

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

---

### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

---

#### 1.1. PRODUCT IDENTIFIER

Product name: HFS2100  
Synonyms: Polymer modifier resin  
Chemical name: Modified adhesive high density polyethylene resin  
Chemical family: Aliphatic compounds, Hydrocarbons, Polymer

#### 1.2. RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS ON USE

Recommended use: Polymer, Raw material  
Restrictions on use: Not available

#### 1.3. MANUFACTURER OR SUPPLIER'S DETAIL

Company: TWO H Chem Ltd.  
Address: 234 Chungmin-Ro, Goesan-Eup, Goesan-Gun, Chungcheongbuk-Do, Korea  
Emergency phone: 82-43-832-6760  
Other calls: 82-70-8255-7369

---

### SECTION 2: HAZARDS IDENTIFICATION

---

#### 2.1. GHS CLASSIFICATION

Not available  
Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

#### 2.2. GHS LABEL ELEMENT

Not available  
Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

Pictogram and symbol: Not applicable  
Signal word: Not applicable  
Hazard statement: Not applicable  
Precautionary statements  
- Prevention: Not applicable  
- Response: Not applicable  
- Storage: Not applicable  
- Disposal: Not applicable

#### 2.3. OTHER HAZARD INFORMATION NOT INCLUDED IN HAZARD CLASSIFICATION

EUH001: It is explosive when dry.  
NFPA RATING SYSTEM HEALTH: 1, FIRE: 1, REACTIVE: 0

---

### SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

---

#### 3.1. INGREDIENTS

Chemical name	Common name	CAS No.	%WT
Maleic Anhydride Modified Polyethylene	Modified PE	-	> 99.0
Maleic Anhydride (Residual)	MAH	108-31-6	< 0.1

---

### SECTION 4: FIRST AID MEASURES

---

4.1. GENERAL ADVICE: No hazards which require special first aid measures.  
Skin contact: Take off contaminated clothing and shoes immediately.  
Wash off with soap and plenty of water.

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

Eye contact:	Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing.
Inhalation:	Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician.
Ingestion:	Clean mouth with water and drink afterwards plenty of water. Do not give milk or alcoholic beverages.

4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYER:  
None known.

4.3. PROTECTION OF FIRST-AIDERS: Not available

---

### SECTION 5: FIRE-FIGHTING MEASURES

---

#### 5.1. SUITABLE AND UNSUITABLE EXTINGUISHING MEDIA

Suitable extinguishing media:	Dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO <sub>2</sub> .
Unsuitable extinguishing media:	High pressure water streams.

#### 5.2. SPECIFIC HAZARDS ARISING FROM THE CHEMICAL

May be ignited by heat, sparks of flames.  
Containers may explode when heated.  
Some of these materials may burn, but none ignite readily.  
Fire will produce irritating and/or toxic gases.  
If inhaled, may be harmful.

#### 5.3. SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE-FIGHTERS

Dike fire-control water for later disposal; Do not scatter the material.  
Move containers from fire area if you can do it without risk.  
Fire involving tanks; Cool containers with flooding quantities of water until well after fire is out.  
Fire involving tanks; Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.  
Fire involving tanks; Always stay away from tanks engulfed in fire.

---

### SECTION 6: ACCIDENTAL RELEASE MEASURES

---

#### 6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Eliminate all ignition sources.  
Stop leak if you can do it without risk.  
Please note that materials and conditions to avoid.  
Ventilate the area.  
Do not touch or walk through spilled material.  
Prevent dust cloud.

#### 6.2. ENVIRONMENTAL PRECAUTIONS AND PROTECTIVE PROCEDURES

Prevent entry into waterways, sewers, basements or confined areas.

#### 6.3. THE METHODS OF PURIFICATION AND REMOVAL

Small spill:	Flush area with flooding quantities of water. And take up with sand or other non-combustible absorbent material and place into containers for later disposal.
Large spill:	Dike far ahead of liquid spill for later disposal. With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

---

### SECTION 7: HANDLING AND STORAGE

---

#### 7.1. PRECAUTIONS FOR SAFE HANDLING

Be careful to dust generation or friction work.  
Please note that materials and conditions to avoid.  
Wash thoroughly after handling.  
Please work with reference to engineering controls and personal protective equipment.  
Be careful to high temperature.

The handling of powder in both loading and unloading operations as well as fabrication may cause dust to be formed, and necessary precautions for personal protection (see Section 8) should be used. As with all finely divided materials, precautions should be taken to avoid inhalation and eye contact. Transfer from storage with a minimum of dusting. Polymer dust particles in the atmosphere are combustible and present a potential explosion hazard. Prevent dust accumulations and dust clouds. Dust layers can be ignited by spontaneous combustion or other ignition sources. Keep away from heat, sparks, flame and all other ignition sources.

Keep container closed. Clean up dust accumulations. For proper safety of personnel and property, the container should be emptied in compliance with NFPA 654, "Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical, and Plastics Industries." Exercise caution when dispensing the contents of this product's container in or around combustible environments (for example, where flammable solvents are being used).

In such cases, the possible occurrence of sparks could ignite vapors and cause a fire or explosion. Evaluate the need for grounding of equipment and container. Electrical equipment should be grounded and conform to applicable electrical code.

#### 7.2. CONDITIONS FOR SAFE STORAGE

Store in a closed container.  
Store in cool and dry place.  
Store away from excessive heat and away from strong oxidizing agents.  
Keep container closed to prevent contamination.

---

### SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

---

#### 8.1. OCCUPANTIONAL EXPOSURE LIMITS

KOREAN REGULATION:	Not available
US (NIOSH / OSHA / ACGIH):	
- NIOSH:	Not available
- OSHA:	Not available
- ACGIH:	Not available
EU REGULATION:	Not available
OTHERS:	Not available

#### 8.2. APPROPRIATE ENGINEERING CONTROLS

Provide local exhaust ventilation or other engineering controls to keep concentration of airborne under threshold limit value.

#### 8.3. PERSONAL PROTECTIVE EQUIPMENT

##### Respiratory protection

- Respiratory: Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.
- In the case exposure to particulate material, the respiratory protective equipment as follow are recommended. ; facepiece filtering respiratory or air purifying respiratory, high-efficiency particulate air (HEPA) filter media or respirator equipped with powered fan, filter media of use (dust, mist, fume).
- In lack of oxygen (< 19.5%), wear the supplied-air respirator or self-contained breathing apparatus oxygen.

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

**Eye protection**

- Wear facepiece with goggles to protect.
- An eye wash unit and safety shower station should be available nearby work place.
- Wear breathable safety goggles to protect from particulate material causing eye irritation or other disorder.

**Hand protection**

- Wear chemical resistant gloves.
- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

**Body protection**

- Wear appropriate protective chemical resistant clothing.
- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

---

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

---

**9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE:	Naturally white pellet
ODOR:	Not available
PHYSICAL STATE:	Solid (pellet)
pH:	Not applicable
BOILING POINT:	Not applicable
MELTING POINT:	128 - 135°C
VAPOR PRESSURE (mmHg):	Not available
VAPOR DENSITY (AIR = 1):	Not available
EVAPORATION RATE:	Not applicable
FLAMMABILITY (SOLID, GAS):	Not applicable
UPPER / LOWER EXPLOSIVE LIMITS:	Not applicable
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	0.950 – 0.960
AUTO IGNITION TEMPERATURE:	Not available
DEGRADATION TEMPERATURE:	Not available
VISCOSITY:	Not available
MOLECULAR WEIGHT:	Not available

---

**SECTION 10: STABILITY AND REACTIVITY**

---

**10.1. REACTIVITY / CHEMICAL STABILITY / POSSIBILITY OF HAZARDOUS REACTIONS**

Fire may produce irritating and / or toxic gases.  
If inhaled, may be harmful.

**10.2. CONDITIONS TO AVOID**

Heat, sparks or flames.

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

### 10.3. INCOMPATIBLES MATERIAL

Combustibles.

### 10.4. HAZARDOUS DECOMPOSITION PRODUCT

Irritating and / or toxic gases.

---

## SECTION 11: TOXICOLOGICAL INFORMATION

---

### 11.1. DELAY BY SHORT TERM AND LONG TERM EXPOSURES, ACUTE AND CHRONIC EFFECT

Acute toxicity	
- Oral:	Not available
- Dermal:	Not available
- Inhalation:	Not available
Skin corrosion / Irritation:	Not available
Serious eye damage / Irritation:	Not available
Respiratory sensitizer:	Not available
Skin sensitization:	Not available
Carcinogenicity:	Not classified
Germ cell mutagenicity:	Not available
Reproductive toxicity:	Not available
Specific target organ toxicity (single exposure):	Not available
Specific target organ toxicity (repeat exposure):	Not available
Aspiration hazard:	Not available

---

## SECTION 12: ECOLOGICAL INFORMATION

---

### 12.1. ECOTOXICITY

Acute toxicity:	Not available
Chronic toxicity:	Not available
- Fish:	Not available
- Crustacea:	Not available
- Algae:	Not available

### 12.2. PERSISTENCE AND DEGRADABILITY

Persistence:	Not available
Degradability:	Not available

### 12.3. BIOACCUMULATIVE POTENTIAL

Bioaccumulation:	Not available
Biodegradation:	Not available

12.4. MOBILITY IN SOIL: Not available

12.5. OTHER HAZARDOUS EFFECT: Not available

---

## SECTION 13: DISPOSAL CONSIDERATIONS

---

### 13.1. DISPOSAL METHOD

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### 13.2. DISPOSAL PRECAUTION

Consider the require attentions in accordance with waste treatment management regulation.

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

---

### SECTION 14: TRANSPORT INFORMATION

---

#### 14.1. INTERNATIONAL REGULATION

US DOT:	Not regulated as a dangerous good
Canadian TDG:	Not regulated as a dangerous good
IATA:	Not regulated as a dangerous good
IMDG:	Not regulated as a dangerous good
- UN number:	Not applicable
- UN proper shipping name:	Not applicable
- Transport hazard class:	Not applicable
- Packing group:	Not applicable
- Marine pollutant:	Not applicable
- Special precautions	
In case of fire:	Not applicable
In case of leakage:	Not applicable

---

### SECTION 15: REGULATORY INFORMATION

---

#### 15.1. NATIONAL AND/OR INTERNATIONAL REGULATORY INFORMATION

POPs management law:	Not applicable
EU Classification	
Classification:	Not applicable
Risk phrases:	Not applicable
Safety phrases:	Not applicable
U.S.A. management information	
OSHA regulation (29CFR1910.119):	Not applicable
CERCLA 103 regulation (40CFR302.4):	Not applicable
EPCRA 302 regulation (40CFR355.30):	Not applicable
EPCRA 304 regulation (40CFR355.40):	Not applicable
EPCRA 313 regulation (40CFR372.65):	Not applicable
Rotterdam convention listed ingredients:	Not applicable
Stockholm convention listed ingredients:	Not applicable
Montreal convention listed ingredients:	Not applicable

---

### SECTION 16: OTHER INFORMATION

---

ISSUE DATE:	July 10, 2010
REVISION DATE AND NUMBER:	May 18, 2023 (2nd)

# MATERIAL SAFETY DATA SHEET

## HFS2100

FILE NO.: PMGHSMDS-HFS2100

REVISION DATE: May 18, 2023

**DISCLAIMER OF RESPONSIBILITY:**

TWO H Chem Ltd. does not recommend and will not knowingly provide any of its products, including samples, for use as: Components of, or packaging for, tobacco products; Components of products where the end product is intended for human or animal consumption; In any application that is intended for any internal contact with human body fluids or body tissues; As a critical component in any medical device that supports or sustains human life; In any product that is designed specifically for ingestion or internal use by pregnant women; and in any application designed specifically to promote or interfere with human reproduction.

The information on this MSDS was obtained from sources which we believe are reliable. 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, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable.

**OTHER INFORMATION:**

- Note 1     - Always ensure adequate ventilation of the workplace.  
              - Local exhaust ventilation of process equipment may be needed.  
              - Avoid breathing vapors or fumes.
- Note 2     - Incorrect operation of processing equipment can cause thermal degradation of the polymer and a potential danger through inclusion of bubbles of air or other gases in material subsequently subjected to high temperatures.
- Note 3     - Avoid sources of ignition such as heat or flames.

**<Record management>**

Revision	Revision categories	Revision content	Revision date
Legislate	Overall	Legislate	July 10, 2010
1st	Overall	Apply GHS standard	May 29, 2015
2nd	Overall	Apply GHS standard	May 29, 2023