

Syngenta Crop Protection, LLC
Post Office Box 18300
Greensboro, NC 27419

In Case of Emergency, Call
1-800-888-8372

1. PRODUCT IDENTIFICATION

Product Name:	BOUNDARY 6.5EC	Product No.:	A12831A
EPA Signal Word:	Caution		
Active Ingredient(%):	Metribuzin (13.8%)	CAS No.:	21087-64-9
Chemical Name:	4-amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5 (4H)-one		
Chemical Class:	Triazinone Herbicide		
Active Ingredient(%):	s-Metolachlor (58.2%)	CAS No.:	87392-12-9
Chemical Name:	Acetamide, 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)-,(S)		
Chemical Class:	Chloroacetanilide Herbicide		
EPA Registration Number(s):	100-1162	Section(s) Revised:	9, 15

2. HAZARDS IDENTIFICATION

Health and Environmental

Harmful if swallowed or inhaled. Irritating to eyes and skin. Vapors may cause drowsiness and dizziness. May be harmful if swallowed and enters airway.

Combustible liquid.

Hazardous Decomposition Products

None known.

Physical Properties

Appearance: Transparent amber liquid
 Odor: Aromatic sulfur-like

Unusual Fire, Explosion and Reactivity Hazards

Combustible liquid. Can release vapors that form explosive mixtures at temperatures at or above the flash point. Heavy vapors can flow along surfaces to distant ignition sources and flash back.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

3. COMPOSITION/INFORMATION ON INGREDIENTS
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Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen
Petroleum Solvent	Not Established	Not Established	50 mg/m ³ (8 ppm) TWA *	No
1,2,4-Trimethylbenzene (< 5%)	Not Established	25 ppm TWA	25 ppm TWA **	No
Naphthalene (< 5%)	10 ppm TWA	10 ppm TWA (skin)	10 ppm TWA **	See "Toxicity", Sec. 11
s-Metolachlor (58.2%)	Not Established	Not Established	10 mg/m ³ TWA ***	No

Metribuzin (13.8%) Not Established 5 mg/m³ TWA 5 mg/m³ TWA ** No

* recommended by manufacturer

** recommended by NIOSH

*** Syngenta Occupational Exposure Limit (OEL)

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.
Syngenta Hazard Category: B, S

4. FIRST AID MEASURES

Have the product container, label or Material Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison control center or doctor, or going for treatment.

- Ingestion: If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.
- Eye Contact: If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.
- Skin Contact: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.
- Inhalation: If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

Notes to Physician

There is no specific antidote if this product is ingested.

Treat symptomatically.

Contains petroleum distillate - vomiting may cause aspiration pneumonia.

Medical Condition Likely to be Aggravated by Exposure

None known.

5. FIRE FIGHTING MEASURES

Fire and Explosion

- Flash Point (Test Method): 188°F
- Flammable Limits (% in Air): Lower: Not Applicable Upper: Not Applicable
- Autoignition Temperature: Not Available
- Flammability: Combustible liquid

Unusual Fire, Explosion and Reactivity Hazards

Combustible liquid. Can release vapors that form explosive mixtures at temperatures at or above the flash point. Heavy vapors can flow along surfaces to distant ignition sources and flash back.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

In Case of Fire

Use appropriate extinguishing media for combustibles in the area. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

6. ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and

drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

7. HANDLING AND STORAGE

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THIS PRODUCT.

FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

- Ingestion: Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.
- Eye Contact: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- Skin Contact: Where contact is likely, wear chemical-resistant gloves (such as barrier laminate, butyl rubber, nitrile rubber or Viton), coveralls, socks and chemical-resistant footwear.
- Inhalation: A respirator is not normally required when handling this substance. Use effective engineering controls to comply with occupational exposure limits.

In case of emergency spills, use a NIOSH approved respirator with any R, P or HE filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance: Transparent amber liquid
- Odor: Aromatic sulfur-like
- Melting Point: Not Applicable
- Boiling Point: Not Available
- Specific Gravity/Density: 1.08 g/ml ; 9.01 lbs/gal @ 68°F (20°C)
- pH: 3 - 5 (1% solution in H₂O @ 77°F (25°C))

Solubility in H₂O

- Metribuzin: 1050 ppm @ 68°F (20°C)
- s-Metolachlor: 0.48 g/l @ 77°F (25°C)

Vapor Pressure

- Metribuzin: 1.2 x 10⁽⁻⁷⁾ mmHg @ 68°F (20°C)
- s-Metolachlor: 2.8 x 10⁽⁻⁵⁾ mmHg @ 77°F (25°C)

10. STABILITY AND REACTIVITY

- Stability: Stable under normal use and storage conditions.
- Hazardous Polymerization: Will not occur.
- Conditions to Avoid: None known.
- Materials to Avoid: None known.
- Hazardous Decomposition Products: None known.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity/Irritation Studies (Finished Product)

Ingestion:	Oral (LD50 Rat) :	1805 mg/kg body weight
Dermal:	Dermal (LD50 Rat) :	> 5000 mg/kg body weight
Inhalation:	Inhalation (LC50 Rat) :	> 2.53 mg/l air - 4 hours
Eye Contact:	Moderately Irritating (Rabbit)	
Skin Contact:	Slightly Irritating (Rabbit)	
Skin Sensitization:	Not a Sensitizer (Guinea Pig)	

Reproductive/Developmental Effects

Metribuzin: Developmental toxicity studies in rats showed both developmental and maternal effects. A reproductive toxicity feeding study in rats showed reduced offspring weights at the highest dose level.
s-Metolachlor: None observed.

Chronic/Subchronic Toxicity Studies

Metribuzin: Dog and rat feeding studies showed decreases in body weight and food consumption, anemia, liver effects, kidney effects, testicular effects and mortality.
A dermal toxicity study in rabbits showed effects on cholesterol levels and liver function.
A rat inhalation study showed behavioral changes, decreased body weight gains, liver enzyme induction and organ weight effects.
Neurotoxicity: Animal studies showed evidence of transient neurobehavioral effects after single oral dosing at 5 mg/kg and above. Other screening studies showed no evidence of neurotoxicity at dietary concentrations up to 900 ppm.
s-Metolachlor: None observed.

Carcinogenicity

Metribuzin: Metribuzin was investigated for carcinogenicity in chronic feeding studies using rats and mice at maximum levels of 900 and 3200 ppm, respectively. There was no evidence of a carcinogenic potential observed in either species.
s-Metolachlor: Benign liver tumors at high dose levels (female rats).

Other Toxicity Information

None

Toxicity of Other Components

1,2,4-Trimethylbenzene (< 5%)

Test results reported in Section 11 for the final product take into account any acute hazards related to the 1,2,4-trimethylbenzene in the formulation.

Naphthalene (< 5%)

Test results reported in Section 11 for the final product take into account any acute hazards related to the naphthalene in the formulation.

Chronic overexposure to naphthalene can affect the liver, kidney, respiratory tract and blood.

Carcinogen Status:

NTP: Anticipated Carcinogen

IARC: Group 2B Possible Human Carcinogen

Petroleum Solvent

Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat and lungs.

Breathing of high vapor concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination.

Target Organs

Active Ingredients

Metribuzin: Liver, kidney, thyroid, testes

s-Metolachlor: Liver

Inert Ingredients

1,2,4-Trimethylbenzene: Not Applicable

Naphthalene: Liver, kidney, respiratory tract, blood

Petroleum Solvent: Respiratory tract, stomach, liver, thyroid, urinary bladder, CNS, skin

12. ECOLOGICAL INFORMATION

Ecotoxicity Effects

s-Metolachlor:

Fish (Rainbow Trout) 96-hour LC50 11.9 ppm

Green Algae 5-day EC50 0.008 ppm

Bird (Bobwhite Quail) LD50 Oral > 2510 mg/kg

Invertebrate (Water Flea) 48-hour EC50 26 ppm

Metribuzin:

Fish (Rainbow Trout) 96-hour LC50 42 ppm

Invertebrate (Water Flea) Daphnia Magna 48-hour EC50 4.18 ppm

Bird (Bobwhite Quail) 21-day LD50 164 mg/kg

Green Algae 6-day EC50 20.8 ppb

Environmental Fate

Metribuzin:

The information presented below is for the active ingredient, metribuzin.

Not persistent in soil. Stable in water. Moderate mobility in soil. Sinks in water (after 24 h).

s-Metolachlor:

The information presented here is for the active ingredient, s-metolachlor.

Low bioaccumulation potential. Not persistent in soil. Stable in water. Sinks in water (after 24 h).

13. DISPOSAL CONSIDERATIONS

Disposal

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

14. TRANSPORT INFORMATION

DOT Classification

Ground Transport - NAFTA

Packages <= 119 gal. Not regulated.

Packages > 119 gal.

Proper Shipping Name: Compounds, Weed Killing, Liquid, (Naphthalene)

Hazard Class: Combustible Liquid

Identification Number: NA 1993

Packing Group: PG III

Comments

Water Transport - International

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (s-Metolachlor/Naphthalene), Marine Pollutant

Hazard Class: Class 9

Identification Number: UN 3082

Packing Group: PG III

Air Transport

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (s-Metolachlor/Naphthalene)

Hazard Class: Class 9

Identification Number: UN 3082

Packing Group: PG III

15. REGULATORY INFORMATION

EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard
Fire Hazard

Section 313 Toxic Chemicals: Metribuzin (13.8%) (CAS No. 21087-64-9)
1,2,4-Trimethylbenzene (< 5%) (CAS No. 95-63-6)
Naphthalene (< 5%) (CAS No. 91-20-3)

California Proposition 65

Not Applicable

CERCLA/SARA 304 Reportable Quantity (RQ)

Report product spills > 750 gal (based on naphthalene [RQ = 100 lbs.] content in the formulation) (CERCLA)

RCRA Hazardous Waste Classification (40 CFR 261)

Not Applicable

TSCA Status

Exempt from TSCA, subject to FIFRA

16. OTHER INFORMATION

NFPA Hazard Ratings

Health: 2
Flammability: 2
Instability: 0

HMIS Hazard Ratings

Health: 2
Flammability: 2
Reactivity: 0

0	Minimal
1	Slight
2	Moderate
3	Serious
4	Extreme

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 10/14/2003

Revision Date: 1/19/2012

Replaces: 8/24/2010

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

End of MSDS