

SAFETY DATA SHEET

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

Product identifier: Harrow

EPA Reg. No. 67760-125

Supplier's name and address:

Cheminova Inc.

P.O. Box 110566

One Park Drive, Suite 150

Research Triangle Park, NC 27709

USA

Phone #: (919) 474-6600 (8 AM to 5:00 PM EST, Monday to Friday)

Emergency Telephone #: 1-866-303-6950 (Medical Emergencies)
1-800-424-9300 (24 Hr. Chemtrec Number)

SDS Prepared by: Cheminova Inc.

SDS Preparation date: August 29, 2013

Product use: Herbicide.

Manufacturer's name and address:

Refer to supplier.

SECTION 2 — HAZARDS IDENTIFICATION

GHS Signal Word:

Warning

Classification:

Health	Environmental	Physical
Eye irritation – Category 2B	Aquatic Toxicity – Acute 1 Aquatic Toxicity – Chronic 1	Not applicable

GHS Pictogram:



Hazard Statements:

Causes eye irritation.

Very toxic to aquatic life.

Precautionary Statements:

Wash skin thoroughly after handling.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

Very toxic to aquatic life with long lasting effects.

SECTION 3 — COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>
Rimsulfuron (2-pyridinesulfonamide, N-[[[(4,6-dimethoxy-2-pyrimidinyl)amino]-carbonyl]-3-(ethylsulfonyl)-)	122931-48-0	50	NE	NE
Thifensulfuron-methyl (2-thiophenecarboxylic acid, 3-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-	79277-27-3	25	NE	NE

yl)amino]carbonyl]amino)sulfonyl]-
, methyl ester)

Inert ingredients:

25

NE= None established

This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

SECTION 4 — FIRST AID MEASURES

- IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call poison control center or doctor for treatment advice.
- IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call poison control center or doctor for treatment advice.
- IF SWALLOWED:** Immediately call a poison control center or doctor. Do not induce vomiting unless told to by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.
- IF INHALED:** Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. You may also contact 1-866-303-6950 for emergency medical treatment information.

Note to Physician: There is no specific antidote against this substance. Gastric lavage and/or administration of activated charcoal can be considered. After decontamination, treatment is supportive and symptomatic.

Most important symptoms and effects, both acute and delayed: Primarily irritation. Generally, sulphonylurea herbicides cause lethargy, confusion, dizziness, seizures and coma on ingestion of large quantities.

Indication of any immediate medical attention and special treatment needed: Immediate medical attention is required in case of ingestion.

SECTION 5 — FIRE FIGHTING MEASURES

Flash point (Method): Not determined

Flammable limits (% by volume): Not applicable

Explosive properties: Not explosive

Suitable extinguishing media: Small fires: dry chemical, carbon dioxide. Large fires: water spray or foam. Avoid heavy hose streams.

Special fire-fighting procedures/equipment: Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Fight fire from protected location or maximum possible distance. Dike area to prevent water runoff. Fire fighters should wear self-contained breathing apparatus and protective clothing.

Special hazards arising from the substance or mixture: The essential breakdown products are volatile, toxic, malodorous, irritant and inflammable compounds such as sulphur dioxide, nitrogen oxides, carbon monoxide, and carbon dioxide.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal precautions: Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill, this may mean wearing respirator, face mask or safety glasses, chemical resistant clothing, protective gloves and rubber boots when cleaning up spills. See Section 8, Personal Protection. Stop the source of the spill immediately if safe to do so. Remove sources of ignition. It is recommended to have a predetermined plan for the handling of spills. Empty, closed containers for the collection of spills should be available. Reduce and avoid formation of airborne dust as much as possible.

Environmental precautions: Contain the spill to prevent any further contamination of surface, soil or water. Wash waters must be prevented from entering surface water drains. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.

Spill response/Cleanup: If appropriate, surface water drains should be covered. Minor spills on the floor or other impervious surface should be swept up or preferably vacuumed up using equipment with high efficiency final filter. Transfer to suitable containers. Clean area with strong industrial detergent and much water. Absorb wash liquid onto inert absorbent clay and collect in suitable containers. The used containers should be properly closed and labelled.

Large spills which soak into the ground should be dug up and placed in suitable containers.

Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal. Refer to Section 13 for disposal.

SECTION 7 — HANDLING AND STORAGE

Safe handling procedures: Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling. Before removing gloves, wash them with water and soap. After work, take off all work clothes and shoes. Take a shower, using water and soap. Wear only clean clothes when leaving the job. Wash protective clothing and protective equipment with water and soap after use. Do not discharge to the environment. Collect all waste material and remains from cleaning equipment, etc., and dispose of as hazardous waste.

Storage recommendations: This product is stable under normal conditions of warehouse storage. Store in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with impermeable floor, without access of unauthorized persons or children. The room should only be used for storage of chemicals. Food, drink, feed and seed should not be present. A hand wash station should be available.

Other information: Like most organic powders, the product can form explosive mixtures with air. Avoid dust formation and take precautionary measures against static discharge. Use explosion protected equipment. Keep away from sources of ignition and protect from exposure to fire and heat.

SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ventilation and engineering controls: If handled indoors, provide mechanical exhaust ventilation to minimize concentrations.

Protective gloves: Wear chemical-resistant gloves: barrier laminate, butyl rubber, nitrile rubber, or viton.

Eye protection: Wear protective eyewear, such as safety glasses or chemical goggles.

Respiratory protection: The product is not likely to present an airborne exposure concern during normal handling, but in the event of a discharge of the material which produces a heavy vapour or dust, workers should put on officially approved face mask or respiratory protection equipment with a universal filter type including particle filter.

Other protective equipment: Wear long-sleeved shirt and long pants, shoes and socks. Wear appropriate chemical resistant clothing to prevent skin contact depending on the extent of exposure. During most normal work situations where exposure to the material cannot be avoided for a limited time span, waterproof pants and apron of chemical resistant material or coveralls or PPE will be sufficient.

Permissible exposure levels: See Section 3.

General hygiene considerations: Follow manufacturer's instructions for cleaning and maintaining PPE. If not such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light grey solid (granules)

Odor: Practically odorless

Odor threshold: ND

pH: ND; product is acidic.

Melting point: **Rimsulfuron:** 172-173° C; decomposes
 Thifensulfuron-methyl: 173° C; decomposes

Freezing point: ND

Initial boiling point and boiling range: ND

Flash point: NA

Evaporation rate: NA

Flammability: NA

Upper/lower flammability or explosive limits: NA

Vapor pressure: **Rimsulfuron:** 8.9×10^{-11} Pa @ 20° C

Thifensulfuron-methyl: 7.5×10^{-9} Pa @ 20° C
 1.7×10^{-8} Pa @ 25° C

Vapor density: ND

Relative density: ND

Solubility(ies): Solubility of **rimsulfuron** at 25° C in:

acetone	14.8	g/l
acetonitrile	17.2	g/l
dichloromethane	35.3	g/l
N,N-dimethylformamide	241	g/l
dimethylsulphoxide	113	g/l
ethyl acetate	2.85	g/l
n-hexane	<0.01	g/l
methanol	1.55	g/l
toluene	0.363	g/l
o-xylene	0.093	g/l
water	0.135	g/l @ pH 5
	7.3	g/l @ pH 7
	5.56	g/l @ pH 9

Solubility of **thifensulfuron-methyl** at 25° C in:

n-hexane acetone	<0.1	g/l
acetone	1.9	g/l
dichloromethane	27.5	g/l
methanol	2.6	g/l
ethanol	0.9	g/l
acetonitrile	7.3	g/l
ethyl acetate	2.6	g/l
xylene	0.2	g/l
water	0.223	g/l @ pH 5 and 25° C
	2.24	g/l @ pH 7 and 25° C
	8.83	g/l @ pH 9 and 25° C
	2.040	g/l @ pH 7 and 20° C

Partition coefficient (n-octanol/water): **Rimsulfuron:** $\log K_{ow} = -1.46$ @ pH 7 and 25° C
Thifensulfuron-methyl: $\log K_{ow} = -1.7$ @ pH 7 and 25° C

Auto-ignition temperature: NA

Decomposition temperature: **Rimsulfuron:** starting from approximately 174° C
Thifensulfuron-methyl: 173° C

Viscosity: ND

ND: Not determined

NA: Not applicable

SECTION 10 — REACTIVITY AND STABILITY DATA

Stability and reactivity: This product is stable under the recommended storage and handling conditions described in Section 7.

Hazardous polymerization: Not known to occur.

Conditions to avoid: Excessive dust formation may pose a dust explosion hazard. Heating of the product may produce harmful and irritant vapors.

Materials to avoid (incompatibles): Strong oxidizing compounds and strong alkalis.

Hazardous decomposition products in a fire: The essential breakdown products are volatile, toxic, malodorous, irritant and inflammable compounds such as sulphur dioxide, nitrogen oxides, carbon monoxide, and carbon dioxide.

SECTION 11 — TOXICOLOGICAL INFORMATION

Routes of exposure: Skin, inhalation, ingestion.

Acute toxicity: The product is not considered harmful by inhalation, in contact with skin or if swallowed. However, it should be treated with the usual care of handling chemicals. The acute toxicity is estimated as:

Toxicological data (product):

LC₅₀, inhalation (mg/L/4 hrs) = >5.05

LD₅₀, oral, (mg/kg) = >5000

LD₅₀, dermal, (mg/kg) = >5000
Mildly irritating to skin
May be irritating to eyes
Skin sensitizer = Not a skin sensitizer.

Carcinogenicity:

Thifensulfuron-methyl: Minor indications of carcinogenic effects were found in female rats, but not in male rats and female and male mice.

Specific Target Organ Toxicity (STOT) – repeated exposure:

Rimsulfuron: Target organs: liver and kidneys.

Teratogenicity, mutagenicity, other reproductive effects: No known teratogenic, mutagenic or reproductive effects.

SECTION 12 — ECOLOGICAL INFORMATION

Environmental hazards:

Ecotoxicological information: The product is toxic to green algae and highly toxic to aquatic plants, but is considered as non-toxic to fish, aquatic invertebrates, soil micro- and macroorganisms, birds, mammals and insects. The ecotoxicity of the active ingredients is measured as:

			Rimsulfuron	Thifensulfuron -methyl
- Fish	Rainbow trout (<i>Salmo gairdneri</i>)	96-h LC ₅₀ 21-day NOEC	> 390 mg/l 125 mg/l	> 100 mg/l 250 mg/l
- Invertebrates	Daphnids (<i>Daphnia magna</i>)	48-h EC ₅₀ 21-day NOEC	> 360 mg/l 1 mg/l	470 mg/l 100 mg/l
- Algae	Green algae (<i>Selenastrum capricornutum</i>)	72-h IC ₅₀	1.2 mg/l	15.9 µg/l
- Plants	Duckweed (<i>Lemna minor</i>)	EC ₅₀	0.005 mg/l	
	(<i>Lemna gibba</i>)			9.0 µg/l
- Birds	Mallard duck (<i>Anas platyrhynchos</i>)	LD ₅₀	> 2000 mg/kg	> 2510 mg/kg
- Earthworms	<i>Eisenia foetida foetida</i>	LC ₅₀	> 1000 mg/kg soil	> 2000 mg/kg soil
- Insects	Bees (<i>Apis mellifera</i>)	LD ₅₀ , oral LD ₅₀ , contact	> 220 µg/bee > 200 µg/bee	> 7.1 µg/bee > 100 µg/bee

Mobility: Under normal conditions the active ingredients are of high to intermediate mobility in soil. There is a potential for leaching to groundwater.

Persistence and degradability: The active ingredients do not meet the criteria for being readily biodegradable. However, they are degraded in the environment. Degradation occurs both by chemical hydrolysis and by microbiological degradation.

Rimsulfuron: Moderately persistent in the environment. Primary degradation half-lives vary with circumstances, from a few weeks to a few months in aerobic water and soil.

Thifensulfuron-methyl: Not persistent in the environment. Primary degradation half-lives vary from a few days to a few weeks in aerobic soil and water. Degradation products are not readily biodegradable and remain in soil for a few months.

Bioaccumulative potential: See Section 9 for n-octanol/water partition coefficients. Due to relatively high solubility in water, none of the active ingredients bioaccumulate. The bioconcentration factors (BCFs) are approximately 1.

SECTION 13 — DISPOSAL CONSIDERATIONS

Handling for disposal: To avoid wastes, use all material by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program.

Methods of disposal: Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems. Refer to product label for specific container disposal instructions.

SECTION 14 — TRANSPORTATION INFORMATION

US DOT 49 CFR information:

Not regulated

INTERNATIONAL:

IMDG/IMO (vessel): UN3077, Environmentally hazardous substance, solid, n.o.s. (rimsulfuron, thifensulfuron-methyl), 9, PGIII, Marine Pollutant

IATA/ICAO (air): UN3077, Environmentally hazardous substance, solid, n.o.s. (rimsulfuron, thifensulfuron-methyl), 9, PGIII, Marine Pollutant

SECTION 15 — REGULATORY INFORMATION

FIFRA: 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 on non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

WARNING

Causes substantial but temporary eye injury.

Harmful if swallowed.

Harmful if absorbed through skin.

Do not get in eyes or on clothing.

Avoid contact with skin, eyes or clothing.

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

This product is toxic to aquatic organisms, including fish and invertebrates.

EPA/CERCLA Reportable Quantity (RQ): Not applicable

SARA TITLE III:

Sec. 302, Extremely Hazardous Substance Notification: This material is not known to contain any Extremely Hazardous Substances.

Sec. 311/312, Hazard Categories: Immediate (acute) health hazard

Sec. 313, Toxic Chemicals Notification: Not applicable

California Proposition 65: Not applicable

SECTION 16 — OTHER INFORMATION

HMIS Rating: 1 Health; 0 Flammability; 0 Reactivity

NFPA Rating: 1 Health; 0 Flammability; 0 Reactivity

0-minimal 1- slight 2-moderate 3-severe 4-extreme

Prepared by: Cheminova Inc.

Telephone #: (919) 474-6600 (8 AM to 5:00 PM EST, Monday to Friday)

SDS preparation date: August 19, 2013