

SAFETY DATA SHEET



REVOLVER® HERBICIDE

Version 4.0 / USA
102000022418

1/13
Revision Date: 10/19/2021
Print Date: 06/17/2022

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

Product identifier

| | |
|----------------------|---------------------|
| Trade name | REVOLVER® HERBICIDE |
| Product code (UVP) | 79644205, 86252163 |
| SDS Number | 102000022418 |
| EPA Registration No. | 101563-53 |

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 | Environmental Science U.S. LLC. 5000 Centregreen Way, Suite 400 Cary, NC 27513 USA |
|----------|---|

Emergency telephone no.

| | |
|---|----------------|
| Emergency Telephone Number (24hr/ 7 days) | 1-800-424-9300 |
| Product Information Telephone Number | 1-800-331-2867 |

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Skin sensitisation, Aspiration hazard: Category 1
Skin irritation, Carcinogenicity: Category 2

Labelling in accordance with regulation HCS 29CFR §1910.1200



Signal word: Danger

Hazard statements

May cause an allergic skin reaction.

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May be fatal if swallowed and enters airways.
Causes skin irritation.
Suspected of causing cancer.

Precautionary statements

Avoid breathing mist/ spray.
Contaminated work clothing should not be allowed out of the workplace.
Wash thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
IF ON SKIN: Wash with plenty of water/ soap.
If skin irritation or rash occurs: Get medical advice/ attention.
Specific treatment (see supplemental first aid instructions on this label).
IF SWALLOWED: Immediately call a POISON CENTER/doctor/ physician.
Take off immediately all contaminated clothing and wash it before reuse.
Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/ attention.
Store locked up.
Dispose of contents/container in accordance with local regulation.

Hazards Not Otherwise Classified (HNOC)

No physical hazards not otherwise classified.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| Hazardous Component Name | CAS-No. | Concentration % by weight |
|---|-------------|---------------------------|
| Foramsulfuron | 173159-57-4 | 2.34 |
| Hydrocarbons, C10-C13, aromatics, <1% naphthalene | | 34.31 |
| Benzenesulfonic acid, mono-C11-13-branched alkyl derivs., calcium salts | 68953-96-8 | 1.8 |
| Octan-1-ol | 111-87-5 | 1.2 |
| Naphthalene | 91-20-3 | 0.35 |

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.

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|---|---|
| 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 | Aspiration may cause pulmonary oedema and pneumonitis. |
| 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. |

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

| | |
|-------------------|--|
| Suitable | Water spray, Carbon dioxide (CO ₂), 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: Carbon monoxide (CO), Carbon dioxide (CO ₂), Hydrogen cyanide (hydrocyanic acid), Nitrogen oxides (NO _x), Sulphur dioxide (SO ₂), Dangerous gases are evolved in the event of a fire. |
|--|---|

Advice for firefighters

| | |
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| Special protective equipment for firefighters | Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing. |
|--|--|

| | |
|----------------------------|--|
| Further information | Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. |
|----------------------------|--|

| | |
|----------------------------------|-------------------|
| Flash point | 128 °C / 262.4 °F |
| Auto-ignition temperature | No data available |
| Lower explosion limit | No data available |
| Upper explosion limit | No data available |
| Explosivity | No data available |

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Precautions Isolate hazard area. Keep unauthorized people away. 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). 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. Handle and open container in a manner as to prevent spillage.

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

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Protect from freezing.

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

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters**

| Components | CAS-No. | Control parameters | Update | Basis |
|---------------|-------------|----------------------|--------|----------|
| Foramsulfuron | 173159-57-4 | 10 mg/m ³ | | OES BCS* |

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| | | | | |
|--|------------|----------------------------------|---------|-----------|
| | | (TWA) | | |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene (Non-aerosol.) | 64742-94-5 | 200 mg/m3 (TWA) | 03 2014 | ACGIH |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 400 mg/m3/100 ppm (REL) | 2010 | NIOSH |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 100 mg/m3 (REL) | 2010 | NIOSH |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 400 mg/m3/100 ppm (PEL) | 02 2006 | OSHA Z1 |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 400 mg/m3/100 ppm (TWA) | 1989 | OSHA Z1A |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 400 mg/m3/100 ppm (TWA) | 06 2008 | TN OEL |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 1,600 mg/m3/400 ppm (TWA PEL) | 08 2010 | US CA OEL |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 1,350 mg/m3/300 ppm (TWA PEL) | 09 2013 | US CA OEL |
| Solvent Naphtha (petroleum), heavy aromatic, <1% naphthalene | 64742-94-5 | 1,800 mg/m3/400 ppm (STEL) | 09 2013 | US CA OEL |
| 1-Octanol | 111-87-5 | 265 mg/m3/50 ppm (TWA) | 2007 | WEEL |
| Naphthalene | 91-20-3 | 10 ppm (TWA) | 02 2012 | ACGIH |
| Naphthalene | 91-20-3 | 50 mg/m3/10 ppm (REL) | 2010 | NIOSH |
| Naphthalene | 91-20-3 | 75 mg/m3/15 ppm (STEL) | 2010 | NIOSH |
| Naphthalene | 91-20-3 | 50 mg/m3/10 ppm (PEL) | 02 2006 | OSHA Z1 |
| Naphthalene | 91-20-3 | 75 mg/m3/15 ppm | 06 2008 | TN OEL |

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| | | (STEL) | | |
|-------------|---------|--|---------|-----------|
| Naphthalene | 91-20-3 | 50 mg/m ³ /10 ppm (TWA) | 06 2008 | TN OEL |
| Naphthalene | 91-20-3 | 0.5 mg/m ³ /0.1 ppm (TWA PEL) | 10 2014 | US CA OEL |
| Naphthalene | 91-20-3 | 10 ppm (TLV) | | OES BCS* |

*OES BCS: Internal Bayer AG, Crop Science Division "Occupational Exposure Standard"

Biological occupational exposure limits

| Components | CAS-No. | Parameters | Biological specimen | Sampling time | Conc. | Basis |
|-------------|---------|---|---------------------|------------------------------|-------|-----------|
| Naphthalene | 91-20-3 | 1-Naphthol, with hydrolysis + 2-Naphthol, with hydrolysis | | Sampling time: End of shift. | | ACGIH BEI |

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.

Hand protection

Chemical-resistant gloves (barrier laminate, butyl rubber, nitrile rubber or Viton)

Eye protection

Safety glasses with side-shields

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

Information on basic physical and chemical properties

| | |
|-----------------|--|
| Form | Liquid |
| Colour | beige |
| Odour | aromatic |
| Odour Threshold | No data available |
| pH | 5.0 - 7.0 (10 %) (23 °C) (deionized water) |

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| | |
|---|--|
| Melting point/range | No data available |
| Boiling Point | No data available |
| Flash point | 128 °C / 262.4 °F |
| Flammability | No data available |
| Auto-ignition temperature | No data available |
| Thermal decomposition | No data available |
| Minimum ignition energy | No data available |
| Self-accelarating decomposition temperature (SADT) | No data available |
| Upper explosion limit | No data available |
| Lower explosion limit | No data available |
| Vapour pressure | No data available |
| Evaporation rate | No data available |
| Relative vapour density | No data available |
| Relative density | No data available |
| Density | ca. 0.96 g/cm ³ (20 °C) |
| Water solubility | dispersible |
| Partition coefficient: n-octanol/water | Foramsulfuron: log Pow: 0.60 |
| Viscosity, dynamic | 25 - 100 mPa.s (20 °C) Velocity gradient 20 /s 20 - 60 mPa.s (20 °C) Velocity gradient 100 /s |
| Viscosity, kinematic | No data available |
| Oxidizing properties | No data available |
| Explosivity | No data available |
| Other information | Further safety related physical-chemical data are not known. |

SECTION 10: STABILITY AND REACTIVITY

| | |
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| Reactivity | Stable under normal conditions. |
| Chemical stability | Stable under recommended storage conditions. |

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|---|--|
| 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 | Strong acids, Strong bases, Store only in the original container. |
| Hazardous decomposition products | No decomposition products expected under normal conditions of use. |

SECTION 11: TOXICOLOGICAL INFORMATION

| | |
|--------------------------|--|
| Exposure routes | Eye contact, Skin contact, Ingestion, Inhalation |
| Immediate Effects | |
| Eye | Causes moderate eye irritation. |
| Skin | Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. May cause skin irritation. |

Information on toxicological effects

| | |
|--|---|
| Acute oral toxicity | LD50 (male/female combined Mouse) > 2,000 mg/kg |
| Acute inhalation toxicity | LC50 (Rat) > 5.25 mg/l Exposure time: 4 h Determined in the form of liquid aerosol. |
| Acute dermal toxicity | LD50 (male/female combined Rat) > 2,000 mg/kg |
| Skin corrosion/irritation | Irritating to skin. (Rabbit) |
| Serious eye damage/eye irritation | slight irritation (Rabbit) |
| Respiratory or skin sensitisation | Skin: Sensitising (Mouse) OECD Test Guideline 429, local lymph node assay (LLNA) |

Assessment STOT Specific target organ toxicity – single exposure

Foramsulfuron: Based on available data, the classification criteria are not met.

Assessment STOT Specific target organ toxicity – repeated exposure

Foramsulfuron did not cause specific target organ toxicity in experimental animal studies.

Assessment mutagenicity

Foramsulfuron was not mutagenic or genotoxic based on the overall weight of evidence in a battery of in vitro and in vivo tests.

Assessment carcinogenicity

Foramsulfuron was not carcinogenic in lifetime feeding studies in rats and mice.

ACGIH

Naphthalene

91-20-3

Group A3

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NTP

Naphthalene 91-20-3

IARC

Naphthalene 91-20-3 Overall evaluation: 2B

OSHA

None.

Assessment toxicity to reproduction

Foramsulfuron did not cause reproductive toxicity in a two-generation study in rats.

Assessment developmental toxicity

Foramsulfuron did not cause developmental toxicity in rats and rabbits.

Aspiration hazard

May be fatal if swallowed and enters airways.

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 aquatic invertebrates | EC50 (Daphnia magna (Water flea)) 6.9 mg/l Exposure time: 48 h |
| Toxicity to aquatic plants | EC50 (Raphidocelis subcapitata (freshwater green alga)) > 5 mg/l Growth rate; Exposure time: 96 h EC50 (Lemna gibba (gibbous duckweed)) 0.75 µg/l Growth rate; Exposure time: 7 d |
| Biodegradability | Foramsulfuron: Not rapidly biodegradable |
| Koc | Foramsulfuron: Koc: 38 - 151 |
| Bioaccumulation | Foramsulfuron: Does not bioaccumulate. |
| Mobility in soil | Foramsulfuron: Mobile in soils |
| Results of PBT and vPvB assessment | |
| PBT and vPvB assessment | Foramsulfuron: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB). |
| Additional ecological | The ecological data refer to a similar formulation. |

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| | |
|----------------------------------|---|
| 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. Do not apply when weather conditions favor runoff or drift. Drift or runoff from treated areas may adversely affect non-target plants. Apply this product as specified on the label. |

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

| | |
|-------------------------------|---|
| Product | Dispose in accordance with all local, state/provincial and federal regulations. |
| Contaminated packaging | Consult state and local regulations regarding the proper disposal of container. 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

| | |
|----------------------|--|
| UN number | 3082 |
| Class | 9 |
| Packaging group | III |
| Proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (NAPHTHALENE) |
| RQ | Reportable Quantity is reached with 28,571 lb of product. |

IMDG

| | |
|----------------------|--|
| UN number | 3082 |
| Class | 9 |
| Packaging group | III |
| Marine pollutant | YES |
| Proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ALKYL (C3-C6) BENZENE SOLUTION) |

IATA

| | |
|-----------------|-------------|
| UN number | 3082 |
| Class | 9 |
| Packaging group | III |

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Environm. Hazardous Mark YES
Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S.
(ALKYL (C3-C6) BENZENE 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. 432-1266

US Federal Regulations

TSCA list

Fatty acids, C16-18 and C18-unsatd., Me esters 67762-38-3

Castor oil, ethoxylated 61791-12-6

Benzenesulfonic acid, mono-C11-13-
branched alkyl derivs., calcium salts 68953-96-8

Octan-1-ol 111-87-5

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No export notification needs to be made.

SARA Title III - Section 302 - Notification and Information

Not applicable.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

None.

US States Regulatory Reporting

CA Prop65

WARNING: This product contains a chemical known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Naphthalene 91-20-3

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

US State Right-To-Know Ingredients

Octan-1-ol 111-87-5 CT, MN, RI

Environmental

CERCLA

None.

Clean Water Section 307(a)(1)

Yes

Naphthalene 91-20-3

Safe Drinking Water Act Maximum Contaminant Levels

Yes

Naphthalene 91-20-3

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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: Causes moderate eye irritation.
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

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 - 2 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

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 2: Hazards Identification. Section 3: Composition / Information on Ingredients. Section 4: First Aid Measures. Section 8: Exposure Controls / Personal Protection. Section 10. Stability and reactivity. Section 11: Toxicological Information. Reviewed and updated for general editorial purposes.

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Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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