SAFETY DATA SHEETS:
Zydex Industries
PRODUCT NAME: ZYCOTHERM SP

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1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY/UNDERTAKING

- **Product Name-** Zycotherm SP
- **Recommended use of chemical and restriction on use- Identified Uses:** Additive for addition to Bitumen modification and for Aggregate treatment.
- **Company Identification-** Zydex Industries , 61, Gotri Sevasi Road, Gotri, Vadodara, Gujarat , India -390 021
- **Customer Information Number-** 91-265-3312000, info@zydexindustries.com www.zydexindustries.com
- **Emergency Telephone Number-** Dr. Ajay Ranka (+91) 9825008145/
  Dr. Moulik Ranka (+91) 7567622211

2. HAZARDS IDENTIFICATION

- **Hazard Classification-**

  Product classification according to Regulation (EC) 1272/2008 (CLP):
  Acute toxicity, Inhalation – Category 4, H332
  Acute toxicity, Oral - Category 4, H302
  Eye irritation - Category 2, H319
  Product classification according to Directive 67/548/EEC or 1999/45/EC: Harmful
  R20/22 Harmful by inhalation and if swallowed.
  R36 Irritating to eyes.
  Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Annex	Hazard class and category	Hazard statement code(s)
A.4S	skin sensitization	Cat. 1 (Skin Sens. 1) H317

  Remarks
  Hazards not otherwise classified
  - May be harmful if inhaled (GHS category 5: acutely toxic - inhalation).
  - May be harmful if swallowed (GHS category 5: acutely toxic - oral).

- **Hazard Pictograms-**

- **Label Elements-**

  Product labelling according to Regulation (EC) 1272/2008 (CLP): Benzyl alcohol
  Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Annex III. Regulations in individual countries/regions may determine which statements are required on the product label. See product label for specifics.

- **Signal Warning-** Warning

  Hazard statements:

  H302 Harmful if swallowed.
  H317 May cause an allergic skin reaction
  H319 Causes serious eye irritation.
  H332 Harmful if inhaled.

- **Precautionary Statements-**

  P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
  P264 Wash thoroughly after handling.
  P270 Do not eat, drink or smoke when using this product.
  P271 Use only outdoors or in a well-ventilated area.
  P280 Wear eye protection/face protection.
  P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
  P330 Rinse mouth.
  P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P337+P313 If eye irritation persists: Get medical advice/attention.
  P312 Call a POISON CENTER or doctor/physician if you feel unwell.
  P501 Dispose of contents/container in accordance with local, regional and international regulations.

- **Other hazards:**

  PBT/vPvB criteria: This product does not meet the PBT and vPvB classification criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

- Substance/Synonyms- Proprietary Organosilane compounds

Component	CAS No.	Concentration (%)
Alkoxy-alkylsilyl compounds	-	39-41
Benzyl Alcohol	100-51-6	58-60
Ethylene Glycol	107-21-1	1-2

4. FIRST AID MEASURES

- **Description of first aid measures-**
  - **General Advice-** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
  - **Inhalation-** Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell.

- **Skin Contact-** Remove/Take off immediately all contaminated clothing. Wash with plenty of soap and water. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.
- **Eye Contact-** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists.
- **Ingestion-** Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

➢ **Most Important symptoms and effects, both acute and delayed**- Dizziness, Drowsiness, headache, irritation, nausea, pre-existing sensitization, skin and/or respiratory disorders or diseases may be aggravated.

➢ **Indication of any immediate medical attention and special treatment needed-** Treat Symptomatically

5. FIREFIGHTING MEASURES

➢ **Suitable Extinguishing Media-** Water fog or fine spray, dry chemical fire extinguisher. Carbon dioxide fire extinguisher. Foam. Alcohol Resistance foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

➢ **Unsuitable Extinguishing Media-** Do not use direct water stream. May spread fire.

➢ **Special hazards arising from substance/mixture**
Hazard Combustion products- During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.
Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

➢ **Advice for firefighters**
Firefighting procedures- Keep people away. Isolate fire & deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reigniting has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

- **Special Protective equipment for firefighter:**
  Wear positive –pressure self – contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

- **Personal precautions, protective equipment and emergency procedures**-
  - **General measures-** Remove ignition sources. Use special care to avoid static electric charges. No naked lights. No smoking
  - **For non-emergency personnel -** Emergency procedures: Evacuate unnecessary personnel. Stop leak without risks if possible. Avoid contact with skin, eyes and clothing. Avoid inhalation of vapours.
  - **For emergency responders -** Protective equipment Equip clean-up crew with proper protection. Avoid inhalation of vapours. Avoid contact with skin and eyes.
  - **Emergency procedures -**Ventilate area.

- **Environmental precautions-** Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

- **Methods and materials for containment and cleaning up-** Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

7. HANDLING AND STORAGE

- **Precautions for safe handling-**
  - Use Hand gloves and Safety glass for handling spill.
  - Ensure thorough ventilation of stores and work areas.
  - Keep away from heat and ignition source, Keep away from sparks.
  - Product reacts with moisture and generates polymeric material and alcohols.
  - Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

- **Conditions for safe storage-**

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables - area. Do not store near perchlorates, peroxides, chromic acid or nitric acid.

- **Storage Stability-** Keep away from moisture.
- **Shelf life**- 48 months

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- **Control parameters-**

Chemical name	EU OELV	EU IOELV	ACGIH - TWA	ACGIH - STEL	UKWELs
Benzyl Alcohol	N/E	N/E	N/E	N/E	N/E
Ethylene Glycol	40 ppm	40 ppm	100 mg/M^3	40 ppm	TWA 52 ppm, STEL 104 ppm

N/E- Not Established (No exposure limits established for listed substances for listed country/ region/organization)

- **Exposure Controls-**
  - Personal protective equipment - Avoid all unnecessary exposure.
  - Hand protection - Wear protective gloves.
  - Eye protection - Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR1910.133 or European Standard EN166.
  - Skin and body protection - Wear appropriate protective gloves to prevent skin exposure. Wear appropriate protective clothing to prevent skin exposure.
  - Respiratory protection - A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
  - Thermal hazard protection - Not required for normal conditions of use.
  - Environmental exposure controls - Avoid release to the environment.
  - Other information - Do not eat, drink or smoke during use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Liquid
Color	:	Pale Yellow to brownish Yellow
Odour	:	Slight Aromatic
Odour Threshold	:	No data available
Melting point	:	< -10°C
Freezing point	:	< -10°C
Boiling point	:	189°C

Flash point	:	>75 °C (167 °F) and > 250 °C (482 °F) [2 wt% in Bitumen] (closed cup method)
Evaporation rate	:	No data available
Partition coefficient	:	No data available
Auto ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity	:	<150 CPS (at 30±2°C)
Kinematic viscosity	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	Not Explosive
Oxidizing properties	:	Not Oxidizing
Molecular weight	:	N/A
Flammability	:	No data available
Vapor pressure	:	No data available
Density	:	1.03±0.01 grams/cc (at 30±2°C)
Relative vapor density	:	(Air =1) >1 calculated
Water solubility	:	Water dispersible
Lower explosion limit	:	No test data available
Upper explosion limit	:	No test data available

[Note: Physical data presented above are typical values and should not be construed as a specification]

10. STABILITY AND REACTIVITY

- **Reactivity-** It can react with Silanol and Hydroxyl group containing molecules.
- **Chemical stability-** St Stable under normal conditions. Moisture exposure may form flammable/explosive vapour-air mixture.
- **Possibility of hazardous reactions-** Under fire conditions closed containers may rupture or explode. Can form explosive mixture with air.
- **Conditions to avoid-** Direct sunlight. Extremely high or low temperatures and moisture.
- **Incompatible materials-** Water. Acids, Oxidizing agents
- **Hazardous decomposition products-** Carbon monoxide, Carbon dioxide

11. TOXICOLOGICAL INFORMATION

- **Acute Toxicity**
  - Acute Oral Toxicity- Toxicity if swallowed- LD50 >2000 mg/kg
  - Acute Dermal Toxicity- Prolonged skin contact is likely to result in mild irritation. Testing was done with mice bare skin - PSI Value is 0.33 (PSI Range- 0 for no irritation and 0-2 for mild irritation)
  - Acute Inhalation Toxicity- At 150°C, the silane component is solid and has no vapour pressure, exposure to vapour is minimal due to low volatility of associated solvents.

- **Skin Irritation-** Brief contact is essentially none irritating to skin.

- **Serious eye damage/Eye irritation-** May cause slight temporary eye irritation. Corneal injury is unlikely.

- **Sensitization-**
  - For skin sensitization- No relevant data available
  - For respiratory sensitization- No relevant data available

- **Specific target organ toxicity (STOT)-**
  - STOT single exposure- Not classified (based on available data, the classification criteria are not met)
  - STOT repeated toxicity- Not classified (based on available data, the classification criteria are not met)

- **Carcinogenicity -** Not classified (based on available data, the classification criteria are not met). BENZYL ALCOHOL: Under conditions of a two-year NTP gavage study, there was no evidence of carcinogenic activity for rats or mice receiving 200 or 400 mg/kg.

- **Reproductive toxicity-** Not classified (based on available data, the classification criteria are not met).
  BENZYL ALCOHOL: No effects on reproductive organs were observed in subchronic and long-term studies with rates and mice. Developmental toxicity oral study, mouse: NOAEL (no-observed-adverse-effect level), maternal toxicity=550 mg/kg bw/day; NOAEL, developmental toxicity=550 mg/kg bw/day. No developmental effects were observed in absence of maternal toxicity.

- **Mutagenicity-** Not classified (based on available data, the classification criteria are not met).
  BENZYL ALCOHOL: Ames testing showed no mutagenic activity and mixed results both positive and negative were observed from other in-vitro genotoxicity assays. Benzyl alcohol showed no genotoxicity during in-vivo testing. The weight of the evidence indicates this material is not mutagenic or clastogenic.

- **Components influencing toxicology**-

Chemical Name	**LC50 Inhalation**	**Species**	**LD50 Oral**	**Species**	**LD50 Skin**	**Species**
Benzyl Alcohol	>4178 /M^3 4 hrs Aerosol	Rat/ adult	1620/mg/kg	Rat/adult	N/E	

BENZYLALCOHOL: Long term animal studies indicate a gavage NOAEL (no-observed-adverse-effect-level) >=400 mg/kg/day for rats and >=200 mg/kg/day for mice. At higher doses, effects on bodyweights, brain lesions, thymus, skeletal muscle, kidneys, liver and central nervous

system were observed. In a 4-week inhalation study in rats on Benzyl Alcohol, no adverse effects were observed with a no-observed-adverse-effect level (NOAEC) of 1,072 mg/m3.

12. ECOLOGICAL INFORMATION

Chemical Name	Fish 96hr LC50	Species	Fish 96hr LC50	Species Fish	Chronic NOEC	Species
Benzyl Alcohol	45mg/L	Pimephalis promelas (Fathead minnow)	>100 mg/L	Oryzias latipes (Medaka)	N/E	

Chemical Name	Invertebrates 48 hr EC50	Species	Invertebrates 24 hr EC50	Species	Invertebrates Chronic NOEC	Species
Benzyl Alcohol	230mg/L	Daphnia magna	440 mg/L	Pseudokirchneriella subcapitata	310 mg/L (72 hours)	Pseudokirchneriella subcapitata

Chemical Name-	Algal 96hr EC50	Species	Algal 72hr EC50 growth rate	Species	Algal Chronic NOEC	Species
Benzyl Alcohol	N/E		770 mg/L	Pseudokirchneriella subcapitata	310 mg/L (72 hours)	Pseudokirchneriella subcapitata

- **Persistence and degradability-** Not Established
- **Bio accumulative Potential-** Not Established
- **Mobility in Soil-** No additional information available
- **Other adverse effects-** Avoid release to the environment

13. DISPOSAL CONSIDERATIONS

- **Waste treatment methods-**
  - **Waste disposal recommendations-** Dispose in a safe manner in accordance with local/national regulations. Dispose of this material and its container to hazardous or special waste collection point.

- **Additional information-** Handle empty containers with care because residual vapours are flammable.
- **Ecology-waste materials**- Hazardous waste due to toxicity. Avoid release to the environment.

14. TRANSPORT INFORMATION

- **UN Number**
  - UN-no (Land transport)- Not Regulated
- **UN proper shipping name**
  - Proper shipping name (Land transport)- BENZYL ALCOHOL SOLUTION
  - Proper shipping name (IATA)- BENZYL ALCOHOL SOLUTION
  - Proper shipping name (IMDG)- BENZYL ALCOHOL SOLUTION

- **Transport hazard class (es)**
  - Class (land transport)- Not applicable
  - Class (IATA)- Not applicable
  - Class (IMDG)- Not applicable

- **Packing group**
  - Packing group (Land transport)- III

- **Environmental hazards**
  - Other information- Not Classified

- **Special precautions for user**
  - Special transport precautions- Ensure there is adequate ventilation.
- Overland transport- Not Regulated
- Transport by sea- Not Regulated
- Air transport- Not Regulated

- **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
  The cargo is not intended to be carried in Bulk.

15. REGULATORY INFORMATION

- EU
  - EU authorization and/or restrictions on use- Not Applicable
  - Other EU information- REACH Registration Numbers, 17-2119878844-17-0000, 01-2119492630-38-0005, 17-2119878842-23-0000

- National regulations- No Additional Information
- CA Prop. 65- Ethylene glycol (ingested)- developmental 107-21-1- June 19, 2015
- Chemical inventories-
- Regulation Status-
  Canadian Domestic Substances List (DSL): Y
  Canadian Non-Domestic Substances List (NDSL): N
  European Inventory of Existing Chemical Substances (EINECS): Y

European List of notified chemical substances (ELINCS): Y
Europe REACH (EC) 1907/2006: Pre registration
U.S. Toxic Substances Control Act (TSCA): Y

16. OTHER INFORMATION

- Hazard rating system
  - NFPA (national fire protection association)
    Health-2 Fire- 1 Reactivity-0

  - HMIS (Hazard Material Identification System)
    Health-1 Fire- 1 Reactivity-0

- Revision date- June 20, 2018

Zydex Industries urges each customer or recipient of this (M) SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective data shown above. However no warranty express or implied is given. Regulatory requirements are subject to change and may differ between various locations.