

1. Chemical product and company identification ►

1.1. Product identifier

Product form	: Mixture
Product name	: TUBALL MATRIX 201
Generic name	: TUBALL MATRIX 201
Type of product	: Nanoform embedded in a matrix
Product group	: Trade product

1.2. Recommended uses and restrictions

Use Categories

No data available

1.2.1. Recommended use

Industrial use as additive in polymers, resins and/or coatings.

1.2.2. Restrictions on use

No data available

1.3. Manufacturer information

Grace Continental Korea Co., Ltd
22, Samjak-ro, Bucheon-si, Gyeonggi-do, Republic of Korea
T +82-32-328-0121

1.4. Supplier information

Europe:	USA:	Asia:	China:	India:
OCSiAI Europe S.a.r.l. L-3364, Leudelange, 1, rue de la Poudrerie, Grand Duchy of Luxembourg	OCSiAI LLC 500 S Front St., Suite 860, Columbus, OH 43215, USA	OCSiAI Asia Pacific Co., Ltd. Office 208, Pilot Plant Bldg., Incheon Technopark 12 Gaetbeol-ro, Yeonsu-gu, Incheon, 406-840 Republic of Korea	OCSiAI Hong Kong Limited No. 1102, 11/F, Lippo Sun Plaza, 28 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong	VIMAL INTERTRADE PVT LTD. Shivam Centrum, Sahar Road, Koldongri, Above Nexa Showroom, Andheri East, Mumbai – 400 069
T +352 27 99 03 73 09.00-17.00 GMT+2 europe@ocsial.com	T +1 415 906 5271 09.00-17.00 GMT-4 usa@ocsial.com	T +82 32 260 0407 09.00-17.00 GMT+9 asiapacific@ocsial.com	T +852 3575 3946 09:00-17:00; GMT+8 china@ocsial.com	T +91 22 6288 4200 09:00-17:00; GMT+5.5 india@ocsial.com

1.5. Emergency telephone number

EMEA	: +44 1865 407333 (English) (Carechem 24)
East/South East Asia	: +65 3158 1074 (English, Hindi, Japanese, Korean, Malay, Mandarin) (Carechem 24)
China (Mainland)	: **0532 8388 9090(English, Mandarin)

2. Hazards identification

2.1. Classification of the substance or mixture

Acute toxicity (dermal), Category 5	H313
Serious eye damage/eye irritation, Category 2	H319
Skin sensitisation, Category 1	H317
Germ cell mutagenicity, Category 2	H341
Hazardous to the aquatic environment — Chronic Hazard, Category 2	H411

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

2.2. Label elements

2.2.1. Hazard pictograms (GHS KR)



2.2.2. Signal word (GHS KR)

Warning.

2.2.3. Hazard statements (GHS KR)

- H313 - May be harmful in contact with skin.
- H317 - May cause an allergic skin reaction.
- H319 - Causes serious eye irritation.
- H341 - Suspected of causing genetic defects.
- H411 - Toxic to aquatic life with long lasting effects.

2.2.4. Precautionary statements (GHS KR)

Precaution:

- 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.
- P264 - Wash hands thoroughly after handling.
- P272 - Contaminated work clothing should not be allowed out of the workplace.
- P273 - Avoid release to the environment.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Treatment:

- P302+P352 - IF ON SKIN: Wash with plenty of water/.
- P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 - If exposed or concerned: Get medical advice/attention.
- P312 - Call a POISON CENTER/doctor/... if you feel unwell.
- P321 - Specific treatment (see ... on this label).
- P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
- P337+P313 - If eye irritation persists: Get medical advice/attention.
- P362+P364 - Take off contaminated clothing and wash it before reuse.
- P391 - Collect spillage.

Storage:

- P405 - Store locked up.

Disposal:

- P501 - Dispose of contents/container according to waste related regulations.

2.3. Hazards - Other hazards which do not result in classification - Hazard Risk

No data available

3. Composition/information on ingredients

Product form : Mixture

Substance name	Other Names	Product identifier number	Concentration (%)
2,3-epoxypropyl neodecanoate	-	CBI approval number: - Expiration date: - CAS-No.: 26761-45-5 KECI-No.: KE-25762	90
Single wall carbon nanotubes*	-	CAS-No.: 7782-42-5 KECI-No.: KE-18101	10

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

Comments : * Single wall carbon nanotubes TUBALL™.

4. First-aid measures

4.1. First-aid measures after eye contact

Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
Get medical attention.

4.2. First-aid measures after skin contact

Take off immediately all contaminated clothing.
Wash contaminated clothing before reuse.
Wash with plenty of soap and water.

4.3. First-aid measures after inhalation

Remove person to fresh air and keep comfortable for breathing.
Get medical attention.

4.4. First-aid measures after ingestion

Rinse mouth out with water.
Do not induce vomiting.
Get medical attention.

4.5. Other medical advice or treatment

Treat symptomatically.
Call a physician immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).
Unsuitable extinguishing media : None known.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable vapours can accumulate in head space of closed systems. Residue may be flammable and explosive.
Explosion hazard : May form flammable/explosive vapour-air mixture.

5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting : Full face mask. Positive pressure self-contained breathing apparatus (SCBA).

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear suitable protective clothing.
Ensure adequate ventilation.
Evacuate area.
Wear suitable protective clothing, gloves and eye/face protection.
In case of fire: Positive pressure self-contained breathing apparatus (SCBA).
Provide adequate ventilation.
Evacuate area.
Avoid inhalation of vapours.

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

6.2. Environmental precautions and protective procedures

Do not allow to enter into surface water or drains.

Collect contaminated extinguishing water separately and must not enter the sewage system.

6.3. Methods and material for containment and cleaning up

Clean spills promptly.

Ventilate affected area.

Stop leak if safe to do so.

Clear up rapidly by scoop or vacuum.

Collect in closed container and remove to a safe place for disposal by burning.

7. Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin, eyes and clothing.

Carry out operations in the open/under local exhaust/ventilation or with respiratory protection.

Avoid breathing dust, fume.

To prevent thermal burns avoid contact with hot product.

Wash contaminated clothing before reuse.

7.2. Conditions for safe storage

Store in dry, well-ventilated area.

Store at ambient temperature.

Keep container tightly closed.

Protect from sunlight.

Keep away from open flames, hot surfaces and sources of ignition.

Store away from water (including sewage plant).

Keep container tightly closed.

Storage temperature : -40 / +40 °C

8. Exposure controls/personal protection

8.1. Occupational Exposure Limits

TUBALL MATRIX 201

2,3-epoxypropyl neodecanoate

Single wall carbon nanotubes (7782-42-5)

No additional information available

8.2. Appropriate engineering controls

No data available

8.3. Personal protection

Personal protective equipment:

Gloves. Protective clothing. Gas mask.

Hand protection:

Wear suitable gloves. EN 374

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Reusable gloves, Disposable gloves	Nitrile rubber (NBR), Butyl rubber	6 (> 480 minutes)	0.4		

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

Eye protection:

Chemical goggles or safety glasses. EN 166

Skin and body protection:

Protective clothing (with elasticated cuffs and closed neck). EN 14605

Respiratory protection:

Wear respiratory protection. Selection of respiratory protection must be based on the result of the risk assessment

Personal protective equipment symbol(s):



9. Physical and chemical properties

a) Appearance	: Flakes. Pasty.
Physical state	: Solid.
Colour	: Black.
b) Odour	: Slight.
c) Odour threshold	: No data available
d) pH	: No data available
e) Melting / freezing point	: -60 °C (2,3-epoxypropyl neodecanoate) /
f) Initial boiling point and boiling range	: 278 °C (2,3-epoxypropyl neodecanoate)
g) Flash point	: 126 °C (2,3-epoxypropyl neodecanoate)
h) Evaporation rate	: No data available
i) Flammability (solid, gas)	: No data available
j) Upper / lower flammability or explosive limits	: No data available
k) Vapour pressure	: No data available
l) Solubility	: Slightly soluble in water. Soluble in organic solvents.
m) Vapour density	: No data available
n) Relative density	: No data available
o) Partition coefficient n-octanol/water	: No data available
p) Auto-ignition temperature	: 397 (2,3-epoxypropyl neodecanoate)
q) Decomposition temperature	: No data available
r) Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
s) Molecular mass	: No data available
Other information	
Explosive properties	: Product is not explosive.
Oxidising properties	: Non oxidizing

10. Stability and reactivity

10.1. Chemical stability and Possibility of hazardous reactions

Stable under normal conditions.
Stable under normal conditions.
None known.

10.2. Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition.

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

10.3. Incompatible materials

Strong oxidizing agents.

10.4. Hazardous decomposition products

Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.

11. Toxicological information

11.1. Information on exposure routes

Oral : Not classified
Skin and eyes contact : Causes serious eye irritation. May cause an allergic skin reaction.
Inhalation : Not classified

11.2. Health hazards

Acute toxicity (oral):

Not classified

Acute toxicity (dermal):

May be harmful in contact with skin.

Acute toxicity (inhalation):

Not classified

2,3-epoxypropyl neodecanoate

LD50 oral rat	> 9700 mg/kg
LD50 dermal rat	3800 mg/kg

Skin corrosion/irritation:

Not classified

Serious eye damage/irritation:

Causes serious eye irritation.

Respiratory sensitization:

Not classified

Skin sensitization:

May cause an allergic skin reaction.

Carcinogenicity:

Not classified

Mutagenicity:

Suspected of causing genetic defects.

Reproductive toxicity:

Not classified

STOT-single exposure:

Not classified

STOT-repeated exposure:

Not classified

Single wall carbon nanotubes (7782-42-5)

NOAEL (oral, rat, 90 days)	> 1000 mg/kg bodyweight/day - OECD 422
----------------------------	--

Aspiration hazard:

Not classified

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

2,3-epoxypropyl neodecanoate

Viscosity, dynamic	7.13 mPa·s @ 20 °C
--------------------	--------------------

--Single wall carbon nanotubes (7782-42-5)

--Viscosity, kinematic (calculated value) (40 °C)	Not applicable
Density	1.78 g/cm ³ Type: 'density' Temp.: 25 °C
Viscosity, kinematic	Not applicable

12. Ecological information

12.1. Ecotoxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified
Hazardous to the aquatic environment, long-term (chronic) : Toxic to aquatic life with long lasting effects.

2,3-epoxypropyl neodecanoate

LC50 fish - 96h	≈ 5 mg/l Test organisms (species): Oncorhynchus mykiss (previous name: Salmo gairdneri)
EC50 crustacea - 48h	≈ 4.8 mg/l Test organisms (species): Daphnia magna
EC50 algae - 72h	≈ 2.9 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
EC50 72h algae	≈ 1.2 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
Partition coefficient n-octanol/water (Log Pow)	4.4 @ 20 °C

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

12.5. Other adverse effects

Ozone : Not classified
Other adverse effects : No additional information available

13. Disposal considerations

13.1. Disposal method

Dispose of this material and its container at hazardous or special waste collection point.
Disposal through controlled incineration or authorised waste dump.

13.2. Disposal precaution


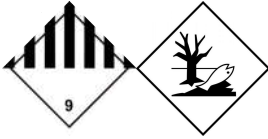
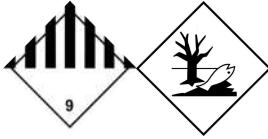
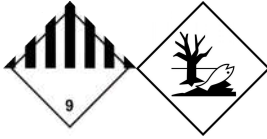
Prevent entry to sewers and public waters.

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

14. Transport information

UN RTDG	ADR	IMDG	IATA
14.1. UN number			
3077	3077	3077	3077
14.2. UN proper shipping name			
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (CONTAINS : 2,3-epoxypropyl neodecanoate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (CONTAINS : 2,3-epoxypropyl neodecanoate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (CONTAINS : 2,3-epoxypropyl neodecanoate)	Environmentally hazardous substance, solid, n.o.s. (CONTAINS : 2,3-epoxypropyl neodecanoate)
14.3. Transport hazard class(es)			
9	9	9	9
			
14.4. Packing group			
III	III	III	III
14.5. Marine pollutant			
Dangerous for the environment : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes
No supplementary information available			

14.6. Special precautions for user

No data available

15. Regulatory information

15.1. Occupational Safety and Health Act

Hazardous Substances Prohibited for Manufacturing	Not applicable
Hazardous Substances Requiring Permission	Not applicable
Threshold Limit Values Chemicals	Not applicable
Hazardous Substances Below Permissible Level	Not applicable
Hazardous Substances Subject to Working Environment Measurement	Not applicable
Hazardous Substances Subject to Workers Requiring Health Examination	Not applicable
Hazardous Substances Subject to Control	Not applicable

15.2. Chemicals Control Act

Toxic Chemicals	Not applicable
Prohibited Chemicals	Not applicable
Restricted Chemicals	Not applicable
Substance requiring preparation for accidents	Not applicable

15.3. ACT ON REGISTRATION, EVALUATION, ETC. OF CHEMICALS (K-REACH)

Korea Existing Chemicals Inventory (KECI)	2,3-epoxypropyl neodecanoate
---	------------------------------

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

KECI-No. : KE-18101. Graphite -> Single wall carbon nanotubes. Listing of country or region list name (yes/no) *	
Korea Inventory of Existing Chemicals (ECL) Yes	
**Yes* indicates that all ingredients in this product comply with the inventory requirements of the country(s) Indicates that there is no exemption.	
Priority Existing Chemical ('PEC') – subject to registration	Not applicable
Priority Control Substances (Korea)	Not applicable
CMR Substances (Korea)	Not applicable

15.4. Safety Control of Dangerous Substances Act

Safety Control of Dangerous Substances Act

15.5. Wastes Control Act

Wastes Control Act

15.6. Other Domestic and International Regulatory Information

Domestic

Persistent Organic Pollutants(POPs) Control Act	Not applicable
Ozone Depleting Substances(ODS)	Not applicable

International

EU Regulatory Information

EU Candidate list (SVHC)	Contains no substance on the REACH candidate list
EU authorization list (REACH Annex XIV)	Contains no REACH Annex XIV substances
EU restriction list (REACH Annex XVII)	Applicable

US Regulatory Information

CERCLA Section 103 (40CFR302.4)	Not applicable
EPCRA Section 302 (40CFR355.30)	Not applicable
EPCRA Section 304 (40CFR355.40)	Not applicable
EPCRA Section 313 (40CFR372.65)	Not applicable

International agreements

No data available

16. Other information

16.1. Data sources:	No data available
16.2. Issue date:	07/11/2016
16.3. Revision number and date:	3.1, 01/06/2021
16.4. Other information:	No data available
16.5. Indication of changes:	See bold triangle '▶'

Disclaimer : This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It is the user's responsibility to take mentioned precaution measures and ensure that this information is complete and sufficient for the use of this product.

Abbreviations and acronyms:	
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
WGK	Water Hazard Class
OEL	Occupational Exposure Limit
EC-No.	European Community number
vPvB	Very Persistent and Very Bioaccumulative
SDS	Safety Data Sheet

TUBALL MATRIX 201

Safety Data Sheet

In Accordance with MOEL Public notice 2020-247

CAS-No.	Chemical Abstract Service number
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
BLV	Biological limit value
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
N.O.S.	Not Otherwise Specified
NOEC	No-Observed Effect Concentration
TLM	Median Tolerance Limit
LD50	Median lethal dose
LC50	Median lethal concentration
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
DMEL	Derived Minimal Effect level
OECD	Organisation for Economic Co-operation and Development
IOELV	Indicative Occupational Exposure Limit Value
STP	Sewage treatment plant
EN	European Standard
PNEC	Predicted No-Effect Concentration
DNEL	Derived-No Effect Level
ATE	Acute Toxicity Estimate
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
IARC	International Agency for Research on Cancer
EC50	Median effective concentration
PBT	Persistent Bioaccumulative Toxic
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
VOC	Volatile Organic Compounds

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

TUBALL MATRIX 201