

SAFETY DATA SHEET

DOW AGROSCIENCES LIMITED

Safety Data Sheet according to Reg. (EU) No 453/2010

Product name: GRAZON™ PRO Herbicide

Revision Date: 31.10.2014

Version: 2.1

Print Date: 03.11.2014

DOW AGROSCIENCES LIMITED encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

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

1.1 Product identifiers

Product name: GRAZON™ PRO Herbicide

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

Identified uses: Plant Protection Product

1.3 Details of the supplier of the safety data sheet

COMPANY IDENTIFICATION

DOW AGROSCIENCES LIMITED

CPC2 CAPITAL PARK

FULBOURN

CAMBRIDGE

England

CB21 5XE

UNITED KINGDOM

Customer Information Number:

SDSQuestion@dow.com

1.4 EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 0031 115 694 982

Local Emergency Contact: 00 31 115 69 4982

National Poisons Information Centre (Beaumont Hospital): 01 809 2166 (8 AM - 10 PM)

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008:

Flammable liquids - Category 3 - H226

Skin irritation - Category 2 - H315

Eye irritation - Category 2 - H319

Skin sensitisation - Category 1B - H317

Specific target organ toxicity - single exposure - Category 3 - Inhalation - H335

Specific target organ toxicity - single exposure - Category 3 - Inhalation - H336

Aspiration hazard - Category 1 - H304

Chronic aquatic toxicity - Category 2 - H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC:

Harmful - R65

Irritant - R36/37/38

R43

R67

Dangerous for the environment - R51/53

For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008:

Hazard pictograms



Signal word: **DANGER**

Hazard statements

- H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.
H411 Toxic to aquatic life with long lasting effects.

Supplemental Hazard Statements

- EUH401 To avoid risks to human health and the environment, comply with the instructions for use.

Precautionary statements

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P331 Do NOT induce vomiting.
P501 Dispose of contents/container to a licensed waste disposal contractor or collection site except for empty clean triple rinsed containers which can be disposed of as non-hazardous waste.

Contains Triclopyr-2-butoxyethyl ester; Hydrocarbons, C9, aromatics; Hydrocarbons, C10-

C13, aromatics, <1% naphthalene

2.3 Other hazards

no data available

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**3.2 Mixture**

This product is a mixture.

CASRN / EC-No. / Index-No.	REACH Registration Number	Concentration	Component	Classification: REGULATION (EC) No 1272/2008
CASRN 64700-56-7 EC-No. 265-024-8 Index-No. -	-	32.5%	Triclopyr-2- butoxyethyl ester	Acute Tox. - 4 - H302 Skin Sens. - 1B - H317 Aquatic Acute - 1 - H400 Aquatic Chronic - 1 - H410
CASRN 1702-17-6 EC-No. 216-935-4 Index-No. 607-231-00-1	-	5.8%	clopyralid (ISO)	Eye Dam. - 1 - H318
CASRN Not available EC-No. 918-668-5 Index-No. -	01-2119455851-35	> 40.0 - < 50.0 %	Hydrocarbons, C9, aromatics	Flam. Liq. - 3 - H226 STOT SE - 3 - H336 STOT SE - 3 - H335 Asp. Tox. - 1 - H304 Aquatic Chronic - 2 - H411
CASRN 1118-92-9 EC-No. 214-272-5 Index-No. -	-	< 10.0 %	N,N- Dimethyloctanamid e	Skin Irrit. - 2 - H315 Eye Dam. - 1 - H318
CASRN not available EC-No. 922-153-0 Index-No. -	01-2119451097-39	< 5.0 %	Hydrocarbons, C10-C13, aromatics, <1% naphthalene	Asp. Tox. - 1 - H304 Aquatic Chronic - 2 - H411

CASRN 68953-96-8 EC-No. 273-234-6 Index-No. –	01-2119964467-24	< 5.0 %	Benzenesulfonic acid, mono-C11-13-branched alkyl derivs., calcium salts	Acute Tox. - 4 - H312 Skin Irrit. - 2 - H315 Eye Dam. - 1 - H318 Aquatic Chronic - 2 - H411
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If present in this product, any not classified components disclosed above for which no country specific OEL value(s) is(are) indicated under Section 8, are being disclosed as voluntarily disclosed components.

For the full text of the H-Statements mentioned in this Section, see Section 16.

CASRN / EC-No. / Index-No.	Concentration	Component	Classification: 67/548/EEC
CASRN 64700-56-7 EC-No. 265-024-8 Index-No. –	32.5%	Triclopyr-2-butoxyethyl ester	Xn - R22 R43 N - R50/53
CASRN 1702-17-6 EC-No. 216-935-4 Index-No. 607-231-00-1	5.8%	clopyralid (ISO)	Xi - R41
CASRN Not available EC-No. 918-668-5 Index-No. –	> 40.0 - < 50.0 %	Hydrocarbons, C9, aromatics	R10 Xn - R65 Xi - R37 R66 R67 N - R51/53
CASRN 1118-92-9 EC-No. 214-272-5 Index-No. –	< 10.0 %	N,N-Dimethyloctanamide	Xi - R38 - R41
CASRN not available EC-No. 922-153-0 Index-No. –	< 5.0 %	Hydrocarbons, C10-C13, aromatics, <1% naphthalene	Xn - R65 R66 N - R51/53
CASRN 68953-96-8 EC-No. 273-234-6 Index-No.	< 5.0 %	Benzenesulfonic acid, mono-C11-13-branched alkyl derivs., calcium salts	Xn - R21 Xi - R38 - R41 R52/53

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If present in this product, any not classified components disclosed above for which no country specific OEL value(s) is(are) indicated under Section 8, are being disclosed as voluntarily disclosed components.

For the full text of the R-phrases mentioned in this Section, see Section 16.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Skin contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

Eye contact: Hold eyes 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 eyes. Call a poison control center or doctor for treatment advice. Suitable emergency eye wash facility should be immediately available.

Ingestion: Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so 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.

4.2 Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician: Skin contact may aggravate preexisting dermatitis. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: no data available

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.

5.3 Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures: No smoking in area. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

6.2 Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

6.3 Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. Pump with explosion-proof equipment. If available, use foam to smother or suppress. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections: References to other sections, if applicable, have been provided in the previous sub-sections.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling: Keep out of reach of children. Keep away from heat, sparks and flame. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Electrically ground and bond all equipment. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

7.2 Conditions for safe storage, including any incompatibilities: Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies. Minimize sources of ignition, such as static build-up, heat, spark or flame. Avoid temperatures above 40°C (104°F)

7.3 Specific end use(s): Refer to product label.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Triclopyr-2-butoxyethyl ester	Dow IHG	TWA	2 mg/m ³
clopyralid (ISO)	Dow IHG	TWA	10 mg/m ³

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

8.2 Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

Skin protection

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all

relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material.

Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

Environmental exposure controls

See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance

Physical state	Liquid.
Color	Yellow
Odor	Aromatic
Odor Threshold	No test data available
pH	2.04 <i>pH Electrode (neat)</i>
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup 55.1 °C <i>Pensky-Martens Closed Cup ASTM D 93</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not applicable to liquids
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.032 at 20 °C / 4 °C <i>Digital Density Meter (Oscillating Coil)</i>
Water solubility	emulsifiable
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available

Kinematic Viscosity	no data available
Explosive properties	No
Oxidizing properties	no data available

9.2 Other information

Molecular weight	no data available
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NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity: No dangerous reaction known under conditions of normal use.

10.2 Chemical stability: Unstable at elevated temperatures.

10.3 Possibility of hazardous reactions: Polymerization will not occur.

10.4 Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid direct sunlight.

10.5 Incompatible materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

10.6 Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide.

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product:

LD50, rat, female, 3,129 mg/kg

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:

LD50, rat, male and female, > 5,000 mg/kg

Acute inhalation toxicity

Vapor concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. As product: The LC50 has not been determined.

Skin corrosion/irritation

Brief contact may cause moderate skin irritation with local redness.

Serious eye damage/eye irritation

May cause moderate eye irritation which may be slow to heal.
May cause slight corneal injury.

Sensitization

Has demonstrated the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory Tract

May cause drowsiness or dizziness.
Route of Exposure: Inhalation

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):
Triclopyr butoxyethyl ester.
In animals, effects have been reported on the following organs:
Kidney.
Liver.

Contains component(s) which have been reported to cause effects on the following organs in animals:
Blood.
Kidney.
Liver.
Eye.
Respiratory tract.

Carcinogenicity

For the minor component(s): Cumene. Has caused cancer in laboratory animals. However, the relevance of this to humans is unknown.

For the active ingredient(s): Did not cause cancer in laboratory animals.

Teratogenicity

For the active ingredient(s): Triclopyr butoxyethyl ester. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Clopyralid caused birth defects in test animals, but only at greatly exaggerated doses that were severely toxic to the mothers. No birth defects were observed in animals given clopyralid at doses several times greater than those expected during normal exposure.

For the solvent(s): Has caused birth defects in lab animals only at doses producing severe toxicity in the mother. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive toxicity

For similar active ingredient(s). Triclopyr. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

For the active ingredient(s): Clopyralid. In animal studies, did not interfere with reproduction.

Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were negative. Genetic toxicity studies in animals were negative for component(s) tested.

Aspiration Hazard

Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

May be fatal if swallowed and enters airways.

COMPONENTS INFLUENCING TOXICOLOGY:

Triclopyr-2-butoxyethyl ester

Acute inhalation toxicity

Prolonged exposure is not expected to cause adverse effects. Based on the available data, narcotic effects were not observed. Based on the available data, respiratory irritation was not observed.

LC50, rat, 4 Hour, dust/mist, > 4.8 mg/l The LC50 value is greater than the Maximum Attainable Concentration.

clopyralid (ISO)

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to dust. Based on the available data, respiratory irritation was not observed. Based on the available data, narcotic effects were not observed.

As product: LC50, rat, 4 Hour, Dust, > 1 mg/l

No deaths occurred at this concentration. The LC50 value is greater than the Maximum Attainable Concentration.

Hydrocarbons, C9, aromatics

Acute inhalation toxicity

Vapor concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

LC50, rat, 4 Hour, > 10.2 mg/l

N,N-Dimethyloctanamide**Acute inhalation toxicity**

Prolonged excessive exposure to mist may cause adverse effects. Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs.

For similar material(s): LC50, rat, male and female, 4 Hour, dust/mist, > 3.551 mg/l

Hydrocarbons, C10-C13, aromatics, <1% naphthalene**Acute inhalation toxicity**

Prolonged excessive exposure may cause adverse effects. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

As product: The LC50 has not been determined.

For similar material(s): LD50, rat, dust/mist, > 4.778 mg/l

Benzenesulfonic acid, mono-C11-13-branched alkyl derivs., calcium salts**Acute inhalation toxicity**

The LC50 has not been determined.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

12.1 Toxicity**Acute toxicity to fish**

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

LC50, *Oncorhynchus mykiss* (rainbow trout), flow-through test, 96 Hour, 1.47 mg/l

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), static test, 48 Hour, 21.6 mg/l

Acute toxicity to algae/aquatic plants

ErC50, *Pseudokirchneriella subcapitata* (green algae), static test, 72 Hour, Growth rate inhibition, 16.6 mg/l

ErC50, *Lemna gibba*, Growth inhibition, 7 d, 61.1 mg/l

Toxicity to Above Ground Organisms

Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg).

oral LD50, *Colinus virginianus* (Bobwhite quail), 14 d, 1,156 mg/kg

oral LD50, *Apis mellifera* (bees), 48 Hour, > 370µg/bee

contact LD50, *Apis mellifera* (bees), 48 Hour, > 413µg/bee

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 14 d, 224 mg/kg

12.2 Persistence and degradability**Triclopyr-2-butoxyethyl ester****Biodegradability:** Chemical degradation (hydrolysis) is expected in the environment.

Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Fail

Biodegradation: 18 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301B or Equivalent**Theoretical Oxygen Demand:** 1.21 mg/mg**Biological oxygen demand (BOD)**

Incubation Time	BOD
	0.004 mg/mg

Stability in Water (1/2-life)

Hydrolysis, half-life, 8.7 d, pH 7, Half-life Temperature 25 °C

Photodegradation**Atmospheric half-life:** 5.6 Hour**Method:** Estimated.**clopyralid (ISO)****Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Fail

Biodegradation: 5 - 10 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301B or Equivalent**Theoretical Oxygen Demand:** 0.71 mg/mg**Stability in Water (1/2-life)**

Hydrolysis, pH 4 - 9, Stable

Photodegradation**Test Type:** Half-life (direct photolysis)**Hydrocarbons, C9, aromatics****Biodegradability:** For the major component(s): Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. For some component(s): Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

N,N-Dimethyloctanamide

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: > 80 %

Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

Hydrocarbons, C10-C13, aromatics, <1% naphthalene

Biodegradability: For similar material(s): Biodegradation may occur under aerobic conditions (in the presence of oxygen). Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

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

Biodegradability: No relevant data found.

12.3 Bioaccumulative potential**Triclopyr-2-butoxyethyl ester**

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 4.62

Bioconcentration factor (BCF): 110 Fish.

clopyralid (ISO)

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): -2.63

Bioconcentration factor (BCF): < 1 Fish. Measured

Hydrocarbons, C9, aromatics

Bioaccumulation: For the major component(s): Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). For the minor component(s): Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

N,N-Dimethyloctanamide

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 2.59 at 23 °C

Hydrocarbons, C10-C13, aromatics, <1% naphthalene

Bioaccumulation: No data available for this product. For similar material(s): Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

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

Bioaccumulation: No relevant data found.

12.4 Mobility in soil**Triclopyr-2-butoxyethyl ester**

Calculation of meaningful sorption data was not possible due to very rapid degradation in the soil.

For the degradation product:

Triclopyr.

Potential for mobility in soil is very high (Koc between 0 and 50).

clopyralid (ISO)

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient(Koc): 4.9

Hydrocarbons, C9, aromatics

No relevant data found.

N,N-Dimethyloctanamide

No relevant data found.

Hydrocarbons, C10-C13, aromatics, <1% naphthalene

No relevant data found.

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

No relevant data found.

12.5 Results of PBT and vPvB assessment

Triclopyr-2-butoxyethyl ester

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

clopyralid (ISO)

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is considered to be very persistent and very bioaccumulating (vPvB).

Hydrocarbons, C9, aromatics

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

N,N-Dimethyloctanamide

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Hydrocarbons, C10-C13, aromatics, <1% naphthalene

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

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

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

12.6 Other adverse effects

Triclopyr-2-butoxyethyl ester

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

clopyralid (ISO)

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Hydrocarbons, C9, aromatics

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

N,N-Dimethyloctanamide

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Hydrocarbons, C10-C13, aromatics, <1% naphthalene

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

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

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material. Contact the authorized waste disposal services.

SECTION 14. TRANSPORT INFORMATION

Classification for ROAD and Rail transport (ADR/RID):

14.1 UN number	UN 1993
14.2 Proper shipping name	FLAMMABLE LIQUID, N.O.S.(Petroleum distillate, Triclopyr)
14.3 Class	3
14.4 Packing group	III
14.5 Environmental hazards	Petroleum distillate, Triclopyr
14.6 Special precautions for user	Special Provision 640E Hazard identification No: 30

Classification for SEA transport (IMO-IMDG):

14.1 UN number	UN 1993
14.2 Proper shipping name	FLAMMABLE LIQUID, N.O.S.(Petroleum distillate, Triclopyr)
14.3 Class	3

14.4	Packing group	III
14.5	Environmental hazards	Petroleum distillate, Triclopyr
14.6	Special precautions for user	EmS: F-E, S-E
14.7	Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

14.1	UN number	UN 1993
14.2	Proper shipping name	Flammable liquid, n.o.s.(Petroleum distillate, Triclopyr)
14.3	Class	3
14.4	Packing group	III
14.5	Environmental hazards	Not applicable
14.6	Special precautions for user	No data available.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**REACH Regulation (EC) No 1907/2006**

This product contains only components that have been either pre-registered, registered, are exempt from registration or are regarded as registered according to Regulation (EC) No. 1907/2006 (REACH). The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer's/user's responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

Other regulations

Registration Number: PCS NO. 05182

15.2 Chemical Safety Assessment

For proper and safe use of this product, please refer to the approval conditions laid down on the product label.

SECTION 16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Full text of R-phrases referred to under sections 2 and 3

R10	Flammable.
R21	Harmful in contact with skin.
R22	Harmful if swallowed.
R36/37/38	Irritating to eyes, respiratory system and skin.
R37	Irritating to respiratory system.
R38	Irritating to skin.
R41	Risk of serious damage to eyes.
R43	May cause sensitisation by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	Harmful: may cause lung damage if swallowed.
R66	Repeated exposure may cause skin dryness or cracking.
R67	Vapours may cause drowsiness and dizziness.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) No 1272/2008

Flam. Liq. - 3 - H226 - On basis of test data.
Skin Irrit. - 2 - H315 - On basis of test data.
Eye Irrit. - 2 - H319 - On basis of test data.
Skin Sens. - 1B - H317 - On basis of test data.
STOT SE - 3 - H335 - Calculation method
STOT SE - 3 - H336 - Calculation method
Asp. Tox. - 1 - H304 - Calculation method
Aquatic Chronic - 2 - H411 - Calculation method

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

Dow IHG	Dow Industrial Hygiene Guideline
TWA	Time Weighted Average (TWA):

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES LIMITED urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.