1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: TSM CONDITIONER

COMPANY: ESI Technology Ltd
Sensor House
Wrexham Technology Park
Wrexham
LL13 7YP

Tel: +44 (0) 1978 262 255
Fax: +44 (0) 1978 262 233

E-mail: sales@esi-tec.com
Web: www.esi-tec.com

RECOMMENDED USE: Surface treatment of metal objects

RESTRICTION FOR USE: None

2: HAZARDOUS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS HAZARD CLASSIFICATION
Met. Corr. 1; May be corrosive to metals

LABEL ELEMENTS: According to GHS Classification

Signal Word: Warning

Product: TSM Conditioner

Hazard Pictograms:


Hazard Statement: H290 - May be corrosive to metals

Precautionary Statement: P234 - Keep in original container
P390 - Absorb spillage to prevent material damage

OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION:
No data available
3: COMPOSITION/INFORMATION ON INGREDIENTS

MIXTURES

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7664-38-2</td>
<td>Phosphoric Acid *</td>
<td>1.00</td>
<td><strong>H314</strong> Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Potassium Hydroxide*</td>
<td>0.20</td>
<td><strong>H290</strong> May be corrosive to metals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>H315</strong> Causes skin irritation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>H319</strong> Causes serious eye irritation</td>
</tr>
<tr>
<td>7732-18-3</td>
<td>Purified H₂O (distilled water)</td>
<td>98.80</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Substances marked * are present in concentrations less than the minimum danger threshold

4: EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:
Flush with plenty of water while removing contaminated clothing. Wash affected area with soap and water. Launder contaminated clothing before reuse. Seek medical attention if irritation persists

EYE CONTACT:
In case of eye contact, immediately flush with plenty of water for at least fifteen minutes whilst holding eyelids open. If irritation persists seek medical attention

INHALATION:
Remove to fresh air. If breathing is difficult have a trained person administer oxygen. Keep warm and at rest, seek medical attention promptly

INGESTION:
Rinse mouth with water and give 200-300ml of water to drink. Do not induce vomiting, seek medical attention promptly

Seek medical attention in case of doubt or if symptoms persist
5: FIREFIGHTING MEASURES

FLASH POINT (method used): None

FLAMMABLE LIMITS:
Lower flammability/Explosion Limit: N/A
Upper flammability/Explosion Limit: N/A

EXTINGUISHING MEDIA:
Suitable Extinguishing Media: As appropriate for surrounding fire

UNSUITABLE EXTINGUISHING MEDIA:
N/A

SPECIFIC HAZARDS THAT MAY DEVELOP:
May react with some metals including aluminium, magnesium, and zinc, resulting in evolution of hydrogen gas

RECOMMENDATIONS:
Fire-fighters should use self-contained breathing apparatus and wear protective clothing
Use appropriate media to surrounding fire conditions
Do not breathe fumes
Avoid runoff to waterways and sewers
Use cold water spray to control vapours and cool containers exposed to fire

6: ACCIDENTAL RELEASE MEASURES

PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES AND PERSONAL PRECAUTIONS:
Control leaks without risk
Use adequate ventilation
Do not inhale vapours
Use protective equipment as required (see section 8)

ENVIRONMENTAL PRECAUTIONS:
Prevent material from entering drains or water courses

METHOD FOR CONTAINMENT AND CLEANING:
Contain and absorb spillage to prevent material damage using absorbent materials such as vermiculite, sand and earth. Use dilute acid solution to neutralise spillage
Ensure are is well ventilated and wash down spillage site once material pick up is complete

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Ventilate area, and absorb spillage with an absorbent material. Flush spill area with copious amounts of water
7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:
Contact with skin, eyes and clothing should be avoided
Area should be adequately ventilated
Use personal protective equipment as required. Wear protective gloves and clothing with eye/face protection.
Hands should be washed on completion of tasks and before breaks
When using this product eating, drinking or smoking is prohibited

Avoid breathing vapours and direct contact. No unauthorised access

RECOMMENDATIONS ON THE CONDITIONS FOR SAFE STORAGE:
Store substances below 80°F (27°C).
Store in a cool, dry place with adequate ventilation
Ensure container is kept sealed
Product is stable under normal conditions
May react with some metals including aluminium, magnesium and zinc which could result in the evolution of phosphorus oxides

8: EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS
Phosphoric Acid          ACGIH TLV:      STEL 3mg/m³
                        LTEL 1mg/m³ @ 8hr TWA
                        OSHA PEL:       1mg/m³

ENGINEERING CONTROLS FOR VENTILATION:
Local exhaust: keep below TLV
Mechanical:      keep below TLV
Special:         N/A
Other:           N/A

EYE PROTECTION:
Chemical safety goggles or protective eye glasses are recommended to protect against splashes

SKIN PROTECTION:
Neoprene or rubber gloves are recommended to protect hands. The condition of the gloves should be checked regularly and changed as appropriate (see manufacturer’s guide)

RESPIRATORY PROTECTION:
Not normally required. For air contaminants above TLV or permissible limits use NIOSH approved respirator for organic vapours

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber or alkali resistant apron is recommended

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use
9: PHYSICAL AND CHEMICAL PROPERTIES

PROPERTIES

Appearance: Clear to slightly turbid liquid
Odour: Odourless
Odour threshold: N/A
pH: N/A
Flammability (solid/gas): N/A
Melting point/Freezing point: N/A
Initial boiling point and boiling range: 210°F to 212°F (99°C to 100°C)
Flash point: N/A
Evaporation rate (Butylacetate = 1): N/A
Vapour pressure (mmHg): N/A
Vapour density (air = 1): N/A
Specific gravity (H₂O = 1): 1 to 1.1
Volatile organic compounds: 0%
Solubility in water: 100%

10: STABILITY AND REACTIVITY DATA

REACTIVITY:
Stable

CHEMICAL STABILITY:
Stable under normal conditions

POSSIBILITY OF HAZARDOUS REACTIONS
Oxides of phosphorous resulting from reactions with some metals such as aluminium, zinc and magnesium

CONDITIONS TO AVOID:
N/A

INCOMPATIBILITY (materials to avoid):
Alkaline materials and materials containing chlorine

HAZARDOUS DE-COMPOSITION OR BY-PRODUCTS:
Oxides of phosphorous. Toxic and irritant vapours may evolve from thermal decomposition or combustion
11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL AND HEALTH EFFECTS:

Skin Contact: Not classified
Ingestion: Not classified
Inhalation: Not classified
Eye: Not classified
Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Not classified
Germ cell mutagenicity: No evidence
Carcinogenicity: No evidence
Reproduction: No data

12: ECOLOGICAL CONSIDERATIONS

No ecological data available
Prevent entry to waterways or drains
Not classified as marine pollutant. Biodegradable

13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
Neutralise absorbent material with dilute acid. Dispose of in accordance with local, government and national regulations. Do not permit entry to waterways or drains

14: TRANSPORTATION INFORMATION

UN Number: 1760
UN Proper Shipping Name: Corrosive Liquids, N.O.S (Phosphoric Acid)
Transport Hazard Class (es): 8
Packing Group: III
Environmental Hazards: Not a marine pollutant
Guidance for transport in bulk: N/A according to Annex II of MARPOL 73/78 and the International Bulk Chemical Code
15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

NATIONAL REGULATIONS
Not available

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA)

16: OTHER INFORMATION

LAST REVISION
03/07/14
Revisions to sections 1 to 16 have been made

DISCLAIMER
To the best of our knowledge, the information provided on this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The suitability of the product for the intended use should be determined by the user. The data on this SDS is from the manufacturers of the original components. ESI Technology Ltd disclaims any and all form of liability and/or responsibility for the application of this product and for any consequential loss or damage.
1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: TSM 300 HARDENER

COMPANY: ESI Technology Ltd
Sensor House
Wrexham Technology Park
Wrexham
LL13 7YP

Tel: +44 (0) 1978 262 255
Fax: +44 (0) 1978 262 233
E-mail: sales@esi-tec.com
Web: www.esi-tec.com

RECOMMENDED USE: Adhesive

RESTRICTION FOR USE: Not applicable

2: HAZARDOUS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS HAZARD CLASSIFICATION
Highly flammable liquid and vapour: H225
May cause an allergic skin reaction: H317
May cause respiratory irritation: H335
Harmful if swallowed: H302
Suspected of causing cancer: H351
Causes serious eye damage: H318
May cause allergy/asthma symptoms or breathing difficulties if inhaled: H334

LABEL ELEMENTS:

Signal Word: Danger
Product: TSM 300 Hardener

Hazard Pictograms:

[Image of pictograms: exclamation mark, water pouring, fire, person with exclamation mark]

Hazard Statement:
Highly flammable liquid and vapour: H225
May cause an allergic skin reaction: H317
May cause respiratory irritation: H335
Harmful if swallowed: H302
Suspected of causing cancer: H351
Causes serious eye damage: H318
May cause allergy/asthma symptoms or breathing difficulties if inhaled: H334

Precautionary Statement: Obtain special instructions before use: P201
If in eyes; Rinse cautiously with water for several minutes. Remove contact lenses if possible and continue to rinse: P305, P351 and P338
If inhaled: If breathing is difficult remove person to fresh air and keep at rest in a position which is comfortable to breathe: P304 and P341
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources: P210
Immediately seek medical attention: P310

OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION:
May form explosive peroxides: EUH019

3: COMPOSITION/INFORMATION ON INGREDIENTS

MIXTURES

<table>
<thead>
<tr>
<th>CAS NO.</th>
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<th>%</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>109-99-9</td>
<td>Tetrahydrofuran</td>
<td>70.0</td>
<td>Highly flammable liquid and vapour: H225</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May cause respiratory irritation: H335</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Harmful if swallowed: H302</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Suspected of causing cancer: H351</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cause serious eye irritation: H319</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May form explosive peroxides: EUH019</td>
</tr>
<tr>
<td>89-32-7</td>
<td>Pyromellitic Dianhydride</td>
<td>30.0</td>
<td>May cause an allergic skin reaction: H317</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Causes serious eye damage: H318</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May cause allergy/asthma symptoms or breathing difficulties if inhaled: H334</td>
</tr>
</tbody>
</table>

4: EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:
In the case of contact with the skin, immediately flush the affected area with plenty of water for at least fifteen minutes while removing contaminated clothing and shoes. Wash clothing and shoes thoroughly before re-use If irritation develops or exposed or concerned seek immediate medical attention

EYE CONTACT:
Immediately flush with water for at least 15 minutes whilst holding the eyelids open. Remove contact lenses if possible
Seek prompt medical attention, preferably an ophthalmologist

INHALATION:
Remove to fresh air. Maintain an open airway and loosen any tight clothing
If respiratory symptoms occur seek medical attention
Seek medical attention promptly if exposed or concerned

INGESTION:
Seek medical attention. Wash out mouth thoroughly with water and give plenty of water to drink. Do not induce vomiting. If unconscious do not give fluids
MOST IMPORTANT SYMPTOMS/EFFECTS:
If inhaled may cause respiratory irritation and cause allergy/asthma symptoms or breathing difficulties
Suspected of causing cancer

SEEK MEDICAL ATTENTION IN CASE OF DOUBT OR IF SYMPTOMS PERSIST

5: FIREFIGHTING MEASURES

FLASH POINT (METHOD USED):
Closed Cup: -14.5°C (5.9°F).
Open Cup: -20°C (-4°F)

EXTINGUISHING MEDIA:
Foam, CO₂ carbon dioxide, dry powder and sand
Water spray may be used to cool exposed fire containers

UNSUITABLE EXTINGUISHING MEDIA:
Water jet may spread fire

SPECIFIC HAZARDS THAT MAY DEVELOP:
The liquid and vapour are highly flammable
May result in toxic fumes such as carbon dioxide, carbon monoxide and explosive peroxides if decomposed in fire
Danger of flashback. Resultant vapour is heavier than air meaning it is possible that it may travel over large distances to sources of ignition. Beware of operating in confined and enclosed spaces
Vapour explosion and poison hazards indoors, outdoors and sewers. Explosive organic peroxides may form from aging or light

RECOMMENDATIONS:
Fire fighters should use self-contained breathing apparatus and wear protective clothing
Use appropriate media to surrounding fire conditions
Do not breathe fumes
Use cold water spray to control vapours and cool containers exposed to fire
Avoid runoff to waterways and sewers

6: ACCIDENTAL RELEASE MEASURES

PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES AND PERSONAL PRECAUTIONS:
Use protective equipment as required (see section 8)
Avoid inhaling vapours. Ventilate area and where possible identify and eliminate possible ignition sources such as hot surfaces, heat, flames, sparks and prohibit smoking

ENVIRONMENTAL PRECAUTIONS:
Prevent material from entering drains, watercourses and environment. Do not allow mixture to contaminate the ground water system. If this happens it must be alerted to the Environment Agency or appropriate body

METHOD FOR CONTAINMENT AND CLEANING:
Use sand, earth or any suitable absorbent material to absorb spillage
Use non-sparking equipment when picking up flammable spill
Must be disposed of in a container

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Shut off all sources of ignition. Inform others to keep at a safe distance
Avoid contact with eyes, skin and clothing
Soak up with an inert absorbent material such as sand or vermiculite. Flush affected area with water
7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:
Contact with skin, eyes and clothing should be avoided
Area should be adequately ventilated
Hands should be washed on completion of tasks and before breaks
Isolate from potential ignition sources such as hot surfaces, heat, flames, sparks and prohibit smoking
Use protective equipment as required (see section 8)
Eating and drinking are prohibited during use
Avoid breathing vapours and direct contact. No unauthorised access

RECOMMENDATIONS ON THE CONDITIONS FOR SAFE STORAGE:
Store substances below 80° F (27° C)
Store in a cool, dry place with adequate ventilation
Ensure container is kept sealed
Protect from direct sunlight, naked flames, sources of ignition, hot surfaces and sparks. Do not smoke

8: EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS
Tetrahydrofuran OEL and TLV: 200ppm (TWA) LTEL 250 ppm STEL (15mins)
590mg/m³ (TWA) LTEL 735mg/m³ STEL (15mins)
PEL: 200ppm (TWA) LTEL

ENGINEERING CONTROLS FOR VENTILATION
Local exhaust: Keep below TLV
Mechanical: Keep below TLV
Special: N/A
Other: N/A

EYE PROTECTION:
Chemical safety goggles or protective eye glasses are recommended to protect against splashes

SKIN PROTECTION:
Neoprene or rubber gloves are recommended to protect hands. The condition of gloves should be checked regularly and changed as appropriate (see manufacturers guide)
Prevent skin contact by wearing impervious protective clothing – boots, apron or overalls

RESPIRATORY PROTECTION:
For air containments above TLV or permissible limits use suitable respirator

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
N/A

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use
9: PHYSICAL AND CHEMICAL PROPERTIES

PROPERTIES

Appearance: Off white
Odour: Ethereal
Odour threshold: N/A
pH: N/A
Flammability (solid/gas): N/A
Melting point/Freezing point: -141ºF (-96ºC)
Initial boiling point and boiling range: 149-153ºF (65-67ºC)
Flash point (Open cup): 7ºF (-14ºC)
Evaporation rate (Butylacetate = 1): >1
Explosive limits/upper lower flammability: Lower 1.8% v/v, Upper 11.8% v/v
Vapour pressure (mmHg): 145mmHg @ 15ºC
Vapour density (air = 1): 0.89 @ 20ºC
Relative density (H²O = 1): 0.9
Solubility in water: 100%

10: STABILITY AND REACTIVITY DATA

REACTIVITY:
Stable under normal conditions

CHEMICAL STABILITY:
Stable under normal conditions

CONDITIONS TO AVOID:
Avoid open flames, ignition sources, sparks heat and hot surfaces
Do not exceed a temperature of 27ºC. Smoking is not permitted

INCOMPATIBILITY (materials to avoid):
Strong oxidising agents/acids, mild steel and various plastics

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:
Burning produces obnoxious and toxic fumes.
Explosive peroxides, Carbon monoxide and Carbon dioxide

HAZARDOUS POLYMERISATION:
None listed
11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL AND HEALTH EFFECTS:

Skin Contact: The classification criteria are not met based on the available data. Acute toxicity estimate mixture calculation: LC50>2000 mg/kg

Ingestion: Acute toxicity 4; Harmful if swallowed Acute toxicity estimate mixture calculation: LC50>2250 mg/kg

Inhalation: The classification criteria are not met based on the available data Acute toxicity estimate mixture calculation: LC50>20.0 mg/l

Eye contact: Irritation / dilated pupils

Skin corrosion/irritation: The classification criteria are not met based on the available data

Respiratory or skin sensitisation: If inhaled may cause asthma/allergy symptoms/breathing difficulties. May cause an allergic skin reaction

Eye damage/irritation: May cause serious eye damage or irritation

Reproductive toxicity: The classification criteria are not met based on the available data

STOT single exposure: May cause respiratory irritation SE3

STOT repeated exposure: The classification criteria are not met based on the available data

Germ cell mutagenicity: The classification criteria are not met based on the available data

Carcinogenicity: Suspected of causing cancer CARC 2

12: ECOLOGICAL CONSIDERATIONS

Toxicity test
No product data available. Avoid introduction to waterways and drains

Potential to persist and degrade in the environment
Biodegradable in water

Potential for bioaccumulation
Low

Potential to move from soil to groundwater
High mobility probable and is soluble in water. Do not permit entry to waterways or drains

13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
Considered as specialised waste. Dispose of after pre-treatment to hazardous waste incinerator facility and in accordance with local government and nation regulations legislation. Seek advice from a chemical disposal company
14: TRANSPORTATION INFORMATION

UN Number: 2056
Proper Shipping Name: Tetrahydrofuran. TSM Hardener Flammable Liquids N.O.S
Transport Hazard Class(es): 3
Packing Group: II
Environmental Hazards: Not a marine pollutant
Guidance for transport in bulk: N/A according to Annex II of MARPOL 73/78 and the International Bulk Chemical Code

15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

NATIONAL REGULATIONS
USA: N/A
EUROPE: Germany – Water hazard class 2

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA)

16: OTHER INFORMATION

LAST REVISION
03/07/14
Revisions to sections 1 to 16 have been made

DISCLAIMER
To the best of our knowledge, the information provided on this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The suitability of the product for the intended use should be determined by the user. The data on this SDS is from the manufacturers of the original components. ESI Technology Ltd disclaims any and all form of liability and/or responsibility for the application of this product and for any consequential loss or damage
1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: TSM NEUTRALISER

COMPANY: ESI Technology Ltd
Sensor House
Wrexham Technology Park
Wrexham
LL13 7YP

Tel: +44 (0) 1978 262 255
Fax: +44 (0) 1978 262 233
E-mail: sales@esi-tec.com
Web: www.esi-tec.com

RECOMMENDED USE: Surface treatment of metal objects

RESTRICTION FOR USE: None

2: HAZARDOUS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS HAZARD CLASSIFICATION
Not classified as dangerous

LABEL ELEMENTS:

Signal Word: N/A
Product: TSM Neutraliser
Hazard Pictograms: N/A
Hazard Statement: N/A
Precautionary Statement: N/A

OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION:
No data available
3: COMPOSITION/INFORMATION ON INGREDIENTS

MIXTURES

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>133-21-6</td>
<td>Ammonium Hydroxide</td>
<td>&lt;0.8</td>
<td>H314 Causes severe skin burns and eye damage&lt;br&gt;H335 May cause respiratory irritation - Single target organ toxicity – single exposure cat. 3&lt;br&gt;H400 Very toxic to aquatic life</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Potassium Hydroxide (Decon 90)</td>
<td>&lt;0.0004</td>
<td>H290 May be corrosive to metals&lt;br&gt;H315 Causes skin irritation&lt;br&gt;H319 Causes serious eye irritation</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Purified H$_2$O (distilled water)</td>
<td>99.1996</td>
<td>n/a</td>
</tr>
</tbody>
</table>

4: EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:
Flush with plenty of water while removing contaminated clothing. Wash affected area with soap and water. Launder contaminated clothing before reuse. Seek medical attention if irritation persists.

EYE CONTACT:
Immediately flush with plenty of water for at least 15 minutes while holding the eyelids open. Seek medical attention, preferably an ophthalmologist.

INHALATION:
Remove to fresh air. If breathing is difficult have a trained person administer oxygen. Keep warm, at rest and seek medical attention promptly.

INGESTION:
Seek medical attention. Do not induce vomiting or swallowing in an unconscious person. If conscious, promptly give lots of water, dilute vinegar or citrus juices to drink, followed by milk.

Seek medical attention in case of doubt or if symptoms persist.
5: FIREFIGHTING MEASURES

FLASH POINT (method used): None

FLAMMABLE LIMITS:
Lower flammability/Explosion Limit: N/A
Upper flammability/Explosion Limit: N/A

EXTINGUISHING MEDIA:
Will not support combustion. Non-flammable

SPECIFIC HAZARDS THAT MAY DEVELOP:
May release toxic fumes from decomposition in fire
Material may emit anhydrous ammonia vapour when heated. Respiratory and eye protection needed for firefighting

RECOMMENDATIONS:
Fire fighters should use self-contained breathing apparatus and wear protective clothing
Use appropriate media to surrounding fire conditions
Do not breathe fumes
Avoid runoff to waterways and sewers
Use cold water spray to control vapors and cool containers exposed to fire

6: ACCIDENTAL RELEASE MEASURES

PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES AND PERSONAL PRECAUTIONS:
Use protective equipment as required (see section 8)
Avoid inhaling vapours

ENVIRONMENTAL PRECAUTIONS:
Prevent material from entering drains or water courses

METHOD FOR CONTAINMENT AND CLEANING:
Contain and absorb spillage to prevent material damage using inert absorbent materials such as vermiculite, sand and earth. Use dilute acid solution to neutralise spillage
Ensure area is well ventilated and wash-down spillage site once material pick-up is complete

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Ventilate area and absorb spillage with an absorbent material. Neutralise with a dilute acid. Flush spill area with copious amounts of water

7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:
Contact with skin, eyes and clothing should be avoided
Area should be adequately ventilated
Use personal protective equipment as required
Hands should be washed on completion of tasks and before breaks
When using this product eating, drinking or smoking is prohibited
Avoid breathing vapours and direct contact. No unauthorised access

RECOMMENDATIONS ON THE CONDITIONS FOR SAFE STORAGE:
Store substances below 80°F (27°C)
Store in a cool, dry place with adequate ventilation
Ensure container is kept sealed
Product is stable under normal conditions
8: EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS
Potassium Hydroxide  
OEL and TLV: 2mg/m³ OES 15 min STEL (short term exposure limit)  
PEL: N/A

ENGINEERING CONTROLS FOR VENTILATION:
Local exhaust: keep below TLV
Mechanical: keep below TLV
Special: N/A
Other: N/A

EYE PROTECTION:
Chemical safety goggles or protective eye glasses are recommended to protect against splashes

SKIN PROTECTION:
Neoprene or rubber gloves are recommended to protect hands. The condition of gloves should be checked regularly and changed as appropriate (see manufacturer’s guide)

RESPIRATORY PROTECTION:
Not normally required. For air contaminants above TLV or permissible limits use NIOSH approved respirator for organic vapours

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber or alkali resistant apron is recommended

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use

9: PHYSICAL AND CHEMICAL PROPERTIES

PROPERTIES

Appearance: Colourless liquid
Odour: Weak ammonia odour
Odour threshold: N/A
pH: N/A
Flammability (solid/gas): N/A
Melting point/Freezing point: 32°F (0.0°C)
Initial boiling point and boiling range: 212°F (100.0°C)
Flash point: Not applicable
Evaporation rate (Butylacetate = 1): < 1

Vapour pressure (mmHg): 760mmHg @ 100°C
Vapour density (air = 1): 1.0
Specific gravity (H₂O = 1): 1.0
Volatile organic compounds: 0%
Solubility in water: 100%
10: STABILITY AND REACTIVITY DATA

REACTIVITY:
Stable

CHEMICAL STABILITY
Stable under normal conditions

CONDITIONS TO AVOID:
Adding NaOH to this material and/or heating will volatise NH3

INCOMPATIBILITY (materials to avoid):
Acids, peroxides, metallic copper, tin, zinc (and their alloys), halogenated compounds

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:
May release toxic fumes from decomposition in fire
Material may emit anhydrous ammonia vapour when heated. Respiratory and eye protection needed for fire fighting

HAZARDOUS POLYMERISATION:
Will not occur

11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL AND HEALTH EFFECTS:

<table>
<thead>
<tr>
<th>Contact</th>
<th>Classification Criteria</th>
<th>Acute Toxicity Estimate Mixture Calculation – LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>The classification criteria are not met based on the available data</td>
<td>LC50&gt;2000mg/kg</td>
</tr>
<tr>
<td>Ingestion</td>
<td>The classification criteria are not met based on the available data</td>
<td>LC50&gt;2000mg/kg</td>
</tr>
<tr>
<td>Inhalation</td>
<td>The classification criteria are not met based on the available data</td>
<td>LC50&gt;2000mg/kg</td>
</tr>
</tbody>
</table>

12: ECOLOGICAL CONSIDERATIONS

No ecological data available
Biodegradable
Do not permit entry to waterways or drains
13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
Neutralise absorbent material with dilute acid. Dispose of in accordance with local, government and national regulations and legislation

14: TRANSPORTATION INFORMATION

UN Number: 1760
UN Proper Shipping Name: Corrosive Liquids, N.O.S (Ammonium Hydroxide)
Transport Hazard Class (es): N/A
Packing Group: III
Environmental Hazards: Not a marine pollutant
Guidance for transport in bulk: N/A according to Annex II of MARPOL 73/78 and the International Bulk Chemical Code

15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

NATIONAL REGULATIONS
USA: Ammonium Hydroxide on OSHA List of Highly Toxics and Reactive (TQ = 15000lbs)
Europe: Not listed on ECHA list of substances of very high concern (SVHC)

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA)

16: OTHER INFORMATION

LAST REVISION
03/07/14
Revisions to sections 1 to 16 have been made

DISCLAIMER
To the best of our knowledge, the information provided on this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The suitability of the product for the intended use should be determined by the user. The data on this SDS is from the manufacturers of the original components. ESI Technology Ltd disclaims any and all form of liability and/or responsibility for the application of this product and for any consequential loss or damage
1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: TSM 300 RESIN

COMPANY: ESI Technology Ltd
Sensor House
Wrexham Technology Park
Wrexham
LL13 7YP

Tel: +44 (0) 1978 262 255
Fax: +44 (0) 1978 262 233

E-mail: sales@esi-tec.com
Web: www.esi-tec.com

RECOMMENDED USE: Adhesive

RESTRICTION FOR USE: None

2: HAZARDOUS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS HAZARD CLASSIFICATION
Highly flammable liquid and vapour: H225
Skin irritant: H315
Eye irritant: H319
Suspected of causing cancer: H351
Harmful if swallowed: H302
May cause an allergic skin reaction: H317
Toxic to aquatic life with long lasting effects: H411
May cause respiratory irritation: H335

LABEL ELEMENTS:

Signal Word: Danger
Product: TSM 300 Resin

Hazard Pictograms:

Hazard Statement: Highly flammable liquid and vapour: H225
Skin irritant: H315
Eye irritant: H319
Suspected of causing cancer: **H351**
Harmful if swallowed: **H302**
May cause an allergic skin reaction: **H317**
Toxic to aquatic life with long lasting effects: **H411**
May cause respiratory irritation: **H335**

**Precautionary Statement:**
Obtain special instructions before use: **P201**
If in eyes; Rinse cautiously with water for several minutes. Remove contact lenses if possible and continue to rinse: **P305, P351 and P338**
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources: **P210**
If exposed or have concern seek medical attention: **P308 and P313**
If inhaled move person to fresh air: **P304 and P340**
If skin irritation/rash occurs seek medical attention: **P333 and P313**

**OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION:**
May form explosive peroxides: **EUH019**

### 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-64-1</td>
<td>Acetone</td>
<td>1,8</td>
<td><strong>H336</strong> May cause drowsiness or dizziness <strong>H225</strong> Highly flammable liquid and vapour <strong>H319</strong> Causes serious eye irritation</td>
</tr>
<tr>
<td>28064-14-4</td>
<td>Epoxy phenol novolac resin</td>
<td>28,6</td>
<td><strong>H319</strong> Causes serious eye irritation <strong>H315</strong> Skin irritant <strong>H411</strong> Toxic to aquatic life with long lasting effects <strong>H317</strong> May cause allergic skin reaction</td>
</tr>
<tr>
<td>109-99-9</td>
<td>Tetrahydrofuran</td>
<td>64,3</td>
<td><strong>H225</strong> Highly flammable liquid and vapour <strong>H302</strong> Harmful if swallowed <strong>H319</strong> Causes serious eye irritation <strong>H335</strong> May cause respiratory irritation <strong>H351</strong> Suspected of causing cancer <strong>EUH019</strong> May form explosive peroxides</td>
</tr>
<tr>
<td>78-93-3</td>
<td>Methyl ethyl ketone (technical)</td>
<td>5,4</td>
<td><strong>H225</strong> Highly flammable <strong>H319</strong> Causes serious eye irritation <strong>H336</strong> May cause drowsiness or dizziness <strong>EUH066</strong> repeated exposure may cause skin dryness or cracking</td>
</tr>
</tbody>
</table>
4: EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:
Flush with plenty of water while removing contaminated clothing. Wash affected area with soap and water. Launder contaminated clothing before reuse. If concerned or skin irritation persists seek medical attention.

EYE CONTACT:
Immediately flush with plenty of water for at least 15 minutes. Remove contact lenses if needed and possible. Seek medical attention, preferably an ophthalmologist.

INHALATION:
Remove to fresh air. If breathing is difficult have a trained person administer oxygen. Keep warm and at rest and seek medical attention promptly.

INGESTION:
Seek medical attention. Do not induce vomiting or swallowing in an unconscious person. If conscious rinse mouth and promptly give lots of water.

MOST IMPORTANT SYMPTOMS/EFFECTS:
If inhaled may cause respiratory irritation and cause allergy/asthma symptoms or breathing difficulties. Suspected of causing cancer.

SEEK MEDICAL ATTENTION IN CASE OF DOUBT OR IF SYMPTOMS PERSIST

5: FIREFIGHTING MEASURES

FLASH POINT (method used): -12.6°C (TCC)

FLAMMABLE LIMITS:  
LEL: 2.4%  
UEL: 12.5%

EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical or foam. Water spray may be used to cool exposed fire containers.

UNSUITABLE EXTINGUISHING MEDIA:
Water jet may spread fire.

SPECIFIC HAZARDS THAT MAY DEVELOP:
The liquid and vapour is highly flammable. May result in toxic fumes such as carbon dioxide, carbon monoxide, phenolic and explosive peroxides if decomposed in fire. Danger of flashback. Resultant vapour is heavier than air meaning it is possible that it may travel over large distances to sources of ignition. Beware of operating in confined and enclosed spaces. Vapour explosion and poison hazards indoors, outdoors and sewers.

RECOMMENDATIONS:
Firefighters should use self-contained breathing apparatus and wear protective clothing. Use appropriate media to surrounding fire conditions. Do not breathe fumes. Avoid runoff to waterways and sewers. Use cold water spray to control vapors and cool containers exposed to fire.
6: ACCIDENTIAL RELEASE MEASURES

PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES AND PERSONAL PRECAUTIONS:
Use protective equipment as required (see section 8)
If safe, stop leak and eliminate all ignition sources, ensure area is adequately ventilated
Ensure mixture is kept away from sparks, open flames, hot surfaces and any ignition sources
Avoid inhaling vapours

METHOD FOR CONTAINMENT AND CLEANING:
Use sand, earth or any suitable absorbent material to absorb spillage
Use non-sparking equipment when picking up flammable spill
Must be disposed of in a container
Flush spill area with copious amounts of water

ENVIRONMENTAL PRECAUTIONS:
Prevent material from entering drains or watercourse. If this happens it must be alerted to the Environment Agency or appropriate body

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Contain and absorb spillage with sand, earth or vermiculite
Ensure area is well ventilated and wash down spillage site once material pick-up is complete
Use non-sparking equipment when cleaning spillage
Keep mixture away from open flames, hot surfaces, sparks, heat and sources of ignition
Use protective equipment as appropriate (section 8)

7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:
Contact with skin, eyes and clothing should be avoided. Inhalation should be avoided
Area should be adequately ventilated
Use personal protective equipment as required
Keep mixture away from open flames, hot surfaces, sparks, heat and sources of ignition
Be aware of and take measures to avoid static discharges
Hands should be washed on completion of tasks and before breaks

RECOMMENDATIONS ON THE CONDITIONS FOR SAFE STORAGE:
Store product at 32°C or below and keep mixture only in original container
Store in bonded container with receiving equipment
Store in a cool, dry place with adequate ventilation
Keep mixture away from open flames, hot surfaces, sparks, heat and sources of ignition
Also keep away from corrosive substances, oxidizing agents, strong acids, alkalis and reducing agents
## 8: EXPOSURE CONTROLS - PERSONAL PROTECTION

### EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Substance</th>
<th>OEL and TLV:</th>
<th>ACGIH TWA PEL:</th>
<th>LD50 SKIN (RABBIT)</th>
<th>LD50 ORAL (RAT)</th>
<th>LD50 IPR (RAT)</th>
<th>LC50 INHAL (RAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>780ppm (1,810 mg/m³) LTEL</td>
<td>500ppm</td>
<td>&gt;2000 mg/kg</td>
<td>&gt;4000 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy phenol novolac resin</td>
<td>OSHA PEL: Not established</td>
<td>ACGIH TLV: Not established</td>
<td>LD50 SKIN (RABBIT) &gt;2000 mg/kg</td>
<td>LD50 ORAL (RAT) &gt;4000 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>OEL and TLV: 200ppm (TWA) LTEL 250 ppm STEL (15mins) 590mg/m³ (TWA) LTEL 735mg/m³ STEL (15mins)</td>
<td>PEL: 200ppm (TWA)</td>
<td>LD50 IPR (RAT) 2900 mg/kg</td>
<td>LC50 INHAL (RAT) 78g/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methyl ethyl ketone</td>
<td>OEL and TLV: 200ppm (TWA) LTEL 300 ppm STEL (15 mins) 590mg³ (TWA)</td>
<td>PEL: 200ppm (TWA)</td>
<td>LD50 ORAL (RAT) 2737 mg/kg</td>
<td>LD50 IPR (MOUSE) 616 mg/kg</td>
<td>LD50 SKIN (RABBIT) 13 g/kg</td>
<td></td>
</tr>
</tbody>
</table>

### EYE PROTECTION:
Chemical safety goggles or protective eye glasses are recommended to protect against splashes.

### SKIN PROTECTION:
Neoprene or rubber gloves are recommended to protect hands. The condition of gloves should be checked regularly and changed as appropriate (see manufacturers guide). Prevent skin contact by wearing impervious protective clothing – boots, apron or overalls.

### RESPIRATORY PROTECTION:
For open systems use appropriate respiratory equipment. Also use appropriate respiratory equipment for inadequate ventilation.

### OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
Use body overalls to prevent any exposure to the skin.

### WORK HYGIENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use.
9: PHYSICAL AND CHEMICAL PROPERTIES

**PROPERTIES**

**Appearance:** Almost colourless liquid  
**Odour:** Ether-like odour  
**Odour threshold:** N/A  
**pH:** N/A  
**Flammability (solid/gas):** N/A  
**Melting point/Freezing point:** N/A  
**Initial boiling point and boiling range:** 150°F 66°C  
**Flash point:** 7°F (-14°C) mixture  
**Evaporation rate (Butylacetate = 1):** 8.0  
**Explosive limits/upper lower flammability:** Lower 1.8% v/v, Upper 11.8% v/v  
**Vapour pressure (mmHg):** 129 @ 20°C  
**Vapour density (air = 1):** 2.4  
**Relative density (H²O = 1):** 0.9  
**Solubility in water:** More than 50%  
**Volatile Organic Compounds:** 712 g/liter

10: STABILITY AND REACTIVITY DATA

**REACTIVITY:**  
Stable under normal conditions

**CHEMICAL STABILITY:**  
Stable under normal conditions

**CONDITIONS TO AVOID:**  
Avoid open flames, ignition sources, sparks heat and hot surfaces  
Do not exceed a temperature of 27°C. Smoking is not permitted  
Avoid direct sunlight and ensure temperature does not exceed 32°C

**INCOMPATIBILITY (materials to avoid):**  
Acids, strong oxidising agents, strong bases, strong reducing agents, peroxides and various plastics

**HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:**  
Burning produces obnoxious and toxic fumes. Carbon dioxide, carbon monoxide, phenolic and explosive peroxides

**HAZARDOUS POLYMERISATION:**  
Will not occur by itself, but masses of more than one pound (0.45kg) of product plus an aliphatic amine will cause irreversible polymerization with considerable heat build up
### 11: TOXICOLOGICAL INFORMATION

#### TOXICOLOGICAL AND HEALTH EFFECTS:

<table>
<thead>
<tr>
<th>Effect</th>
<th>Classification Criteria</th>
<th>Acute Toxicity Estimate Mixture Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Contact</td>
<td>The classification criteria are not met based on the available data</td>
<td>LC50 &gt; 2000 mg/kg bw/day</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Acute toxicity 4; Harmful if swallowed</td>
<td>LC50 766 mg/kg bw/day</td>
</tr>
<tr>
<td>Inhalation</td>
<td>The classification criteria are not met based on the available data</td>
<td>LC50 &gt; 20.0 mg/l</td>
</tr>
<tr>
<td>Eye contact</td>
<td>Eye irritant 2; Causes serious eye irritation</td>
<td></td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Skin irritant 2; Causes serious skin irritation</td>
<td></td>
</tr>
<tr>
<td>Respiratory or skin sensitisation</td>
<td>Skin sens. 1; May cause an allergic skin reaction</td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>The classification criteria are not met based on the available data</td>
<td></td>
</tr>
<tr>
<td>STOT single exposure</td>
<td>May cause respiratory irritation SE3</td>
<td></td>
</tr>
<tr>
<td>STOT repeated exposure</td>
<td>The classification criteria are not met based on the available data</td>
<td></td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Suspected of causing cancer CARC 2</td>
<td></td>
</tr>
</tbody>
</table>

### 12: ECOLOGICAL CONSIDERATIONS

- **Toxicity test**
  - Aquatic chronic 2; Toxic to aquatic life with long lasting effects

- **Potential to persist and degrade in the environment**
  - Poorly biodegradable

- **Potential for bioaccumulation**
  - Low

- **Potential to move from soil to groundwater**
  - High mobility probable

### 13: DISPOSAL CONSIDERATIONS

- **Waste Disposal Method:**
  - Considered as specialised waste. Dispose of after pre-treatment to hazardous waste incinerator facility and in accordance with local government and nation regulations legislation. Seek advice from a chemical disposal company
14: TRANSPORTATION INFORMATION

UN Number: UN1133

UN Proper Shipping Name: Adhesives containing flammable liquid
Transport Hazard Classes: 3
Packing Group: II
Environmental Hazards: Marine pollutant/Environmentally hazardous substance
Guidance for transport in bulk: N/A according to ANNEX II of MARPOL 73/78 and the International Bulk Chemical Code

15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

NATIONAL REGULATIONS
USA: N/A
EUROPE: Germany – Water hazard class 2

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA)

16: OTHER INFORMATION

LAST REVISION
03/07/14
Revisions to sections 1 to 16 have been made

DISCLAIMER
To the best of our knowledge, the information provided on this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The suitability of the product for the intended use should be determined by the user. The data on this SDS is from the manufacturers of the original components. ESI Technology Ltd disclaims any and all form of liability and/or responsibility for the application of this product and for any consequential loss or damage.
1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: TSM ROSIN SOLVENT
COMPANY: ESI Technology Ltd
Sensor House
Wrexham Technology Park
Wrexham
LL13 7YP
Tel: +44 (0) 1978 262 255
Fax: +44 (0) 1978 262 233
E-mail: sales@esi-tec.com
Web: www.esi-tec.com

RECOMMENDED USE: Soldering with flux coating

RESTRICTION FOR USE: Not applicable

2: HAZARDOUS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS HAZARD CLASSIFICATION
Flammable liquid H225
Skin irritant H315
Eye irritant H319
May cause drowsiness or dizziness H336 STOT SE3
Suspected of damaging fertility or the unborn child H361d
May be fatal if swallowed and enters airways H304
May cause damage to organs if prolonged or repeated exposure H373 STOT RE2

LABEL ELEMENTS:

Signal Word: Danger
Product: TSM Rosin Solvent

Hazard Pictograms:

Hazard Statement: May cause drowsiness or dizziness H336 STOT SE3
Causes serious eye irritation H319
Suspected of damaging fertility or the unborn child H361d
May cause damage to organs through prolonged or repeated exposure H373 STOT RE2
Causes skin irritation H315
Highly flammable liquid and vapour H225
May be fatal if swallowed and enters airways H304

Precautionary Statement:
Obtain special instructions before use P201
Wear protective gloves, clothing, face and eye protection P280
If eye irritation persists seek medical attention P337 and P313
If swallowed immediately seek medical attention P301 and P310
Do not induce vomiting P331
Keep away from heat, sparks, hot surfaces, open flames, and other ignition sources. Do not smoke P210

OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION:
No data available

3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>CHEMICAL IDENTIT</th>
<th>%</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
</table>
| 108-88-3| Toluene          | 50.00 | Flammable liquid H225
|         |                  |     | Skin irritant H315                                      |
|         |                  |     | May cause damage to organs through prolonged or repeated exposure H373 STOT RE2 |
|         |                  |     | Suspected of damaging fertility or the unborn child H361d |
|         |                  |     | May cause drowsiness or dizziness H336 STOT SE3         |
|         |                  |     | May be fatal if swallowed and enters airways H304       |
| 67-63-0 | Isopropyl Alcohol| 50.00 | May cause drowsiness or dizziness H336 STOT SE3         |
|         |                  |     | Causes serious eye irritation H319                      |
|         |                  |     | Highly flammable liquid and vapour H225                |
4: EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:
In the case of contact with the skin, immediately flush the affected area with plenty of water for at least fifteen minutes while removing contaminated clothing and shoes. Wash clothing and shoes thoroughly before re-use. Seek medical attention immediately at once
If skin irritation occurs seek immediate medical attention

EYE CONTACT:
In case of eye contact, immediately flush with plenty of water for at least fifteen minutes Remove contact lenses if possible
Seek immediate medical attention

INHALATION:
If inhaled, remove to fresh air and loosen tight clothing. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, administer oxygen. Prompt action is critical in order to reduce personal injury
Seek medical attention immediately

INGESTION:
Aspiration hazard. If swallowed, do NOT induce vomiting. Seek medical attention at once. Wash out mouth thoroughly with water and give plenty of water to drink (only if conscious)
If vomiting occurs, keep head below hips to prevent aspiration into lungs
Do not give milk or alcoholic beverages

MOST IMPORTANT SYMPTOMS/EFFECTS:
If vomiting occurs lean individual forward to reduce risk of aspiration. Effects may last for several hours. Activated charcoal in water solution may be drunk (30g activated charcoal to 240ml water)
SEEK MEDICAL ATTENTION IN CASE OF DOUBT OR IF SYMPTOMS PERSIST

5: FIREFIGHTING MEASURES

FLASH POINT (METHOD USED):
Closed Cup: 40°F (4°C)

FLAMMABLE LIMITS: LEL: 1.2, UEL: 7.1

EXTINGUISHING MEDIA:
Foam, dry powder or carbon dioxide
Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures

UNSUITABLE EXTINGUISHING MEDIA:
Do not use direct water jet as it may spread fire

SPECIFIC HAZARDS THAT MAY DEVELOP:
The liquid and vapour are highly flammable
May result in toxic fumes such as carbon dioxide, carbon monoxide and explosive peroxides if decomposed in fire
Oxides of carbon
Danger of flashback. Resultant vapour is heavier than air meaning it is possible that it may travel over large distances to sources of ignition

RECOMMENDATIONS:
Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode
Water spray may be used to keep fire exposed containers cool. Avoid runoff to waterways and sewers
6: ACCIDENTIAL RELEASE MEASURES

PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES AND PERSONAL PRECAUTIONS:
Use protective equipment as required (see section 8)
Avoid inhaling vapours. Ventilate area and where possible identify and eliminate possible ignition sources such as hot surfaces, heat, flames, sparks and prohibit smoking

ENVIRONMENTAL PRECAUTIONS:
Prevent material from entering drains, watercourses and environment. Do not allow mixture to contaminate the ground water system. If this happens it must be alerted to the Environment Agency or appropriate body

METHOD FOR CONTAINMENT AND CLEANING:
Use sand, earth or any suitable absorbent material to absorb spillage
Use non-sparking equipment when picking up flammable spill
Must be disposed of in a container

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Shut off all sources of ignition. Inform others to keep at a safe distance
Avoid contact with eyes, skin and clothing
Soak up with an inert absorbent material such as sand or vermiculite. Flush affected area with water
After material pick up, ventilate the area and clean spill site

7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:
Obtain special instructions before use
Contact with skin, eyes and clothing should be avoided
Use personal protective equipment as required (see section 8)
Hands should be washed on completion of tasks and before breaks
Isolate from potential ignition sources such as hot surfaces, heat, flames, sparks and prohibit smoking
Eating and drinking are prohibited during use
Avoid breathing vapours and direct contact. No unauthorised access

RECOMMENDATIONS ON THE CONDITIONS FOR SAFE STORAGE:
Store substances below 25ºC
Store in a cool, well ventilated place with the container lid sealed
Protect from direct sunlight, naked flames, sources of ignition, hot surfaces and sparks

Incompatible with strong oxidising agents, aluminium, acids, halogenated compounds and halogens
8: EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS

<table>
<thead>
<tr>
<th></th>
<th>OSHA PEL:</th>
<th>ACGIH TLV:</th>
<th>OTHER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>200 ppm</td>
<td>200 ppm</td>
<td>150 ppm STEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 ORAL (RAT) 636 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 INTRAPERITONEAL (MOUSE) 1.12 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LC50 INHALATION (MOUSE) 49 gm/m3/4H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 SKIN (RABBIT) 14100</td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>400 ppm (TWA)</td>
<td>400 ppm</td>
<td>500 ppm STEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 ORAL (RAT) 5840 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 INTRAPERITONEAL (MOUSE) 933 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 ORAL (DOG) 6150 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD50 SKIN (RABBIT) 13 g/kg</td>
</tr>
</tbody>
</table>

ENGINEERING CONTROLS FOR VENTILATION

- Local exhaust: Keep below TLV
- Mechanical: Keep below TLV
- Special: N/A
- Other: N/A

EYE PROTECTION:
Chemical safety goggles or protective eye glasses are recommended to protect against splashes

SKIN PROTECTION:
Neoprene or rubber gloves are recommended to protect hands. The condition of gloves should be checked regularly and changed as appropriate (see manufacturers guide)
Prevent skin contact by wearing impervious protective clothing – boots, apron or overalls

RESPIRATORY PROTECTION:
Use respiratory protection as necessary

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
N/A

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use
Wash hands before breaks and at the end of the working day
Do not eat, drink or smoke when using this product
Keep work clothes separately, ensure any contaminated clothing is cleaned thoroughly
ROSIN SOLVENT

9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance:</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour:</td>
<td>Sweet aromatic Benzene-like odour</td>
</tr>
<tr>
<td>Odour threshold:</td>
<td>N/A</td>
</tr>
<tr>
<td>pH:</td>
<td>N/A</td>
</tr>
<tr>
<td>Flammability:</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting point/Freezing point:</td>
<td>-128 ºF to -139 ºF (-89 to -95ºC)</td>
</tr>
<tr>
<td>Initial boiling point and boiling range:</td>
<td>180 ºF (82ºC)</td>
</tr>
<tr>
<td>Flash point</td>
<td>N/A</td>
</tr>
<tr>
<td>Open cup:</td>
<td>N/A</td>
</tr>
<tr>
<td>Closed cup:</td>
<td>40ºF (4ºC)</td>
</tr>
<tr>
<td>Evaporation rate (Butylacetate):</td>
<td>2.8</td>
</tr>
<tr>
<td>Flammability (solid/gas):</td>
<td>N/A</td>
</tr>
<tr>
<td>Auto-ignition temperature:</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapour pressure (mmHg):</td>
<td>36 @ 86ºF (30ºC)</td>
</tr>
<tr>
<td>Vapour density (air = 1):</td>
<td>2.07-3.14mmHg</td>
</tr>
<tr>
<td>Specific gravity (H²O = 1):</td>
<td>0.8</td>
</tr>
<tr>
<td>Solubility in water:</td>
<td>&gt;10%</td>
</tr>
</tbody>
</table>

10: STABILITY AND REACTIVITY DATA

REACTIVITY: Stable under normal conditions

CHEMICAL STABILITY: Stable under normal conditions

CONDITIONS TO AVOID:
Avoid open flames, ignition sources, sparks heat and hot surfaces
Avoid direct sunlight and do not exceed temperature of 25ºC

INCOMPATIBILITY (materials to avoid):
Aluminium, halogenated compounds, halogens, acids and strong oxidising agents

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:
May decompose in fire and release toxic fumes
11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL AND HEALTH EFFECTS:

Skin Contact: The classification criteria are not met based on the available data
Acute toxicity estimate mixture calculation: LC50>2000 mg/kg

Ingestion: The classification criteria are not met based on the available data
Acute toxicity estimate mixture calculation: LC50>2000 mg/kg bw/day

Inhalation: The classification criteria are not met based on the available data
Acute toxicity estimate mixture calculation: LC50>20.0 mg/l

Eye contact: Causes serious eye irritation

Skin corrosion/irritation: Causes skin irritation

Respiratory/skin sensitisation: The classification criteria are not met based on the available data

Eye damage/irritation: Causes serious eye irritation

STOT single exposure: May cause drowsiness or dizziness STOT SE3

STOT repeated exposure: May cause damage to organs through prolonged or repeated exposure – central nervous system STOT RE2

Germ cell mutagenicity: The classification criteria are not met based on the available data

Carcinogenicity: The classification criteria are not met based on the available data

12: ECOLOGICAL CONSIDERATIONS

Toxicity test
No product data available, the classification criteria are not met
Estimated mixture LC50>100mg/l (fish)

Potential to persist and degrade in the environment
Poorly biodegradable

Potential for bioaccumulation
Low

Potential to move from soil to groundwater
High mobility in soil, may evaporate quickly. Do not permit entry to waterways or drains
13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
Considered as specialised waste. Dispose of after pre-treatment to hazardous waste incinerator facility and in accordance with local government and nation regulations legislation. Seek advice from a chemical disposal company.

Empty containers that have held this product may be hazardous as they retain product residue.

14: TRANSPORTATION INFORMATION

UN Number: 1993
Proper Shipping Name: Flammable liquid N.O.S (Toluene / Isopropyl Alcohol)
Transport Hazard Class (es): 3
Packing Group: II
Environmental Hazards: Not a marine pollutant
Guidance for transport in bulk: N/A according to Annex II of MARPOL 73/7 and the International Bulk Chemical Code

15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

NATIONAL REGULATIONS
USA: N/A
EUROPE: Germany – Water hazard class 2

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA)

16: OTHER INFORMATION

LAST REVISION
03/07/14
Revisions to sections 1 to 16 have been made

DISCLAIMER
To the best of our knowledge, the information provided on this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The suitability of the product for the intended use should be determined by the user. The data on this SDS is from the manufacturers of the original components. ESI Technology Ltd disclaims any and all form of liability and/or responsibility for the application of this product and for any consequential loss or damage.
# SAFETY DATA SHEET

## SOLVENT CLEANER

**PRODUCT:** TSM SOLVENT CLEANER  
**COMPANY:** ESI Technology Ltd  
Sensor House  
Wrexham Technology Park  
Wrexham  
LL13 7YP  
Tel: +44 (0) 1978 262 255  
Fax: +44 (0) 1978 262 233  
E-mail: sales@esi-tec.com  
Web: www.esi-tec.com

**RECOMMENDED USE:** Solvent for use as electronic cleaning agent  
**RESTRICTION FOR USE:** Food additive, medicine products

## 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

**GHS HAZARD CLASSIFICATION**

- **Cat2:** Flammable liquids  
  Highly flammable liquid and vapour: **H225**
- **Cat 2A:** Eye irritation  
  Causes serious eye irritation: **H319**
- **Cat3:** Central nervous system  
  May cause drowsiness or dizziness: **H336**

**LABEL ELEMENTS:**

- **Signal Word:** Danger
- **Product:** TSM Solvent Cleaner
- **Hazard Pictograms:**

**Hazard Statement:**

- May cause drowsiness or dizziness: **H336**
- Highly flammable liquid and vapour: **H225**
- Causes serious eye irritation: **H319**
Precautionary Statement:
Keep away from heat, sparks, open flames, hot surfaces; No smoking; P210
Wear protective gloves, face protection, eye protection and protective clothing; P280
Keep container tightly closed; P233
Ground/bond container and receiving equipment; P240
Use non-sparking tools only; P242
Wash skin thoroughly after handling; P264
Avoid breathing gas, vapours, spray, mist and dust; P261
Use explosion-proof electrical, lighting, ventilating equipment: P241
Use only outdoors or in a well-ventilated area; P271
Take precautionary measures against static discharge; P243

Response:
If inhaled: If breathing is difficult remove person to fresh air and keep at rest in a position which is comfortable to breathe: P304 and P340
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if possible and continue to rinse: P305, P351 and P338
Use dry chemical, dry sand or alcohol resistant foam for extension: P370 and P378
Seek medical attention if eye irritation persists: P337 and P313

Storage:
Keep cool and store in a well-ventilated area: P403 and P235
Keep container tightly closed and store in a well-ventilated area: P403 and P233

Disposal:
Dispose of contents and/or container to an approved waste disposal unit: P501

3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-64-1</td>
<td>Acetone</td>
<td>100</td>
<td>H336 May cause drowsiness or dizziness&lt;br&gt;H225 Highly flammable liquid and vapour&lt;br&gt;H319 Causes serious eye irritation</td>
</tr>
</tbody>
</table>

4: EMERGENCY AND FIRST AID PROCEDURES

GENERAL INFORMATION:
Place contaminated clothing in a sealed bag for decontamination
Show this safety sheet to the medical examiner attending
First aider needs to protect himself

SKIN CONTACT:
In the case of contact with the skin, immediately remove clothing and shoes and flush with plenty of water for at least 15 minutes
Seek medical attention if irritation persists
EYE CONTACT:
Immediately flush with water for at least 15 minutes whilst holding the eyelids open. Remove contact lenses if possible
Seek medical attention if irritation persists

INHALATION:
In case of accidental inhalation of the vapours or decomposition products move to a well-ventilated area, preferably fresh air
If breathing is difficult have a trained person administer oxygen
Keep affected person warm and at rest
Seek medical attention if necessary

INGESTION:
Do not induce swallowing or vomiting in an unconscious person. In case of vomiting, be sure that vomit can freely drain because of danger of suffocation
If conscious rinse mouth with plenty of water
Seek medical attention if necessary

5: FIREFIGHTING MEASURES

FLASH POINT (METHOD USED):
Open cup: 16°F (-9°C)
Closed cup: 0°F (-18°C)
Auto ignition temperature: 1000°F (538°C)

FLAMMABLE LIMITS:
Lower flammability/Explosion limit: 2.60% (v)
Upper flammability/Explosion limit: 12.80% (v)

EXTINGUISHING MEDIA:
Carbon dioxide
Dry powder
Foam

UNSUITABLE EXTINGUISHING MEDIA:
High volume water jet

SPECIFIC HAZARDS THAT MAY DEVELOP:
Liquids are highly flammable
If in contact with naked flames or strong heating can cause combustion
With intense warming vapour-air mixtures are explosive
Burning may release oxides of carbon and other hazardous gases or vapours

RECOMMENDATIONS:
Fire fighters should wear protective clothing and safety goggles and suitable protective gloves
Self-contained breathing apparatus should also be used if necessary
Use extinguishing media appropriate to surrounding environment and for fighting adjacent fires
Cool containers with water spray
6: ACCIDENTIAL RELEASE MEASURES

PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES AND PERSONAL PRECAUTIONS
Mark the contaminated area with signs and prevent access to unauthorised persons
Stop the leak and turn containers leak side up to prevent the escape of more liquid
Use personal protective equipment (see section 8)
Avoid inhaling vapours and contact with eyes and skin
Store away from heat and keep away from flames, sparks and sources of ignition

ENVIRONMENTAL PROCEDURES:
Prevent material from entering drains or watercourses

METHOD FOR CONTAINMENT AND CLEANING:
Store away from heat and keep away from flames and sparks
Contain and take up spillage with absorbent, inert material and place in a suitable, closed, labelled container
Absorb small quantities with paper towels or other inert material and allow to evaporate in a safe place such as a fume hood or cupboard

Recovery;
Pick up spillage and transfer to labelled containers. Keep in closed containers for disposal
Earth the containers and necessary equipment
Product is flammable therefore take precautions as necessary

Neutralisation;
Contain spillage and soak with non-combustible absorbent material such as sand, vermiculite, earth/diatomaceous earth
Dispose of according to local/national regulation (see section 13)

Cleaning and decontamination;
Remove contaminated soil
Collect spillage and transfer to suitable, properly labelled, closed containers for disposal
Thoroughly clean any contaminated objects and floors whilst taking into account environmental regulations
Contain spillage and soak with non-combustible absorbent material such as sand, vermiculite, earth/diatomaceous earth
Dispose of according to local/national regulation (see section 13)

Disposal;
Dispose of contents or container to an approved incineration plant. Dispose of taking into account local regulations
Do not allow to enter drains, soil or water courses
7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING
Earth the equipment. Ground/bond container and receiving equipment
Ensure to prevent the build-up of electrostatic discharge and do not use sparking tools
Do not smoke
Provide adequate ventilation. Provide sufficient air exchange and/or exhaust in work rooms
Electrical installations/working materials must comply with the technological safety standards
Handle in accordance with good industrial hygiene and safety practice
Do not inhale or ingest and prevent contact with skin and eyes
Wear personal protective equipment as necessary

RECOMMENDATIONS FOR SAFE STORAGE
The floor of the depot should be impermeable and designed to form a water-tight basin
Electrical installations and working materials must comply with technological safety standards
Store in a well-ventilated place and keep away from heat, open flames, hot surfaces and sources of ignition. Store contents under inert gas. Store contents under nitrogen
Keep away from incompatible materials to be indicated by the manufacturer
Recommended packing materials: Carbon steel, stainless steel
Unsuitable packing materials: Plastic
Storage temperature: NA

8: EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS:
Acetone OEL and TLV: 780ppm (1,810 mg/m³) LTEL
ACGIH TWA PEL 500ppm:

EYE PROTECTION:
Contact lenses should not be worn when working with this chemical
Where the potential for eye contact exists, splash proof goggles or a face shield must be worn

SKIN PROTECTION:
Wear protective clothing and closed footwear
Wear personal protective equipment appropriate to the quantity of material handled
Use appropriate gloves to protect hands. The condition of the gloves should be checked regularly and changed as appropriate (see manufacturer’s guide)
Remove and wash contaminated clothing

RESPIRATORY PROTECTION:
Use a respirator with an approved filter if necessary

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
The appropriate personal protective should be based on an evaluation of the performance characteristics of the protective equipment relative to the tasks to be performed, conditions present, duration of use and potential hazards or risks that may occur

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use
Use appropriate barrier cream to prevent defatting and cracking of the skin
Wash hands before breaks and at the end of the working day
Do not eat, drink or smoke when using this product
9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance:</td>
<td>Transparent colourless liquid</td>
</tr>
<tr>
<td>Odour:</td>
<td>Characteristic. Acetone, ketone. Sweetish odour</td>
</tr>
<tr>
<td>Odour threshold:</td>
<td>N/A</td>
</tr>
<tr>
<td>pH:</td>
<td>N/A</td>
</tr>
<tr>
<td>Flammability:</td>
<td>N/A</td>
</tr>
<tr>
<td>Initial boiling point and boiling range:</td>
<td>133°F (56.29°C) @ 1,013.25 hPa</td>
</tr>
<tr>
<td>Flash point:</td>
<td>0°F (-18°C) Closed cup</td>
</tr>
<tr>
<td>Open cup:</td>
<td>15.8°F (-9°C)</td>
</tr>
<tr>
<td>Closed cup:</td>
<td>0°F (-18°C)</td>
</tr>
<tr>
<td>Evaporation rate:</td>
<td>5.6 (BuA c = 1)</td>
</tr>
<tr>
<td>Flammability (solid/gas):</td>
<td>N/A</td>
</tr>
<tr>
<td>Crystalisation temperature:</td>
<td>-138.5°F (-94.7°C)</td>
</tr>
<tr>
<td>Auto-ignition temperature:</td>
<td>1000°F (538°C)</td>
</tr>
</tbody>
</table>

| Vapour pressure (mmHg):                       | 24.7 kPa @ 68°F (20°C)         |
| Vapour density (air = 1):                     | 2                              |
| Specific gravity (H²O = 1):                    | 0.79 g/cm³                     |
| Solubility in water:                          | Completely miscible            |

10: STABILITY AND REACTIVITY DATA

REACTIVITY:
Stable under normal conditions (ours)

CHEMICAL STABILITY:
Stable under normal conditions and room temperature

CONDITIONS TO AVOID:
Avoid contact with string oxidising agents and acids. Avoid heat, flames and other sources of ignition

INCOMPATIBILITY (materials to avoid):
Potassium sulphate, sodium hydroxide, sulphuric acid, nitric acid, hydrogen peroxide, chloroform, activated carbon and bromine (ours)
Reacts violently with peroxides, nitric acid, halogenated hydrocarbons and strong oxidising agents

HAZARDOUS DECOMPOSITION OR BY PRODUCTS:
Thermal decomposition or burning may release oxides of carbon and other hazardous gases or vapours (ours)
Carbon dioxide and carbon dioxide (Solvay)

HAZARDOUS POLYMERISATION:
Will not occur
11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL HEALTH EFFECTS:

Skin Contact: Mild skin irritation

Ingestion: Ingestion will cause gastric irritation and vomiting. Aspiration during swallowing or vomiting may severely damage the lungs

Inhalation: Components of the product may be absorbed into the body by inhalation. May cause narcotic effects if inhaled. Irritating to the respiratory system

Skin corrosion/irritation: Causes serious skin irritation
Respiratory or skin sensitisation: N/A
Reproductive toxicity: N/A
STOT – Single exposure: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects. May cause drowsiness or dizziness

STOT – Repeated exposure: If inhaled symptoms include vertigo, drowsiness, diarrhoea and vomiting. Dermal symptoms may include dermatitis

Serious eye damage/irritation: Irritating to eyes and mucous membranes
Germ cell mutagenicity: Not applicable
Carcinogenicity: Not classifiable as a human carcinogen

12: ECOLOGICAL CONSIDERATIONS

Toxicity test
Aquatic compartment (including sediment)
Acute toxicity to fish: LC50-24h:8.750mg/l (zebra fish)
Acute toxicity to daphnia and other aquatic invertebrates: EC50-24h:6.400mg/l (water flea)
Toxicity to microorganisms: EC50-16h:1.700mg/l (pseudomonas putida)

Chronic aquatic toxicity: Does not have any known long term adverse effects on the aquatic organisms tested

Potential to persist and degrade in the environment
Ultimate aerobic biodegradability: Readily biodegradable
Anaerobic: Biodegradable

Potential for bioaccumulation: Not potentially bioaccumulable

Potential to move from soil to groundwater: Product readily filters into the soil. Product evaporates readily
13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
Do not dispose with domestic refuse and do not allow product to enter drains, soil or water courses
Dispose of according to local and national regulations
Dispose of to an approved incineration plant
Clean container with water and do no re-use containers

14: TRANSPORTATION INFORMATION

UN Number: 1090
UN Proper shipping name: Acetone
Transport Hazard Class (es): 3
Packing Group: II
Environmental Hazards: N/A
Guidance for transport in bulk: N/A according to ANNEX II of MARPOL 73/78 and the International Bulk Chemical Code

15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

HMIS classification
Health - Moderate
Flammability - Serious
Reactivity – Minimal

NFPA classification
Health - 1
Fire - 3
Instability/reactivity - 0

TSCA NOTIFICATION
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA)

16: OTHER INFORMATION

LAST REVISION
03/07/14
Revisions to sections 1 to 16 have been made

DISCLAIMER
To the best of our knowledge, the information provided on this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The suitability of the product for the intended use should be determined by the user. The data on this SDS is from the manufacturers of the original components. ESI Technology Ltd disclaims any and all form of liability and/or responsibility for the application of this product and for any consequential loss or damage