SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

DTBP S-500

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

1.1 Product identifier
   Trade name: DTBP S-500
   REACH Registration Number: 01-2119513335-48-0001
   Substance name: Di-tert-butyl peroxide
   Index-No.: 617-001-00-2
   EC-No.: 203-733-6

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Use of the Substance/Mixture: polymerisation initiators

1.3 Details of the supplier of the safety data sheet
   Company: United Initiators GmbH
   Dr.-Gustav-Adolph-Str. 3
   82049 Pullach
   E-mail address of person responsible for the SDS: contact@united-in.com

1.4 Emergency telephone number
   +49 / 89 / 74422 – 0 (24 h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
   Classification (REGULATION (EC) No 1272/2008)
   Flammable liquids, Category 2: H225: Highly flammable liquid and vapour.
   Organic peroxides, Type E: H242: Heating may cause a fire.
   Germ cell mutagenicity, Category 2: H341: Suspected of causing genetic defects.
   Chronic aquatic toxicity, Category 3: H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements
   Labelling (REGULATION (EC) No 1272/2008)
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Version | Revision Date | SDS Number | Print Date
--------|---------------|------------|-----------
1.2     | 24.02.2017    | 600000000027 | 24.01.2018

Hazard pictograms : ![Hazard Pictograms]
Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.
                   H242 Heating may cause a fire.
                   H341 Suspected of causing genetic defects.
                   H412 Harmful to aquatic life with long lasting effects.

Precautionary statements :
Prevention:
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 Keep/Store away from clothing/ strong acids, bases, heavy metal salts and other reducing substances /combustible materials.
P233 Keep container tightly closed.
P235 Keep cool.
P243 Take precautionary measures against static discharge.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P370 + P378 In case of fire: Use .? to extinguish.

Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.
Vapours may form explosive mixture with air.

SECTION 3: Composition/information on ingredients

3.1 Substances
Substance name : Di-tert-butyl peroxide
Index-No. : 617-001-00-2
EC-No. : 203-733-6
SAFETY DATA SHEET  
according to Regulation (EC) No. 1907/2006

DTBP S-500

Version 1.2  Revision Date: 24.02.2017  SDS Number: 600000000027  Print Date: 24.01.2018

Chemical nature : Organic Peroxide liquid

Hazardous components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-tert-butyl peroxide</td>
<td>110-05-4</td>
<td>203-733-6</td>
<td>&gt;= 99 - &lt;= 100</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.  
Show this safety data sheet to the doctor in attendance.  
Do not leave the victim unattended.  
Call a physician immediately.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing.

If inhaled : If unconscious, place in recovery position and seek medical advice.  
If symptoms persist, call a physician.  
If breathed in, move person into fresh air.

In case of skin contact : Wash contaminated clothing before re-use.  
If on skin, rinse well with water.  
If on clothes, remove clothes.  
If symptoms persist, call a physician.

In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
Remove contact lenses.  
Protect unharmed eye.  
Keep eye wide open while rinsing.  
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.  
Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Risks : Suspected of causing genetic defects.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically and supportively.
SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media: Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting:
Contact with incompatible materials or exposure to temperatures exceeding SADT may result in a self-accelerating decomposition reaction with release of flammable vapors which may auto-ignite.
The product burns violently.
Flash back possible over considerable distance.
Vapours may form explosive mixtures with air.
The product will float on water and can be reignited on surface water.
Cool closed containers exposed to fire with water spray.

5.3 Advice for firefighters
Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

Specific extinguishing methods:
Do not use a solid water stream as it may scatter and spread fire.
Remove undamaged containers from fire area if it is safe to do so.
Use water spray to cool unopened containers.

Further information:
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Personal precautions: Use personal protective equipment.
Ensure adequate ventilation.
Remove all sources of ignition.
Evacuate personnel to safe areas.
Follow safe handling advice and personal protective equipment recommendations.
Beware of vapours accumulating to form explosive concentra-
6.2 Environmental precautions

Environmental precautions: Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Contact with incompatible substances can cause decomposition at or below SADT.
Clear spills immediately.
Suppress (knock down) gases/vapours/mists with a water spray jet.
To clean the floor and all objects contaminated by this material, use plenty of water.
Soak up with inert absorbent material.
Isolate waste and do not reuse.
Non-sparking tools should be used.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Advice on safe handling: Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
Avoid formation of aerosol.
Take precautionary measures against static discharges.
Never return any product to the container from which it was originally removed.
Provide sufficient air exchange and/or exhaust in work rooms.
Avoid confinement.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Smoking, eating and drinking should be prohibited in the application area.
Wash thoroughly after handling.
For personal protection see section 8.
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

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Protect from contamination.

Advice on protection against fire and explosion:
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Keep away from heat and sources of ignition. Use only explosion-proof equipment. Keep away from combustible material.

Hygiene measures:
Keep away from food and drink. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers:
Avoid impurities (e.g. rust, dust, ash), risk of decomposition. Electrical installations / working materials must comply with the technological safety standards. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in original container. Keep containers tightly closed in a cool, well-ventilated place. Store in accordance with the particular national regulations.

Advice on common storage:
Keep away from strong acids, bases, heavy metal salts and other reducing substances.

Storage class (TRGS 510):
5.2, Organic peroxides and self-reacting hazardous materials

Recommended storage temperature:
< 40 °C

Other data:
No decomposition if stored normally.

7.3 Specific end use(s)
Specific use(s):
For further information, refer to the product technical data sheet.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-tert-butyl peroxide</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>20 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>3 mg/kg</td>
</tr>
</tbody>
</table>

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-tert-butyl peroxide</td>
<td>Fresh water</td>
<td>0.144 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.0144 mg/l</td>
</tr>
</tbody>
</table>
8.2 Exposure controls

Engineering measures
Minimize workplace exposure concentrations.

Personal protective equipment

Eye protection: Tightly fitting safety goggles
Please wear suitable protective goggles. Also wear face protection if there is a splash hazard.
Ensure that eyewash stations and safety showers are close to the workstation location.

Hand protection
Material: butyl-rubber
Break through time: >= 480 min
Glove thickness: 0.5 mm

Skin and body protection: Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.

Respiratory protection: In the case of dust or aerosol formation use respirator with an approved filter.
Filter type: ABEK-filter

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: liquid
Colour: colourless
Odour: aromatic
Odour Threshold: No data available
pH: No data available
Melting point/freezing point: < -25 °C
Initial boiling point and boiling range: 110 - 116 °C
Flash point: 0 °C
Method: ISO 3679
Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Upper explosion limit : No data available

Lower explosion limit : No data available

Vapour pressure : 35 hPa (20 °C)

Relative vapour density : No data available

Density : 0,79 g/cm³ (20 °C)

Solubility(ies)
   Water solubility : 0,171 g/l (20 °C)
                      insoluble
   Partition coefficient: n-octanol/water : log Pow: 3,2 (20 °C)

Viscosity
   Viscosity, dynamic : 0,8 mPa.s (20 °C)

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.
                       Organic peroxide

9.2 Other information

Self-Accelerating decomposition temperature (SADT) : 80 °C
   Method: UN-Test H.4
   SADT-Self Accelerating Decomposition Temperature. Lowest
temperature at which the tested package size will undergo a
self-accelerating decomposition reaction.

SECTION 10: Stability and reactivity

10.1 Reactivity
   Stable under recommended storage conditions.

10.2 Chemical stability
   Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
   Hazardous reactions : Vapours may form explosive mixture with air.

10.4 Conditions to avoid
   Conditions to avoid : Protect from contamination.
                        Contact with incompatible substances can cause decomposi-
                        tion at or below SADT.
Heat, flames and sparks. Avoid confinement.

10.5 Incompatible materials
Materials to avoid: Accelerators, strong acids and bases, heavy metals and heavy metal salts, reducing agents

10.6 Hazardous decomposition products
Irritant, caustic, flammable, noxious/toxic gases and vapours can develop in the case of fire and decomposition

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Not classified based on available information.

Components:

Di-tert-butyl peroxide:

Acute oral toxicity: LD50 (Rat, female): > 2.000 mg/kg
Method: OECD Test Guideline 423
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity: LC50 (Rat, male and female): > 22 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 436
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity: LD50 (Rat, male and female): > 2.000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation
Not classified based on available information.

Components:

Di-tert-butyl peroxide:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Serious eye damage/eye irritation
Not classified based on available information.
Components:

Di-tert-butyl peroxide:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation

Respiratory or skin sensitisation
Skin sensitisation
Not classified based on available information.
Respiratory sensitisation
Not classified based on available information.

Components:

Di-tert-butyl peroxide:
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.

Germ cell mutagenicity
Suspected of causing genetic defects.

Components:

Di-tert-butyl peroxide:
Genotoxicity in vitro
: Method: OECD Test Guideline 471
Result: negative
: Method: OECD Test Guideline 476
Result: negative

Genotoxicity in vivo
: Species: Rat (male)
Method: OECD Test Guideline 474
Result: negative
: Species: Mouse (male)
Method: OECD Test Guideline 483
Result: negative

Germ cell mutagenicity- Assessment
: Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Carcinogenicity
Not classified based on available information.

Components:

Di-tert-butyl peroxide:
Remarks: This information is not available.
Reproductive toxicity
Not classified based on available information.

STOT - single exposure
Not classified based on available information.

STOT - repeated exposure
Not classified based on available information.

Repeated dose toxicity

Components:

Di-tert-butyl peroxide:
Species: Rat, male and female
NOAEL: 100 mg/kg
LOAEL: 300 mg/kg
Application Route: Oral
Exposure time: 28 d
Method: OECD Test Guideline 422

Aspiration toxicity
Not classified based on available information.

Components:

Di-tert-butyl peroxide:
No data available

Further information

Product:
Remarks: Solvents may degrease the skin.

SECTION 12: Ecological information

12.1 Toxicity

Components:

Di-tert-butyl peroxide:
Toxicity to fish: LC50 (Poecilia reticulata (guppy)): 1.000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 73,1 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae: EC50 (Pseudokirchneriella subcapitata (green algae)): 36 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
NOEC (Pseudokirchneriella subcapitata (green algae)): 15 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 (Bacteria): 1.000 mg/l
Exposure time: 0,5 h
Method: OECD Test Guideline 209

12.2 Persistence and degradability

Components:
Di-tert-butyl peroxide:
Biodegradability : Result: Not readily biodegradable.

12.3 Bioaccumulative potential

Components:
Di-tert-butyl peroxide:
Bioaccumulation : Bioconcentration factor (BCF): 60,03
Partition coefficient: n-octanol/water : log Pow: 3,2

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

Product:
Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Product:
Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Dispose of wastes in an approved waste disposal facility.

Contaminated packaging:
- Empty remaining contents.
- Dispose of as unused product.
- Do not re-use empty containers.
- Do not burn, or use a cutting torch on, the empty drum.
- Dispose of in accordance with local regulations.

SECTION 14: Transport information

14.1 UN number
- ADR: UN 3107
- RID: UN 3107
- IMDG: UN 3107
- IATA: UN 3107

14.2 UN proper shipping name
- ADR: ORGANIC PEROXIDE TYPE E, LIQUID (DI-tert-BUTYL PEROXIDE)
- RID: ORGANIC PEROXIDE TYPE E, LIQUID (DI-tert-BUTYL PEROXIDE)
- IMDG: ORGANIC PEROXIDE TYPE E, LIQUID (DI-tert-BUTYL PEROXIDE)
- IATA: Organic peroxide type E, liquid (Di-tert-Butyl peroxide)

14.3 Transport hazard class(es)
- ADR: 5.2
- RID: 5.2
- IMDG: 5.2
- IATA: 5.2

14.4 Packing group
- ADR
  - Packing group: Not assigned by regulation
  - Classification Code: P1
  - Labels: 5.2
  - Tunnel restriction code: (D)
- RID
  - Packing group: Not assigned by regulation
  - Classification Code: P1
  - Hazard Identification Number: 539
  - Labels: 5.2
- IMDG
  - Packing group: Not assigned by regulation
### 14.5 Environmental hazards

**ADR**  
Environmentally hazardous : no

**RID**  
Environmentally hazardous : no

**IMDG**  
Marine pollutant : no

### 14.6 Special precautions for user

Not applicable

### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

### SECTION 15: Regulatory information

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

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).</td>
<td></td>
</tr>
<tr>
<td>Regulation (EC) No 1005/2009 on substances that deplete the ozone layer</td>
<td></td>
</tr>
<tr>
<td>Regulation (EC) No 850/2004 on persistent organic pollutants</td>
<td></td>
</tr>
</tbody>
</table>

**P6b**  
SELFC-REACTIVE SUBSTANCES AND MIXTURES AND ORGANIC PEROXIDES

<table>
<thead>
<tr>
<th>Quantity 1</th>
<th>Quantity 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 t</td>
<td>200 t</td>
</tr>
</tbody>
</table>

**Water contaminating class (Germany)**  
WGK 1 slightly water endangering
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

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Other regulations: Gefahrenguppe nach § 3 BGV B4: Ib (German regulatory requirements)

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

The components of this product are reported in the following inventories:

AICS (AU): On the inventory, or in compliance with the inventory
NZIoC (NZ): On the inventory, or in compliance with the inventory
ENCS (JP): On the inventory, or in compliance with the inventory
ISHL (JP): On the inventory, or in compliance with the inventory
KECI (KR): On the inventory, or in compliance with the inventory
PICCS (PH): On the inventory, or in compliance with the inventory
IECSC (CN): On the inventory, or in compliance with the inventory
TCSI (TW): On the inventory, or in compliance with the inventory
TSCA (US): On TSCA Inventory

15.2 Chemical safety assessment
A Chemical Safety Assessment has been carried out for this substance.
For further information see eSDS.

SECTION 16: Other information

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Mari-
Further information
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.