

**Butorphanol Formulation**

|         |                |              |                                 |
|---------|----------------|--------------|---------------------------------|
| Version | Revision Date: | SDS Number:  | Date of last issue: 28.09.2024  |
| 5.0     | 03.12.2024     | 918655-00020 | Date of first issue: 03.10.2016 |

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**SECTION 1. IDENTIFICATION**

Product identifier : Butorphanol Formulation

Other means of identification : Dolorex® (A006877)

**Manufacturer or supplier's details**

Company : MSD

Address : Rua Coronel Bento Soares, 530  
Cruzeiro - Sao Paulo - Brazil CEP 12730-340

Telephone : 908-740-4000

Emergency telephone : 1-908-423-6000

E-mail address : EHSDATASTEWARD@msd.com

**Recommended use of the chemical and restrictions on use**

Recommended use : Veterinary product

Restrictions on use : Not applicable

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**SECTION 2. HAZARDS IDENTIFICATION****GHS Classification in accordance with ABNT NBR 14725 Standard**

Specific target organ toxicity - : Category 2 (Central nervous system)  
single exposure (Oral)

Specific target organ toxicity - : Category 2 (Blood, Central nervous system)  
repeated exposure (Oral)

**GHS label elements in accordance with ABNT NBR 14725 Standard**

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H371 May cause damage to organs (Central nervous system) if swallowed.  
H373 May cause damage to organs (Blood, Central nervous system) through prolonged or repeated exposure if swallowed.

Precautionary Statements : **Prevention:**  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.

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**Response:**

P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.

**Storage:**

P405 Store locked up.

**Other hazards which do not result in classification**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

**Components**

| Chemical name   | CAS-No.    | Classification  | Concentration (% w/w) |
|---|------------|---|-----------------------|
| 17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R*,R*)]-2,3-dihydroxysuccinate | 58786-99-5 | Acute Tox. (Oral), 4<br>Repr., 2<br>STOT SE,<br>(Oral)(Central nervous system) , 1<br>STOT RE,<br>(Oral)(Blood, Central nervous system) , 1<br>Aquatic Acute, 3<br>Aquatic Chronic, 3 | >= 1 -< 2,5           |

**SECTION 4. FIRST AID MEASURES**

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : May cause damage to organs if swallowed.  
 May cause damage to organs through prolonged or repeated exposure if swallowed.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment

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Notes to physician : when the potential for exposure exists (see section 8).  
: Treat symptomatically and supportively.

**SECTION 5. FIRE-FIGHTING MEASURES**

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Carbon oxides

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions : Avoid release to the environment.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g., by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to

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determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Do not breathe mist or vapors.  
Do not swallow.  
Avoid contact with eyes.  
Avoid prolonged or repeated contact with skin.  
Wash skin thoroughly after handling.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment  
Do not eat, drink or smoke when using this product.  
Take care to prevent spills, waste and minimize release to the environment.
- Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.  
When using do not eat, drink or smoke.  
Wash contaminated clothing before re-use.  
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Self-reactive substances and mixtures  
Organic peroxides  
Explosives  
Gases

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

## Ingredients with workplace control parameters

| Components  | CAS-No.    | Value type<br>(Form of exposure) | Control parameters / Permissible concentration | Basis    |
|---|------------|----------------------------------|--|----------|
| 17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R*,R*)]-2,3-dihydroxysuccinate | 58786-99-5 | TWA                              | 3 µg/m3 (OEB 4)                                | Internal |
|   |            | Wipe limit                       | 30 µg/100 cm²                                  | Internal |
|   |            | STEL                             | 25 µg/m3                                       | Internal |

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**Engineering measures** : The information below is intended for larger pilot/commercial-scale operations and manufacturing. For smaller scale, clinical, or pharmacy settings, site-specific internal risk assessment practices should be conducted to determine appropriate exposure control measures. The health hazard risks of handling this material are dependent on multiple factors, including but not limited to physical form and quantity handled. If applicable, use process enclosures, local exhaust ventilation (e.g., Biosafety Cabinet, Ventilated Balance Enclosures), or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels as low as reasonably achievable.

All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment. Essentially no open handling permitted.

Use closed processing systems or containment technologies. If handled in a laboratory, use a properly designed biosafety cabinet, fume hood, or other containment device if the potential exists for aerosolization. If this potential does not exist, handle over lined trays or benchtops.

**Personal protective equipment**

**Respiratory protection** : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

**Filter type** : Particulates type

**Hand protection**

**Material** : Chemical-resistant gloves

**Remarks** : Consider double gloving.

**Eye protection** : Wear safety glasses with side shields or goggles. If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

**Skin and body protection** : Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

**Physical state** : liquid

**Color** : colorless

**Odor** : No data available

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|  |   |  |
|--|---|--|
| Odor Threshold                                   | : | No data available  |
| pH   | : | No data available  |
| Melting point/freezing point                     | : | No data available  |
| Initial boiling point and boiling range          | : | 100 °C   |
| Flash point                                      | : | No data available  |
| Evaporation rate                                 | : | No data available  |
| Flammability (solid, gas)                        | : | Not applicable   |
| Flammability (liquids)                           | : | No data available  |
| Upper explosion limit / Upper flammability limit | : | No data available  |
| Lower explosion limit / Lower flammability limit | : | No data available  |
| Vapor pressure                                   | : | No data available  |
| Relative vapor density                           | : | No data available  |
| Relative density                                 | : | No data available  |
| Density  | : | No data available  |
| Solubility(ies)<br>Water solubility              | : | No data available  |
| Partition coefficient: n-octanol/water           | : | Not applicable   |
| Autoignition temperature                         | : | No data available  |
| Decomposition temperature                        | : | No data available  |
| Viscosity<br>Viscosity, kinematic                | : | No data available  |
| Explosive properties                             | : | Not explosive  |
| Oxidizing properties                             | : | The substance or mixture is not classified as oxidizing. |
| Particle characteristics<br>Particle size        | : | Not applicable   |

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**SECTION 10. STABILITY AND REACTIVITY**

|            |   |  |
|------------|---|--|
| Reactivity | : | Not classified as a reactivity hazard. |
|------------|---|--|

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|                                    |   |  |
|------------------------------------|---|--|
| Chemical stability                 | : | Stable under normal conditions.                |
| Possibility of hazardous reactions | : | Can react with strong oxidizing agents.        |
| Conditions to avoid                | : | None known.                                    |
| Incompatible materials             | : | Oxidizing agents                               |
| Hazardous decomposition products   | : | No hazardous decomposition products are known. |

## SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure :

- Inhalation
- Skin contact
- Ingestion
- Eye contact

**Acute toxicity**

Not classified based on available information.

**Product:**

Acute oral toxicity : Acute toxicity estimate: > 5.000 mg/kg  
Method: Calculation method

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|                           |   |                            |
|---------------------------|---|----------------------------|
| Acute oral toxicity       | : | LD50 (Mouse): 395 mg/kg    |
|                           |   | LD50 (Dog): > 50 mg/kg     |
|                           |   | LD50 (Monkey): > 50 mg/kg  |
| Acute inhalation toxicity | : | Remarks: No data available |
| Acute dermal toxicity     | : | Remarks: No data available |

**Skin corrosion/irritation**

Not classified based on available information.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

Remarks : No data available

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|         |   |                   |
|---------|---|-------------------|
| Species | : | Rat               |
| Result  | : | No eye irritation |

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**Respiratory or skin sensitization****Skin sensitization**

Not classified based on available information.

**Respiratory sensitization**

Not classified based on available information.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|                    |                                      |
|--------------------|--------------------------------------|
| Routes of exposure | : Dermal                             |
| Assessment         | : Does not cause skin sensitization. |
| Result             | : negative                           |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|                       |   |
|-----------------------|---|
| Genotoxicity in vitro | : Test Type: Bacterial reverse mutation assay (AMES)<br>Result: negative                                      |
|                       | Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)<br>Result: negative |

**Carcinogenicity**

Not classified based on available information.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|                   |            |
|-------------------|------------|
| Species           | : Rat      |
| Application Route | : Oral     |
| Exposure time     | : 2 Years  |
| Result            | : negative |

|                   |            |
|-------------------|------------|
| Species           | : Mouse    |
| Application Route | : Oral     |
| Exposure time     | : 2 Years  |
| Result            | : negative |

**Reproductive toxicity**

Not classified based on available information.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|                      |   |
|----------------------|---|
| Effects on fertility | : Test Type: Fertility/early embryonic development<br>Species: Rat<br>Application Route: Oral<br>Fertility: LOAEL: 160 mg/kg body weight<br>Result: Effects on fertility. |
|----------------------|---|



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|                                    |   |  |
|------------------------------------|---|--|
| Effects on fetal development       | : | Test Type: Embryo-fetal development<br>Species: Rat<br>Application Route: Subcutaneous<br>Developmental Toxicity: LOAEL: 1 mg/kg body weight<br>Result: No teratogenic effects., Increased stillbirths                           |
|                                    | : | Test Type: Embryo-fetal development<br>Species: Rabbit<br>Application Route: Oral<br>Developmental Toxicity: LOAEL: 30 mg/kg body weight<br>Result: No teratogenic effects., Maternal toxicity observed., Postimplantation loss. |
|                                    | : | Test Type: Embryo-fetal development<br>Species: Rat<br>Application Route: Subcutaneous<br>Developmental Toxicity: LOAEL: 0,5 mg/kg body weight<br>Result: Maternal toxicity observed.  |
| Reproductive toxicity - Assessment | : | Some evidence of adverse effects on sexual function and fertility, based on animal experiments., Some evidence of adverse effects on development, based on animal experiments.   |

**STOT-single exposure**

May cause damage to organs (Central nervous system) if swallowed.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|               |   |                          |
|---------------|---|--------------------------|
| Target Organs | : | Central nervous system   |
| Assessment    | : | Causes damage to organs. |

**STOT-repeated exposure**

May cause damage to organs (Blood, Central nervous system) through prolonged or repeated exposure if swallowed.

**Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|               |   |   |
|---------------|---|---|
| Target Organs | : | Blood, Central nervous system                                   |
| Assessment    | : | Causes damage to organs through prolonged or repeated exposure. |

**Repeated dose toxicity****Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

|                   |   |              |
|-------------------|---|--------------|
| Species           | : | Rat          |
| LOAEL             | : | 0,4 mg/kg    |
| Application Route | : | Subcutaneous |
| Exposure time     | : | 6 Months     |

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Target Organs : Blood, Central nervous system

Species : Monkey  
LOAEL : 0,15 mg/kg  
Application Route : Intramuscular  
Exposure time : 6 Months  
Target Organs : Central nervous system

Species : Dog  
LOAEL : 0,1 mg/kg  
Application Route : Intramuscular  
Exposure time : 3 Months  
Symptoms : reduced body weight gain

**Aspiration toxicity**

Not classified based on available information.

**Experience with human exposure****Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

Ingestion : Symptoms: Drowsiness, Sweating, Nausea, Dizziness, Vertigo, Palpitation, respiratory depression

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:****17-(cyclobutylmethyl)morphinan-3,14-diyl [S-(R\*,R\*)]-2,3-dihydroxysuccinate:**

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 38,1 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

**Persistence and degradability**

No data available

**Bioaccumulative potential**

No data available

**Mobility in soil**

No data available

**Other adverse effects**

No data available

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Do not dispose of waste into sewer.  
Dispose of in accordance with local regulations.  
Contaminated packaging : Empty containers should be taken to an approved waste

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handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

**SECTION 14. TRANSPORT INFORMATION****International Regulations****UNRTDG**

Not regulated as a dangerous good

**IATA-DGR**

Not regulated as a dangerous good

**IMDG-Code**

Not regulated as a dangerous good

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation****ANTT**

Not regulated as a dangerous good

**Special precautions for user**

Not applicable

**SECTION 15. REGULATORY INFORMATION****Safety, health and environmental regulations/legislation specific for the substance or mixture**

National List of Carcinogenic Agents for Humans - (LINACH) : Not applicable

Brazil. List of chemicals controlled by the Federal Police : Not applicable

**The ingredients of this product are reported in the following inventories:**

AICS : not determined

DSL : not determined

IECSC : not determined

**SECTION 16. OTHER INFORMATION**

Revision Date : 03.12.2024  
Date format : dd.mm.yyyy

**Further information**

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

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Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

**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; TECL - 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

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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