SAFETY DATA SHEET
BIORESTOR®Asphalt Rejuvenator Emulsifiable Concentrate

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifier

Product Name: BIORESTOR® Asphalt Rejuvenator Emulsifiable Concentrate

Product Code(s): BIORESTOR® Asphalt Rejuvenator Emulsifiable Concentrate

Synonym(s): Terpene/oleo chemical/polymer blend

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

General use: Asphalt rejuvenator

Uses advised against: None known

1.3 Details of the supplier and of the safety data sheet

Manufacturer/Distributor

BioBased Spray Systems, LLC.
2506 Fair Rd
Sidney, Ohio 45365-7523
(888) 743-7319

1.4 Emergency telephone number: Chemtrec (800) 424-9300; Outside USA (703) 527-3887

SECTION 2 - HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

Product definition: Mixture

Classification in accordance with 29 CFR 1910 (OSHA HCS) and Regulation (EC) No. 1272/2008

Flammable liquid - Category 4 [227]
Skin irritation - Category 2 [315]
Skin sensitizer - Category 1 [H317]
Eye irritation - Category 2B [320]
Chronic aquatic - Category 1 [H410]

2.2 Label Elements

Hazard Symbol(s):

GHS07 GHS09

Signal Word: Warning

Hazard Statement(s):

H227 - Combustible liquid
H315 - Causes skin irritation
H317 - May cause allergic skin reaction
H320 - Causes eye irritation
H410 - Very toxic to aquatic life with long lasting effects

Precautionary Statements:

[Prevention]

P210 - Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P3052 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P261 - Avoid breathing mists, vapor and spray.
P264 - Wash hands or other skin areas contacting this product thoroughly after handling.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P273 - Avoid release to the environment.
P280 - Wear protective gloves protective clothing and eye protection.

[Response]

P370 + P378 - In case of fire: Use water fog, foam, dry chemical or carbon dioxide for extinction.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P321 - Specific treatment: Seek medical attention. Refer to Section 4 of this SDS.
P333 + P337 + P313 - If skin irritation or rash occurs or if eye irritation persists: Get medical attention.
P362 - Take off contaminated clothing and wash before reuse.
P391 - Collect spillage.

[Storage]

P403 + P235 - Store in well-ventilated place. Keep cool.

[Disposal]

P501 - Dispose of contents and container in accordance with national and local regulations.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

None known

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

% by Weight	Ingredient	CAS Number	EC Number	Index Number	GHS Classification
<45	Dipentene	138-86-3	205-341-0	601-029-00-7	H226, H315, H317, H410
<10	Styrene-butadiene copolymer	9003-55-0	----------	----------	----------
<8	Surfactant	Proprietary	----------	----------	H302, H318

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identify and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with the applicable provisions of paragraph (i).

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

SECTION 4 - FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation: If product mist or vapor causes respiratory irritation or distress, move the exposed person to fresh air immediately. If breathing is difficult or irregular, administer oxygen; if respiratory arrest occurs, start artificial respiration by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. If symptoms persist or if you feel unwell, seek medical attention.

Eyes: Immediately flush eyes with large amounts of water for 15 minutes, occasionally lifting upper and lower lids. Remove contact lenses, if present and easy to do, after first 2 minutes and continue rinsing. Obtain immediate medical attention, preferably from an ophthalmologist.

Skin: Remove contaminated clothing. Flush skin with lukewarm water for 15 minutes. Wash affected area with soap and water. Thoroughly clean contaminated clothing and shoes before reuse. If irritation persists or if rash develops, seek medical attention.

Ingestion: Rinse mouth with water if the victim is conscious. Remove dentures, if present. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs naturally, have the victim lean forward to reduce the risk of aspiration of material into the lungs. This material can get into the lungs during swallowing or vomiting, resulting in lung inflammation or lung damage. Do not leave the victim unattended. Never give anything by mouth to an unconscious or convulsing person. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

Potential health symptoms and effects

Eyes: Causes eye irritation with redness, swelling, stinging and tearing.

Skin: Causes skin irritation with redness, itching and discomfort. May cause an allergic skin reaction in susceptible individuals. Repeated exposure to unprotected skin may cause drying and cracking of the skin.

Inhalation: Mist or vapor may cause irritation of the nose, throat and lungs. May cause an allergic, asthma-like response in some individuals.

Ingestion: May cause digestive upset including gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic: Preexisting disorders of the skin and respiratory system may be aggravated by exposure to this product. Prolonged and repeated skin exposure may result in defatting of skin and dermatitis. May cause an allergic skin reaction. May cause an allergic respiratory reaction with asthma-like symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

Advice to Doctor and Hospital Personnel

Treat supportively and symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

5.1 Extinguishable media

Suitable methods of extinction: Use extinguishing media such as foam, dry chemical or carbon dioxide.

Unsuitable methods of extinction: Water spray may be ineffective. Water jets and high pressure streams may spread the fire.

5.2 Special hazards arising from the substance or mixture

Combustible liquid. Vapors are heavier than air and can travel along the ground to a source of ignition and flash back. Closed containers may explode due to the buildup of pressure when exposed to extreme heat. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Obtain medical attention.

Rags soaked with any solvent can present a fire hazard and should be stored in UL listed or Factory Mutual approved, covered containers. Improperly stored rags, under certain conditions, can lead to spontaneous combustion.

Explosion hazards: Vapors may form explosive mixtures with air, especially in confined areas.

5.3 Advice for firefighters

Full protective equipment including self-contained breathing apparatus should be used. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. Firefighters should control runoff water to prevent environmental contamination.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with eyes, skin and clothing. Wear all appropriate personal protective equipment specified in Section 8. If normal use presents a

6.2 Environmental precautions

Avoid dispersal of spilled material or runoff and prevent contact with soil and entry into drains, sewers and waterways.

6.3 Methods and materials for containment and cleaning up

Cover drains and contain spill. Cover with a large quantity of inert absorbent. Do not use combustible absorbents such as sawdust. Collect product using non-sparking tools and place into approved container for proper disposal. Observe possible material restrictions (Sections 7.1 and 10.5). Do not flush spilled material down the drain. Clean contaminated area with soap and water.

SECTION 7 - HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with eyes, skin and clothing. Wear all appropriate personal protective equipment specified in Section 8. If normal use presents a respiratory hazard, use only adequate ventilation or wear an appropriate respirator. Do not get in eyes or on skin and clothing.

Advice on protection against fire and explosion

Keep away from heat, sparks, open flames and hot surfaces. No smoking. To avoid fire or explosion, dissipate static electricity by grounding and bonding containers and equipment before transferring material.

7.2 Conditions for safe storage, including any incompatibilities

Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10.5), food and drink. Transfer only to approved containers having correct labeling. Keep containers tightly closed. Protect container against physical damage. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Containers of this material may be hazardous when empty as they may retain product residues. Use appropriate containment to avoid environmental contamination. Ventilate closed areas. Do not take internally. Keep out of reach of children.

7.3 Specific end uses

Apart from the uses mentioned in Section 1.2, no other specific uses are stipulated.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Contains no substances with occupational exposure values.

8.2 Exposure controls

Engineering Measures: Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. Use adequate ventilation. Local exhaust is preferable. Refer to Section 7.1.

Individual protection measures: Wear protective clothing to prevent repeated or prolonged contact with product. Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the representative supplier.

Hygiene measures: Facilities storing or using this material should be equipped with an eyewash station and safety shower. Change contaminated clothing. Preventive skin protection is recommended. Wash hands thoroughly after use, before eating, drinking, smoking or using the lavatory.

Eye/face protection: Wear protective goggles or safety glasses with unperforated side shields during use. Refer to 29 CFR 1910.133, ANSI Z87.1 or European Standard EN 166.

Hand Protection: Wear gloves recommended by glove supplier for protection against materials in section 3. Gloves should be impermeable to chemicals and oil. Breakthrough time of selected gloves must be greater than the intended use period.

Other protective equipment: Wear protective clothing. Wear protective boots if the situation requires.

Respiratory Protection: None required with normal use. Always use an approved respirator when vapor/aerosols are generated. Where risk assessment shows air-purifying respirators are appropriate use a full-faced respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Environmental exposure controls: Do not empty into drains.

PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Clear, colorless to pale yellow liquid
Odor	Characteristic
Odor Threshold	No data available
Molecular Weight	Not applicable
Chemical Formula	Not applicable
pH	Not determined
Melting Point, Range	No data available
Initial Boiling Point	170 - 180 °C (338 - 356 °F)
Evaporation Rate	<1 (n-BuAc =1)
Flammability (solid, gas)	Not applicable
Flash Point	91 °C (196 °F) TCC
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Lower Explosive Limit (LEL)	No data available
Upper Explosive Limit (UEL)	No data available
Vapor Pressure	<2 mm Hg @ 22° C, *estimated*
Vapor Density	No data available

Density	0.8780 - 0.8880 g/ml (7.33 - 7.41 lb/gal)
Viscosity	No data available
Solubility in Water	No data available
Partition Coefficient: n-octanol/water	4 - 5
Oxidizing Properties	Not applicable
Explosive Properties	Not applicable
Volatiles by Weight @ 21º C	>35%

9.2 Other data
No data available

SECTION 10 - STABILITY AND REACTIVITY

10.1 Reactivity
No special reactivity has been reported.

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Hazardous polymerization does not occur.

10.4 Conditions to avoid
Extreme temperatures. Contact with incompatible materials.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Thermal decomposition products include oxides of carbon.

SECTION 11 - TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Acute Oral Toxicity
Expected to have low acute oral toxicity

Acute inhalation toxicity
Expected to have low acute inhalation toxicity

Acute dermal toxicity
Expected to have low acute dermal toxicity

Skin irritation
Causes skin irritation

Eye irritation
Causes eye irritation

Sensitization
Can cause allergic reaction and sensitization; may cause allergic respiratory reaction

Genotoxicity
No data available

Mutagenicity
No data available

Specific organ toxicity - single exposure
No data available.

Specific organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Further information
No component of this product present at levels greater than or equal to the 0.1% threshold (de minimis) is identified as a probable, possible, potential or confirmed carcinogen by ACGIH, IARC, NTP or OSHA.

No data is available regarding the mutagenicity or teratogenicity of this material, nor is there available data that indicated that it causes adverse developmental or fertility effects.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12 - ECOLOGICAL INFORMATION

12.1 Toxicity
Large discharges of this material to the environment may be harmful to aquatic life with long lasting effects to the environment. Dipentene is very toxic to aquatic life with long term effects in the environment.

12.2 Persistence and degradability
Expected to biodegrade over time.

12.3 Bioaccumulation potential
The bioaccumulation potential for this product is low.

12.4 Mobility in soil

Dipentene absorbs to soil and have low mobility.

12.5 Results of PBT and vPvB assessment

This material is not identified as a PBT substance.

12.6 Other adverse effects

Additional ecological information

Do not allow material to run into surface waters, wastewater or soil.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13 - DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Methods of disposal: The generation of waste should be avoided or minimized whenever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

RCRA P-Series: No listing

RCRA U-Series: No listing

SECTION 14 - TRANSPORT INFORMATION

Note: Transportation information provided is for reference only. Customer is urged to consult 49 CFR 100 - 177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

May be reclassified as not regulated for transport in non-bulk packages having a maximum capacity less than or equal to 450 liters (119 gallons).

Limited quantity for miscellaneous materials in Packing Group III when inner packagings are not over 5.0 liters (1.3 gallons) net capacity each, packed in a strong outer packaging.

U.S. DOT

Proper Shipping Name:	Combustible liquid, n.o.s. (Dipentene)
Hazard Class:	3
UN/NA:	NA1993
Packing Group:	III
NAERG:	Guide #128
Packaging Authorization:	Non-Bulk: 49 CFR 173.203; Bulk: 173.241
Packaging Exceptions:	49 CFR 173.150

IMO/IMDG

Proper Shipping Name:	Environmentally hazardous substance, liquids, n.o.s. (Dipentene)
Hazard Class:	3
UN/NA:	UN3082
Packing Group:	III
Marine Pollutant:	YES
EMS Number:	F-A, S-F

Drum Label(s)

ICAO/IATA

Proper Shipping Name:	Environmentally hazardous substance, liquids, n.o.s. (Dipentene)
Hazard Class:	3
UN/NA:	UN3082
Packing Group:	III
Quantity Limitations:	49 CFR 175.27 and 175.75 - Cargo Aircraft Only: No limit; Passenger Aircraft: No limit

RID/ADR

Proper Shipping Name:	Environmentally hazardous substance, liquids, n.o.s. (Dipentene)
Hazard Class:	3
UN/NA:	UN3082
Packing Group:	III

SECTION 15 - REGULATORY INFORMATION

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

U. S. Federal Regulations

OSHA Hazard Communication Standard: This material is classified as hazardous in accordance with OSHA 29 CRF 1910.1200.

OSHA Process Safety Management Standard: This material is not regulated under OSHA PSM Standard 29 CFR 1910.119.

EPA Risk Management Planning Standard: This material is not regulated under EPA RMP Standard (RMP) 40 CFR Part 68.

EPA Federal Insecticide, Fungicide and Rodenticide Act: This product is not a registered Pesticide under the FIFRA, 40 CFR Part 150.

TSCA Status: Components of this product are listed on the TSCA Inventory. This product is not subject to TSCA 12(b) Export Notification.

Drug Enforcement Administration (DEA) List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.4(f)(2) and Chemical Code Number

None listed

Drug Enforcement Administration (DEA) List s1 & 2, Exempt Chemical MIxtures (21 CFR 1310.12(c)) and Code Number

None listed

Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) Chemicals

None listed

Superfund Amendments and Reauthorization Act (SARA)

SARA Section 311/312 Hazard Categories: This product does not contain any chemical components which are subject to the reporting requirements of Section 311/312 of the Emergency Planning and Community Right-to Know Act of 1986.

SARA 313 Information: None of the chemicals in this product exceed the threshold (de minimis) reporting levels established by Section 313 of the Emergency Planning and Community Right-to Know Act of 1986.

SARA 302/304 Extremely Hazardous Substance: No components of the product are subject to the reporting requirements of these sections of Title III of SARA.

SARA 302/304 Emergency Planning & Notification: No components of the product are subject to the reporting requirements of these sections of Title III of SARA.

Comprehensive Response Compensation and Liability Act (CERCLA): No components of the product exceed the threshold (de minimis) reporting levels for hazardous wastes established by CERCLA.

Clean Air Act (CAA)

This product does not contain any chemicals listed as a Hazardous Air Pollutant (HAP) designated in CAA Section 112 (b).
This product does not contain any Class 1 Ozone depletors.
This product does not contain any Class 2 Ozone depletors.

Clean Water Act (CWA)

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
Dipentene (CAS #138-86-3) is listed as a Priority Pollutant under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

U.S. State Regulations

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986

This product contains no chemical(s) known to the State of California to cause cancer, birth defects or other reproductive harm.

Other U.S. State Inventories

This product is not listed on any State Hazardous Substance Inventories, Right-to-Know lists or Air Quality/Air Pollutants lists.

Canada

WHMIS Hazard Symbol and Classification

Flammable liquid and vapor
Causes skin irritation
May cause an allergic skin reaction

Canadian National Pollutant Release Inventory (NPRI): Terpenes (all isomers) are listed on the NPRI.

European Economic Community

WGK, Germany (Water danger/protection): 3

Global Chemical Inventory Lists

Country	Inventory Name	Inventory Listing*
Canada:	Domestic Substance List (DSL)	Yes
Canada:	Non-Domestic Substance List (NDSL)	No
Europe:	Inventory of New and Existing Chemicals (EINECS)	Yes
United States:	Toxic Substance Control Act (TSCA)	Yes
Australia:	Australian Inventory of Chemical Substances (AICS)	Yes
New Zealand:	New Zealand Inventory of Chemicals (NZIoC)	Yes
China:	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Japan:	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea:	Existing Chemicals List (KECI)	Yes
Philippines:	Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Yes

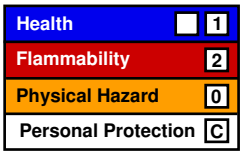
*Yes - All components of this product are in compliance with the inventory requirements administered by the governing country.
No - One or more components of this product are not on the inventory or are exempt from listing.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

SECTION 16 - OTHER INFORMATION

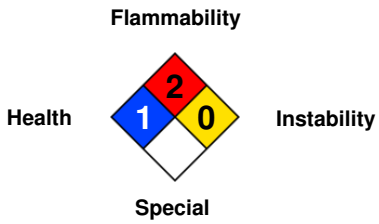
Hazardous Material Information System (HMIS)



HMIS Hazard Rating Legend
0 = Minimal 1 = Slight 2 = Moderate 3 = Serious
4 = Severe * = Chronic Health Hazard

NFPA Hazard Rating Legend
0 = Insignificant 1 = Slight 2 = Moderate
3 = High 4 = Extreme

National Fire Protection Association (NFPA)



Full text of GHS Hazard Phrases referenced in Section 3 (not covered in Section 2)

H226 - Flammable liquid and vapor
H302 - Harmful if swallowed
H319 - Causes serious eye irritation
H412 - Harmful to aquatic life with long lasting effects

Abbreviation Key

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	Accord Dangereux Routier (European regulations concerning the international transport of dangerous goods by road)
CAS	Chemical Abstract Services
CFR	Code of Federal Regulations
DOT	Department of Transportation
EMS Guide	Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA	Environmental Protection Agency
ERG	Emergency Response Guide Book
FDA	Food and DrugAdministration
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
HCS	Hazard Communication Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association half maximal
ICAO	International Civil Aviation Organization
IDLH	Immediately Dangerous to Life and Health
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
mppcf	Millions of Particles Per Cubic Foot
NA	North America
NAERG	North American Emergency Response Guide Book
NIOSH	National Institute for Occupational Safety
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PBT	Persistent, Bioaccumulating and Toxic
PEL	Permissible exposure limit
PMCC	Pensky-Martens Closed Cup
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
RID	Dangerous Goods by Rail
RQ	Reportable Quantity
TCC/Tag	Tagliabue Closed Cup
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time-weighted Average
UN	United Nations
VOC	Volatile Organic Compounds
vPvB	Very Persistent and Very Bioaccumulating
WHMIS	Workplace Hazardous Materials Information System

Revision date: 29 July 2019, Version 2
Superseded SDS: 17 April 2019, Version 1