SAFETY DATA SHEET

VARRO® HERBICIDE

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
United States
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</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
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.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable
Water spray, Carbon dioxide (CO2), Foam, Sand

Unsuitable
None known.

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
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.

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
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 material 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

<table>
<thead>
<tr>
<th>Substance</th>
<th>Code</th>
<th>Concentration</th>
<th>Date</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic (Non-aerosol.)</td>
<td>64742-94-5</td>
<td>200 mg/m^3 (TWA)</td>
<td>03 2014</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>400 mg/m^3/100 ppm (REL)</td>
<td>2010</td>
<td>NIOSH</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>100 mg/m^3 (REL)</td>
<td>2010</td>
<td>NIOSH</td>
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<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>400 mg/m^3/100 ppm (PEL)</td>
<td>02 2006</td>
<td>OSHA Z1</td>
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<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>400 mg/m^3/100 ppm (TWA)</td>
<td>1989</td>
<td>OSHA Z1A</td>
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<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>400 mg/m^3/100 ppm (TWA)</td>
<td>06 2008</td>
<td>TN OEL</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>46 ppb (AN ESL)</td>
<td>07 2011</td>
<td>TX ESL</td>
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<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>2560 ug/m^3 (ST ESL)</td>
<td>07 2011</td>
<td>TX ESL</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>460 ppb (ST ESL)</td>
<td>07 2011</td>
<td>TX ESL</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>256 ug/m^3 (AN ESL)</td>
<td>07 2011</td>
<td>TX ESL</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>1,600 mg/m^3/400 ppm (TWA PEL)</td>
<td>08 2010</td>
<td>US CA OEL</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>1,350 mg/m^3/300 ppm (TWA PEL)</td>
<td>09 2013</td>
<td>US CA OEL</td>
</tr>
<tr>
<td>Solvent Naphtha (petroleum), heavy aromatic</td>
<td>64742-94-5</td>
<td>1,800 mg/m^3/400 ppm (STEL)</td>
<td>09 2013</td>
<td>US CA OEL</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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>brown</td>
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<tr>
<td>Physical State</td>
<td>Liquid</td>
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<tr>
<td>Odor</td>
<td>aromatic</td>
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<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 - 8.0 at 1% (23 °C) (deionized water)</td>
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<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
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<tr>
<td>Vapor Density (Air = 1)</td>
<td>No data available</td>
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<tr>
<td>Density</td>
<td>ca. 1.00 g/cm³ at 20 °C</td>
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<tr>
<td>Evaporation rate</td>
<td>No data available</td>
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<tr>
<td>Boiling Point</td>
<td>No data available</td>
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<tr>
<td>Melting / Freezing Point</td>
<td>No data available</td>
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<tr>
<td>Water solubility</td>
<td>dispersible</td>
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<tr>
<td>Minimum Ignition Energy</td>
<td>Not applicable</td>
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<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>30 - 140 mPa×s at 20 °C Velocity gradient 20 /s</td>
</tr>
<tr>
<td>Flash point</td>
<td>115 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>425 °C / 797 °F</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosivity</td>
<td>Not explosive</td>
</tr>
</tbody>
</table>

92/69/EEC, A.14 / OECD 113
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 irritation
Irritating to skin. (Rabbit)

Eye irritation
Irritating to eyes. (Rabbit)

Sensitisation
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
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 (Lemna gibba (gibbous duckweed)) 0.00131 mg/l
Growth rate; Exposure time: 7 d
The value mentioned relates to the active ingredient thiencarbazone-
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
Environn. 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 64742-94-5
Isotridecanol, ethoxylated 9043-30-5
Benzenesulfonic acid, mono-C11-13-branched alkyl derivs., calcium salts 68953-96-8

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D) None.
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 64742-94-5 CA, CT, MN, NJ
Canadian Regulations
Canadian Domestic Substance List
None.

Environmental
CERCLA
None.
Clean Water Section 307 Priority Pollutants
None.
Safe Drinking Water Act Maximum Contaminant Levels
None.

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>49CFR</td>
<td>Code of Federal Regulations, Title 49</td>
</tr>
<tr>
<td>ACGIH</td>
<td>US. ACGIH Threshold Limit Values</td>
</tr>
<tr>
<td>ATE</td>
<td>Acute toxicity estimate</td>
</tr>
<tr>
<td>CAS-Nr.</td>
<td>Chemical Abstracts Service number</td>
</tr>
<tr>
<td>CERCLA</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Act</td>
</tr>
<tr>
<td>EINECS</td>
<td>European inventory of existing commercial substances</td>
</tr>
<tr>
<td>ELINGS</td>
<td>European list of notified chemical substances</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods</td>
</tr>
<tr>
<td>N.O.S.</td>
<td>Not otherwise specified</td>
</tr>
<tr>
<td>NTP</td>
<td>US. National Toxicology Program (NTP) Report on Carcinogens</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>TDG</td>
<td>Transportation of Dangerous Goods</td>
</tr>
<tr>
<td>TWA</td>
<td>Time weighted average</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>WHO</td>
<td>World health organisation</td>
</tr>
</tbody>
</table>
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: Revised according to the current OSHA Hazard Communication Standard (29CFR1910.1200)

Revision Date: 12/20/2016

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.