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1. Identification of the substance / preparation and of the company / undertaking

Product name:	TPX-HP-Clear
Applications Recommended:	Photocatalytic coating agent
Manufacturer:	Kon Corporation
Address:	22646, Matsunokihara, Miyano, Yamauchi-cho, Takeo-City, Saga-prefecture, Japan
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2. Hazards identification

【GHS classification】

Physical hazards	Flammable liquid	Not classified
	Pyrophoric liquid	Not classified
	Self-heating liquid	Not classified
	Water-reactive flammable chemicals	Not classified
	Oxidizing liquid	Not classified
	Metal corrosive substance	Unclassifiable
Health hazards	Acute toxicity(Oral)	Not classified
	Acute toxicity(Transdermal)	Not classified
	Acute toxicity(Inhalation: Steam)	Not classified
	Acute toxicity(Inhalation: Dust, Mist)	Unclassifiable
	Skin corrosivity / Irritative	Not classified
	Damaging Serious / irritation to the eye	Category 2B
	Respiratory sensitization	Unclassifiable
	Skin sensitization	Unclassifiable
	Germ cell mutagenicity	Category 1B
	Carcinogenic	Unclassifiable
	Reproductive toxicity	Category 1A
	Specific target organ toxicity(single exposure)	Category 3 (Respiratory tract irritation, Anesthetic action)
	Specific target organ toxicity(repeated exposure)	Category 1(Liver), Category 2(Central nerve)
Environmental hazards	Aquatic environmental hazards(Acute)	Unclassifiable
	Aquatic environmental hazards(Chronic)	Unclassifiable
	Harmful effect on the ozone layer	Unclassifiable

※Hazard information not mentioned above, are “Not a classification target” or “Unclassifiable”.

【GHS label elements】
※Ethanol is a component of this product is applicable.

Symbol	  ※Ethanol
Signal word	Danger, Warning
Hazard and toxicity information	Eye irritation, Causing genetic defects, Fear of adverse effects on fertility or to the fetus, Fear of irritation to the respiratory tract, Fear of dizziness or drowsiness, Damage to organs through repeated exposure or long-term

Precautionary statement	Preventive measures	That you get the instruction manual before use, read the safety precautions of all, you do not use it until you understand.
	Correspondence	If there is exposed or concerned, get a diagnosis and medical attention.
	Storage	To keep it under lock and key.
	Disposal	May correspond in accordance with laws and regulations.

3. Composition / Information on ingredients

Distinction of single product or mixture : Mixture (Aqueous dispersion)

Component name	Content	Chemical formula	CAS No.
Titanium oxide (Ⅳ)	＜ 0.5wt%	TiO_2	13463-67-7
Silicon dioxide	＜ 0.5wt%	SiO_2	7631-86-9
Ethanol	＜ 15wt%	C_2H_5OH	64-17-5
Water	Remaining amount	H_2O	7732-18-5

4. First aid measures

Inhalation	Remove to fresh air, and take a rest in the easy style of breathes. Get medical attention/advice if you feel unwell.
Ingestion	Wash out mouth. Receive medical attention, the allowance. Get medical attention/advice if you feel unwell.
Skin contact	Wash the affected area with plenty of water. If skin irritation or rash occurs, get medical advice/attention.
Eye contact	Rinse cautiously with clean water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eyes irritation persists, get medical advice/attention.

5. Fire-fighting measures

For the product itself does not burn, if this product is involved in a fire, never to be taken into account especially for firefighting.

6. Accidental release measures

Personal precaution	Wear proper protective equipment.
Environment precautions	Prevent from flowing out into sewer, watercourse or river.
Methods and materials for containment and cleaning up	Collect in a container empty. Wipe off residual spill by using absorbing water paper or cloth, and collect in plastic bag.
Measures to prevent secondary disaster	The product which was remained on the floor are risk of slipping, collect carefully, and wipe enough.

7. Handling and storage

Handling	Wear proper protective equipment to avoid contact and inhalation. Use only outdoors or in a well-ventilated area.
Storage conditions	Store the product in a cool and dark space of 5 ～ 25 ℃ (No freezing).
Incompatible materials	No information
Packaging materials	Metal containers should be avoided because of the potential for corrosion by water. Be placed in sealable containers for quality maintenance.

8. Exposure controls / Personal protection		
Allowable concentration		(temporary) 0.3 mg／m^3 (TiO_2; Titanium dioxide nanoparticle) ＜Japan Society for Occupational Health(2013)＞ Third-class dust Total dust 8 mg／m^3 (SiO_2; Amorphous silicon dioxide) Respirable dust 2 mg／m^3(〃)
Engineering measures		Placing local or whole exhaust ventilation.
Protective equipment	Respiratory protection	Wear dust mask or an appropriate respiratory protective equipment.
	Hand protection	Wear appropriate protective gloves.
	Eye protection	Wear appropriate protective glasses.
	Skin and body protection	Wear the appropriate protective clothing.
Hygiene measures		When using this product, do not eat, drink or smoke. Wash your hands clean after handling.

9. Physical and chemical properties	
Appearance	Semi-transparent liquid
Smell	None
pH	6～9
Melting point / freezing point	No data
Boiling point	100℃(Water)
Flash point	Noncombustibility
Explosive range	Non-explosive
Vapor pressure	3.2kPa/25℃(Water)
Vapor density	No data
Specific gravity (relative density)	1.00 (25℃)
Solubility in water	Dispersion
Octanol / water partition coefficient	No data
Decomposition temperature	No data
Viscosity	＜ 12 mPa･s

10. Stability and reactivity		
Stability		Stable in normal handling conditions
Possibility of a hazardous reactions		No information
Conditions to avoid	Incompatible materials	Material was prohibited from mixing with water
	Hazardous decomposition products	No information

11. Toxicological information		
Acute toxicity	Oral	【Titanium oxide (Ⅳ)】LD_{50}＞10,000 mg/kg(IUCLID (2000)) ; rat 【Silicon dioxide】LD_{50}＞5,000, 15,000, 20,000 mg/kg(IUCLID (2000)) ; rat 【Ethanol】LD_{50}＞6,200-15,000 mg/kg(Reference 2) ; rat From the above, classified as "Not classified".
	Transdermal	【Titanium oxide (Ⅳ)】approxLD_{50}＞10,000 mg/kg (IUCLID(2000)) ; rabbit 【Silicon dioxide】LD_{50}＞5,000 mg/kg (IUCLID(2000)) ; rabbit 【Ethanol】LDLo＞20,000 mg/kg bw (SIDS(2009)) ; rabbit From the above, classified as "Not classified".
	Inhalation	【Ethanol】 LD_{50}＞60,000 mg/kg (SIDS(2004)) ; mouse From the above, classified as "Not classified".

Acute toxicity	Dust / mist inhalation	【Titanium oxide (Ⅳ)】LC_{50}＞6.82 mg/L/4h (IUCLID(2000)) ; rat 【Silicon dioxide、Ethanol】No data From the above, classified as " Unclassifiable ".
Skin corrosion / irritation		【Titanium oxide (Ⅳ)】0.5g/24h= Mild irritation, 0.1g/24h=None (IUCLID(2000)) ; rabbit 【Silicon dioxide】None (IUCLID(2000)) ; rabbit 【Ethanol】None (SIDS(2004)) ; rabbit From the above, classified as "Not classified".
Serious eye damage / eye irritation		【Titanium oxide (Ⅳ)】 There is a result of that there is mild irritation, but as a result of that there is no irritating in (was washed in 5 minutes after application) Another test is obtained. (IUCLID (2000)) ; rabbit 【Silicon dioxide】 There is a result of that there is no irritating at the test using a rabbit (SIDS(2004),IARC(2013)) ,but as a result of that there is slightly irritating for man in Another test is obtained. (IUCLID (2000)) 【Ethanol】 In tests with rabbits, there is the assessment(SIDS(2009)) that moderately irritating was observed . 1-3 days after an application, corneal opacity, iritis, conjunctival redness, conjunctival edema was observed, and MMAS (Modified Maximum Average Score ; equivalent of the AOI) is 24.0 (ECETOCTR48 (1998)). However the symptoms almost recovered within 7 days. From the above, classified as " Category 2B ".
Respiratory sensitization / skin sensitization		【Titanium oxide (Ⅳ)、Ethanol】No data 【Silicon dioxide】 No skin sensitization of workers in the exposure more than 10 years of Experience. (SIDS(2004)) From the above, classified as " Unclassifiable ".
Germ cell mutagenicity		【Titanium oxide (Ⅳ)】 Negative in the bone marrow cell micronucleus test / chromosome aberration test was carried out under the condition that the belly vaginal administration of mouse. (NTPDB(2005)) 【Silicon dioxide】 Negative in alveolar cell gene mutation test after long-term inhalation exposure in rats. (SIDS(2004)) Negative in the bone marrow cell micronucleus test in vivo using mouse. (JJFC(2003)) 【Ethanol】 Dominant lethal test (germ cells in vivo heritable mutagenicity test) by oral administration in mice and rats is a positive result (further intraperitoneal administration in the case of mouse) . (SIDS(2009)、IARC(1988)) Also, as in vitro mutagenicity test, Ames test was all negative. (DFGOT Vol.12(1999) 、SIDS(2009) 、NTP DB (2009)) Further, chromosome aberration test, except for positive result of 1 case using CHO cells, were all negative. (SIDS(2009)) From the above, classified as " Category 1B ".
Carcinogenic		【Titanium oxide (Ⅳ)】 In IARC, it is classified into groups 2B. However, the occurrence of tumors in inhalation exposure test to the lung to rats and mice and hamsters, observed only for rats of high-dose administration. Moreover, similar trend was observed the tests for rats using other inert poorly soluble particles. It is considered that the rat-peculiar immune system acted. In epidemiological population studies on human made in Europe and North America, the causal relationship of titanium oxide and carcinogenicity did not show.(March 2012 dated 25 issue; Japan titanium oxide Industry Association of opinion) 【Silicon dioxide】 In IARC, the amorphous silica has been classified in group 3. However, this classification is not in consideration of the particle size (nanoscale).

Carcinogenic	【Ethanol】 In IARC, alcoholic beverages are classified into Group 1 based on a lot of epidemiological studies in humans to consume alcoholic beverages habitually. In EU, it has not been classified into carcinogenic. From the above, classified as " Unclassifiable ".
Reproductive toxicity	【Titanium oxide (Ⅳ)、Silicon dioxide】 No data 【Ethanol】 Classified into groups 1A, because epidemiology reports and epidemiological studies results are clearly suggested the human's reproductive toxicity. (IARC,SIDS(2009)) From the above, classified as " Category 1A ".
Specific target organ toxicity (single exposure)	【Titanium oxide (Ⅳ)】 Lethal dose by oral administration in rats is 10,000 mg / kg or more. In addition, the Ingestion of this substance in humans is regarded substantially harmless. Moreover "oral" is classified as "Not classified". However, the data in the other path is insufficient. 【Silicon dioxide】 No data 【Ethanol】 Classified into groups Category 3 (anesthetic action, respiratory tract irritation), based on the results of inhalation exposure studies of to humans. (Patty(5th,2001),SIDS(2009),ACGIH(2001)) From the above, classified as " Category 3 (anesthetic action, respiratory tract irritation) ".
Specific target organ toxicity (repeated exposure)	【Titanium oxide (Ⅳ)】 In any of the tests on rats and mice, it is no influence caused by exposure at a dose of 1,250 mg/kg/day more than the upper limit guidance. On the other hand, there is a description that the pneumoconiosis changes for few worker of occupational exposure more than 20 years were revealed. The epidemiological studies that main purpose is whether titanium oxide has fibrosis effect have been often performed. However, the most of the studies are negative for the causal relationship. The hard evidence of association between titanium oxide and pulmonary fibrosis has not found. In case of inhalation exposure to rats for 2 years exceeding the guidance concentration upper limit of 250 mg/m^3(5days/week, 6h/day:dust), serious effect was not observed. However, there is no data of percutaneous exposure the other. 【Silicon dioxide】 No data 【Ethanol】 Long-term high intake of alcohol in humans, have been reported to particularly affecting on the liver. (DFGOT(1996)) ⇒"Category 1 (liver)" Also, patients who become severe physical dependence with alcohol intake, have been reported to do intentional behavior and hyperreflexia for obtaining alcohol conspicuously, in addition to withdrawal symptoms. (HSDB(2003)) ⇒"Category 2 (Central nerve)" From the above, classified as " Category 1 (liver), Category 2 (Central nerve)".
Aspiration hazard	No data

12. Ecological information

Aquatic environment acute hazard		No data
Aquatic environment chronic hazard		No data
Biological toxicity	Fish toxicity	No data
Persistence / degradability	Bioaccumulation	No data
	Mobility in the soil	No data

13. Disposal considerations

Residual waste	Avoid release to the environment. Disposal of contents and container must be in accordance with the criteria of the relevant laws and regulations.

14. Transport information		
International regulation	Maritime Regulatory Information	Non-hazardous materials
	Aviation regulatory information	Non-hazardous materials
National regulations (Japan)	Land regulatory information	Not applicable
	Maritime Regulatory Information	Non-hazardous materials
	Aviation regulatory information	Non-hazardous materials
Special safety measures	In case of stowing, give no damage. Reliably prevent collapse of cargo. Please make sure that there is nothing of any leaked liquid upon transportation. Be placed in a cool, dark place.	

15. Regulatory information
Follow all regulations in your country.
【In Japan】
Industrial Safety and Health Act
Act on Prevention of Marine Pollution and Maritime Disaster

16. Other information
Data that has been described here are based on the latest knowledge and experience. The purpose of the safety data sheet is intended to provide information of how to use safety this product. Data that has been described here, does not guarantee any performance of the product. Notes are intended for normal using. In the case of special using, should be considered this point. In addition, this product has been containing water. Therefore, if you have long-term storage in a metal container, please note that there is a possibility that the container is corroded.

【References】

1. GHS data-base (NITE; National Institute of Technology and Evaluation)
2. SANGYO CHUDOKU-BINRAN (Written in Japanese) (SIKAYAKUSYUPPAN Co., Ltd)
3. Handbook of Danger and Harmful Chemical Substances
(JISHA; Japan Industrial Safety and Health Association)
4. JIS Z 7253
5. Applicable laws and regulations
6. Other available data