Safety Data Sheet(SDS)

Last revised date : 23-11-2023

1. Identification

1) Product identifier : RADIANZ

2) Recommended use of the chemical and restrictions on use

○ Recommended use of the chemical

Construction materials

○ Restrictions on use

Use for recommended use only
Do not use it for weapons manufacturing and related purposes
Do not use with strong acid or base chemicals

3) Details of the supplier of the safety data sheet

○ Seller

Company name : Lotte Chemical Corporation
Address : 05551 Lotte World Tower, 300, Olympic-ro, Songpa-gu, Seoul, 05551 Rep. of KOREA
Telephone number :

Advanced Materials	+82-31-596-3856	Advanced Materials	+82-31-596-3114

Emergency phone number

Yeosu Plant (Advanced Materials)	+82-61-689-1100	null	null
null	null	null	null

Fax number : +82-31-596-3179

2. Hazards identification

1) Hazard classification

- Carcinogenicity Category 1A
- Specific target organ toxicity single exposure Category 3(Respiratory tract irritation)

2) Allocation label elements

Hazard pictograms

Signal word

- DANGER

Hazard statements

H335 May cause respiratory irritation
H350 May cause cancer

Precautionary statements

- Prevention

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a wellventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection /hearing protection/…

- Response

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313 If exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER/ doctor/…/if you feel unwell.

- Storage

P403+P233 Store in a wellventilated place. Keep container tightly closed.
P405 Store locked up.

- Disposal

P501 Dispose of contents/container to …

3) Other hazards: Not applicable

According to experience and information provided, this product does not affect harmful effects when using and handling it as a regulation.

3. Composition/Information on ingredients

Chemical name	Common name	CAS No.	Content(wt%)
Quartz (SiO2)	quartz (SiO2)	14808-60-7	>=83 ~ <=92
Polyester Resin	Polyester Resin(Mixture)	Not available	>=7 ~ <=15
Titanium dioxide	titanium dioxide	13463-67-7	>=0.1 ~ <=1.5

4. First-aid measures

1) Following eye contact
   - In case of contact with substance, immediately flush skin or eyes with running water for at least 20
   - Seek immediate medical assistance.
2) Following skin contact
   - Get medical attention if irritation develops and persists.
   - In case of contact with substance, immediately flush skin or eyes with running water for at least 20
3) Following inhalation
   - Administer oxygen if breathing is difficult.
   - If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
   - If symptoms persist, call a physician.
   - Move to fresh air.
4) Following ingestion
   - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
   - Seek immediate medical assistance.
5) Delayed and immediate effects and also chronic effects from short and long term exposure
   - May cause cancer
   - May cause respiratory irritation
6) Advice to physician
   - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
   - In the case of accident or if you feel unwell, seek medical advice immediately.

5. Fire-Fighting measures

1) Suitable (and unsuitable) extinguishing media
   - ○ Suitable extinguishing media
     - Dry chemical.
   - ○ Unsuitable extinguishing media
     - Direct water.
2) Special hazards arising from the substance or mixture
   - ○ Pyrolytic product
     - Can decompose at high temperatures forming toxic gases.
     - Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
   - ○ Risk of fire and explosion
     - Fire may produce irritating and/or toxic gases.
     - May ignited from heat, friction or contamination.
     - Some may burn but none ignite readily.

○ Other

- May cause toxic effects if inhaled.

3) Special protective equipment for firefighters

- Rescuers should put on appropriate protective gear.

6. Accident release measures

1) Personal precautions, protective equipment and emergency procedures

- Avoid dust formation.

2) Environmental precautions

- Try to prevent the material from entering drains or water courses.

3) Methods and materials for containment and cleaning up

- Pick up and arrange disposal without creating dust.

7. Handling and storage

1) Precautions for safe handling

- Caution: Dangerous fire hazard when exposed to heat, or flame, sparks.
- Use only in a well-ventilated area.

2) Conditions for safe storage (including any incompatibilities)

- Store in a cool/low-temperature, well-ventilated {dry} place {away from heat and ignition sources}

8. Exposure controls & personal protection

1) Chemical exposure limits, Biological exposure standard

Components	ACGIH regulations	Biological limit values
Quartz (SiO2)	0.025 mg/m3 TWA (respirable particulate matter)	No data available

2) Appropriate engineering controls

- Ensure adequate ventilation and exhaust ventilation at the workplace.
- If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

3) Personal protective equipment

○ Respiratory protection

- If high frequency of use or exposure, wear air respirator.

○ Eye protection

- If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate
- Wear Non-moisture permeable goggle for dust protection.

○ Hand protection

- Wear chemical safety gloves.

○ Skin protection

- Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

9. Physical and chemical information

Property name	Values	Source
Appearance		
Physical state	solid	
Color	Various	
Odor	none	
Odor threshold	none	
pH	none	
Melting point/freezing point	none	
Initial boiling point and boiling range(℃)	none	
Flash point(℃)	490	
Evaporation rate	none	
Flammability(solid, gas)	none	
Upper/lower flammability or explosive limits	none	
Vapour pressure	none	
Solubility(ies)	none	
Vapour density	none	
Relative density	none	
n-octanol/water partition coefficient	none	
Auto ignition temperature	none	
Decomposition temperature	none	
Viscosity(㎟/s, 40℃)	none	
Molecular weight(mass)	none	
Density	none	
SAPT	none	
Specific gravity	2.3 - 2.5	

10. Stability and reactivity

1) Chemical stability and Possibility of hazardous reactions

- Fire may produce irritating, corrosive and/or toxic gases.
- Some may burn but none ignite readily.
- Stable under normal temperatures and pressures.

2) Conditions to avoid

- Ignition source(heat, spark, flame, etc.).

3) Incompatible materials

- Combustibles, reducing material.

4) Hazardous decomposition products

- This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regula

11. Toxicological information

1) Information on the likely routes of exposure

- No data available

2) Health hazard information

○ Acute toxicity

● Acute toxicity(Oral) PRODUCT : Not classified

- No data available

● Acute toxicity(Dermal) PRODUCT : Not classified

- No data available

● Acute toxicity(Inhalation:Gases) PRODUCT : Not classified

- No data available

● Acute toxicity(Inhalation:Vapours) PRODUCT : Not classified

- No data available

● Acute toxicity(Inhalation:Dust/mist) PRODUCT : Not classified

- No data available

○ Skin corrosion/irritation PRODUCT : Not classified

- No data available

○ Serious eye damage/eye irritation PRODUCT : Not classified

- No data available

○ Respiratory sensitization PRODUCT : Not classified

- No data available

○ Skin sensitization PRODUCT : Not classified

- No data available

○ Carcinogenicity PRODUCT : Category 1A

- Quartz (SiO2)
  : 1 (IARC) K (NTP) Applicable (OSHA) A2 (ACGHI) 1A (Ministry of Employment and Labor Notice)

○ Germ cell mutagenicity PRODUCT : Not classified

- Quartz (SiO2)
  : Negative chromosomal abnormality test using in vivo mammalian bone marrow cells

○ Reproductive toxicity PRODUCT : Not classified

- No data available

○ Specific target organ toxicity single exposure PRODUCT : Category 3(Respiratory tract irritation)

- Quartz (SIO2)
  : As a result of acute inhalation toxicity test using humans, effects on the respiratory system were shown

○ Specific target organ toxicity repeated exposure PRODUCT : Not classified

- Quartz (SiO2)
  : As a result of repeated toxicity tests in humans, effects on the respiratory system and kidneys were shown. Not applicable to classification in this section due to carcinogenic effects

○ Aspiration hazard PRODUCT : Not classified

- No data available

12. Ecological information

1) Ecotoxicity

● Fish

- Titanium dioxide
  : LC50 >100 mg/ℓ 96 hr Carassius auratus (OECD Guideline 203)

● Crustaceans

- Titanium dioxide
  : LC50 >500 mg/ℓ 48 hr Daphnia magna

● Aquatic algae

- Titanium dioxide
  : EC50 >50 mg/ℓ 72 hr Selenastrum capricornutum

2) Persistence and degradability

No data available

3) Bioaccumulative potential

No data available

4) Mobility in soil

No data available

5) Other adverse effects

No data available

13. Disposal considerations

1) Disposal methods
   - Empty containers should be taken to an approved waste handling site for recycling or disposal.
2) Precautions (including disposal of contaminated container of package)
   - Dispose of in accordance with local regulations.
   - Send to a licensed waste management company.

14. Transport information

1) UN No. : Not applicable

2) Proper shipping name : Not applicable

3) Hazard class : Not applicable

4) Packing group : Not applicable

5) Marine pollutant : Not applicable

6) Special precautions for user related to transport or transportation measures :

Emergency measures in case of fire : Not applicable

Emergency measures in the effluent : Not applicable

- ADR

  · Tunnel restriction code : Not applicable

- IMDG

  · Marine pollutant : Not applicable

- Air transport(IATA)

  · UN No. : Not applicable

  · Proper shipping name : Not applicable

  · Class or division : Not applicable

  · Packing group : Not applicable

- Maritime transport in bulk according to IMO instruments :

Not applicable

15. Regulatory information

Australia Industrial Chemicals Act

- Not applicable

China Inventory of Existing Chemical Substances (IECSC)

● Inventory - China - Inventory of Existing Chemical Substances (IECSC)

- Quartz (SiO2) : Present [27176]

- Titanium dioxide : Present [11377]

92/32/EEC

- Not applicable

European Union Official Journal of the European Communities 15 June 1990 - Annex Based on Article 13 of Directive 67/548/EEC Amended by Directive 79/831/EEC

● Inventory-European Union-European Inventory of Existing Commercial Chemical Substances (EINECS)

- Quartz (SiO2) : 238-878-4

- Titanium dioxide : 236-675-5

Japan Law Concerning the Examination and Regulations of Manufacture, etc. of Chemical Substances

● Inventory - Japan - Existing and New Chemical Substances (ENCS)

- Quartz (SiO2) : (1)-548

- Titanium dioxide : (1)-558, (5)-5225

New Zealand Environmental Protection Authority, Inventory of Chemicals

● Inventory - New Zealand - Inventory of Chemicals (NZIoC)

- Quartz (SiO2) : HSNO Approval: HSR003125

- Titanium dioxide : May be used as a single component chemical under an appropriate group standard

Turkey Regulation on Inventory and Control of Chemicals

- Not applicable

Taiwan Chemical Substance Inventory

● Inventory - Taiwan - Taiwan Chemical Substance Inventory (TCSI)

- Quartz (SiO2) : Present

- Titanium dioxide : Present

U.S. Toxic Substances Control Act

● Inventory - United States - Section 8(b) Inventory (TSCA)

- Quartz (SiO2) : Present (ACTIVE)

- Titanium dioxide : Present (ACTIVE)

Vietnam National Chemicals Inventory (NCI)

● Inventory - Vietnam - National Chemicals Inventory (NCI) (DRAFT)

- Quartz (SiO2) : Present 13976

- Titanium dioxide : Present 13460

16. Other information

1) Reference

NCIS, KOSHA, Montreal Protocol, ECHA, OECD SIDS, EU IUCLID, HSDB(PubChem), NITE, NTP, ACGIH, IARC, NIOSH, ChemIDplus, EPA, EPI Suite, INCHEM

2) Issue date : 02-03-2009

3) Revision date

○ Revised date count : 2-8

○ Last revised date : 23-11-2023

4) Other

ACGIH : American Conference of Governmental Industrial Hygienists
ADR : Agreement Concerning the International Carriage of Dangerous Goods by Road
ATE : The Acute Toxicity Estimate
ECHA : European Chemicals Agency
EPA : United States Environmental Protection Agency
EPI Suite : The Estimation Programs Interface for Windows
EU IUCLID : International Uniform Chemical Information Database
HSDB : Hazardous Substances Data Bank
IARC : International Agency for Research on Cancer
IATA : International Air Transport Association
IMDG : International Maritime Dangerous Goods Codes
INCHEM : Internationally Peer Reviewed Chemical Safety Information
M-Factor : The Multiplication Factor
NIOSH : National Institute of Occupational Safety and Health
NITE : National Institute of Technology and Evaluation(JAPAN)
NTP : National Toxicology Program
SCL : Specific Concentration Limit
OECD SIDS : Organization for Economic Co-operation and Development Screening Information Dataset