MATERIAL SAFETY DATA SHEET

BARRICADE – (Lambdacyhalothrin 2.43 % CS)

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND SUPPLIER

PRODUCT NAME	:	**BARRICADE**
CHEMICAL GROUP	:	Synthetic Pyrethroid
RECOMMENDED USE	:	A liquid insecticide for spraying application
FORMULATION	:	Capsule Suspension
SUPPLIER ADDRESS	:	**Arbuda Agrochemicals Limited** 1104, Ruby Crescent Business Boulevard, Ashok Chakravarti Road, Kandivali-East, Mumbai-400101, Maharashtra, India Customer Care No- +91 9076907642 Email - info@arbudaagrochemicals.com
MANUFACTURE ADDRESS	:	**Arbuda Agrochemicals Limited** Plot No-279-283,GIDC, Taluka – Talod District – Sabarkanta, Gujarat – 383215, INDIA.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	**CAS-No.**	**Concentration (% w/w)**
lambda-cyhalothrin (ISO)	91465-08-6	>= 1 - < 2.5
Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified	64742-95-6	>= 1 - < 2.5

3. HAZARDS IDENTIFICATION

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 Classification

Not classified as hazardous according to criteria laid down in Part I of Schedule-1.

GHS Classification

Acute toxicity (Inhalation)	:	Category 4
Short-term(acute) aquatic hazard	:	Category 1
Long-term (chronic) aquatic hazard	:	Category 1

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements	:	H332 Harmful if inhaled. H410 Very toxic to aquatic life with long lasting effects.
Precautionary statements	:	**Prevention:** P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. P271 Use only outdoors or in a well-ventilated area. P273 Avoid release to the environment. **Response:** P304 + P340 + P317 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical help. P391 Collect spillage. **Disposal:** P501 Dispose of contents/ container to an approved waste disposal plant.

4. FIRST AID MEASURES

General advice	:	Have the product container, label or Safety Data Sheet with you when calling the emergency number, a poison control center or physician, or going for treatment.
If inhaled	:	Move the victim to fresh air. If breathing is irregular or stopped, administer artificial respiration. Keep patient warm and at rest. Call a physician or poison control centre immediately.
In case of skin contact	:	Take off all contaminated clothing immediately. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.
If swallowed	:	If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed	:	Aspiration may cause pulmonary oedema and pneumonitis. Skin contact paresthesia effects (itching, tingling, burning or numbness) are transient, lasting up to 24 hours.
Notes to physician	:	Do not induce vomiting: contains petroleum distillates and/oraromatic solvents. Treat symptomatically.

5. FIRE - FIGHTING MEASURES

Suitable extinguishing media	:	Extinguishing media - small fires Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Extinguishing media - large fires Alcohol-resistant foam or Water spray
Unsuitable extinguishing media	:	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards during firefighting	:	As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health.
Specific extinguishing methods	:	Do not allow run-off from fire fighting to enter drains or water courses. Cool closed containers exposed to fire with water spray.
Special protective equipment for firefighters	:	Wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	**:**	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	**:**	Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	**:**	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Clean contaminated surface thoroughly. Clean with detergents. Avoid solvents. Retain and dispose of contaminated wash water

7. HANDLING AND STORAGE

Advice on safe handling	:	No special protective measures against fire required.Avoid contact with skin and eyes. When using do not eat, drink or smoke. For personal protection see section 8.
Conditions for safe storage	:	No special storage conditions required. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep away from food, drink and animal feeding stuffs.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	**CAS-No.**	**Value type (Form of exposure)**	**Control parameters / Permissible concentration**
lambda-cyhalothrin (ISO)	91465-08-6	TWA	0.04 mg/m3 (Skin)
Solvent naphtha (petroleum), light arom.; Low boiling point naphtha - unspecified	64742-95-6	TWA	19 ppm 100 mg/m3

Engineering measures	:	Containment and/or segregation is the most reliable technical protection measure if exposure cannot be eliminated. The extent of these protection measures depends on the actual risks in use. Maintain air concentrations below occupational exposure standards. Where necessary, seek additional occupational hygiene advice.
Personal protective equipment		
Respiratory protection	:	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Suitable respiratory equipment: Respirator with a half face mask The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self- contained breathing apparatus must be used.

Hand protection		
Material	:	Nitrile rubber
Break through time	:	> 480 min
Glove thickness	:	0.5 mm
Remarks	:	Wear protective gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. The break through time depends among other things on the material, the thickness and the type of glove and therefore has to be measured for each case. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	:	No special protective equipment required.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Remove and wash contaminated clothing before re-use. Wear as appropriate: Impervious clothing
Protective measures	:	The use of technical measures should always have priority over the use of personal protective equipment. When selecting personal protective equipment, seek appropriate professional advice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	Light beige to brown
Odour	:	No data available
Odour Threshold	:	No data available
pH	:	4 - 8 Concentration: 1 % w/v
Melting point/range	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	Method: Pensky-Martens closed cup does not flash
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available

Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	No data avaible
Relative vapour density	:	No data avaible
Density	:	1.03 g/cm3 (25 °C)
Solubility(ies)	:	No data available
Water solubility		
Solubility in other solvents	:	No data available
Partition coefficient: n- octanol/water	:	No data available
Auto-ignition temperature	:	600 °C
Decomposition temperature	:	No data available
Viscosity, dynamic	:	33 - 263 mPa.s (40 °C) 41 - 303 mPa.s (20 °C33 - 263 mPa.s (40 °C)
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing
Surface tension	:	49.8 mN/m, 20 °C
Particle size	:	No data available

10. STABILITY AND REACTIVITY

Reactivity	:	None reasonably foreseeable
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use
Conditions to avoid	:	No decomposition if used as directed.
Incompatible materials	:	None known
Hazardous decomposition products	:	No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Ingestion Inhalation Skin contact Eye contact
Acute toxicity **Product:**		
Acute oral toxicity	:	LD50(Rat, male and female): > 5,000 mg/kg Remarks: Based on data from similar materials
Acute inhalation toxicity	:	LC50(Rat, male and female): > 4.62 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations. Remarks: Based on data from similar materials
Acute dermal toxicity	:	LD50(Rat, male and female): > 4,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity Remarks: Based on data from similar materials
Components: **Lambdacyhalothrin (ISO):**		
Acute oral toxicity	:	LD50 (Rat, female): 56 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): 0.06 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rat, male): 632 mg/kg

Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified:

Acute oral toxicity	:	LD50 (Rat): 3,952 mg/kg

Skin corrosion/irritation
Product:

Species	:	Rabbit
Result	:	No skin irritation
Remarks	:	Based on data from similar materials

Components:

lambda-cyhalothrin (ISO):

Species	:	Rabbit
Result	:	No skin irritation
Remarks	:	May cause temporary itching, tingling, burning or numbness of exposed skin, called paresthesia

Serious eye damage/eye irritation

Product:

Species	:	Rabbit
Result	:	No skin irritation
Remarks	:	Based on data from similar materials

Components:

lambda-cyhalothrin (ISO):

Species	:	Rabbit
Result	:	No skin irritation

Respiratory or skin sensitisation

Components:

lambda-cyhalothrin (ISO):

Species	:	Maximisation Test
Result	:	Guinea pig
Remarks	:	Does not cause skin sensitisation.
Test Type	:	Local lymph node assay (LLNA)
Species	:	Mouse
Result	:	Does not cause skin sensitisation

Germ cell mutagenicity Components:

lambda-cyhalothrin (ISO):

Germ cell mutagenicity -
Assessment : Animal testing did not show any mutagenic effects.

Carcinogenicity

Components:

lambda-cyhalothrin (ISO):

Carcinogenicity - Assessment : Weight of evidence does not support classification as a carcinogen.

Reproductive toxicity

Components:

lambda-cyhalothrin (ISO):

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity.

STOT - single exposure

Components:

lambda-cyhalothrin (ISO):

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure

Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified

Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation., The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

lambda-cyhalothrin (ISO):

Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): 0.000078 mg/l Exposure time: 96 h LC50 (Ictalurus punctatus (channel catfish)): 0.00016 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.00036 mg/l Exposure time: 48 h LC50 (Americamysis): 0.000007 mg/l Exposure time: 48 h EC50 (Hyalella azteca (Amphipod)): 0.000002 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): > 0.31 mg/l Exposure time: 96 h

M-Factor (Acute aquatic toxicity)	:	100,000
Toxicity to microorganisms	:	EC50 (activated sludge): > 100 mg/l Exposure time: 3 h
Toxicity to fish (Chronic toxicity)	:	NOEC: 0.000031 mg/l Exposure time: 300 d Species: Pimephales promelas (fathead minnow)
Toxicity to daphnia and other aquatic invertebrates	:	NOEC: 0.000002 mg/l Exposure time: 21 d
(Chronic toxicity)	:	Species: Daphnia magna (Water flea) NOEC: 0.00022 µg/l Exposure time: 28 d Species: Americamysis
M-Factor (Chronic aquatic toxicity)	:	100,000

Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified:

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): 9.2 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 3.2 mg/l Exposure time: 48 h ErC50 (Raphidocelis subcapitata (freshwater green alga)): 2.6 - 2.9 mg/l Exposure time: 72 h NOEC (Raphidocelis subcapitata (freshwater green alga)): 1 mg/l End point: Growth rate Exposure time: 72 h
Toxicity to fish (Chronic toxicity)	:	NOEC: 1.23 mg/l Exposure time: 28 d Species: Oncorhynchus mykiss (rainbow trout)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 2.14 mg/l Exposure time: 28 d Species: Daphnia magna (Water flea)

Ecotoxicology Assessment

Chronic aquatic toxicity	:	Toxic to aquatic life with long lasting effects.

Persistence and degradability

Components:

lambda-cyhalothrin (ISO):

Biodegradability	:	Result: Not readily biodegradable.
Stability in water	:	Degradation half life (DT50): 7 d Remarks: Product is not persistent.

Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified:

Biodegradability	:	Result: Readily biodegradable.

Bioaccumulative potential
Components:

lambda-cyhalothrin (ISO):

Bioaccumulation	:	Remarks: Bioaccumulates

Mobility in soil

Components:

lambda-cyhalothrin (ISO):

Distribution among environmental compartments	:	Remarks: immobile
Stability in soil	:	Dissipation time: 56 d Percentage dissipation: 50 % (DT50) Remarks: Product is not persistent.

Other adverse effects

Components:

lambda-cyhalothrin (ISO):

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not contaminate ponds, waterways or ditches with chemical or used container. Do not dispose of waste into sewer. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations.

Contaminated packaging	:	Empty remaining contents. Triple rinse containers. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

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14. TRANSPORT INFORMATION

International Regulations
UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (LAMBDA-CYHALOTHRIN AND SOLVENT NAPHTHA)
Class	:	9
Packing group	:	III
Labels	:	9

IATA-DGR

UN number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (LAMBDA-CYHALOTHRIN AND SOLVENT NAPHTHA)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	Yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (LAMBDA-CYHALOTHRIN AND SOLVENT NAPHTHA)
Class	:	9
Packing group	:	III
Labels	:	9

EmS Code	:	F-A, S-F
Marine pollutant	:	Yes

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

None known.

16. OTHER INFORMATION

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50

- Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship;

REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System.

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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.