

## Safety Data Sheet

Conforms to OSHA Hazard Communication Standard (HCS)  
29CFR 1910.1200

Printing date 02/05/2015



Version number 1

Reviewed on 02/05/2015

## 1 Identification of the Substances/Preparation and of the Company/Undertaking

- **Product identifier**
- **Product name:** TYZOR® ET
- **Relevant identified uses of the substance or mixture and uses advised against**  
Industrial use as formulation of Coatings and paints, thinners, paint removers ; Esterification and transesterification processes; Fuels ; Polymer preparations and compounds . Not for consumer application.
- **Application of the substance / the mixture** Catalysts/Cross-linking agent
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**  
Dorf Ketal Specialty Catalysts LLC  
11200 Westheimer Road  
Suite 400  
Houston, Texas 77042  
Phone= +1 713 343 2377  
Fax= +1 832 649 7615  
Email: ehss@dorketal.com
- **Emergency telephone number:**  
For Chemical Emergency ONLY (spill, leak, fire, exposure or accident) call Chemtrec at +1 (703) 527 3887 or Chemtrec India at 000-800-100-7141. DORF KETAL Emergency Control Room +91 22-65271001.

## 2 Hazard(s) identification

- **Classification of the substance or mixture**  
Flam. Liq. 3 H226 Flammable liquid and vapour.  
Eye Irrit. 2A H319 Causes serious eye irritation.
- **OSHA/HCS status**  
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
- **Label elements**
- **GHS label elements**  
The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**  

  
 GHS02 GHS07
- **Signal word** Warning
- **Hazard-determining components of labeling:**  
titanium(4+) ethanolate
- **Hazard statements**  
Flammable liquid and vapour.  
Causes serious eye irritation.
- **Precautionary statements**  
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
Wear protective gloves/protective clothing/eye protection/face protection.

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If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

If eye irritation persists: Get medical advice/attention.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**

HEALTH	1	Health = 1
FIRE	2	Fire = 2
REACTIVITY	0	Reactivity = 0

· **Other hazards**

The criteria for PBT and vPvB is not met and this product is not hazardous to the ozone layer.

## 3 Composition/information on ingredients

· **Chemical characterization: Substance**

· **Dangerous components:**

3087-36-3	titanium(4+) ethanolate	Flam. Liq. 3, H226 Eye Irrit. 2A, H319	> 60%
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## 4 First-aid measures

· **Description of first aid measures**

· **General information:**

Take affected persons out into the fresh air.

Do not leave affected persons unattended.

· **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.

· **Skin Contact:**

Immediately rinse with water.

If skin irritation continues, consult a doctor.

Remove contaminated clothing and shoes.

Wash clothing before reuse.

Clean shoes thoroughly before reuse.

· **Eye Contact:**

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.

Check for and remove any contact lenses.

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Rinse opened eye for several minutes under running water. Then consult a doctor.

- **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.

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

Causes serious eye irritation

Pain or irritation

Redness and Watering

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

No further relevant information available.

### 5 Fire-fighting measures

- **Extinguishing media** In case of fire use the following suitable extinguishing agent.

- **Suitable extinguishing agents:**

Foam

Fire-extinguishing powder

Alcohol resistant foam

Carbon dioxide

- **For safety reasons unsuitable extinguishing agents:**

Water with full jet

Water spray

- **Special hazards arising from the substance or mixture**

Flammable liquid and vapour.

In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

In case of fire, the following can be released:

Carbon monoxide (CO)

Carbon dioxide

Metal oxides

- **Advice for firefighters**

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.

- **Protective equipment:**

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

### 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Wear protective clothing.

Keep away from ignition sources

Ensure adequate ventilation

Wear protective equipment. Keep unprotected persons away.

Use respiratory protective device against the effects of fumes/dust/aerosol.

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- **Environmental precautions:**

Do not allow product to reach sewage system or any water course.  
Inform respective authorities in case of seepage into water course or sewage system.

- **Methods and material for containment and cleaning up:**

Stop leak if without risk.  
Move containers from spill area.  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Ensure adequate ventilation.  
Do not flush with water or aqueous cleansing agents

## 7 Handling and storage

- **Precautions for safe handling**

Put on appropriate personal protective equipment .  
Do not ingest.  
Avoid contact with eyes, skin and clothing.  
Avoid breathing vapour or mist.  
Ensure good ventilation/exhaustion at the workplace.  
Prevent formation of aerosols.

- **Information about protection against explosions and fires:**

Keep ignition sources away - Do not smoke.  
Protect against electrostatic charges.

- **Conditions for safe storage, including any incompatibilities**

- **Requirements to be met by storerooms and receptacles:**

Avoid storage near extreme heat, ignition sources or open flame.

- **Information about storage in one common storage facility:**

Store away from oxidizing agents.  
Store away from foodstuffs.

- **Further information about storage conditions:**

Moisture-sensitive material. Once opened, container should be kept under nitrogen blanketing to prevent decomposition.  
Keep receptacle tightly sealed.  
Protect from heat and direct sunlight.

- **Specific end use(s)** No further relevant information available.

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## 8 Exposure controls/personal protection

- **Control parameters**

- **Components with limit values that require monitoring at the workplace:**

No exposure limit value known.

- **Exposure controls**

- **Appropriate engineering controls:**

If there are no applicable exposure limit requirement or guidelines, general ventilation should be sufficient for most operations.

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Use local exhaust ventilation or other engineering control to maintain airborne levels below exposure limit requirement or guidelines.

Local exhaust ventilation may be necessary for some operations.

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

· **Breathing equipment:**

Regarding use of the substance in the use applications, respiratory protection is not required to keep the exposure via inhalation at acceptable level.

· **Protection of hands:**

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves** Gloves: EN374. Gloves should be worn when there is potential for dermal exposure

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**

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.



Tightly sealed goggles

· **Body protection:** Protective work clothing

## 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

**Form:**

Liquid

**Color:**

Light yellow

· **Odor:**

Alcohol-like

· **Odour threshold:**

No data available.

· **pH-value:**

No data available

· **Melting point/Freezing Point :**

-75 °C (-103 °F) (OECD 102)

· **Boiling point/Boiling range:**

Substance decomposes before boiling (OECD 103). 351.44 K at 101.3 kPa (BP of main degradation product, ethanol, used for CSA)

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· <b>Flash point:</b>	42 - 43 °C (108 - 109 °F) (ASTM-D 93)
· <b>Flammability (solid, gaseous):</b>	Not applicable.
· <b>Decomposition temperature:</b>	No data available.
· <b>Auto ignition temperature</b>	Auto ignition temperature of the critical decomposition product ethanol is 363 °C at 1013 hPa
· <b>Explosion limits:</b> <b>Lower:</b> <b>Upper:</b>	not applicable (Substance non-explosive) not applicable (Substance non-explosive)
· <b>Oxidizing properties</b>	No
· <b>Vapor pressure:</b>	Substance decomposes during vapour pressure testing (OECD 104). 57.26 hPa at 19.6 °C (read across data of hydrolysing product ethanol)
· <b>Relative density at 25 °C (77 °F)</b>	1.109 g/cm <sup>3</sup> (9.255 lbs/gal) (ASTM D 891)
· <b>Vapour density</b>	No data available
· <b>Evaporation rate</b>	No data available
· <b>Solubility(water):</b>	Testing is not technically feasible as substance is hydrolytically unstable. 789000 mg/L at 20 °C (water solubility of degradation product ethanol)
· <b>Partition coefficient (n-octanol/water):</b>	Hydrolytically unstable, Log Kow (Pow): -0.3 at 25 °C for hydrolysing product ethanol released in water
· <b>Viscosity:</b> <b>Dynamic:</b>  <b>Kinematic:</b>	50 mPas at 25 °C (DKTM-112.1) (viscosity of main degradation product ethanol is 1.17 mPas) No data available.

## 10 Stability and reactivity

### · **Reactivity**

Under normal conditions of storage and use, hazardous reactions will not occur.

Water reactive, complete hydrolysis will take place with no significant reaction products other n-butanol and hydrated titanium dioxide when comes in contact with water or moisture

· **Chemical stability** The product is stable under storage at normal ambient temperature.

### · **Possibility of hazardous reactions**

Under normal conditions of storage and use, hazardous reactions are not known.

### · **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:

Acids

Oxidizing material

Hydrolyses in water to form ethanol and titanium oxides

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· **Hazardous decomposition products:**

Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
Hydrolyzes in water to form ethanol.  
When heated to decomposition hydrocarbons, carbon monoxide, carbon dioxide may be produced.

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## 11 Toxicological information

· **Information on toxicological effects**

There is no experimental data available on toxicokinetics and the assessment has been made qualitatively on the basis of the physical and chemical properties and other relevant data obtained from the degradation products. As the substance is hydrolyzed, the hazardous degradation product is metabolized and excreted rapidly.

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**3087-36-3 titanium(4+) ethanolate**

Dermal	LD50	No study available
Oral	LD50	> 2000 mg/kg (Rat)
Inhalative	LC50	14000 mg/m <sup>3</sup> (Mouse)

· **Primary irritant effect:**

· **on the skin:** No irritating effect.

· **on the eye:** Irritating effect.

· **Respiratory/ Skin sensitization:** Not sensitising

· **Germ cell mutagenicity:** No adverse effect observed. Negative

· **Carcinogenicity:** Substance has not been classified for carcinogenicity

· **Reproductive toxicity:** Substance is not classified for reproductive toxicity.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

None of the ingredients are listed.

· **NTP (National Toxicology Program)**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients are listed.

· **Single dose toxicity:** No data available

· **Repeated Dose toxicity:** No adverse effect observed.

· **Aspiration hazard:** Substance is not classified for aspiration hazard.

· **Other relevant information:** No data available

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### 12 Ecological information

- **Toxicity**

Substance is not classified as dangerous to aquatic organisms. Because this substance hydrolysis rapidly the intrinsic ecotoxicological properties are related to the most critical decomposition product ethanol.

- **Aquatic toxicity:**

#### 3087-36-3 titanium(4+) ethanolate

EC10 (72h)	11.5 mg /l (Algae)
EC50 (72h)	275 mg /l (Algae)
LC50	5800 mg/l (Micro-organisms)
LC50 (48h)	5012 mg /l (Daphnia)
LC50 (96 h)	14200 mg/l (Fish)
NOEC (10-d)	9.6 mg/l (Daphnia)

- **Persistence and degradability**

Readily degradable. Main organic decomposition product (ethanol) is readily biodegradable; . No persistence potential.(half-life is < 5 minutes, OECD 111)

- **Bioaccumulative potential**

No potential for bioaccumulation. Substance hydrolysis rapidly resulting the decomposition products which are readily biodegradable (ethanol) and non-bioaccumulative (hydrated titanium oxides). (OECD Guideline111)

- **Mobility in soil**

High mobility in soil based on high water solubility and estimated Koc 1.045 L/kg of degradation product ethanol.

- **Results of PBT and vPvB assessment** The substance is not a PBT or a vPvB

- **Other adverse effects** No further relevant information available.

### 13 Disposal Information

- **Waste treatment methods**

The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed off in a safe way. Dispose off surplus and non-recyclable products via a licensed waste disposal contractor. 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.

### 14 Transport information

- **UN-Number**

- **DOT, ADR, IMDG, IATA**

UN1993

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· <b>UN proper shipping name</b>	
· <b>DOT</b>	Flammable liquids, n.o.s. (Contains titanium(4+) ethanolate)
· <b>ADR</b>	1993 Flammable liquids, n.o.s. (Contains titanium(4+) ethanolate), special provision 640E
· <b>IMDG, IATA</b>	FLAMMABLE LIQUID, N.O.S. (Contains titanium(4+) ethanolate)
· <b>Transport hazard class(es)</b>	
· <b>DOT</b>	
	
· <b>Class</b>	3 Flammable liquids
· <b>Label</b>	3
· <b>ADR</b>	
	
· <b>Class</b>	3 (F1) Flammable liquids
· <b>Label</b>	3
· <b>IMDG, IATA</b>	
	
· <b>Class</b>	3 Flammable liquids
· <b>Label</b>	3
· <b>Packing group</b>	
· <b>DOT, ADR, IMDG, IATA</b>	III
· <b>Environmental hazards:</b>	
· <b>Marine pollutant:</b>	No
· <b>Special precautions for user</b>	Warning: Flammable liquids
· <b>Danger code (Kemler):</b>	30
· <b>EMS Number:</b>	F-E, <u>S-E</u>
· <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.

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· **Transport/Additional information:**

· **IMDG**

· **Limited quantities (LQ)**

5L

## 15 Regulatory information

· **Sara**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH)**

None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients are listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

## 16 Other information

File name: TYZOR ET SDS US en FEB-05-2015

Superseded SDS date: Not applicable

Change history: Not applicable

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**· Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)  
IMDG: International Maritime Code for Dangerous Goods  
IATA: International Air Transport Association  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
EINECS: European Inventory of Existing Commercial Chemical Substances  
ELINCS: European List of Notified Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
DNEL: Derived No-Effect Level (REACH)  
PNEC: Predicted No-Effect Concentration (REACH)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent  
APF = Assigned protection factor  
PBT: Persistent, Bioaccumulative and Toxic  
vPvB: very Persistent and very Bioaccumulative  
IOELV: Indicative Occupational Exposure Limit Values  
Flam. Liq. 3: Flammable liquids, Hazard Category 3  
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A

**· Disclaimer:**

The data and recommendations presented in this data sheet concerning the use of our product and the materials contain there in are believed to be accurate and are based on information which is considered reliable as of the date hereof. However, the customer should determine the suitability of much material for his purpose before adopting them on a commercial scale. Since the use our product by others is beyond our control, no guarantee, express or implied, is made and no responsibility assumed for the use of this material or the results to be obtained there from. Information on this document is furnished for the purpose of compliance with Government Health and Safety Regulations and shall not be used for any other purposes. Moreover, the recommendations contained in this Safety Data Sheet are not to be constructed as a license to operate under, or a recommendation to infringe, any existing patents, nor should they be confused with state, municipal or insurance requirements, or with national safety codes.