

SAFETY DATA SHEET (SDS)



Product Name: *TransIT-X2®* Dynamic Delivery System

Product Number: MIR 6000, MIR 6003, MIR 6004, MIR 6005, MIR 6006, MIR 6010

Revision Date: FEB 14 2017

Print Date: AUG 15 2018

Disclaimer: Mirus Bio LLC believes that the information on this SDS was obtained from reliable sources. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, Mirus Bio LLC does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with handling and disposal of this product.

This product is sold to the Buyer with a limited license to use this product for research only. This product, or parts from this product, may not be re-packaged or re-sold without written permission from Mirus Bio LLC. A license from Mirus Bio LLC is required for commercial application of this product. For obtaining a license to use this product for commercial application, contact Mirus Bio LLC, 545 Science Drive, Madison, WI 53711. Email: license@mirusbio.com

©1996-2018 All rights reserved. Mirus Bio LLC. All trademarks are the property of their respective owners.

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. **Product Name:** *TransIT-X2*[®] Dynamic Delivery System

1.2. **Product Numbers:** MIR 6000, MIR 6003, MIR 6004, MIR 6005, MIR 6006, MIR 6010

1.3. **Identified Product Use:** For research use only

1.4. **Supplier Details:**

1.4.1. **Company:** Mirus Bio LLC, 545 Science Drive, Madison, WI 53711, USA

1.4.2. **Telephone:** 888.530.0801 (Toll Free within the U.S.) or +1.608.441.2852

1.4.3. **Fax:** +1.608.441.2849

1.4.4. **Emergency Phone No.:** US and Canada: 1.800.633.8253; International: +1.801.629.0667

1.5. **Precautionary Labeling:** The components of *TransIT-X2*[®] Dynamic Delivery System (< 0.15% by weight) are potentially harmful, although the chemical, physical, and toxicological properties have not been thoroughly investigated by Mirus Bio LLC. Handle with care, and practice safe laboratory techniques. The information included within this SDS pertains to ethanol, which is used as a solvent.

2. HAZARDS IDENTIFICATION

2.1. **Classification of the substance or mixture:**

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2. **GHS label elements, including precautionary statements:**

Pictogram



Signal word

Danger

Hazard statement(s)

H225

Highly flammable liquid and vapor.

H315 + H320

Causes skin and eye irritation

H335

May cause respiratory irritation

Precautionary statement(s)

P210

Keep away from heat/sparks/open flames/hot surfaces - no smoking.

P233

Keep container tightly closed.

P240

Ground/bond container and receiving equipment.

P241

Use explosion-proof electrical/ventilating/lighting equipment.

P242

Use only non-sparking tools.

P243

Take precautionary measures against static discharge.

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P303 + P361 + P353

IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/ shower.

P370 + P378

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

P403 + P235

Store in a well-ventilated place. Keep cool.

P501

Dispose of contents/ container to an approved waste disposal plant.

2.3. Other Hazards which do not result in the classification or are not covered by GHS: None

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Chemical Name	CAS-No	EINECS-No	Common Name(s)	Weight %
Ethanol	64-17-5	200-578-6	Ethyl alcohol	80
Water	7732-18-5	231-791-2	n/a	20

Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance: none

4. FIRST AID MEASURES

4.1. Description of first aid measures:

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms/effects, acute and delayed

See sections 2 and 11 (hazard and toxicological information) for the most important symptoms and effects.

4.3. Indication of immediate medical attention and special treatment needed, if necessary

No data available

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

5.1.1. Suitable Extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide

5.1.2. Unsuitable extinguishing media

None

5.2. Specific hazards arising from the substance or mixture

No data available

5.3. Special protective equipment and precautions for firefighters

Wear self-contained breathing apparatus for firefighting if necessary

5.4. Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. For personal protection, refer to section 8.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3. Methods and Materials for Containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4. References to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - no smoking. Take measures to prevent the buildup of electrostatic charge. For precautions see section 2.2.

7.2. Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters e.g. occupational exposure limit values or biological limit values.

Ethanol (64-17-5)		
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1900 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm

8.2. Appropriate engineering controls.

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3. Individual protection measures, such as personal protective equipment.

Appropriate engineering controls:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation.
Personal protective equipment:	Avoid all unnecessary exposure.
Materials for protective clothing:	GIVE EXCELLENT RESISTANCE: butyl rubber. viton. GIVE GOOD RESISTANCE: neoprene. tetrafluoroethylene. GIVE LESS RESISTANCE: nitrile rubber. polyethylene. GIVE POOR RESISTANCE: natural rubber. PVA. PVC.
Hand protection:	Gloves.
Eye protection:	Safety glasses.
Skin and body protection:	Protective clothing.
Respiratory protection:	Wear gas mask with filter type A if conc. in air > exposure limit.
Other information:	Do not eat, drink or smoke during use.

9. PHYSICAL AND CHEMICAL PROPERTIES

- 9.1. **Appearance (physical state, color etc.):** Form: liquid, clear
Color: colorless
- 9.2. **Odor:** No data available
- 9.3. **Odor threshold:** No data available
- 9.4. **pH:** No data available
- 9.5. **Melting point/freezing point:** -144 °C (-227.2 °F) (for 100% ethanol)
- 9.6. **Initial boiling point and boiling range:** 80 °C (176 °F) (for 100% ethanol)
- 9.7. **Flash point:** 20.0 °C (68 °F) - closed cup
- 9.8. **Evaporation rate:** No data available
- 9.9. **Flammability (solid, gas):** Flammable
- 9.10. **Upper/lower flammability or explosive limits:** 19%(V) / 3.3% (V) (for 100% ethanol)
- 9.11. **Vapor pressure:** 59.5 hPA (44.6 mmHg) at 20 °C (68 °F) (for 100% ethanol)
- 9.12. **Vapor density:** 1.6
- 9.13. **Relative density:** 0.855 g/mL at 25 °C (77 °F) (for 100% ethanol)
- 9.14. **Solubility(ies):** Water soluble
- 9.15. **Partition coefficient: n-octanol/water** No data available
- 9.16. **Auto-ignition temperature:** 363 °C (685 °F) (for 100% ethanol)
- 9.17. **Decomposition temperature:** No data available
- 9.18. **Viscosity:** No data available

10. STABILITY AND REACTIVITY

- 10.1. Reactivity:** No data available
- 10.2. Chemical stability:** Stable under recommended storage conditions.
- 10.3. Possibility of hazardous reactions:** Vapors may form explosive mixture with air.
- 10.4. Conditions to avoid (e.g. static discharge, shock or vibration):** Heat, flames and sparks. Extremes of temperature and direct sunlight.
- 10.5. Incompatible materials:** Alkali metals, Oxidizing agents, Peroxides, Strong Inorganic Acids
- 10.6. Hazardous decomposition products:** Other decomposition products – no data available. In the event of a fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects: Ethanol

Acute toxicity

LD50 Oral - Rat - 7,060 mg/kg

Remarks: Lungs, Thorax, or Respiration: Other changes.

LC50 Inhalation - Rat - 10 h - 20000 ppm

Dermal: No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 24 h

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Mild eye irritation - 24 h

(OECD Test Guideline 405)

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Carcinogenicity - Mouse - Oral

Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Liver: Tumors. Blood: Lymphomas including Hodgkin's disease.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

Reproductive toxicity - Human - female - Oral

Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects.

Effects on Newborn: Drug dependence.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Information on toxicological effects: Water

LD50 Oral - Rat - > 90000 mg/kg

Water summary: There is no data available for the teratogenic, mutagenic, or reproductive toxicity effect of water. No data available to designate as causing specific target organ toxicity through single or repeated exposure. No data available to designate as an aspiration hazard or as a respiratory skin sensitizer.

12. ECOLOGICAL INFORMATION**12.1. Ecotoxicity (aquatic and terrestrial, where available):****Acute Fish toxicity (ethanol):**

LC50 / 96 hour *Oncorhynchus mykiss* (rainbow trout) > 10,000 mg/l

LC50 / 96 hour *Pimephales promelas* (fathead minnow) > 13,400 mg/l

Toxicity to aquatic plants (ethanol):

Growth inhibition / 96 hours *Chlorella vulgaris* (Fresh water algae) 1,000 mg/l

Toxicity to microorganisms (ethanol):

Toxicity Threshold / *Pseudomonas putida* 6,500 mg/l

Summary: Inhibition of cell multiplication begins.

12.2. Persistence and degradability: No data available

12.3. Bioaccumulative potential: No data available

12.4. Mobility in the soil: No data available

12.5. Other adverse effects: No data available

13. DISPOSAL CONSIDERATIONS**13.1. Waste Treatment Recommendations:**

Remove waste in accordance with local and/or national regulations. Hazardous waste should not be mixed with other waste or different types of hazardous waste if mixing leads to pollution or increased difficulty in properly disposing of the waste. All entities that store, transport or handle hazardous waste should take the necessary measures to prevent risks of pollution or damage to people or animals.

Recycle by distillation. Remove to an authorized waste incinerator for solvents with energy recovery. Do not discharge into surface water. May be discharged to wastewater treatment installation.

14. TRANSPORT INFORMATION

- 14.1. **UN number:** 1170
- 14.2. **UN proper shipping name:** Ethanol solutions
- 14.3. **Transport hazard class(es):** Class 3
- 14.4. **Packing group, if applicable:** Packing Group II
- 14.5. **Environmental hazards (e.g.: Marine pollutant (Yes/No)):** No
- 14.6. **Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code):** DOT Quantity
Limitations – Passenger/Cargo: 1L; Cargo: 60L
- 14.7. **Special precautions which a user needs to be aware of, or needs to comply with, in connection with the transport or conveyance within or outside their premises:** Refer to section 8

Covers specifications required for DOT(US), IMDG, and IATA.

15. REGULATORY INFORMATION

- 15.1. Safety, health and environmental regulations specific for the product in question:

OSHA Hazards: Flammable liquid, Target Organ Effect, Irritant

SARA 311/312 Hazards: Fire Hazard, Chronic Health Hazard

California Prop. 65 Components: This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

WHMIS Classification: B2 – Flammable and combustible material – flammable liquid
D2B – Poisonous and infectious material – other effects – Toxic

16. OTHER INFORMATION

Full text of H-phrases: see section 16:

Acute Tox. 3 (Dermal)	Acute toxicity (dermal), Category 3
Acute Tox. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Carc. 1A	Carcinogenicity, Category 1A
Eye Irrit. 2A	Serious eye damage/eye irritation, Category 2A
Flam. Liq. 2	Flammable liquids, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT SE 1	Specific target organ toxicity — single exposure, Category 1
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H225	Highly flammable liquid and vapor
H226	Flammable liquid and vapor
H301	Toxic if swallowed
H311	Toxic in contact with skin
H315	Causes skin irritation
H319	Causes serious eye irritation
H331	Toxic if inhaled
H336	May cause drowsiness or dizziness
H350	May cause cancer
H361	Suspected of damaging fertility or the unborn child
H370	Causes damage to organs

NFPA health hazard: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard: 3 - Liquids and solids that can be ignited under almost all ambient conditions.

NFPA reactivity: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

HMIS III Rating

Health: 2 Moderate Hazard - Temporary or minor injury may occur
 Flammability: 3 Serious Hazard
 Physical: 1 Slight Hazard
 Personal Protection: D

Disclaimer: Mirus Bio LLC believes that the information on this MSDS was obtained from reliable sources. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, Mirus Bio LLC does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with handling.