



Product Safety Assessment

Pyroxsulam

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Names

- CAS No. 422556-08-9
- Pyroxsulam
- ADMITT[®] herbicide (Chile)
- CRUSADER[®] herbicide (Australia)
- QUASAR[®] herbicide (France)
- N-(5,7-dimethoxy[1,2,4]triazolo[1,5-a]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl)pyridine-3-sulfonamide
- MERIT[®] herbicide (Argentina)
- POWERFLEX[®] herbicide (United States)
- SIMPLICITY[®] herbicide (Canada)
- ACROSS[®] herbicide (Mexico)
- BROADWAY[®] herbicide (Europe)

Although much of the information in this document relates to the registration and sale of pyroxsulam in the United States of America, a number of other countries around the world, many of which are also member nations of the OECD (Organization for the Economic Co-Operation and Development) have registered pyroxsulam products. For further details, consult the relevant country-specific [Product Label](#), [Safety Data Sheet](#), or [Contact Us](#).

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Product Overview

- Pyroxsulam is the active ingredient in a sulfonamide-based herbicide marketed by Dow AgroSciences LLC, a wholly owned subsidiary of The Dow Chemical Company. Pyroxsulam formulations are sold under a variety of trade names depending on the country of registration. For further details, see [Product Description](#).
- Pyroxsulam products can be formulated as liquid concentrates or wettable granules. It is also available as a milled (powder) concentrate. Pyroxsulam is a systemic herbicide that internally disrupts growing weeds resulting in their death.¹ For further details, see [Product Description](#).
- Pyroxsulam is currently registered by the U.S. Environmental Protection Agency (EPA) to control broadleaf weeds and annual grasses in wheat crops.² For further details, see the relevant [Product Label](#) and [Product Description & Regulatory Information](#).
- Occupational exposure to pyroxsulam could occur in manufacturing or formulating operations or during herbicide application in the field. Consumers could be exposed to traces of pyroxsulam through residues in food. Based on risk-assessment calculations, the EPA concluded that “there is reasonable certainty that no harm will result to the general population, or to infants and children, from aggregate exposure to pyroxsulam residues.”³ For further details, see [Exposure Potential](#).

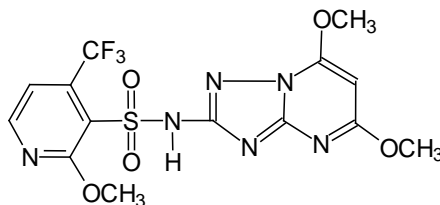
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- Eye contact with pyroxsulam may cause slight irritation. Brief skin contact may cause slight irritation, but is unlikely to result in absorption of harmful amounts. Inhalation exposure is unlikely because of the material's low volatility. In animal studies, effects on the liver were reported from repeated doses.⁴ For further details, see [Health Information](#).
- Pyroxsulam is broken down quickly in soil and water systems by microbial degradation, although it cannot be considered to be readily biodegradable. If released to the environment, it would not persist and would be removed by wastewater-treatment facilities. The potential for groundwater contamination by pyroxsulam is low because of its low use rates, short soil half-life, and the limited mobility observed in field studies. Pyroxsulam has been shown to be practically non-toxic to birds, fish, honeybees, earthworms and aquatic invertebrates. Pyroxsulam is moderately toxic to green and blue-green algae and aquatic higher plants, depending on the species.⁵ For further details, see [Environmental Information](#) or relevant [Product Label](#).
- Pyroxsulam formulations are stable under normal storage conditions, but can decompose at elevated temperatures.⁶ Consult the [Product Label](#) for specific use and storage information. For further details, see [Physical Hazard Information](#).

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Manufacture of Product

- **Capacity** – Dow AgroSciences LLC manufactures and formulates pyroxsulam at various facilities on multiple continents.
- **Process** – Pyroxsulam is produced using a complex and proprietary process. The structure of pyroxsulam is shown below:



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Product Description^{7,8}

Pyroxsulam is the active ingredient in a sulfonamide-based herbicide manufactured by Dow AgroSciences LLC, a wholly owned subsidiary of The Dow Chemical Company. Pyroxsulam is absorbed by the foliage and roots of plants. Treated weeds will stop growing almost immediately. Pyroxsulam is a systemic herbicide, meaning it disrupts the internal growth processes of established weeds, resulting in weed death 2 to 4 weeks following application. It is effective at very low application rates: for wheat the registered use rate ranges from 9 to 18.8 grams of active ingredient per acre. Pyroxsulam formulations are sold under a variety of trade names depending on the country of registration. Pyroxsulam is manufactured as a milled (powder) concentrate and is formulated as liquid concentrates or granules. Liquid formulations typically contain about 1 to 4.5% active ingredient while wettable granules typically contain about 7.5% active ingredient. Cloquintocet-mexyl (CAS No. 99607-70-2), is added to most pyroxsulam formulations as an herbicide "safener." Safeners selectively protect crops (wheat) from herbicide damage without reducing activity in target weed species.

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Product Uses and Regulatory Information^{9,10}

Pyroxsulam is used to control established annual grass and broadleaf weeds. Liquid concentrate and wettable granule formulations are registered by the EPA for use on wheat and triticale crops.

The use on rye is also registered in several European countries. It is not registered for use on residential lawns.

Pyroxsulam products are registered for use on a global basis in over 25 countries. European countries with registrations include Belgium, France, Germany, Poland, and the United Kingdom plus nine other Member States of the European Union. Registrations outside of Europe include Argentina, Australia, Canada, Chile, Mexico, Morocco, Pakistan, Tunisia Turkey, United States and Uruguay.

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of pyroxsulam. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant [Product Label](#), [Safety Data Sheet](#), or [Contact Us](#).

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Exposure Potential^{11,12,13,14}

Pyroxsulam is used in the production of commercial herbicides. Based on the uses for pyroxsulam, the public could be exposed through:

- **Workplace exposure** – Exposure can occur in facilities that manufacture or formulate pyroxsulam. Those working with pyroxsulam in these operations could be exposed during maintenance, sampling, testing, or other procedures. Each facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit exposure. Agricultural workers could be exposed while mixing or applying herbicide in the field. Applicators are expected to follow label precautions, including wearing personal protective equipment appropriate to application method. See [Health Information](#) and [Product Label](#).
- **Consumer exposure to products containing pyroxsulam** – Consumers could be exposed to trace amounts of pyroxsulam through residues in grain products or drinking water. To ensure pesticide safety with regard to human health, the EPA performs comprehensive risk-assessment calculations using conservative estimates of pesticide concentrations in drinking water, food, and nonfood sources. Risk-assessment calculations for pyroxsulam were performed for chronic (long-term) exposures from wheat and drinking water. Based on these assessments, the EPA concluded that “there is reasonable certainty that no harm will result to the general population and to infants and children from aggregate exposure to pyroxsulam residues.” Cloquintocet-mexyl, an additive in most pyroxsulam formulations, is also considered safe by the EPA. See [Health Information](#).
- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil, ditches, sewers, waterways, or groundwater. Pyroxsulam breaks down quickly in soil and water by microbial degradation. If released to the environment, it would not persist and would be removed by wastewater-treatment facilities. The potential for groundwater contamination is low because of its low use rates, short soil half-life, and the limited mobility observed in field studies. Pyroxsulam is moderately toxic and on an acute basis to green and blue-green algae and aquatic higher plants, depending on the species. Sweep up or soak up small spills with an absorbent material such as sand or dirt and collect the recovered material in a container suitable for disposal. Please consult the relevant [Safety Data Sheet](#) or [Product Label](#) for more information about protective equipment and procedures. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, dike the area to contain the material and contact Dow AgroSciences. Consult the relevant [Safety Data Sheet](#) or [Product Label](#) for more detailed information about protective equipment and procedures. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).
- **In case of fire** – Keep people away. Isolate the fire and deny unnecessary entry. If possible, fight the fire from a protected location or safe distance. Toxic and irritating gases may be formed under fire conditions. Withdraw all personnel from the area in case of rising sound

from venting safety devices or discoloration of the container. Contain fire-water run-off to minimize the potential for environmental damage. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Use alcohol-resistant foam, carbon-dioxide extinguishers, or dry-chemical extinguishers to fight the fire. Foam systems are preferred because uncontrolled water can spread possible contamination. Follow emergency procedures carefully. Consult the [Product Label](#) and [Safety Data Sheet](#) for specific firefighting measures. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

- **Emergency Response Information** – In case of an emergency such as poisoning, product spillage, or fire associated with a Dow AgroSciences LLC product in the United States call **800-992-5994** (more information is available at www.dowagro.com/company/contact/index.htm). For emergencies outside the U.S., access www.dowagro.com/products/ for a list of country sites or contact pages for relevant information.

For more information, see the [Product Label](#) or [Safety Data Sheet](#).

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Health Information^{15,16}

Laboratory testing – Pyroxsulam has been evaluated by comprehensive regulatory schemes prior to product registration in the US and EU (i.e., U.S. Federal Insecticides, Fungicides, Rodenticides Act). These schemes require laboratory testing for potential short-term (acute) and long-term (chronic) health effects. Laboratory testing helps scientists determine how chemicals might affect humans, domestic animals, or wildlife in cases of overexposure. Pesticide products used according to label directions are unlikely to cause toxic effects. The amount of pesticide that people and pets may be exposed to is low compared to concentrations used in laboratory testing.

Health information for products containing pyroxsulam is summarized on the relevant [Safety Data Sheet](#) or [Product Label](#). It is important to note that health risks associated with individual products may vary based on their formulation or intended use. These products may also contain other components or additives that have additional health risks. The [Safety Data Sheet](#) or [Product Label](#) is the preferred source for specific health information. An overview of health information below is primarily directed at the active ingredient pyroxsulam.

Eye contact – Eye contact may cause slight irritation.

Skin contact – Brief contact may cause slight irritation, but is unlikely to result in absorption of harmful amounts. Pyroxsulam has caused allergic skin reactions in animal testing.

Inhalation – Exposure is unlikely due to low volatility.

Repeated exposure – Effects on the liver have been reported in repeated dose animal testing.

Ingestion – The material has low toxicity if swallowed. Swallowing small amounts incidental to normal handling operations is not likely to cause injury; however, swallowing larger amounts may cause injury.

Cancer and birth defect information – Pyroxsulam has been classified as “not likely to be a human carcinogen” by the EPA. Pyroxsulam did not cause birth defects or any other fetal effects in animals testing.

For more information, see the relevant [Product Label](#) or [Safety Data Sheet](#).

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Environmental Information^{17,18}

Although it cannot be considered to be readily biodegradable, pyroxsulam is broken down quickly in soil and water systems by microbial degradation. If released to the environment, it would not persist and would be removed by wastewater-treatment facilities. Pyroxsulam has a low bioconcentration potential (tendency to accumulate in the food chain) and very high soil mobility. The potential for groundwater contamination by pyroxsulam is considered to be low because of its low use rates, short soil half-life, and the limited mobility observed in field studies.

Cloquintocet-mexyl, an additive in some pyroxsulam formulations, has a moderate bioconcentration potential.

Pyroxsulam is toxic to certain aquatic plant and algae organisms on an acute (single, high dose) basis. It is practically nontoxic to birds, fish, honeybees, earthworms, and aquatic vertebrates on an acute basis.

For more information, see the relevant [Product Label](#) or [Safety Data Sheet](#).

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Physical Hazard Information¹⁹

Pyroxsulam is stable under normal conditions of storage and use, but can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure build-up in closed systems. Store the material in the original container. Consult the [Product Label](#) for specific use and storage information.

For more information, see the relevant [Product Label](#) or [Safety Data Sheet](#).

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Additional Information

- Safety Data Sheets or Product Labels (www.dowagro.com/products/)
- Contact Us (www.dowagro.com/company/contact/index.htm)
- *SIMPLICITY*[®] *Herbicide Specimen Label*, Dow AgroSciences LLC, Canadian Label Code: CN-28887-001-E, CN NAFTA, February 2008 (www.dowagro.com/ca/prod/simplicity.htm)
- *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007 (www.dowagro.com/PublishedLiterature/dh_0115/0901b80380115960.pdf?filepath=science/pdfs/noreg/010-80111.pdf&fromPage=GetDoc)
- "Pyroxsulam: Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register*, Volume 73, Number 39, February 27, 2008, pages 10398–10402, web page (<http://www.epa.gov/EPA-PEST/2008/February/Day-27/p3490.pdf>)
- "Acetic acid, [(5-chloro-8-quinolinyl)oxy]-, 1-methylhexyl ester (Cloquintocet-mexyl): Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register*, Volume 73, Number 44, March 5, 2008, pages 11816–11820

For more business information about pyroxsulam, visit the [Dow AgroSciences LLC](http://www.dowagro.com/) web site at www.dowagro.com/.

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References

- ¹ *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007, pages 2 and 5.
- ² "Pyroxsulam; Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register* Volume 73, Number 39, February 28, 2008, summary.
- ³ "Pyroxsulam; Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register* Volume 73, Number 39, February 28, 2008, page 10401.
- ⁴ *Pyroxsulam Milled Concentrate Material Safety Data Sheet*, Dow AgroSciences LLC, July 28, 2009, pages 1–2 and 5.
- ⁵ *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007, pages 8–10.
- ⁶ *Pyroxsulam Milled Concentrate Material Safety Data Sheet*, Dow AgroSciences LLC, July 28, 2009, pages 4–5.
- ⁷ *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007, pages 2 and 5.
- ⁸ *SIMPLICITY® Herbicide Material Safety Data Sheet*, Dow AgroSciences LLC, Product Code: 111065, July 5, 2007, page 1.
- ⁹ "Pyroxsulam; Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register* Volume 73, Number 39, February 28, 2008, summary.
- ¹⁰ *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007, pages 2–5.
- ¹¹ *Pyroxsulam Milled Concentrate Material Safety Data Sheet*, Dow AgroSciences LLC, July 28, 2009, pages 1–3.
- ¹² *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007, pages 8–10.
- ¹³ "Pyroxsulam; Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register* Volume 73, Number 39, February 28, 2008, pages 10400–10401.
- ¹⁴ "Acetic acid, [(5-chloro-8-quinolinyl)oxy]-, 1-methylhexyl ester (Cloquintocet-mexyl); Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register*, Volume 73, Number 44, March 5, 2008, page 11819.
- ¹⁵ *Pyroxsulam Milled Concentrate Material Safety Data Sheet*, Dow AgroSciences LLC, July 28, 2009, pages 1–2 and 5.
- ¹⁶ "Pyroxsulam; Pesticide Tolerance," U.S. Environmental Protection Agency, *Federal Register*, Volume 73, Number 39, February 28, 2008, pages 10400–10401.
- ¹⁷ *Pyroxsulam Milled Concentrate Material Safety Data Sheet*, Dow AgroSciences LLC, July 28, 2009, page 5–6.
- ¹⁸ *Pyroxsulam Technical Bulletin*, Dow AgroSciences LLC, Form No. Y45-356-001 (09/07) DAS, September 2007, pages 8–10.
- ¹⁹ *Pyroxsulam Milled Concentrate Material Safety Data Sheet*, Dow AgroSciences LLC, July 28, 2009, pages 4–5.

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NOTICES:

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