SECTION 1: Identification of the substance or mixture and of the company/undertaking

1.1 Product identifier : Hexaconazole (BSI, ANSI, draft E-ISO, (m) draft F-ISO)

1.2 Relevant identified uses of the substance or mixture and uses advised against : Fungicide

1.3 Details of the supplier of the safety data sheet : Tagros Chemicals India Ltd.
“Jhaver Centre”, Rajah Annamalai Building, IV Floor, 72, Marshalls Road, Egmore, Chennai-600 008, India
Telephone number: +91-44-42007400
E-mail: info@tagros.com

1.4 Emergency telephone number : +91-4142-239373 Ext. 151

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture : Classification as per Directives 67/548/EEC:
Xn; R22
R43
N; R51-53

Classification as per Regulation (EC) No 1272/2008:
Acute Tox. 4 *, H302
Skin Sens. 1, H317
Aquatic Chronic 2, H411

2.2 Label elements
Pictogram, Signal Word Code(s) : GHS07 GHS09

Hazard statement Code(s) : H302: Harmful if swallowed.
H317: May cause an allergic skin reaction.
H411: Toxic to aquatic life with long lasting effects.
Precautionary Statements:

P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330: Rinse mouth.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P272: Contaminated work clothing should not be allowed out of the workplace.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.
P321: Specific treatment-treat symptomatically.
P363: Wash contaminated clothing before reuse.
P501: Dispose of contents/container in accordance with local/regional/national/regulation.
P273: Avoid release to the environment.
P391: Collect spillage.

2.3 Other hazards:
Toxic to aquatic life with long lasting effects. Does not meet the criteria for vPvB in accordance with Annex XIII of REACH.

SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No/ EC No</th>
<th>Index No.</th>
<th>Classification (Directives 67/548/EEC)</th>
<th>Classification (Regulation (EC) No 1272/2008)</th>
<th>Con. % w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexaconazole (ISO) (RS)-2-(2,4-dichlorophenyl)-1-(1H-1,2,4-triazol-1-yl)hexan-2-ol</td>
<td>79983-71-4/413-050-7</td>
<td>613-171-00-7</td>
<td>Xn; R22 R43 N; R51-53</td>
<td>Acute Tox. 4 *, H302 Skin Sens. 1, H317 Aquatic Chronic 2, H411</td>
<td>92.0 (min)</td>
</tr>
</tbody>
</table>
SECTION 4: First aid measures

4.1 Description of first aid measures

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.
IF INHALED: Avoid breathing dust/fume/gas/mist/vapours/spray. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician. IF EYE CONTACT, immediately flush with plenty of water at least for 15 minutes. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

Prolonged or repeated exposure may irritate the respiratory tract and eyes and may cause headaches and dizziness. Some individuals may develop an allergic response.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

If product is involved in a fire, use water spray, foam, dry powder, carbon dioxide or sand. Keep nearby containers and equipment cool with a water stream.

5.2 Special hazards arising from the substance or mixture

May give off toxic fumes if heated to decomposition. Do not breathe fumes. Wear self contained breathing apparatus.

5.3 Advice for firefighters

Whenever this product involved in a major fire, firefighters to wear boots, overalls, gloves, eye and face protection and breathing apparatus. Keep containers cool with water spray. Water should be used only to cool the unaffected stock.
SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures: Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Remove ignition sources and need to evacuate the danger area or to consult an expert. When dealing with a spillage do not eat, drink or smoke.

6.2 Environmental precautions: Do not discharge into the drains/surface water/groundwater.

6.3 Methods and material for containment and cleaning up: Transfer any product remaining in damaged or leaking containers into a clean, empty drum, and label the drum. Absorb spillage and cover contaminated areas with lime, damp sawdust, and earth or other absorbent material and place in a secure container for safe disposal. Contain a large spillage by a barrier of earth or sandbags. Prevent liquid from spreading to other cargo, vegetation, or waterways. Clean contaminated floors and objects thoroughly with plenty of water, observing environmental regulations.

6.4 Reference to other sections: Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling: Ensure good ventilation. Avoid build up of dust. Wear full protective clothing by those handling concentrates. Adequate washing facilities should be available at all times and should be close to site of handling. Eating, drinking and smoking should be prohibited during handling. Wash hands after use and to remove contaminated clothing and protective equipment before entering eating areas.
PRODUCT: HEXACONAZOLE TECHNICAL

7.2 Conditions for safe storage, including any incompatibilities: It should be stored in clearly labelled rigid and leak proof containers and away from containers of food and drink. Storage should be under lock and key and secure from access by children and other unauthorized persons. Store in a well-ventilated place. Do not store together with oxidizing agents & strong alkalies.

7.3 Specific end use(s): When opening a container and mixing, protective impermeable boots, clean overalls impermeable gloves, eye protection and a respirator should be worn. Avoid contact to mouth and eyes. Before eating, drinking or smoking, hands and other exposed skin should be thoroughly washed with alkaline soap.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit: Exposure limit values are not available.

DNEL and PNEC values: Not available

8.2 Exposure controls

8.2.1 Appropriate engineering controls: Mechanical ventilation should be used when handling this product in closed spaces.

8.2.2 Individual protection measures, such as personal protective equipment

General precautions: Do not inhale dust.

Eye/face protection: Wear safety goggles with imperforated side shield and face shield.

Skin protection: Avoid contact with skin. Wear apron, boots and full protective suit.

Respiratory protection: Wear dust mask. Use respiratory protection in case of insufficient exhaust ventilation or prolonged exposure.
PRODUCT: HEXACONAZOLE TECHNICAL

Thermal hazards: Whenever this product involved in a major fire, firefighters to wear boots, overalls, gloves, eye and face protection and breathing apparatus.

8.2.3 Environmental exposure controls: Keep away from food, drink and animal feed stuff. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheet.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: White to off white crystalline powder
Odour: Odourless
Odour threshold: Not available
pH: Not available
Melting point/freezing point: 110-112 °C
Initial boiling point and boiling range: Not applicable
Flash point: Not available
Evaporation rate: Not applicable
Flammability (solid, gas): Non-flammable
Upper/lower flammability or explosive limits: Non-explosive
Vapour pressure: 0.018 mPa (20 °C)
Relative density/sp. gravity: 1.29 g/cm³ (25 °C)
Solubility(ies): In water 0.017 g/l (20°C). In dichloromethane 336, methanol 246, acetone 164, ethyl acetate 120, toluene 59, hexane 0.8 (all in g/l, 20 °C)
Partition coefficient: n-octanol/water : $K_{ow} : \log P = 3.9 \ (20^\circ C)$
Auto-ignition temperature : Not available
Decomposition temperature : Not available
Viscosity : Not available
Explosive properties : Non-explosive
Oxidising properties : Non-oxidizer
9.2 Other information : Henry: $3.33 \times 10^{-4} \ \text{Pa m}^3 \ \text{mol}^{-1} \ (\text{calc.})$

SECTION 10: Stability and reactivity

10.1 Reactivity : Unstable in strong alkaline and oxidising agents.
10.2 Chemical stability : Stable for two years at ambient conditions.
10.3 Possibility of hazardous reactions : Incompatible with oxidizing materials.
10.4 Conditions to avoid : Avoid excessive heat and flame.
10.5 Incompatible materials : Strong alkaline and oxidising agents.
10.6 Hazardous decomposition products : Keep away from strong oxidizers & alkaline materials.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity, oral, dermal, inhalation : Oral LD$_{50}$: $>2000 \ \text{mg/kg bw (Rats)}$
Dermal LD$_{50}$: $>2000 \ \text{mg/kg bw (Rats)}$
skin corrosion/irritation : Non-irritant to skin of rabbits
serious eye damage/irritation : Minimally irritation to rabbits eyes
respiratory or skin sensitisation : Non-sensitiser to skin of Guinea pigs
Section 12: Ecological Information

12.1 Toxicity

- Guppy, *Poecilia reticulata*, 96 hours: EC₅₀: 9.04 mg/l
- *Daphnia magna*, 48 hours: EC₅₀: 3.70 mg/l
- *Chlorella vulgaris*, 72 hours: EC₅₀: 8.10 µg/ml
- Bees, *Apis indica*: LC₅₀: 0.33 w/v
- Acute toxicity Earthworm, *Lampropeltis mauritii*: Hexaconazole technical exhibited only 37.50% mortality to earthworm even at a higher doses level of 1000 mg/kg (dry wt. of soil)
- Birds, mallard ducks: LD₅₀: >4000 mg/kg

12.2 Persistence and degradability: Hexaconazole was not susceptible to chemical hydrolysis or to phototransformation, and was not likely to volatilize from water or moist soil. Microbial action was important in the transformation of Hexaconazole in soils. Laboratory aerobic soil studies demonstrated that Hexaconazole was persistent in loamy sand soil and moderately persistent in sandy loam and silty clay loam soils.

12.3 Bioaccumulative potential: A log Kow value of 3.9 indicates a potential for
PRODUCT: HEXACONAZOLE TECHNICAL

bioaccumulation, where Kow is the octanol–water partition coefficient. However, data from studies on fish and residue levels of hexaconazole in rat and goat tissue and milk showed that bioaccumulation was limited.

12.4 Mobility in soil: Laboratory soil adsorption and leaching studies and field soil dissipation studies indicated that Hexaconazole had negligible leaching potential and is not expected to contaminate groundwater through leaching.

12.5 Results of PBT and vPvB assessment: Toxic to aquatic life with long lasting effects. Does not meet the criteria for vPvB in accordance with Annex XIII of REACH.

12.6 Other adverse effects: When used as recommended, it is unlikely that Hexaconazole and its degradation products will reach levels of adverse environmental significance.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product Disposal**
Avoid exposure, if possible by the use of appropriate protective clothing and masks. Dispose of in a pesticide approved landfill, or in a chemical incinerator equipped with scrubbers. Dispose in a safe manner in accordance with local/national regulations

Never pour waste or surplus products into public sewers or where there is any danger of run-off or seepage to streams, watercourses, open waterways, ditches, fields with drainage systems, or to the catchment areas of boreholes, wells, springs, or ponds.

**Package disposal**
Puncture containers to prevent reuse. Dispose of container in accordance with local regulation.

SECTION 14: Transport information
PRODUCT: HEXACONAZOLE TECHNICAL

14.1 UN number : 2588
14.2 UN proper shipping name : PESTICIDE, SOLID, TOXIC, N.O.S. (Hexaconazole Technical)
14.3 Transport hazard class(es) : ADR: 6.1
IMDG: 6.1
ICAO/IATA: 6.1
RID: 6.1
14.4 Packing group : III
14.5 Environmental hazards : Hexaconazole designated as marine pollutant.
14.6 Special precautions for user : Ensure that containers are sound and that labels are securely fixed and undamaged before dispatch. Do not load together with food and animal feed.
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code : Not relevant

SECTION 15: Regulatory information
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture : Hexaconazole has been classified under Dangerous substances Directive (67/548/EEC) & Regulation No 1272/2008.
15.2 Chemical safety assessment : Evaluation of ADI has been performed by National Institute of Public Health and Environmental Protection, Bilthoven, Netherlands

SECTION 16: Other information
16.1 Indication of changes
Changes have been made in all section.
16.2 Abbreviations and acronyms
LD_{50}: Lethal Dose, 50%
LC_{50}: Lethal Concentration, 50%
STOT: Specific Target Organ Toxicity
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration
ADR: International Carriage of Dangerous Goods by Road
IMDG: International Maritime Dangerous Goods
ICAO/IATA: International Civil Aviation Organization /International Airlines Travel Agent
RID: International Carriage of Dangerous Goods by Rail

16.3 Key literature references and sources for data
- Our study reports
- World Health Organization for the International Programme on Chemical Safety.
- BCPC, Pesticide Manual
- Submission Management and Information Division, Pest Management Regulatory Agency, Canada

16.4 Text of R-phrases mentioned in Section 3:
R22: Harmful if swallowed.
R43: May cause sensitisation by skin contact
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Text of the hazard statements mentioned in Section 3:
H302: Harmful if swallowed
H317: May cause an allergic skin reaction
H411: Toxic to aquatic life with long lasting effects

16.5 Training
Training of workers in techniques to avoid contact with substance is essential.

16.6 Liability
The information provided in this safety data sheet is accurate at the date of publication and will be updated as and when appropriate. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.