SAFETY DATA SHEETS

This SDS packet was issued with item:

078889523

The safety data sheets (SDS) in this packet apply to the individual products listed below. Please refer to invoice for specific item number(s).

078889499

The safety data sheets (SDS) in this packet apply to one or more components included in the items listed below. Items listed below may require one or more SDS. Please refer to invoice for specific item number(s).

078889481 078889507 078889515 078889556 078889564 078889572 078889580 078889598

Merck Animal Health
One Merck Dr.
Whitehouse Station, NJ 08889

MATERIAL SAFETY DATA SHEET

Merck Animal Health urges each user or recipient of this MSDS to read the entire data sheet to become aware of the hazards associated with this material.

SECTION 1. IDENTIFICATION OF SUBSTANCE AND CONTACT INFORMATION

MSDS NAME: **Indoxacarb Topical Solution (EAA)**

SYNONYM(S): Indoxacarb Topical Solution (w/ Ethyl Acetoacetate)
Indoxacarb Topical Solution (EAA), Activyl

MSDS NUMBER: SP001933

EMERGENCY NUMBER(S): (908) 423-6000 (24/7/365) English Only

Transportation Emergencies - CHEMTREC:
(800) 424-9300 (Inside Continental USA)
(703) 527-3887 (Outside Continental USA)
Rocky Mountain Poison Center (For Human Exposure):
(303) 595-4869

Animal Health Technical Services:
For Animal Adverse Events: Small Animals and Horses: (800) 224-5318
For Animal Adverse Events: Livestock: (800) 211-3573
For Animal Adverse Events: Poultry: (800) 219-9286

INFORMATION: Animal Health Technical Services:
For Small Animals and Horses: (800) 224-5318
For Livestock: (800) 211-3573
For Poultry: (800) 219-9286

MERCK MSDS HELPLINE: (800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Liquid
Off-white to yellow
Characteristic odor
Highly Flammable.
Irritating to eyes and respiratory system.
May be harmful by inhalation or if swallowed.
Prolonged exposure may cause serious health effects.
May cause effects to:
central nervous system
blood
respiratory system
Dangerous for the environment.
Toxic to aquatic organisms.
Toxic to wildlife.
May cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS:

The toxicological properties of this material have not been fully characterized in humans and animals. Therefore, laboratory or process control systems and appropriate work practices should be in place to minimize the potential for inhalation exposure, skin contact, eye contact, or ingestion when working with this material.

This product is an insecticide.

Indoxacarb topical solution (EAA) is irritating to the eyes and may be harmful if inhaled or swallowed.

Acute exposure to isopropanol by ingestion or inhalation may cause headache, dizziness, hallucinations, distorted perception, labored breathing, nausea, and vomiting. Exposure to very high concentrations of isopropanol has been reported to cause central nervous system (CNS) depression, brain or nerve damage, respiratory depression, absence of reflexes, low blood pressure, slow or fast heart rates, low body temperature, bleeding and inflammation of the stomach, decreased urination, failure to form urine, kidney and liver damage, and coma. Chronic exposure may also cause thinning, inflammation, drying and cracking of the skin.

Ethylacetoacetate has been reported to cause irritation to eyes and respiratory system.

LISTED CARCINOGENS

No carcinogens or potential carcinogens listed by OSHA, IARC, NTP or ACGIH are present in concentrations >0.1% in this mixture.

SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

PRODUCT USE: Veterinary product

CHEMICAL FORMULA: Mixture.

The formulation for this product is proprietary information. Only hazardous ingredients in concentrations of 1% or greater and/or carcinogenic ingredients in concentrations of 0.1% or greater are listed in the Chemical Composition table. Active ingredients in any concentration are listed. For additional information about carcinogenic ingredients see Section 2.

CHEMICAL COMPOSITION

INGREDIENT	CAS NUMBER	PERCENT
Indoxacarb	173584-44-6	19.53
Isopropyl Alcohol	67-63-0	30-40
Ethylacetoacetate	141-97-9	20-30
Glyceryl Triacetate	102-76-1	20-30

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

ADDITIONAL INFORMATION: This MSDS is written to provide health and safety information for individuals who will be handling the final product formulation during research, manufacturing, and distribution. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate MSDS for each ingredient. Refer to the package insert or product label for handling guidance for the consumer.

SECTION 4. FIRST AID MEASURES

INHALATION: Remove to fresh air. If any trouble breathing, get immediate medical attention. Administer artificial respiration if breathing has ceased. If irritation or symptoms occur or persist, consult a physician. Remove to fresh air. Administer artificial respiration if breathing has ceased. IMMEDIATELY consult a physician.

SKIN CONTACT: In case of skin contact, while wearing protective gloves, carefully remove any contaminated clothing, including shoes, and wash skin thoroughly with soap and water. If irritation or symptoms occur or persist, consult a physician. In case of skin contact, IMMEDIATELY flush exposed skin thoroughly with plenty of water. While wearing protective gloves, remove any contaminated clothing, including shoes and continue to wash skin thoroughly with soap and water for at least 15 minutes. Get IMMEDIATE medical attention.

EYE CONTACT: In case of eye contact, immediately rinse eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. If irritation occurs or persists, consult a physician.

INGESTION: Rinse mouth and drink a glass of water. Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. If symptoms persist, consult a physician. Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. IMMEDIATELY consult a physician. Do not attempt to give anything by mouth to a seizing, drowsy or unconscious person. If alert, rinse mouth and drink a glass of water.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA:

Flash Point:	1.5 deg C(34.7 deg F
Classification:	Highly Flammable (EU Criteria) Flammable (US OSHA Criteria)

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing and self-contained breathing apparatus (SCBA).

SUITABLE EXTINGUISHING MEDIA:
Carbon dioxide (CO2), extinguishing powder or water spray.

See Section 9 for Physical and Chemical Properties.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Wear appropriate personal protective equipment as specified in Section 8. Keep personnel away from the clean-up area.

SPILL RESPONSE / CLEANUP:
All spills should be handled according to site requirements and based on precautions cited in the MSDS. In the case of liquids, use proper absorbent materials. For laboratories and small-scale operations, incidental spills within a hood or enclosure should be cleaned by using a HEPA filtered vacuum or wet cleaning methods as appropriate. For large dry or liquid spills or those spills outside enclosure or hood, appropriate emergency response personnel should be notified. In manufacturing and large-scale operations, HEPA vacuuming prior to wet mopping or cleaning is required.

ENVIRONMENTAL PRECAUTIONS:
This product is toxic to aquatic organisms. This product is toxic to wildlife. Do not allow product to reach ground water, water course, sewage or drainage systems.

See Sections 9 and 10 for additional physical, chemical, and hazard information.

SECTION 7. HANDLING AND STORAGE

HANDLING:
Keep containers adequately sealed during material transfer, transport, or when not in use. Wash face, hands, and any exposed skin after handling. Do not eat, drink, or smoke when using this substance or mixture.

Appropriate handling of this material is dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. See Section 8 (Exposure Controls) for additional guidance.

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

STORAGE:
Keep away from heat, sparks, open flames, and direct sunlight. Avoid extreme heat. Store in a cool, dry, well ventilated area. Store in adequately sealed container.

See Section 8 for exposure controls and additional safe handling information.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE BAND (OEB):
OEB 3: 10-100 mcg/m^3. Materials in an OEB 3 category are considered moderate health hazards. The OEB is a range of airborne concentrations expressed as an 8-hour Time Weighted Average (8-hr. TWA) and is intended to be used with Industrial Hygiene Risk Assessment to assist with industrial hygiene sampling and selection of proper controls for worker protection. Consult your site safety and industrial hygiene staff for guidance on handling and control strategies.

OCCUPATIONAL EXPOSURE GUIDELINE (OEG):
Internal Occupational Exposure Limit of 20 mcg/m^3 and a wipe limit of 200 mcg/100 cm2 have been established for Indoxacarb.

EXPOSURE CONTROLS
The health hazard risks of handling this material are dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. Exposure controls for normal operating or routine procedures follow a tiered strategy. Engineering controls are the preferred means of long-term or permanent exposure control. If engineering controls are not feasible, appropriate use of personal protective equipment (PPE) may be considered as alternative control measures. Exposure controls for non-routine operations must be evaluated and addressed as part of the site-specific risk assessment.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

Respiratory Protection:	Respiratory protective equipment (RPE) may be required for certain laboratory and large-scale manufacturing tasks if potential airborne breathing zone concentrations of substances exceed the relevant exposure limit(s). Workplace risk assessment should be completed before specifying and implementing RPE usage. Potential exposure points and pathways, task duration and frequency, potential employee contact with the substance, and the ability of the substance to be rendered airborne during specific tasks should be evaluated. Initial and ongoing strategies of quantitative exposure measurement should be obtained as required by the workplace risk assessment. All RPE must conform to local and regional specifications for efficacy and performance. Consult your site or corporate health and safety professional for additional guidance.
Skin Protection:	Gloves that provide an appropriate barrier to the skin are recommended if there is potential for contact with this material. Consult your site safety staff for guidance.
Eye Protection:	Safety glasses with side shields. Use of goggles or full face protection may be required based on hazard, potential for contact, or level of exposure. Consult your site safety staff for guidance.
Body Protection:	In small-scale or laboratory operations, lab coats or equivalent protection is required. Disposable Tyvek or other dust impermeable suit should be considered based on procedure or level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance. In large-scale or manufacturing operations, disposable Tyvek or other dust impermeable suit is recommended and based on level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

EXPOSURE LIMIT VALUES

INGREDIENT	CAS NUMBER	ACGIH TLV (TWA)	OSHA PEL (TWA)
Isopropyl Alcohol	67-63-0	200 ppm	400 ppm 980 mg/m^3

INGREDIENT	CAS NUMBER	ACGIH TLV (STEL / SKIN)	ACGIH TLV (CEIL)	OSHA PEL (STEL / SKIN)	OSHA PEL (CEIL)
Isopropyl Alcohol	67-63-0	400 ppm			

Fields in the above table(s) that do not contain data indicate that exposure limits are not available for those endpoints.

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORM:	Liquid
COLOR:	Off-white to yellow
ODOR:	Characteristic odor
SPECIFIC GRAVITY:	1.00
SOLUBILITY:	
Water:	Not determined
PARTITION COEFFICIENT (log Pow):	Log Kow = 4.65 (Indoxacarb)

See Section 5 for flammability/explosivity information.

SECTION 10. STABILITY AND REACTIVITY

STABILITY/ REACTIVITY:
Stable under normal conditions.

INCOMPATIBLE MATERIALS / CONDITIONS TO AVOID:
Keep away from heat, sparks, open flame, and direct sunlight.

HAZARDOUS DECOMPOSITION PRODUCTS / REACTIONS:
No dangerous decomposition is expected if used according to manufacturer's specifications.

SECTION 11. TOXICOLOGICAL INFORMATION

The information presented below pertains to the formulated product unless indicated otherwise.

ACUTE TOXICITY DATA

INHALATION:
Indoxacarb dust mixture (21% active with non-active isomer): LC50 > 5 mg/L (4-hr. inhalation) study in rats.

Ethyl acetoacetate: Irritating to respiratory tract

Isopropanol: Inhalation LC50 (8hr): 16,000 ppm (rat)
Isopropanol caused reduced ciliary activity in the nasal mucosa and trachea at 400 ppm for 24 hours and severe pathological degeneration of the respiratory mucosa at 5500 ppm for 24 hours in guinea pigs.

SKIN:
Indoxacarb topical solution (EAA) Dermal LD50: > 2000 mg/kg (Rat). No abnormal clinical signs or irritation reported.

Not irritating in a skin irritation study in rabbits (PII=0).

EYE:
Indoxacarb topical solution (EAA) was moderately irritating in a rabbit eye irritation study (MTS = 22.7).

ORAL:
Indoxacarb topical solution (EAA): In an acute oral rat study, 1/5 animals had to be euthanized due to moribund condition following dosing with 2000 mg/kg. In this moribund animal, abnormal gait and stance, piloerection, decreased body tone and activity, gasping, vocalization, and tearing eyes were observed. In addition, distended, air-filled stomach and intestines, bright red lungs and dark red lesions in the stomach lining were observed in this animal at necropsy. Piloerection and decreased body tone was observed in one additonal animal dosed at 2000 mg/kg. Other than the one moribund animal, no visible lesions were observed at necropsy of the other animals dosed in this study and no clinical signs were observed in animals treated with doses below 2000 mg/kg (175 mg/kg and 550 mg/kg).

DERMAL AND RESPIRATORY SENSITIZATION:
Indoxacarb topical solution (EAA) was not sensitizing in a guinea pig maximization skin sensitization assay. No clinical signs or irritation were reported in treated animals.

REPEAT DOSE TOXICITY DATA

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

SUBCHRONIC / CHRONIC TOXICITY:
Indoxacarb: In a 90-day rat feeding study, indoxacarb caused hematological (hemolysis, hemolytic anemia) effects, and decreased body weight (greater in females than males). Female rats in the 4.1 and 8.5 mg/kg/day groups had decreases in the indicators of erythrocyte mass: red blood cell count, hemoglobin concentration, and hematocrit. These decreases, though small, were usually between 10 and 17% relative to control and were associated with other changes that indicated a slight regenerative response (e.g. increased reticulocyte counts). These hematologic effects were of equivocal biological significance based on the absence of clinical anemia by the end of the exposure period. Despite the absence of anemia, red cell effects were considered to be adverse based on the magnitude of decreases observed and the associated regenerative response [LOEL = 4.1 mg/kg/day (female); NOEL = 1.7 mg/kg/day (females) and 3.2 mg/kg/day (males)]. Subchronic 90-day studies in mice and dogs with a similar test substance showed similar effects with less sensitivity than female rats [NOAEL = 2.1-4.6 mg/kg/day].

Rats and mice exposed to isopropanol at a dosage of 5000 ppm/day for 13 weeks showed signs of narcosis, increased body weights, and increased relative liver weights. An increase in size and frequency of hyaline droplets was observed in the kidneys of male rats. In a separate study, continuous inhalation of 8 ppm isopropanol in rats for 86 days showed increased bromosulfophthalein retention, liver parenchymal dystrophy, enlarged spleen and degenerative changes in the brain. Daily application of isopropanol (50%) for 187 days did not produce any apparent injury to the skin of rats. Rats exposed to 0.5 to 10% isopropanol in the drinking water for 27 weeks showed decreased body weight but no gross or microscopic tissue abnormalities. One out of three dogs died when exposed to isopropanol in the drinking water for 7 months; histopathological changes were noted in the kidneys of the dog that died.

Rats exposed to a concentrated vapor of ethyl acetoacetate for 8 hours showed no mortalities. NOAEL >1000 mg/kg in oral rat feeding study.

REPRODUCTIVE / DEVELOPMENTAL TOXICITY:
Indoxacarb: The developmental toxicity of indoxacarb was evaluated in rats at dosages as high as 3.5 mg/kg/day. Indoxacarb was not teratogenic at any dosages tested. The NOAEL for both maternal and fetal toxicity was 2.0 mg/kg/day based on slight decreases in body weight parameters at the high dosage of 3.5 mg/kg/day. There were no effects reported in a 2-generation reproductive study with a similar test substance [NOAEL = 20 ppm for both dams and offspring based on decreases in body weight parameters].

Isopropanol (2.5%) in drinking water had no effect on the reproduction and growth of rats in a three-generation study. In a two-generation study, rats were dosed by oral gavage with dosages up to 1000 mg/kg/day of isopropanol. No reproductive toxicity was observed except for a statistically significant reduction in the mating index of the high-dose first generation males. Toxicity was observed in the first-generation offspring at 1000 mg/kg/day, as evidenced by reduced body weight and increased mortality. Isopropanol was not teratogenic in rats given dosages up to 1200 mg/kg/day on gestation days 6 through 15 or in rabbits given dosages up to 480 mg/kg/day on gestation days 6 through 18. No evidence of developmental toxicity, as determined by pathological findings, organ weights, or behavioral tests was observed in rats administered up to 1200 mg/kg/day on gestation day 6 through postnatal day 21. Teratogenic effects were reported in rats exposed to 3500, 7000, or 10,000 ppm isopropanol for 7 hours daily on gestation days 1 to 19 . Reported maternal and fetal effects observed in animals dosed at 7000 ppm and greater included malformations, resorptions, skeletal defects, and fetal deaths at maternally toxic doses.

MUTAGENICITY / GENOTOXICITY:
Indoxacarb: Test have shown that indoxacarb does not cause genetic damage in bacterial or mammalian cell cultures or in animals. Negative in bacterial reverse mutation assay, the in vitro mammalian chromosome aberration test, and the in vivo mouse bone marrow micronucleus test.

Isopropanol was negative in a sister chromatid exchange assay, in a bacterial mutagenicity study (Ames) with activation, in an in vitro CHO/HGPRT gene mutation assay, in an in vivo bone marrow micronucleus assay in mice, and in mutagenicity tests in Neurospora crassa.

Ethyl acetoacetate was negative in a bacterial mutagenicity study (Ames) both with and without metabolic activation, and negative in a cytogenetic assay. Ethyl acetoacetate was positive in a Bacillus subtilis recombination assay.

CARCINOGENICITY:
This material or product has not been evaluated for carcinogenicity.

Indoxacarb: Similar test substances were evaluated in 2-year studies with rats, mice, and dogs. Hematological effects and reduced body weight were observed consistent with 90-day studies. No tumor formation was reported.

Male mice exposed to 7.5 ppm isopropanol for 3 to 7 hours daily, 5 days per week for 5 to 8 months showed no significant increase in the number of lung tumors observed. No increases in lung tumors were observed in the same strains of mice that received subcutaneous injections of isopropanol once weekly for 20 to 40 weeks. However, isopropanol has not been tested adequately in animals to assess carcinogenicity.

SECTION 12. ECOLOGICAL INFORMATION

The below aquatic and avian toxicity is for the DuPont product (DPX-MP062), a mixture containing 75% active indoxacarb with inactive isomer.

ECOTOXICITY DATA

PRODUCT / CHEMICAL NAME	STUDY TYPE	RESULT
Indoxacarb	96-hr LC50 (bluegill)	0.9 mg/L
	96-hr LC50 (rainbow trout)	0.65 mg/L
	48-hr EC50 (daphnid)	0.6 mg/L

ENVIRONMENTAL DATA

Partition Coefficient (log Pow) Results: Log Kow = 4.65

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

Soil Adsorption/Desorption Results:	Indoxacarb: This product is expected to be immobile in soil (Koc = 3300 to 9600)
Biodegradation Results:	Indoxacarb: Moderately persistent with aerobic half lives ranging from 3 to 693 days and anaerobic range from 147 to 233 days.

OTHER INGREDIENT ENVIRONMENTAL DATA: Indoxacarb M factor = 1.

ADDITIONAL ECOTOXICITY / ENVIRONMENTAL INFORMATION:
Indoxacarb has been reported to be very toxic to freshwater and estuarine/marine fish and invertebrates. Risk to bees: High toxicity via contact routes
Indoxacarb: Bobwhite quail (Oral) LD50 = 98 mg/kg
Mallard duck (5 day) dietary > 5620 ppm
Worms (14 day) LC50 > 1250 mg/kg

SECTION 13. DISPOSAL CONSIDERATIONS

MATERIAL WASTE:
Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations. Incineration is the preferred method of disposal, when appropriate. Operations that involve the crushing or shredding of waste materials or returned goods must be handled to meet the recommended exposure limit(s).

PACKAGING AND CONTAINERS:
Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations.

SPECIAL ENVIRONMENTAL HANDLING PROCEDURES:
This product contains materials that are harmful to the environment. Do not allow product to reach ground water, water courses, sewage or drainage systems.

SECTION 14. TRANSPORT INFORMATION

Refer to site-specific procedures and requirements for additional guidance.

DOT CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II

IATA/ICAO CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II

ADR CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II
Classification Code:	F1

IMDG/IMO CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II

SECTION 15. REGULATORY INFORMATION

TSCA LISTING

INGREDIENT	TSCA
Isopropyl Alcohol	X
Ethylacetoacetate	X
Glyceryl Triacetate	X

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

Substances not included in the table above are TSCA exempt or not regulated under TSCA.

U.S. STATE REGULATIONS

INGREDIENT	California Proposition 65	CARTK	NJRTK	CTRTK	MARTK
Isopropyl Alcohol		X	1076		X
Ethylacetoacetate					X

INGREDIENT	PARTK	MNRTK	MIRTK	RIRTK
Isopropyl Alcohol	X	X		X
Ethylacetoacetate	X			

Fields in the above tables that do not contain data indicate that those materials have not been listed by local regulations.

X: Listed on applicable state hazardous substance or right-to-know lists.

SECTION 16. OTHER INFORMATION

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequence of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

DEPARTMENT ISSUING MSDS: Global Safety & the Environment
Merck & Co., Inc.
One Merck Drive
Whitehouse Station, NJ 08889

MERCK MSDS HELPLINE: (800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

MSDS CREATION DATE: 25-Sep-2007

SUPERSEDES DATE: 28-Sep-2011

SIGNIFICANT CHANGES (US SUBFORMAT): OEB, OEG, Synonyms

Obtained by Global Safety Management, www.globalsafetynet.com, (877) 683-7460

Merck Animal Health
One Merck Dr.
Whitehouse Station, NJ 08889

MATERIAL SAFETY DATA SHEET

Merck Animal Health urges each user or recipient of this MSDS to read the entire data sheet to become aware of the hazards associated with this material.

SECTION 1. IDENTIFICATION OF SUBSTANCE AND CONTACT INFORMATION

MSDS NAME: **Indoxacarb Topical Solution (EAA)**

SYNONYM(S): Indoxacarb Topical Solution (w/ Ethyl Acetoacetate)
Indoxacarb Topical Solution (EAA), Activyl

MSDS NUMBER: SP001933

EMERGENCY NUMBER(S): (908) 423-6000 (24/7/365) English Only

Transportation Emergencies - CHEMTREC:
(800) 424-9300 (Inside Continental USA)
(703) 527-3887 (Outside Continental USA)
Rocky Mountain Poison Center (For Human Exposure):
(303) 595-4869

Animal Health Technical Services:
For Animal Adverse Events: Small Animals and Horses: (800) 224-5318
For Animal Adverse Events: Livestock: (800) 211-3573
For Animal Adverse Events: Poultry: (800) 219-9286

INFORMATION: Animal Health Technical Services:
For Small Animals and Horses: (800) 224-5318
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MERCK MSDS HELPLINE: (800) 770-8878 (US and Canada)
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Monday to Friday, 9am to 5pm (US Eastern Time)

Obtained by Global Safety Management, Inc. www.globalsafetynet.com

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Liquid
Off-white to yellow
Characteristic odor
Highly Flammable.
Irritating to eyes and respiratory system.
May be harmful by inhalation or if swallowed.
Prolonged exposure may cause serious health effects.
May cause effects to:
central nervous system
blood
respiratory system
Dangerous for the environment.
Toxic to aquatic organisms.
Toxic to wildlife.
May cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS:

The toxicological properties of this material have not been fully characterized in humans and animals. Therefore, laboratory or process control systems and appropriate work practices should be in place to minimize the potential for inhalation exposure, skin contact, eye contact, or ingestion when working with this material.

This product is an insecticide.

Indoxacarb topical solution (EAA) is irritating to the eyes and may be harmful if inhaled or swallowed.

Acute exposure to isopropanol by ingestion or inhalation may cause headache, dizziness, hallucinations, distorted perception, labored breathing, nausea, and vomiting. Exposure to very high concentrations of isopropanol has been reported to cause central nervous system (CNS) depression, brain or nerve damage, respiratory depression, absence of reflexes, low blood pressure, slow or fast heart rates, low body temperature, bleeding and inflammation of the stomach, decreased urination, failure to form urine, kidney and liver damage, and coma. Chronic exposure may also cause thinning, inflammation, drying and cracking of the skin.

Ethylacetoacetate has been reported to cause irritation to eyes and respiratory system.

LISTED CARCINOGENS

No carcinogens or potential carcinogens listed by OSHA, IARC, NTP or ACGIH are present in concentrations >0.1% in this mixture.

SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

PRODUCT USE: Veterinary product

CHEMICAL FORMULA: Mixture.

The formulation for this product is proprietary information. Only hazardous ingredients in concentrations of 1% or greater and/or carcinogenic ingredients in concentrations of 0.1% or greater are listed in the Chemical Composition table. Active ingredients in any concentration are listed. For additional information about carcinogenic ingredients see Section 2.

CHEMICAL COMPOSITION

INGREDIENT	CAS NUMBER	PERCENT
Indoxacarb	173584-44-6	19.53
Isopropyl Alcohol	67-63-0	30-40
Ethylacetoacetate	141-97-9	20-30
Glyceryl Triacetate	102-76-1	20-30

Obtained by Global Safety Management, Inc. www.globalsafetynet.com

ADDITIONAL INFORMATION: This MSDS is written to provide health and safety information for individuals who will be handling the final product formulation during research, manufacturing, and distribution. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate MSDS for each ingredient. Refer to the package insert or product label for handling guidance for the consumer.

SECTION 4. FIRST AID MEASURES

INHALATION: Remove to fresh air. If any trouble breathing, get immediate medical attention. Administer artificial respiration if breathing has ceased. If irritation or symptoms occur or persist, consult a physician. Remove to fresh air. Administer artificial respiration if breathing has ceased. IMMEDIATELY consult a physician.

SKIN CONTACT: In case of skin contact, while wearing protective gloves, carefully remove any contaminated clothing, including shoes, and wash skin thoroughly with soap and water. If irritation or symptoms occur or persist, consult a physician. In case of skin contact, IMMEDIATELY flush exposed skin thoroughly with plenty of water. While wearing protective gloves, remove any contaminated clothing, including shoes and continue to wash skin thoroughly with soap and water for at least 15 minutes. Get IMMEDIATE medical attention.

EYE CONTACT: In case of eye contact, immediately rinse eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. If irritation occurs or persists, consult a physician.

INGESTION: Rinse mouth and drink a glass of water. Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. If symptoms persist, consult a physician. Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. IMMEDIATELY consult a physician. Do not attempt to give anything by mouth to a seizing, drowsy or unconscious person. If alert, rinse mouth and drink a glass of water.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA:

Flash Point:	1.5 deg C(34.7 deg F
Classification:	Highly Flammable (EU Criteria) Flammable (US OSHA Criteria)

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing and self-contained breathing apparatus (SCBA).

SUITABLE EXTINGUISHING MEDIA:
Carbon dioxide (CO2), extinguishing powder or water spray.

See Section 9 for Physical and Chemical Properties.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Wear appropriate personal protective equipment as specified in Section 8. Keep personnel away from the clean-up area.

SPILL RESPONSE / CLEANUP:
All spills should be handled according to site requirements and based on precautions cited in the MSDS. In the case of liquids, use proper absorbent materials. For laboratories and small-scale operations, incidental spills within a hood or enclosure should be cleaned by using a HEPA filtered vacuum or wet cleaning methods as appropriate. For large dry or liquid spills or those spills outside enclosure or hood, appropriate emergency response personnel should be notified. In manufacturing and large-scale operations, HEPA vacuuming prior to wet mopping or cleaning is required.

ENVIRONMENTAL PRECAUTIONS:
This product is toxic to aquatic organisms. This product is toxic to wildlife. Do not allow product to reach ground water, water course, sewage or drainage systems.

See Sections 9 and 10 for additional physical, chemical, and hazard information.

SECTION 7. HANDLING AND STORAGE

HANDLING:
Keep containers adequately sealed during material transfer, transport, or when not in use. Wash face, hands, and any exposed skin after handling. Do not eat, drink, or smoke when using this substance or mixture.

Appropriate handling of this material is dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. See Section 8 (Exposure Controls) for additional guidance.

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STORAGE:
Keep away from heat, sparks, open flames, and direct sunlight. Avoid extreme heat. Store in a cool, dry, well ventilated area. Store in adequately sealed container.

See Section 8 for exposure controls and additional safe handling information.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE BAND (OEB):
OEB 3: 10-100 mcg/m^3. Materials in an OEB 3 category are considered moderate health hazards. The OEB is a range of airborne concentrations expressed as an 8-hour Time Weighted Average (8-hr. TWA) and is intended to be used with Industrial Hygiene Risk Assessment to assist with industrial hygiene sampling and selection of proper controls for worker protection. Consult your site safety and industrial hygiene staff for guidance on handling and control strategies.

OCCUPATIONAL EXPOSURE GUIDELINE (OEG):
Internal Occupational Exposure Limit of 20 mcg/m^3 and a wipe limit of 200 mcg/100 cm2 have been established for Indoxacarb.

EXPOSURE CONTROLS
The health hazard risks of handling this material are dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. Exposure controls for normal operating or routine procedures follow a tiered strategy. Engineering controls are the preferred means of long-term or permanent exposure control. If engineering controls are not feasible, appropriate use of personal protective equipment (PPE) may be considered as alternative control measures. Exposure controls for non-routine operations must be evaluated and addressed as part of the site-specific risk assessment.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

Respiratory Protection:	Respiratory protective equipment (RPE) may be required for certain laboratory and large-scale manufacturing tasks if potential airborne breathing zone concentrations of substances exceed the relevant exposure limit(s). Workplace risk assessment should be completed before specifying and implementing RPE usage. Potential exposure points and pathways, task duration and frequency, potential employee contact with the substance, and the ability of the substance to be rendered airborne during specific tasks should be evaluated. Initial and ongoing strategies of quantitative exposure measurement should be obtained as required by the workplace risk assessment. All RPE must conform to local and regional specifications for efficacy and performance. Consult your site or corporate health and safety professional for additional guidance.
Skin Protection:	Gloves that provide an appropriate barrier to the skin are recommended if there is potential for contact with this material. Consult your site safety staff for guidance.
Eye Protection:	Safety glasses with side shields. Use of goggles or full face protection may be required based on hazard, potential for contact, or level of exposure. Consult your site safety staff for guidance.
Body Protection:	In small-scale or laboratory operations, lab coats or equivalent protection is required. Disposable Tyvek or other dust impermeable suit should be considered based on procedure or level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance. In large-scale or manufacturing operations, disposable Tyvek or other dust impermeable suit is recommended and based on level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

EXPOSURE LIMIT VALUES

INGREDIENT	CAS NUMBER	ACGIH TLV (TWA)	OSHA PEL (TWA)
Isopropyl Alcohol	67-63-0	200 ppm	400 ppm 980 mg/m^3

INGREDIENT	CAS NUMBER	ACGIH TLV (STEL / SKIN)	ACGIH TLV (CEIL)	OSHA PEL (STEL / SKIN)	OSHA PEL (CEIL)
Isopropyl Alcohol	67-63-0	400 ppm			

Fields in the above table(s) that do not contain data indicate that exposure limits are not available for those endpoints.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORM:	Liquid
COLOR:	Off-white to yellow
ODOR:	Characteristic odor
SPECIFIC GRAVITY:	1.00
SOLUBILITY:	
Water:	Not determined
PARTITION COEFFICIENT (log Pow):	Log Kow = 4.65 (Indoxacarb)

See Section 5 for flammability/explosivity information.

SECTION 10. STABILITY AND REACTIVITY

STABILITY/ REACTIVITY:
Stable under normal conditions.

INCOMPATIBLE MATERIALS / CONDITIONS TO AVOID:
Keep away from heat, sparks, open flame, and direct sunlight.

HAZARDOUS DECOMPOSITION PRODUCTS / REACTIONS:
No dangerous decomposition is expected if used according to manufacturer's specifications.

SECTION 11. TOXICOLOGICAL INFORMATION

The information presented below pertains to the formulated product unless indicated otherwise.

ACUTE TOXICITY DATA

INHALATION:
Indoxacarb dust mixture (21% active with non-active isomer): LC50 > 5 mg/L (4-hr. inhalation) study in rats.

Ethyl acetoacetate: Irritating to respiratory tract

Isopropanol: Inhalation LC50 (8hr): 16,000 ppm (rat)
Isopropanol caused reduced ciliary activity in the nasal mucosa and trachea at 400 ppm for 24 hours and severe pathological degeneration of the respiratory mucosa at 5500 ppm for 24 hours in guinea pigs.

SKIN:
Indoxacarb topical solution (EAA) Dermal LD50: > 2000 mg/kg (Rat). No abnormal clinical signs or irritation reported.

Not irritating in a skin irritation study in rabbits (PII=0).

EYE:
Indoxacarb topical solution (EAA) was moderately irritating in a rabbit eye irritation study (MTS = 22.7).

ORAL:
Indoxacarb topical solution (EAA): In an acute oral rat study, 1/5 animals had to be euthanized due to moribund condition following dosing with 2000 mg/kg. In this moribund animal, abnormal gait and stance, piloerection, decreased body tone and activity, gasping, vocalization, and tearing eyes were observed. In addition, distended, air-filled stomach and intestines, bright red lungs and dark red lesions in the stomach lining were observed in this animal at necropsy. Piloerection and decreased body tone was observed in one additonal animal dosed at 2000 mg/kg. Other than the one moribund animal, no visible lesions were observed at necropsy of the other animals dosed in this study and no clinical signs were observed in animals treated with doses below 2000 mg/kg (175 mg/kg and 550 mg/kg).

DERMAL AND RESPIRATORY SENSITIZATION:
Indoxacarb topical solution (EAA) was not sensitizing in a guinea pig maximization skin sensitization assay. No clinical signs or irritation were reported in treated animals.

REPEAT DOSE TOXICITY DATA

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SUBCHRONIC / CHRONIC TOXICITY:
Indoxacarb: In a 90-day rat feeding study, indoxacarb caused hematological (hemolysis, hemolytic anemia) effects, and decreased body weight (greater in females than males). Female rats in the 4.1 and 8.5 mg/kg/day groups had decreases in the indicators of erythrocyte mass: red blood cell count, hemoglobin concentration, and hematocrit. These decreases, though small, were usually between 10 and 17% relative to control and were associated with other changes that indicated a slight regenerative response (e.g. increased reticulocyte counts). These hematologic effects were of equivocal biological significance based on the absence of clinical anemia by the end of the exposure period. Despite the absence of anemia, red cell effects were considered to be adverse based on the magnitude of decreases observed and the associated regenerative response [LOEL = 4.1 mg/kg/day (female); NOEL = 1.7 mg/kg/day (females) and 3.2 mg/kg/day (males)]. Subchronic 90-day studies in mice and dogs with a similar test substance showed similar effects with less sensitivity than female rats [NOAEL = 2.1-4.6 mg/kg/day].

Rats and mice exposed to isopropanol at a dosage of 5000 ppm/day for 13 weeks showed signs of narcosis, increased body weights, and increased relative liver weights. An increase in size and frequency of hyaline droplets was observed in the kidneys of male rats. In a separate study, continuous inhalation of 8 ppm isopropanol in rats for 86 days showed increased bromosulfophthalein retention, liver parenchymal dystrophy, enlarged spleen and degenerative changes in the brain. Daily application of isopropanol (50%) for 187 days did not produce any apparent injury to the skin of rats. Rats exposed to 0.5 to 10% isopropanol in the drinking water for 27 weeks showed decreased body weight but no gross or microscopic tissue abnormalities. One out of three dogs died when exposed to isopropanol in the drinking water for 7 months; histopathological changes were noted in the kidneys of the dog that died.

Rats exposed to a concentrated vapor of ethyl acetoacetate for 8 hours showed no mortalities. NOAEL >1000 mg/kg in oral rat feeding study.

REPRODUCTIVE / DEVELOPMENTAL TOXICITY:
Indoxacarb: The developmental toxicity of indoxacarb was evaluated in rats at dosages as high as 3.5 mg/kg/day. Indoxacarb was not teratogenic at any dosages tested. The NOAEL for both maternal and fetal toxicity was 2.0 mg/kg/day based on slight decreases in body weight parameters at the high dosage of 3.5 mg/kg/day. There were no effects reported in a 2-generation reproductive study with a similar test substance [NOAEL = 20 ppm for both dams and offspring based on decreases in body weight parameters].

Isopropanol (2.5%) in drinking water had no effect on the reproduction and growth of rats in a three-generation study. In a two-generation study, rats were dosed by oral gavage with dosages up to 1000 mg/kg/day of isopropanol. No reproductive toxicity was observed except for a statistically significant reduction in the mating index of the high-dose first generation males. Toxicity was observed in the first-generation offspring at 1000 mg/kg/day, as evidenced by reduced body weight and increased mortality. Isopropanol was not teratogenic in rats given dosages up to 1200 mg/kg/day on gestation days 6 through 15 or in rabbits given dosages up to 480 mg/kg/day on gestation days 6 through 18. No evidence of developmental toxicity, as determined by pathological findings, organ weights, or behavioral tests was observed in rats administered up to 1200 mg/kg/day on gestation day 6 through postnatal day 21. Teratogenic effects were reported in rats exposed to 3500, 7000, or 10,000 ppm isopropanol for 7 hours daily on gestation days 1 to 19 . Reported maternal and fetal effects observed in animals dosed at 7000 ppm and greater included malformations, resorptions, skeletal defects, and fetal deaths at maternally toxic doses.

MUTAGENICITY / GENOTOXICITY:
Indoxacarb: Test have shown that indoxacarb does not cause genetic damage in bacterial or mammalian cell cultures or in animals. Negative in bacterial reverse mutation assay, the in vitro mammalian chromosome aberration test, and the in vivo mouse bone marrow micronucleus test.

Isopropanol was negative in a sister chromatid exchange assay, in a bacterial mutagenicity study (Ames) with activation, in an in vitro CHO/HGPRT gene mutation assay, in an in vivo bone marrow micronucleus assay in mice, and in mutagenicity tests in Neurospora crassa.

Ethyl acetoacetate was negative in a bacterial mutagenicity study (Ames) both with and without metabolic activation, and negative in a cytogenetic assay. Ethyl acetoacetate was positive in a Bacillus subtilis recombination assay.

CARCINOGENICITY:
This material or product has not been evaluated for carcinogenicity.

Indoxacarb: Similar test substances were evaluated in 2-year studies with rats, mice, and dogs. Hematological effects and reduced body weight were observed consistent with 90-day studies. No tumor formation was reported.

Male mice exposed to 7.5 ppm isopropanol for 3 to 7 hours daily, 5 days per week for 5 to 8 months showed no significant increase in the number of lung tumors observed. No increases in lung tumors were observed in the same strains of mice that received subcutaneous injections of isopropanol once weekly for 20 to 40 weeks. However, isopropanol has not been tested adequately in animals to assess carcinogenicity.

SECTION 12. ECOLOGICAL INFORMATION

The below aquatic and avian toxicity is for the DuPont product (DPX-MP062), a mixture containing 75% active indoxacarb with inactive isomer.

ECOTOXICITY DATA

PRODUCT / CHEMICAL NAME	STUDY TYPE	RESULT
Indoxacarb	96-hr LC50 (bluegill)	0.9 mg/L
	96-hr LC50 (rainbow trout)	0.65 mg/L
	48-hr EC50 (daphnid)	0.6 mg/L

ENVIRONMENTAL DATA

Partition Coefficient (log Pow) Results: Log Kow = 4.65

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Soil Adsorption/Desorption Results:	Indoxacarb: This product is expected to be immobile in soil (Koc = 3300 to 9600)
Biodegradation Results:	Indoxacarb: Moderately persistent with aerobic half lives ranging from 3 to 693 days and anaerobic range from 147 to 233 days.

OTHER INGREDIENT ENVIRONMENTAL DATA: Indoxacarb M factor = 1.

ADDITIONAL ECOTOXICITY / ENVIRONMENTAL INFORMATION:
Indoxacarb has been reported to be very toxic to freshwater and estuarine/marine fish and invertebrates. Risk to bees: High toxicity via contact routes
Indoxacarb: Bobwhite quail (Oral) LD50 = 98 mg/kg
Mallard duck (5 day) dietary > 5620 ppm
Worms (14 day) LC50 > 1250 mg/kg

SECTION 13. DISPOSAL CONSIDERATIONS

MATERIAL WASTE:
Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations. Incineration is the preferred method of disposal, when appropriate. Operations that involve the crushing or shredding of waste materials or returned goods must be handled to meet the recommended exposure limit(s).

PACKAGING AND CONTAINERS:
Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations.

SPECIAL ENVIRONMENTAL HANDLING PROCEDURES:
This product contains materials that are harmful to the environment. Do not allow product to reach ground water, water courses, sewage or drainage systems.

SECTION 14. TRANSPORT INFORMATION

Refer to site-specific procedures and requirements for additional guidance.

DOT CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II

IATA/ICAO CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II

ADR CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II
Classification Code:	F1

IMDG/IMO CLASSIFICATION:

Proper Shipping Name:	Isopropanol solutions
Hazard Class:	3
UN Number:	UN 1219
Packing Group:	II

SECTION 15. REGULATORY INFORMATION

TSCA LISTING

INGREDIENT	TSCA
Isopropyl Alcohol	X
Ethylacetoacetate	X
Glyceryl Triacetate	X

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Substances not included in the table above are TSCA exempt or not regulated under TSCA.

U.S. STATE REGULATIONS

INGREDIENT	California Proposition 65	CARTK	NJRTK	CTRTK	MARTK
Isopropyl Alcohol		X	1076		X
Ethylacetoacetate					X

INGREDIENT	PARTK	MNRTK	MIRTK	RIRTK
Isopropyl Alcohol	X	X		X
Ethylacetoacetate	X			

Fields in the above tables that do not contain data indicate that those materials have not been listed by local regulations.

X: Listed on applicable state hazardous substance or right-to-know lists.

SECTION 16. OTHER INFORMATION

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequence of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

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