

SAFETY DATA SHEET
FLUDUAL
SECTION 1: Identification of the substance/mixture and of the company/undertaking
1.1. Product identifier

Product name	FLUDUAL
Chemical name	flufenacet 400g/l & diflufenican 100g/l
Product number	DFFFLU0500SCA

1.2. Relevant identified uses of the substance or mixture and uses advised against
1.3. Details of the supplier of the safety data sheet

Supplier	Hockley Agro Hockley House 3 Longstone Road Ashbrook Office Park Manchester M22 5LB TEL: +44 (0) 161 209 7400 FAX: +44 (0) 161 209 7401 sds@hockley.co.uk
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1.4. Emergency telephone number

Emergency telephone	+44 (0)800 246 1274 (24 hours)
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SECTION 2: Hazards identification
2.1. Classification of the substance or mixture
Classification (EC 1272/2008)

Physical hazards	Not Classified
Health hazards	Acute Tox. 4 - H302 Skin Sens. 1 - H317 STOT RE 2 - H373
Environmental hazards	Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410

2.2. Label elements
Pictogram


Signal word	Warning
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Hazard statements	H302 Harmful if swallowed. H317 May cause an allergic skin reaction. H373 May cause damage to organs (Nervous system) through prolonged or repeated exposure if swallowed. H410 Very toxic to aquatic life with long lasting effects.
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Precautionary statements	P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P308+P311 IF exposed or concerned: Call a POISON CENTER or doctor. P501 Dispose of contents/ container in accordance with national regulations.
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Supplemental label information	<p>EUH208 Contains flufenacet, 5-chloro-2-methyl-isothiazol-3-one / 2-methyl-isothiazol-3-one. May produce an allergic reaction.</p> <p>EUH401 To avoid risks to human health and the environment, comply with the instructions for use.</p>
Contains	<p>FLUFENACET (ISO), REACTION MASS OF: 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE [EC NO. 247-500-7] AND 2-METHYL-2H -ISOTHIAZOL-3-ONE [EC NO. 220-239-6] (3:1)</p>
Supplementary precautionary statements	<p>P260 Do not breathe vapour/ spray.</p> <p>P261 Avoid breathing vapour/ spray.</p> <p>P264 Wash contaminated skin thoroughly after handling.</p> <p>P270 Do not eat, drink or smoke when using this product.</p> <p>P272 Contaminated work clothing should not be allowed out of the workplace.</p> <p>P273 Avoid release to the environment.</p> <p>P301+P312 IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of water.</p> <p>P314 Get medical advice/ attention if you feel unwell.</p> <p>P321 Specific treatment (see medical advice on this label).</p> <p>P330 Rinse mouth.</p> <p>P333+P313 If skin irritation or rash occurs: Get medical advice/ attention.</p> <p>P362+P364 Take off contaminated clothing and wash it before reuse.</p> <p>P391 Collect spillage.</p>

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.2. Mixtures

FLUFENACET (ISO)	33.60%
<p>CAS number: 142459-58-3 EC number:</p> <p>M factor (Acute) = 100 M factor (Chronic) = 100</p>	
<p>Classification</p> <p>Acute Tox. 4 - H302 Skin Sens. 1 - H317 STOT RE 2 - H373 Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410</p>	<p>Classification (67/548/EEC or 1999/45/EC)</p> <p>Xn;R22,R48/22 R43 N;R50/53</p>
DIFLUFENICAN	8.40%
<p>CAS number: 83164-33-4</p>	
<p>Classification</p> <p>Aquatic Chronic 3 - H412</p>	<p>Classification (67/548/EEC or 1999/45/EC)</p> <p>R52/53</p>
GLYCEROL	>1.00%
<p>CAS number: 56-81-5 EC number: 200-289-5</p>	
<p>Classification</p> <p>Not Classified</p>	<p>Classification (67/548/EEC or 1999/45/EC)</p> <p>-</p>

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REACTION MASS OF: 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE [EC NO. 247-500-7] AND 2-METHYL-2H-ISOTHIAZOL-3-ONE [EC NO. 220-239-6] (3:1)		>0.0002 - <0.0015 %
CAS number: 55965-84-9		
M factor (Acute) = 1		M factor (Chronic) = 1
Classification	Classification (67/548/EEC or 1999/45/EC)	
Acute Tox. 3 - H301	T;R23/24/25 C;R34 R43 N;R50/53	
Acute Tox. 3 - H311		
Acute Tox. 3 - H331		
Skin Corr. 1B - H314		
Eye Dam. 1 - H318		
Skin Sens. 1 - H317		
Aquatic Acute 1 - H400		
Aquatic Chronic 1 - H410		

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Remove contaminated clothing.
Inhalation	Remove person to fresh air and keep comfortable for breathing. Get medical attention.
Ingestion	Call a physician or poison center immediately. Rinse mouth.
Skin contact	Wash skin thoroughly with soap and water. if available with polyethyleneglycol 400, subsequently rinse with water. Get medical attention if symptoms are severe or persist after washing.
Eye contact	Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Continue to rinse for at least 15 minutes. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

General information	The absorption of this product into the body may lead to the formation of methaemoglobin that, in sufficient concentration, cause cyanosis.
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4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Monitor methaemoglobin.
Specific treatments	Treat symptomatically. In case of ingestion gastric lavage should be considered in cases of significant ingestions only within the first 2 hours. However, the application of activated charcoal and sodium sulphate is always advisable. In case of methaemoglobinemia, oxygen and specific antidotes (methylene blue/toluene blue) should be given.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Water spray, foam, dry powder or carbon dioxide.
Unsuitable extinguishing media	High volume water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products	Hydrogen cyanide (HCN). Hydrogen fluoride (HF). Carbon monoxide (CO). Nitrous gases (NOx). Sulphurous gases (SOx).
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5.3. Advice for firefighters

Protective actions during firefighting Control run-off water by containing and keeping it out of sewers and watercourses.

Special protective equipment for firefighters In case of fire and/or explosion do not breathe fumes. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with spilled product or contaminated surfaces. For personal protection, see Section 8.

6.2. Environmental precautions

Environmental precautions Do not allow the product to get into surface water, drains and ground water. If spillage enters drains leading to sewage works, inform local water company immediately. If spillage enters rivers or watercourses, inform the Environment Agency (emergency telephone number 0800 807060).

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Absorb spillage with inert, damp, non-combustible material. Collect spillage for reclamation or disposal in sealed containers via a licensed waste contractor. Clean contaminated objects and areas thoroughly, observing environmental regulations. Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact.

6.4. Reference to other sections

Reference to other sections Information regarding safe handling, see section 7. For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions For professional users only. Do not handle until all safety precautions have been read and understood. Read label before use. For personal protection, see Section 8. Avoid contact with skin, eyes and clothing. Contaminated work clothing should not be allowed out of the workplace. Wash hands thoroughly after handling.

Advice on general occupational hygiene Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in accordance with national regulations. Store in tightly-closed, original container in a dry, cool and well-ventilated place. Protect from freezing and direct sunlight.

7.3. Specific end use(s)

Specific end use(s) Refer to the label and/or leaflet

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

GLYCEROL

Long-term exposure limit (8-hour TWA): WEL 10 mg/m³ mist

WEL = Workplace Exposure Limit

8.2. Exposure controls

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Protective equipment



Appropriate engineering controls

Refer to CoSHH (Control of Substances Hazardous to Health) assessment. Engineering controls should be used in preference to personal protective equipment wherever practicable. Refer to CoSHH Essentials.

Eye/face protection

Wear approved safety goggles (EN 166).

Hand protection

Wear protective gloves made of the following material: Nitrile rubber. Protective gloves should have a minimum thickness of 0.4 mm. Wash when contaminated and dispose of when contaminated inside, when perforated or when contamination on the outside cannot be removed. Wash hands frequently and always before eating, drinking, smoking or using the toilet.

Other skin and body protection

Wear standard coveralls and Category 3 Type 4 suit. Wear two layers of clothing wherever possible. Polyester/cotton or cotton overalls should be worn under chemical protection suit and should be professionally laundered frequently. If there is a risk of significant exposure, consider a higher protective type suit.

Respiratory protection

Respiratory protection is not required under anticipated circumstances of exposure. Respiratory protection should only be used to control residual risk of short duration activities, when all reasonably practicable steps have been taken to reduce exposure at the source, e.g. containment and/or local extract ventilation. Always follow respirator manufacturer's instruction regarding wearing and maintenance.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Suspension.
Colour	White to beige
Odour	Characteristic. weak
pH	pH (concentrated solution): 4.0 - 6.5 (23°C)
Flash point	> 100°C No flash point – Determination conducted up to the boiling point
Relative density	~ 1.19 g/cm ³ @ 20°C
Partition coefficient	Diflufenican: log Pow: 4.2 Flufenacet: log Pow: 3.2

9.2. Other information

Other information	dispersible in water
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SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	See Section 10.3 (Possibility of hazardous reactions) for further information.
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10.2. Chemical stability

Stability	Stable under the prescribed storage conditions.
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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Under normal conditions of storage and use, no hazardous reactions will occur.
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10.4. Conditions to avoid

Conditions to avoid	Extremes of temperature and direct sunlight.
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10.5. Incompatible materials

Materials to avoid Keep only in the original container.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 500.0

Species Rat

Notes (oral LD₅₀) LD50 rat, 500 - 2000 mg/kg

ATE oral (mg/kg) 500.0

Acute toxicity - dermal

Notes (dermal LD₅₀) LD50 rat, >4000 mg/kg

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LC50 rat, > 2.078 mg/l
Exposure time: 4h
Highest attainable concentration

Skin corrosion/irritation

Skin corrosion/irritation Rabbit Not irritating.

Serious eye damage/irritation

Serious eye damage/irritation Rabbit Not irritating.

Respiratory sensitisation

Respiratory sensitisation Mouse: Not sensitising.

Skin sensitisation

Skin sensitisation Local Lymph Node Assay (LLNA) - Mouse: Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vivo No evidence of mutagenicity in animal studies.

Carcinogenicity

Carcinogenicity No evidence of carcinogenicity in animal studies.

Reproductive toxicity

Reproductive toxicity - fertility Flufenacet did not cause reproductive toxicity in a two-generation study in rats.
Diflufenican did not cause reproductive toxicity in a two-generation study in rats.

Reproductive toxicity - development

Flufenacet caused developmental toxicity only at dose levels toxic to the dams. The developmental effects seen with Flufenacet are related to maternal toxicity. Diflufenican did not cause developmental toxicity in rats and rabbits.

Specific target organ toxicity - repeated exposure

Summary Flufenacet caused neurobehavioral effects and/or neuropathological changes in animal studies.
Diflufenican did not cause specific target organ toxicity in experimental animal studies.

SECTION 12: Ecological Information

12.1. Toxicity

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Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hours: 54.9 mg/l, Cyprinus carpio (Common carp)

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 68.2 mg/l, Daphnia magna

Acute toxicity - aquatic plants EC₅₀, 72 hours: 0.00885 mg/l, Pseudokirchneriella subcapitata

12.2. Persistence and degradability

Biodegradation Flufenacet: Not readily biodegradable
Diflufenican: Not readily biodegradable

12.3. Bioaccumulative potential

Bioaccumulative potential Flufenacet: BCF: 71, Diflufenican: BCF: 1.596,

Partition coefficient Diflufenican: log Pow: 4.2 Flufenacet: log Pow: 3.2

12.4. Mobility in soil

Mobility Flufenacet: Moderately mobile in soils Diflufenican: Slightly mobile in soils

Adsorption/desorption coefficient Flufenacet: Koc 202 Diflufenican: Koc 3417

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product contains substances classified as PBT.

12.6. Other adverse effects

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Disposal of this product, process solutions, residues and by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any local authority requirements. In accordance with current regulations and, if necessary, after consultation with the site operator and/or with the responsible authority, the product may be taken to a waste disposal site or incineration plant. Advice may be obtained from the local waste regulation authority (part of the Environment Agency in the UK).

Disposal methods Small containers (< 10 l or < 10 kg) should be rinsed thoroughly using an integrated pressure rinsing device, or, by manually rinsing three times. Add washings to sprayer at time of filling. Dispose of empty and cleaned packaging safely. Follow advice on product label and/or leaflet. Large containers (> 25 l or > 25 kg) should not be rinsed or re-used for any other purpose. Return large containers to supplier.

Waste class 02 01 08* agrochemical waste containing dangerous substances

SECTION 14: Transport information

General Environmentally Hazardous Substance Mark NOT required for single packagings and combination packagings containing inner packagings ≤ 5L for liquids, or ≤ 5kg for solids. (ADR special provision 375, IMDG code 2.10.2.7, IATA special provision A197)

Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provisions of the Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class all provisions of this Code relevant to any additional hazards continue to apply.

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14.1. UN number

UN No. (ADR/RID)	3082
UN No. (IMDG)	3082
UN No. (ICAO)	3082
UN No. (ADN)	3082

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (FLUFENACET, DIFLUFENICAN SOLUTION)
Proper shipping name (IMDG)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (FLUFENACET, DIFLUFENICAN SOLUTION)
Proper shipping name (ICAO)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (FLUFENACET, DIFLUFENICAN SOLUTION)
Proper shipping name (ADN)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (FLUFENACET, DIFLUFENICAN SOLUTION)

14.3. Transport hazard class(es)

ADR/RID class	9
ADR/RID classification code	M6
ADR/RID label	9
IMDG class	9
ICAO class/division	9
ADN class	9

Transport labels



14.4. Packing group

ADR/RID packing group	III
IMDG packing group	III
ADN packing group	III
ICAO packing group	III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant



14.6. Special precautions for user

EmS	F-A, S-F
ADR transport category	3
Emergency Action Code	•3Z
Hazard Identification Number (ADR/RID)	90

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Tunnel restriction code (-)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations

MAPP 18554
Transport
Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No 1348) Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 (SI 1997 No 2367) Air Navigation Dangerous Goods Regulations 2002 (SI 2002 No 2786)

Supply and Use
Chemical (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No 716)
Chemical (Hazard Information and Packaging for Supply) (Northern Ireland) Regulations 2009
Control of Substances Hazardous to Health Regulations 2002 (SI 2002 No 2677) EH40
Occupational Exposure Limits - Table 1 List of approved workplace exposure limits Control of Pesticide Regulations 1986 Dangerous Substances and Explosive Atmospheres Regulations 2002

Waste Treatment
Environmental Protection Act 1990, Part II Environmental Protection (Duty of Care) Regulations 1991 The Waste Management Licensing Regulations 1994 (as amended) Hazardous Waste Regulations 2005 (Replacing Special Waste Regulations 1996 as amended) Landfill Directive Regulation on Substances That Deplete the Ozone Layer 1994 (EEC/3093/94) Water Resources Act 1991 Anti-Pollution Works Regulations 1999

EU legislation

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).
EC Regulation 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products (as amended)

15.2. Chemical safety assessment

A Chemical Safety Assessment is not required for this substance.

SECTION 16: Other information

SDS number

20793

Hazard statements in full

H301 Toxic if swallowed.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H373 May cause damage to organs through prolonged or repeated exposure.
H373 May cause damage to organs (Nervous system) through prolonged or repeated exposure if swallowed.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
H412 Harmful to aquatic life with long lasting effects.