Material Safety Data Sheet.

SECTION 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

SECTION 2: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION.

HAZARDOUS SUBSTANCES PRESENT:
No hazardous substance is contained in this preparation.

<table>
<thead>
<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>7664-38-2</td>
<td>Phosphoric Acid *</td>
<td>1.00</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Potassium Hydroxide *</td>
<td>0.20</td>
</tr>
<tr>
<td>7732-18-3</td>
<td>Purified H₂O (distilled water)</td>
<td>98.80</td>
</tr>
</tbody>
</table>

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

SECTION 3: HEALTH AND ASSOCIATED HAZARDS DATA.

ROUTES OF ENTRY:
INHALATION: YES    SKIN: YES    INGESTION: Accidental

SIGNS AND SYMPTOMS OF EXPOSURE:

SKIN CONTACT:
May cause severe irritation or burns.

EYE CONTACT:
May cause severe irritation or burns.
INHALATION:
May cause severe irritation of respiratory system. In confined areas, vapours in high concentrations are anaesthetic. Over-exposure may result in light-headedness and staggering gait. Mist may cause coughing, sneezing, salivation, and difficult breathing.

INGESTION:
May cause burns to mouth, throat, and stomach.

HEALTH HAZARDS (ACUTE AND CHRONIC):
None known.

CARCINOGENICITY:

<table>
<thead>
<tr>
<th>NTP:</th>
<th>Not listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC Monographs:</td>
<td>Not listed</td>
</tr>
<tr>
<td>OSHA Regulated:</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
None identified.

This product is not classed as flammable and not classified as hazardous to health.

SECTION 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.

EYE CONTACT:
In case of eye contact, immediately flush with plenty of water for at least fifteen minutes. Seek medical aid immediately.

INHALATION:
If inhaled, remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, administer oxygen. Prompt action is critical in order to reduce personal injury.

INGESTION:
Seek medical attention immediately. If conscious, promptly give lots of water, milk, or milk of magnesia (dilute vinegar, or citrus juices to drink, followed by milk.). If swallowed, do NOT induce vomiting.

Seek medical attention in case of doubt or if symptoms persist.
SECTION 5: FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT (method used):
NONE

FLAMMABLE LIMITS:
LEL: N/A  UEL: N/A

EXTINGUISHING MEDIA:
Will not support combustion or burn.

SPECIAL FIREFIGHTING PROCEDURES:
Fire-fighters should wear standard protective clothing and adequate respiratory protection. If product is present in a fire, avoid exposure to skin and eyes from mists and splashes.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
May react with some metals including aluminium, magnesium, and zinc, resulting in evolution of hydrogen gas.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

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.

SECTION 7: HANDLING AND STORAGE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Store substances below 80°F (27°C), in a cool dry place. Keep containers tightly sealed. Avoid storing or mixing with materials containing chlorine.

OTHER PRECAUTIONS:
Avoid breathing mist. Avoid eye and skin contact.

Unauthorised access should be denied.

SECTION 8: EXPOSURE CONTROLS-- PERSONAL PROTECTION.

VENTILATION:

Local exhaust: keep below TLV
Mechanical: keep below TLV
Special: N/A
Other: N/A

PROTECTIVE GLOVES:
Chemical resistant or rubber gloves are recommended.
RESPIRATORY PROTECTION:
Self-contained breathing apparatus is recommended for emergency use.

EYE PROTECTION:
Full-face shield or chemical safety goggles are recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber apron or suitable protective clothing is recommended. Safety shower and eye wash station should be available in the local work area.

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use. Wash hands thoroughly after use and before eating, drinking or smoking.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point</td>
<td>210°F to 212°F (99°C to 100°C)</td>
</tr>
<tr>
<td>Vapour pressure (mmHg)</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapour density (air = 1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Specific gravity (H₂O = 1)</td>
<td>1 to 1.1</td>
</tr>
<tr>
<td>Melting point</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation rate (BuAc = 1)</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Volatile organic compounds</td>
<td>None</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>100%</td>
</tr>
</tbody>
</table>

APPEARANCE AND ODOUR:
Clear to slightly turbid liquid; no odour.

SECTION 10: STABILITY AND REACTIVITY DATA.

STABILITY:
Stable under normal conditions of use and storage.

CONDITIONS TO AVOID:
N/A

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

HAZARDOUS DE-COMPOSITION OR BY-PRODUCTS:
Oxides of phosphorous.

HAZARDOUS POLYMERISATION:
Will not occur.
SECTION 11: TOXOLOGICAL INFORMATION.

PHOSPHORIC ACID:

OSHA PEL: 1 mg/m³ (TWA)
ACGIH TLV: 1 mg/m³
OTHER: N/A

PURIFIED H₂O (distilled water):

OSHA PEL: N/E
ACGIH TLV: N/E
OTHER: N/E

Substances contained may cause tissue damage in less than four hours of exposure to unbroken animal skin. No data is available concerning the preparation itself.

SECTION 12: 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.

SECTION 13: ECOLOGICAL CONSIDERATIONS.

Prevent entry to waterways or drains. No ecological data available.

SECTION 14: TRANSPORTATION INFORMATION.

<table>
<thead>
<tr>
<th>SHIPPING NAME</th>
<th>CLASS</th>
<th>PACKING GROUP</th>
<th>UN NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive Liquid, N.O.S. (Phosphoric Acid)</td>
<td>8</td>
<td>III</td>
<td>1760</td>
</tr>
</tbody>
</table>

*NB: When shipped as part of a kit the Shipping Name, Class, Packing Group and UN Number will be as follows;

| Chemical Kits       | 9     | II            | 3316      |
SECTION 15: REGULATORY INFORMATION.

SECTION 313 SUPPLIER INFORMATION:
This product contains a toxic chemical or chemicals (as listed below), subject to the reporting requirements of Section 313 Title III of the Superfund Amendment and Reauthorisation Act of 1986 and 40 CFR Part 372.

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>% By Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>7664-38-2</td>
<td>Phosphoric Acid</td>
<td>1.00</td>
</tr>
</tbody>
</table>

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

SECTION 16: OTHER INFORMATION.

To the best of our knowledge, the information provided on this Material Safety Data Sheet meets the requirements of the Occupational Health & Safety 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. The data on this MSDS is from the manufacturers of the original components. TSM disclaims any and all form of liability and/or responsibility for the application of this product.
Material Safety Data Sheet.

SECTION 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

SECTION 2: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION.

<table>
<thead>
<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>89-32-7</td>
<td>Pyromellatic Dianhydride</td>
<td>30.0</td>
</tr>
<tr>
<td>109-99-9</td>
<td>Tetrahydorafuran</td>
<td>70.0</td>
</tr>
</tbody>
</table>

SECTION 3: HEALTH AND ASSOCIATED HAZARDS DATA.

ROUTES OF ENTRY:

INHALATION: YES    SKIN: YES    INGESTION: ACCIDENTAL

SIGNS AND SYMPTOMS OF EXPOSURE:

SKIN CONTACT:
Over exposure may cause a sensitisation of the affected area.

EYE CONTACT:
May cause irritation and a burning sensation.

INHALATION:
May cause headache, dizziness, irritation of nose and throat. Vapour may cause breathing difficulties.

INGESTION:
May cause sore throat, abdominal pain and may cause severe damage to digestion system.
HEALTH HAZARDS (ACUTE AND CHRONIC):
Chronic over-exposure may include kidney and/or liver damage. Acute over-exposure may induce narcosis and/or loss of consciousness. May be a skin sensitiser to some individuals. Harmful by inhalation. May emit harmful vapours when heated.

CARCINOGENICITY:

- NTP: not listed
- IARC Monographs: not listed
- OSHA Regulated: not listed

CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Pre-existing skin or eye problems, impaired liver or kidney function.

FLAMABILITY
Highly flammable liquid.

SECTION 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.

EYE CONTACT:
Irrigate the eye thoroughly with water for at least 15 minutes. Seek medical assistance at once to prevent lasting damage.

INHALATION:
If inhaled, remove to fresh air. Keep warm and at rest. If not breathing administer oxygen or artificial respiration. Seek medical attention if needed.

INGESTION:
Seek medical attention at once. Wash out mouth thoroughly with water and give plenty of water to drink. DO NOT INDUCE VOMITING. If unconscious do not give fluids.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA.

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.

SPECIAL FIREFIGHTING PROCEDURES:
Keep run off water away from the sewers and drains. Use the appropriate breathing apparatus and protective clothing.
UNUSAL FIRE AND EXPLOSION HAZARDS:
Danger of “Flash Back”. Vapour explosion and poison hazards indoors, outdoors and sewers. Explosive organic peroxides may form from aging or light.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

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. Do not allow mixture to contaminate the ground water system. Prevent this product from entering the drains. Soak up with an inert absorbent material such as sand and vermiculite. Flush affected area with water.

SECTION 7: HANDLING AND STORAGE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Store substances below 80°F (27°C), in a cool dry place. Keep containers tightly sealed. Protect from direct sunlight and naked flames. Avoid spilling and eye and skin contact. Smoking is prohibited at all times. Eating and drinking are prohibited during use.

OTHER PRECAUTIONS:
Avoid breathing in vapours. Keep away from food and drink, and animal stuffs.

SECTION 8: EXPOSURE CONTROLS -- PERSONAL PROTECTION.

VENTILATION:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local extraction</td>
<td>Advised to control the emissions of contaminants into the work area.</td>
</tr>
<tr>
<td>Mechanical</td>
<td>keep below TLV</td>
</tr>
<tr>
<td>Special</td>
<td>N/A</td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
</tr>
</tbody>
</table>

PROTECTIVE GLOVES:
Nitrile, PTFE or chemical resistant are recommended.

RESPIRATORY PROTECTION:
Self-contained breathing apparatus is recommended for emergency use.

EYE PROTECTION:
Full-face shield or chemical safety goggles are recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber apron or suitable protective clothing is recommended. Safety shower and eye wash station should be available in the local work area.
WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

Boiling point: 65-67°C
Vapour pressure (mmHg): 123 mmHg @20°C
Vapour density (air = 1): 0.89 @ 20°C
Melting point: -96°C
Solubility in water: Miscible in all proportions.
Flashpoint: -14.0 °C

APPEARANCE AND ODOUR: Off white in colour with no odour.

SECTION 10: STABILITY AND REACTIVITY DATA.

STABILITY:
Stable under normal conditions.

CONDITIONS TO AVOID:
Acid, flames, sparks, light, excessive heat.

INCOMPATIBILITY (materials to avoid):
Strong oxidising agents. Peroxides and various plastics.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:
Peroxides, carbon dioxides - burning produces obnoxious and toxic fumes.

HAZARDOUS POLYMERISATION:
None listed.

SECTION 11: TOXOLOGICAL INFORMATION.

TETRAHYDROFURAN
OSHA PEL: 200 ppm (TWA) 250 ppm STEL
ACGIH TLV: 200 ppm (TWA) 250 ppm STEL
OTHER: LDLO ORAL (RAT) 3000 mg/kg

PYROMELLATIC DIANHYDRIDE
LD 50: ORAL (RAT) 3250 mg/kg

TARGET ORGANS:
Central nervous system, eyes, kidneys, liver, respiratory system, lungs and skin.

MEDICAL SYMPTOMS:
Irritation of eyes and skin and mucus membranes, dilated pupils, respiratory failure, vomiting, central nervous failure, depression and death.
SECTION 12: ECOLOGICAL INFORMATION.

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

SECTION 13: DISPOSAL CONSIDERATIONS.

WASTE DISPOSAL METHOD:
Chemical residues are generally considered as specialised waste, and as such are covered by the local regulations, which may vary form area to area. Contact your local waste authority for advice, or pass onto a chemical disposal company.

SECTION 14: TRANSPORTATION INFORMATION.

<table>
<thead>
<tr>
<th>SHIPPING NAME</th>
<th>CLASS</th>
<th>PACKING GROUP</th>
<th>UN NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSM Hardener</td>
<td>3</td>
<td>II</td>
<td>1993</td>
</tr>
<tr>
<td>Flammable Liquids, N.O.S (Tetrahydrofuran)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*NB: When shipped as part of a kit the Shipping Name, Class, Packing Group and UN Number will be as follows;

| Chemical Kits       | 9     | II            | 3316      |

SECTION 15: REGULATORY INFORMATION.

SECTION 313 SUPPLIER INFORMATION:
This product contains a toxic chemical or chemicals (as listed below), subject to the reporting requirements of Section 313 Title III of the Superfund Amendment and Reauthorisation Act of 1986 and 40 CFR Part 372.

<table>
<thead>
<tr>
<th>CAS NUMBER:</th>
<th>CHEMICAL NAME:</th>
<th>PARTS BY WEIGHT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>89-32-7</td>
<td>Pyromellatic Dianhaydide</td>
<td>80</td>
</tr>
<tr>
<td>109-99-9</td>
<td>Tetrahydrofuran</td>
<td>180</td>
</tr>
</tbody>
</table>

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA).
SECTION 16: OTHER INFORMATION.

To the best of our knowledge, the information provided on this Material Safety Data Sheet meets the requirements of the Occupational Health & Safety 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. The data on this MSDS is from the manufacturers of the original components. TSM disclaims any and all form of liability and/or responsibility for the application of this product.
Material Safety Data Sheet.

SECTION 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

SECTION 2: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION.

<table>
<thead>
<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1336-21-6</td>
<td>Ammonium Hydroxide</td>
<td>&lt;0.8</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Potassium Hydroxide (Decon 90)</td>
<td>&lt;0.0004</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Purified H2O (distilled water)</td>
<td>99.1996</td>
</tr>
</tbody>
</table>

SECTION 3: HEALTH AND ASSOCIATED HAZARDS DATA.

ROUTES OF ENTRY:

INHALATION: YES  SKIN: YES  INGESTION: Accidental

SIGNS AND SYMPTOMS OF EXPOSURE:

SKIN CONTACT:
May cause irritation, reddening, and possible burns.

EYE CONTACT:
Liquid contact to the eye can be severely damaging and can result in loss of vision. May cause possible burning and reddening.

INHALATION:
May cause headache, coughing, and possible lung damage (edema and difficulty in breathing). Excessive inhalation of vapors is irritating to the mucous membranes of the respiratory tract.
INGESTION:
Ingestion is corrosive to the digestive tract. May cause possible burning sensation.

Health Hazards (Acute and Chronic):
Ammonium hydroxide is irritating and corrosive to body tissue and a person with sensitive skin may react to even dilute solutions.

CARCINOGENICITY:

<table>
<thead>
<tr>
<th>NTP</th>
<th>Not listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC Monographs</td>
<td>Not listed</td>
</tr>
<tr>
<td>OSHA Regulated</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Avoid exposure to anyone with eye or pulmonary disease.

This product is not classed as flammable and not classified as hazardous to health.

SECTION 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 aid 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 and 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.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT (method used): NONE

FLAMMABLE LIMITS:  
LEL: N/A  
UEL: N/A

EXTINGUISHING MEDIA:
Will not support combustion.
SPECIAL FIREFIGHTING PROCEDURES:
Use appropriate media to surrounding fire conditions. Use cold water spray to control vapors and cool containers exposed to fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When heated, material will emit anhydrous ammonia vapor which will require respiratory and eye protection for firefighting. Use protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

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.

SECTION 7: HANDLING AND STORAGE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Store substances below 80°F (27°C), in a cool dry place. Keep containers tightly sealed.

OTHER PRECAUTIONS:
Avoid breathing vapours and direct contact. No unauthorised access.

SECTION 8: EXPOSURE CONTROLS -- PERSONAL PROTECTION.

VENTILATION:
- Local exhaust: keep below TLV
- Mechanical: keep below TLV
- Special: N/a
- Other: N/a

PROTECTIVE GLOVES:
Neoprene or rubber gloves are recommended.

RESPIRATORY PROTECTION:
For air contaminants above TLV or permissible limits use NIOSH approved respirator for organic vapours.

EYE PROTECTION:
Full-face shield or chemical safety goggles are recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber apron is recommended. Safety shower should be available in the local work area.

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

Boiling point: 212°F (100°C)
Vapour pressure (mmHg): 760mmHg @ 100°C
Vapour density (air = 1): 1.0
Specific gravity (H₂O = 1): 1.0
Melting point: 32°F (0.0°C)
Evaporation rate (BuAc = 1): <1
Volatile organic compounds: 0%
Solubility in water: 100%

Appearance and Odor: Colourless liquid; mild ammonia odor.

SECTION 10: STABILITY AND REACTIVITY DATA.

STABILITY:
Stable.

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:
None known.

HAZARDOUS POLYMERISATION:
Will not colour.

SECTION 11: TOXILOGICAL INFORMATION.

No substance classified as hazardous is contained in this preparation per directive 67/548/EEC.

Ammonium Hydroxide
OSHA PEL: 35 ppm (STEL)
ACGIH TLV: 35 ppm (STEL)
OTHER: N/A

Distilled Water
OSHA PEL: Not established
ACGIH TLV: Not established
OTHER: N/A
SECTION 12: ECOLOGICAL CONSIDERATIONS.

No ecological data available. Do not permit entry to waterways or drains.

SECTION 13: DISPOSAL CONSIDERATIONS.

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

SECTION 14: TRANSPORTATION INFORMATION.

<table>
<thead>
<tr>
<th>SHIPPING NAME</th>
<th>CLASS</th>
<th>PACKING GROUP</th>
<th>UN NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive Liquids, N.O.S. (Ammonium Hydroxide)</td>
<td>8</td>
<td>III</td>
<td>1760</td>
</tr>
</tbody>
</table>

*NB: When shipped as part of a kit the Shipping Name, Class, Packing Group and UN Number will be as follows;

| Chemical Kits | 9 | II | 3316 |

SECTION 15: REGULATORY INFORMATION.

SECTION 313 SUPPLIER INFORMATION:
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<table>
<thead>
<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL NAME</th>
<th>% BY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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

SECTION 16: OTHER INFORMATION.

To the best of our knowledge, the information provided on this Material 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. The data on this MSDS is from the manufacturers of
the original components. TSM disclaims any and all form of liability and/or responsibility for
the application of this product.
Material Safety Data Sheet.

SECTION 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

SECTION 2: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION.

<table>
<thead>
<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-64-1</td>
<td>Acetone GPR</td>
<td>1.8 %</td>
</tr>
<tr>
<td>28064-14-4</td>
<td>Epoxy phenol novolac resin</td>
<td>28.6%</td>
</tr>
<tr>
<td>109-99-9</td>
<td>Tetrahydorufuran</td>
<td>64.3%</td>
</tr>
<tr>
<td>78-93-3</td>
<td>Butanone (technical)</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

SECTION 3: HEALTH AND ASSOCIATED HAZARDS DATA.

ROUTES OF ENTRY:

INHALATION: YES  SKIN: YES  INGESTION: Accidental

SIGNS AND SYMPTOMS OF EXPOSURE:

SKIN CONTACT:
May cause severe irritation or burns. Repeated contact may cause drying or flaking of skin. Absorption into the skin may cause dermatitis. In rare cases may cause an allergic skin reaction.

EYE CONTACT:
May cause severe irritation or burns. May cause pain on contact. Vapours may irritate eyes.

INHALATION:
Excessive exposure to solvents may cause respiratory irritation and central nervous system depression. Signs and symptoms of central nervous system depression, in order of
increasing exposure, are headaches, dizziness, drowsiness, and lack of coordination. Signs and symptoms of excessive exposure may be nausea and/or vomiting.

**INGESTION:**
May cause headache, nausea, dizziness, vomiting and gastrointestinal irritation.

**HEALTH HAZARDS (ACUTE AND CHRONIC):**
Chronic over-exposure may result in kidney and/or liver damage.

**CARCINOGENICITY:**

<table>
<thead>
<tr>
<th>NTP:</th>
<th>Not listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC Monographs:</td>
<td>Not listed</td>
</tr>
<tr>
<td>OSHA Regulated:</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:**
Skin disorders, respiratory system disease.

Highly flammable. May cause irritation and a burning sensation.

### SECTION 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 and soap or at least fifteen minutes while removing contaminated clothing and shoes. Wash clothing and shoes thoroughly before re-use.

**EYE CONTACT:**
Irrigate the eye thoroughly with water for at least 15 minutes while holding eyelids open. Seek medical assistance at once to prevent lasting damage.

**INHALATION:**
If inhaled, remove to fresh air. Keep warm and at rest. If not breathing administer oxygen or artificial respiration.

**INGESTION:**
Seek medical assistance at once to prevent lasting damage. Wash out mouth thoroughly with water and give plenty of water to drink. DO NOT INDUCE VOMITING. If unconscious do not give fluids.

### SECTION 5: FIRE AND EXPLOSION HAZARD DATA.

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

**FLAMMABLE LIMITS:**

<table>
<thead>
<tr>
<th></th>
<th>LEL: 2.4%</th>
<th>UEL: 12.5%</th>
</tr>
</thead>
</table>

**EXTINGUISHING MEDIA:**
Foam, CO₂ carbon dioxide, dry powder and sand. Water may be ineffective.
AUTOIGNITION TEMPERATURE:  610°F (320°C)

FLAMMABLE LIMITS:  
LEL: 1.8  
UEL: 11.8

SPECIAL FIREFIGHTING PROCEDURES:  
Keep run off water away from the sewers and drains. Use the appropriate breathing apparatus with full face piece operated in the positive pressure mode and protective clothing. Move containers from fire area if possible without risk. Use water to keep fire-exposed containers cool.

UNUSAL FIRE AND EXPLOSION HAZARDS:  
May become combustion able in a fire. Vapors may flow along surfaces to distant ignition source. Danger of "Flash Back". Closed containers exposed to heat may explode. Contact with strong oxidisers may cause fire. May form explosive peroxides, especially when heated. Vapour explosion and poison hazards indoors, outdoors and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:  
Inform others to keep at a safe distance, isolate hazard area. Wear self-contained breathing apparatus and full protective clothing. Shut off all sources of ignition: no flares, smoking or flames in area. Stop leak if you can do so without risk. Do not allow mixture to contaminate the ground water system. Avoid contact with eyes, skin and clothing. Do not allow mixture to contaminate the ground water system. Prevent this product from entering the drains. Soak up with sand or an inert absorbent material. Use water spray to reduce vapors. Place into container for later disposal. Flush area with water.

SECTION 7: HANDLING AND STORAGE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:  
Store substances below 80°F (27°C), in a cool dry, well ventilated place. Keep containers tightly sealed when not in use. Take precautionary measures against static discharges. Keep away from open flames and spark producing equipment. Protect from direct sunlight. Avoid spilling and eye and skin contact.

OTHER PRECAUTIONS:  
Bond and ground containers when transferring liquid. Use caution when opening. Avoid prolonged exposure to vapors and skin contact. Avoid breathing in vapours. Keep away from food and drink, and animal stuffs.

SECTION 8: EXPOSURE CONTROLS -- PERSONAL PROTECTION.

VENTILATION:  
Use only with adequate ventilation.

Local extraction:  
A system of local or general extraction is recommended to keep employee exposure below the airborne exposure limits.
Mechanical: keep below TLV
Special: N/A
Other: N/A

PROTECTIVE GLOVES:
Use gloves impervious to this material when prolonged or frequently repeated contact could occur. Neoprene, Nitrile, PTFE or chemical resistant are recommended.

RESPIRATORY PROTECTION:
Respiratory protection required if airborne concentration exceeds TLV. At concentrations up to 1000 ppm, a chemical cartridge respirator with organic vapor cartridge is recommended. Self-contained breathing apparatus is recommended for emergency use.

EYE PROTECTION:
Full-face shield or chemical safety goggles are recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber apron or suitable protective clothing is recommended. Safety shower and eye wash station should be available in the local work area.

WORK/HYGENIC PRACTICES:
Use good housekeeping practices. Wash all equipment thoroughly after use and before eating, drinking or smoking.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

Boiling Point: 150°F (66°C)
Specific Gravity (H2O = 1): 0.9
Melting Point: N/A
Evaporation Rate (BuAc = 1): 8.0
Vapour Pressure (mmHg): 129 @ 68°F (20°C)
Vapour Density (Air = 1): 2.4
Volatile Organic Compounds: 712 g/liter
Solubility in Water: More than 50%.
Appearance and Odor: Tacky liquid, colourless. Slight either vapour characteristic to mixture.

SECTION 10: STABILITY AND REACTIVITY DATA.

STABILITY:
Fairly stable under normal conditions of use and storage.

CONDITIONS TO AVOID:
Acid, flames, sparks, light, excessive heat, incompatible materials, other sources of ignition, light, air and oxidising agents. Avoid subjecting resin to temperatures above 90°F/32°C due to presence of volatile methyl ethyl ketone.

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

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

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 polymerisation with considerable heat buildup.

SECTION 11: TOXOLOGICAL INFORMATION.

Tetrahydrofuran
OSHA PEL: 200 ppm (TWA)
ACGIH TLV: 200 ppm
OTHER: 250 ppm (STEL)
LD50 IPR (RAT) 2900 mg/kg
LC50 INHAL (RAT) 78g/m3

Epoxy Novolac
OSHA PEL: Not established
ACGIH TLV: Not established
OTHER: LD50 SKIN (RABBIT) >2000 mg/kg
LD50 ORAL (RAT) >4000 mg/kg

Methyl Ethyl Ketone
OSHA PEL: 200 ppm (TWA)
ACGIH TLV: 200 ppm
OTHER: 300 ppm (STEL)
LD50 ORAL (RAT) 2737 mg/kg
LD50 IPR (MOUSE) 616 mg/kg
LD50 SKIN (RABBIT) 13 g/kg

TARGET ORGANS:
Central nervous system, eyes, kidneys, liver, respiratory system, lungs and skin.

MEDICAL SYMPTOMS:
Irritation of eyes and skin and mucus membranes, dilated pupils, respiratory failure, vomiting, central nervous failure, depression and death.

SECTION 12: ECOLOGICAL INFORMATION.

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

WASTE DISPOSAL METHOD:
Do not permit entry into any sewers, on the ground, or into any body of water. Chemical residues are generally considered as specialised waste, and as such are covered by the local regulations, which may vary from area to area. Contact your local waste authority for advice, or pass onto a chemical disposal company. Compliance with applicable laws are the responsibility of the waste generator.

SECTION 14: TRANSPORTATION INFORMATION.

<table>
<thead>
<tr>
<th>SHIPPING NAME</th>
<th>CLASS</th>
<th>PACKING GROUP</th>
<th>UN NUMBER</th>
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</thead>
<tbody>
<tr>
<td>TSM RESIN</td>
<td>3</td>
<td>II</td>
<td>1993</td>
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<tr>
<td>Flammable Liquids, N.O.S (Tetrahydrofuran/Ethyl Methyl Ketone) (Methyl Ethyl Ketone) / Acetone</td>
<td>Flammable Liquid</td>
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</tr>
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*NB: When shipped as part of a kit the Shipping Name, Class, Packing Group and UN Number will be as follows;

<table>
<thead>
<tr>
<th>Chemical Kits</th>
<th>Class</th>
<th>Packing Group</th>
<th>UN Number</th>
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<tbody>
<tr>
<td>9</td>
<td>II</td>
<td>3316</td>
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</table>

SECTION 15: REGULATORY INFORMATION.

SECTION 313 SUPPLIER INFORMATION:
This product contains a toxic chemical or chemicals (as listed below), subject to the reporting requirements of Section 313 Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

<table>
<thead>
<tr>
<th>CAS NUMBER:</th>
<th>CHEMICAL NAME:</th>
<th>%:</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-64-1</td>
<td>Acetone</td>
<td>1,8</td>
</tr>
<tr>
<td>28064-14-4</td>
<td>Epoxy phenol novolak resin</td>
<td>28,6</td>
</tr>
<tr>
<td>109-99-9</td>
<td>Tetrahydrofuran</td>
<td>64,3</td>
</tr>
<tr>
<td>78-93-3</td>
<td>Butanone (MEK)</td>
<td>5,4</td>
</tr>
</tbody>
</table>

TSCA NOTIFICATION:
All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA).
SECTION 16: OTHER INFORMATION.

To the best of our knowledge, the information provided on this Material Safety Data Sheet meets the requirements of the Occupational Health & Safety Act under 29 CFR 1910.1200 (g)(2)(c)(1)-(4), for a mixture of chemicals that have not been tested as a whole. The data on this MSDS is from the manufacturers of the original components. TSM disclaims any and all form of liability and/or responsibility for the application of this product.
Material Safety Data Sheet.

SECTION 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

SECTION 2: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION.

<table>
<thead>
<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>108-88-3</td>
<td>Toluene</td>
<td>50.00</td>
</tr>
<tr>
<td>67-63-0</td>
<td>Isopropyl Alcohol</td>
<td>50.00</td>
</tr>
</tbody>
</table>

SECTION 3: HEALTH AND ASSOCIATED HAZARDS DATA.

ROUTES OF ENTRY:
INHALATION: YES  SKIN: YES  INGESTION: ACCIDENTAL

SIGNS AND SYMPTOMS OF EXPOSURE:

SKIN CONTACT:
Reddening of affected area. Over exposure may lead to dermatitis. May cause irritation. May be rapidly absorbed by skin.

EYE CONTACT:
May cause severe irritation or burning. Contact with the surface of the eye may cause severe damage.

INHALATION:
In confined areas, vapours in high concentrations are anaesthetic. Over exposure may result in headache, light-headedness and staggered gait. Mist may cause coughing, sneezing, salivation and difficult breathing. Unusual skin sensations (e.g. pins and needles) may be noticed. Very high concentrations may cause unconsciousness and possible death.
INGESTION:
May cause severe damage to digestion system if swallowed may cause abdominal spasms and other symptoms that parallel overexposure from inhalation. Entry to lungs may prove fatal.

HEALTH HAZARDS (ACUTE AND CHRONIC):
Harmful by inhalation. Chronic effects may include kidney and/or liver damage. Exposure to toluene may affect the developing foetus if pregnant.

CARCINOGENICITY:

- NTP: not listed
- IARC Monographs: not listed
- OSHA Regulated: not listed

CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Susceptible persons may have pre-existing skin disorders or impaired liver or kidney function.

SECTION 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.

EYE CONTACT:
In case of eye contact, immediately flush with plenty of water for at least fifteen minutes. Seek medical aid immediately.

INHALATION:
If inhaled, remove to fresh air. 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 at once.

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.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT (method used): 40°F (4°C) Closed Cup
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.
SPECIAL FIREFIGHTING PROCEDURES:

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.

UNUSAL FIRE AND EXPLOSION HAZARDS:
Vapour / air mixture may flow and become explosive at distant ignition sources. Closed containers exposed to heat may explode. Contact with strong oxidisers may cause fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Shut off all sources of ignition. Inform others to keep at a safe distance. Wear appropriate clothing. If regulations allow, mop up spill with plenty of water and run to waste, diluting greatly with running water. Otherwise absorb on an inert absorbent. Transfer to container and arrange for removal by a disposal company. Ventilate area to dispel residual vapour. Do not permit liquid to enter sewer.

SECTION 7: HANDLING AND STORAGE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Store substances in covered containers, in a cool dry and well ventilated place, away from fire hazards. Keep containers tightly sealed. Protect from direct sunlight and heat. Protect against physical damage.

OTHER PRECAUTIONS:
Empty containers may be hazardous as they may retain product traces (vapours, liquids). Avoid breathing in vapours. Avoid eye, skin and clothing contact.

SECTION 8: EXPOSURE CONTROLS -- PERSONAL PROTECTION.

VENTILATION:

Local extraction: To control emissions at source preventing dispersion.
Mechanical: keep below TLV
Special: N/A
Other: N/A

PROTECTIVE GLOVES:
Chemical resistant gloves are recommended (polyethylene or neoprene).

RESPIRATORY PROTECTION:
Use government approved respirator.

EYE PROTECTION:
Full-face shield or chemical safety goggles are recommended.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
A rubber apron or suitable protective clothing is recommended. Safety shower and eye wash
station should be available in the local work area.

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

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

Boiling Point: 180°F (82°C)
Vapour Pressure (mmHg): 33-36.7
Vapor Density (Air = 1): 2.07-3.14
Specific Gravity (H2O = 1): 0.8
Melting Point: -89 to -95°C
Solubility in Water: >10%

APPEARANCE AND ODOUR:
Liquid and colourless in appearance. Odour is characteristic to chemicals used.

SECTION 10: STABILITY AND REACTIVITY DATA.

STABILITY: Stable under ordinary conditions of use and storage.

CONDITIONS TO AVOID: Heat, flame, and other sources of ignition.

INCOMPATIBILITY (materials to avoid): Halogen-halogen compounds, nitric acid, strong
acids, sulfuric acids, chlorine, nitrogen oxides, alkali metals, aluminium, oxidising agents,
UF6 and organic nitro compounds.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:
When heated to decomposition carbon monoxide and carbon dioxide may form.

HAZARDOUS POLYMERISATION:
None listed

SECTION 11: TOXOLOGICAL INFORMATION.

Isopropyl Alcohol
OSHA PEL: 400 ppm (TWA)
ACGIH TLV: 400 ppm
OTHER: 500 ppm STEL
LD50 ORAL (RAT) 5840 mg/kg
LD50 INTRAPERITONEAL (MOUSE) 933 mg/kg
LD50 ORAL (DOG) 6150 mg/kg
LD50 SKIN (RABBIT) 13 g/kg

Toluene
OSHA PEL: 200 ppm (TWA)
ACGIH TLV: 20 ppm
OTHER: 150 ppm STEL
LD50 ORAL (RAT) 636 mg/kg
LD50 INTRAPERITONEAL (MOUSE) 1.12 mg/kg
LC50 INHALATION (MOUSE) 49 gm/m3/4H
LD50 SKIN (RABBIT) 14100

SYSTEMATIC EFFECT:
CNS disorders, inebriation, spasms, unconsciousness, respiratory arrest and cardiovascular failure. The information available to us suggests that risks of an embroyotoxic effect must be considered possible. Pregnant women should not be exposed to this product.

SECTION 12: ECOLOGICAL INFORMATION.

No ecological data available. Do not permit entry to waterways or drains.

SECTION 13: DISPOSAL CONSIDERATIONS.

WASTE DISPOSAL METHOD:
Chemical residues are generally classified as special waste, and as such are covered by regulations, which vary according to location. Contact your local waste disposal authority for advice, or pass to a chemical disposal company.

SECTION 14: TRANSPORTATION INFORMATION.

<table>
<thead>
<tr>
<th>SHIPPING NAME</th>
<th>CLASS</th>
<th>PACKING GROUP</th>
<th>UN NUMBER</th>
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<tbody>
<tr>
<td>Flammable Liquids, N.O.S. (Toluene / Isopropyl Alcohol)</td>
<td>3</td>
<td>II</td>
<td>1993</td>
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<tr>
<td>Flammable Liquid</td>
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</tbody>
</table>

*NB: When shipped as part of a kit the Shipping Name, Class, Packing Group and UN Number will be as follows;

Chemical Kits   9   II   3316

SECTION 15: REGULATORY INFORMATION.

SECTION 313 SUPPLIER INFORMATION:
This product contains a toxic chemical or chemicals (as listed below), subject to the reporting requirements of Section 313 Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.
TSM300 Adhesive Kit

CAS Number:  Chemical Name:  % By Weight:
108-88-3         Toluene            50.0
68-63-0    Isopropyl Alcohol           50.0

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

SECTION 16: OTHER INFORMATION.

To the best of our knowledge, the information provided on this Material 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. The data on this MSDS is from the manufacturers of the original components. TSM disclaims any and all form of liability and/or responsibility for the application of this product.
Material Safety Data Sheet.

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION.

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

SECTION 2: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION.

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<tr>
<th>CAS NUMBER</th>
<th>CHEMICAL IDENTITY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-64-1</td>
<td>Acetone</td>
<td>100</td>
</tr>
</tbody>
</table>

SECTION 3: HEALTH AND ASSOCIATED HAZARDS DATA.

Highly flammable. Irritating to eyes. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness.

SECTION 4: EMERGENCY AND FIRST AID PROCEDURES.

GENERAL:
IN ALL CASES OF DOUBT OR WHEN SYMPTOMS PERSIST, ALWAYS SEEK MEDICAL ATTENTION.

AFTER SKIN CONTACT:
Remove contaminated clothing. In case of contact, immediately wash skin with soap and copious amount of water. Seek medical attention.

AFTER EYE CONTACT:
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes. Seek medical attention. Continue to rinse.

AFTER INHALATION:
If inhaled, remove to fresh air. If recovery not rapid, seek medical attention. If not breathing give artificial respiration. Keep affected person warm and at rest.
AFTER INGESTION:
Only when conscious, rinse mouth with plenty of water and give plenty of water to drink - (approx. 500ml). DO NOT INDUCE VOMITING. In case of spontaneous vomiting, be sure that vomit can freely drain because of danger of suffocation. Keep patient at rest and obtain medical attention.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA.

EXTINGUISHING MEDIA:
Water spray, fog or mist. Dry chemical powder, sand, dolomite, Halon, appropriate foam or CO2. Unsuitable: Water may be effective for cooling, but may not effect extinguishments.

SPECIAL RISKS:
Specific Hazards (s): Flammable liquid. Emits toxic fumes under fire conditions.
Explosion Hazards: Vapour may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions. Extremely flammable. Forms explosive mixtures with air.

SPECIAL FIRE FIGHTING PROCEDURES:
Move container from fire area if it can be done without risk. Take measures to retain water used for extinguishing. Do not release contaminated water into drains, soil and surface water. Dispose of contaminated water and soil according to local regulations.

HAZARDOUS COMBUSTION PRODUCTS:
Burning may release oxides of carbon and other hazardous gases or vapours.

PROTECTIVE MEASURES IN FIRE:
Fire fighters should wear self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL:
Avoid direct contact with skin, eyes and clothing. Do not breathe vapour or fumes. Evacuate area. Shut off all sources of ignition.

PRECAUTIONS TO PROTECT ENVIRONMENT:
Prevent contamination of soil, drains and surface water.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves.

METHOD FOR CLEANING UP:
Accidental release measures - avoid ignition sources. Take-up spillage with absorbent, inert material and place in a suitable and closable labelled container for recovery or disposal. Wash the area clean with water and detergent, observing environmental requirements. Absorb small quantities with paper towels or other inert material and allow to evaporate in safe place (fume hood/cupboard).
SECTION 7: HANDLING AND STORAGE.

HANDLING PRECAUTIONS:
Directions for safe handling: Product should be used in accordance with good industrial principles for handling and storing of hazardous chemicals. Avoid breathing vapour. Avoid contact with eyes, skin and clothing. Do not use contact lenses. Avoid vapour formation and ignition sources. Avoid prolonged or repeated exposure. Ensure good ventilation and local exhaust extraction in work place. (Engineering controls must be to explosion/flameproof standard). Earth container and transfer equipment to eliminate accumulation of static charge.

STORAGE PRECAUTIONS:

STORAGE CRITERIA:
Flammable liquid storage.

SECTION 8: EXPOSURE CONTROLS -- PERSONAL PROTECTION.

PROTECTIVE GLOVES:
Use impervious gloves made of butyl rubber of PTFE (Teflon).

RESPIRATORS:
For short periods of work, a suitable RPE fitted with a combination charcoal or organic vapor cartridge is recommended.

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

VENTILATION:
Work in fume cupboard. Respiratory protection required in insufficiently ventilated working areas.

OTHER PROTECTION:
Wear protective clothing and closed footwear. Wear personal protective equipment appropriate to the quantity of material handled.

OTHER PROTECTION:
Wear protective clothing and closed footwear. Wear personal protective equipment appropriate to the quantity of material handled.

HYGIENIC WORK PRACTICES:
DO NOT SMOKE IN WORK AREA! SKIN PROTECTION - use appropriate barrier cream to prevent defatting and cracking of skin.

INGREDIENT NAME: ACETONE
CAS No.: 67-64-1
STD LT EXP 8 Hrs 750 ppm
STEXP 15 Min 1500 ppm
INGREDIENT COMMENTS:
Refer to the current edition of HSE Guidance Note EH 40/200* for occupational exposure limits.

ENGINEERING CONTROLS:
Safety shower and eye bath use non-sparking tools. Mechanical exhaust required.

GENERAL HYGIENE MEASURES:
Wash thoroughly after handling. Wash contaminated clothing before reuse.

EXPOSURE LIMITS – EUROPEAN UNION

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EXPOSURE LIMITS – DENMARK

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<td></td>
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<td>OEL</td>
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EXPOSURE LIMITS - GERMANY

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<td></td>
<td>OEL</td>
<td>1,200 mg/m3 500ppm</td>
</tr>
</tbody>
</table>

EXPOSURE LIMITS - NORWAY

<table>
<thead>
<tr>
<th>Source</th>
<th>OEL</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OEL</td>
<td>295 mg/m3 125ppm</td>
</tr>
</tbody>
</table>

EXPOSURE LIMITS – SWEDEN

<table>
<thead>
<tr>
<th>Source</th>
<th>LLV</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Level</td>
<td>1600 mg/m3 250ppm</td>
</tr>
</tbody>
</table>

EXPOSURE LIMITS - SWITZERLAND

<table>
<thead>
<tr>
<th>Source</th>
<th>OEL</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OEL</td>
<td>1,200 mg/m3 500ppm</td>
</tr>
</tbody>
</table>

EXPOSURE LIMITS – UNITED KINGDOM

<table>
<thead>
<tr>
<th>Source</th>
<th>OEL</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OEL</td>
<td>1,810 mg/m3 750ppm</td>
</tr>
<tr>
<td>OEL</td>
<td></td>
<td>STEL</td>
<td>3,620 mg/m3 1,500ppm</td>
</tr>
</tbody>
</table>

PERSONAL PROTECTIVE EQUIPMENT:

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.


COLOUR: Colourless.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENSITY/SPECIFIC GRAVITY (g/ml):</td>
<td>~ 0.79</td>
<td>Temperature (°C): 20</td>
</tr>
<tr>
<td>VAPOUR DENSITY (air=1):</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>VAPOUR PRESSURE:</td>
<td>24.7 kPa</td>
<td>Temperature (°C): 20</td>
</tr>
<tr>
<td>EVAPORATION RATE:</td>
<td>5.6</td>
<td>Reference: BuAc = 1</td>
</tr>
<tr>
<td>VOLATILE BY VOL. (%):</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY DESCRIPTION:</td>
<td>Miscible with water. Miscible with: Alcohol. Ether.</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY VALUE (g/100g H2O 20°C):</td>
<td>100</td>
<td>Method: CC (Closed cup).</td>
</tr>
<tr>
<td>FLASH POINT (°C):</td>
<td>-18</td>
<td>Reference: n-Butyl acetate =1</td>
</tr>
<tr>
<td>AUTO IGNITION TEM P. (°C):</td>
<td>540</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C3H6O</td>
<td></td>
</tr>
<tr>
<td>PH</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BP/BP Range</td>
<td>56°C</td>
<td>760 mmHg</td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>-94°C</td>
<td></td>
</tr>
<tr>
<td>Explosive Limits</td>
<td>Lower: 2%</td>
<td>Upper: 13%</td>
</tr>
<tr>
<td>SG/Density</td>
<td>0.79 g/cm³</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION 10: STABILITY AND REACTIVITY DATA.**

**STABILITY:**
Stable under normal conditions of use.

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

**MATERIALS TO AVOID:**
Potassium sulphate, sodium hydroxide, sulphuric acid, nitric acid, hydrogen peroxide, chloroform, activated carbon, bromine.

**HAZARDOUS DECOMPOSITION PRODUCTS:**
Thermal decomposition or burning may release oxides of carbon and other hazardous gases or vapours.

**HAZARDOUS POLYMERISATION:**
Hazardous Polymerisation: will not occur.

**SECTION 11: TOXICOLOGICAL INFORMATION.**

**TOXIC DOSE - LD 50:**
5800 mg/kg (oral rat)

**TOXICOLOGICAL INFORMATION:**
Low order of acute toxicity.
HEALTH HAZARDS, GENERAL:
Vapor will irritate the membranes of nose, throat, lungs and eyes.

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

ROUTE OF ENTRY:
Inhalation. Ingestion. Skin and/or eye contact.

TARGET ORGANS:
Central nervous system. Eyes. Respiratory system, lungs. Skin.

MEDICAL SYMPTOMS:
Symptoms may include irritation to eyes and mucous membranes, (inflammation of nasal mucous membranes), general respiratory distress and unproductive cough. Skin irritation, dryness of skin due to de-fatting. Inhalation of vapor may cause intoxication including drowsiness, disorientation and central nervous system depression.

MEDICAL CONSIDERATIONS:
Skin disorders and allergies.

SIGNS AND SYMPTOMS OF EXPOSURE:
To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

SECTION 12: ECOLOGICAL INFORMATION.

LC 50, 96 HRS, FISH mg /l: 8300 mg/l (96 hours)

ECOLOGICAL INFORMATION: Prevent contamination of soil, drains or surface water, use appropriate containment method to avoid environmental contamination.

MOBILITY: Soluble in water. Lost within short period through evaporation and dissolution.

BIO ACCUMULATION: Not expected to bio-accumulate.

DEGRADABILITY: Poses a significant risk of oxygen depletion in aquatic systems. Environmental half-life expected to be 1-<10 days. Readily biodegradable.

SECTION 13: DISPOSAL CONSIDERATIONS.

DISPOSAL METHODS: This material and/or its container must be disposed of as hazardous waste according to Special Waste Regulations 1996 or according to local regulations, in compliance with Duty of Care Regulations and Special Waste Regulations. Observe all federal, state and local environmental regulations.

WASTE CLASS: WASTE CODE: 0705** HAZARDOUS PROPERTY: H3-A, (H4)
SECTION 14: TRANSPORTATION INFORMATION.

<table>
<thead>
<tr>
<th>SHIPPING NAME</th>
<th>CLASS</th>
<th>PACKING GROUP</th>
<th>UN NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSM Solvent Cleaner (Acetone)</td>
<td>3</td>
<td>II</td>
<td>1090</td>
</tr>
</tbody>
</table>

ADR ITEM No.: 3° (b)
HAZARD No. (ADR): 33 highly flammable liquid (flash-point below 23°C).
ADR MARGINAL: 2301
ADR LABEL No.: 3
HAZCHEM CODE: 2YE
CEFICTEC(R) No.: 30
PROPER SHIPPING NAME I: ACETONE
ROAD TRANSPORT NOTES: Flash point: -18°C
UN No. SEA: UN 1090
IMDG CLASS: 3.1
IMDG PAGE No.: 3102
IMDG PACK GR.: II
UN No., AIR: UN-ID 1090
ICAO CLASS: 3
AIR PACK GR.: II

*NB: When shipped as part of a kit the Shipping Name, Class, Packing Group and UN Number will be as follows;

| Chemical Kits              | 9     | II            | 3316      |

SECTION 15: REGULATORY INFORMATION.

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 606-001-00-8
NOTA: 6
INDICATION OF DANGER: F Xi
Highly Flammable Irritant.

RISK PHRASES:
R-11 Highly flammable.
R-36 Irritating to eyes.
R-66 Repeated exposure may cause skin dryness or cracking.
R-67 Vapours may cause drowsiness and dizziness.

SAFETY PHRASES:
S-2 Keep out of reach of children.
S-9 Keep container in a well ventilated place.
S-16 Keep away from sources of ignition - No Smoking.
S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
UK REGULATORY REFERENCES:

COUNTRY SPECIFIC INFORMATION:
Germany WGK: 1

SWITZERLAND
Swiss poison class: 5

NORWAY
Labelling for organic solvents where the package is 1 litre or more.
YL-tall m3/1:3749
YL-group: 5
Risk Phrases: 20
Harmful by inhalation
Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation / spraying wear suitable respiratory equipment. Use compressed air – or fresh airline breathing apparatus in confined spaces.

SECTION 16: OTHER INFORMATION.

To the best of our knowledge, the information provided on this Material Safety Data Sheet meets the requirements of the Occupational Health & Safety Act, for a mixture of chemicals that have not been tested as a whole. The data on this MSDS is from the manufacturers of the original components. TSM disclaims any and all form of liability and/or responsibility for the application of this product.