

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

- 1.1 Product identifier:** COTIOX KA-100 (Titanium Dioxide), KA-320, KA-350, KA-400(E171)
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**
Relevant identified uses: White pigment for paints, coatings, printing inks, plastics, paper etc.
Uses advised against: Use for recommended use only
Reason why uses advised against: Not available
- 1.3 Details of the Supplier of the safety data sheet**
- Manufacturer/Supplier: COSMO CHEMICAL CO., LTD.
 - Street address/P.O. Box: 55, Wonbong-ro, Onsan-eup, Ulju-gun, Ulsan, Republic of Korea
 - Country ID/Postcode/Place: 45010
 - Telephone number (if possible, indicate telefax):
 - Onsan Plant: +82-52-231-6175 / FAX +82-52-237-2104
 - Sales Office: +82-2-2058-9111 / FAX +82-2-2058-9119
 - E-mail address of competent person responsible for the SDS: overseas@cosmochem.co.kr
 - National contact: Not available
- 1.4 Emergency telephone number**
Emergency telephone number: +82-2-2058-9111
Other comments(e.g. language(s) of the phone service): Korean, English

SECTION 2: Hazards identification

- 2.1 Classification of the substance or mixture**
- 2.1.1 Classification according to Regulation (EC) No. 1272/2008 [CLP]**
Not classified
- 2.1.2 Additional information:** Not available
- 2.2 Label elements**
- Labelling according to Regulation (EC) No. 1272/2008 [CLP]**
- Hazard pictograms:** Not applicable
- Signal word:** Not applicable
- Hazard statements:** Not applicable
- Precautionary statements:** Not applicable
- Supplemental Hazard information (EU):**
- Additional Information according to Regulation (EU) No. 2020/217 :**
Titanium dioxide contained in this product is not classified pursuant to Regulation (EU) No. 2020/217 (14th ATP to Regulation (EU) 1272/2008, Annex VI). (see section 9.2)
1. The label on the packaging of solid mixtures containing 1 % or more of titanium dioxide shall bear the following statement:
 - EUH212: 'Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.'
 2. The label on the packaging of liquid and solid mixtures not intended for the general public and not classified as hazardous which are labelled with EUH212(or EUH211), shall bear statement EUH210.'
 - EUH210 : Safety data sheet available on request
- 2.3 Other hazards:** Not available

SECTION 3: Composition/information on ingredients

3.1 Substances

CAS No.	EC No.	REACH Registration No.	% [weight]	Substance Name	Classification according to Regulation (EC) No 1272/2008 (CLP)	SCL, M-factor, ATE
13463-67-7	236-675-5	01-2119489379-17-XXXX	97 - 100	Titanium dioxide	- (NOTE*)	-

NOTE* : This substance does not fall under the criteria below. (see section 9.2)

- titanium dioxide; [in powder form containing 1 % or more of particles with aerodynamic diameter $\leq 10 \mu\text{m}$]

SECTION 4: First aid measures

4.1 Description of first aid measures

4.1.1 General notes:

- Show this safety data sheet to the doctor in attendance.
- Treat symptomatically.

4.1.2 Following inhalation:

- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

4.1.3 Following skin contact:

- IF ON SKIN: Wash with plenty of soap and water.
- Call a POISON CENTER or doctor/physician if you feel unwell.

4.1.4 Following eye contact:

- In case of contact with substance, flush eyes with running water at least 15 minutes, lifting lower and upper eyelids.
- Call a POISON CENTER or doctor/physician if you feel unwell.

4.1.5 Following ingestion:

- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

4.1.6 Self-protection of first aider:

- Exposures require specialized first aid with contact and medical follow-up .
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

4.2 Most important symptoms and effects, both acute and delayed

- Inhalation above the exposure limit will result in contamination and potential harmful effects.
- Excessive exposure can cause temporary dryness and irritation of the mucous membrane.
- Inhalation may exacerbate a previously-existing respiratory illness.
- Inhalation may exacerbate a previously-existing respiratory illness.
- Minimize the contact of inert foreign materials.
- Titanium dioxide does not penetrate intact or damaged skin.
- Prolonged contact with the skin will cause a rash/irritation due to mechanical wear.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment: Inform the healthcare personnel of the contamination situation and have them take appropriate protective measures

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media: Not available

5.2 Special hazards arising from the substance or mixture

- None fire or explosion inherent in this product.

5.3 Advice for fire-fighters

- Special protective equipment is not required.
- Fire-fighter must use self-contained oxygen breathing apparatus and personal protective equipment as required.
- Move containers from fire area if you can do it without risk.
- Evacuate area and fight fire from a safe distance.
- Stop leak if you can do it without risk.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Protective equipment:

- Wear a respiratory protective device(mask) by considering physicochemical properties of exposed particulate material.

Emergency procedures:

- Must work against the wind, let the upwind people to evacuate.
- Do not touch or walk through spilled material.
- Avoid excessive skin contact.

6.1.2 For emergency responders

- Wear a respiratory protective device by considering physicochemical properties of exposed particulate material.
- Eliminate all ignition sources.
- Ventilate closed spaces before entering to avoid breathing dust/fume.
- Stop leak if you can do it without risk.

6.2 Environmental precautions:

- Avoid release to the environment.
- Prevent entry into waterways, surface water sewers, basements or confined areas.
- If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

6.3.1 For containment:

- Collect spillage.
- Cover with plastic sheet to prevent spreading.

6.3.2 For cleaning up:

- Take up mechanically, placing in appropriate.
- When handling and collecting waste, prevent dust generation.
- Waste must be disposed of in accordance with federal, state and local environmental control regulations.

6.3.3 Other information: Not available

6.4 Reference to other sections

- See also sections 8 and 13 of the Safety Data Sheet.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Protective measures:

- Prevent dust generation.
- Avoid excessive skin contact.
- Please work with reference to engineering controls and personal protective equipment.
- Since emptied containers retain product residue follow all SDS and label warnings even after container is

emptied.

Measures to prevent fire:

- Eliminate all ignition sources.

Measures to prevent aerosol and dust generation:

- When stored in an enclosed space, store in a well-ventilated confined place.
- Use carefully in handling/storage.

Measures to protect the environment:

- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

Advice on general occupational hygiene: Not available

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions:

- Store in a well-ventilated place. Keep container tightly closed.
- Observe label precautions.
- Do not apply direct heat.
- Do not apply any physical shock to container.

Packaging materials: Not available

Requirements for storage rooms and vessels: Keep container tightly closed.

Storage class: Not available

Further information on storage conditions: No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Recommendations: White pigment for paints, coatings, printing inks, plastics, paper etc.

Industrial sector specific solutions: Not available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limits

Chemical Name	EU regulation	ACGIH regulation	OSHA regulation	NIOSH regulation	Biological exposure index
Titanium dioxide	Not applicable	TWA = 10 mg/m ³	TWA = 15 mg/m ³ (Total dust)	TWA = 2.4 mg/m ³ (CIB 63, fine); 0.3 mg/m ³ (CIB 63, ultrafine, including engineered nanoscale)	Not available

Other Country Occupational Exposure limits

Country	Titanium dioxide
Korea regulation	TWA = 10 mg/m ³
China regulation	TWA = 8 mg/m ³
Hong Kong regulation	TWA = 10 mg/m ³
Indonesia regulation	TWA = 10 mg/m ³
Malaysia regulation	TWA = 10 mg/m ³
Philippines regulation	TWA = 15 mg/m ³
Singapore regulation	TWA = 10 mg/m ³
Taiwan regulation	TWA = 10 mg/m ³

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Substance/mixture related measures to prevent exposure during identified uses:

- If exposure limits are exceeded or irritation is experienced, ventilation is required.

Structural measures to prevent exposure: Not available

Organisational measures to prevent exposure: Not available

Technical measures to prevent exposure: Not available

8.2.2 Personal protection equipment:

8.2.2.1 Eye and face protection:

- Wear the protective glasses or safety goggles to protect from particulate material.

8.2.2.2 Skin protection

- Skin protective equipment is generally not required.

Hand protection:

- Wear protective gloves if possible.

Other skin protection:

- Wash hands before and after handling.

8.2.2.3 Respiratory protection:

- If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.
- In case of insufficient ventilation, wear suitable respiratory protective equipment.

8.2.2.4 Thermal hazards: Not available

8.2.3 Environmental exposure controls:

Substance/mixture related measures to prevent exposure:

- Ensure not to cause environmental pollution by releasing to the environment.

Instruction measures to prevent exposure: Not available

Organisational measures to prevent exposure: Not available

Technical measures to prevent exposure: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- a) **Physical state** : Solid/powder
- b) **Colour** : White
- c) **Odour(Odour threshold)** : Odorless (Not available)
- d) **Melting point/freezing point** : 1,830°C
- e) **Boiling point or initial boiling point and boiling range** : 2,972°C
- f) **Flammability (solid, gas):** Not applicable
- g) **Upper / lower flammability or explosive limits:** Not applicable
- h) **Flash point:** Not applicable
- i) **Auto-ignition temperature:** Not applicable
- j) **Decomposition temperature:** Not applicable
- k) **pH:** 6.0 ~ 9.0
- l) **Kinematic viscosity** : Not available
- m) **Solubility(ies):** Insoluble in water
- n) **Partition coefficient(n-octanol/water):** Not applicable
- o) **Vapour pressure:** Not applicable
- p) **Density and/or relative density:** 3.4 ~ 4.3
- q) **Relative vapour density:** Not applicable
- r) **Particle characteristics** : Not available
- s) **Explosive properties:** Not available
- t) **Oxidising properties:** Not available
- u) **Molecular weight:** 79.9

9.2 Other information

Particle characteristics according to Regulation 2020/217 (14th ATP to Regulation (EU) 1272/2008, Annex VI)

Percentage of particles with an aerodynamic diameter ≤10µm in the products Identified in section 1.1

Mean (%)	Minimum (%)	Maximum(%)	Method
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0.012	0.011	0.013	EN15051-2
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9.2.1 Information with regard to physical hazard classes: Not available

9.2.2 Other safety characteristics: Not available

SECTION 10: Stability and reactivity

- 10.1 Reactivity:** Stable under normal temperatures and pressures.
Explosive properties: No explosive | Oxidizing properties: Not available.
- 10.2 Chemical stability:** Stable under normal temperatures and pressures
- 10.3 Possibility of hazardous reactions:** No Hazardous reactions occur.
- 10.4 Conditions to avoid:** Dust formation
- 10.5 Incompatible materials:** Not available
- 10.6 Hazardous decomposition products:** Not available

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity:

[Oral] : Not classified ($ATE_{mix} > 2,000$ mg/kg)

- **Titanium dioxide** : Mouse $LD_{50} > 5,000$ mg/kg (OECD Guideline 420) (OECD SIDS)

[Dermal] : Not available

- **Titanium dioxide** : Not available

[Inhalation] : Not classified ($ATE_{mix} > 5$ mg/kg)

- **Titanium dioxide** : Rat $LC_{50} > 3.43$ mg/L (OECD Guideline 403, There were no mortalities) (ECHA)

Skin corrosion/irritation:

 Not classified

- **Titanium dioxide** : In the skin irritation test using rabbits, the test material was not irritating.
(erythema score: 0) (OECD Guideline 404)

Serious eye damage/irritation:

 Not classified

- **Titanium dioxide** : In the eye irritation test using rabbits, the test material was not classified.
(Conjunctival redness score: 1-2)(OECD Guideline 405, GLP) (Dust may cause physical irritation with eyes.) (ECHA)

Respiratory sensitization:

 Not available

- **Titanium dioxide** : Not available

Skin sensitization:

 Not classified

- **Titanium dioxide** : Does not cause sensitization in laboratory animals. (local lymph node assay, OECD Guideline 403) (Buehler Test, Guinea pig)

Germ cell mutagenicity:

 Not classified

- **Titanium dioxide** : Titanium dioxide was negative when tested in vitro in bacterial reverse mutation assays and in mammalian cell gene mutation and clastogenicity assays as well as when tested in vivo.

Carcinogenicity:

 Not classified (See section 2.2 - Additional Information)

- **Titanium dioxide** :

IARC : Group 2B

ACGIH : A4

OSHA: Present

NTP : Not applicable

EU CLP : Not applicable (See section 9.2)

Reproductive toxicity:

 Not classified

- **Titanium dioxide** : Titanium dioxide was not classifiable as a reproductive hazard based on in vivo test results for titanium dioxide submitted in the European Union (REACH) joint submission registration dossier for the substance.

STOT-single exposure:

 Not classified

- **Titanium dioxide** : Titanium dioxide is not classifiable based on a lack of significant and/or severe toxic effects in humans or in experimental animals following acute exposures.

STOT-repeated exposure: Not classified

- **Titanium dioxide** : Repeated inhalation exposures in rats to poorly soluble dusts such as titanium dioxide lead to a pattern of pulmonary effects including inflammation and fibrosis that are not observed in other rodent species, nonhuman primates, or humans under similar conditions. Therefore, titanium dioxide is not classifiable for repeated exposure.

Aspiration hazard: Not available

- **Titanium dioxide** : Not available

11.2 Information on other hazards :

11.2.1 Endocrine disrupting properties :

- This product does not contain any known or suspected endocrine disruptors.

11.2.2 Other information : Not available

SECTION 12: Ecological information

12.1 Toxicity

Acute toxicity : Not classified

Acute (short-term) fish toxicity:

- **Titanium dioxide** : 96hr-LC₅₀(*Oryzias latipes*) > 10,000 mg/L (OECD Guideline 203)

Acute (short-term) toxicity to crustacea:

- **Titanium dioxide** :

48hr-EC₅₀(*Daphnia magna*) > 100 mg/L, 48hr-EL₅₀(*Daphnia magna*) > 100 mg/L,

48hr-EC₅₀>100mg/L, 48hr-EC₁₀=91.2 mg/L (OECD Guideline 202)

Acute (short-term) toxicity to algae and cyanobacteria:

- **Titanium dioxide** :

72hr-EC₅₀(*Pseudokirchneriella subcapitata*) > 100mg/L (growth rate, static,

72h-EyL50 >1000 mg/L static, OECD Guideline 201)

Chronic toxicity: Not classified

Chronic (long-term)fish toxicity: Not available

Chronic (long-term) toxicity to crustacea: Not available

Chronic (long-term) toxicity to algae and cyanobacteria: Not available

Sediment toxicity :

- **Titanium dioxide** : NOEC(*Hyalella azteca*) ≥ 100,000mg/L dw (ASTM 1706)

Toxicity to other aquatic plants / organisms: Not available

Toxicity to microorganisms: Not available

12.2 Persistence and degradability

Persistence: Titanium dioxide is persistent.

Biodegradation: Not readily biodegradable.

12.3 Bioaccumulative potential

Partition coefficient n-octanol/water (log K_{ow}):

Bioconcentration factor (BCF): Titanium dioxide does not bioaccumulate.

12.4 Mobility in soil: Not available

12.5 Results of PBT and vPvB assessment:

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6 Endocrine disrupting properties:

This product does not contain any known or suspected endocrine disruptors.

12.7 Other adverse effects:

No possibility of ozone depletion, photochemical ozone creation

12.8 Additional information: Not available

SECTION 13: Disposal considerations**13.1 Waste treatment methods****13.1.1 Product / Packaging disposal:**

- Waste and container must be disposed of in accordance with federal, state and local environmental control regulations.
- The product should not be allowed to enter drains, water courses or the soil.

Waste codes / waste designations according to LoW: 06 11 99

13.1.2 Waste treatment-relevant information:

- Waste and container must be disposed of in accordance with federal, state and local environmental control regulations.

13.1.3 Sewage disposal-relevant information: Avoid disposing to the environment**13.1.4 Other disposal recommendations:**

- Consider the required attentions in accordance with waste treatment management regulation.

SECTION 14: Transport information

14.1 UN number: Not applicable

14.2 UN proper shipping name: Not applicable

14.3 Transport hazard class(es): Not applicable

14.4 Packing group: Not applicable

14.5 Environmental hazards: No

14.6 Special precautions for user:

in case of fire : Not applicable

in case of leakage : Not applicable

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable

SECTION 15: Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****15.1.1 EU regulations**

Harmonized classification – Annex VI of Regulation (EC) No 1272/2008 (CLP Regulation):

Not regulated

Authorisations and/or restrictions on use

- **Authorisations:** Not regulated

- **Restrictions on use:** Not regulated

Other EU regulations:

- **Candidate List of substances of very high concern for Authorisation:** Not regulated

15.1.2 U.S.A regulations

U.S.A Inventory (TSCA) :

- **Titanium dioxide :** Present (ACTIVE)

U.S.A management information (OSHA Regulation) : Not regulated

U.S.A management information (CERCLA Regulation) : Not regulated

U.S.A management information (EPCRA 302 Regulation) : Not regulated

U.S.A management information (EPCRA 304 Regulation) : Not regulated

U.S.A management information (EPCRA 313 Regulation) : Not regulated

15.1.3 Other regulations:

- **Substance of Roterdame Protocol :** Not regulated

- **Substance of Stockholme Protocol :** Not regulated

- **Substance of Montreal Protocol :** Not regulated

15.2 Chemical Safety Assessment: No. Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: Other information

16.1 Indication of changes: Rev. 9 / **Revision date:** August 31th, 2021

16.2 Abbreviations and acronyms:

ACGIH: American Conference of Government Industrial Hygienists

CAS No: Chemical Abstracts Service number

C&L: Classification and Labelling

CLP: Classification Labelling and Packaging Regulation

CAS No.: Chemical Abstracts Service number

CMR: Carcinogen, Mutagen, or Reproductive Toxicant

DMEL: Derived Minimal Effect Levels

DNEL: Derived No-Effect Level

ES: Exposure scenario

EC: European Commission

EC No: European Chemical number: EINECS, ELINCS or NLP

ECHA: European Chemicals Agency

EEC: European Economic Community

EINCS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

EN: European Standard

ERC: Environmental Release Category

EU: European Union

EWC: European Waste Catalogue(replaced by LoW)

GHS: Globally harmonized System

GLP: Good Laboratory Practice

IARC: International Agency for Research on Cancer

ISHL: Industrial Safety & Health Law

IMDG: International Maritime Dangerous Goods

IUCLID: International Uniform Chemical Information Database

IUPAC: International Union for Pure Applied chemistry

Kow: octanol-water partition coefficient

LC₅₀: Lethal concentration, 50 %

LD₅₀: Median Lethal dose

NIOSH: National Institute for Occupational Safety & Health

NTP: National Toxicology Program

NOAEL: No Observed Adverse Effect Level

OECD: Organisation for Economic Co-operation and Development

OSHA: European Agency for Safety and Health at work

PBT: Persistent, Bioaccumulative and Toxic

PNEC(s): Predicted No Effect Concentration(s)

(Q)SAR: Qualitative Structure Activity Relationship

REACH: Registration, Evaluation, Authorisation and restrictions of Chemicals Regulation (EC) No 453/2010

SDS: Safety Data Sheet

STP : Sewage Treatment Plant

SVHC: Substances of Very High Concern

UN: United Nations

vPvB: Very Persistent and Very Bioaccumulative

WEL: Workplace Exposure Limits

MARPOL: International Convention for the Prevention of Pollution from Ships (IMO)

IBC: Intermediate Bulk Container

CERCLA: Comprehensive Environmental Response, Compensation & Liability Act (US)

EPCRA: Emergency Planning and Community Right-to-Know Act (US)

16.3 Key literature references and sources for data:

Korean Safety Data sheet provided by COSMO CHEMICAL,CO.,LTD.

UN Recommendations on the transport of dangerous goods 17th;

https://www.unece.org/trans/danger/publi/unrec/rev20/20files_e.html

EU CLP; <https://echa.europa.eu/information-on-chemicals/cl-inventory-database>

REACH information on registered substances; <https://echa.europa.eu/information-on-chemicals/registered-substances>

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; <http://monographs.iarc.fr>

National Toxicology Program; <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html>

TOMES-LOLI®; <http://www.rightanswerknowledge.com/loginRA.asp>

National Chemicals Information System; <http://ncis.nier.go.kr/main.do>

CCRIS(Cheical Carcinogenesis Research Information System);

<https://toxnet.nlm.nih.gov/newtoxnet/ccris.htm>

Organization for Economic Co-operation and Development (OECD) Screening Information Data Set (SIDS)

GETIS International limit values: http://limitvalue.ifa.dguv.de/WebForm_gw2.aspx

US EPA(United States Environmental Protection Agency) ; <https://www.epa.gov/>

16.4 Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Classification according to Regulation (EC) 1272/2008	Classification procedure
Not classified	Not applicable

16.5 Relevant H-statements (number and full text): Not applicable

16.6 Training advice:

- Do not handle until all safety precautions have been read and understood.

16.7 Further information:

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation, as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is the responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current state of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guarantee of technical performance, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS supersedes all previous versions.