

SAFETY DATA SHEET

1. Identification of the substance or mixture and of the supplier

- A. GHS product identifier : Featheleve[®] PTMB-7991D Ebony Green
- B. Recommended use of the chemical and restrictions on use
Recommended use : Not available
Restrictions on use : Not available
- C. Supplier
Company name : CQV Co., Ltd.
Address : 144, Seongjung-Ro, Jincheon-Eup, Jincheon-Gun, Chungbuk-Do, Korea
Emergency phone number : 82-43-531-2500
Respondent : Byung-Ki Choi
Fax : 82-43-536-0314

2. Hazards identification

- A. GHS classification of the substance/mixture
Not classified according to OSHA 29 CFR 1910.1200
- B. GHS label elements, including precautionary statements
Pictogram and symbol : Not applicable
Signal word : Not applicable
Hazard statements : Not applicable
Precautionary statements
Precaution : Not applicable
Treatment : Not applicable
Storage : Not applicable
Disposal : Not applicable
- C. Other hazard information not included in hazard classification (NFPA)
Health : 0
Flammability : Not available
Reactivity : Not available

3. Composition/information on ingredients

Chemical Name (INCI Name)	CAS number	EC number	Content (%)
Titanium Dioxide (CI 77891)	13463-67-7	236-675-5	81 - 89

Tin Oxide	18282-10-5	242-159-0	0 - 1
Silica	7631-86-9	231-545-4	1 - 3
Iron Oxides (CI 77491)	1309-37-1	215-168-2	7 - 13
Iron Oxides (CI 77499)	1317-61-9	215-277-5	1 - 3

4. First aid measures

A. Eye contact

- In case of contact with substance, immediately flush eyes with running water at least 20 minutes.

B. Skin contact

- In case of contact with substance, immediately flush skin with running water at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.
- Wash contaminated clothing and shoes before reuse.
- Get immediate medical advice/attention.

C. Inhalation

- Specific medical treatment is urgent.
- Move victim to fresh air.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.

D. Ingestion

- Do not let him/her eat anything, if unconscious.
- Get immediate medical advice/attention.

E. Indication of immediate medical attention and notes for physician

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

F. Most important symptoms and effects, both acute and delayed

Not available

5. Fire fighting measures

A. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media: Dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO₂
- Unsuitable extinguishing media: High pressure water streams

B. Specific hazards arising from the chemical

- If inhaled, may be harmful.

C. Special protective equipment and precautions for fire-fighters

- Dike fire-control water for later disposal; do not scatter the material.
- Move containers from fire area if you can do it without risk.
- Fire involving Tanks; Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks; Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Fire involving Tanks; Always stay away from tanks engulfed in fire.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

- Eliminate all ignition sources.
- Stop leak if you can do it without risk.
- Please note that materials and conditions to avoid.
- Ventilate the area.
- Do not touch or walk through spilled material.
- Prevent dust cloud.

B. Environmental precautions and protective procedures

- Prevent entry into waterways, sewers, basements or confined areas.

C. The methods of purification and removal

- Small Spill; Flush area with flooding quantities of water. And take up with sand or other non-combustible absorbent material and place into containers for later disposal.
- Large Spill; Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

7. Handling and storage

A. Precautions for safe handling

- Please note that materials and conditions to avoid.
- Wash thoroughly after handling.
- Please work with reference to engineering controls and personal protective equipment.
- Be careful to high temperature.

B. Conditions for safe storage

- Store in a closed container.
- Store in cool and dry place.

8. Exposure controls/personal protection

A. Occupational Exposure limits

Korea regulation

Titanium Dioxide : TWA = 10 mg/m³

Iron Oxide Red : TWA = 5 mg/m³

ACGIH regulation

Titanium Dioxide : TWA = 10 mg/m³

Iron Oxide Red : TWA = 5 mg/m³ (resp.)

Biological exposure index : Not available

OSHA regulation :

Titanium Dioxide : TWA = 15 mg/m³

Silica : TWA = 20 mppcf (80 mg/m³/%SiO₂)(Mineral Dusts)

Iron Oxide Red : TWA = 10 mg/m³(fume); TWA = 15 mg/m³(Rouge, total); TWA = 5 mg/m³(Rouge, resp.)

NIOSH regulation :

Tin Oxide : TWA = 2 mg/m³ (as Sn)

Silica : TWA = 6 mg/m³

Iron Oxide Red : TWA = 5 mg/m³(dust and fume)

EU regulation :

Titanium Dioxide : TWA = 10 mg/m³

Other :

Silica : Australia: TWA = 2 mg/ m³ (respirable dust, listed under Fumed silica)

Switzerland: TWA = 4 mg/ m³ (inhalable); 0.3 mg/ m³respirable) UK: TWA = 6

mg/ m³ (inhalable dust); 2.4 mg/ m³ (respirable dust), STEL = 18 mg/ m³

(calculated, inhalable dust); 7.2 mg/ m³ (calculated, respirable dust) Czech

Republic: TWA = 0.1 mg/ m³ (respirable fraction); 4.0 mg/ m³ (as amorphous

SiO₂) Austria: TWA = 4 mg/ m³ (inhalable fraction); 0.3 mg/ m³ (respirable

fraction)

B. Appropriate engineering controls

- Provide local exhaust ventilation system or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

C. Personal protective equipment

Respiratory protection :

- Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.

- In case exposed to particulate material, the respiratory protective equipments as follow are recommended.

:facepiece filtering respirator or air-purifying respirator, high-efficiency particulate air(HEPA) filter media or respirator equipped with powered fan, filter media of use(dust, mist, fume)

- In lack of oxygen(< 19.5%), wear the supplied-air respirator or self-contained oxygen breathing apparatus.

Eye protection :

- Wear facepiece with goggles to protect.

- An eye wash unit and safety shower station should be available nearby work place.

- Wear breathable safety goggles to protect from particulate material causing eye irritation or other disorder.

- An eye wash unit and safety shower station should be available nearby work place.

Hand protection :

- Wear chemical resistant gloves.

- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection :

- Wear appropriate protective chemical resistant clothing.
- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. Physical and chemical properties

A. Appearance

Description : Powder

Color : Green

B. Odor : Not available

C. Odor threshold : Not available

D. pH : 6 – 10

E. Melting point/freezing point : Not available

F. Initial boiling point and boiling range : Not available

G. Flash point : Not available

H. Evaporation rate : Not available

I. Flammability (solid, gas) : Not available

J. Upper/lower flammability or explosive limits : Not available

K. Vapor pressure : Not available

L. Solubility (ies) : Not available

M. Vapor density : Not available

N. Specific gravity : Not available

O. Partition coefficient: n-octanol/water : Not available

P. Auto ignition temperature : Not available

Q. Decomposition temperature : Not available

R. Viscosity : Not available

S. Molecular weight : Not available

10. Stability and reactivity

A. Chemical stability and Possibility of hazardous reactions

- Inhalation of material may be harmful.

B. Conditions to avoid

- Ignition sources (heat, sparks or flames)

C. Incompatible materials

- Combustibles

D. Hazardous decomposition products

- Not available

11. Toxicological information

A. Information on the likely routes of exposure

Not available

B. Information of Health Hazardous

Acute toxicity

Oral : Not available

- Titanium Dioxide : Rat LD₅₀ > 5000 mg/kg (OECD Guideline 425, EPA OPPTS 870.1100)
- Tin Oxide : Rat LD₅₀ > 9000 mg/kg
- Silica : Rat LD₅₀ > 5000 mg/kg (OECD TG 401, GLP)
- Iron Oxide Red : Rat LD₅₀ > 5000 mg/kg (EU Method B.1)
- Iron Oxide Black : Rat LD₅₀ > 5000 mg/kg

Dermal : Not available

- Silica : Rabbit LD₅₀ > 5000 mg/kg

Inhalation : Not available

- Titanium Dioxide : Rat LC₅₀ > 6.82 mg/L / 4 hr
- Tin Oxide : Rat LC₅₀ > 5 mg/L / 4 hr (OECD TG 403, GLP)
- Silica : Rat LC₅₀ > 2.08 mg/kg / 4 hr (OECD TG 403, GLP)
- Iron Oxide Red : Rat = 8.5 mg/kg bw/day

Skin corrosion/ irritation : Not classified

- Titanium Dioxide : In test on skin irritation with rabbits, skin irritations were not observed. (OECD Guideline 404)
- Tin Oxide : Skin irritation test using rabbit, not skin irritation. (OECD TG 404)
- Silica : In skin irritation test with rabbits, there were no symptoms of skin irritation(OECD TG 404, GLP).
- Iron Oxide Red : As a result of skin irritation test using rabbit, skin irritation was not observed. (OECD TG 404, GLP)
- Iron Oxide Black : In skin irritation test with rabbits, skin irritations were not observed.(OECD TG 404, GLP)

Serious eye damage/ irritation : Not classified

- Titanium Dioxide : In test on eye irritation with rabbits, eye irritations were not observed. (OECD Guideline 405, EU Method B.5, EPA OPPTS 870.2400)
- Tin Oxide : The test substance was not irritating to the rabbit eyes. (OECD TG 405)
- Silica : In eye irritation test with rabbits, there were no symptoms of eye irritation.(OECD TG 405, GLP)
- Iron Oxide Red : As a result of eye irritation test using rabbit, eye irritation was not observed. (OECD TG 405, GLP)
- Iron Oxide Black : In eye irritation test with rabbits, eye irritations were not observed.(cornea=5, iris=0, conjunctivae=2.4)(OECD TG 405, GLP)

Respiratory sensitization : Not classified

- Titanium Dioxide : Titanium oxide does not show respiratory sensitizing properties in animal studies or in exposure related observations in humans.

Skin sensitization : Not classified

- Titanium Dioxide : In test on skin sensitization with guinea pig, skin sensitizations were not observed. (OECD Guideline 406, EU Method B.6, EPA OPP 81-6, GLP)

- Tin Oxide : No activation of the lymph nodes of mice were observed in the LLNA performed with the test material. (OECD TG 429)
- Silica : There is no evidence of skin sensitisation in workers over decades.
- Iron Oxide Red : As a result of skin sensitization test using guinea pig, it does not cause skin sensitization.
- Iron Oxide Black : In skin sensitisation test with guinea pigs, skin sensitizations were not observed.

Carcinogenicity : Not classified

Mutagenicity : Not classified

- Titanium Dioxide : Negative reactions were observed in in vitro (mammalian cell gene mutation test(OECD Guideline 476, GLP), mammalian chromosome aberration test(OECD Guideline 473, GLP), bacterial reverse mutation assay(OECD Guideline 471)) and in in vivo (micronucleus assay).
- Tin Oxide : Negative reactions were observed in these in vitro genotoxicity studies(bacterial reverse mutation assay(e.g. Ames test)(gene mutation)(OECD Guideline 471), mammalian cell gene mutation assay(OECD Guideline 476), mammalian cell micronucleus test(OECD Guideline 487)).
- Silica : Negative reactions were observed in both in vitro ((Bacterial reverse mutation assay(OECD TG 471, GLP), Mammalian Chromosome Aberration Test(OECD TG 473, GLP), Mammalian Cell Gene Mutation Test(OECD TG 476, GLP)) and in vivo (mammalian cell gene mutation assay).
- Iron Oxide Red : Negative reactions were observed in both in vitro (mammalian chromosome aberration test (OECD TG 473, GLP, read across), Ames test (read across), mammalian cell gene mutation assay (OECD TG 476, GLP, read across) and in vivo comet assay.
- Iron Oxide Black : Negative reactions were observed with and without metabolic activation in vitro(mammalian chromosome aberration test(OECD TG 473, GLP), mammalian cell gene mutation assay(OECD TG 476, GLP)).

Reproductive toxicity : Not classified

- Titanium Dioxide : Based on the weight of evidence from the available long-term toxicity/carcinogenicity studies in rodents and the relevant information on the toxicokinetic behaviour in rats it is concluded that TiO₂ does not present a reproductive toxicity hazard.
- Silica : No effects were observed in developmental toxicity and teratogenicity test with mouse(OECD TG 414).

Specific target organ toxicity (single exposure) : Not classified

- Iron Oxide Black : In acute oral toxicity test with rats, acute toxic effects were not observed.

Specific target organ toxicity (repeat exposure) : Not classified

- Titanium Dioxide : Titanium dioxide did not show any adverse effects whatsoever in a chronic oral repeated dose toxicity study in rats, with a NOAEL of 3500 mg/kg bw/day.
Titanium dioxide is not absorbed to any relevant extent through human skin, thus no toxic effects can be expected via the dermal route of exposure.
Titanium dioxide showed fibrogenic effects in a chronic inhalation repeated dose toxicity study in rats with a NOAEC of 10 mg/m³.

- Tin Oxide : No toxicity related symptoms were observed in rats as a result of oral toxicity test for 13 weeks (NOAEL \geq 10,000 mg/kg)
- Iron Oxide Red : No adverse effects were observed in sub-chronic inhalation toxicity studies for 90 days with rats. (NOAEC = 4.7 mg/m³) (OECD TG 413)
- Iron Oxide Black : In repeated inhalation toxicity study with rats for 13 weeks, repeated toxicity related effects were not observed. (NOAEL = 4.7 mg/m³air) (OECD TG 413, GLP)

Aspiration Hazard : Not classified

12. Ecological information

A. Ecological toxicity

- **Acute toxicity** : Not classified

Fish : Not available

- Titanium Dioxide : 96hr-NOEC(*Oncorhynchus mykiss*) > 100 mg/L (OECD Guideline 203)
- Silica : 96hr-LC0(*Brachydanio rerio*) = 10000 mg/L (OECD TG 203, GLP)
- Iron Oxide Red : 96hr-LC0(*Brachydanio rerio*) \geq 50000 mg/L
- Iron Oxide Black : 96hr-LC0(*Brachydanio rerio*) \geq 10000 mg/L (OECD TG 203, GLP)

crustacean : Not available

- Silica : 24hr-EC₅₀(*Daphnia magna*) > 1000 mg/L (OECD TG 202, GLP)
- Iron Oxide Red : 48hr-EC₅₀(*Daphnia magna*) > 100 mg/L (OECD TG 202, GLP)
- Iron Oxide Black : 48hr-EC0(*Daphnia magna*) \geq 10000 mg/L (GLP)

Algae : E(r)C₅₀ = 62.54 mg/L

- Titanium Dioxide : 72hr-EC₅₀(*Pseudokirchnerella subcapitata*) = 61 mg/L , 72hr-NOEC(*Pseudokirchnerella subcapitata*) = 12.7 mg/L
- Silica : 72hr-EC₅₀(*Scenedesmus subspicatus*) > 10000 mg/L (OECD TG 201, GLP), 72h-NOELR(*Scenedesmus subspicatus*)= 10000 mg/L (OECD TG 201, GLP)

- **Chronic toxicity** : Not classified

Fish : Not available

crustacean : Not available

Algae : Not available

B. Persistence and degradability

Persistence : Not available

- Titanium Dioxide : Low persistency (log Kow is less than 4 estimated.) (= 2.23) (estimated)
- Tin Oxide : Low persistency (log Kow is less than 4 estimated.) (= 1.29) (estimated)
- Iron Oxide Red : Low persistency (log Kow is less than 4 estimated.) (= 0.97) (estimated)

Degradability : Not available

C. Bioaccumulative potential

Bioaccumulation : Not available

- Titanium Dioxide : Bioaccumulation is expected to be low according to the BCF < 500 (= 13.73) (estimated)
- Tin Oxide : Bioaccumulation is expected to be low according to the BCF < 500 (= 100) (estimated)
- Silica : Not bioaccumulating due to inherent substance properties.
- Iron Oxide Red : Bioaccumulation is expected to be low according to the BCF < 500 (= 3.162) (estimated)

Biodegradation : Not available

- Titanium Dioxide : not readily biodegradable (estimated)
- Tin Oxide : not readily biodegradable (estimated)
- Silica : Not applicable for inorganic substance.
- Iron Oxide Red : not readily biodegradable (estimated)
- Iron Oxide Black : As not well-biodegraded, it is expected to have high accumulation potential in living organisms(10% biodegradation was observed after 45)

D. Mobility in soil : Not available

- Titanium Dioxide : No potency of mobility to soil. (Koc = 86.1) (estimated)
- Tin Oxide : No potency of mobility to soil. (Koc = 13.16) (estimated)
- Iron Oxide Red : No potency of mobility to soil. (Koc = 6.942) (estimated)

E. Other hazardous effect : Not available

F. Hazardous to the ozone layer : Not classified

13. Disposal considerations

A. Disposal method :

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

B. Disposal precaution :

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

14. Transport information

A. UN Number : Not applicable

B. UN Proper shipping name : Not applicable

C. Transport Hazard class : Not applicable

D. Packing group : Not applicable

E. Environmental hazards : Not applicable

F. IMDG/IATA/ICAO : Not applicable

G. Special precautions

in case of fire : Not applicable

in case of leakage : Not applicable

15. Regulatory information

① KOREA Regulatory information

A. Occupational Safety and Health Act : Not regulated

Titanium Dioxide :

Iron Oxide Red :

Iron Oxide Black :

B. Chemicals Control Act : Not regulated

Titanium Dioxide : KE-33900

Tin Oxide : (KE-33849)

Silica : (KE-31032)

Iron Oxide Red : (KE-10897)

Iron Oxide Black : (KE-34314)

C. Safety Control of Dangerous Substances Act : Not regulated

Titanium Dioxide : Non-dangerous goods

Tin Oxide : Non-dangerous goods

Silica : Non-dangerous goods

Iron Oxide Red : Non-dangerous goods

D. Wastes Control Act : Not regulated

E. Other regulation

Internal information

Persistent Organic Pollutants Acts : Not regulated

② Foreign Regulatory Information

External information

EU classification(classification) : Not regulated

EU classification(risk phrases) :

Titanium Dioxide : Not applicable

Tin Oxide : Not applicable

Silica : Not applicable

Iron Oxide Red : Not applicable

Iron Oxide Black : Not applicable

EU SVHC list : Not regulated

EU Authorisation List : Not regulated

EU Restriction list : Not regulated

EU BPR : Not regulated

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

Substance of Rotterdam Convention : Not regulated Not regulated

Substance of Stockholm Convention : Not regulated Not regulated

Substance of Montreal Protocol : Not regulated Not regulated

16. Other information

A. Information source and references :

– American Conference of Governmental Industrial Hygienists TLVs and BEIs.

- EPISUITE v4.11; <http://www.epa.gov/opt/exposure/pubs/episuitedl.html>
- EU CLP; <https://echa.europa.eu/information-on-chemicals/cl-inventory-database>
- Emergency Response Guidebook 2008;
http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/erg2008_eng.pdf
- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans;
<http://monographs.iarc.fr>
- International Uniform Chemical Information Database(IUCLID)
- Korea Maritime Dangerous Goods Inspection Center;
<http://www.komdi.or.kr/index.html>
- Korea Occupational Health & Safety Agency; <http://www.kosha.net>
- Ministry of Public Safety and Security-Korea dangerous material inventory management system; <http://hazmat.mpss.kfi.or.kr/index.do>
- NIOSH Pocket Guide; <http://www.cdc.gov/niosh/npg/npgdcas.html>
- National Chemicals Information System; <http://ncis.nier.go.kr/ncis/>
- National Emergency Management Agency-Korea dangerous material inventory management system; <http://www.nema.go.kr/hazmat/main/main.jsp>
- National Institute of Technology and Evaluation(NITE);
<http://www.safe.nite.go.jp/english/db.html>
- National Toxicology Program; http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm
- National Toxicology Program; <http://ntp.niehs.nih.gov/results/dbsearch/>
- OECD SIDS; <http://webnet.oecd.org/hpv/ui/Search.aspx>
- REACH information on registered substances;
<http://apps.echa.europa.eu/registered/registered-sub.aspx>
- REACH information on registered substances; <https://echa.europa.eu/information-on-chemicals/registered-substances>
- TOMES-LOLI@ <http://www.rightanswerknowledge.com/loginRA.asp>
- TOMES-LOLI@ <http://www.rightanswerknowledge.com/loginRA.asp>
- The Chemical Database -The Department of Chemistry at the University of Akron
- U.S. National library of Medicine(NLM) Hazardous Substances Data Bank(HSDB);
<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
- Waste Control Act enforcement regulation attached [1]

B. Issuing date : 17-08-2021

C. Revision number and date

revision number 1

date of the latest revision 01-04-2024

D. Others :

- Revised Safety Data Sheet based on the amendments made on the Ministry of Employment and Labor Public Notice on Standard for Classification Labeling of Chemical Substance and Material Safety Data Sheet.
- This SDS is authored in pursuant to the Article 41 of the Occupational Safety and Health Act.
- The content is based on the latest information and knowledge that we currently possess.
- This SDS was authored to aid buyer, processor or any other third person who handles the chemical of subject in the SDS; additionally, it does not warrant suitability of the chemical for special purposes or the commercial use of statements that approves the use of it in combination with other chemicals as well as technical or legal liabilities.

- The content of the SDS may vary depending on the country or the region and may not coincide with the actual regulations. Therefore, the buyer or the processor of the chemical is responsible for observing responsible government's or the region's regulations.