INDUSTRIAL HYGIENE AND TOXICOLOGY

SECOND REVISED EDITION

VOLUME II

TOXICOLOGY

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Second Revised Edition *In Three Volumes*

VOLUME I:
General Principles

VOLUME II:
Toxicology

VOLUME III:
Industrial Environmental Analysis

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FRANK A. PATTY, *Editor*

VOLUME II

TOXICOLOGY

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Armature Workers

Lead "tinning" baths and lead pots, when small and equipped with temperature controls, may not present serious lead exposures. However, the larger operations, especially when no temperature control is in use, can offer serious exposures. Wherever there is any question of exposure, the operation should either be provided with mechanically induced air flow to remove or dilute the lead fumes before they can be inhaled, or else air, blood, or urine samples should be collected and analyzed for lead to establish whether ventilation is necessary.

Waterproof varnishes, especially those made from cashew nutshell liquid–formaldehyde resins, may cause dermatitis. This may result from contact with the wet varnish, from the varnish dust dispersed in grinding armatures, or from skin contact with dirty solvent baths for dipping and cleaning old armatures. The solvent bath should not be permitted to become badly contaminated and skin contact must be avoided. In the case of wet or dry varnish, good personal cleanliness is an effective preventive measure, and varnish dust should be controlled by process ventilation. Protective creams and clothing may be useful in some instances.

Art-Metal Casting

Art-metal casts for displays, trophies, medals, and the like are usually cast from white metal or britannia metal, which are alloys of tin, antimony, and copper, often having some zinc and bismuth, occasionally lead, and possibly arsenic. The alloys are melted in pots, temperatures rarely exceeding 300 or 400°C. Burring, filing, belt "sanding," and buffing may be done and, unless controlled, significant exposures to mechanically generated metal dusts may result. At the temperatures ordinarily employed there is little likelihood of an exposure to metal fumes, however. Where uncertainties exist, exposures should be evaluated and, when found excessive, controlled. Other possible exposures in the industry involve plating baths and cyanide dips. Soldering operations are usually at low temperatures to avoid fusing the low-melting-point alloys, and therefore are not conducive to the formation of metal fumes.

Asbestos Workers

Dustiness around asbestos workers is sometimes above the proposed standard of 5 million particles per cubic foot. Perhaps mining offers the greatest exposure to dust, and in fabrication plants the operations, listed in the probable, decreasing order of dustiness, are: screening, picking, stacking, and willowing in the preparation room; carding, dry weaving, spinning, twisting, winding, and warping. The sawing, filing, drilling, and grinding of brake linings is ordinarily well controlled. Grinding, mixing, and bagging asbestos cement and insulating material, and the sawing or beveling of asbestos board, are dusty operations unless properly engineered. The asbestos content of these dusts frequently is not high but diatomaceous

earth in considerable quantities may accompany it, thus complicating the exposure with free silica. It is desirable in asbestos exposures to keep the dust count down to 5 million particles, or less, per cubic foot of air.

Asphalt (Mineral Pitch)

The name "asphalt" applies to bitumen or to earth or rocks impregnated with bitumen and to a residue from certain petroleums, coal tar, lignite tar, etc. (artificial asphalt). It is a black solid formed in the earth from slow decomposition of organic matter. It is composed chiefly of hydrocarbons along with varying amounts of oxygen, nitrogen, and sulfur compounds.

Asphalt is used principally for water-excluding coatings upon roads, floors, or roofs. It is employed as a rust preventive in ducts, collectors, tanks, and so forth to protect metals from corrosive (acid) liquids and gases. For such application it is commonly dissolved in benzene.

Vapors and gases from heated asphalt are obnoxious and toxic, containing among other compounds some hydrogen sulfide. Dermatitis from contact with asphalt has been reported as common, with the entire body sometimes affected. Skin cancer has also been reported, but statistics are lacking. Some authorities attribute most of the poisoning that has occurred from the use of asphalt to the solvents employed with it (benzene, phenol, etc.).

Grinding operations and hot processes should have exhaust ventilation. Personal cleanliness is the heart of any program for preventing skin disease.

Automobile Manufacture

The manufacture of automobiles has few operations that are peculiar to the industry. There are many exposures and potential exposures common to other industries.

These are discussed elsewhere under specific headings such as: Abrasive Blasting, Anodizing, Battery Manufacture, Electroplating, Foundry Operations, Forging and Iron Working, Garages, Grinding and Polishing, Heat Treating, Industrial X-Ray, Lead Workers, Metal Cleaning, Metalizing, Motor Testing, Painting and Decorating, Pickling, Plastics and Resins, Radio Manufacture and Repair, Welding, etc.

Body polishing by the use of tripoli polishing compounds is an operation more or less peculiar to the production of highly polished automobile bodies. No harmful effects have been associated with this operation. However, any dust arising from the polishing, and especially from compressed-air blowoff operations, and from the cleaning of the brushes should be controlled. There seems no logical excuse for condoning such dust in concentrations of more than 5 million particles per cubic foot of air. Since the tripoli polish is applied as a slurry, dust control has not been a difficult problem.