

MATERIAL SAFETY DATA SHEET (MSDS)**“TOYOLAC” ABS Resin****Grade Name : “TOYOLAC” 532**

MSDS No. : TPM014

Toray Plastics (Malaysia) Sdn. Bhd.

Date : 6 June, 2006

1. COMPANY / IDENTIFICATION**1.1 NAME OF MANUFACTURER / SUPPLIER****ADDRESS : 2628 MK.1, SPT., Lorong Perusahaan 4, Prai Free Industrial Zone,
13600 Prai, Penang, Malaysia.****1.2 SAFETY MANAGER****PRODUCTION, TECHNOLOGY****DIVISION : Production Division****MANAGER : Director & Factory Manager****SALES****DIVISION : Sales & Marketing Division****MANAGER : General Manager****1.3 MSDS MANAGER****DEPT. : Technology Centre****MANAGER : Technology Centre Manager****1.4 INFORMATION CENTER (CUSTOMER SERVICE CENTER)****DEPT. : Sales & Marketing Department****ADDRESS : 2628 MK.1, SPT., Lorong Perusahann 4, Prai Free Industrial Zone,
13600 Prai, Penang, Malaysia.****Tel. No. : +60-4-3988088****Fax.No. : +60-4-3908975, 39977264**

2. COMPOSITION / INFORMATION ON INGREDIENTS**CHEMICAL NAME : Acrylonitrile-Butadiene-Styrene Copolymer****GENERIC NAME : ABS Resin****ABBREVIATION NAME : -****CAS NUMBER : 9003-56-9****SUBSTANCE (O) MIXTURE () ; UN CLASS &UN NUMBER**

CHEMICAL NAME	COMP (%)	CHEMICAL FORMULA (CONSTITUTIONAL FORMULA, STRUCTURAL FORMULA)	CAS No.	TSCA Status
Acrylonitrile-Butadiene -Styrene Copolymer	100	$-\text{[(C}_8\text{H}_8)_k\text{-(C}_3\text{H}_3\text{N)}_l\text{-(C}_4\text{H}_6)_m\text{]}_n\text{-}$	9003-56-9	Regd.

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Opaque yellowish white or colored pellets with slight or no odor. Slipped pellets create slipping hazard. It can burn in a fire with toxic smoke. Melted material can cause serious burns. Fumes and smoke generated during melt processing may cause eye, skin and respiratory tract irritation. Secondary processing can produce dust, which may cause respiratory hazard and an explosion.

3.2 CLASS NAME OF HAZARDS CHEMICALS FOR MSDS IN JAPAN

Not Applicable.

3.3 PHYSICAL & CHEMICAL HAZARDS

Not Applicable.

3.4 POTENTIAL HUMAN HEALTH EFFECTS

Eye : May cause irritation or injury due to mechanical action.

Skin : Pellets not likely to cause skin irritation.

Ingestion : Not acute toxicity.

Inhalation : Pellet inhalation unlikely due to its physical form.

3.5 ENVIRONMENTAL EFFECTS

Not Applicable.

3.6 OTHERS

See REGULATORY INFORMATION.

4. FIRST-AID MEASURES

4.1 INHALATION

Not likely to be inhaled due to its physical form. However, if symptoms are experienced, move victim to fresh air place. Seek medical assistance for further treatment, observation and support if necessary.

For processing fume inhalation irritation, leave contaminated area and breathe fresh air. If coughing, difficult breathing or any other symptoms develop seek medical assistance at once, even if symptoms develop at a later time.

4.2 SKIN CONTACT

Wash skin thoroughly with soap and gently water. Seek medical assistance for further treatment, observation and support if necessary.

For molten resin skin contact, cool rapidly with water and immediately seek medical assistance. Do not attempt removal of resin without medical assistance. Do not use solvent for removal.

For skin contact with fume condensate, immediately wash thoroughly with soap and water. If irritation develops seek medical assistance.

4.3 EYE CONTACT

Remove contact lenses at once. Immediately flush the contaminated eye(s) with gently clear water or normal saline for at least 20-30 minutes. Seek medical assistance for further treatment, observation and support if necessary.

4.4 INGESTION

Have victim rinse mouth thoroughly with water. Seek medical assistance for further treatment, observation and support if necessary.

5. FIRE FIGHTING MEASURES

5.1 SPECIFIC HAZARDS WITH REGARD TO FIRE FIGHTING MEASURES

Apply water from a safe distance to cool and protect area. Move container from fire area if it can be done without risk. Keep personnel to safe area. The heat generated by a fire will liberate toxic fumes and smoke, such as dense black smoke, carbon monoxide, carbon dioxide, hydrogen cyanide and hydrocarbon fragments. Breathing apparatus that is approved pressure demand and protective clothing should be used for all fires.

5.2 EXTINGUISHING MEDIA

Water spray, carbon dioxide foam, polymer foam and dry chemical foam. Water spray is the best extinguishing medium. Carbon dioxide and dry chemical foam are not generally recommended because their lack of cooling capacity may permit re-ignition.

6. ACCIDENTAL RELEASE MEASURES

6.1 MEASURES FOR HANDLING PERSONNEL

Shut off all sources of ignition and wear dust mask if dust is presents.

6.2 MEASURES FOR ENVIRONMENTAL EFFECTS

Do not flush to sewer or drain. In case of huge amount is released and spilled, it may cause environmental impact of pollution.

6.3 MEASURES WHEN HANDLING SPILLED SUBSTANCES

Restrict access to area until completion of clean up. Shovel into clean, labeled containers and cover. Sweep or gather up material immediately and place in proper container for disposal and recovery.

7. HANDLING AND STORAGE

7.1 HANDLING

Exposure control for handling personnel:

Ventilate the room in order to remove dust, heat and products of pyrolysis.

Use good industrial hygiene practices.

Prevent contact with skin and eyes.

Protective measures against fire & explosion:

Prevent accumulation of dust.

Avoid generating fumes or dust.

Take precautionary measures against static discharges.

In case of fire and/or explosion, do not breathe fumes.

Others:

Avoid rough handling or dropping.

Do not flush to sewer or drain.

7.2 STORAGE

Store in a dry place away from moisture, excessive heat, sunlight and sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETER

	CONTENT (%)	Acrylonitrile -Butadiene -Styrene Copolymer				
Labor Safety & Health Act (Japan)	ppm(mg/m ³)	Total dust : 8(mg/m ³)				
ACGIH	ppm(mg/m ³)	Total dust : 10(mg/m ³)				
OSHA	ppm(mg/m ³)					

Neither Japan Association of Industrial Health and Hygiene nor ACGIH specifies the tolerable concentration of ABS resin dust, but it is believed that the above values are reasonable guidelines for operation.

8.2 ENGINEERING MEASURES

In order to keep suitable working environment, a continuous supply of fresh air with ventilation systems is recommended.

Local Exhaust : Required when material is heated at more than 200⁰C.

Special : Use process enclosure if necessary to control airborne smelling.

If engineering controls are not effective in controlling exposure to this material or its fumes or impurities, then wear suitable personal protective equipment including approved respiratory protection as mentioned below.

8.3 PERSONAL PROTECTION

Eye / Face :

Wear safety glasses with side shields or chemical goggles. Moreover, useful face shield when processing fumes condenses from hoods, ducts and other surfaces.

Skin :

Wear safety gloves to prevent any contact with processing fume condensates. Wear long pants, long sleeves and safety shoes when applicable.

Respiratory :

When processing fumes, and dust or powder from secondary processing are not adequately controlled, use respiratory approved for protection from organic vapors and gases.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical State	: Solid	Vapor pressure	: Negligible
Appearance	: Plastic pellet	Vapor density	: Not Applicable (air = 1)
Odor	: Slight odor	Specific gravity	: 1.01-1.06 (water = 1)
Boiling point	: Not Applicable	Solubility(%)	in water : Insoluble
Melting point	: See COMMENT below		in others : Soluble in organic solvents
Volatility	: Negligible	pH	: Not Applicable
Odor Threshold	: Not Established	Evaporation rate	: Negligible

COMMENT : This product does not exhibit a sharp melting point, but it softens gradually over a broad temperature range, between 100-150°C.

10. STABILITY & REACTIVITY

Flash point	: Not Applicable	Autoignition temperature	: 405°C, estimated
Explosion limit(%)		Combustibility	
Upper	: Not established	Spontaneous	: Not Applicable
Lower	: 60g/m3(Particle size<200nm)	Reactivity with water	: Not Applicable
Flammable limit(%)		Flammability	: Inflammable
Upper	: Not established	(Requires a continuous flame source to ignite)	
Lower	: Not established	Dust explosion	: See Explosion limit
Flammability	: Inflammable	Self-reactivity	: Not Applicable
Oxidizibility	: Not Applicable		

STABILITY & REACTIVITY

This product is considered a stable material under recommended conditions of storage and handling. And it is not reactive material under recommended conditions of handling, storage, processing and use.

CONDITIONS TO AVOID:

Do not exceed recommended melt temperature. In order to prevent autoignition and hazardous decomposition of hot lump of purged material, it should be collected in small, flat shapes or thin strands to allow for rapid cooling and quench in water. Do not allow product to remain in barrel at elevated temperatures for extended periods of time.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:

Processing fumes evolved at recommended processing conditions may include trace level of Styrene, Acrylonitrile, Acrolein, Acetaldehyde, Acetophenone, Ethylbenzene, Cumene, 4-vinylcyclohexene and phenols. When it is burned, hazardous combustion products may include intense heat, dense black smoke, carbon monoxide, carbon dioxide, hydrogen cyanide and hydrocarbon fragments.

11. TOXICOLOGICAL INFORMATION

Acute toxicity	:	Oral LD50 (Rat) >5 g/kg (estimated)
Sub-acute toxicity	:	No specific information is available.
Chronic toxicity	:	No specific information is available.
Carcinogenic effects	:	No specific information is available.
Mutagenic effects	:	No specific information is available.
Irritant properties	:	Processing fumes will irritate skin and eyes.
Allergenic and Sensitizing effects	:	The formed gas and fume have sensitivity.
Teratogenic effects	:	No specific information is available.
Others	:	Styrene monomer is listed as a possible carcinogen by IARC. Rats exposed to acrylonitrile by repeatedly orally and inhalation induced brain and stomach tumors.

12. ECOLOGICAL INFORMATION

Biodegradability	:	No specific information is available.
Bioaccumulation	:	No specific information is available.
Fish toxicity	:	No specific information is available.

13. DISPOSAL CONSIDERATION

Do not dump this product into sewers, any ocean or water area in order to prevent marine animals and birds from ingesting. Recycling is encouraged. Disposal by controlled incineration or source landfill in accordance with governing body requirements may be acceptable.

14. TRANSPORT INFORMATION

Avoid wetting and rough handling in order to maintain suitable packing condition. In case the packing is damaged and released pellets or powder, sweep or gather up material and place in proper container for disposal or recovery.

(See ACCIDENTAL RELEASE MEASURES and DISPOSAL INFORMATION).

15. REGULATORY INFORMATION

REGULATORY / CLASSIFICATION	Regulatory Information	Allowed Concentration
TSCA(USA)	This product complies with the Chemical Substance Inventory requirements of the US EPA Toxic Substances Control Act.	
EINECS No.	-	
California Proposition 65	Chemical substances identified under the California Proposition 65 column are known to the State of California to cause cancer and/or reproductive toxicity.	
FDA	-	
UL	Registered	
CSA	Registered	
OSHA	Not Regulated	

Other regulatory information

We are not able to check up the regulatory information in regard to the substances in your country or region. Therefore, we request this matter would be filled by your responsibility. Regulatory information with regard to this substance in your country or in your region should be examined by your own responsibility. Ensure this matter in compliance with federal requirements and ensure conformity to local regulations.

16. OTHER INFORMATION / REFERENCES

This information relates to this specific material. It may not be valid for this material, if used in combination with any other materials or in any process. It is user's responsibility to satisfy him-selves as to the suitability and completeness of this information for his own particular use. The information herein is given in good faith, but no warranty, express or implied, is made. Please consult us for further information. To the best of our knowledge, the information contained herein is accurate. However, we assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of user. All 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 that exist. This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It is advised to make their own tests to determine the safety and suitability of each such product or combination for their own purposes.