SAFETY DATA SHEET

LightRay® High-Temp UV Resin

According to Regulation (EC) No 1907/2006 and Regulation (EU) 2020/878

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

1.1. Product identifier

LightRay® High-Temp UV Resin

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

Methacrylate based, UV-curable, one-component synthetic resin. The purpose of using the synthetic resin is the trenchless repair of sewer pipe systems. Its application requires trained personnel and controlled, professional or industrial conditions.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Hazard classes / categories	Hazard statements	
Skin Irrit. 2	H412	H412 Harmful to aquatic life with long-lasting effects.
Skin Sens. 1	H412	H412 Harmful to aquatic life with long-lasting effects.
Eye Dam. 1	H412	H412 Harmful to aquatic life with long-lasting effects.
Aquatic Chronic 3	H412	H412 Harmful to aquatic life with long-lasting effects.

2.2. Label elements

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

Hazard pictograms:

Signal word: Danger

Hazard statements:

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H412	Harmful to aquatic life with long-lasting effects.

Precautionary statements:

P261	Avoid breathing dust/fume/gas/mist/vapours/ spray.
P264	Wash hands, forearms and face thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and 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.
P273	Avoid release to the environment.
P391	Collect spillage.

Hazard determining component(s) for labelling:

Hydroxypropyl methacrylate; Trimethylolpropane trimethacrylat.

2.3. Other hazards

The mixture does not meet the persistent (P), bioaccumulative (B) and toxic (T) criteria. The mixture is not PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization

Name	EC No.	CAS No.	REACH Reg. No.	Content (%)	Classification according to Regulation (EC) No 1272/2008 (CLP)	
					Hazard categories[1]	H-phrase(s)[1]
Dipropylene glycol diacrylate	260-754-3	57472-68-1	01-2119484629-21	<40	Skin Irrit. 2 Eye Dam. 1 Skin Sens. 1	H315 H318 H317
Trimethylolpropane trimethacrylate	221-950-4	3290-92-4	01-2119542176-41	<20	Aquatic Chronic 2	H411
Hydroxypropyl methacrylate	248-666-3	27813-02-1	01-2119490226-37	<10	Skin Irrit. 2 Eye Sens. 1	H319 H317
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	423-340-5	162881-26-7	01-2119489401-38	<5	Skin Sens. 1 Aquatic Chronic 4	H317 H413

[1] – See Section 16 for the full text of the abbreviations declared above.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice: Soiled, fairly soaked clothing and shoes must be immediately removed.

4.1.1. Inhalation: Remove the exposed person to fresh air and keep at rest in a position comfortable for breathing. Provide artificial respiration, if not breathing. Get medical attention immediately.

4.1.2. Skin contact: Remove contaminated clothing. Wash with water and polyethylene glycol alternately, if available or with plenty of warm water and soap. Consult a doctor in the event of a skin reaction. Wash the less contaminated clothing before reuse. Clean shoes thoroughly before reuse.

4.1.3. Eye contact Immediately rinse with plenty of water for at least 10 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses, if present and easy to do. Continue rinsing. Go to an eye doctor immediately.

4.1.4. Ingestion: Do not induce vomiting. Call a poisoning center/doctor. Never give anything by mouth to an unconscious person. If the exposed person is conscious, wash out mouth.

4.1.5. Information to physician: The product irritates the respiratory tract and may trigger sensitisation of the skin and respiratory tract. Treatment of acute irritation or bronchial constriction is primarily symptomatic. Following severe exposure the patient should be kept under medical review for at least 48 hours.

4.1.6. First aid/protective precautions: The rescue personnel must wear protective equipment (rubber gloves, airtight safety goggles).

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

Sensitization, eye irritation.

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

Symptomatic treatment is required.

SECTION 5: : Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Foam, carbon dioxide, dry chemical, water fog.

Unsuitable extinguishing media: High volume water jet.

5.2. Special hazards arising from the substance or mixture

In case of fire may be liberated: carbon monoxide, carbon dioxide, organic decomposition products.

5.3. Advice for firefighters

Special protective equipment: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Safety boots, gloves, safety helmet and protective clothing should be worn. Further information: In the event of fire and/or explosion do not breathe fumes. Fire in vicinity poses risk of pressure build-up and rupture. Containers at risk from fire should be cooled with water and, if possible, removed from the danger area. Eliminate all ignition sources, if safe to do so.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep people away from and upwind of spill/leak. Ensure adequate ventilation after making sure that there is no risk of ignition. Clean-up may only be performed by trained personnel. Unauthorized persons must be removed.
6.1.1. For non-emergency personnel: Remove not affected people. Inform the relevant emergency services and authorities.
6.1.2. For emergency responders: People dealing with major spillages should wear full protective clothing including respiratory protection. The required protective equipment must be used (see 8.2.).

6.2. Environmental precautions

The product must not be allowed to enter soil, groundwater or surface water. Avoid dispersal and spreading of spilt material. It must be prevented from entering the water and sewer system

6.3. Methods and material for containment and cleaning up

Absorb spilled material in a suitable absorbent, e.g. rag, dry sand, bentonite, (diatomaceous) earth. For proper effect, allow to stand for approx. 30 minutes and then collect the used adsorbent in a sealable container. Do not use flammable materials, e.g. sawdust for soaking. Contaminated adsorbent material shall be disposed according to Section 13. In case of large amount of spillage, contain it by diking.

6.4. Reference to other sections

Information regarding disposal can be found in Section 13 (Waste treatment methods).

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling should be performed in a well-ventilated place. Wear suitable personal protective equipment. Prevent generation of vapour or mist. Keep away from flames and hot surfaces. Take measures to prevent the build-up of electrostatic charge. Use explosion-proof equipment. In case of dust or aerosol formation, ventilation or local exhaust should be used. Avoid contact with skin, eyes, and clothing. Wash hands and face thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

The container should be filled to a maximum of ca. 90% because oxygen (air) is needed for stabilization. When using large containers, ensure that sufficient oxygen (air) is supplied to ensure stability. Store at maximum 30 °C and only in the original container. May polymerize with strong heat generation. Protect from light.

7.3. Specific end use(s)

Conform to Section 1 concerning the relevant identified uses of the mixture.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No exposure limit value is known in the EU directives.
DNEL values
Hydroxypropyl methacrylate:
Workers: systemic effects, long-term exposure, dermal
Limit value: 4.2 mg/kg bw/day
Workers: systemic effects, long-term exposure, inhalation
Limit value: 14.7 mg/m3
Trimethylolpropane trimethacrylate:
Workers: systemic effects, long-term exposure, inhalation
Limit value: 14.81 mg/m3
Workers: systemic effects, long-term exposure, dermal
Limit value: 42 mg/kg bw/day
Workers: local effects, long-term exposure, dermal
Limit value: 9.33 mg/kg bw/day
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide:
Workers: systemic effects, long-term and short-term exposure, inhalation
Limit value: 21 mg/m3
Workers: systemic effects, long-term and short-term exposure, dermal
Limit value: 3.3 mg/kg
PNEC values
Hydroxypropyl methacrylate:
Freshwater: 0.904 mg/l
Freshwater sediment: 6.28 mg/kg
Marine water: 0.904 mg/l
Marine sediment: 6.28 mg/kg
Soil: 0.727 mg/kg
Sewage treatment plant: 10 mg/l

Trimethylolpropane trimethacrylate:
Freshwater: 2.76 µg/l
Freshwater – intermittent release: 20 µg/l
Freshwater sediment: 0.495 mg/kg dw
Marine water: 0.276 µg/l
Marine sediment: 0.05 mg/kg dw
Soil: 0.097 mg/kg dw
Sewage treatment plant: 10 mg/l

8.2. Exposure controls

General occupational safety regulations must be observed. Install a closed system or local exhauster as possible so that workers should not be exposed directly. Also install safety shower and eye rinsing facilities.

Respiratory protection:	At high concentrations, a gas mask can be used (EN 14387, filter type A).
Hand protection:	Chemical protective gloves (EN 374).
More information:	Please follow the glove manufacturer's instructions for permeability and breakthrough time.

Also consider the specific conditions of use of the product, such as the risk of cuts, abrasions and contact time.
The hand protection mentioned above is based on the knowledge gained about the chemical and the intended handling of the product, however, it may not be suitable for all workplaces. A targeted hazard assessment should be performed prior to commencing work to ensure that the suitability of the gloves for certain work environments and operations can be determined in advance. If there is any evidence of failure or chemical penetration, gloves should be discarded and replaced.

Eye protection:	Safety glasses with side protection (e.g. EN 166). A face-shield, if the situation requires.
Skin and body protection:	Protective clothing. Protective boots, if the situation requires (e.g. EN ISO 20346).
General safety and hygiene measures:	Store work clothes separately. Take off immediately all contaminated clothing. Follow stand ard occupational health measures. Do not eat, drink or smoke while working. After use, the skin should be thoroughly cleansed and then cared for.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a) Appearance/Physical state:	liquid/pasty material (yellowish)
b) Odour:	characteristic
c) Odour threshold:	not known
d) pH value:	not applicable
e) Melting point/freezing point:	not defined (mixture)
f) Boiling range:	240 oC (1013 hPa) (Hydroxypropyl methacrylate)
g) Flash point:	96 oC (Hydroxypropyl methacrylate) > 130 oC (closed cup) (Trimethylolpropane trimethacrylate)
h) Evaporation rate:	not typical
i) Flammability (solid, gaseous):	not applicable (liquid)
j) Ignitable, explosive range:	no data
k) Vapour pressure:	no data
l) Vapour density:	not defined (mixture)
m) Density:	1.1 ± 0,1 g/cm3 (at 25 °C)
n) Solubility in water:	slightly soluble
o) Partition coefficient n-octanol/water:	not defined (mixture)
p) Self-ignition temperature:	360 oC (1013 hPa) (Trimethylolpropane trimethacrylate)
q) Decomposition temperature:	not defined (mixture)
r) Viscosity, dynamic:	3000 ± 500 mPa.s (at 25 °C)
s) Explosive properties:	no data
t) Oxidising properties:	non-oxidising

9.2. Information on basic physical and chemical properties

No data.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactive material. Polymerizes exothermically if heated or exposed to strong light.

10.2. Chemical stability

No decomposition if handled and stored as directed (Section 7).

10.3. Possibility of hazardous reactions

In the presence of radical generators (e.g. peroxides), reducing chemicals and / or heavy metal ions, heatgenerating polymerization can be initiated.

10.4. Conditions to avoid

The product is normally delivered stabilized. However, when the storage time and / or temperature is substantially exceeded, polymerization accompanied by heat generation may begin.

10.5. Incompatible materials

Peroxides, amines, sulfur compounds, heavy metal ions, alkali compounds, reducing and oxidizing agents. Free radical initiators. Inorganic acids.

10.6. Hazardous decomposition products

No decomposition products if used as directed.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

No test data is available for the product.
11.1.1. Acute toxicity

LD50	Rat	> 2000 mg/kg oral
LD50	Rabbit	> 3000 mg/kg dermal
Trimethylolpropane trimethacrylate:		
LD50	Rat	> 2000 mg/kg oral
LD50	Rat	> 2000 mg/kg dermal
Hydroxypropyl methacrylate:		
LD50	Rat	> 2000 mg/kg oral
OECD 401, limit test		
LD50	Rabbit	> 5000 mg/kg dermal
OECD 401, limit test		
Repeated dose toxicity:		
NOAEL	Rat	300 mg/kg oral
OECD 422		

11.1.2. Irritation/Corrosion
Non-irritant. (Rabbit, dermal, OECD 404)
(Trimethylolpropane trimethacrylate)
Non-irritant. (Rabbit, eye, OECD 405)
(Trimethylolpropane trimethacrylate)
11.1.3. Sensitisation
May cause an allergic skin reaction.
(Hydroxypropyl methacrylate)
Not a skin sensitiser. (Guinea pig, dermal, OECD 406)
(Trimethylolpropane trimethacrylate)
11.1.7. STOT- single exposure
No data.

11.2. Information on other hazards

No data available.

SECTION 12: Ecological information

12.1. Toxicity

No test data is available for the product.

Endpoint	*Species*	*Effective dose*	*Exposure*
Hydroxypropyl methacrylate:			
Fish:			
LC50	Oryzias latipes (Japanese ricefish/medaka)	493 mg/l	48 h
DIN 38412, Part 15			
Aquatic invertebrates:			
EC50	Daphnia magna (big water flea)	> 143 mg/l	48 h
OECD 202			
NOEC	Daphnia magna (big water flea)	45.2 mg/l	21 days
Aquatic plants:			
EC50	Pseudokirchneriella subcapitata (green alga)	> 97.2 mg/l	72 h
OECD 201			
Microorganisms:			
EC10	Pseudomonas putida	1140 mg/l	16 h
Bringmann-Kühn test			

Trimethylolpropane trimethacrylate:

Fish:			
LC50	Oncorhynchus mykiss (rainbow trout)	2 mg/l	96 h
Aquatic invertebrates:			
EC50	Daphnia magna (big water flea)	> 9.22 mg/l	48 h
Aquatic plants:			
EC50	Pseudokirchneriella subcapitata (green alga)	3.88 mg/l	72 h
Microorganisms:			
EC50	Activated sludge	> 1000 mg/l	3 h

Toxic to aquatic life with long-lasting effects.

12.2. Persistence and degradability

Trimethylolpropane trimethacrylate:
Biodegradability
Biodegradation: 53%, 28 days, i.e. inherently biodegradable
OECD 301B

12.3. Bioaccumulative potential

log KOW = 0.97 (20 oC)
(Hydroxypropyl methacrylate)

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

The mixture does not meet the persistent (P), bioaccumulative (B) and toxic (T) criteria. The mixture is not PBT or vPvB.

12.6. Endocrine disrupting properties

No data available.

12.7. Other adverse effects

No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste is hazardous. Waste management must comply with the regulations.
Whenever possible, waste should be returned to the material life cycle for recycling. Consult local authorities and waste management experts. For energetic conversion, a special waste incineration facility with a high temperature zone, duration of dwell control, afterburner, waste heat utilizer (economizer), DeNOx, fine dust removal, and scrubber/absorber is needed. If incineration is not possible, take the waste to an appropriate, licensed landfill.

SECTION 14: Transport information

Land transport (ADR/RID/GGVSE)
Sea transport (IMDG Code/GGVSee)
Air transport (ICAO-IATA/DGR)

14.1. UN number or ID number	Not dangerous goods
14.2. UN proper shipping name	Not dangerous goods
14.3. Transport hazard class(es)	Not dangerous goods
14.4. Packing group	Not dangerous goods
14.5. Environmental hazards	Marine pollutant: no
14.6. Special precautions for user	Not dangerous goods
14.7. Maritime transport in bulk according to IMO instruments	Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

The mixture has been notified in accordance with Annex VIII of the CLP Regulation.

15.2. Chemical safety assessment

Chemical safety assessment has not been carried out for the product.

SECTION 16: Other information

The information given corresponds with our actual knowledge and experience. This information is meant to describe our product in view of possible safety requirements. Classification of the mixture is based on the classification of components.

16.1. Indication of changes

This is the second edition of the datasheet.

16.2. Abbreviations and acronyms

bw: bodyweight
CAS No.: Chemical Abstracts Service number
CLP: Regulation on Classification, Labelling and Packaging [i.e., Regulation (EC) No 1272/2008]
DIN: Deutsches Institut für Normung (German national organization for standardization)
DNEL: Derived No-Effect Level
dw: dry weight
EC: European Commission
EC10: Median effect concentration (generating an effect response in 10% of the test population)
EC50: Median effect concentration (generating an effect response in 50% of the test population)
EC No.: EINECS and ELINCS number
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
ErC50: EC50 based on growth rate
EU: European Union
KOW: n-Octanol/water partition coefficient
LC50: Concentration associated with 50% death rate (mg/m⊠ or ⊠g/m⊠)
LD50: Median lethal dose (mg/kg bodyweight)
NOAEL: No Observed Adverse Effect Level
NOEC: No Observed Effect Concentration
OECD: Organisation for Economic Cooperation and Development
PBT: Persistent, Bioaccumulative and Toxic
PNEC: Predicted No Effect Concentration
REACH: The Registration, Evaluation, Authorisation and Restriction of Chemicals [i.e., Regulation (EC) No 1907/2006]
vPvB: very Persistent and very Bioaccumulative

16.3. Key literature references and sources for data

Safety data sheets, received from the raw materials suppliers.

16.4. Full text of abbreviations

H-Phrases	
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long-lasting effects.
H412	Harmful to aquatic life with long-lasting effects.
H413	May cause long lasting harmful effects to aquatic life.
P-Phrases	
P261	Avoid breathing dust/fume/gas/mist/vapours/ spray.
P264	Wash hands, forearms and face thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and 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.
P273	Avoid release to the environment.
P391	Collect spillage.
Hazard classes	
Aquatic Chronic	Hazardous to the aquatic environment, chronic
Eye Dam.	Serious eye damage
Eye Irrit.	Serious eye irritation
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation