

and to establish NESHAP for the listed source categories and subcategories. The category of major sources covered by today's proposed NESHAP, Primary Magnesium Refining, was listed on July 16, 1992 (57 FR 31576). Major sources of HAP are those that emit or have the potential to emit greater than 10 tons/yr of any one HAP or 25 tons/yr of any combination of HAP.

B. What Criteria Are Used in the Development of NESHAP?

Section 112 of the CAA requires that we establish NESHAP for the control of HAP from both new and existing major sources. The CAA requires the NESHAP to reflect the maximum degree of reduction in emissions of HAP that is achievable. This level of control is commonly referred to as the MACT.

The MACT floor is the minimum level allowed for NESHAP and is defined under section 112 (d)(3) of the CAA. In essence, the MACT floor ensures that the standard is set at a level that assures that all major sources achieve the level of control at least as stringent as that already achieved by the better-controlled and lower-emitting sources in each source category or subcategory. For new sources, the MACT floor cannot be less stringent than the emissions control that is achieved in practice by the best-controlled similar source. The MACT standards for existing sources cannot be less stringent than the average emission limitation achieved by the best-performing 12 percent of existing sources (for which we have emissions information) in the category or subcategory or by the best-performing five sources (for which we have or could reasonably obtain emissions information) for categories or subcategories with fewer than 30 sources.

In developing MACT, we also consider control options that are more stringent than the floor. We may establish standards more stringent than the floor based on the consideration of cost of achieving the emissions reductions, nonair quality health and environmental impacts, and energy impacts.

C. What Source Category Is Affected by the Proposed Rule?

Section 112(c) of the CAA requires us to list all categories of major and area sources of HAP for which we will develop national emission standards. We published the initial list of source categories on July 16, 1992 (57 FR 31576). "Primary Magnesium Refining" is one of the source categories on the initial list. The listing was based on our determination that primary magnesium

refining facilities may reasonably be anticipated to emit a variety of HAP listed in section 112(b) in quantities sufficient to be major sources.

The source category is comprised of one plant, US Magnesium Corporation located in Rowley, Utah. The plant produces magnesium from brine (salt water) taken from the Great Salt Lake. The production process concentrates the magnesium salts in the brine, then processes the brine to remove impurities that would affect metal quality. After the brine solution is converted to a powder mixture of magnesium chloride ($MgCl_2$) and magnesium oxide in the spray dryers, the powder is conveyed to the melt/reactors. The melt/reactors melt the powder mixture and convert the remaining magnesium oxide to magnesium chloride by injecting chlorine into the molten salt. The purified molten salt is then transferred to the electrolytic cells where the molten magnesium chloride salt is separated into magnesium metal and chlorine by electrolysis. The electrolysis process passes a direct electric current through the molten magnesium chloride, causing the dissociation of the salt and results in the generation of chlorine gas and magnesium metal. The magnesium metal is then transferred to the foundry for casting into ingots for sale. The chlorine produced is piped to a chlorine plant where it is liquefied for reuse or sale.

The HAP emitted from the primary magnesium refining process are chlorine, hydrochloric acid, dioxin/furan, and trace amounts of HAP metals. Emission controls include various combinations of wet scrubbers (venturi and packed-bed) for acid gas and particulate matter (PM) control.

Chlorine is emitted from the melting and purification of reactor cell product and is controlled by conversion to hydrochloric acid in the chlorine reduction burner and subsequent absorption of the hydrochloric acid in venturi and packed-bed scrubber. Using these control technologies, upwards of 99.9 percent control of chlorine is achieved. The electrowinning of the melted magnesium chloride to magnesium metal produces as a by-product chlorine gas which is recovered at the chlorine plant. When the chlorine plant is inoperable, the chlorine produced at the electrolytic cells is routed to a series of packed-bed scrubbers which use ferrous chloride as the adsorbing medium.

Hydrochloric acid is emitted from the spray drying and storage of magnesium chloride powder and the melting and purification of reactor cell product prior to the electrowinning process.

Hydrochloric acid emissions are controlled by venturi and packed-bed scrubbers.

Dioxin/furan are generated in the melt reactor and are subject to incidental control by the chlorine reduction burner and wet scrubbers used to control chlorine, hydrochloric acid (HCl), and PM.

D. What Are the Health Effects Associated With Emissions From Primary Magnesium Refiners?

Acute (short-term) exposure to high levels of chlorine in humans can result in chest pain, vomiting, toxic pneumonitis, and pulmonary edema. At lower levels, chlorine is a potent irritant to the eyes, the upper respiratory tract, and lungs. Chronic long-term exposure to chlorine gas in workers has resulted in respiratory effects including eye and throat irritation and airflow obstruction. Animal studies have reported decreased body weight gain, eye and nose irritation, non-neoplastic nasal lesions, and respiratory epithelial hyperplasia from chronic inhalation exposure to chlorine. No information is available on the carcinogenic effects of chlorine in humans from inhalation exposure. We have not classified chlorine for potential carcinogenicity.

Hydrochloric acid is corrosive to the eyes, skin, and mucous membranes. Acute inhalation exposure may cause eye, nose and respiratory tract irritation and inflammation and pulmonary edema in humans. Chronic occupational exposure to HCl has been reported to cause gastritis, bronchitis, and dermatitis in workers. Prolonged exposure to low concentrations may cause dental discoloration and erosion. No information is available on the reproductive or developmental effects of hydrochloric acid to humans. In rats exposed to hydrochloric acid by inhalation, altered estrus cycles have been reported in females and increased fetal mortality and decreased fetal weight have been reported in offspring. We have not classified hydrochloric acid for carcinogenicity.

There are a variety of metal HAP contained in the PM emitted from the primary magnesium refining process. The principal HAP metals emitted include trace quantities of phosphorous and manganese. Health effects in humans have been associated with both deficiencies and excess intakes of manganese. Chronic exposure to low levels of manganese in the diet is considered to be nutritionally essential in humans, with a recommended daily allowance of 2 to 5 milligrams per day. Chronic exposure to high levels of manganese by inhalation in humans