



Product Stewardship Summary

Coal Tar Pitch

(CAS number 65996-93-2)
(EC number 266-028-2)

Product Description

Coal tar pitch is a black, viscous residue that remains after the distillation of coal tar. This process occurs at our plants and involves heating coal tar (the raw material used to produce coal tar pitch) in a still. As the temperature in the still increases, various constituents (or distillates) are removed from the coal tar and sold to customers for use in the manufacture of industrial and consumer products. The various constituents removed from the coal tar include “light oils” (e.g., benzene, toluene, xylene and naphthalene), “middle oils” (e.g., carbolic acid), “heavy oils” (e.g., creosote) and anthracene oil. The remaining residue is known as “coal tar pitch.” Coal tar pitch is a distinct product from the raw material coal tar and other coal tar distillates, such as creosote.

Uses and Applications

Coal tar pitch is an industrial product that is typically sold in bulk to customers as either a liquid or a solid. It is often supplied to customers via rail in either tanker cars (liquid pitch) or hopper cars (solid pitch). The primary use of coal tar pitch is as a binder in the manufacture of carbon electrodes for the aluminum industry and in the manufacture of graphite electrodes for steel arc furnaces. It is also used for roofing and as a component in the manufacture of activated carbon, carbon refractory blast furnace linings and clay targets. Coal tar pitch is not sold for consumer use.

Synonyms

Solid coal tar pitch is extruded into small rods and, for this reason, is often referred to as “pencil pitch.” In the aluminum industry, coal tar pitch is used as a binder in the manufacture of electrodes that primarily consist of petroleum or anthracite coal. As these electrodes are heated at high temperatures over a period of weeks, the ingredients in the electrodes are converted to carbon. For this reason, coal tar pitch is also often referred to as “carbon pitch” or “binder pitch.” Additional synonyms for coal tar pitch include “roofing pitch” because of its use in the roofing industry and “target pitch” because of its use in the manufacture of clay targets.

Health Information

The American Conference of Governmental Industrial Hygienists (ACGIH) and the Occupational Safety and Health Administration (OSHA) have each established a permissible 8-hour time-weighted-average (TWA) exposure level of 0.2 mg/m³ for the volatiles that are emitted from coal tar pitch (“coal tar pitch volatiles”). This number represents the average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded. According to OSHA, it is also the highest level of exposure an employee may be exposed to without incurring the risk of adverse health effects.

OSHA considers engineering controls, such as ventilation and automation, the best method for controlling exposure to coal tar pitch volatiles. Respiratory protection to limit inhalation exposure and protective clothing to prevent dermal exposure to coal tar pitch and coal tar pitch volatiles are also recommended, although maintaining exposures below the TWA level is preferable.

Acute, or short-term, exposure to coal tar pitch has been associated with several health effects. For instance, coal tar pitch is a phototoxic substance. This means that dermal contact with coal tar pitch in the presence of ultraviolet light (sunlight) can result in a skin reaction similar to an exaggerated sunburn, as well as blisters. Short-term exposure in the absence of sunlight may also irritate the skin and cause other skin conditions such as dermatitis and acne.

Additional health effects associated with short-term exposure to coal tar pitch include eye and respiratory tract irritation; severe burns from exposure to hot liquid coal tar pitch; and respiratory difficulty, convulsions, and possible cardiovascular collapse from exposure to airborne concentrations of coal tar pitch mist or vapor significantly beyond the 8-hour TWA workplace exposure limit of 0.2 mg/m³.

Several agencies, including the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) and the ACGIH, have evaluated coal tar pitch with respect to its carcinogenicity and concluded that it is a human carcinogen. Other agencies, such as the National Institute for Occupational Safety and Health (NIOSH) and the Agency for Toxic Substances and Disease Registry (ATSDR) have also evaluated the potential health effects associated with coal tar pitch. These evaluations, particularly those from the NTP, NIOSH and ATSDR, are not limited to coal tar pitch, but rather include assessments of health effects associated with other products derived from coal, including soot, coal tar and creosote, as well as other industries from which coal tar is derived, including gas works and coke ovens. It is important to distinguish between the potential hazards posed by exposure to coal tar pitch and those posed by exposure to different derivatives of coal.

When the available scientific and medical literature is limited to coal tar pitch, chronic (or long-term) exposure to coal tar pitch above the 8-hour TWA workplace exposure limit of 0.2 mg/m³ and in the absence of proper personal protective equipment has been associated with cancers of the skin, lung and bladder. The risk of lung and bladder cancer has largely been associated with studies of aluminum industry workers employed for many years in a particular industrial process that continuously bakes coal tar pitch 24 hours a day at temperatures in excess of approximately 900 to 950 degrees Celsius. Similar exposures are not expected among the general population.

The risk of skin cancer has largely been associated with historical studies and anecdotal reports of workers who did not follow good personal hygiene practices. In particular, the studies and reports suggest that exposed workers did not regularly bathe or wash contaminated clothing. Similar exposures are not expected among workers today who follow good personal hygiene practices and wear proper personal protective equipment.

Much of the data relating to skin cancer also derives from animal studies using dermal administration. There is no evidence in the published literature that low level or incidental exposure to coal tar pitch causes skin cancer in animals, but continuous dermal exposure for long periods of time has been shown to cause skin cancer in mice. There are no long-term ingestion studies or inhalation studies with coal tar pitch.

There is no evidence in the scientific literature that low level or intermittent exposure to coal tar pitch causes any type of cancer in humans. There is also no evidence in the scientific literature that low levels of coal tar pitch in soils, sediments, groundwater, surface water, or drinking water cause cancer in humans exposed to these media.

Besides cancer, long-term exposure in the absence of good personal hygiene practices can also affect skin pigmentation and may cause skin growths. Additional data also suggests that coal tar pitch is both a mutagen and a reproductive hazard, which means that long-term exposure to the substance may cause genetic defects, may harm an unborn child and may damage fertility.

For further information relating to the safe handling and use of coal tar pitch, including the proper personal protective equipment to wear when handling or working near the product, please refer to the applicable Safety Data Sheet (SDS) on the Koppers Inc. website. <http://koppers.com/pages/product-sds>.

Environmental Information

Long-term toxicity to fish is expected to be minimal. It is also not expected to be toxic at the limit of water solubility.

Coal tar pitch is immobile and does not appreciably leach to groundwater. It is also very poorly soluble in water. Coal tar pitch that is released or disposed in the environment is likely to remain unchanged for many years. When coal tar pitch is seen in soil, it is usually present as distinct pieces or chunks of black, hard material, which is not likely to be contacted in the same way as is soil.

Exposure

Coal tar pitch is an industrial product and is not sold directly to consumers or for direct consumer use. Exposure to coal tar pitch is primarily limited to occupational settings, such as tar distillation, roofing and aluminum smelting. In these settings, occupational exposure to liquid, solid, heated or vaporous coal tar pitch is controlled by the use of enclosed processing systems, industrial hygiene controls and personal protective equipment. Each industrial facility should also have a thorough training program for employees and appropriate work processes, as well as safety equipment in place to limit exposure. Workers should follow the recommended safety measures in the relevant Safety Data Sheet (SDS).

Information Sources

Data is compiled from a variety of sources, including publicly available documents, internal data and other sources such as, but not limited to, Safety Data Sheets (SDS). For additional information regarding this product, including its physical and chemical properties, transport information and regulatory information, please refer to the applicable Safety Data Sheet (SDS) on the Koppers Inc. website. <http://koppers.com/pages/product-sds>.

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