SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name: VARRO® HERBICIDE

Product code (UVP): 79303688

SDS Number: 102000014337

EPA Registration No.: 264-1062

Relevant identified uses of the substance or mixture and uses advised against

Use: Herbicide

Restrictions on use: See product label for restrictions.

Information on supplier

Supplier: Bayer CropScience

2 T.W. Alexander Drive

Research Triangle PK, NC 27709

USA

Responsible Department: Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/7 days): 1-800-334-7577

Product Information Telephone Number: 1-866-99BAYER (1-866-992-2937)

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Skin irritation: Category 2

Eye irritation: Category 2B

Labelling in accordance with regulation HCS 29CFR §1910.1200

Signal word: Warning

Hazard statements

Causes skin and eye irritation.

Precautionary statements

Wash thoroughly after handling.

Wear protective gloves.
IF ON SKIN: Wash with plenty of water/ soap.
Specific treatment (see supplemental first aid instructions on this label).
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
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.

Hazards Not Otherwise Classified (HNOC)
No physical hazards not otherwise classified.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Component Name</th>
<th>CAS-No.</th>
<th>Concentration % by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiencarbazone-methyl</td>
<td>317815-83-1</td>
<td>1.0</td>
</tr>
<tr>
<td>Mefenpyr-diethyl</td>
<td>135590-91-9</td>
<td>6.0</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic, &lt;1% naphthalene</td>
<td>64742-94-5</td>
<td>60.7</td>
</tr>
<tr>
<td>Isotridecanol, ethoxylated</td>
<td>9043-30-5</td>
<td>9.8</td>
</tr>
<tr>
<td>Benzenesulfonic acid, mono-C11-13-branched alkyl derivs., calcium salts</td>
<td>68953-96-8</td>
<td>3.2</td>
</tr>
</tbody>
</table>

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice
Move out of dangerous area. When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Inhalation
Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Skin contact
Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

Eye contact
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 a physician or poison control center immediately.

Ingestion
Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed
**Symptoms**

If large amounts are ingested, the following symptoms may occur:

- Headache, Nausea, Dizziness, Somnolence
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
- Aspiration may cause pulmonary oedema and pneumonitis.
- Inhalation may provoke the following symptoms:
  - Cough, Shortness of breath, Cyanosis, Fever

Symptoms and hazards refer to the solvent.

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

**Risks**

Contains hydrocarbon solvents. May pose an aspiration pneumonia hazard.

**Treatment**

Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.

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**SECTION 5: FIREFIGHTING MEASURES**

**Extinguishing media**

- **Suitable**: Water spray, Carbon dioxide (CO2), Foam, Sand
- **Unsuitable**: High volume water jet

**Special hazards arising from the substance or mixture**

In the event of fire the following may be released; Hydrogen chloride (HCl), Hydrogen cyanide (hydrocyanic acid), Carbon monoxide (CO), Nitrogen oxides (NOx), Sulphur oxides

**Advice for firefighters**

- **Special protective equipment for firefighters**: In the event of fire and/or explosion do not breathe fumes. Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

**Further information**

- Contain the spread of the fire-fighting media. Do not allow run-off from fire fighting to enter drains or water courses.
- Keep out of smoke. Fight fire from upwind position.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flash point</strong></td>
<td>115 °C</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>425 °C / 797 °F</td>
</tr>
<tr>
<td><strong>Lower explosion limit</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Upper explosion limit</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Explosivity</strong></td>
<td>Not explosive</td>
</tr>
</tbody>
</table>

92/69/EEC, A.14 / OECD 113
SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Precautions
Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up
Methods for cleaning up
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations. Keep in suitable, closed containers for disposal.

Additional advice
Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

Reference to other sections
Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling
Use only in area provided with appropriate exhaust ventilation.

Hygiene measures
Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.
Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers
Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Store in a place accessible by authorized persons only. Keep away from direct sunlight. Protect from freezing.

Advice on common storage
Keep away from food, drink and animal feedingstuffs.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiencarbazone-methyl</td>
<td>317815-83-1</td>
<td>10 mg/m3 (TWA)</td>
<td></td>
<td>OES BCS*</td>
</tr>
<tr>
<td>Mefenpyr-diethyl</td>
<td>135590-91-9</td>
<td>10 mg/m3</td>
<td></td>
<td>OES BCS*</td>
</tr>
</tbody>
</table>
**Exposure controls**

**Personal protective equipment**
In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

**Respiratory protection**
When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

<table>
<thead>
<tr>
<th>Substance</th>
<th>TWA</th>
<th>REL</th>
<th>PEL</th>
<th>STEL</th>
<th>Date</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic, &lt;1% naphthalene</td>
<td>200 mg/m³</td>
<td>400 mg/m³/100 ppm</td>
<td>400 mg/m³/100 ppm</td>
<td>1,600 mg/m³/400 ppm</td>
<td>03 2014</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic, &lt;1% naphthalene</td>
<td>1,350 mg/m³/300 ppm</td>
<td>09 2013</td>
<td>US CA OEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic, &lt;1% naphthalene</td>
<td>1,800 mg/m³/400 ppm</td>
<td>09 2013</td>
<td>US CA OEL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*OES BCS: Internal Bayer AG, Crop Science Division "Occupational Exposure Standard"
Hand protection  Chemical resistant nitrile rubber gloves
Eye protection  Chemical resistant goggles must be worn.
Skin and body protection  Wear long-sleeved shirt and long pants and shoes plus socks.
General protective measures  Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance  brown
Physical State  Liquid
Odor  aromatic
Odour Threshold  No data available
pH  7.0 - 8.5 (10 %) (23 °C) (deionized water)
Vapor Pressure  No data available
Vapor Density (Air = 1)  No data available
Density  ca. 1.00 g/cm³ (20 °C)
Evaporation rate  No data available
Boiling Point  No data available
Melting / Freezing Point  No data available
Water solubility  dispersible
Minimum Ignition Energy  Not applicable
Decomposition temperature  No data available
Partition coefficient: n-octanol/water  Not applicable
Viscosity  40 - 140 mPa.s (20 °C) Velocity gradient 20 /s
           40 - 100 mPa.s (20 °C) Velocity gradient 100 /s
Flash point  115 °C
Auto-ignition temperature  425 °C / 797 °F
Lower explosion limit  No data available
Upper explosion limit  No data available
Explosivity  Not explosive
            92/69/EEC, A.14 / OECD 113
Other information  Further safety related physical-chemical data are not known.
SECTION 10: STABILITY AND REACTIVITY

Reactivity
Thermal decomposition: No data available
Chemical stability: Stable under recommended storage conditions.
Possibility of hazardous reactions: No hazardous reactions when stored and handled according to prescribed instructions.
Conditions to avoid: Extremes of temperature and direct sunlight.
Incompatible materials: No data available
Hazardous decomposition products: No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes: Eye contact, Skin contact, Inhalation, Ingestion
Immediate Effects
Eye: Moderate eye irritation.
Skin: Moderate skin irritation.

Information on toxicological effects
Acute oral toxicity: LD50 (female Rat) > 2,000 mg/kg
Acute inhalation toxicity: LC50 (Rat) > 1.73 mg/l
   Exposure time: 4 h
   Determined in the form of liquid aerosol.
   Highest attainable concentration.
   No deaths
Acute dermal toxicity: LD50 (male/female combined Rat) > 2,000 mg/kg
Skin corrosion/irritation: Irritating to skin. (Rabbit)
Serious eye damage/eye irritation: Irritating to eyes. (Rabbit)
Respiratory or skin sensitisation: Skin: Non-sensitizing. (Mouse)
   OECD Test Guideline 429, local lymph node assay (LLNA)

Assessment STOT Specific target organ toxicity – repeated exposure
Thiencarbazone-methyl did not cause specific target organ toxicity in experimental animal studies.
Mefenpyr-diethyl did not cause specific target organ toxicity in experimental animal studies.

Assessment mutagenicity
Thiencarbazone-methyl was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.
Mefenpyr-diethyl was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.
Assessment carcinogenicity
Thiencarbazone-methyl was not carcinogenic in a lifetime feeding study in rats. Thiencarbazone-methyl caused at high dose levels an increased incidence of tumours in mice in the following organ(s): urinary bladder. The tumours seen with Thiencarbazone-methyl were caused through the chronic irritation due to the presence of bladder stones. Mefenpyr-diethyl was not carcinogenic in lifetime feeding studies in rats and mice.

ACGIH
Solvent Naphtha (petroleum), heavy aromatic, 64742-94-5 Group A3 <1% naphthalene

NTP
None.

OSHA
None.

Assessment toxicity to reproduction
Thiencarbazone-methyl did not cause reproductive toxicity in a two-generation study in rats. Mefenpyr-diethyl did not cause reproductive toxicity in a two-generation study in rats.

Assessment developmental toxicity
Thiencarbazone-methyl did not cause developmental toxicity in rats and rabbits. Mefenpyr-diethyl caused developmental toxicity only at dose levels toxic to the dams. The developmental effects seen with Mefenpyr-diethyl are related to maternal toxicity.

Further information
Only acute toxicity studies have been performed on the formulated product. The non-acute information pertains to the active ingredient(s).

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish
LC50 (Oncorhynchus mykiss (rainbow trout)) 6.95 mg/l Exposure time: 96 h

Toxicity to aquatic invertebrates
EC50 (Daphnia magna (Water flea)) 2.4 mg/l Exposure time: 48 h

Toxicity to aquatic plants
EC50 (Raphidocelis subcapitata (freshwater green alga)) 1.017 mg/l Growth rate; Exposure time: 72 h The value mentioned relates to the active ingredient thiencarbazone-methyl.
EC50 (Leucaena gibba (gibbous duckweed)) 0.00131 mg/l Growth rate; Exposure time: 7 d The value mentioned relates to the active ingredient thiencarbazone-methyl.
SAFETY DATA SHEET

VARRO® HERBICIDE

Biodegradability
- Thiencarbazone-methyl: Not rapidly biodegradable
- Mefenpyr-diethyl: Not rapidly biodegradable

Koc
- Thiencarbazone-methyl: Koc: 100
- Mefenpyr-diethyl: Koc: 625

Bioaccumulation
- Thiencarbazone-methyl: Does not bioaccumulate.
- Mefenpyr-diethyl: Bioconcentration factor (BCF) 232

Mobility in soil
- Thiencarbazone-methyl: Moderately mobile in soils
- Mefenpyr-diethyl: Slightly mobile in soils

Additional ecological information
- No other effects to be mentioned.

Environmental precautions
- 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 contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water.
- Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods
Product
- It is best to use all of the product in accordance with label directions. If it is necessary to dispose of unused product, please follow container label instructions and applicable local guidelines.
- Dispose in accordance with all local, state/provincial and federal regulations.

Contaminated packaging
- Do not re-use empty containers.
- Triple rinse containers.
- Puncture container to avoid re-use.
- Dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State/Provincial and local authorities, by burning.
- If burned, stay out of smoke.
- Follow advice on product label and/or leaflet.

RCRA Information
- Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR
- Not dangerous goods / not hazardous material
IMDG
UN number 3082
Class 9
Packaging group III
Marine pollutant YES
Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (THIENCARBAZONE-METHYL SOLUTION)

IATA
UN number 3082
Class 9
Packaging group III
Environm. Hazardous Mark YES
Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (THIENCARBAZONE-METHYL SOLUTION)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 264-1062
US Federal Regulations
TSCA list
Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene 64742-94-5
Alcohols, C11-14-iso-, C13-rich, ethoxylated 78330-21-9
Fatty acids, C16-18 and C18-unsatd., Me esters 67762-38-3
Castor oil, ethoxylated 61791-12-6
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D) Not applicable.
SARA Title III - Section 302 - Notification and Information None.
SARA Title III - Section 313 - Toxic Chemical Release Reporting None.
US States Regulatory Reporting
CA Prop65 This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients
Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene
Amorphous silica

EPA/FIFRA Information:
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 required on the pesticide label:

Signal word: Caution!

Hazard statements: Harmful if swallowed, inhaled or absorbed through the skin.
Moderate eye irritation.
Avoid inhalation of vapour or mist.
Avoid contact with skin, eyes and clothing.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms
49CFR Code of Federal Regulations, Title 49
ACGIH US. ACGIH Threshold Limit Values
ATE Acute toxicity estimate
CAS-Nr. Chemical Abstracts Service number
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
EINECS European inventory of existing commercial substances
ELINCS European list of notified chemical substances
IARC International Agency for Research on Cancer
IATA International Air Transport Association
IMDG International Maritime Dangerous Goods
N.O.S. Not otherwise specified
NTP US. National Toxicology Program (NTP) Report on Carcinogens
OECD Organization for Economic Co-operation and Development
TDG Transportation of Dangerous Goods
TWA Time weighted average
UN United Nations
WHO World health organisation

NFPA 704 (National Fire Protection Association):
Health - 1 Flammability - 1 Instability - 0 Others - none

Health - 2 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard
Reason for Revision: The following sections have been revised: Section 3: Composition / Information on Ingredients. Section 9: Physical and Chemical Properties. Reviewed and updated for general editorial purposes.

Revision Date: 12/17/2018

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