

HEALTH RISKS OF METALWORKING FLUIDS

Millions of machine operators are exposed to mists from metalworking processes that pose a variety of health risks.

These airborne particles of metalworking fluids (MWF) must be carefully controlled, which is why the Occupational Safety & Health Administration (OSHA) has set strict permissible exposure limits (PEL) to protect workers against many of these adverse health effects: 5 mg/m³ for an eight-hour time-weighted average (TWA) for mineral oil mist and 15 mb/m³ for an eight-hour TWA for Particulates Not Otherwise Classified.

The National Institute for Occupational Safety and Health (NIOSH) has set an even stricter 0.5 mb/m³ per 10-hour day limit. Machine shops must use mist collection equipment to limit worker exposure. If your facility is meeting the PEL requirements but workers are still experiencing symptoms, it may be necessary to set lower goals.

SKIN

Mineral oils found in MWFs have a degreasing and dehydration effect on the skin and often cause acne-like disorders. Water-based, synthetic, and semi-synthetic MWFs can cause contact dermatitis. Prolonged contact may cause allergic contact eczema.

IMMUNE DISORDERS

Microorganisms, bacteria and fungi can absorb into vapors and can lead to weakening of the immune systems, increasing the likelihood of contracting an illness or disease.

BRAIN

Over exposure to MWFs can cause changes in organs including brain tumors. Vapors of low-viscosity hydrocarbons even have narcotic properties.

NERVES

Over exposure to MWFs can cause changes in organs as well as potential nerve damage.

LUNGS

MWF particles of <100 microns can be inhaled, <5 micros can reach the lower respiratory tract, and <2.5 micros can penetrate into the pulmonary alveoli. These particles can cause complications including asthma, chronic bronchitis and hypersensitivity pneumonitis.

DIGESTIVE TRACK

When larger MWF particles enter nose, mouth or lungs, contaminants can enter the digestive tract. This has been linked with pancreatic, colon, bladder and liver cancer.