



MATERIAL SAFETY DATA SHEET (MSDS)

MSDS No. :1010

Issued Date: Jan.20, 2009

1. CHEMICAL, PRODUCT & COMPANY IDENTIFICATION

PRODUCT NAME : Titacon TX910, TX915, TX920, TX925, TX940
NAME OF COMPANY : TITAN PLASTICS COMPOUNDS CO., LTD
SECTION IN CHARGE : Quality Management
ADDRESS : No.8, S. 1st Rd., Pingtung Export Processing Zone, Pingtung City, 90093, Taiwan, R.O.C
TELEPHONE NUMBER : 886-8-7522966
FACSIMILE NUMBER : 886-8-7522066

2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPOSITION: Polyoxymethylene(Polyacetal) , Thermopolyurethane
POM \geq 59%, TPU \leq 40% Stabilizers etc. \leq 2%
STRUCTURAL FORMULA: Polyoxymethylene (Polyacetal) $-(\text{-CH}_2\text{O-})_n\text{-}$
CHEMICAL FORMULA: $-(\text{[CH}_2\text{-O]}_m\text{-[CH}_2\text{CH}_2\text{-O]}_n\text{)}_p\text{-}$
CAS No. : 24969-26-4 (base resin) .
INGREDIENTS CONTRIBUTING TO THE HAZARD : Formaldehyde.

3. HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS: Incomplete combustion leads to generation of toxic gases such as carbon monoxide, in addition to carbonic acid gas and water.
Decomposition of polymer also leads to generation of formaldehyde.

HUMAN HEALTH EFFECTS: Not applicable.

ENVIRONMENTAL EFFECTS: Not applicable.

PHYSICAL AND CHEMICAL HAZARDS: It is inflammable substance and combustible if an igniting source is existent.
Neither dangerous reaction, fire nor explosion can be caused under normal conditions.

THE CLASSIFICATION: Not applicable.

4. FIRST-AID MEASURES

INGESTION : Help to vomit as much as possible. If sick feeling continues, and ask a physician for advice.

INHALATION: When a gas generated from the molten polymer has been inhaled, remove fresh air without delay and wait until the victim is recovered. If sick feeling continues, ask a physician for advice.

SKIN CONTACT:	Cool the contacted skin with clean water without delay, if a contact with the polymer in a molten form. Do not force to remove the solid resin on the skin. If any burns are observed on the skin, ask a physician for advice.
EYE CONTACT:	Cool and rinse the eye with clean water for at least 15 minutes when the eyes had contact with molten polymer. In case of wearing contact lenses, remove the lenses as soon as possible, and ask a physician for advice. When the eye had contact with the polymer in an ordinary solid form, rinse the eye with clean water without delay. If the discomfort persists, ask a physician for advice.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA :	Water, form fire-extinguishing agent, powder fire-extinguishing agent, and carbon dioxide gas.
SPECIFIC METHODS :	Extinguish the fire with water. A method of extinguishing an ordinary fire may be applied. Do not apply water directly to processing machines.
SPECIFIC HAZARDS :	Incomplete combustion leads to generation of toxic gases such as carbon monoxide or formaldehyde, in addition to carbonic acid gas and water.
SPECIAL EQUIPMENT FOR THE PROTECTION OF FIREFIGHTERS	In case the fire gained force, use a gas mask or other protective equipment.

6. ACCIDENTAL LEAKAGE MEASURES

PERSONAL PRECAUTIONS :	When pellets were spilled on the road or floor, wipe them off with a besom or cleaner not to cause slipping.
ENVIRONMENTAL PRECAUTION :	Handle the spillage in accordance with provisions given in the "Resin pellet spillage preventive manual", in order to prevent intakes by marine animals and birds.

7. HANDLING AND STORAGE

HANDLING 1:	Polyacetal resin in a pellet form will neither ignite nor explode at room temperatures, but it falls under the inflammables designated by the Fire Service Law. Keep it away from the igniting sources, as it quickly gains force once it is ignited.
HANDLING 2:	Polyacetal resin in a powdered form is likely to cause dust explosion and is therefore designated in the Guideline for Hazard of Dust Explosion in U.S. Bureau of Mines. Effective earthing means or use of inert gas like N ₂ are required for dust handling equipment to eliminate static electricity.
HANDLING 3:	Polyacetal pellets spilled on the floor are likely to cause slipping. Remove such spillage at any times.
HANDLING 4:	For molding work, effective means for local exhaust are required to discharge gases generated by melt processing.
HANDLING 5:	Avoid inhaling of gases generated in moulding work. Do not directly touch resin of high temperature.
HANDLING 6	Avoid retaining hot resin in the processing machines for many hours.

HANDLING 7:	Avoid mixed extrusion with strong acid, oxidizing agents and PVC.
STORAGE 1:	Keep the substance away from any fire or heat sources for the sake of safe storage.
STORAGE 2:	This polymer is a synthetic resin designated as an inflammable substance by the Fire Service Law and should be handled in accordance with municipal rules and regulations (concerning firefighting equipment, indoor storage, for instance).
RECOMMENDED PACKAGING MATERIALS:	No information.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONTROL CONCENTRATION	None at present.
PERMISSIBLE CONCENTRATION:	<p>OSHA PEL/1985 Max. permissible concentration of inactive powder 15mg/m³ - ditto - (Aspiration) 5mg/ m³ ACGIH TLV/1992 1993 Exposure limit of the powder TWA 10 mg/ m³ (Reference) Human exposure to formaldehyde - Ministry of Health & Welfare/2002 Guideline value 0.08 ppm OSHA Parameter/1992 TWA 0.75 ppm STEL 2 ppm ACGIH TLV/1992 1993 TWA 0.3 ppm</p>
ENGINEERING MEASURE:	<p>When handling dust: Use totally enclosed containers resisting dust explosion. When heat melted in molding: Effective local ventilation must be provided.</p>
RESPIRATORY PROTECTION:	Wear a dust-proof mask.
EYE PROTECTION:	Wear protective glasses or goggles.
HAND PROTECTION:	Wear heat-resisting gloves against burns, when handling molten polymer.
SKIN & BODY PROTECTION:	Wear long sleeve clothes against burns, when handling molten polymer.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE :	Pellet.
ODOR:	Slight characteristic odor.
PHYSICAL STATE:	Solid.
BOILING POINT:	Not applicable.
VAPOUR PRESSURE :	< 0.001 mmHg @ 20 °C
VOLATILITY:	Not applicable.

SUBLIMATION :	None
MELTING POINT :	165 °C (329 deg. F) .
DENSITY:	1.33 ~ 1.4
SOLUBILITY:	Insoluble in water.
FLASH POINT:	320°C or higher.
IGNITION POINT:	400°C or higher.
EXPLOSION PROPERTY:	Not applicable.
INFLAMMABILITY:	Inflammable(Designated as inflammable resin by the Fire Service Law).
REACTIVITY WITH WATER:	None.
OXIDIZABILITY:	None.
SELF-REACTIVITY:	None.
DUST EXPLOSIVENESS	Upper explosion limit : Not applicable. Lower explosion limit : 35g/ m ³ .

10. STABILITY AND REACTIVITY

STABILITY AND REACTIVITY CONDITIONS TO AVOID:	Stable for normal storage or handling. Avoid contacts with strong acid, oxidizing agent or PVC under hot melt conditions.
HAZARDOUS DECOMPOSITION PRODUCTS :	Formaldehyde, trioxane, paraformaldehyde, and formic acid will be generated when heated (for drying or melting)or burnt.

11. TOXICOLOGICAL INFORMATION

SENSITIZING & IRRITANT EFFECTS:	Gas generated in drying or melting is irritating eyes and skins.
OTHERS	No finding in this report means that there will be no hazard in general, but no proving data available at the time of reporting.
OTHER CAUTIONS 1:	With regard to dust, the maximum permissible concentration and limits are fixed by OSHA and ACGIH.
OTHER CAUTIONS 2:	Formaldehyde will be generated when heated (for drying or melting)or burnt.

12. ECOLOGICAL INFORMATION

BIODEGRADABILITY:	No finding.
BIOACCUMULATION :	No finding.
FISH TOXICITY:	No finding.

13. DISPOSAL CONSIDERATION

WASTE FROM RESIDUES 1 :	Recycling is encouraged. This is designated as waste plastics among industrial wastes by the Wastes Disposal Law. Disposal waste through licensed wastes handlers or local autonomous bodies if they are handling wastes disposal.
WASTE FROM RESIDUES 2 :	When disposed by incineration, use the well controlled incinerators in accordance with the Wastes Disposal Law, Air Pollution Control Law and Water Pollution Prevention Law.

14. TRANSPORT CONSIDERATION

UN CLASSIFICATION NUMBER:	Not applicable.
OTHER CAUSIONS 1:	Handle with care so as not to give damages to containers or not to be subjected to wetting.
OTHER CAUSIONS 2:	Secure the containers firmly so as not to cause collapsing.

15. REGULATORY INFORMATION

FIRE SERVICE LAW:	Inflammable synthetic resin. Designated quantity: More than 20 m ³ for the foamed product. More than 3,000 kg for other types.
WASTE DISPOSAL LAW:	Waste plastics among industrial wastes.
OTHERS :	Formaldehyde is designated as Class 3 substance by the Industrial Safety and Health Law (Regulations concerning hazards caused by specific chemicals) and designated as deleterious substance by the Poisons and Deleterious Substance Control Law. Recommended usage, criteria, and limit values are provided by Japan Industrial Safety and Health Society, OSHA and ACGIH.

16. OTHER INFORMATION

HANDLING OF THE DETAILS GIVEN ABOVE:	Details given above are based on references, information and data available at this moment, but no warranty can be made on exactness of these details. They are also prepared on the assumption that the product will be handled in a normal way. For special handling, adequate safety and environmental measures should be taken in respect to its applications. Our products are not specifically intended for implants for medical and dental applications, and therefore they are not recommended for such applications. "No finding" in this report means that there will be no hazard in general, but no proving data is available at the time of reporting.
WHERE TO CALL FOR FURTHER INFORMATION :	08-7522966