PAPI™ PB 219
Isocyanate

Description PAPI™ PB 219 Polymeric MDI is a light brown, low viscosity polymeric Methylene Diphenyl Diisocyanate (MDI) containing high quantities of Monomeric Methylene Diphenyl Diisocyanate (MMDI) isomers with an average functionality of 2.2-2.3. It may be used to produce viscoelastic (VE) and high resiliency (HR) foams.

Benefits PAPI™ PB 219 Polymeric MDI has high o,p' content providing excellent processing and enhanced foam physical properties.

Typical Properties	Nominal Value	Unit	Test Method
Isocyanate (NCO) Content	32.10 to 33.30	wt%	ASTM D5155
Viscosity (Dynamic) (25°C)	10 to 50	mPa·s	ASTM D4889
Acidity, as HCl (Hot)	110	ppm	Dow Method
Specific Gravity (25°C)	1.20		ASTM D4659

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

For other physical properties including, but not limited to: Boiling and Melting point, Vapor Pressure, Flash Point and Thermal Expansion, please see section 9 of the Material Safety Data Sheet (MSDS). For Storage / shelf life information see section 7 of the MSDS and for CAS numbers see section 3.

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Safety Considerations

Before working with Dow polyurethane materials it is necessary to understand the hazards involved in handling all of the components and to establish and follow safe work procedures. Safety Data Sheets (SDS), product literature, and safe handling and storage information are available for the polyurethane materials supplied by Dow. Recommendations for handling, storage and disposal of any ingredient not furnished by Dow should be acquired from the supplier.

Safety Data Sheets are available from The Dow Chemical Company (Dow) to help customers satisfy their own handling, safety and disposal needs, and those required by locally applicable health and safety regulations. SDS are updated regularly. Therefore, please request and review the most current SDS before handling or using any product. Copies of the SDS are available on request through Dow Customer Information Group (CIG) CUSTINFOGRP@dow.com or through the nearest Dow Sales office.

Safety Precautions

All Dow Isocyanates are hazardous or potentially hazardous materials and require care in handling.

All persons who work with these materials must know and follow proper safe handling procedures.

Handling

Avoid contact with eyes, skin, or clothing. Workers should wear appropriate eye protection. Safety glasses are considered a minimum requirement. If there is the possibility of exposure to the eyes, chemical workers' goggles must be worn.

Avoid breathing vapor or mist.
Wear protective clothing impervious to Isocyanates, overalls, boots, apron and gloves.
If handled indoors, provide mechanical exhaust ventilation. General or local exhaust ventilation should be provided to control airborne levels below the exposure guidelines. During spray operations, airline masks or positive pressure hose masks should be worn because of the high concentration of isocyanate mist in the atmosphere.

The vapor pressure of all MDI is low at room temperature (see SDS for values). However, at temperatures over 40°C (104°F), the vapor pressure increases enough that low functionality MDI products begin to constitute a toxic hazard. Aerosol mists can also be problem.

Please review the SDS for the specific product and your country for this information.

Toxicity

Harmful if inhaled. Causes skin irritation. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. (See handling precautions).

Occupational Exposure Limits (OELs) have been set for Isocyanates in most countries. The atmospheric levels should be maintained below the exposure guidelines.

Fire and Explosion

Isocyanates will burn but do not ignite easily. In the event of a fire, toxic vapors and decomposed material are likely to be present. Suitable fire extinguishing agents include water fog, carbon dioxide, or dry chemical powder. All fire fighters should be equipped with protective clothing and a positive pressure, self-contained breathing apparatus. Drums of isocyanate involved in a fire should be sprayed with water to minimize the risk of rupture. However, water contamination in a closed container or a confined area is to be avoided due to exothermic CO_2 evolution upon water contamination .

Caution: Polyurethanes or polyisocyanurates produced from this product may present a fire risk in certain applications if exposed to fire and/or excessive heat, e.g. welding and cutting torches, in the presence of oxygen or air.

Spills and Disposal

In case of spills, evacuate and ventilate the spill area. Only properly trained and protected personnel should be involved in the spill cleanup and waste disposal operations. A suitable decontaminant solution is described in the SDS, section 6.
Waste disposal should always be in accordance with national and local regulations.

Spills can be covered with a commercial absorbent or sand, shoveled into open, properly labeled containers and removed from the work area for decontamination.

Storage

Shipping and storage temperatures for isocyanates are critical. Recommended temperatures should be strictly followed:

Isocyanates are products with limited shelf life. Depending upon the isomer and oligomer composition, specific storage temperature and shelf life must be applied.
If shipping or storage temperature should fall below recommended temperature, some crystallization could result.

Polymeric and modified pure MDI products that have been frozen will exhibit the same dimerization characteristics as pure MDI. Unless proper action is taken to heat or melt the product, dimerization will proceed rapidly and deteriorate the clarity, shelf life and assay of the product. Crystallized isocyanate can be melted, but dimer cannot be removed by heating.

Keep container closed as moisture contamination will induce an exothermic reaction with evolution of carbon dioxide (CO_2) which may cause dangerous pressure generation. Isocyanates should be stored separately from chemicals that may react with them (i.e. amines, polyols, etc.)
For recommended storage temperature and Shelf Life, please refer to Safety Data Sheet section 7.

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Bulk Storage
Construction material for tanks, lines, pumps, etc. can be mild steel for storage at temperatures up to 35°C. Series 300 stainless steel or stainless cladding is recommended for storage at temperatures above 35°C. Only low temperature heating media should be used in tank jackets or coils unless adequate circulation or agitation of the isocyanate is maintained. A slight positive pressure using dry inert -40°C (-40°F) dew point nitrogen must be maintained in bulk storage tanks of isocyanate to prevent solids formation from occurring in the presence of atmospheric moisture. If nitrogen is unavailable, a pad of -40°C (-40°F) dew point air may be used.
For low viscosity isocyanates, such as pure MDI and TDI, transfer pumps should contain a stainless steel shaft with mechanical seals. Packed glands can leak sufficiently to cause reaction with moisture and subsequent scoring of the pump shaft by the formed ureas.

Drum Storage
Isocyanates will react when exposed to atmospheric moisture. Where drums are to be partially emptied, it is recommended that a calcium chloride-filled dryer tube be used in the air bleed opening. Should the isocyanate be exposed to moisture, a skin will develop on its surface similar to that found on paint. Normally, however, the remaining liquid under the skin may be used without formulation changes. Filtration should be considered to avoid issues during processing such as restricted filter and injection nozzles.

At temperatures below the recommended low storage temperature limit, crystallization of the isocyanate can occur. Unless proper action is taken to heat or melt the product, dimerization will proceed rapidly and deteriorate both the clarity and assay of the product. Crystallized isocyanate can be melted, but dimer cannot be removed by heating.

Melting Instructions
Crystallized MDI material can be re-melted at 50°C to 70°C. For detailed procedures, consult the Dow Answer center at www.dowpolyurethanes.com or the “ISONATE™ and PAPI™ Pure, Modified and Polymeric MDI Handling & Storage Guide” (Form No. 109-01224) available through Dow Customer Information Group (CIG) CUSTINFOGRP@dow.com or the nearest Dow Sales office.

First Aid Procedure

Decreased ventilatory capacity has been associated with exposure to TDI isocyanates, it is also possible that exposure to MDI may also cause impairment of lung function.

Inhalation
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility. Obtain medical attention immediately. Effects may be delayed.

Eye contact
Flush eyes with water for at least 15 minutes. Obtain prompt medical attention.

Skin contact
Remove material from skin immediately by washing with soap and plenty of water (warm water is preferable if readily available). Remove contaminated clothing and shoes while washing. Seek prompt medical attention if irritation persists.

Ingestion
Do not induce vomiting if swallowed. Immediately call a physician who will decide on need and method for emptying the stomach. Obtain medical attention.

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c. use as a critical component in medical devices that support or sustain human life; or
d. use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

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To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability for the accuracy and completeness of such information.

Additional Information

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www.dowpolyurethanes.com

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