

# Material Safety Data Sheet (MSDS)



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Date / Revised: 15.05.2022  
Product: RED Series Resin - Diamond Black

Version: 1.0

## SECTION 1: Identification of the substance/mixture

### Product identifier

## RED Series Resin - Diamond Black

### 1.1. Relevant identified uses of the substance or mixture

Recommended use: 3D printing material

### 1.2. Details of the supplier of the safety data sheet

Company:

Number 4 Printing Materials  
Limited

Room 806, Block B Sea View Estate,  
Watson Road, Fortress Hill, Hong Kong  
Email: info@numberfour3d.com

**Emergency telephone number: (852) 9809 3648**

## SECTION 2: Hazards Identification

### 2.1. Classification of the substance or mixture

For the classification of the mixture the following methods have been applied: extrapolation on the concentration levels of the hazardous substances, on basis of test results and after evaluation of experts. The methodologies used are mentioned at the respective test results.

According to Regulation (EC) No 1272/2008 [CLP]

Acute Tox. 4 (oral)	H302 Harmful if swallowed.
Skin Corr./Irrit. 2	H315 Causes skin irritation.
Eye Dam./Irrit. 1	H318 Causes serious eye damage.
Skin Sens. 1	H317 May cause an allergic skin reaction.
STOT RE 2 (oral)	H373 May cause damage to organs through prolonged or repeated oral exposure.
Aquatic Chronic 3	H412 Harmful to aquatic life with long lasting effects.

## 2.2. Label elements

### Globally Harmonized System, EU (GHS)

Label Elements:

Pictogram:



Signal Word:

DANGER

Hazard Statements:

H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H373	May cause damage to organs through prolonged or repeated oral exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P280	Wear protective gloves and eye protection or face protection.
P260	Do not breathe dust/gas/mist/vapours.
P273	Avoid release to the environment.

Precautionary Statements (Response):

P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or physician.

Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.
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Labeling of special preparations (GHS):

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 6 %, Inhalation - vapour

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 6 %, Inhalation - mist

According to Regulation (EC) No 1272/2008 [CLP]

Hazard determining component(s) for labelling: 2-Propen-1-one, 1-(4-morpholinyl)-, diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide, 2-Oxepanone, 2-ethyl-2(hydroxymethyl)-1 polymer, 3-propanediol and 5-isocyanato-1-(isocyanatomethyl)-1, 3, 3-trimethylcyclohexane, 2-hydroxyethyl acrylate, Tri(propylene glycol) diacrylate, 2-propenoic acid, (1-methyl-1,2-ethanediyl)bis(oxy(methyl-2,1-ethanediyl))es

### 2.3. Other hazards

According to Regulation (EC) No 1272/2008 [CLP]

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

## SECTION 3: Composition/Information on Ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Chemical nature

Acrylated polymer

Hazardous ingredients (GHS)

According to Regulation (EC) No. 1272/2008

Photo-initiator

Content (W/W): <= 4 %

CAS Number: 75980-60-8

EC-Number: 278-355-8

INDEX-Number: 015-203-00-X

Skin Sens. 1B

Repr. 2 (fertility)

Repr. 2 (unborn child)

Aquatic Chronic 2

H317, H361fd, H411

Isomer Mixture

Content (W/W): <= 16 %

CAS Number: 42978-66-5

EC-Number: 256-032-2

INDEX-Number: 607-249-00-X

Skin Corr./Irrit. 2

Eye Dam./Irrit. 2

Skin Sens. 1B

STOT SE 3 (irr. to respiratory syst.)

Aquatic Chronic 2

H319, H315, H317, H335, H411

Specific concentration limit:

STOT SE 3, irr. to respiratory syst.: >= 10 %

Polymeric Urethane Acrylate

Content (W/W): <= 50 %

CAS Number: 68987-79-1

Skin Corr./Irrit. 2

Eye Dam./Irrit. 2

H319, H315

Acryloylmorpholine Copolymer

Content (W/W): <= 30 %

CAS Number: 5117-12-4

EC-Number: 418-140-1

INDEX-Number: 613-222-00-3

Acute Tox. 4 (oral)

Eye Dam./Irrit. 1

Skin Sens. 1

STOT RE 2

H318, H302, H317, H373

## **SECTION 4: First-Aid Measures**

### **4.1. Description of first aid measures**

Immediately remove contaminated clothing.

If difficulties occur after vapour/aerosol has been inhaled, remove to fresh air and seek medical attention.

On skin contact:

Wash thoroughly with soap and water

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Rinse mouth and then drink 200-300 ml of water. Do not induce vomiting unless told to by a poison control center or doctor.

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

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11., (Further) symptoms and / or effects are not known so far

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

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

## **SECTION 5: Fire-Fighting Measures**

### **5.1. Extinguishing media**

Suitable extinguishing media:  
water spray, dry powder, foam

Unsuitable extinguishing media for safety reasons:  
water jet

### **5.2. Special hazards arising from the substance or mixture**

Endangering substances: harmful vapours, carbon oxides, nitrogen oxides

Advice: Evolution of fumes/fog. The substances/groups of substances mentioned can be released in case of fire.

### **5.3. Advice for fire-fighters**

Special protective equipment:

Wear self-contained breathing apparatus and chemical-protective clothing.

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Further information:

If exposed to fire, keep containers cool by spraying with water. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations

## SECTION 6: Accidental Release Measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Do not breathe vapour/spray. Ensure adequate ventilation. Avoid contact with the skin, eyes and clothing. Use personal protective clothing. Information regarding personal protective measures, see section 8.

### 6.2. Environmental precautions

Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

### 6.3. Methods and material for containment and cleaning up

For large amounts: Dike spillage. Pump off product.

For residues: Pick up with inert absorbent material (e.g. sand, earth etc.).

Dispose of absorbed material in accordance with regulations.

### 6.4. Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

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## SECTION 7: Handling and Storage

### 7.1. Precautions for safe handling

Avoid aerosol formation. Do not inhale vapours / aerosols. Avoid contact with the skin, eyes and clothing. Wear suitable protective clothing and gloves. Provide good ventilation of working area (local exhaust ventilation if necessary).

Protection against fire and explosion:

Heated containers should be cooled to prevent polymerization. Take precautionary measures against static discharges.

### 7.2. Conditions for safe storage, including any incompatibilities

Further information on storage conditions: Containers should be stored tightly sealed in a dry place. Keep container dry because product takes up the humidity of air. Protect against heat. Protect from the effects of light. The stabilizer is only effective in the presence of oxygen. Ensure adequate inhibitor and dissolved oxygen level.

Protect from temperatures above: 40 °C

### 7.3. Specific end use(s)

For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

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## SECTION 8: Exposure Controls/Personal Protection

### 8.1. Control parameters

## 8.2. Exposure controls

### Personal protective equipment

#### Respiratory protection:

Suitable respiratory protection for higher concentrations or long-term effect: Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

#### Hand protection:

Chemical resistant protective gloves (EN ISO 374-1)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1): nitrile rubber (NBR) - 0.4 mm coating thickness

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Manufacturer's directions for use should be observed because of great diversity of types.

#### Eye protection:

Tightly fitting safety goggles (cage goggles) (e.g. EN 166) and face shield.

#### Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

### General safety and hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift.

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## SECTION 9: Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

Form:	liquid
Colour:	diamond black / milky white / novel red / brick red / snowy grey / sand grey
Odour:	acrylic-like
Odour threshold:	Not determined due to potential health hazard by inhalation.
pH value:	substance/mixture is non-soluble (in water)
Onset of boiling:	The substance / product polymerizes therefore not determined.
Flash point:	> 140 °C
Evaporation rate:	not determined

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Lower explosion limit:	For liquids not relevant for classification and labelling., The lower explosion point may be 5 – 15 °C below the flash point.
Upper explosion limit:	For liquids not relevant for classification and labelling.
Ignition temperature:	not determined
Vapour pressure:	(20 °C) not applicable
Density:	(20 °C) 1.13 g/mL
Relative vapour density (air):	not determined
Solubility in water:	partly soluble, Information applies to the solvent
Solubility (qualitative) solvent(s):	alcohols, esters, ketones soluble
Partitioning coefficient n-octanol/water (log Kow):	not applicable for mixtures
Self ignition:	not self-igniting
Thermal decomposition:	178.73 °C, 323.06 kJ/kg
Viscosity, dynamic:	350 mPa·s, (28 °C)
Explosion hazard:	not explosive
Fire promoting properties:	not fire-propagating

## 9.2. Other information

Hygroscopy:	Non-hygroscopic
Grain size distribution:	The substance / product is marketed or used in a non solid or granular form.

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## SECTION 10: Stability and Reactivity

### 10.1. Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

### 10.2. Chemical stability

The product is stable if stored and handled as prescribed/indicated.

### 10.3. Possibility of hazardous reactions

The product can polymerize if the shelf life or storage temperature are greatly exceeded. Heat develops during polymerization. Reacts with peroxides and other radical components.  
The product is stabilized against spontaneous polymerization prior to despatch.

#### 10.4. Conditions to avoid

Avoid UV-light and other radiation with high energy. Avoid heat.  
See SDS section 7 - Handling and storage.

#### 10.5. Incompatible materials

Substances to avoid:  
peroxides, oxidizable substances, strong oxidizing agents, free radical initiators, initiators

#### 10.6. Hazardous decomposition products

Hazardous decomposition products:  
No hazardous decomposition products if stored and handled as prescribed/indicated.

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## SECTION 11: Toxicological Information

### 11.1. Information on toxicological effects

#### Acute toxicity

Experimental/calculated data:

LD50 rat (oral): 300 - 2,000 mg/kg

The product has not been tested. The statement has been derived from the properties of the individual components. Result of analysis for GOAL end points expected (see date)

LC50 rat (by inhalation): 4 h  
not determined

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 6 %, Inhalation - vapour

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 6 %, Inhalation - mist

#### Irritation

Experimental/calculated data:

Skin corrosion/irritation

rabbit: Irritant.

The product has not been tested. The statement has been derived from the properties of the individual components.

Serious eye damage/irritation

rabbit: irreversible damage

The product has not been tested. The statement has been derived from the properties of the individual components.

#### Respiratory/Skin sensitization

Assessment of sensitization:

May cause allergic skin reaction. The product has not been tested. The statement has been derived from the properties of the individual components.

Experimental/calculated data:

skin sensitizing

The product has not been tested. The statement has been derived from the properties of the individual components.



#### Germ cell mutagenicity

Assessment of mutagenicity:

Based on the ingredients, there is no suspicion of a mutagenic effect.

#### Carcinogenicity

Assessment of carcinogenicity:

No data available.

#### Reproductive toxicity

Assessment of reproduction toxicity:

No reliable data are available concerning reproduction toxicity.

#### Developmental toxicity

Assessment of teratogenicity:

Based on the ingredients, there is no suspicion of a teratogenic effect.

#### Experiences in humans

Experimental/calculated data:

No data available.

#### Specific target organ toxicity (single exposure)

No data available.

#### Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Repeated exposure may affect certain organs. The product has not been tested. The statement has been derived from the properties of the individual components.

#### Aspiration hazard

No aspiration hazard expected.

#### Other relevant toxicity information

The product has been assessed on the basis of the components' available data. To some extent data gaps exist for individual components. According to our present knowledge and experience dangers which are not covered by the current labeling are not to be expected

## **SECTION 12: Ecological Information**

### **12.1. Toxicity**

Assessment of aquatic toxicity:

Acutely toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment. The product has not been tested. The statement has been derived from the properties of the individual components.

Toxicity to fish:

LC50 (96 h) > 1 - 10 mg/l, Fish

The product has not been tested. The statement has been derived from the properties of the individual components.

### **12.2. Persistence and degradability**

Assessment biodegradation and elimination (H<sub>2</sub>O):

Not readily biodegradable (by OECD criteria).

### **12.3. Bioaccumulative potential**

Assessment bioaccumulation potential:

The product has not been tested.

### **12.4. Mobility in soil**

Assessment transport between environmental compartments:

Volatility: No data available.

### **12.5. Results of PBT and vPvB assessment**

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not contain a substance fulfilling the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria.

### **12.6. Other adverse effects**

The product does not contain substances that are listed in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

### **12.7. Additional information**

Add. remarks environm. fate & pathway:

Treatment in biological waste water treatment plants has to be performed according to local and administrative regulations.

Other ecotoxicological advice:

The product has been assessed on the basis of the components' available data. To some extent data gaps exist for individual components. According to our present knowledge and experience dangers which are not covered by the current labeling are not to be expected. Do not discharge product into the environment without control.

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## SECTION 13: Disposal Considerations

### 13.1. Waste treatment methods

Must be disposed of or incinerated in accordance with local regulations.

Contaminated packaging:

Uncontaminated packaging can be re-used.

Packs that cannot be cleaned should be disposed of in the same manner as the contents.

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## SECTION 14: Transport Information

### Land transport

ADR	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

RID	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

### Inland waterway transport

ADN	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

**Sea transport**

IMDG	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

**Air transport**

IATA/ICAO	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

**14.1. UN number or ID number**

See corresponding entries for "UN number or ID number" for the respective regulations in the tables above.

**14.2. UN proper shipping name**

See corresponding entries for "UN proper shipping name" for the respective regulations in the tables above.

**14.3. Transport hazard class(es)**

See corresponding entries for "Transport hazard class(es)" for the respective regulations in the tables above.

**14.4. Packing group**

See corresponding entries for "Packing group" for the respective regulations in the tables above.

**14.5. Environmental hazards**

See corresponding entries for "Environmental hazards" for the respective regulations in the tables above.

**14.6. Special precautions for user**

See corresponding entries for "Special precautions for user" for the respective regulations in the tables above.

**14.7. Maritime transport in bulk according to IMO instruments**

Maritime transport in bulk is not intended.

## **SECTION 15: Regulatory Information**

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

#### Prohibitions, Restrictions and Authorizations

Annex XVII of Regulation (EC) No 1907/2006: Number on List: 75, 3

Directive 2012/18/EU - Control of Major Accident Hazards involving dangerous substances (EU): If other regulatory information applies that is not already provided elsewhere in this safety datasheet, then it is described in this subsection.

### **15.2. Chemical Safety Assessment**

Advice on product handling can be found in sections 7 and 8 of this safety data sheet.  
Listed in above regulation: no

## SECTION 16: Other Information

Full text of the classifications, including the hazard classes and the hazard statements, if mentioned in section 2 or 3:

Acute Tox.	Acute toxicity
Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
Skin Sens.	Skin sensitization
STOT RE	Specific target organ toxicity — repeated exposure
Aquatic Chronic Repr.	Hazardous to the aquatic environment - chronic Reproductive toxicity
STOT SE	Specific target organ toxicity — single exposure
Aquatic Acute	Hazardous to the aquatic environment - acute
H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H373	May cause damage to organs through prolonged or repeated oral exposure.
H412	Harmful to aquatic life with long lasting effects.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H411	Toxic to aquatic life with long lasting effects.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H373	May cause damage to organs through prolonged or repeated exposure.

### Abbreviations

ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road.  
 ADN = The European Agreement concerning the International Carriage of Dangerous Goods by Inland waterways. ATE = Acute Toxicity Estimates. CAO = Cargo Aircraft Only. CAS = Chemical Abstract Service. CLP = Classification, Labelling and Packaging of substances and mixtures. DIN = German national organization for standardization. DNEL = Derived No Effect Level. EC50 = Effective concentration median for 50% of the population. EC = European Community. EN = European Standards. IARC = International Agency for Research on Cancer. IATA = International Air Transport Association. IBC-Code = Intermediate Bulk Container code. IMDG = International Maritime Dangerous Goods Code. ISO = International Organization for Standardization. STEL = Short-Term Exposure Limit. LC50 = Lethal concentration median for 50% of the population. LD50 = Lethal dose median for 50% of the population. TLV = Threshold Limit Value. MARPOL = The International Convention for the Prevention of Pollution from Ships. NEN = Dutch Norm. NOEC = No Observed Effect Concentration. OEL = Occupational Exposure Limit. OECD = Organization for Economic Cooperation and Development. PBT = Persistent, Bioaccumulative and Toxic. PNEC = Predicted No Effect Level. PPM = Parts per million. RID = The European Agreement concerning the International Carriage of Dangerous Goods by Rail. TWA = Time Weight Average. UN-number = UN number at transport. vPvB = very Persistent and very Bioaccumulative.

### Disclaimer

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.