

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

February 6, 2017

TO: File for Decamethylcyclopentasiloxane (CAS No. 541-02-6)
FROM: Mike Depa, Air Quality Division, Toxics Unit
SUBJECT: Derivation of Initial Threshold Screening Level

The initial threshold screening level (ITSL) for decamethylcyclopentasiloxane is 200 $\mu\text{g}/\text{m}^3$, with annual averaging time.

Previously, the averaging time (AT) assigned to the decamethylcyclopentasiloxane ITSL was 24 hours, pursuant to Rule 232(2)(b) of the Air Pollution Control Rules promulgated at that time (June 24, 1992; see attached memo). The recently promulgated (December 22, 2016) Air Pollution Control Rule 232(2)(b) states that ITSLs based on Rule 232(1)(a) are assigned an annual AT. An updated literature review was not performed at this time.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

June 24, 1992

TO: Decamethylcyclopentasiloxane File (CAS # 541-02-6)

FROM: Gary Butterfield

SUBJECT: ITSL for Decamethylcyclopentasiloxane

A CAS-on-line search did not find any studies that could be used for calculation of an ITSL for this material. Dow Corning provided data from a 90 day rat inhalation study that they conducted. Sprague-Dawley rats, 10 of each sex per dose group, were exposed for 6 hours a day, seven days a week for 13 weeks to 0, 20, 59 or 119 ppm (or 0, 304, 895 or 1800 mg/m³). In the 90 day study a NOAEL of 59 ppm (or 895 mg/m³) was identified, based on altered liver weight in the female rate exposed to 119 ppm. The liver weights returned to normal during a 28 day recovery period. No alterations in pathology, blood chemistry, body weights, or other parameters were observed from exposure to any tested level of decamethylcyclopentasiloxane vapors.

Utilizing the NOAEL of 895 mg/m³ and EPA's methods for calculating RfCs, an ITSL can be calculated as follows.

1. Dose adjustment to NOAEL for discontinuous exposure.
 $\text{NOAEL}(\text{adj}) = (895 \text{ mg/m}^3) \times (6/24) \times (7/7) = 224 \text{ mg/m}^3/\text{d}$

2. The default value of 1 for calculating the NOAEL(hec) from the NOAEL(adj) for the ratio of animal to human blood-air partition coefficient.
 $\text{NOAEL}(\text{hec}) = \text{NOAEL}(\text{adj}) \times 1$

3. UF is based on a factor of 10 for sensitive humans, a factor of 10 for animal-to-human adjustment, and a factor of 10 for adjustment of subchronic to chronic exposure.
 $\text{RfC} = \text{NOAEL}(\text{hec}) \times (1/10 \times 1/10 \times 1/10) = 0.2 \text{ mg/m}^3/\text{d}$

4. The Air Toxics Rules allow the ITSL to be equal to the RfC.
 $\text{ITSL} = 200 \text{ } \mu\text{g/m}^3 \text{ with 24 hour averaging.}$