SAFETY DATA SHEET
TITANIUM PUTTY (Ti) HARDENER.

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

1.1. Product identifier
Product name TITANIUM PUTTY (Ti) HARDENER.
Product number X0018

1.2. Relevant identified uses of the substance or mixture and uses advised against
Identified uses Hardener.

1.3. Details of the supplier of the safety data sheet
Supplier
ITW Performance Polymers
Bay 150
Shannon Industrial Estate
Co. Clare
Ireland
V14 DF82
353(61)771500
353(61)471285
mail@itwpp.com

1.4. Emergency telephone number
Emergency telephone +44(0)1235 239 670 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification (EC 1272/2008)
Physical hazards Not Classified
Health hazards Acute Tox. 4 - H302 Acute Tox. 4 - H332 Skin Corr. 1B - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317 Muta. 2 - H341
Environmental hazards Not Classified

2.2. Label elements
Pictogram

Signal word Danger
Hazard statements
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H341 Suspected of causing genetic defects.
H302+H332 Harmful if swallowed or if inhaled.
TITANIUM PUTTY (Ti) HARDENER.

Precautionary statements

P261 Avoid breathing vapour/spray.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing.
Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Contains

TRIETHYLENETETRAMINE, PHENOL, 2-ETHYL-4-METHYLIMIDAZOLE

Supplementary precautionary statements

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe vapour/spray.
P264 Wash contaminated skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P352 IF ON SKIN: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER/doctor if you feel unwell.
P321 Specific treatment (see medical advice on this label).
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.
P363 Wash contaminated clothing before reuse.
P405 Store locked up.
P501 Dispose of contents/container in accordance with national regulations.

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

<table>
<thead>
<tr>
<th>TRIETHYLENETETRAMINE</th>
<th>5-10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 112-24-3</td>
<td>EC number: 203-950-6</td>
</tr>
<tr>
<td></td>
<td>REACH registration number: 01-2119487919-13-0000</td>
</tr>
</tbody>
</table>

Classification

Acute Tox. 4 - H312
Skin Corr. 1B - H314
Eye Dam. 1 - H318
Skin Sens. 1 - H317
Aquatic Chronic 3 - H412
## TITANIUM PUTTY (Ti) HARDENER.

<table>
<thead>
<tr>
<th>PHENOL</th>
<th>5-10%</th>
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<tbody>
<tr>
<td>CAS number: 108-95-2</td>
<td>EC number: 203-632-7</td>
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</tbody>
</table>

**Classification**
- Acute Tox. 3 - H301
- Acute Tox. 3 - H311
- Acute Tox. 3 - H331
- Skin Corr. 1B - H314
- Eye Dam. 1 - H318
- Muta. 2 - H341
- STOT RE 2 - H373

<table>
<thead>
<tr>
<th>2-ETHYL-4-METHylimidazole</th>
<th>1-5%</th>
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</thead>
<tbody>
<tr>
<td>CAS number: 931-36-2</td>
<td></td>
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</table>

**Classification**
- Acute Tox. 4 - H302
- Skin Irrit. 2 - H315
- Eye Dam. 1 - H318
- Skin Sens. 1B - H317

<table>
<thead>
<tr>
<th>TITANIUM DIOXIDE</th>
<th>1-5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 13463-67-7</td>
<td>EC number: 236-675-5</td>
</tr>
<tr>
<td></td>
<td>REACH registration number: 01-2119489379-17-0000</td>
</tr>
</tbody>
</table>

**Classification**
- Not Classified

<table>
<thead>
<tr>
<th>4-methylimidazole</th>
<th>&lt;1%</th>
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</thead>
<tbody>
<tr>
<td>CAS number: 822-36-6</td>
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</tr>
</tbody>
</table>

**Classification**
- Acute Tox. 4 - H302
- Acute Tox. 3 - H311
- Skin Corr. 1B - H314
- Eye Dam. 1 - H318
- Carc. 2 - H351

The full text for all hazard statements is displayed in Section 16.

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

**General information**
Avoid contact with skin and eyes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**Inhalation**
Move affected person to fresh air at once. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention if any discomfort continues.

**Ingestion**
Rinse mouth thoroughly with water. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention.
TITANIUM PUTTY (Ti) HARDENER.

Skin contact
Remove affected person from source of contamination. Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing.

Eye contact
Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes and get medical attention. Get medical attention if irritation persists after washing.

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

General information
The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

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

Notes for the doctor
No specific recommendations. If in doubt, get medical attention promptly.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Extinguish with foam, carbon dioxide or dry powder.

5.2. Special hazards arising from the substance or mixture
Specific hazards
Irritating gases or vapours.

5.3. Advice for firefighters
Protective actions during firefighting
Avoid breathing fire gases or vapours. Keep up-wind to avoid fumes. Do not use water jet as an extinguisher, as this will spread the fire. Control run-off water by containing and keeping it out of sewers and watercourses.

Special protective equipment for firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Personal precautions
Wear protective clothing as described in Section 8 of this safety data sheet. Provide adequate ventilation. Use suitable respiratory protection if ventilation is inadequate. No smoking, sparks, flames or other sources of ignition near spillage. Avoid contact with skin and eyes.

6.2. Environmental precautions
Environmental precautions
Avoid or minimise the creation of any environmental contamination. Do not discharge into drains or watercourses or onto the ground. Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up
Absorb spillage with sand or other inert absorbent. Collect and place in suitable waste disposal containers and seal securely. Containers with collected spillage must be properly labelled with correct contents and hazard symbol.

6.4. Reference to other sections
Reference to other sections
Wear protective clothing as described in Section 8 of this safety data sheet.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
TITANIUM PUTTY (Ti) HARDENER.

Usage precautions
Use only in well-ventilated areas. Handle and open container with care. Keep away from heat, sparks and open flame. Do not eat, drink or smoke when using the product. Do not use in confined spaces without adequate ventilation and/or respirator. Good personal hygiene procedures should be implemented.

7.2. Conditions for safe storage, including any incompatibilities
Storage precautions
Store in tightly-closed, original container in a dry, cool and well-ventilated place. Store away from incompatible materials (see Section 10).

7.3. Specific end use(s)
Specific end use(s)
The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters
Occupational exposure limits
PHENOL
Long-term exposure limit (8-hour TWA): WEL 2 ppm(Sk)
Short-term exposure limit (15-minute): WEL
TITANIUM DIOXIDE
Long-term exposure limit (8-hour TWA): 10 mg/m³ total dust
WEL = Workplace Exposure Limit

Ingredient comments
WEL = Workplace Exposure Limits

TRIETHYLENETETRAMINE (CAS: 112-24-3)

DNEL
Workers - Inhalation; Long term systemic effects: 1 mg/m³
Workers - Inhalation; Short term systemic effects: 5380 mg/m³
Workers - Dermal; Long term systemic effects: 0.57 mg/kg/day

8.2. Exposure controls
Protective equipment
Appropriate engineering controls
Provide adequate general and local exhaust ventilation.

Eye/face protection
Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. The following protection should be worn: Chemical splash goggles. Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses. Personal protective equipment for eye and face protection should comply with European Standard EN166.

Hand protection
Wear protective gloves made of the following material: Rubber or plastic. It is recommended that gloves are made of the following material: Butyl rubber. To protect hands from chemicals, gloves should comply with European Standard EN374. The selected gloves should have a breakthrough time of at least 8 hours.

Other skin and body protection
Wear apron or protective clothing in case of contact.
TITANIUM PUTTY (Ti) HARDENER.

Hygiene measures

Provide eyewash station and safety shower. Keep away from food, drink and animal feeding stuffs. Good personal hygiene procedures should be implemented. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Do not eat, drink or smoke when using the product.

Respiratory protection

If ventilation is inadequate, suitable respiratory protection must be worn. Respirator selection must be based on exposure levels, the hazards of the product and the safe working limits of the selected respirator. Check that the respirator fits tightly and the filter is changed regularly. Wear a respirator fitted with the following cartridge: Gas filter, type A2. Half mask and quarter mask respirators with replaceable filter cartridges should comply with European Standard EN140.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Paste</td>
</tr>
<tr>
<td>Colour</td>
<td>White/off-white</td>
</tr>
<tr>
<td>Odour</td>
<td>Amine</td>
</tr>
<tr>
<td>pH (concentrated solution)</td>
<td>9.75 @ 20 ºC</td>
</tr>
<tr>
<td>Melting point</td>
<td>n/d°C</td>
</tr>
<tr>
<td>Initial boiling point and range</td>
<td>&gt;177°C @</td>
</tr>
<tr>
<td>Flash point</td>
<td>136°C</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>&lt;0.01 mmHg @ ºC</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.78 @ 20 ºC</td>
</tr>
<tr>
<td>Solubility</td>
<td>Slightly soluble in water.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>640-1600 Pa s @ 25°C</td>
</tr>
</tbody>
</table>

9.2. Other information

Other information Not available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Acids. Strong oxidising agents.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Not available.

10.4. Conditions to avoid

Conditions to avoid Avoid heat, flames and other sources of ignition. Avoid excessive heat for prolonged periods of time. Avoid exposure to high temperatures or direct sunlight.

10.5. Incompatible materials

Materials to avoid Avoid contact with the following materials: Strong oxidising agents. Strong acids. Chlorinated hydrocarbons.

10.6. Hazardous decomposition products
TITANIUM PUTTY (Ti) HARDENER.

Hazardous decomposition products
Fire or high temperatures create: Nitrous gases (NOx). Oxides of the following substances: Carbon monoxide (CO). Carbon dioxide (CO2). Vapours/gases/fumes of: Ammonia or amines.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral
ATE oral (mg/kg) 1,402.76

Acute toxicity - dermal
ATE dermal (mg/kg) 3,391.95

Acute toxicity - inhalation
ATE inhalation (gases ppm) 11,312.22
ATE inhalation (vapours mg/l) 48.48
ATE inhalation (dusts/mists mg/l) 8.08

Inhalation
Irritating to respiratory system. May cause sensitisation by inhalation.

Ingestion
Harmful if swallowed.

Skin contact
Irritating to skin. Harmful in contact with skin. May cause sensitisation by skin contact.

Eye contact
Irritating to eyes.

Acute and chronic health hazards
Causes burns.

Route of entry
Inhalation Skin absorption Ingestion.

Target organs
Prolonged or repeated exposure may cause the following adverse effects: May cause damage to the liver and kidneys. Respiratory system, lungs Central nervous system

SECTION 12: Ecological information

Ecotoxicity
Avoid release to the environment.

12.1. Toxicity

Toxicity
Not considered toxic to fish.

12.2. Persistence and degradability

Persistence and degradability
Phenol: Biological degradability % : 99.5 %.

12.3. Bioaccumulative potential

Bioaccumulative potential
No data available on bioaccumulation.

12.4. Mobility In soil

Mobility
Do not discharge into drains or watercourses or onto the ground.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment
This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects
TITANIUM PUTTY (Ti) HARDENER.

Other adverse effects
Not available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information
When handling waste, the safety precautions applying to handling of the product should be considered.

Disposal methods
Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

Waste class
08 04 99

SECTION 14: Transport information

General
No other information known.

14.1. UN number
UN No. (ADR/RID) 1760
UN No. (IMDG) 1760
UN No. (ICAO) 1760

14.2. UN proper shipping name
Proper shipping name (ADR/RID) CORROSIVE LIQUID, N.O.S. (TRIETHYLENETETRAMINE, 1-METHYLMIDAZOLE)
Proper shipping name (IMDG) CORROSIVE LIQUID, N.O.S. (TRIETHYLENETETRAMINE, 1-METHYLMIDAZOLE)
Proper shipping name (ICAO) CORROSIVE LIQUID, N.O.S. (TRIETHYLENETETRAMINE, 1-METHYLMIDAZOLE)

14.3. Transport hazard class(es)
ADR/RID class 8
ADR/RID label 8
IMDG class 8
ICAO class/division 8

Transport labels

14.4. Packing group
ADR/RID packing group III
IMDG packing group III
ICAO packing group III

14.5. Environmental hazards
Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user
TITANIUM PUTTY (Ti) HARDENER.

EmS  F-A, S-B
Emergency Action Code  2X
Hazard Identification Number (ADR/RID)  80
Tunnel restriction code  (E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
No information required.

SECTION 15: Regulatory information

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

15.2. Chemical safety assessment
No chemical safety assessment has been carried out.

SECTION 16: Other information

Revision date  04/04/2018
Revision  19
Supersedes date  25/04/2017
Hazard statements in full
H301 Toxic if swallowed.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H332 Harmful if inhaled.
H341 Suspected of causing genetic defects.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.
H412 Harmful to aquatic life with long lasting effects.

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.