

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

1.1. Product identifier ►

Product form : Mixture
 Product name : TUBALL BATT H2O PVP
 Type of product : Nanoform embedded in a matrix

1.2. Relevant identified uses of the substance or mixture and uses advised against ►

1.2.1. Relevant identified uses

Use of the substance/mixture : Industrial use as additive in metal and/or ceramic composites

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet ►

Europe:	USA:	Asia:	China:	India:
OCSiAl Europe S.a.r.l. L-3364, Leudelange, 1, rue de la Poudrerie, Grand Duchy of Luxembourg	OCSiAl LLC 500 S Front St., Suite 860, Columbus, OH 43215, USA	OCSiAl Asia Pacific Co., Ltd. Office 208, Pilot Plant Bldg., Incheon Technopark 12 Gaetbeol-ro, Yeonsu-gu, Incheon, 406-840 Republic of Korea	OCSiAl 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

1.4. 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)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

No labelling applicable

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures ►

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Water	(CAS-No.) 7732-18-5 (EC-No.) 231-791-2	98.8 – 99.4	Not classified
PVP (polyvinylpyrrolidone)	(CAS-No.) 9003-39-8	0.4 – 0.8	Not classified

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Single wall carbon nanotubes	(CAS-No.) Not assigned for EU-REACH (EC-No.) 943-098-9 (REACH-No.) 01-2120130006-75-0000	0.2 – 0.4	Eye Irrit. 2, H319
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Full text of H- and EUH-statements: see section 16

*Single wall carbon nanotubes TUBALL™		
Name of (set of) nanoform(s)	Tuball™ - grades 1RW02 / 1RW03 are part of one set of nanoform	
Value	-	
Number based particle size distribution	d10	1.2 - 1.45 nm
	d50	1.6 - 1.8 nm
	d90	1.9 - 2.2 nm
Shape and aspect ratio of particles	Elongated tubes; length to diameter ratio 2000 – 10000:1	
Crystallinity	Amorphous	
Surface functionalisation / treatment	No	
Process	Chemical vapor deposition (CVD)	
Specific surface area	300 – 1500 m ² /g	
Additional information	G/D range : ≥ 40 (RAMAN at 532 nm)	

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Get medical attention.
- First-aid measures after skin contact : Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. Wash with plenty of soap and water.
- 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.
- First-aid measures after ingestion : Rinse mouth out with water. Do not induce vomiting. Get medical attention.

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

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : None known.
- Hazardous decomposition products in case of fire : Carbon dioxide (CO₂). Carbon monoxide.

5.3. Advice for firefighters

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment : Wear suitable protective clothing.
- Emergency procedures : Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Evacuate area.

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6.1.2. For emergency responders

- Protective equipment : Wear suitable protective clothing, gloves and eye/face protection. In case of fire: Positive pressure self-contained breathing apparatus (SCBA).
- Emergency procedures : Provide adequate ventilation. Evacuate area. Avoid contact with skin, eyes and clothing.

6.2. Environmental precautions

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

- For containment : Clean spills promptly. Ventilate affected area. Stop leak if safe to do so.
- Methods for cleaning up : Collect spillage. Soak up with inert absorbent material (for example sand, sawdust, a universal binder, silica gel). Collect in closed container and remove to a safe place for disposal by burning.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Avoid contact with skin, eyes and clothing.
- Hygiene measures : Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities ►

- Storage conditions : Store in dry, well-ventilated area. Store at ambient temperature. Keep container tightly closed.
- Incompatible products : Acids. Bases. Oxidizing agent.
- Storage temperature : > 5 °C

7.3. Specific end use(s)

After 6 months storage, pre-mixing is recommended using a high-speed mixer at 0.1-0.2 kWh per 1 kg of dispersion.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Single wall carbon nanotubes	
DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	Low hazard (no threshold identified)
Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	Low hazard (no threshold identified)
Long-term - systemic effects, dermal	No hazard identified
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	Low hazard (no threshold identified)
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	Low hazard (no threshold identified)
Acute - systemic effects, oral	No hazard identified
Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	No hazard identified
Long-term - systemic effects, dermal	No hazard identified
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	No hazard identified
PNEC (Water)	
PNEC aqua (freshwater)	No hazard identified
PNEC aqua (marine water)	No hazard identified

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PNEC (Sediment)	
PNEC sediment (freshwater)	No hazard identified
PNEC sediment (marine water)	No hazard identified
PNEC (Soil)	
PNEC soil	No hazard identified
PNEC (Oral)	
PNEC oral (secondary poisoning)	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
PNEC (STP)	
PNEC sewage treatment plant	No data available: testing technically not feasible

8.2. Exposure controls

Personal protective equipment:

Protective goggles. Gloves. Protective clothing.

Hand protection:

Wear suitable gloves. EN 374

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Reusable gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	0.4		EN 374
Reusable gloves	Chloroprene rubber (CR)	6 (> 480 minutes)	0.5		EN 374
Reusable gloves	Butyl rubber	6 (> 480 minutes)	0.7		EN 374

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:

No respiratory protection needed under normal use conditions

Personal protective equipment symbol(s):



SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties ►

Physical state	: Liquid
Colour	: Black.
Odour	: Odourless.
Odour threshold	: No data available
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: 0 °C (Water)
Freezing point	: No data available
Boiling point	: 100 °C (Water)
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Density	: 1.001 g/cm ³
Solubility	: No data available
Partition coefficient n-octanol/water (Log Pow)	: No data available
Viscosity, kinematic	: No data available

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Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

Single wall carbon nanotubes

Particle size	See section 3.2
Particle size distribution	See section 3.2
Particle shape	See section 3.2
Particle aspect ratio	See section 3.2
Particle aggregation state	Bundles of nanotubes
Particle agglomeration state	Single wall carbon nanotubes are embedded in a matrix
Particle specific surface area	See section 3.2
Particle dustiness	1660 mg/kg (DIRM - Single wall carbon nanotubes)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon dioxide. Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

PVP (polyvinylpyrrolidone)

LD50 oral rat	> 2000 mg/kg
LC50 Inhalation - Rat (Dust/Mist)	> 5.2 mg/l/4h

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified

PVP (polyvinylpyrrolidone)

IARC group	3 - Not classifiable
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Reproductive toxicity	: Not classified
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Single wall carbon nanotubes

NOAEL (animal/female, F0/P)	> 1000 mg/kg bw/day - OECD 422
NOAEL (animal, F1)	> 1000 mg/kg bw/day - for adverse effects on prenatal development (conceptus to birth) - OECD 422
NOAEL (animal, F1)	> 1000 mg/kg bw/day - for adverse effects on postnatal development (pup) - OECD 422

STOT-single exposure	: Not classified
STOT-repeated exposure	: Not available

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Single wall carbon nanotubes

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

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Not classified

PVP (polyvinylpyrrolidone)

LC50 fish - 96h > 10000 mg/l

12.2. Persistence and degradability

PVP (polyvinylpyrrolidone)

Persistence and degradability Not readily biodegradable.

Biodegradation < 10 % - 15 days - OECD 302B

12.3. Bioaccumulative potential

PVP (polyvinylpyrrolidone)

Bioaccumulative potential Not bioaccumulable.

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

Component

Single wall carbon nanotubes	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
PVP (polyvinylpyrrolidone)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations ►

13.1. Waste treatment methods

Regional legislation (waste)	: Dispose of this material and its container at hazardous or special waste collection point.
Waste treatment methods	: Disposal through controlled incineration or authorised waste dump.
Sewage disposal recommendations	: Prevent entry to sewers and public waters.
Product/Packaging disposal recommendations	: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
Additional information	: Clean up even minor leaks or spills if possible without unnecessary risk.
European List of Waste (LoW) code	: 06 13 99 - wastes not otherwise specified

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
Not applicable	Not regulated	Not regulated	Not regulated	Not regulated
14.2. UN proper shipping name				
Not applicable	Not regulated	Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)				
Not applicable	Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group				
Not applicable	Not regulated	Not regulated	Not regulated	Not regulated

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14.5. Environmental hazards

Not applicable	Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available				

14.6. Special precautions for user

Overland transport

Not applicable

Transport by sea

Not regulated

Air transport

Not regulated

Inland waterway transport

Not regulated

Rail transport

Not regulated

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

Contains no REACH substances with Annex XVII restrictions

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

15.1.2. National regulations

Germany

Employment restrictions : Observe restrictions according Act on the Protection of Working Mothers (MuSchG)
Observe restrictions according Act on the Protection of Young People in Employment (JArbSchG)

Water hazard class (WGK) : WGK nwg, Non-hazardous to water (Classification according to AwSV, Annex 1)

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

SZW-lijst van kankerverwekkende stoffen : None of the components are listed

SZW-lijst van mutagene stoffen : None of the components are listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : None of the components are listed

SZW-lijst van reprotoxische stoffen – Vruchtbaarheid : None of the components are listed

SZW-lijst van reprotoxische stoffen – Ontwikkeling : None of the components are listed

SZW-lijst van reprotoxische stoffen – Ontwikkeling : None of the components are listed

Switzerland

Storage class (LK) : LK 10/12 - Liquids

15.2. Chemical safety assessment

For the following substances of this mixture a chemical safety assessment has been carried out

Single wall carbon nanotubes

SECTION 16: Other information

Abbreviations and acronyms:

CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
WGK	Water Hazard Class
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
OEL	Occupational Exposure Limit

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CAS-No.	Chemical Abstract Service number
STP	Sewage treatment plant
IOELV	Indicative Occupational Exposure Limit Value
EC-No.	European Community number
EN	European Standard
VOC	Volatile Organic Compounds
BLV	Biological limit value
N.O.S.	Not Otherwise Specified
vPvB	Very Persistent and Very Bioaccumulative
SDS	Safety Data Sheet
PNEC	Predicted No-Effect Concentration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
PBT	Persistent Bioaccumulative Toxic
TLM	Median Tolerance Limit
LD50	Median lethal dose
NOAEC	No-Observed Adverse Effect Concentration
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
DIRM	Mass-based Dustiness Index
EC50	Median effective concentration
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
LC50	Median lethal concentration
IMDG	International Maritime Dangerous Goods
LOAEL	Lowest Observed Adverse Effect Level
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
OECD	Organisation for Economic Co-operation and Development

Full text of H- and EUH-statements:

Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H319	Causes serious eye irritation.

- Revision : All recent revision(s) are noted by a bold triangle pointed to right '►'.
- 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.

SDS EU (REACH Annex II)

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