Substance Safety Summary

SUBSTANCE: Titanium Dioxide

GENERAL STATEMENT

Titanium dioxide pigment (chemical formula: TiO_2) is an inorganic white pigment found in an array of end uses. TiO_2 is a naturally occurring mineral used as a bright white pigment for paint, in the food industry as a coloring, in sunscreens and cosmetics, and in other industrial uses. After processing, it is exists as white, powdery solid. The most common use—coatings and plastics—accounts for more than 80 percent of global consumption.

CHEMICAL IDENTITY

CATEGORY	DETAIL
EC Number	236-675-5
CAS Number	13463-67-7
Name Subclass 1	Titanium Dioxide (TiO_2)
Structural Formula	O═══Ti═══O

USES AND APPLICATIONS

This chemical or product is generally used in the following manner as a coloring agent or a pigment. It can also be used as an agent for adsorbing gases or liquids, as a filler, or as a semiconductor/photovoltaic agent. TiO_2 is the most used in terms of volume of all pigments employed by the plastic industry.

PHYSICAL/CHEMICAL PROPERTIES

PROPERTY	DETAIL
Physical State	Solid
Form	Crystalline
Color	White
Odor	Odorless
Melting Point	1560–1843°C
Boiling Point	3,000°C
Bulk Density	3.9 g/mL at 25°C
Water Solubility	Immiscible

HEALTH EFFECTS

	HUMAN HEALTH SAFETY ASSESSMENT
Consumer	Based on available data, TiO_2 is not a hazardous substance. The substance is used in powdered form in industrial settings only. No indirect exposure via the environment is expected. Therefore, no relevant consumer exposure is expected. Because TiO_2 has been well-studied, a reasonable determination of its adverse effects on the population at-large can be stated. Health risks through exposure to TiO_2 in its powdered form are presumed to be extremely low since TiO_2 is typically fully incorporated into the end product in which it is used.
Worker	Workers should follow the recommended safety measures contained within the Safety Data Sheet (SDS) and on any product packaging. Employees should be trained in the appropriate work processes and safety equipment to limit exposure to chemical substances. Occupational use of this substance is considered to be safe provided the recommended safety measures and engineering controls as outlined in the SDS are followed.

EFFECT ASSESSMENT	RESULTS
Acute Toxicity Oral Inhalation/Dermal	No classification required since it does not meet regulated classification criteria.
Irritant Effect on Skin & Eyes	Skin, eye, and respiratory: Not chemically irritating, may be mechanically irritating.
Sensitization	Not sensitizing.
Toxicity after Repeated Exposure	Not classified for toxicity after repeated exposure.
Genotoxicity/Mutagenicity	Does not cause genetic toxicity.
Carcinogenicity	Based on epidemiologic evidence, not a carcinogen. EU published the classification of titanium dioxide as a suspected carcinogen (category 2) by inhalation in certain powder forms under the CLP regulation. The EU has underlined in the classification that the suspected hazard could occur if dust—like TiO_2 powder—is inhaled in extremely high concentrations over a long period of time, causing lung impairment,
Toxicity for Reproduction	Does not present a reproductive toxicity hazard.

ENVIRONMENTAL EFFECTS

The substance is a natural mineral. Exposure to the environment is not relevant since TiO_2 is not classified as dangerous to the environment.

EFFECT ASSESSMENT	RESULT
Aquatic Toxicity	Not expected to be harmful to aquatic species.
Persistence and Degradability	Not readily biodegradable.
Bioaccumulation Potential	Not bioaccumulative.
PBT/vPvB Conclusion	This substance does not fulfill the criterial for PBT or vPvB.

EXPOSURE

	HUMAN HEALTH SAFETY ASSESSMENT
Human Health	The substance is used in industrial settings only. The most relevant route for worker exposure to TiO_2 is by inhalation of dust. Because TiO_2 is generally not absorbed through the skin or via the gastrointestinal tract, dangers of exposures to workers via these routes are minimal. Uses in industrial settings are generally under controlledconditions and often in closed system.
Environment	In accordance with all local legislation and permit requirements.

RISK MANAGEMENT RECOMMENDATION

Risk management measures for industrial site use include containment through engineering controls and personal protective equipment. If accidental exposure occurs, use of personal protective equipment such as an approved respirator, chemical resistant gloves, chemical goggles, and protective clothing should be utilized whenever appropriate. Refer to the SDS.

SIGNAL WORD (IN ACCORDANCE WITH 29 CFR 1910.1200)

Warning

CONCLUSION

The assessment has revealed that the substance is considered to be safe for the above described uses and applications.

COMPANY CONTACT INFORMATION

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