ASTRA INDUSTRIAL COMPLEX CO., LTD. (**ASTRACHEM**)
P.O. BOX 30447, AL-KHOBAR 31952
KINGDOM OF SAUDI ARABIA
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MATERIAL SAFETY DATA SHEET

MONTSAN® 250EC

ASTRA INDUSTRIAL COMPLEX CO., LTD. (**ASTRACHEM**)
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1. PRODUCT IDENTIFICATION

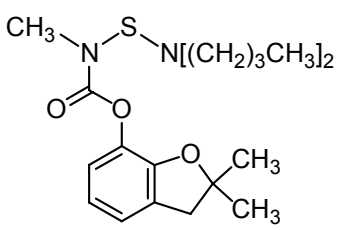
Product Name: ***MONTSAN® 250EC***

Chemical Class: Carbamate Pesticide

Use: **Montsan®** 250EC is an emulsifiable concentrate formulation containing 250 g/L of the active ingredient *Carbosulfan*. It is used for the control of a wide range of soil-dwelling and foliar insect pests. Examples of uses include control of millipedes, springtails, symphylids, wireworms, beetles, fruit flies, white grubs, aphids, caterpillars, flea beetles, stem borers, leafhoppers, planthoppers, codling moth, scales and free-living nematodes in a wide range of crops, e.g. vegetables, cotton, sugar beet, potatoes, rice, top fruit, citrus, maize, sugar cane and coffee.

Producer: **Astra Industrial Complex Co., Ltd.**
P.O. Box 30447, Al-Khobar 31952
Kingdom of Saudi Arabia
Emergency Tel # (+966) 3 8121 406

2. COMPOSITION / INFORMATION ON INGREDIENTS

Substance	Proportions (% w/w)	Chemical structure
Carbosulfan Technical **CAS No.** *55285-14-8* **Chemical Name**: 2,3-dihydro-2,2-dimethylbenzofuran-7-yl (dibutylaminothio)methylcarbamate (IUPAC). **EC Class**: R23/25-R43; R50/53	*26.8* (250 ± 12 g/L)	
Blend of anionic and nonionic emulsifiers: Including Alkyl Aryl Sulfonate and Alkoxylate Alkyl Aryl alcohol	10.56	
Organic solvents	62.72	

3. HAZARD IDENTIFICATION

Most Important Hazards:

Adverse human health effects**:**	Harmful if swallowed, may cause sensitization by skin contact.
Environmental effects:	very toxic to aquatic organisms. May cause long-term adverse effects to the aquatic environment.

Physical and chemical Hazards:

Fire or explosion:	Slightly combustible. May be support combustion at elevated temperatures. Burning and thermal decomposition may from toxic by products.

Emergency Overview

Immediate Concerns:

Dark amber liquid with an aromatic hydrocarbon odor.

Moderately combustible. May support combustion if heated above the products flash point

Thermal decomposition and burning may form toxic-by products.

For large exposures or fire, wear personal protective equipment.

Highly toxic if inhaled, and moderately toxic if swallowed or absorbed through the skin

Potential Health Effects:

Effects from over exposure may result from either swallowing, inhaling or coming into contact with the skin or eyes. Conditions of increased temperature and humidity facilitate skin absorption of this product, and therefore, promote increased toxicity. Symptoms of overexposure include headaches, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration, blurred vision, tearing, pinpoint pupils, blue skin color, convulsions, tremors and coma.

4. FIRST AID MEASURES

Eye:

Flush with water for at least 15 minutes. If irritation occurs and persists contact a Medical doctor

Skin:

Remove contaminated clothing and thoroughly wash with soap and water. If irritation occurs and persists, contact a medical doctor.

Ingestion:

Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

Inhalation:

Remove victim to fresh air. If breathing discomfort occurs and persists, see a medical doctor, if breathing has stopped, give artificial respiration. GET MEDICAL ATTENTION

Note to Physician:

This product is highly toxic if inhaled, and a moderately toxic if swallowed or absorbed through the skin. Carbosulfan is reversible cholinesterase inhibitor. Atropine sulfate is antidotal. Support respiration as needed with removal of secretions, maintenance of a patent airway and, if necessary, artificial ventilation. If cyanosis is absent: Adults – start treatment by giving 2 mg atropine intravenously or intramusculary, if necessary, and reeat with 0.4 – 2.0 mg atropine at 15 minute intervals until atropinization occurs (tachycardia, flushed skin, dry mouth, mydrasis); Children under 12 initial dose = 0.05 mg/kg body weight and repeat dose = 0.02 – 0.05 mg/kg body weight. Use of oximes such as 2-PAM is controversial. Observe patient to insure that these symptoms do not recur as atropinization wears off. If in eyes, instill one drop of homatropine. Contains aromatic hydrocarbons that may produce a severe pneumonities if aspirated during vomiting. Consideration should be given to gastric lavage with an endotracheal tube in place. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

Flash point and Method:

Flash point 46 C (115 F) (TCC)

Extinguishing Media:

Foam, CO_2 or dry chemicals Soft stream water fog only if necessary. Contain all runoff.

Fire and explosion hazards:

Moderately combustible. When heated above the flash point, this material release vapors which, when mixed with air, can burn or be explosive.

Special fire fighting procedures:

Isolate fire area. Evacuate downwind. Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke, gases or vapors generated.

Hazardous Decomposition Products:

On burning, carbon monoxide, carbon dioxide, nitrogen oxides and sulfur oxides. Contact with aqueous acids may produce carbofuran.

6. ACCIDENTAL RELEASE MEASURES

Release Notes:

Isolate and post spill area. Wear protective clothing and personal protective equipment as prescribed in Section 8 “Exposure Controls / Personal Protection” keep unprotected persons and animals out of the area.

Keep material out of lakes, streams, ponds and sewer drains. Dike to confine spill and absorb with a non-combustible absorbent such as clay, sand or soil. Vacuum, shovel or pump waste into a drum and label contents for disposal.

To clean and neutralize spill area, tools and equipment, wash with acetic acid or vinegar solution. Follow this by washing with a bleach or caustic/soda ash solution. Finally, wash with a strong soap and water solution. Absorb, as above, any excess liquid and add both solutions to the drums of waste already collected. Repeat if necessary. Dispose of drummed waste according to the method outlined in Section 13 “Disposal Considerations”

7. HANDLING AND STORAGE

General Procedures:

Store in a cool, dry, well-ventilated place. Do not use or store near heat, open flame or hot surfaces. Store in original containers only. Keep out of reach of children and animals. Do not contaminate other pesticides, fertilizers, water, .food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Use local exhaust at all process locations where vapor or mist may be emitted. Ventilate all transport vehicles prior to unloading.

Personal Protective Equipment

Eyes and Face:

For splash, mist or spray exposure, wear chemical protective goggles or a face shield.

Respiratory:

For splash, mist or spray exposure wear, as a minimum, a properly fitted half-face or full-face air purifying respirator which is approved for pesticides (U.S. NIOSH/MSHA, EU CEN or comparable certification organization). Respirator use and selection must be based on airborne concentrations.

Protective clothing:

Depending upon concentrations encountered, wear coveralls or long-sleeved uniform and head covering. For larger exposures as in the case of spills, wear full body cover barrier suit, such as a PVC suit. Leather items – such as shoes, belts and watchbands – that become contaminated should be removed and destroyed. Launder all work clothing before re-use (separately from household laundry).

Work Hygienic Practices:

Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking or using tobacco. Shower at the end of the workday.

Gloves:

Wear chemical protective gloves made of materials such as neoprene. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

Comments:

Personal protective recommendations for mixing or applying this product are prescribed on the product label. Information stated above provides useful, additional guidance for individuals whose use or handling of this product is not guided by the product label.

9. PHYSICAL AND CHEMICAL PROPERTIES

Assay "**Carbosulfan**"	250 ± 12 g/L
Appearance	Brown to amber liquid
Odour	Aromatic solvent
Density	Specific gravity = 0.952 @ 20°C
Acidity as H_2SO_4(g/Kg)	"7.06 @ 23.3°C (CIPAC MT 75)"
Flash Point	46 C
Solubility in Water:	Emulsifiers

10. STABILITY AND REACTIVITY

Stability:	Stable
Condition to avoid:	Excessive heat and fire.
Polymerization:	will not occur

Hazardous Decomposition Products:

On combustion or on thermal decomposition (pyrolysis) releases: Carbon oxides (CO, CO_2), Nitrogen oxides, Sulphur oxides.

11. TOXICOLOGICAL INFORMATION

Toxicology Data:

Technical

Acute Oral LD_{50} (rat)	250, mg/kg (Male rats)
Acute Inhalation LC_{50} (4 h rat)	1.53, mg/l air (Male rats)
Eye Irritation (rabbit)	Slight eye irritation
Dermal Irritation (rabbit)	Moderate skin irritation

Formulation

Acute Oral LD_{50} rat	87.5 mg/Kg
Dermal LD_{50}(Rabbit)	1500 mg/Kg

Sensitization:

Carbosulfan produces skin sensitization (allergic reaction) in laboratory animals and may produce similar effects in humans.

Acute Effects from Overexposure:

This product is highly toxic if inhaled, and a moderately toxic if swallowed or absorbed through the skin. Carbosulfan is reversible cholinesterase inhibiting pesticide which elicites symptoms in humans typical cholinesterase inhibitions including headaches, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration, blurred vision, more severe signs of cholinesterase inhibition include tearing, in-point pupils, excessive respiratory secretions, cyanosis, convulsions, generalized tremor and coma. Excessive cholinesterase inhibition may result in death. With dermal exposure to this product, conditions of increased temperature and humidity facilitate skin absorption and, therefore, promote increased toxicity. Inhalation of aromatic hydrocarbon vapors may cause dizziness, disturbances in vision, drowsiness, respiratory irritation, and eye, skin and mucous membrane irritation. Vomiting after ingestion of this product may

cause aspiration of aromatic hydrocarbons into the lungs which may result in fatal pulmonary edema.

Chronic Effects from Overexposure:

No data available for the formulation. In studies with laboratory animals, carbosulfan did not cause reproductive toxicity, teratogenicity,or carcinogenicity. Chronic exposure to carbosulfan to animals has caused decreased cholinesterase activity (erythrocyte, plasma, and/or brain). An overall absence of genotoxicity has been demonstrated in mutagenicity testing with carbosulfan. Chronic exposure to aromatic hydrocarbons may cause headches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage. Inhalation of xylene vapors at high doses has also resulted in an increased incidence of malformations and decreases in fetal weight in laboratry animals. Damage from xylene may be potentiated by alcohol. Under the conditions of 2-year inhalation studies, conducted by the National Toxicology Program (NTP), there was clear evidence of carcinogenic activity in female rats based on increased incidence of renal tubule neoplasms. The incidences of testicular adenoma were also increased. There was some evidence of carcinogenic activity in female rats based on increased incidences of renal tubule adenomas. There was some evidence of carcinogenic activity in male mice based on increased incidence of alveolar / bronchiolar neoplasm. There was some evidence of carcinogenic activity in female mice based on increased incidences of hepatocellular neoplasms. Studies conducted by the international Agency for Research on Cancer (IARC) showed that there is inadequate evidence in humans for the carcinogenicity of ethylbezene and that there is sufficient evidence in experimental animals, therefore the overall evaluation shows that ethylbenzene is possibly carcinogenic to humans (Grou 2B)

Chemical Name	NTP Status	IARC Status	OSHA Status	Other
Ehtylbenzene	Listed	Listed	Not Listed	Not listed (ACGIH)

12. ECOLOGICAL INFORMATION

Unless otherwise indicated, the data presented below are for the active ingredient.

Environmental Data:

Carbosulfan is rapidly degraded in neutral soil (half-life <5 day) with the degradation rate increasing as pH decreases. A major breakdown product is carbofuran, which degrades more slowly (half-life approx. 50 days).

Carbosulfan is hydrolytically unstable in acid, with stability increasing with increasing pH. The bioconcentration potential of carbosulfan is low with Log Pow of 3.3 and a measured BCF in fish of 990. carbosulfan and its major breakdown product are unlikely to leach into groundwater.

Ecotoxicological Information:

With LC_{50} values between 7.6 and 56 µg/L to aquatic arthropods and fish in the laboratory, this product is considered highly toxic. Care should be taken to avoid contamination of the aquatic algae. Carbosulfan is also considered highly toxic to water fowl (Oral LD_{50} = 10 mg/kg), and only slightly less toxic to upland game birds (Oral LD_{50} = 20 to 82 mg/kg). carbosulfan is an easily metabolized and reverible cholinesterase inhibitor. Recovery from symptoms of sublethel exposure occurs quickly.

13. DISPOSAL CONSIDERATION

Disposal Method:

Open dumping or burning of this material or its packaging is prohibited. If spilled material cannot be disposed of by use acording to label instructions, an acceptable method of disposal is to incinerate in accordance with local, state, and national environemtnal laws, rules, standards and regulations. However, because acceptable methods of disposal may vary by location and regulatory requirements may change, the appropriate agencies should be contacted prior to disposal.

Empty container:

Non-returnable containers which held this material should be cleaned, prior to disposal by triple rinsing. Containers which held this material should be cleaned by being triple rinsed, and recyled, with the rinsate being incinerated. Do not cut or weld metal containers. Vapors that from may create an explosion hazard.

14. TRANSPORT INFORMATION

UN. No:	**UN 2991**	
Proper Shipping name:	**Carbamate Pesticide, Liquid**, toxic, Flammable, flash point ≥23°C (Carbosulfan)	
Class:	**6.1**	
Classification Code:	TF2	
Packing group:	**III**	
Subsidiary Risks:	6.1 + 3	
Special provisions:	61	
Limited quantities:	LQ19	
Packaging:	Packing instructions	P001, IBC03, R001
	Special packing provisions	-
	Mixed Packaging Provisions	MP15
	Instructions	T7
UN Portable tanks:	Special Provisions	TP2 TP28
	Tank Code	L4BH
ADR Tank:	Special Provision	TU15 TE1 TE15 TE19
	Vehicle for tank carriage	FL
	Transport Category	2
Special provision carriage:	Packages	-
	Bulk	-
	Loading, unloading & Handling	CV13 CV28
	Operation	S2 S9
Hazard Identification	**63**	

15. REGULATORY INFORMATION

SARA Title III (Superfund Amendments and Reauthorization Act)

Section 302 Extremely Hazardous Substances (40 CFR 355): Carbofuran

Section 302.4 Reportable Quantity (40 CFR 355) the following is a list of the ingredients that are listed.

Chemical Name	**RQ**
Carbofuran	10 lbs

Section 311 Hazard Categories (40 CFR 370): Immediate, Delayed, Fire.

Section 312 Threshold Planning Quantity (40 CFR 370): the threshold planning quantity (TPQ) for this product, if treated as a mixture is 10, 000 lbs. this product contains the following ingredients with a TPQ of less than 10,000 lbs: None

Section 313 Reportable Ingredients (40 CFR 372): this product contains the following ingredients subject to section 313 reporting requirements (1, 2, 4-trimethylbenzene) (xylene, mixed isomers) ethylbenzene) (cumene)

CERCLA (Comprehensive Environmental Response Compensation and Liability Act): Listed.

Chemical Name	**Wt%**	**RQ**
Carbosulfan	26.8	1 lb
Solvants	< 0.9	100 lbs
Carbofuran	<0.63	10 lb
Cumene	<0.43	5000 ibs
Ethylbenzene	<0.14	1000 ibs

Comments: Hazard Code: 3XE

U.S. EPA Hazard Waste Number: P189 (Carbosulfan)

U.S. EPA Hazardous Waste Number: P127 (Carbofuran)

16. OTHER INFORMATION

Buyer assumes all responsibility for safety and use not in accordance with the product label instructions.