This Safety Data Sheet has been prepared to comply with the EC Directive, Canadian WHMIS and the OSHA Hazard Communication Standard.

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product Name:** WiDE®-15B

**Manufacturer:** Brewer Science, Inc.
2401 Brewer Drive
Rolla, MO 65401

**Information Phone Number:** (573) 364-0300  
**Fax:** (573) 368-3318

**Email:** msds@brewerscience.com

**Emergency Phone Number:**
Chemtrec Domestic North America: 800-424-9300  
Chemtrec International: 703-527-3887

**SDS Date of Preparation:** 05/29/02

**Product Use:** Anti-Reflective Coating

### SECTION 2: HAZARDS IDENTIFICATION

Clear liquid with a sweet, sharp, fishy odor.

**EMERGENCY OVERVIEW:** Flammable liquid and vapor. May cause eye and skin irritation. Inhalation of vapors may cause mucous membrane and respiratory irritation, headache, dizziness, nausea and other symptoms of central nervous system depression. May be absorbed through the skin to cause symptoms similar to inhalation. Prolonged overexposure may cause liver and kidney damage. May cause harm to the unborn child.

**EU Preparation Classification (1999/45/EC):** Flammable, Toxic (T) Harmful (Xn), Irritant (Xi)  
R10, R20, R36/37/38, R43, R61

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS# / EINECS#</th>
<th>%</th>
<th>EU Classification (67/548/EEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexanone</td>
<td>108-94-1 / 203-631-1</td>
<td>30-40</td>
<td>Xn R10, R20</td>
</tr>
<tr>
<td>n-Methyl-2-pyrrolidone (NMP)</td>
<td>872-50-4 / 212-828-1</td>
<td>25-40</td>
<td>T, Xi R36/37/38, R61</td>
</tr>
<tr>
<td>Tetrahydrofurfuryl Alcohol (THFA)</td>
<td>97-99-4 / 202-625-6</td>
<td>20-30</td>
<td>Xi R36</td>
</tr>
<tr>
<td>Crosslinker</td>
<td>Proprietary</td>
<td>&lt;2</td>
<td>Xi R43</td>
</tr>
<tr>
<td>Dye</td>
<td>Proprietary</td>
<td>1-5</td>
<td>No EU Classification or R phrase</td>
</tr>
<tr>
<td>Surfactant</td>
<td>Proprietary</td>
<td>&lt;1</td>
<td>No EU Classification or R phrase</td>
</tr>
<tr>
<td>Polymer Solids</td>
<td>Proprietary</td>
<td>1-5</td>
<td>No EU Classification or R phrase</td>
</tr>
</tbody>
</table>

See Section 16 for further information on EU Classification.

### SECTION 4: FIRST AID MEASURES

**Eye:** Rinse thoroughly with water for at least 15 minutes, holding the eye lids open to be sure the material is washed out. Get immediate medical attention.

**Skin:** Remove contaminated clothing. Wash contact area thoroughly with soap and water. Get medical attention if irritation or symptoms of exposure develop. Launder clothing before re-use.

**Inhalation:** Remove victim to fresh air. Give artificial respiration if needed. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**Ingestion:** Do not induce vomiting unless directed to do so by medical personnel. Keep the victim calm and warm. Get immediate medical attention.
SECTION 5: FIRE FIGHTING MEASURES

Extinguishing Media: Use water fog or spray, alcohol foam, carbon dioxide or dry chemical.

Special Fire Fighting Procedures: Wear an approved, positive pressure, self-contained breathing apparatus and full protective clothing. Cool fire exposed containers with water.

Unusual Fire Hazards: Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Vapors may form explosive mixtures with air in confined areas.

Hazardous Decomposition Products: Oxides of carbon and nitrogen, aldehydes, hydrogen fluoride and unknown materials.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill: Remove all ignition sources such as open flames, spark producing equipment, pilot lights, etc. Wear appropriate protective clothing to prevent eye and skin contact including impervious gloves, safety goggles and respirator if needed. Ventilate area. Cover with an inert absorbent material and collect into an appropriate container for disposal. Report spills and releases as required to appropriate authorities.

SECTION 7: HANDLING AND STORAGE

Handling: Avoid breathing vapors, aerosols and mists. Use with adequate ventilation. Avoid contact with the eyes, skin and clothing. Always wear impervious gloves, chemical safety goggles and protective clothing when handling this material. Wash thoroughly after handling. Do not eat, drink or smoke in the work area. Keep product away from heat, sparks, flames and all other sources of ignition. No smoking in storage or use areas. Keep containers closed when not in use.

Storage: Store in a cool, dry, well-ventilated location away from incompatible materials. Keep containers closed when not in use.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexanone</td>
<td>50 ppm PEL-TWA, 20 ppm TLV-TWA skin</td>
</tr>
<tr>
<td></td>
<td>10 ppm TWA, 20 ppm STEL UK WEL (Skin)</td>
</tr>
<tr>
<td></td>
<td>10 ppm TWA, 20 ppm STEL EU OEL (Skin)</td>
</tr>
<tr>
<td>n-Methyl-2-pyrrolidone</td>
<td>10 ppm skin (AIHA WEEL)</td>
</tr>
<tr>
<td></td>
<td>20 ppm DFG-MAK skin (as vapor)</td>
</tr>
<tr>
<td></td>
<td>25 ppm TWA, 75 ppm STEL UK WEL</td>
</tr>
<tr>
<td>Tetrahydrofurfuryl alcohol</td>
<td>0.5 ppm TWA AIHA WEEL</td>
</tr>
<tr>
<td>Crosslinker</td>
<td>None Established</td>
</tr>
<tr>
<td>Dye</td>
<td>None Established</td>
</tr>
<tr>
<td>Surfactant</td>
<td>None Established</td>
</tr>
<tr>
<td>Polymer Solids</td>
<td>None Established</td>
</tr>
</tbody>
</table>

Ventilation: Use with adequate general or local exhaust ventilation to maintain exposure levels below the occupational exposure limits. Use explosion proof electrical equipment and wiring where required.

Respiratory Protection: If needed, an approved respirator with organic vapor cartridges may be used. For higher exposures, a supplied air respirator may be required. Respirator selection and use should be based on contaminant type, form and concentration. Follow applicable regulations and good Industrial Hygiene practice.

Skin Protection: Impervious gloves are recommended. Based on available test data, butyl rubber gloves are suggested.

Eye Protection: Chemical safety goggles or face shield recommended.

Other Protective Equipment: Impervious clothing as needed to prevent skin contact and contamination of personal clothing. An eye wash facility and safety shower should be available in the work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear liquid with a sweet, sharp, fishy odor. The odor threshold for cyclohexanone is reported to be 0.12 ppm (mean value). No odor threshold data is available for n-methyl-2-pyrrolidone or tetrahydrofurfuryl alcohol.
SECTION 10: STABILITY AND REACTIVITY

Stability: Stable: X Unstable:

Incompatibility/Conditions to Avoid: Strong oxidizing agents, strong acids, strong bases, reducing agents, acid chlorides, acid anhydrides. Keep away from heat, sparks, flames and other sources of ignition.

Hazardous Decomposition Products: Combustion will produce oxides of carbon and nitrogen, aldehydes, hydrogen fluoride and unknown materials.

Hazardous Polymerization: May Occur: Will not occur: X

SECTION 11: TOXICOLOGICAL INFORMATION

Potential Health Effects:

Eye: May cause moderate irritation with pain, redness and blurred vision. Corneal injury is possible.

Skin: May cause redness, irritation, swelling, cracking and dryness. Prolonged or repeated exposure may cause defatting and dermatitis. Cyclohexanone and n-methyl-2-pyrrolidone are absorbed through the skin causing effects similar to those described under inhalation.

Inhalation: Inhalation of vapors, mists or aerosols may cause mucous membrane and respiratory irritation and abdominal pain. Central nervous system depression with symptoms of headache, dizziness, nausea, drowsiness and unconsciousness may also occur.

Ingestion: Swallowing may cause central nervous system depression with headache, nausea, dizziness and unconsciousness; gastrointestinal irritation, abdominal pain and injury to the lungs, liver and brain.

Chronic Hazards: Chronic absorption of cyclohexanone may cause damage to the liver and kidneys. Human experience has demonstrated severe dermatitis from prolonged/repeated skin exposure to n-methyl-2-pyrrolidone. Cyclohexanone has been reported to cause adverse reproductive effects in laboratory animals. N-Methyl-2-Pyrrolidone may cause harm to the unborn child.

Carcinogen Status: None of the components of this product are listed as carcinogens by ACGIH, OSHA, IARC, NTP or the EU Dangerous Substances Directive.

Medical Conditions Aggravated by Exposure: Pre-existing skin, liver and kidney diseases.

Cyclohexanone: Oral rat LD50 - 1535 mg/kg; Inhalation rat LC50 - 8000 ppm/4 hr; Skin rabbit LD50 - 1 mL/kg
n-Methyl-2-pyrrolidone: Oral rat LD50 - 3914 mg/kg; Skin rabbit LD50 - 8 gm/kg
Tetrahydrofurfuryl alcohol: Oral rat LD50 - 1600 mg/kg; Skin guinea pig LD50 - 5 gm/kg;
Crosslinker: Oral rat LD50 – 5,000 mg/kg; Skin rabbit LD50 - 3000 mg/kg; Inhalation rat LC50 – >30 mg/m3/4 hr (maximum concentration achievable)
Dye: No toxicity data is available
Surfactant: No toxicity data is available
Polymer Solids: No toxicity data is available

SECTION 12: ECOLOGICAL INFORMATION

This product has not been tested as a whole. The following ecotoxicity data is available for the components:

Prepared By: Safety & Environmental Units
Approved By: Safety & Environmental Units
Issue/Revision Date F.7.6.1317.F / 10/14/09
Cyclohexanone: LC50 pimephales promelas (fathead minnow) 527 mg/L/96 hr flow-through bioassay.
n-Methyl-2-pyrrolidone: The LC50/96 hour values in fish are greater than 100 mg/L.

SECTION 13: DISPOSAL INFORMATION

Dispose in accordance with all local, state and federal regulations.

SECTION 14: TRANSPORT INFORMATION

**DOT Shipping Name:** Resin Solution, Flammable
**DOT Hazard Class:** 3, PG III
**UN Number:** UN1866

**DOT Labels Required (49CFR172.101):** Flammable Liquid (See 173.120 for domestic shipment exemption for combustible liquids)

**Hazardous Substance (49CFR172.101):** Cyclohexanone (RQ 5,000 lbs)
**Reportable Quantity:** Product – 12,500 lbs

**IATA Shipping Name:** Resin Solution, Flammable
**IATA Hazard Class:** 3, PG III
**UN Number:** UN1866

**IATA Hazard Labels Required:** Flammable Liquid

SECTION 15: REGULATORY INFORMATION

**U.S. FEDERAL REGULATIONS:**

**CERCLA 103 Reportable Quantity:** This product has a reportable quantity of 12,500 lbs based on the RQ of Cyclohexanone of 5,000 lbs present at 30-40%. Some states have more stringent reporting requirements. Report all spills in accordance with local, state, and federal regulations.

**SARA TITLE III:**

**Hazard Category for Section 311/312:** Acute Health, Chronic Health, Fire Hazard

**Section 313 Toxic Chemicals:** This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: n-Methyl-2-pyrrolidone CAS#872-50-4 25-40%.

**Section 302 Extremely Hazardous Substances (TPQ):** None

**EPA Toxic Substances Control Act (TSCA) Status:** This product contains a substance(s) that is not listed on the EPA TSCA inventory. A low volume exemption has been granted. This exemption restricts the use of this product to Microelectronic Manufacturing Applications.

**STATE REGULATIONS:**

**California Proposition 65:** This product contains the following substances known to the State of California to cause cancer and reproductive toxicity: 1,4-dioxane (0.002% maximum) (cancer); n-Methyl-2-pyrrolidone (25-40%) (developmental toxicity).

**INTERNATIONAL REGULATIONS:**

**European Community Labeling:** Contains Cyclohexanone and n-Methyl-2-pyrrolidone

- R10 Flammable
- R20 Harmful by inhalation.
- R36/37/38 Irritating to eyes, respiratory tract, and skin.
- R43 May cause sensitization by skin contact.
- R61 May cause harm to the unborn child.
- S25/25 Avoid contact with skin and eyes.
- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S37 Wear suitable gloves.

Prepared By: Safety & Environmental Units
Approved By: Safety & Environmental Units
Issue/Revision Date F.7.6.1317.F / 10/14/09
S51 Use only in well ventilated areas.
S53 Avoid exposure – Obtain special instructions before use.
S60 This material and its contents must be disposed of as hazardous waste.

**SECTION 16: OTHER INFORMATION**

**HMIS Ratings:**
- Health – 2*
- Flammability - 2
- Reactivity - 0

**NFPA Ratings:**
- Health - 2
- Flammability - 2
- Reactivity – 0

**SDS Revision History:**
- 05/29/02: New MSDS
- 03/06/03: Updated Section 15
- 07/05/06: Changed Emergency Telephone Numbers
- 08/06/08: Updated Crosslinker toxicity status in section 11.
- 10/14/09: Updated EU Classification in Sections 2, 3, and 15. Updated exposure limits.

**EU Classes and Risk Phrases for Reference (See Sections 2 and 3):**
- T Toxic
- Xi Irritant
- Xn Harmful
- R10 Flammable
- R20 Harmful by inhalation.
- R36 Irritating to eyes.
- R43 May cause sensitization by skin contact.
- R36/37/38 Irritating to eyes, respiratory tract, and skin.
- R61 May cause harm to the unborn child.

This above information is believed to be correct but does not propose to be all inclusive and shall be used only as a guide. Brewer Science, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product.