



## Section 1 - Identification of The Material and Supplier

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**Chemical nature:** Fluazifop is a 2-(4-aryloxyphenoxy)propionic acid derivative.  
**Trade Name:** Resilience Herbicide  
**Product Use:** Agricultural herbicide for use as described on the product label.  
**Creation Date:** April, 2013  
**This version issued:** April, 2013 and is valid for 5 years from this date.

## SECTION 2 - HAZARDS IDENTIFICATION

### Statement of Hazardous Nature

This product is classified as: Xn, Harmful. N, Dangerous to the environment. Hazardous according to the criteria of SWA.

Not subject to the ADG Code when transported in Australia by Road or Rail (refer to SP AU01). However if transported by Air or Sea, this provision does not apply. Then the product is classed as Dangerous (Class 9 Environmentally Hazardous) by IATA and IMDG respectively. See details below and in Section 14 of this MSDS.

**Risk Phrases:** R63, R65, R66, R50/53. Possible risk of harm to the unborn child. Harmful: May cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.

**Safety Phrases:** S23, S46, S60, S61, S24/25, S36/37. Do not breathe vapours or spray mists. If swallowed, contact a doctor or Poisons Information Centre immediately and show this MSDS or label. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/Safety Data Sheets. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves.

**SUSMP Classification:** S6

**ADG Classification:** Class 9: Miscellaneous dangerous goods.

**UN Number:** 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.



### GHS Signal word: DANGER.

#### HAZARD STATEMENT:

H227: Combustible liquid.  
AUH066: Repeated exposure may cause skin dryness or cracking.  
H304: May be fatal if swallowed and enters airways.  
H361: Suspected of damaging fertility or the unborn child.  
H410: Very toxic to aquatic life with long lasting effects.

#### PREVENTION

P281: Use personal protective equipment as required.

#### RESPONSE

P352: Wash with plenty of soap and water.  
P301+P310: IF SWALLOWED: Immediately call a POISON CENTRE or doctor.  
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P308+P313: If exposed or concerned: Get medical advice.  
P332+P313: If skin irritation occurs: Get medical advice.  
P337+P313: If eye irritation persists: Get medical advice.  
P391: Collect spillage.  
P370+P378: In case of fire, note the following. Alcohol resistant foam is the preferred firefighting medium but, if it is not available, normal foam can be used.

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**STORAGE**

P402+P404: Store in a dry place. Store in a closed container.

P403+P235: Store in a well-ventilated place. Keep cool.

**DISPOSAL**

P501: Dispose of contents and containers as instructed on the registered label.

**Emergency Overview**

**Physical Description & Colour:** Clear, light brown coloured liquid.

**Odour:** Characteristic solvent odour.

**Major Health Hazards:** Fluazifop-p-butyl is not harmful orally or dermally. It is reported to cause only slight skin and mild eye irritation in rabbits, and no skin sensitization in guinea pigs. Possible risk of harm to the unborn child, if aspirated, may cause lung damage, repeated exposure may cause skin dryness or cracking.

**Potential Health Effects****Inhalation:**

**Short Term Exposure:** Available data indicates that this product is not harmful. In addition product is unlikely to cause any discomfort or irritation.

**Long Term Exposure:** No data for health effects associated with long term inhalation.

**Skin Contact:**

**Short Term Exposure:** Available data indicates that this product is not harmful. It should present no hazards in normal use. However product may be irritating, but is unlikely to cause anything more than mild transient discomfort.

**Long Term Exposure:** No data for health effects associated with long term skin exposure.

**Eye Contact:**

**Short Term Exposure:** This product may be irritating to eyes, but is unlikely to cause anything more than mild transient discomfort.

**Long Term Exposure:** No data for health effects associated with long term eye exposure.

**Ingestion:**

**Short Term Exposure:** Significant oral exposure is considered to be unlikely. Because of the low viscosity of this product, it may directly enter the lungs if swallowed, or if subsequently vomited. Once in the lungs, it is very difficult to remove and can cause severe injury or death. However, this product may be irritating to mucous membranes but is unlikely to cause anything more than transient discomfort.

**Long Term Exposure:** No data for health effects associated with long term ingestion.

**Carcinogen Status:**

**SWA:** No significant ingredient is classified as carcinogenic by SWA.

**NTP:** No significant ingredient is classified as carcinogenic by NTP.

**IARC:** No significant ingredient is classified as carcinogenic by IARC.

**SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS**

Ingredients	CAS No	Conc,%	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )
Fluazifop-p butyl ester	79241-46-6	212g/L	not set	not set
Solvent naphtha (petroleum), light arom.	64742-95-6	636g/L	not set	not set
Other non hazardous ingredients	secret	to 100%	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The SWA TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak" is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

**SECTION 4 - FIRST AID MEASURES****General Information:**

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

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**Inhalation:** First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

**Skin Contact:** Wash gently and thoroughly with water (use non-abrasive soap if necessary) for 5 minutes or until chemical is removed.

**Eye Contact:** No effects expected. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed. Obtain medical advice if irritation becomes painful or lasts more than a few minutes. Take special care if exposed person is wearing contact lenses.

**Ingestion:** If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

## SECTION 5 - FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** This product is classified as a Flammable liquid, category 4 (C1 combustible) liquid. There is little risk of an explosion from this product if commercial quantities are involved in a fire. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids. Vapours from this product are heavier than air and may accumulate in sumps, pits and other low-lying spaces, forming potentially explosive mixtures. They may also flash back considerable distances.

Fire decomposition products from this product are likely to be toxic if inhaled. Take appropriate protective measures.

**Extinguishing Media:** Try to contain spills, minimise spillage entering drains or water courses.

**Fire Fighting:** If a significant quantity of this product is involved in a fire, call the fire brigade. There is little danger of a violent reaction or explosion if significant quantities of this product are involved in a fire. Recommended personal protective equipment is full fire kit and breathing apparatus.

**Flash point:** Approx 72°C

**Upper Flammability Limit:** No data.

**Lower Flammability Limit:** No data.

**Autoignition temperature:** No data.

**Flammability Class:** Flammable liquid, category 4 (C1 combustible)

## SECTION 6 - ACCIDENTAL RELEASE MEASURES

**Accidental release:** In the event of a major spill, prevent spillage from entering drains or water courses. As a minimum, wear overalls, goggles and gloves. Suitable materials for protective clothing include rubber, PVC. Eye/face protective equipment should comprise as a minimum, protective goggles. If there is a significant chance that vapours or mists are likely to build up in the cleanup area, we recommend that you use a respirator. Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned below (section 8).

Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. If spill is too large or if absorbent material is not available, try to create a dike to stop material spreading or going into drains or waterways. Because of the environmentally hazardous nature of this product, special care should be taken to restrict release to waterways or drains. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Recycle containers wherever possible after careful cleaning. Refer to product label for specific instructions. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this MSDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

## SECTION 7 - HANDLING AND STORAGE

**Handling:** Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

**Storage:** This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this schedule of poison. Check packaging - there may be further storage instructions on the label.

## SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: **AS/NZS 4501 set 2008**, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

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**SWA Exposure Limits****TWA (mg/m<sup>3</sup>)****STEL (mg/m<sup>3</sup>)**

Exposure limits have not been established by SWA for any of the significant ingredients in this product.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

**Ventilation:** This product should only be used in a well ventilated area. If natural ventilation is inadequate, use of a fan is suggested.

**Eye Protection:** Eye protection such as protective glasses or goggles is recommended when product is being used.

**Skin Protection:** You should avoid contact even with mild skin irritants. Therefore you should wear suitable impervious elbow-length gloves and facial protection when handling this product. See below for suitable types.

**Protective Material Types:** We suggest that protective clothing be made from the following: rubber, PVC.

**Respirator:** Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above.

Safety deluge showers should, if practical, be provided near to where this product is being used.

**SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES:**

<b>Physical Description &amp; colour:</b>	Clear, light brown coloured liquid.
<b>Odour:</b>	Characteristic solvent odour.
<b>Boiling Point:</b>	No specific data.
<b>Freezing/Melting Point:</b>	No specific data. Liquid at normal temperatures.
<b>Volatiles:</b>	No specific data. Expected to be low at 100°C.
<b>Vapour Pressure:</b>	No data.
<b>Vapour Density:</b>	No data.
<b>Specific Gravity:</b>	0.99 approx
<b>Water Solubility:</b>	Emulsifiable.
<b>pH:</b>	5-7 (1% in water).
<b>Volatility:</b>	No data.
<b>Odour Threshold:</b>	No data.
<b>Evaporation Rate:</b>	No data.
<b>Coeff Oil/water Distribution:</b>	No data
<b>Autoignition temp:</b>	No data.

**SECTION 10 - STABILITY AND REACTIVITY**

**Reactivity:** This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.

**Conditions to Avoid:** Protect this product from light. Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight.

**Incompatibilities:** strong acids, strong bases, strong oxidising agents.

**Fire Decomposition:** Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas in reducing atmospheres. Hydrogen fluoride gas and other compounds of fluorine. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.

**Polymerisation:** This product will not undergo polymerisation reactions.

**SECTION 11 - TOXICOLOGICAL INFORMATION**

**Toxicity:** The reported acute oral LD<sub>50</sub> values for technical fluzifop-p-butyl are 3680 to 4096 mg/kg in male rats, and 2451 to 2721 mg/kg in female rats. Ingestion of large quantities may also cause problems in the central nervous system such as drowsiness, dizziness, loss of coordination, and fatigue. Fluzifop-p-butyl is not harmful via the dermal route as well. The reported dermal LD<sub>50</sub> for the compound is greater than 2400 mg/kg in rabbits. The formulation Fusilade DX is reported to have similar acute toxicity via the dermal route, and does not cause skin sensitization in guinea pigs, but may cause moderate skin and mild eye irritation in rabbits. The formulation Fusilade DX is reported to have an 4-hour inhalation LC<sub>50</sub> of greater than 0.54 mg/L in male rats and 0.77 mg/L in female rats, indicating moderate toxicity via the inhalation route. Breathing small amounts of the product Fusilade 2000 may cause vomiting and severe lung congestion; larger amounts may ultimately lead to laboured breathing, coma, and death.

**Chronic toxicity:** Rats fed small amounts of fluzifop-p-butyl for 90 days developed no compound-induced effects at doses at or below 10 mg/kg/day.

**Reproductive effects:** No data are currently available.

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**Teratogenic effects:** No data are currently available.

**Mutagenic effects:** Numerous tests have shown the compound to be nonmutagenic.

**Carcinogenic effects:** No data are currently available.

**Organ toxicity:** Organ toxicity has not been seen in experimental animals.

**Fate in humans and animals:** No data are currently available.

Fluazifop-p Butyl Ester is a SWA Class 3 Reproductive risk, possible risk of harm to the unborn child.

### Classification of Hazardous Ingredients

Ingredient	Risk Phrases
Fluazifop-p Butyl Ester	Conc>=5%: Xn; R63

## SECTION 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.

**Effects on birds:** Fluazifop-p-butyl is practically nontoxic to bird species; the reported acute oral LD<sub>50</sub> for the technical product in mallards is greater than 3528 mg/kg. The reported 5-day dietary LC<sub>50</sub> in mallard duck is greater than 4321 ppm, and in bobwhite quail is greater than 4659 ppm.

**Effects on aquatic organisms:** Fluazifop-p-butyl may be highly to moderately toxic to fish, but only slightly toxic to other aquatic species, such as invertebrates. The reported 96-hour LC<sub>50</sub> values for the technical product in fish species are 0.53 mg/L in bluegill sunfish and 1.37 mg/L in rainbow trout, indicating very high to high toxicity. The 48-hour LC<sub>50</sub> in Daphnia magna is reported as greater than 10 mg/L, indicating only slight toxicity.

**Effects on other organisms:** The compound is of low toxicity to bees. Oral and contact LD<sub>50</sub> values for bees are greater than 0.20 mg/bee.

#### Environmental Fate:

**Breakdown in soil and groundwater:** Fluazifop-p-butyl is of low persistence in moist soil environments, with a reported half-life in these conditions of less than 1 week. Fluazifop-p-butyl breaks down rapidly in moist soils to the fluazifop acid, which is also of low persistence. Fluazifop-p-butyl and fluazifop-p are both reported to be of low mobility in soils and not to present appreciable risks for groundwater contamination. The reported soil adsorption coefficient for fluazifop-p indicates a moderate to low affinity for soil.

**Breakdown in water:** Fluazifop-p-butyl is rapidly hydrolysed (cleaved apart by water) under most conditions to the fluazifop acid. It is relatively stable to breakdown by UV or sunlight, and non-volatile.

**Breakdown in vegetation:** After uptake by the leaves of plants, Fluazifop-p-butyl is rapidly broken down in the presence of water to fluazifop-p, which is translocated throughout the plant. The compound accumulates in the actively growing regions of the plant (meristems of roots and shoots, root rhizomes and stolons of grass), where it interferes with energy (ATP) production and cell metabolism in susceptible species.

## SECTION 13 - DISPOSAL CONSIDERATIONS

**Disposal:** Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 <http://www.chemclear.com.au/> and for help with the disposal of empty drums, contact DrumMuster <http://www.drummuster.com.au/> where you will find contact details for your area.

## SECTION 14 - TRANSPORT INFORMATION

**Not subject to the ADG Code when transported by Road or Rail in Australia, but classed as Dangerous by IATA and IMDG when carried by Air or Sea transport (see details below).**

**ADG Code:** 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

**Hazchem Code:** •3Z

**Special Provisions:** 179, 274, AU01

**Limited quantities:** ADG 7 specifies a Limited Quantity value of 5 L for this class of product.

**Dangerous Goods Class:** Class 9: Miscellaneous Dangerous Goods.

**Packaging Group:** III

**Packaging Method:** P001, IBC03, LP01

Class 9 Miscellaneous Dangerous Goods shall not be loaded in the same vehicle or packed in the same freight container with Dangerous Goods of Class 1 (Explosives).

## SECTION 15 - REGULATORY INFORMATION

**AICS:** All of the significant ingredients in this formulation are compliant with NICNAS regulations.

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The following ingredients: Fluazifop, liquid hydrocarbon, are mentioned in the SUSMP.

## Section 16 - Other Information

This MSDS contains only safety-related information. For other data see product literature.

### Acronyms:

<b>ADG Code</b>	Australian Code for the Transport of Dangerous Goods by Road and Rail (7 <sup>th</sup> edition)
<b>AICS</b>	Australian Inventory of Chemical Substances
<b>SWA</b>	Safe Work Australia, formerly ASCC and NOHSC
<b>CAS number</b>	Chemical Abstracts Service Registry Number
<b>Hazchem Code</b>	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
<b>IARC</b>	International Agency for Research on Cancer
<b>NOS</b>	Not otherwise specified
<b>NTP</b>	National Toxicology Program (USA)
<b>R-Phrase</b>	Risk Phrase
<b>SUSMP</b>	Standard for the Uniform Scheduling of Medicines & Poisons
<b>UN Number</b>	United Nations Number

### Contact Points:

Call Adama on (02)9431 7800 and ask for the technical manager.

Fax: (02)9431 7700

Police and Fire Brigade:

Dial 000

Emergency contact:

1800 024 973 (24 hours)

**If ineffective:**

**Dial Poisons Information Centre  
(13 1126 from anywhere in Australia)**

The information contained in this Material Safety Data Sheet is provided in good faith and is believed to be correct at the date hereof. However, it is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Adama Australia Pty Ltd makes no representation as to the accuracy or comprehensiveness of the information and to the full extent allowed by law excludes all liability whatsoever, whether with respect to negligence or otherwise, for any loss or damage arising from or connection with the supply or use of the information in this Material Safety Data Sheet.

Please read all labels carefully before using product.

This MSDS is prepared in accord with the SWA document "Preparation of Safety Data Sheets for Hazardous Chemicals - Code of Practice" (December 2011)  
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## SAFETY DATA SHEET