1. IDENTIFICATION

Product Identifier

Product Name

Arrow 2EC Herbicide

Other means of identification

SDS # MANA-013

Registration Number(s) EPA Reg. No. 66222-60

UN/ID No NA1993

Recommended use of the chemical and restrictions on use

Recommended Use EPA registered pesticide.

Details of the supplier of the safety data sheet

Manufacturer Address

Makhteshim Agan of North America, Inc. (d/b/a ADAMA)
3120 Highwoods Blvd., Suite 100
Raleigh, NC 27604
1-919-256-9300

Emergency Telephone Number

Emergency Telephone (24 hr) For fire, spill and/or leak contact INFOTRAC:
1-800-535-5053 (North America) 1-352-323-3500 (International)
For medical emergencies and health/safety inquiries, contact PROSAR:
1-877-250-9291

2. HAZARDS IDENTIFICATION

This chemical is a product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-EPA registered chemicals. Please see Section 15 for additional EPA information.

Appearance Amber liquid

Physical State Liquid

Odor Mild Aromatic

Classification

| Acute toxicity – Inhalation (Dusts/Mists) | Category 4 |
| Aspiration toxicity                     | Category 1 |
| Flammable Liquids                       | Category 4 |

Hazards Not Otherwise Classified (HNOC)

Causes mild skin irritation

Signal Word

Danger

Hazard Statements

Harmful if inhaled
May be fatal if swallowed and enters airways
Combustible liquid
Precautionary Statements - Prevention
Avoid breathing dust/mist
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Call a poison center/doctor if you feel unwell
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do not induce vomiting
IN CASE OF FIRE: Use CO2, dry chemical, or foam for extinction

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep cool

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other Hazards
Toxic to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clethodim</td>
<td>99129-21-2</td>
<td>26.4</td>
</tr>
<tr>
<td>Proprietary Solvent</td>
<td>Proprietary</td>
<td>&lt;24</td>
</tr>
</tbody>
</table>

*If Chemical Name/CAS No is “proprietary” and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.*

4. FIRST-AID MEASURES

First Aid Measures

General Advice
When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison control center or doctor for treatment advice.

Skin Contact
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. Get medical attention if necessary.

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Give oxygen if breathing is difficult. If breathing has stopped, call 911, give artificial respiration. Seek medical advice.
**Ingestion**

Immediately call a poison center or doctor/physician. Never give anything by mouth to an unconscious person. Obtain medical attention. Do not induce vomiting unless directed by medical personnel.

**Most important symptoms and effects**

**Symptoms**

May cause gastrointestinal irritation, nausea, diarrhea, and vomiting. Liquid ingestion may result in vomiting; aspiration of liquid into the lungs must be avoided as liquid contact with the lungs can result in chemical pneumonitis and pulmonary edema/hemorrhage. May cause mild skin and eye irritation. May cause nose and throat irritation.

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

**Notes to Physician**

Treat symptomatically. If the product is ingested, probable mucosal damage may contraindicate the use of gastric lavage.

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5. **FIRE-FIGHTING MEASURES**

**Suitable Extinguishing Media**

Dry chemical. Foam. Carbon dioxide (CO2).

**Unsuitable Extinguishing Media**

Not determined.

**Specific Hazards Arising from the Chemical**

Combustible liquid.

**Hazardous Combustion Products**

Carbon monoxide. Carbon dioxide (CO2). Nitrogen oxides (NOx). Oxides of sulfur. Chlorine compounds. Toxic gases may be formed by fire.

**Protective equipment and precautions for firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Evacuate area of unprotected personnel. Remain upwind of fire to avoid hazardous vapors and decomposition products. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

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6. **ACCIDENTAL RELEASE MEASURES**

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

**Personal Precautions**

Wear protective clothing as described in Section 8 of this safety data sheet. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

**Environmental Precautions**

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

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

**Methods for Containment**

Prevent further leakage or spillage if safe to do so.

**Methods for Clean-Up**

For small spills, absorb with sand, clay, or other inert absorbent. Place in appropriate containers for disposal. For large spills: recover free product. Dike for later disposal. Absorb with inert material, and then place in suitable container for chemical waste. Flush spill area with water, collect rinse water in containers for proper disposal.
7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection recommended in Section 8. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Do not contaminate water, food or feed by storage, disposal or by cleaning equipment. Keep away from heat/sparks/open flames/hot surfaces. — No smoking. Use only in well-ventilated areas.

Conditions for safe storage, including any incompatibilities

Storage Conditions
Keep container tightly closed and store in a cool, dry and well-ventilated place. Keep out of the reach of children. Store away from incompatible materials. Protect from excessive heat. Store locked up. Keep/store only in original container. Do not use food or drink containers for mixing or storage. Store above 18°F (-8°C).

Incompatible Materials
Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines
This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls
Please refer to the product label. Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection
Use splash goggles or face shield when contact may occur.

Skin and Body Protection
Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Viton or other impervious gloves are required. Long sleeve shirt, trousers, and safety shoes.

Respiratory Protection
Ensure adequate ventilation, especially in confined areas. Wear an appropriate NIOSH/MSHA approved respirator if ventilation is inadequate.

General Hygiene Considerations
Wash hands before eating, drinking, smoking and using the toilet. Remove contaminated clothing promptly and wash thoroughly before reused. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate. Do not reuse them. Follow manufacturer’s instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid</th>
<th>Appearance</th>
<th>Amber liquid</th>
<th>Odor</th>
<th>Mild Aromatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Amber</td>
<td>Odor Threshold</td>
<td>Not determined</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization
Not known to occur.

Conditions to Avoid
Elevated temperatures.

Incompatible Materials
Strong oxidizing agents.

Hazardous Decomposition Products

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact
Avoid contact with eyes.

Skin Contact
Causes mild skin irritation.

Inhalation
Harmful if inhaled.

Ingestion
May be fatal if swallowed and enters airways.
Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary Solvent</td>
<td>&gt; 5000 mg/kg (Rat)</td>
<td>&gt; 2000 mg/kg (Rabbit)</td>
<td>&gt; 590 mg/m³ (Rat) 4 h</td>
</tr>
</tbody>
</table>

Information on physical, chemical and toxicological effects

**Symptoms**
Please see section 4 of this SDS for symptoms.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Carcinogenicity**
Not classifiable as a human carcinogen.

**Aspiration hazard**
May be fatal if swallowed and enters airways.

Product Information (Numerical measures of toxicity)

Acute Oral LD50 (Rat): 2,000-5,000 mg/kg
Acute Dermal LD50 (Rabbit): >5,000 mg/kg
Acute Inhalation LC50 (Rat): >2.09 mg/L (4-hr)
Eye Irritation: Moderately irritating.
Dermal Irritation: Moderately irritating.
Dermal Sensitization: Not a contact sensitizer.

12. ECOLOGICAL INFORMATION

**Ecotoxicity**
Toxic to aquatic life with long lasting effects. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply where runoff is likely to occur. Do not apply where weather conditions favor drift from areas treated. Do not contaminate water when disposing of equipment washwaters or rinsate.

The use of this product may pose a hazard to the federally designated endangered species of Solano Grass and Wild Rice. Use of this product is prohibited in the following areas where the species are known to exist:

Solano Grass: Solano County, California: The vernal lakes area bounded by the Union Pacific Railroad and Hastings Road to the north, Highway 113 to the east, Highway 12 to the south, and Travis Air Force Base to the west.

Wild Rice: Hays County, Texas.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary Solvent</td>
<td>2.5: 72 h Skeletonema costatum mg/L EC50</td>
<td>19: 96 h Pimephales promelas mg/L LC50 static 2.34: 96 h Oncorhynchus mykiss mg/L LC50 1740: 96 h Lepomis macrochirus mg/L LC50 static 45: 96 h Pimephales promelas mg/L LC50 flow-through 41: 96 h Pimephales promelas mg/L LC50</td>
<td>0.95: 48 h Daphnia magna mg/L EC50</td>
<td></td>
</tr>
</tbody>
</table>

**Persistence/Degradability**
Not determined.

**Bioaccumulation**
Not determined.

**Mobility**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary Solvent</td>
<td>6.1</td>
</tr>
</tbody>
</table>
13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes END USERS MUST DISPOSE OF ANY UNUSED PRODUCT AS PER THE LABEL RECOMMENDATIONS. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinse is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or Hazardous Waste representative at the nearest EPA regional office. Never place any unused product down an indoor or outdoor drain. Do not contaminate water, food or feed by disposal.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

DOT Pack size less than 119 Gallons: Not Regulated
Pack size over 119 Gallons: NA 1993, Combustible liquid, N.O.S. (Naphthalene), PG III

IATA Not regulated

IMDG Not Regulated

15. REGULATORY INFORMATION

International Inventories

TSCA All ingredients are listed or exempt from listing on Chemical Substance Inventory

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

US Federal Regulations

SARA 311/312 Hazard Categories

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

SARA 313 Not determined
US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

EPA Pesticide Registration Number 66222-60

EPA Statement
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

**EPA Pesticide Label**
Signal Word: Caution

Harmful if swallowed. Causes moderate eye damage. Avoid contact with eyes, skin or clothing

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Caution</th>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Harmful if swallowed</td>
<td>N/A</td>
</tr>
<tr>
<td>Acute toxicity – Inhalation</td>
<td>N/A</td>
<td>Harmful if inhaled</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>N/A</td>
<td>Causes mild skin irritation</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Causes moderate eye irritation</td>
<td>N/A</td>
</tr>
<tr>
<td>Aspiration Hazard</td>
<td>N/A</td>
<td>May be fatal if swallowed and enters airways</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Instability</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Hazards</td>
<td>Flammability</td>
<td>Physical Hazards</td>
<td>Personal Protection</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>0</td>
<td>See section 8</td>
</tr>
</tbody>
</table>

Issue Date: 27-Sep-2013
Revision Date: 04-Sept-2015
Revision Note: Updated format from 02-Jun-2014

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet