

**MATERIAL SAFETY DATA SHEET**

**READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSAL OF PRODUCT**

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

<b>1.1 Material Identity / Product identifier:</b>	Expandable Polystyrene
<b>Chemical name:</b>	Expandable Polystyrene (containing pentane expanding agent).
<b>Synonyms:</b>	FR-ESP, flame Retardant Expandable polystyrene, poly(phenylethene).
<b>Structural Formula:</b>	$(C_8H_8)_x$ ; $(-CH(C_6H_5)-CH_2-)_x$
<b>CAS Registry Number:</b>	9003-53-6
<b>Chemical Name and/ or Family or Description:</b>	
<b>Chemical Family:</b>	Polymer.
<b>1.2 Relevant identified uses of the substance or mixture:</b>	Used primarily for the manufacture of foamed thermal insulation and packaging
<b>1.3 Company Information</b>	
<b>Company name:</b>	Novidesa S.A. de C.V.
<b>Company address:</b>	Km. 154 Carretera México-Veracruz (Vía Texcoco), (KM. 8 Carretera Apizaco-Veracruz) Corredor Industrial San Cosme Xalostoc, Tlaxcala 90460
<b>Telephone Numbers</b>	
<b>Transportation Emergency Company:</b>	+ (52) (241) 413-0000
<b>SETIQ (México)</b>	01-800-00-214-00
<b>CHEMTREC (USA):</b>	800-424-930
<b>CANUTEC (Canada)</b>	(613) 996-66660
<b>Medical Emergency:</b>	+ (52) (241) 413-0000
<b>General MSDS Assistance:</b>	+ (52) (241) 413-0000
<b>Technical Information:</b>	+ (52) (241) 413-0000

**2. HAZARD IDENTIFICATION**

<b>2.1 Classification of the substance or mixture</b>	
<b>2.1.1 Directive 67/548/EEC &amp; Directive 1999/45/EC</b>	In use, may form flammable/explosive vapour-air mixture.
<b>2.1.2 Regulation (EC) No. 1272/2008 (CLP)</b>	In use may form flammable/explosive vapour-air mixture.
<b>2.2 Label elements</b>	
<b>2.2.1 Label elements</b>	According to Directive 67/548/EEC & Directive 1999/45/EC
<b>Hazard Symbol</b>	None.
<b>Risk Phrases</b>	R18: In use, may form flammable/explosive vapour-air mixture
<b>Safety Phrases</b>	S3/7: Keep container tightly closed in a cool place. S9: Keep container in a well-ventilated place. S16: Keep away from sources of ignition - No smoking. S33: Take precautionary measures against static discharges.
<b>2.2.2 Label elements</b>	According to Regulation (EC) No. 1272/2008 (CLP)
<b>Hazard Pictogram</b>	None.
<b>Signal word(s)</b>	None.
<b>Hazard statement(s)</b>	EUH018: In use may form flammable/explosive vapour-air mixture.
<b>Precautionary statement(s)</b>	P210: Keep away from heat, sparks, open flame, hot surfaces - No smoking. P233: Keep container tightly closed. P243: Take precautionary measures against static discharge. P403 + P235: Store in a well-ventilated place. Keep cool.
<b>2.3 Other hazards:</b>	Product releases pentane, a flammable hydrocarbon. May cause irritation to skin and eyes.

### 3. COMPOSITION AND INFORMATION ON INGREDIENTS

Polystyrene (CAS No. 9003-53-6), containing pentane isomers as blowing agent.

#### 3.1 Substances: Polymer

EC Classification No. 67/548/EEC

Hazardous ingredient(s)	%W/W	CAS No.	EC No.	EC Classification and Risk Phrases
Pentane (mixed isomers)	< 7	109-66-0 78-78-4	203-692-4 201-142-8	F+; R12, Xn; R65, R66, R67, N; R51/53.
Expandable Polystyrene	>93	9003-53-6	Not available	R18: In use, may form flammable/explosive vapour-air mixture

EC Classification No. 1272/2008

Hazardous ingredient(s)	%W/W	CAS No.	EC No.	Hazard pictogram(s) And Hazard Codes
Pentane (mixed isomers)	< 7	109-66-0 78-78-4	203-692-4 201-142-8	GHS02, Flam. Liq. 1; H224 GHS08, Asp. Tox.1; H304 GHS07, STOT SE 3 H336, GHS09, Aquatic Chronic. 2;H411, EUH066

### 4. FIRST AID MEASURES

<b>4.1</b>	<b>General</b>	Pentane used to expand the pearl is the main risk in the management of EPS.
	<b>Inhalation</b>	If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.
	<b>Ingestion</b>	If more than several mouthfuls of this material are swallowed, give two glasses of water (16 oz.). Get medical attention..
	<b>Skin</b>	Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.
	<b>Eye</b>	Flush eyes with plenty of water for several minutes. Remove larger particulates from the eye as one would any foreign object. Get medical attention if eye irritation persists or particulates are difficult to remove from the eye.
<b>4.2</b>	<b>POTENTIAL HEALTH EFFECTS</b>	<b>Primary Route of Exposure</b> Eye <u>  </u> X <u>  </u> Skin <u>  </u> X <u>  </u> Inhalation <u>  </u> X <u>  </u> Ingestion <u>  </u>  <b>Effects of Overexposure</b>
	<b>Ingestion</b>	Dust may cause irritation of the nose and throat. Overexposure to high concentrations of dust may cause respiratory irritation, experienced as coughing and difficulty breathing. If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur.
	<b>Inhalation</b>	Vapors or mist may cause irritation of the nose and throat. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.
	<b>Eye contact</b>	Vapor may cause irritation, experienced as discomfort, with excess tear production and blinking, and seen as excess redness of the eye. Product may contain residual amounts of dust or small particulates which may cause eye irritation or abrasion experienced as mild discomfort and slight excess redness of the eye.
	<b>Skin contact</b>	Product may contain residual amounts of dust or small particulates that may cause skin irritation or abrasion experienced as local redness with possible mild discomfort.
	<b>Sensitization Properties:</b>	Unknown
	<b>Chronic:</b>	Prolonged or repeated inhalation of dust or particulates may impair lung function or cause lung damage.
<b>4.3</b>	<b>Medical attention</b>	Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease.

## 5. FIRE –FIGHTING MEASURES

**Ignition Temperature - AIT (degrees C):**

260 (500 F) for Pentane  
 471 (880 F) by ASTM D-1929 Expanded polystyrene

**Flash Point (degrees C)**

-40 (-40 F) CC for Pentane

**Flammable Limits % (Lower-Upper):**

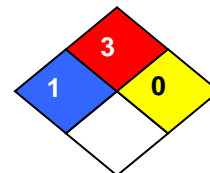
Lower: 1.5 for Pentane

Upper: 7.8 for Pentane

5.1	<b>Recommended Fire Extinguishing Agents And Special Procedures:</b>	Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, foam or carbon dioxide to extinguish flames.
	<b>Unsuitable extinguish media</b>	Do not use water jet.
5.2	<b>Unusual or Explosive Hazards:</b>	Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers. Explosive air-vapor mixtures may form. Fire gives off dense black smoke and acid gasses. Electrostatic discharge can be a source of ignition due to accumulated pentane vapors exceeding the L.E.L. (lower explosive limit) of 1.5% (15,000 ppm). Pentane vapors may be emitted from newly opened containers or when the product is heated. If ignited, there could be a very high rate of flame propagation
	<b>Combustion decomposition products</b>	Can produce carbon monoxide, carbon dioxide, styrene, aliphatic hydrocarbons
5.3	<b>Advice for firefighters</b>	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Chemical protection suit. Keep containers cool by spraying with water if exposed to fire. Flammable concentrations of pentane may accumulate on storage in closed containers
	<b>Personal protective equipment</b>	Wear full protective clothing (chemical splash suit) and positive pressure self-contained breathing apparatus.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD IDENTIFICATION**

**NFPA -Health:** 1 – Slightly dangerous. Irritation or possible reversible damage within 7 days.  
**NFPA -Flammability:** 3 – Liquid or solid can burn under almost all ambient temperatura condicions.  
**NFPA -Instability:** 0 - Normally stable, even under fire conditions, and not reactive with water.



## 6. ACCIDENTAL RELEASE MEASURES

6.1	<b>Personal precautions</b>	Caution - spillages may be slippery. The remaining pentane in the EPS may form explosive mixtures with air. Pentane vapor is heavier than air, watch out for pits and confined spaces. Away or avoid the danger of any cause of fire. Avoid friction, sparks and other means of ignition. Avoid static discharges. Use only non-sparking tools.
6.2	<b>Environmental precautions</b>	Prevent entry into sewers or drains
6.3	<b>Methods and material for containment and cleaning up</b>	If safe to do the following: Small spills: Sweep up and shovel into waste drums or plastic bags. Transfer to a lidded container for disposal or recovery. Large spills: If possible, use vacuum equipment suitable for hazardous environments for cleaning up spills. Transfer to a covered container for disposal or spilled material recuperación.
6.4	<b>Reference to other sections</b>	See section 8 to personal protective protection and section 13 to waste treatment methods

**Remark:** see section 8 to personal protective protection and section 13 to waste treatment methods

## 7. HANDLING AND STORAGE

7.1	<b>Precautions for safe handling</b>	Provide adequate ventilation including appropriate local extraction system. Do not breathe fumes / vapor. Avoid creating dust clouds. Should be kept away from open flames and other sources of ignition. Extinguish any other fire. Away or avoid the danger of any cause of fire. avoid friction, sparks and other means of ignition. The electrical system should not generate sparks. Do not smoke during use. Avoid static discharges. Make sure you are properly grounded. Avoid release to the environment. They must obtain permission from the appropriate local authority before discharge of waste material.
7.2	<b>Process Hazards</b>	Avoid static discharges. To avoid the formation of static electricity, and creating an explosive mixture of pentane / air, the containers should be emptied completely during processing. The line speed should not exceed 8 m / s during normal pumping operations. All parts of the plant and equipment must be interconnected among themselves and grounded. Ground rods should be checked periodically. Be used antistatic clothing and footwear.
7.3	<b>Conditions for safe storage, including any incompatibilities</b>	When stored in closed containers of flammable concentrations may pentane. Before unloading cargo containers, keep the doors open and let it ventilate for one hour. Keep container in a cool, well ventilated place and keep tightly closed. Keep away from direct sunlight and other sources of heat or ignition. Keep away from rain and wet conditions. Mass: Keep under inert gas. Open reservoirs must be covered with an open rigid grid. Avoid static discharges. The electrical system should not generate sparks. The product is usually octagonal barrels fiber. Do not stack containers. Storage Temperature: Ambient.
7.4	<b>Specifically designed for local vessels storage</b>	The storage rooms must be kept cool to reduce the release of pentane, and be provided with an adequate venting system to avoid accumulation of pentane. Furthermore, should applied safety devices to alert the formation of explosive mixtures of pentane / air. The electrical system should not generate sparks. The equipment to be installed in potentially explosive atmospheres must comply with the requirements of NOM-001-SEE-2005 Chapter 5 and ATEX Directive 94/9/EC.
7.5	<b>Specific end use(s)</b>	See section 1.2

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control Parameters.

#### 8.1.1 Occupational Exposure Limits.

Limits expandable agent, during the conversion process (expansion) preparation releases pentane.

SUBSTANCE	CAS No.	TWA - LTEL		STEL		LMPE-PPT (MEX)		LMPE-CT o Pico (MEX)	
		(8 h ppm)	(8 h mg/m <sup>3</sup> )	(15min. ppm)	(15min. mg/m <sup>3</sup> )	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
<b>Pentane (isomers mixed)</b>	109-66-0 78-78-4	600	1800	-----	-----	600	1800	760	2250

Maximum permissible exposure limits for mixing, andparticle days 8 hours40 hours per week: LMPE-PPT

8.1.2 Biological limit value not established.

8.1.3 PNEC and DNEL not established.

### 8.2 Exposure controls

8.2.1 Appropriate engineering controls Use only in well ventilated.

### 8.2.2 Personal Protection Equipment

Eye protection / face



Safety glasses.

Skin protection (hand guard / Other)



Wear suitable gloves. Recommended: Impervious gloves (EN 374). Penetration time of glove material: see the information provided by the manufacturer of the gloves.

Wear suitable protective clothing.

Safety shoes or boots antistatic antistatic

Respiratory Protection



If dust is generated during handling, you must use an approved dust mask

Thermal hazards

Not applicable.

### 8.2.3 Environmental Exposure Controls

Local regulations on volatile organic compounds (VOCs) must be complied with where applicable to the EPS industry

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Solid smalls spherical beads
<b>Color:</b>	White.
<b>Odor:</b>	Perceptible
<b>Molecular Weight:</b>	10,000-300,000
<b>pH:</b>	Not available.
<b>Melting Point:</b>	240,0 °C
<b>Boiling Point:</b>	Not available.
<b>Flash Point:</b>	345-360 °C (closed cup) (<-50°C pentane)
<b>Explosive properties:</b>	In use, air-mixtures may form flammable / explosive vapor.
<b>Auto ignition (Ignition) Temperature:</b>	285 °C (Pentane) (ASTM E-659)
<b>Lower Flammable (Explosive) Limit (LFL/LEL):</b>	1,5 % (v/v) (Pentane)
<b>Upper Flammable (Explosive) Limit (UFL/UEL):</b>	7,8 % (v/v) (Pentane)
<b>Relative Density :</b>	1020-1050 Kg/m <sup>3</sup> @20°C (spherical)
<b>Vapors Density (air = 1):</b>	2,5 (Pentane)
<b>Partition coefficient: n-octanol/water:</b>	long Pow=0.73
<b>Solubility (Water):</b>	insoluble.
<b>Solubility(Others)</b>	Soluble in aromatic solvents, halogenated ketones.

9.2 Additional information: None.

## 10. STABILITY AND REACTIVITY

10.1	<b>Reactivity</b>	Stable under normal conditions
10.2	<b>Chemical stability</b>	Not available
10.3	<b>Possibility of hazardous reactions</b>	In use, air-mixtures may form flammable / explosive vapor
10.4	<b>Conditions to avoid</b>	Keep away from heat, ignition sources and direct sunlight.
10.5	<b>Incompatible materials</b>	Avoid storing or handling of these materials with explosives of Class 1 UN .
10.6	<b>Hazardous decomposition products</b>	Pentane, styrene monomer, carbon monoxide (in case of fire or during the hot wire cutting). The release of pentane increases with temperature. (beads are expanded with evolution of pentane).
10.7	<b>Hazardous Polymerization</b>	Does not occur

## 11. TOXICOLOGICAL INFORMATION

This assessment is based on the information available on similar products.

### 11.1 Information on toxicological effects

#### 11.1.1 Polymer severe toxicity

<b>Inhalation:</b>	The product may release vapors of pentane, which in high concentrations can cause dizziness, headache and anesthetic effects.
Ingestion:	Unlikely to be hazardous by ingestion.
Skin contact:	Not available.
Eye Contact:	Not available.
Irritation:	May cause irritation to skin and eyes.
Corrosivity:	Not available.
Sensitization:	No data.
Repeated dose toxicity:	No data.
Carcinogenicity:	No data.
Mutagenicity:	No data.
Reproductive toxicity:	No data.

**11.2 Other information:** None

## 12. ECOLOGICAL INFORMATION

This environmental hazard assessment is based on information available on similar products.

This product contains a substance that is classified as hazardous to the environment. However, recent studies on aquatic organisms have shown that the beads of EPS (Expanded Polystyrene), not containing this substance need not be classified as hazardous to the environment

### 12.1 Toxicity

#### Aquatic invertebrates:

EC50 (48 h) > 100 mg / l, Daphnia magna (OECD Guidelines 202, part 1, static) Nominal concentration. The product has a low solubility in the test medium. An eluent has to be examined. No toxic effects within the range of solubility.

#### Aquatic plants:

EC50 (72 h) > 100 mg / l (growth rate), Scenedesmus subspicatus (OECD Guidelines 202, part 1, static) Nominal concentration. The product has a low solubility in the test medium. An eluent is to be examined. No toxic effects within the range of solubility.

### 12.2 Persistence and degradability

The product itself has not been tested. In accordance with the required stability of the product is not biodegradable. The statement has been obtained from the product structure. Can be largely eliminated from water by abiotic processes such as mechanical separation.

### 12.3 Bioaccumulative potential:

The product has a low potential for bioaccumulation.

### 12.4 Mobility in soil:

The product is essentially insoluble in water. The expandable polystyrene sinks in fresh water, can float or sink in seawater.

### 12.5 Results of PBT and vPvB:

Not classified as PBT or vPvB.

### 12.6 Other adverse effects:

Pentane has a Global Warming Potential (GWP) very low (<0.00044) and a zero Ozone Depletion Potential.

### 13. DISPOSAL CONSIDERATION

The beads old and unused surplus may contain residual pentane. Therefore, the product should be subject to all existing security measures for fresh material. See also Section 7.

**13.1 Methods of waste treatment is possible recovery or recycling.** Separate all containers for recovery or disposal.

**13.2 Additional information:** The normal route of elimination by incineration using a specialized contractor accredited. Dispose of contents in accordance with applicable local, state or national

### 14. TRANSPORT INFORMATION

#### 14.1 US DOT Information

**Shipping Name:** Polymeric beads, expandable  
**UN/NA #:** UN2211, **Hazard Class:** 9, **Packing group:** III  
**Required Label (s):** Class9: Miscellaneous  
**Additional information:** 2012 Emergency Response Guidebook, Guide N° 133.

#### 14.2 Canadian TDG Information

**Shipping Name:** Polymeric beads, expandable  
**UN/NA #:** UN2211, **Hazard Class:** 9, **Packing group:** III  
**Required Label (s):** Class9: Miscellaneous  
**Additional information:** 2012 Emergency Response Guidebook, Guide N° 133.

#### 14.3 International Air Transport Association (IATA) and International Civil Aviation Organization (ICAO) Information

**Shipping Name:** Polymeric beads, expandable  
**UN/NA #:** UN2211, **Hazard Class:** 9, **Packing group:** III  
**Required Label (s):** Class9: Miscellaneous

#### 14.4 International Maritime Dangerous Goods (IMDG) Regulations

**Shipping Name:** Polymeric beads, expandable  
**UN/NA #:** UN2211, **Hazard Class:** 9, **Packing group:** III  
**Required Label (s):** Class9: Miscellaneous  
**Additional information:** EmS N°: F-A, S-I  
**Marine pollutant:** No

### 15. REGULATORY INFORMATION

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

#### Federal Regulations:

**SARA Title III:**  
**Section 302/304 Extremely Hazardous Substances**

None.

#### Chemical Name

None

#### Section 311 Hazardous Categorization:

Acute  Chronic  Fire  Pressure  Reactive  N/A

#### Section 313 Toxic Chemical

None.

#### CERCLA 102(a)/DOT Hazardous Substances:

None.

#### States Right-to-Know Regulations:

State Right-to-know

#### Chemical Name

Pentane  
FL, MA, MN, NJ, PA, RI

**California Prop. 65:**

The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

**16. OTHER INFORMATION**

**Risk Phrases and Safety Phrases:**

R12	Extremely flammable.
R65	Harmful if swallowed can cause lung damage.
R66	Repeated exposure may cause skin dryness or cracking skin.
R67	Vapours may cause drowsiness and dizziness.

**Symbol of Danger**



**Regulation (EC) No. 1272/2008 (CLP)**

**Hazard statements, precautionary statements and codes of danger:**

H224 Extremely flammable liquid and vapor.  
H304 May be fatal if swallowed and enters airways.  
H336 May cause drowsiness or dizziness.  
H411 Toxic to aquatic life with long lasting effects  
EUH066 Repeated exposure may cause skin dryness or cracking skin  
Flam. infl. Flammable liquids 1 Category 1  
Tox. asp. 1 Danger of aspiration. Category 1  
STOT only 3 specific target organ toxicity (single exposure) Category 3

**Hazard pictograms**



THIS INFORMATION IS BASED UPON CALCULATED DATA. THE COMPANY HOLDS NO RESPONSIBILITY FOR DAMAGE SUFFERED BY THE PURCHASER OR OTHER PERSONS HANDLING THESE GOODS IF SAFETY INSTRUCTIONS ARE NOT OBSERVED. THE COMPANY HOLDS NO RESPONSIBILITY FOR THE WRONG USE OF THIS MATERIAL, EVEN IF SAFETY INSTRUCTIONS HAVE BEEN FOLLOWED. THE PURCHASER IS SOLELY RESPONSIBLE FOR THE USE OF THIS MATERIAL.