

## TYZOR® TPT-20B

### 1. Product and company identification

|                              |                                                                                                                                                                                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product name</b>          | : TYZOR® TPT-20B                                                                                                                                                                                                                                           |
| <b>Synonym</b>               | : Butoxyisopropoxytitanium; Titanium, (butyl alcohol, isopropyl alcohol) complexes                                                                                                                                                                         |
| <b>Material uses</b>         | : <input checked="" type="checkbox"/> Catalysts/Cross-linking agent./Adhesion promoters                                                                                                                                                                    |
| <b>Supplier/Manufacturer</b> | : DORF KETAL SPECIALTY CATALYSTS LLC<br>11200 WESTHEIMER ROAD, SUITE 400<br>HOUSTON, TEXAS 77042<br>U.S.A.<br>Telephone no.: +1-713-343-2377<br>Fax no.: +1-832-649-7615<br>ehss@dorketal.com                                                              |
| <b>Validation date</b>       | : 04/04/2013.                                                                                                                                                                                                                                              |
| <b>Prepared by</b>           | : Atrion International Inc.                                                                                                                                                                                                                                |
| <b>In case of emergency</b>  | : For Chemical Emergency ONLY (in the case of fire, leak, spill, exposure or accident) call CHEMTREC at +1 (703) 527-3887 3887 or CHEMTREC India at 000-800-100-7141.<br>For ALL other emergencies call DORF KETAL Emergency Control Room +91 22-65271001. |

### 2. Hazards identification

|                                                |                                                                                                                                                                                                                                                                     |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Physical state</b>                          | : Liquid. [Clear.]                                                                                                                                                                                                                                                  |
| <b>Color</b>                                   | : Colorless to light yellow.                                                                                                                                                                                                                                        |
| <b>Odor</b>                                    | : Alcohol-like.                                                                                                                                                                                                                                                     |
| <b><u>Emergency overview</u></b>               |                                                                                                                                                                                                                                                                     |
| <b>Signal word</b>                             | : WARNING!                                                                                                                                                                                                                                                          |
| <b>Hazard statements</b>                       | : COMBUSTIBLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.                                                                                                      |
| <b>Precautions</b>                             | : Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapor or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. |
| <b>OSHA/HCS status</b>                         | : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).                                                                                                                                                               |
| <b>Routes of entry</b>                         | : <input checked="" type="checkbox"/> Dermal contact. Eye contact. Inhalation. Ingestion.                                                                                                                                                                           |
| <b><u>Potential acute health effects</u></b>   |                                                                                                                                                                                                                                                                     |
| <b>Inhalation</b>                              | : Irritating to respiratory system.                                                                                                                                                                                                                                 |
| <b>Ingestion</b>                               | : No known significant effects or critical hazards.                                                                                                                                                                                                                 |
| <b>Skin</b>                                    | : Irritating to skin.                                                                                                                                                                                                                                               |
| <b>Eyes</b>                                    | : Severely irritating to eyes. Risk of serious damage to eyes.                                                                                                                                                                                                      |
| <b><u>Potential chronic health effects</u></b> |                                                                                                                                                                                                                                                                     |
| <b>Chronic effects</b>                         | : Contains material that may cause target organ damage, based on animal data.                                                                                                                                                                                       |
| <b>Carcinogenicity</b>                         | : No known significant effects or critical hazards.                                                                                                                                                                                                                 |
| <b>Mutagenicity</b>                            | : No known significant effects or critical hazards.                                                                                                                                                                                                                 |
| <b>Teratogenicity</b>                          | : No known significant effects or critical hazards.                                                                                                                                                                                                                 |
| <b>Developmental effects</b>                   | : No known significant effects or critical hazards.                                                                                                                                                                                                                 |

## 2. Hazards identification

- Fertility effects** : No known significant effects or critical hazards.
- Target organs** : Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes.

### Over-exposure signs/symptoms

- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing
- Ingestion** : No specific data.
- Skin** : Adverse symptoms may include the following:  
irritation  
redness
- Eyes** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

## 3. Composition/information on ingredients

| Name                         | CAS number | %      |
|------------------------------|------------|--------|
| titanium tetraisopropanolate | 546-68-9   | 60-100 |
| titanium tetrabutanolate     | 5593-70-4  | 10-30  |

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

## 4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

## 5. Fire-fighting measures

- Flammability of the product** : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.
- Extinguishing media**
- Suitable** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on explosion hazards** : Air/vapor mixtures may be explosive.

## 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## 7. Handling and storage

### Handling

- Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

### Storage

- Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Moisture-sensitive material. Once opened, a part container should be kept under nitrogen blanketing to prevent decomposition.

## 8. Exposure controls/personal protection

### United States

No exposure limit value known.

#### Consult local authorities for acceptable exposure limits.

### Recommended monitoring procedures

- If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

### Engineering measures

- Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

### Hygiene measures

- Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

### Personal protection

#### Respiratory

- Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## 8. Exposure controls/personal protection

- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## 9. Physical and chemical properties

- Physical state** : Liquid. [Clear.]
- Flash point** : Closed cup: 42°C (107.6°F) [Pensky-Martens.]
- Color** : Colorless to light yellow.
- Odor** : Alcohol-like.
- Relative density** : 0.965 [25 °C]
- Viscosity** : Not available.

## 10. Stability and reactivity

- Chemical stability** : The product is stable.
- Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
- Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials. Hydrolyzes in water to form 2-propanol and titanium dioxide.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Under normal conditions of storage and use, hazardous polymerization will not occur.

## 11. Toxicological information

### Acute toxicity

| Product/ingredient name      | Result                          | Species | Dose         | Exposure |
|------------------------------|---------------------------------|---------|--------------|----------|
| titanium tetraisopropanolate | LC50 Inhalation Dusts and mists | Rat     | 7.78 mg/l    | 4 hours  |
|                              | LD50 Dermal                     | Rabbit  | >16000 mg/kg | -        |
|                              | LD50 Oral                       | Rat     | 7500 mg/kg   | -        |
| titanium tetrabutanolate     | LD50 Oral                       | Rat     | 3122 mg/kg   | -        |

### Chronic toxicity

## 11. Toxicological information

Not available.

### Irritation/Corrosion

| Product/ingredient name      | Result                   | Species | Score | Exposure | Observation |
|------------------------------|--------------------------|---------|-------|----------|-------------|
| Titanium tetraisopropanolate | Eyes - Moderate irritant | Rabbit  | -     | -        | -           |
|                              | Skin - Mild irritant     | Rabbit  | -     | -        | -           |

### Sensitizer

Not available.

### Carcinogenicity

#### Classification

Not available.

### Mutagenicity

Not available.

### Teratogenicity

Not available.

### Reproductive toxicity

Not available.

## 12. Ecological information

**Ecotoxicity** : No known significant effects or critical hazards.

### Aquatic ecotoxicity

Not available.

### Persistence/degradability

Not available.

**Other adverse effects** : No known significant effects or critical hazards.




## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Disposal should be in accordance with applicable regional, national and local laws and regulations.**

**Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.**

## 14. Transport information

| Regulatory information    | UN number | Proper shipping name                                                               | Classes | PG* | Label                                                                               | Additional information                                                                                                                                                                                                                                                                              |
|---------------------------|-----------|------------------------------------------------------------------------------------|---------|-----|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DOT Classification</b> | UN1993    | Flammable liquids, n.o.s. (titanium tetraisopropanolate, titanium tetrabutanolate) | 3       | III |  | <b>Limited quantity</b><br>Yes.<br><br><b>Packaging instruction</b><br><b>Passenger aircraft</b><br>Quantity limitation: 60 L<br><br><b>Cargo aircraft</b><br>Quantity limitation: 220 L<br><br><b>Special provisions</b><br>B1, B52, IB3, T4, TP1, TP29                                            |
| <b>IMDG Class</b>         | UN1993    | FLAMMABLE LIQUID, N.O.S. (titanium tetraisopropanolate, titanium tetrabutanolate)  | 3       | III |  | <b>Emergency schedules (EmS)</b><br>F-E, _S-E_                                                                                                                                                                                                                                                      |
| <b>IATA-DGR Class</b>     | UN1993    | Flammable liquid, n.o.s. (titanium tetraisopropanolate, titanium tetrabutanolate)  | 3       | III |  | <b>Passenger and Cargo Aircraft</b> Quantity limitation: 60 L<br>Packaging instructions: 355<br><b>Cargo Aircraft Only</b><br>Quantity limitation: 220 L<br>Packaging instructions: 366<br><b>Limited Quantities - Passenger Aircraft</b> Quantity limitation: 10 L<br>Packaging instructions: Y344 |

PG\* : Packing group

## 15. Regulatory information

- HCS Classification** : Combustible liquid  
Irritating material  
Target organ effects
- U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined  
**United States inventory (TSCA 8b)**: All components are listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances**: No products were found.  
**SARA 302/304 emergency planning and notification**: No products were found.  
**SARA 302/304/311/312 hazardous chemicals**: titanium tetraisopropanolate  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**:  
 titanium tetraisopropanolate: Fire hazard, Immediate (acute) health hazard; titanium tetrabutanolate: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard  
**Clean Air Act (CAA) 112 accidental release prevention**: No products were found.
- Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed
- Clean Air Act Section 602 Class I Substances** : Not listed



## 15. Regulatory information

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 313

**Form R - Reporting requirements** : Not applicable.

**Supplier notification** : Not applicable.

### State regulations

**Massachusetts** : None of the components are listed.

**New York** : None of the components are listed.

**New Jersey** : None of the components are listed.

**Pennsylvania** : None of the components are listed.

### California Prop. 65

None of the components are listed.

**United States inventory (TSCA 8b)** : All components are listed or exempted.

**Canada inventory** : ☒ All components are listed or exempted.

### International regulations

**International lists** : ☒ **Australia inventory (AICS)**: All components are listed or exempted.  
**China inventory (IECSC)**: All components are listed or exempted.  
**Japan inventory**: All components are listed or exempted.  
**Korea inventory**: All components are listed or exempted.  
**Malaysia Inventory (EHS Register)**: Not determined.  
**New Zealand Inventory of Chemicals (NZIoC)**: All components are listed or exempted.  
**Philippines inventory (PICCS)**: All components are listed or exempted.  
**Taiwan inventory (CSNN)**: Not determined.

**Chemical Weapons Convention List Schedule I Chemicals** : Not listed

**Chemical Weapons Convention List Schedule II Chemicals** : Not listed

**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

## 16. Other information

**Label requirements** : COMBUSTIBLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

**Hazardous Material Information System (U.S.A.)** :

Health

\*

2



## 16. Other information

|                  |   |
|------------------|---|
| Flammability     | 2 |
| Physical hazards | 0 |
|                  |   |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection :  
Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Date of issue : 04/04/2013.

Date of previous issue : 09/07/2011.

Version : 1.01

Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.