverse environmental factors (high temperature and humidity) | |
| | <ul style="list-style-type: none"> Exposure to infrared radiation from drying equipment | |
| Chemical hazards  | <ul style="list-style-type: none"> Exposure to organic solvents and various cleaning formulations, and to their vapors | 6 |
| | <ul style="list-style-type: none"> Exposure to potentially hazardous metal dusts generated by mechanical operations (buffing, brush cleaning, etc.), or by gas evolution and sprays from plating and surface preparation baths | 6 |
| | <ul style="list-style-type: none"> Chronic poisoning by inhalation or ingestion of many of the chemicals used in Plating shops | 7 |
| | <ul style="list-style-type: none"> Dermatoses caused by exposure of the skin to cleaning formulations, acid and alkaline solutions, organic solvents, etc. | 7 |
| | <ul style="list-style-type: none"> Irritation of mucous membranes (in particular of the respiratory tract) by acid or alkaline vapors or aerosols, and other chemicals | |
| | <ul style="list-style-type: none"> Latex allergy caused by the use of latex gloves | 8 |
| Biological hazards  | <ul style="list-style-type: none"> No biological hazards specific for Electroplaters have been identified | |
| Ergonomic, psychosocial and organizational factors  | <ul style="list-style-type: none"> Musculo-skeletal injuries related to awkward working postures (including frequent bending when inserting or removing jigs from the plating baths) | |
| | <ul style="list-style-type: none"> Overexertion while handling heavy and/or bulky loads, such as batches of articles to be plated, jigs carrying metal parts for plating, containers of chemicals, etc. | 9 |
| | <ul style="list-style-type: none"> Discomfort and psychological problems related to prolonged wear of protective clothing (including heavy boots, aprons and other impermeable pieces), and to fears (sometimes acute) caused by awareness of the dangerous aspects of the work | |

Preventive measures

- 1** Use safety shoes or boots with non-slip soles, and/or safety helmet
 - 2** Check electrical equipment for safety before use. Take faulty or suspect electrical equipment to a qualified electricity technician for testing and repair
 - 3** Wear personal protective equipment and chemical resistant clothing to avoid exposure of skin or eyes to corrosive solids, liquids, gases or vapors
 - 4** Obey all safety instructions regarding the storage, transport, handling or pouring of chemicals, or the disposal of spent plating baths; do NOT mix chemical without the supervision of a qualified chemist or safety professional;
 - 5** Wear safety goggles in all cases where the eyes may be exposed to dust, flying particles, or splashes of harmful liquids
 - 6** Wear respirator when exposed to harmful aerosols, dusts, gases or vapors
 - 7** Take extreme care when handling highly corrosive agents such as hydrofluoric acid, chromic acid (chromium trioxide), concentrated nitric acid, etc.; use safer substitutes whenever possible
 - 8** Use non-latex gloves if a sensitivity to latex has been diagnosed
 - 9** Learn and use safe lifting and moving techniques for heavy or awkward loads; use mechanical aids to assist in lifting
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Specialized information

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| Synonyms | Plater; metal plater; metal electroplater; electroplating worker; metal coating worker; galvanizer; plating-tank operator |
| Definitions and/or description |  <p>Sets up and controls plating equipment to coat metal objects electrolytically with chromium, copper, cadmium, or other metal to provide protective or decorative surfaces or to build up worn surfaces according to specifications: Reads work order to determine size and composition of object to be plated; type concentration and temperature of plating solution; type and thickness and location of specified plating metal; and amount of electrical current and time required to complete plating process. Immerses object in cleaning and rinsing baths [METAL-CLEANER, IMMERSION (any industry)]. Suspends object, such as part or mold, from cathode rod (negative terminal) and immerses object in plating solution. Suspends stick or piece of plating metal from anode (positive terminal) and immerses metal in plating solution. Moves controls on rectifier to adjust flow of current through plating solution from anode to cathode and to permit electrodeposition of metal on object. Removes plated object from solution at periodic intervals and observes object to ensure conformance to specifications. Adjusts voltage and amperage based on observation. Examines object visually at end of process to determine thickness of metal deposit or measures thickness, using instruments, such as micrometers or calipers. Grinds, polishes or rinses object in water and dries object to maintain clean even surface. May mix, and test strength of plating solution, using instruments and chemical tests. May measure, mark, and mask areas excluded from plating. May plate small objects, such as nuts or bolts, using motor-driven barrel. May direct other workers performing variety of duties, such as racking, cleaning, or plating objects. May operate electroplating equipment with reverse polarity and be known as Plating Stripper (electroplating). May be designated according to plating materials used as Brass Plater (electroplating); Bronze Plater (electroplating); Cadmium Plater (electroplating); Chromium Plater (electroplating); Copper Plater (electroplating); Gold Plater (electroplating). May be designated: Nickel Plater (electroplating); Plastics Plater (plastic prod.); Silver Plater (electroplating); Tin Plater (electroplating); [DOT]</p> |
| Related and specific occupations | Chemical plater; electroforming worker; electroplater apprentice; electroplater helper; master electroplater; metal cleaner; metal finisher; metal polisher; surface finisher; or according to specific method ; or metal: barrel plater; chromium plater; gold plater; zinc plater; nickel plater, etc. |
| Tasks | Adjusting (current, voltage,); cleaning; coating; controlling; determining; directing; drying; ensuring; examining; grinding; immersing; marking; masking; measuring; mixing; moving (controls); observing; performing; plating; polishing; racking; reading (plating parameters); rinsing; setting up; stripping; suspending; testing; |
| Primary equipment used | Calculators or computers; chemical dispensing equipment; coating thickness measuring instruments; exhaust hoods; plating jigs of barrels, mixers, vats; rectifiers; surface preparation equipment (buffing wheels, grinding wheels, rotating brushes, mechanical polishers, etc.); stress relief (annealing) ovens; surface quality measuring instruments; weighing equipment |
| Workplaces where the occupation is common | Electroplating departments in the metal or electrical industries; specialized electroplating shops; jewelry and electronics industries (gold plating) |
| Notes |  <ol style="list-style-type: none"> Examples of hazardous chemicals used in electroplating shops are listed below: Acids: sulfuric; hydrochloric; hydrofluoric; nitric; formic; chromic (chromium trioxide) Alkalis: sodium hydroxide; potassium hydroxide; ammonia Solvents: trichloroethylene; trichloroethane, acetone; carbon tetrachloride, methyl isobutyl ketone, kerosene Inorganic salts: cyanides, salts of cadmium, gold, chromium, copper, tin, zinc, nickel Organic additives: inhibitors, brighteners, foam-suppressing agents Miscellaneous: soaps and detergents, oxidizers, water-softening agents All workers should undergo periodic examinations by occupational physician to reveal early symptoms of possible chronic effects or allergies |
| References |  <p>ILO Encyclopaedia of Occupational Health and Safety, 3d Edition. Parmeggiani, L, Editor. Vol. 1, pp. 744-5 (1983)</p> <p>ILO Encyclopaedia of Occupational Health and Safety, 4th Edition, Stellman, J. Mager, Editor, Vol. 2, pp. 55.29-32, 35-39 (1998)</p> <p>DOT (Dictionary of occupational titles), 4th Edition, U.S. Department of Labor, 2 vol., (1991)</p> <p>Occupational Diseases - A Guide to their Recognition. DHEW (NIOSH) publication No. 77-181, 1977, 609 PP. Multiple pagination - see entries "Sewage-treaters" or "Sewage treatment" in index,</p> |