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## MATERIAL SAFETY DATA SHEET

DATE : Oct, 1, 2011

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### 1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier : DENKA STYROL MF-21-301, MW-1-301, MW-1-321, HRM-2S-311  
Supplier : Denka Singapore Private Limited(DSPL)  
Address : 4 Shenton Way, #29-02 SGX Centre 2, Singapore 068807  
Telephone No. : +65-6224-1305  
Facsimile No. : +65-6224-3840  
Emergency contact : +65-6876-5527 (Seraya Plant)  
MSDS Reference No. : PS1-10-001E

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### 2. HAZARDS IDENTIFICATION

GHS classification : It can't be classified for data shortage.  
GHS label element : Not applicable  
Most important danger  
hazardous property  
Physicochemical danger : Flammability  
When dust is generated, the danger of dust explosion is possessed.  
Be careful to burns by a heated polymer.  
Hazardous property : It's in the state of the pellet, but when it becomes dust, it's  
easy to inhale. Moreover , when burning, there is a case that  
harmful gas (Carbon monoxide ,Nitrogen oxide etc.) occurs.  
Precautionary Statement : Get an instruction manual (catalog, technical data and  
product safety data sheet, etc.) before use, and please  
don't treat until all safe attention is read and understood.  
Please treat in outdoor or install the local exhaust ventilation  
in the handling work place.  
Please make it not touch the resin of the melting high  
temperature directly , and put on the protective glove , goggles  
and mask while handling it.  
When using a product, don't eat, drink and smoke. After treating,  
please wash hand enough.  
When a product scattered, please collect the whole quantity  
immediately. Please avoid release to the environment.  
Avoid and don't inhale an inhalation of dust and the gas which  
occurs at the time of fusion.  
Clean dust to prevent its accumulation, since it may cause spark  
due to statics electricity or dust explosion.  
Please avoid the direct sunlight, water and moist\_and  
sudden temperature change, lock and keep by a well  
ventilated place.  
Please keep it so as not to do the collapse of cargo piles.  
Keep away from the heat source and the ignition source.

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Dispose of in accordance with national, state and local regulation.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Distinction of single products and a mixture : Single  
Chemical identity : Polystyrene

Ingredient	Content	CAS registry No.
Polystyrene	95 ~ 100 wt%	9003-53-6
Additive agent etc.	0 ~ 5wt%	Secret

Additive agent etc.: This product do not contains regulated components.

REACH Regulation / Registration Number for each substance

Styrene	01-2119457861-32
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**4. FIRST AID MEASURES**

Inhalation : ①Not likely to inhale pellets due to their physical form. If inhale gases and/or fumes from the molten resin at high temperature , leave the place immediately and breathe fresh air.  
②If coughing and/or difficult breath occurs , seek immediate medical attention.

On skin contact : ①Wash well with water. If condenses of gas generated from the substance molten at high temperature, wash well with soapy water.  
② In case of molten plastic contact with skin, cool immediately with water and seek medical attention.

On eye contact : Remove contact lenses stick to eye balls. Immediately flush the affected eyes well with clean water. Do not rub the eyes to prevent corneas injuries. Seek medical attention if irritation persists.

Ingestion : Not likely to ingest. If a large amount is swallowed, seek medical attention.

**5. FIRE FIGHTING MEASURES**

Extinguishing media : Water pouring, water spray and regular fire extinguishers can be used.

Special danger hazardous property at the time of the Fire : This product emits intense heat, dense black smoke, carbon dioxide, carbon monoxide, carbon, hydrogen cyanide and so on.

Special firefighting procedures : The extinction work is done from the windward.

Protection of the person who extinguishes a fire : When firefighting, an appropriate protective equipment (fire prevention clothes and protective equipment and protection

glasses for the respiratory organ) is worn.

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## 6. ACCIDENTAL RELEASE MEASURES

- Notes for human body : If spilled on road or floor, sweep and collect materials to prevent slipping and falling.
- Notes of environment : Released materials must be collected for environmental protection.
- Removal method : Vaccum or sweep material and place in a disposal container.
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## 7. HANDLING AND STORAGE

- Handling technical measures and instructions : • Do not touch the resin of the melting high temperature directly, and the protective glove, protective spectacles, and the protection side are put on.
- Gases generated during processing the material may cause irritation to the skin and the respiratory organs. If a large amount of the gases is inhaled, it may cause nausea and headache. Refrain from inhaling them.
  - Install the local exhaust ventilation in the handling work place.
  - Clean dust from cutting and sanding operation to prevent its accumulation, since it may cause spark due to static electricity or dust explosion.
  - Do not eat, drink, and do not smoke when you use the product.

### Storage

- An appropriate safekeeping condition : • Avoid sunshine, wetting, moisture, heat and keep it at room temperature. ( a change in quality, prevention of transformation). Keep it at a remote place from fire, the source of heat, ignition source ( prevention of fire ).
- Measures to prevent the static electricity disaster are taken.
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## 8. EXPOSURE CONTROLES / PERSONAL PROTECTION

- Equipment measures : Because the gas is generated in the part opened in air when the high temperature is processed, the local ventilation etc. are installed to obtain a comfortable working environment.
- Management density : It is not decided.
- Allowable concentration : Japan association of industrial health and ACGIH do not determine the permission density about dust of SBC resin together, but it is thought that what apply the next value is proper.
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	The weighted mean at time	
	Inhalant dust	Total dust
Japan association of Industrial health (2006) Class 3 dust	2 mg / m <sup>3</sup>	8 mg / m <sup>3</sup>
ACGIH(2006) PNOS	Respirable 3 mg / m <sup>3</sup>	Inhalable 10 mg / m <sup>3</sup>

“PNOS : Particulates(Insoluble)Not Otherwise Specified”

Protective equipment

Respiratory protection : ①A protection against dust mask is put on at the time of fine particle occurrence work such as mechanical processing and sanding of a resin product.  
②The mask for an organic gas is worn when working in the place where the densities such as the generated gas, Hume, and the mist are high.

Hand protection : When dealing with a pellet, it isn't necessary in particular, but when treating molten resin, adiathermancy uses good gloves.

Eye protection : When working in the place where the densities such as the dust generation work, the generated gas, hume, and the mist like the machining and the sanding etc. of the resin product are high, protective spectacles made of the resin are worn.

Protection equipment of skin and a body : When working, usual work clothes are put on, but when treating molten resin, work clothes of a long sleeve are put on.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE : Pellets  
 Color : Transparence  
 Odor : Odorless  
 pH value : Not available  
 Melting point : No definite temperature.  
 Flash point : >550°C (Polystyrene)  
 Auto-ignition temperature : 488~496°C  
 Explosion characteristic : There is a possibility of exploding dust.  
 SPECIFIC GRAVITY : 1.00-1.10  
 SOLUBILITY : Water-insoluble

## 10. STABILITY AND REACTIVITY

Stability : It's stable in general storage handling.  
 Reactivity : Without self-reaction.  
 The decomposition product : Can burn in a fire or high temperature and emit carbon monoxide and nitrogen oxides, etc.

**1 1. TOXICOLOGICAL INFORMATION**

Polystyrene

Acute toxicity oral	:	LD50 (rat) >5,000mg/kg (Presumption)
Skin corrosive /irritation	:	The gas etc. which occurs from molten resin stimulates skin.
Serious eye damage and eye irritation	:	Because there were not noxious data, it was assumed that we cannot classify it.
Respiratory organ sensitizing potential	:	
Skin sensitization	:	
Germ cell mutagenicity	:	
Carcinogenicity	:	
Reproductive toxicity	:	
Specific target organ systemic toxicity (single exposure)	:	
Specific target organ systemic toxicity (repeated exposure)	:	
Aspiration hazard	:	

**1 2. ECOLOGICAL INFORMATION**

Aqueous environment acute harmful effect	:	No data
Aqueous environment chronic harmful effect	:	No data
Others	:	Do not discharge into even any ocean or the waterways or sewer to prevent the aquatic life and birds from taking it.

**1 3. DISPOSAL CONSIDERATIONS**

Residual waste	:	Consult State Land Waste Accthority for disposal. It's entrusted to the professional waste processor who got permission.
Disposal method of a pollution container and wrapping	:	The same processing as the waste is done.

**1 4. TRANSPORT INFORMATION**

International regulation	:	Not applicable
The United Nations No.	:	Not applicable
Specific security	:	• A water getting wet and violent handling are avoided so

measures , condition of Transportation	that packing should not tear. When the bag tears and the pellet disperses, slippery Can cause falls if walked on.
	<ul style="list-style-type: none"> <li>• When a product scattered, the whole quantity is collected promptly.</li> <li>• When airlifting it, the static electricity disaster prevention is surely executed.</li> </ul>

## 1 5 . REGULATORY INFORMATION

REGULATIONS :

**white mineral oil (petroleum) (CAS: 8042-47-5)**

AIGIH Threshold Limit Values(2010) TLV-TWA 5 mg/m<sup>3</sup>

OSHA Z-1 PEL 5 mg/m<sup>3</sup>

NFPA

Fire-1

Health-1

Reactivity-0

Physical Hazard-1

HMIS

Health-1

Flammability-1

Reactivity-0

Personal Protection Index-B

Fire Service Law : Dispose of in accordance with national ,state and local regulation.

Industrial Safety : Not applicable  
and Heath Law

## 1 6 . OTHER INFORMATION

References cited and reference book :

- 1) JYUSI PELLETT ROUSHUTU BOISI MANUAL / THE JAPAN PLASTICS INDUSTRY FEDERATION (1993. Feb)
- 2) Regulation (EC) No1272/2008 AnnexVI
- 3) PLASTIC DATA HAND BOOK (Kogyo Chosakai)1980
- 4) I. philips and G. C. Marks :British Plastics, 385~390 (1961. July)
- 5) A. M. Thiess, N. Friendheim and H. Rossman :Polymer Preprint, 17, 35~39 (1976)
- 6) IARC MONOGRAPHS Supplement No. 7 Overall evaluation of carcinogenicity. An updating of IARC Monographs, Volumes1~42 (1987)

①This information herein is given in good faith but no warranty, express or implied, is made to the best of our knowledge, the information contained herein is accurate.

②This information is concerned with an ingredient and a product, and this material is combined with the other material, and it isn't assumed about a processed case.

- ③After this information made usual handling the subject, and special handling in case of puts security measures suitable for the use and directions into effect, please use.
  - ④Final determination of suitability of any material is the sole responsibility of the user. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his own particular use.
  - ⑤All materials may present unknown hazards and should be used in caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.
  - ⑥You should execute the adequate test before using this material in the view of safety and suitability for your purpose under your responsibility.
  - ⑦The mentioning contents of this note are declined by new knowledge, and I don't have that and it's sometimes changed, so please accept it.
  - ⑧Information on this MSDS is the dissemination of information to have use a product safely, and the contents aren't guaranteed.
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