1. Identification

Product identifier used on the label

**Tinuvin® 328**

**Recommended use of the chemical and restriction on use**

Unsuitable for use: This material is not intended for use in products for which prolonged contact with mucous membranes, body fluids or abraded skin, or implantation within the human body, is specifically intended, unless the finished product has been tested in accordance with nationally and internationally applicable safety testing requirements. Because of the wide range of such potential uses, we are not able to recommend this material as safe and effective for such uses and assume no liability for such uses.

Recommended use*: additive for the plastics industry

* The “Recommended use” identified for this product is provided solely to comply with a Federal requirement and is not part of the seller’s published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller’s sales agreement.

**Details of the supplier of the safety data sheet**

**Company:**

BASF CORPORATION

100 Park Avenue

Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

**Emergency telephone number**

CHEMTREC: 1-800-424-9300

BASF HOTLINE: 1-800-832-HELP (4357)

**Other means of identification**

**Molecular formula:** C22 H29 N3 O

**Chemical family:** Additive for plastic material stabilization

**Synonyms:** UV Stabilizer

2. Hazards Identification


**Classification of the product**

STOT RE 2 Specific target organ toxicity — repeated
Aquatic Chronic exposure
Combustible Dust Hazardous to the aquatic environment - chronic
Combustible Dust (1) Combustible Dust

Label elements

Pictogram:

Signal Word: Warning

Hazard Statement:
- May form combustible dust concentration in air.
- May cause damage to organs (Liver, Kidney) through prolonged or repeated exposure.
- May cause long lasting harmful effects to aquatic life.

Precautionary Statements (Prevention):
- P260 Do not breathe dust/gas/mist/vapours.
- P273 Avoid release to the environment.

Precautionary Statements (Response):
- P311 Call a POISON CENTER or doctor/physician.

Precautionary Statements (Disposal):
- P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

See section 12 - Results of PBT and vPvB assessment. 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. The product is under certain conditions capable of dust explosion.


Emergency overview

CAUTION:
- May cause mechanical irritation to eyes, skin and respiratory system.
- Overexposure may cause liver and kidney damage, and blood disorders.
- Take precautionary measures against static discharges.
- Refer to MSDS Section 7 and 10 for Dust Explosion information.
- Avoid dust formation.
- Use with local exhaust ventilation.
- Wear suitable protective clothing, gloves and eye/face protection.

3. Composition / Information on Ingredients


<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Weight %</th>
<th>Chemical name</th>
</tr>
</thead>
</table>


4. First-Aid Measures

Description of first aid measures

**General advice:**
Remove contaminated clothing.

**If inhaled:**
If difficulties occur after dust has been inhaled, remove to fresh air and seek medical attention.

**If on skin:**
Wash thoroughly with soap and water.

If irritation develops, seek medical attention.

**If in eyes:**
Wash affected eyes for at least 15 minutes under running water with eyelids held open.

If irritation develops, seek medical attention.

**If swallowed:**
Rinse mouth immediately with water. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Do not induce vomiting due to aspiration hazard. Seek medical attention.

**Most important symptoms and effects, both acute and delayed**

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11. Further important symptoms and effects are so far not known.

**Indication of any immediate medical attention and special treatment needed**

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

5. Fire-Fighting Measures

**Extinguishing media**

Suitable extinguishing media: dry powder, foam

Unsuitable extinguishing media for safety reasons: carbon dioxide
Additional information:
Avoid whirling up the material/product because of the danger of dust explosion.

Special hazards arising from the substance or mixture
Hazards during fire-fighting:
- harmful vapours
- Evolution of fumes/fog. The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters
Protective equipment for fire-fighting:
- Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
Dusty conditions may ignite explosively in the presence of an ignition source causing flash fire.

6. Accidental release measures

Further accidental release measures:
- Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Avoid the formation and build-up of dust - danger of dust explosion. Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition.

Personal precautions, protective equipment and emergency procedures
- Avoid dust formation. Use personal protective clothing.

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

Methods and material for containment and cleaning up
- Nonsparking tools should be used.

7. Handling and Storage

Precautions for safe handling
- Breathing must be protected when large quantities are decanted without local exhaust ventilation.

- Closed containers should only be opened in well-ventilated areas. Avoid dust formation. Do not use any sparking tools.

- Protection against fire and explosion:
- Avoid dust formation. Take precautionary measures against static discharges.

- Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

- Dust explosion class: Dust explosion class 2 (Kst-value 200 up to 300 bar m s⁻¹).
Conditions for safe storage, including any incompatibilities
No applicable information available.

Further information on storage conditions: Keep container tightly closed and dry; store in a cool place.

8. Exposure Controls/Personal Protection

No occupational exposure limits known.

Advice on system design:
It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.

Personal protective equipment

Respiratory protection:
Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.

Hand protection:
Wear chemical resistant protective gloves.

Eye protection:
Safety glasses with side-shields.

Body protection:
Body protection must be chosen based on level of activity and exposure.

General safety and hygiene measures:
Wear protective clothing as necessary to minimize contact. Handle in accordance with good industrial hygiene and safety practice. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>powder</td>
</tr>
<tr>
<td>Odour:</td>
<td>odourless</td>
</tr>
<tr>
<td>Odour threshold:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Colour:</td>
<td>white to slightly yellow</td>
</tr>
<tr>
<td>pH value:</td>
<td>5.8 (1 %%(m), 20 - 25 °C)</td>
</tr>
<tr>
<td></td>
<td>(as aqueous suspension)</td>
</tr>
<tr>
<td>melting range:</td>
<td>80 - 86 °C</td>
</tr>
<tr>
<td></td>
<td>(1,013 hPa)</td>
</tr>
<tr>
<td>Boiling point:</td>
<td>not applicable</td>
</tr>
<tr>
<td>Sublimation point:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flash point:</td>
<td>229 °C</td>
</tr>
<tr>
<td>Flammability:</td>
<td>not highly flammable</td>
</tr>
<tr>
<td>Flash point:</td>
<td>229 °C (DIN 51758)</td>
</tr>
<tr>
<td>Boiling point:</td>
<td>not applicable (Regulation 440/2008/EC, A.10)</td>
</tr>
</tbody>
</table>
Lower explosion limit: For solids not relevant for classification and labelling.
Upper explosion limit: For solids not relevant for classification and labelling.
Autoignition: 450 °C
390 °C (BAM)
Vapour pressure: 0.000005 Pa (measured)
(20 °C)
Density: 1.17 g/cm³ (pyknometer)
(20 °C)
Relative density: No data available.
Bulk density: 300 - 1,000 kg/m³
Vapour density: No data available.
Partitioning coefficient n-octanol/water (log Pow): > 6.5 (measured)
(23 °C) (OECD Guideline 117)
Self-ignition temperature: not self-igniting
Thermal decomposition: > 220 °C
Thermal decomposition above the indicated temperature is possible. No decomposition if stored and handled as prescribed/indicated.
Viscosity, dynamic: not determined
Particle size: D50 11.6 µm (measured)
Solubility in water: < 0.0001 g/l (20 °C)
Solubility (quantitative): No data available.
Solubility (qualitative): No data available.
Molar mass: 351.49 g/mol
Evaporation rate: The product is a non-volatile solid.
Other Information: If necessary, information on other physical and chemical parameters is indicated in this section.

10. Stability and Reactivity

Reactivity
No hazardous reactions if stored and handled as prescribed/indicated.
Corrosion to metals:
Corrosive effects to metal are not anticipated.
Oxidizing properties:
not fire-propagating
Dust explosivity characteristics:
Kst: 250 m.bar/s
Revaluation 2015
Dust explosion class:
Dust explosion class 2 (Kst-value 200 up to 300 bar m s⁻¹) (St 2)
Minimum ignition energy:
No data available.
Reactions with water/air:

<table>
<thead>
<tr>
<th>Reaction with:</th>
<th>water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable gases:</td>
<td>no</td>
</tr>
<tr>
<td>Toxic gases:</td>
<td>no</td>
</tr>
<tr>
<td>Corrosive gases:</td>
<td>no</td>
</tr>
<tr>
<td>Smoke or fog:</td>
<td>no</td>
</tr>
<tr>
<td>Peroxides:</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<tr>
<td>Peroxides:</td>
<td>no</td>
</tr>
</tbody>
</table>

Formation of flammable gases:

Remarks: Forms no flammable gases in the presence of water.

Oven temperature: 220 °C
Specific decomposition gas volume: 0.04 l/kg

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

Possibility of hazardous reactions
Dust explosion hazard.

Conditions to avoid
Avoid dust formation. Avoid deposition of dust. Avoid all sources of ignition: heat, sparks, open flame. Avoid electro-static charge.

Incompatible materials
strong acids, strong bases, strong oxidizing agents

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

Thermal decomposition:
> 220 °C
Thermal decomposition above the indicated temperature is possible. No decomposition if stored and handled as prescribed/indicated.

11. Toxicological information

Primary routes of exposure
Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity
Assessment of acute toxicity: Virtually nontoxic after a single ingestion. Virtually nontoxic after a single skin contact. Virtually nontoxic by inhalation.

**Oral**  
Type of value: LD50  
Species: rat  
Value: > 7,750 mg/kg (similar to OECD guideline 401)

**Inhalation**  
Type of value: LC50  
Species: rat  
Value: > 0.4 mg/l (similar to OECD guideline 403)  
Exposure time: 4 h  
Highest concentration available for testing.

**Dermal**  
Type of value: LD50  
Species: rabbit  
Value: > 1,100 mg/kg (similar to OECD guideline 402)  
No mortality was observed.

**Assessment other acute effects**  
Assessment of STOT single:  
Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

**Irritation / corrosion**  
Assessment of irritating effects: Not irritating to eyes and skin.

**Skin**  
Species: rabbit  
Result: non-irritant  
Method: OECD Guideline 404

**Eye**  
Species: rabbit  
Result: non-irritant  
Method: OECD Guideline 405

**Sensitization**  
Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Guinea pig maximization test  
Species: guinea pig  
Result: Non-sensitizing.  
Method: OECD Guideline 406

**Aspiration Hazard**  
not applicable

**Chronic Toxicity/Effects**

**Repeated dose toxicity**  
Assessment of repeated dose toxicity: Repeated oral exposure may affect certain organs. The substance may cause damage to the liver after repeated ingestion. The substance may cause damage to the kidney after repeated ingestion.
Genetic toxicity
Assessment of mutagenicity: The substance was not mutagenic in bacteria. The substance was not mutagenic in mammalian cell culture.

Carcinogenicity
Assessment of carcinogenicity: The whole of the information assessable provides no indication of a carcinogenic effect.

Reproductive toxicity
Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The results were determined in a Screening test (OECD 421/422).

Teratogenicity
Assessment of teratogenicity: In animal studies the substance did not cause malformations. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Symptoms of Exposure
The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11. Further important symptoms and effects are so far not known.

12. Ecological Information

Toxicity
Aquatic toxicity
Assessment of aquatic toxicity:
There is a high probability that the product is not acutely harmful to aquatic organisms. No toxic effects occur within the range of solubility. May cause long-term adverse effects in the aquatic environment. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish
LC50 (96 h) > 100 mg/l, Brachydanio rerio (OECD 203; ISO 7346; 92/69/EEC, C.1, static)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. Limit concentration test only (LIMIT test). Nominal concentration.

Aquatic invertebrates
EC50 (24 h) > 100 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. Nominal concentration.

EC50 (48 h) > 0.083 mg/l, Daphnia magna (OECD Guideline 202, part 1, semistatic)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. Limit concentration test only (LIMIT test). The value meets the highest applied test concentration. No toxic effects occur within the range of solubility. The statement of the toxic effect relates to the analytically determined concentration.

Aquatic plants
EC50 (72 h) > 10 mg/l (biomass), Desmodesmus subspicatus (OECD Guideline 201, static)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. No effects at the highest test concentration. The EC50 is higher than the solubility limit. Nominal concentration.

No observed effect concentration (72 h) < 0.1 mg/l (biomass), Desmodesmus subspicatus (OECD Guideline 201, static)

The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. No effects at the highest test concentration. The EC50 is higher than the solubility limit. Nominal concentration.

EL50 (72 h) > 0.1 mg/l (growth rate), Pseudokirchneriella subcapitata (Algal growth inhibition test, static)

The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. Limit concentration test only (LIMIT test). No toxic effects occur within the range of solubility. Nominal concentration.

No observed effect concentration (72 h) 0.1 mg/l (growth rate), Pseudokirchneriella subcapitata (Algal growth inhibition test, static)

The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. Limit concentration test only (LIMIT test). No toxic effects occur within the range of solubility. Nominal concentration.

**Microorganisms/Effect on activated sludge**

**Toxicity to microorganisms**

OECD Guideline 209 aquatic activated sludge/EC20 (3 h): > 100 mg/l

Limit concentration test only (LIMIT test). Nominal concentration.

**Persistence and degradability**

**Assessment biodegradation and elimination (H2O)**

Not readily biodegradable (by OECD criteria). Poorly biodegradable.

**Elimination information**

2 - 8 % CO2 formation relative to the theoretical value (28 d) (OECD 301B; ISO 9439; 92/69/EEC, C.4-C) (aerobic, activated sludge, domestic)

**Assessment photodegradation**

After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.

**Bioaccumulative potential**

**Bioaccumulation potential**

Bioconcentration factor: 4,790 (56 d) (OECD Guideline 305 E)

Accumulation in organisms is expected.

**Mobility in soil**

**Assessment transport between environmental compartments**

The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is expected.

**Additional information**

Adsorbable organically-bound halogen (AOX):
This product contains no organically-bound halogen.

Other ecotoxicological advice:
Must not be discharged into the environment.

13. Disposal considerations

Waste disposal of substance:
Do not discharge into drains/surface waters/groundwater. Dispose of in accordance with national, state and local regulations.

Container disposal:
Dispose of in accordance with national, state and local regulations. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

RCRA: None

14. Transport Information

Land transport
USDOT
Not classified as a dangerous good under transport regulations

Sea transport
IMDG
Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO
Not classified as a dangerous good under transport regulations

15. Regulatory Information

Federal Regulations

Registration status:
Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Chronic; Fire (Combustible Dust)

NFPA Hazard codes:
Health : 1 Fire: 3 Reactivity: 0 Special:

HMIS III rating
Health: 1 Flammability: 3 Physical hazard: 0

16. Other Information

SDS Prepared by:
We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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END OF DATA SHEET