

Safety Data Sheet(SDS)

Last revised date : 26-12-2022

1. Identification

1) Product identifier : PC/GF FR NH-3303

2) Recommended use of the chemical and restrictions on use

○ Recommended use of the chemical

Others(Synthetic Resin Plastics)

○ Restrictions on use

Use for recommended use only

Do not use it for weapons manufacturing and related purposes.

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 :

Basic Chemicals	+82-2-829-4114	Advanced Materials	+82-31-596-3114
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Emergency phone number

Yeosu Plant	+82-61-688-2100	Ulsan Plant	+82-52-278-3500
Daesan Plant	+82-41-689-5900	Yeosu Plant(Advanced Materials)	+82-61-689-1100

Fax number : +82-2-834-6070

2. Hazards identification

1) Hazard classification

- Not applicable

2) Allocation label elements

Hazard pictograms

- Not applicable

Signal word

- NONE

Hazard statements

- Not applicable

Precautionary statements

- Not applicable

3) Other hazards:

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%)
2,2-Bis(4-hydroxyphenyl) propane polycarbonate	-	24936-68-3	$\geq 55 \sim \leq 65$
Glass, oxide	-	65997-17-3	$\geq 25 \sim \leq 35$
Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)	-	14807-96-6	$\geq 5.5 \sim \leq 7$
Additive	-		$\geq 0.1 \sim \leq 4$

4. First-aid measures

1) Following eye contact

- Call a physician immediately.

2) Following skin contact

- Get medical attention if irritation develops and persists.
- Remove contaminated clothing and shoes.

3) Following inhalation

- If symptoms persist, call a physician.
- Move to fresh air.

4) Following ingestion

- If accidentally swallowed obtain immediate medical attention.

5) Delayed and immediate effects and also chronic effects from short and long term exposure

No data available

6) Advice to physician

- 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
 - Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
 - Unsuitable extinguishing media
 - Do not use a solid water stream as it may scatter and spread fire.
- 2) Special hazards arising from the substance or mixture
 - Pyrolytic product
 - No data available
 - Risk of fire and explosion
 - Heating or fire can release toxic gas.
 - Other
 - May cause toxic effects if inhaled.
- 3) Special protective equipment for firefighters
 - In the event of fire, wear self-contained breathing apparatus.

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
 - Keep in suitable, closed containers for disposal.
 - Pick up and arrange disposal without creating dust.

7. Handling and storage

- 1) Precautions for safe handling
 - For personal protection see section 8.
 - Smoking, eating and drinking should be prohibited in the application area.
- 2) Conditions for safe storage (including any incompatibilities)
 - Please note that materials and conditions to be avoided.
 - Store in a dry place. Store in a closed container.

8. Exposure controls & personal protection

1) Chemical exposure limits, Biological exposure standard

Components	ACGIH regulations	Biological limit values
Glass, oxide	No data available	No data available
Talc ($Mg_3H_2(SiO_3)_4$)	2 mg/m ³ TWA (particulate matter containing no asbestos and <1% crystalline silica, respirable partic	No data available

2) Appropriate engineering controls

- Ensure adequate ventilation and exhaust ventilation at the workplace.

3) Personal protective equipment

- Respiratory protection
 - If you have a direct contact or exposed to the material, wear the appropriate form of respiratory protection certified.
- Eye protection
 - If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.
- 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	Soild	
Color	Depends on customer needs	
Odor	Odorless	
Odor threshold	No data available	
pH	No data available	
Melting point/freezing point	No data available	
Initial boiling point and boiling range(°C)	No data available	
Flash point(°C)	No data available	
Evaporation rate	No data available	
Flammability(solid, gas)	No data available	
Upper/lower flammability or explosive limits	No data available	
Vapour pressure	No data available	

Solubility(ies)	insolubility (water)	
Vapour density	No data available	
Relative density	No data available	
n-octanol/water partition coefficient	No data available	
Auto ignition temperature	No data available	
Decomposition temperature	400	
Viscosity(mm ² /s, 40°C)	No data available	
Molecular weight(mass)	10,000~80,000	
Specific gravity	1.35 ~ 1.55	

10. Stability and reactivity

1) Chemical stability and Possibility of hazardous reactions

- No decomposition if stored and applied as directed.
- Stable at normal ambient temperature and pressure.

2) Conditions to avoid

- Follow precautionary advice and avoid incompatible materials and conditions

3) Incompatible materials

- Combustible 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

- Glass, oxide

: LD50> 2000 mg / kg experimental species: Rat, (route of administration: gavage, Female / Male, OECD TG 423, GLP)

- Talc (Mg₃H₂(SiO₃)₄)

: LD50> 5000 mg / kg experimental species: Rat, (the route of administration: gavage, male, OECD TG 423,

GLP)

- Acute toxicity(Dermal) PRODUCT : Not classified
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : LD50> 2000 mg / kg experimental species: Rat, (female / male, OECD TG 402, GLP)
- 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
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : LC50> 2.1 mg / l 4 hr Experimental Arts: RAT (similar substance test data)
- Skin corrosion/irritation PRODUCT : Not classified
 - Glass, oxide
 - : Edema Score: 0/0, fully Restored, no irritant, Rabbit, OECD TG 404
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : relative tissue viability (%): 112.9, no irritation, human, EU Method B.46
- Serious eye damage/eye irritation PRODUCT : Not classified
 - Glass, oxide
 - : No irritation, Human
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : Sensitization No, Rat, in vivo, male, Not irritant, Rabbit, corneal opacity (0), Iris (0), conjunctival hyperemia (1.2), conjunctival edema (0.7), OECD TG 405
- Respiratory sensitization PRODUCT : Not classified
 - No data available
- Skin sensitization PRODUCT : Not classified
 - Glass, oxide
 - : No hypersensitivity
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : Sensitization No, Guinea pig, female, OECD TG 406
- Carcinogenicity PRODUCT : Not classified
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : 3 (IARC)
 - A4 (ACGIH)
 - Only in the case of the talc containing asbestos is 1A (Notice of Ministry of Employment and Labor)
- Germ cell mutagenicity PRODUCT : Not classified
 - Glass, oxide
 - : In Vitro - Genetic Toxicity: Chinese Hamster Ovary (CHO))
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)
 - : in vivo - gene mutation tests with mammalian germ cells: negative (rat, male), OECD TG 478 in vitro -

Chromosome aberration test using mammalian cells: negative (rat pleural mesothelial cells (RPMC), without metabolic activation system), OECD TG 473 , EU Method B.10

○ Reproductive toxicity PRODUCT : Not classified

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)

: There was no negative impact on the result of prenatal administration of talc / kg body weight of 900 mg daily to pregnant rabbits on gestation 6-18 days. Dose-related effect on the reproductive function did not appear. Search NOAEL is considered to be 900 mg / kg bw / day in reproductive toxicity studies. Guidelines: There were OECD TG 416, GLP equal or similar NOAEL (developmental toxicity) = 1600 mg / kg bw / day, 1600 mg / kg bw talc administered in corn oil did not affect the reproductive, developmental indicators, maternal, no effect on fetal survival, rat, GLP

○ Specific target organ toxicity single exposure PRODUCT : Not classified

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)

: Oral: No Observed clinical signs / special pathological abnormality is not detected (rat / male / OECD TG 423 / GLP) dermal: Test item is a single dose to one female (n ° 14) on the 3rd and the 4th after applying it showed a slight irritation (mild scratches) signs. The observed clinical signs were found only on the day of application, which may be partly due to. The stress caused by the application process. These signs include the following: 2, 3 and a female 4 hours (n ° 15) and 1, 2, 3, and red emission nose for three males (n ° 21, 23, 24) for 4 hours. After 30 minutes and 1 hour immediately appear diarrhea in one male (n ° 21). Women No. 14 at necropsy showed the organizational change in bowel filled with liquid. Was not observed clinically during the exposure manifestations: The findings showed only one of the animals, because there was no connection with specific clinical symptoms, tests and show that there are no relevant (rat / male / female / OECD TG 402 / GLP) Inhalation . After exposure, eyelid ptosis and congenital expression was observed in the two males and one female only one day (rat / male / female / OECD TG 403 / GLP)

○ Specific target organ toxicity repeated exposure PRODUCT : Not classified

- Glass, oxide

: Inhalation (Ambassietic): The rat was exposed to the inhalation of the E-glass fine fibers (Code 104E) fibers for 7 hours for a maximum of 1, 3 days, 8 days or 14 days of actual exposure. 3 weeks. After sacrificing the lungs, BAL fluid was examined for the total concentration of total cells, granules and the total concentration of proteins. This analysis showed that the total number of cells, granule fraction and total protein concentration gradually increased as the accumulated repetition exposure period increases. The data represents the induction of inflammatory reactions even after 7 hours of exposure. In addition, the analysis of the number of proliferation cells per MM bronchial duct was used to investigate the analysis of the number of proliferation cells per MM bronchial duct using BRDU DNA labeling to significantly increase the number of proliferative cells in the lungs of animals exposed to E-glass fine fibers (p <0.05) Note). controls). This also represents inflammatory response in lung reality. In conclusion, the study data indicates that the inhalation of the E-glass fine fibers can lead to inflammation reactions in the lungs of the ripple after repeated exposure of a single exposure or 3 to 14 days. Rats were exposed to inhalation of E-Glass Microfiber (CODE 104E) fibers for 7 hours a day for actual exposure for up to 1, 3, 8 or 14 days. 3 weeks. After sacrificing the lungs, the BAL fluid investigated the total concentration of total cells, granules fractions and proteins. This analysis

showed that the longer the accumulated repetition period, the longer the total cell, the granules fraction and the total protein concentration gradually increased. This result shows the induction of inflammatory reactions even after 1 day exposure of 7 hours. Further, as a result of analyzing the number of proliferation cells per MM bronchi, using the BRDU DNA label, the number of proliferation cells was significantly increased in the lungs of the animal exposed to the E-Glass fine fibers (statistically significant in $P < 0.05$ appear). This is known to exhibit inflammatory reactions in waste propeller. In conclusion, research data indicates that the suction of E-Glass fine fibers can lead to inflammatory responses in the lungs of mice after a single or 3 to 14 days after repetition exposure. As a result of exposed to 650 ppm concentrations, resulting in the brain and thymus lesions of deaths are found. In the exposed rat (male), which is exposed to 650 ppm for 14 weeks, the cause of death occurred because such degenerative lesions are not observed. However, half of the survivors of the 650 ppm group had neuronal deadlocks or malaria in the body stenomed by the brain. The lesions of the central nervous system have been accompanied by nerve behavior. It has been found that each rat exposed to 2,4-pentane dion representing the abnormality during the modified IRWIN screening test has been shown to have brain damage. Generally, the opposite of this statement was true. Exceptionally, two men are exposed to 650 ppm, showing normal reactions with brain malaria during IRWIN tests. In addition, some females exposed to 650 ppm showed acute degeneration of nuclear and displacement temperatures, but died before performing awareness testing. Since the results of electron microscopy test in sciatic nerve preparation were negative, the neurotoxic effect of 2,4-pentane dion appears to be a central rather than peripheral. Description of the difference in mortality rate of men and women (each 650 ppm exposure group, 30% for men and women) is not known. The difference between gender may be related to brain thiamine, folic acid and / or flute single concentration. The proposed mechanism of 2,4-pentane di-toxicity is because B vitamins or the non-activation of the bonding is not activated. Concentration of repetition exposure to 2,4-pentane dion - Reaction profile is very clear

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$)

: Orally (Chronic): The result of oral exposure using Talc as feed for 101 days with a rat (female / male), NOAEL was 100 mg / kg / day yeoteum. Were common toxicity endpoint, there was no side effects, one of the animals treated with talc it has boyeoteum above leiomyosarcoma. But twenty-six kinds unrelated to the processing of talc found in the uterus of the two animals. Well not a rat chronic pathological effects associated with oral administration, Rat, OECD TG 452 Inhalation (chronic) through rats, day 6, and 12 months respirable dust 10.8 mg talc / m^3 density for 7.5 hours, 5 days a week between the exposure result , the two groups with a treatment period of 6 months and 12 months, indicating a high mortality rate. Was 50% of the animals died during treatment in both groups, exposure to the test substance should result in a marked fibrosis. Being of the animals exposed to 24 in one lung adenoma detection, Rat, OECD TG 452

○ Aspiration hazard PRODUCT : Not classified

- No data available

12. Ecological information

1) Ecotoxicity

- Fish
 - Glass, oxide
 - : LC50 > 1000 mg / ℓ 96 hr, (OECD TG 203, ring Formula test i.e. all test media were changed every 24 hours, fresh water, GLP)
 - Talc (Mg₃H₂(SiO₃)₄)
 - : LC50 89581.016 mg / ℓ 96 hr Fishes Species , (QSAR, exponential type)
- Crustaceans
 - Glass, oxide
 - : NOEC ≥ 1000 mg / ℓ 3 day Daphnia magna, (OECD TG 202, ring formulas, fresh water, GLP)
 - Talc (Mg₃H₂(SiO₃)₄)
 - : LC50 36812.359 mg / ℓ 48 hr daphnids Species , (QSAR model, QSAR model, fresh water)
- Aquatic algae
 - Glass, oxide
 - : NOEC ≥ 1000 mg / ℓ 3 day, (OECD TG 201, ring formulas, GLP)
 - Talc (Mg₃H₂(SiO₃)₄)
 - : EC50 7202.7 mg / ℓ 96 hr Green algae , (QSAR model, QSAR model, fresh water)

2) Persistence and degradability

No data available

3) Bioaccumulative potential

- n-octanol water partition coefficient
 - Talc (Mg₃H₂(SiO₃)₄)
 - : -9.4 log Kow , (log Pow, 25 °C)
- Bioconcentration factor(BCF)
 - Talc (Mg₃H₂(SiO₃)₄)
 - : 3.162 BCF , (ℓ / kg)

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 : No
- 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 : No
- Air transport(IATA)
 - UN No. : Not applicable
 - Proper shipping name : Not applicable
 - Class or division : Not applicable
 - Packing group : 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)
 - 2,2-Bis(4-hydroxyphenyl) propane polycarbonate : Present [21562]
 - Glass, oxide : Present [04789]
 - Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$) : Present [14442]

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)

- Glass, oxide : 266-046-0

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$) : 238-877-9

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

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

- 2,2-Bis(4-hydroxyphenyl) propane polycarbonate : (7)-738

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$) : (1)-468

New Zealand Environmental Protection Authority, Inventory of Chemicals

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

- 2,2-Bis(4-hydroxyphenyl) propane polycarbonate : May be used as a single component chemical under an appropriate group standard

- Glass, oxide : May be used as a single component chemical under an appropriate group standard

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$) : 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)

- 2,2-Bis(4-hydroxyphenyl) propane polycarbonate : Present

- Glass, oxide : Present

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$) : Present

U.S. Toxic Substances Control Act

Vietnam National Chemicals Inventory (NCI)

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

- 2,2-Bis(4-hydroxyphenyl) propane polycarbonate : Present 15829

- Glass, oxide : Present 21278

- Talc ($\text{Mg}_3\text{H}_2(\text{SiO}_3)_4$) : Present 13975

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 : 26-12-2022

3) Revision date

- Revised date count : 2-1

- Last revised date : 26-12-2022

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