

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

November 8, 1999

TO: File for paraffin wax fume (8002-74-2)

FROM: Marco Bianchi

SUBJECT: Initial Threshold Screening Level

The initial threshold screening level (ITSL) for paraffin wax fume is  $20\mu\text{g}/\text{m}^3$  based on an 8 hr. averaging time.

The following references or databases were searched to identify data to determine the ITSL: IRIS-online, HEAST, NTP Management Status Report-online, RTECS, EPB-CCD, EPB library, CAS-online, NLM-online, IARC-online, NIOSH Pocket Guide, and ACGIH Guide.

Paraffin wax (petroleum) is a complex combination of hydrocarbons obtained from petroleum fractions by solvent crystallization (solvent deoiling) or by the sweating process. It consists predominately of straight chain hydrocarbons having carbon numbers predominantly greater than  $\text{C}_{20}$ . Paraffin has a wide variety of uses, such as making candles, as a sealant or coating for paper and food products, extracting perfumes from flowers, and as a chewing gum base.

According to the American Conference of Governmental Industrial Hygienists (ACGIH) documentation (1992) for paraffin wax fume, paraffin is neither digested nor absorbed and is considered nontoxic, although in the past it may have possessed small amounts of impurities with carcinogenic potential. Ingested paraffin may induce a mild laxative effect. But purposeful inhalation of oily or fatty materials into the lungs to relieve constipation has caused lipoid pneumonia (Antico, 1996; and Gondouin, 1996). The concentration of these oily/fatty materials was unknown. A concentration of 0.6 to  $1\text{ mg}/\text{m}^3$  of paraffin fume in a workroom where paraffin candles were poured was considered mildly disagreeable in one plant, however, in other plants, concentrations below  $2\text{ mg}/\text{m}^3$  produced no discomfort or complaints (ACGIH, 1992).

Since no other information could be obtained for paraffin wax fume other than the ACGIH documentation, a Threshold Limit Value (TLV) of  $2\text{ mg}/\text{m}^3$  will be used to derive an ITSL for this compound. The ACGIH recommends this value because of the low intrinsic toxicity of paraffin wax fume, and to minimize the potential for irritation of respiratory passages and other unpleasant effects that can be associated with occupational exposure to this compound. The National Institute of Occupational Safety and Health (NIOSH) also concurs with the TLV by establishing a Recommended

Exposure Level (REL) of 2 mg/m<sup>3</sup>. The ITSL for paraffin wax fume will be derived from the TLV of 2 mg/m<sup>3</sup>.

*The ITSL was determined as follows:*

$$\text{ACGIH TLV} = 2 \text{ mg/m}^3$$

$$2 \text{ mg/m}^3 \div 100 = 0.02 \text{ mg/m}^3$$

$$0.02 \text{ mg/m}^3 \times \frac{1000 \text{ ug/m}^3}{1 \text{ mg/m}^3} = 20 \text{ ug/m}^3$$

**The ITSL for paraffin wax fume = 20 ug/m<sup>3</sup> based on 8 hr. averaging.**

**References:**

1. Documentation of Threshold Limit Values and Biological Exposure Indices. 1992. Paraffin Wax Fume. American Conference of Governmental Industrial Hygienists (ACGIH), 6th Edition.
2. Antico A. et al. 1996. Lipoid pneumonia: a case of cavitary bilateral nodular opacity. *Monaldi Arch Chest Dis*; Vol. 51, ISS 4, page 296-298.
3. Gondouin A. et al. 1996. Exogenous lipid pneumonia: a retrospective multicentre study of 44 cases in France. *Eur Respir J*; Vol 9, ISS 7, page 1463-1469.