REVOLVER® HERBICIDE

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

Product identifier

Trade name	REVOLVER® HERBICIDE
Product code (UVP)	79644205
SDS Number	102000022418
EPA Registration No.	432-1266

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

Use	Herbicide
Restrictions on use	See product label for restrictions.

Information on manufacturer

Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
United States

Emergency Telephone Number (24hr/ 7 days)	1-800-334-7577 (24 hours/day)
Product Information Telephone Number	1-800-331-2867
SDS Information or Request	SDSINFO.BCS-NA@bayer.com

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200
Skin sensitisation : Category 1
Skin irritation : Category 2
Eye irritation : Category 2B

Signal word: Warning

Hazard statements
Causes skin irritation.
Causes eye irritation.
May cause an allergic skin reaction.

Precautionary statements
Wash thoroughly after handling.

Wear protective gloves.
Avoid breathing mist and spray.
Contaminated work clothing should not be allowed out of the workplace.
IF ON SKIN: Wash with plenty of water/soap.
Specific measures (see supplemental first aid instructions on this label).
If skin irritation or rash 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.
Dispose of contents/container in accordance with local regulation.

Other hazards
No other hazards known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
Foramsulfuron	173159-57-4	2.34
Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	34.76
Calcium dodecylbenzenesulfonate, branched	70528-83-5	1.80
1-Octanol	111-87-5	1.20
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.

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.

Most important symptoms and effects, both acute and delayed

Symptoms No symptoms known or expected.

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	Dangerous gases are evolved in the event of a fire.

Advice for firefighters

Special protective equipment for fire-fighters	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
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Explosivity	not applicable

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions	Avoid contact with spilled product or contaminated surfaces. Use personal protective equipment.

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	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	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/m3 (TWA)		OES BCS*
Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	2560ug/m3 (ST ESL)	07 2011	TX ESL
Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	460ppb (ST ESL)	07 2011	TX ESL
Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	256ug/m3 (AN ESL)	07 2011	TX ESL
Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	46ppb (AN ESL)	07 2011	TX ESL
Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	1,600 mg/m3/400 ppm (TWA PEL)	08 2010	US CA OEL
1-Octanol	111-87-5	3.5ppb (ST ESL)	02 2013	TX ESL
1-Octanol	111-87-5	18ug/m3 (ST ESL)	02 2013	TX ESL
1-Octanol	111-87-5	50ppb (AN ESL)	07 2011	TX ESL
1-Octanol	111-87-5	270ug/m3	07 2011	TX ESL

		(AN ESL)		
1-Octanol	111-87-5	265 mg/m3/50 ppm (TWA)	2010	WEEL
Naphthalene	91-20-3	10 ppm (TWA)		OES BCS*
Naphthalene	91-20-3	10 ppm (TWA)	02 2012	ACGIH
Naphthalene	91-20-3	15 ppm (STEL)	02 2012	ACGIH
Naphthalene	91-20-3	10 ppm (TWA)	02 2013	ACGIH NIC
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 (STEL)	1989	OSHA Z1A
Naphthalene	91-20-3	50 mg/m3/10 ppm (TWA)	1989	OSHA Z1A
Naphthalene	91-20-3	75 mg/m3/15 ppm (STEL)	06 2008	TN OEL
Naphthalene	91-20-3	50 mg/m3/10 ppm (TWA)	06 2008	TN OEL
Naphthalene	91-20-3	10ppb (AN ESL)	07 2011	TX ESL
Naphthalene	91-20-3	38ppb (ST ESL)	02 2013	TX ESL
Naphthalene	91-20-3	50ug/m3 (AN ESL)	07 2011	TX ESL
Naphthalene	91-20-3	200ug/m3 (ST ESL)	02 2013	TX ESL
Naphthalene	91-20-3	75 mg/m3/15 ppm (STEL)	08 2010	US CA OEL
Naphthalene	91-20-3	50 mg/m3/10 ppm (TWA PEL)	08 2010	US CA OEL

*OES BCS: Internal Bayer CropScience "Occupational Exposure Standard"

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 made of waterproof material such as polyethylene or polyvinyl chloride
Eye protection	Tightly fitting safety goggles
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	beige
Physical State	Liquid
Odor	aromatic
Odour Threshold	no data available
pH	5.0 - 7.0 at 10 % (23 °C) (deionized water)
Vapor Pressure	no data available
Vapor Density (Air = 1)	no data available
Density	ca. 0.96 g/cm³ at 20 °C
Evapouration 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	no data available
Viscosity	25 - 100 mPa.s at 20 °C Velocity gradient 20 /s 20 - 60 mPa.s at 20 °C Velocity gradient 100 /s
Flash point	128 °C
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Explosivity	not applicable
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	no data available
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, Ingestion, Inhalation
Immediate Effects	
Eye	Moderate eye irritation.
Skin	Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. May cause skin irritation.
Ingestion	May be harmful if swallowed.

Information on toxicological effects

Acute oral toxicity	LD50 (rat) > 5,000 mg/kg
Acute inhalation toxicity	LC50 (rat) > 5.25 mg/l Exposure time: 4 h Determined in the form of liquid aerosol.
	LC50 (rat) > 20 mg/l Exposure time: 1 h Determined in the form of liquid aerosol. Extrapolated from the 4 hr LC50.
Acute dermal toxicity	LD50 (rat) > 5,000 mg/kg
Skin irritation	Moderate skin irritation. (rabbit)
Eye irritation	Mild eye irritation. (rabbit)
Sensitisation	Sensitising (guinea pig)

Assessment repeated dose toxicity

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 A4

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.

Further information

Acute toxicity studies have been bridged from a similar formulation(s).
The non-acute information pertains to the active ingredient(s).

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to aquatic invertebrates	EC50 (Water flea (Daphnia magna)) 6.9 mg/l Exposure time: 48 h
Toxicity to aquatic plants	EC50 (Pseudokirchneriella subcapitata) > 5 mg/l Growth rate; Exposure time: 96 h
	EC50 (Lemna gibba (duckweed)) 0.75 µg/l Growth rate; Exposure time: 7 d
Biodegradability	Not applicable for this mixture.
Bioaccumulation	Not applicable for this mixture.
Mobility in soil	Not applicable for this mixture.
Additional ecological information	The ecological data refer to a similar formulation. 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	Pesticide, spray mixture or rinse water that cannot be used according to label instructions may be disposed of on site or at an approved waste disposal facility.
Contaminated packaging	Do not re-use empty containers. Triple rinse containers. Completely empty container into application equipment, then dispose of empty container in a sanitary landfill, by incineration or by other procedures approved by state/provincial and local authorities. 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

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
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.

Freight Classification:	COMPOUNDS, TREE OR WEEDKILLING, N.O.I., other than poison; HAVING A DENSITY OF GREATER THAN 20 LBS. PER CUBIC FOOT

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1266
US Federal Regulations
TSCA list

Solvent Naphtha (petroleum), heavy aromatic	64742-94-5
Calcium dodecylbenzenesulfonate, branched	70528-83-5
1-Octanol	111-87-5
Naphthalene	91-20-3

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

Naphthalene	91-20-3	0.1%

US States Regulatory Reporting
CA Prop65
This product contains a chemical known to the State of California to cause cancer.
Naphthalene 91-20-3

US State Right-To-Know Ingredients

1-Octanol	111-87-5	CT, MN
Naphthalene	91-20-3	CA, CT, MN, NJ

Canadian Regulations
Canadian Domestic Substance List

Solvent Naphtha (petroleum), heavy aromatic	64742-94-5
Naphthalene	91-20-3

Environmental

CERCLA

Naphthalene	91-20-3	100 lbs

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

International Regulations
European Inventory of Existing Commercial Substances (EINECS)

Solvent Naphtha (petroleum), heavy aromatic	64742-94-5
Naphthalene	91-20-3

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: Moderate eye irritation.
Avoid contact with skin, eyes and clothing.
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

SECTION 16: OTHER INFORMATION

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

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)
Health - 1 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: 07/18/2014

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