



Product Information

ISONATE™ M 143 Diphenylmethane Diisocyanate

Description

ISONATE™ M 143 Diphenylmethane Diisocyanate is a light-yellow, low viscosity, modified diphenylmethane diisocyanate containing a high percentage of pure diphenylmethane diisocyanate, and a lesser amount of polycarbodiimide adducts.

Applications

ISONATE™ M 143 Diphenylmethane Diisocyanate is used for high performance compact and micro-cellular polyurethane elastomers, printing rolls, mechanical parts, and flow-in place gaskets. In addition ISONATE™ M 143 Diphenylmethane Diisocyanate can be used in the manufacture of polyurethane coatings, adhesives and sealants. Technology for coating systems of both solvent type and newer solvent-less, 2-component varieties have also been readily adaptable to ISONATE™ M 143 Diphenylmethane Diisocyanate due to its ease of reaction and excellent handling characteristics.

Typical Analysis

Properties	Value
Isocyanate equivalent	145
Isocyanate content, %	29.0
Acidity, ppm HCl	14
Viscosity at 25°C, mPa.s	39
Monomer content, weight %	70

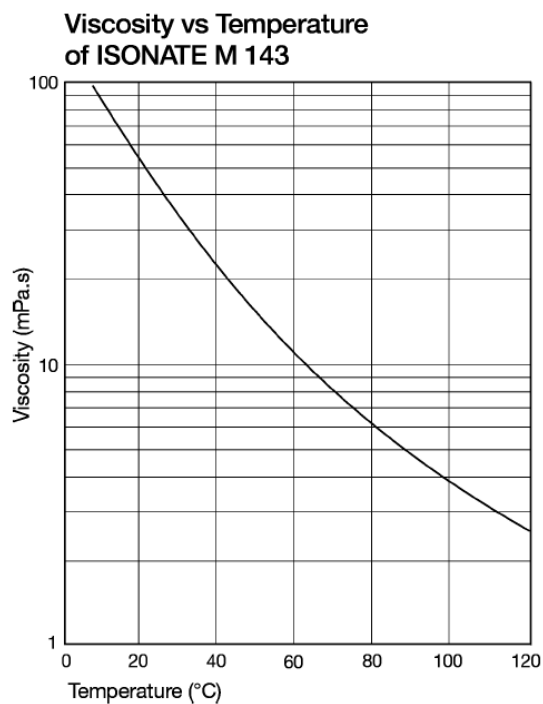
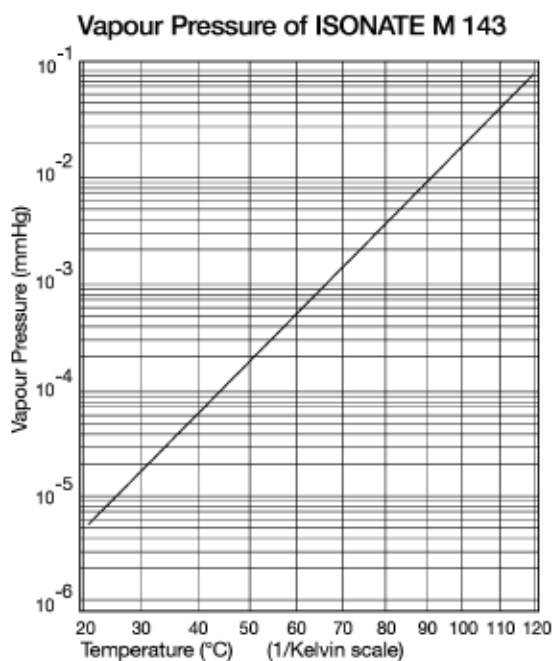
Typical Physical Properties

Properties	Value
Functionality	2.17
Physical state at 25°C	liquid
Color, Gardner	6
Density at 25°C, g/ml	1.21
Vapor pressure at 43°C, mmHg	< 10 ⁻⁴
Boiling point, °C	polymerises and decomposes at about 230°C with evolution of CO ₂
Flash point DIN 51758 (Pensky Martens Closed Cup), °C	220

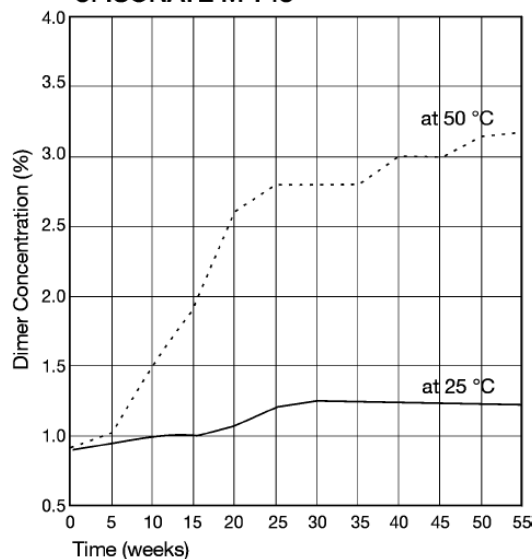
Typical Physical Properties (Cont.)

Properties	Value
Specific heat capacity, kJ/(kgK)	1.80
Thermal conductivity, W/(m.K)	0.13
Coefficient of cubic expansion, 1/K	0.0009
Heat of vaporization, kJ/kg	360
Heat of fusion, kJ/kg	136
Shelf life ¹	3 months
Vapor density (air.1)	approximately 8.6
% volatile by volume	nil

1. Under recommended handling conditions.



**% Dimer Concentration vs Time
of ISONATE M 143**



Handling and Storage

Store in a Dry Place at 25 to 40 °C

Keep container closed as moisture contamination will include an exothermic reaction with evolution of CO₂ which may cause dangerous pressure generation.

Drum Storage

As with all isocyanates, ISONATE™ M 143 Diphenylmethane Diisocyanate must be protected against reaction with atmospheric moisture. Drums should be emptied, if possible, via a totally enclosed system (dip-tube technique or equivalent), taking care to blanket the drum and receiver with dry nitrogen. The use of dry air is not recommended as it may cause undesired oxidation and extreme darkening of the ISONATE™ M 143 Diphenylmethane Diisocyanate or related products.

ISONATE™ M 143 Diphenylmethane Diisocyanate is a low viscosity stable liquid at 25°C, it does crystallize below this temperature. The crystalline portion of the solidified product is 4,4'-diphenylmethane diisocyanate and, in this solid form, it exhibits the same dimerization characteristics as pure diphenylmethane diisocyanate. Unless proper action is taken to reform the original solution, subsequent dimerization will proceed quickly and deteriorate the clarity and assay of the product.

Caution

Polyurethanes 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.

Melting Crystallized ISONATE M 143 Diphenylmethane Diisocyanate

The recommended technique for melting crystallized material is drum rolling (5–10 RPM) in atmospheric steam. This method provides for efficient heat transfer while the solid block of frozen diphenylmethane diisocyanate cools the liquified portion, so that the product temperature never reaches a high enough level (> 60°C) to cause excessive dimerization. A second, but slower technique, involves drum rolling in a hot air oven. Another satisfactory method is static melting in a steam chest.

Handling and Storage (Cont.)

Melting Crystallized ISONATE M 143 Diphenylmethane Diisocyanate (Cont.)

As can be seen, agitation and subsequent quick but even heating is the key to ISONATE™ M 143 Diphenylmethane Diisocyanate quality maintenance during melting. Static melting in hot air ovens is not recommended.

Bulk Storage

Construction material for tanks, lines, pumps, etc. should be series 300 stainless steel or stainless cladding. Mild steel, epoxy, phenolic, etc. coated metal or GRP tanks have yielded erratic product quality data and therefore are not recommended for maintenance of highest standards of quality.

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. Only low temperatures heating media should be used in tank jackets or coils unless adequate circulation or agitation of ISONATE™ M 143 Diphenylmethane Diisocyanate is maintained. A slight positive pressure using dry inert gas must be maintained over stored ISONATE™ M 143 Diphenylmethane Diisocyanate to prevent solids formation that can occur in the presence of atmospheric moisture.

Safety Considerations

Safety Data Sheet [SDS] for ISONATE™ M 143 Diphenylmethane Diisocyanate is available from The Dow Chemical Company. SDS is provided to help customers satisfy their own handling, safety and disposal needs, and those that may be required by locally applicable health and safety regulations. SDS sheets 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 your nearest Dow Sales office.

Toxicity

Harmful by inhalation. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation and skin contact. Avoid breathing vapor or mist. Use with adequate ventilation. Avoid contact with eyes, skin, or clothing. Always wear chemical goggles. Wear a mask or respirator of a type approved by local government and public bodies. If handled indoors, provide mechanical exhaust ventilation. During spray operations, airline masks or positive pressure hose masks should be worn because of the high concentration of isocyanate mist in the atmosphere. OELs (Occupational Exposure Limits) have been set for MDI in most countries. The atmospheric levels should be maintained below the exposure guidelines. Wear protective clothing, overalls, boots, apron and gloves

Fire

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 CO₂ evolution upon water contamination.

Spills

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. Spills can be covered with a commercial absorbent or sand, shoveled into open, properly labeled containers and removed from the work area for decontamination. A suitable decontaminant solution is described in the SDS, section 6. Waste disposal of isocyanates should always be in accordance with national and local regulations.

**Safety
Considerations
(Cont.)**

First Aid Procedure

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.

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.

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

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

Customer Notice

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they were not intended or tested, Dow personnel are willing to assist in dealing with ecological and product safety considerations. Your Dow representative can arrange the proper contacts.

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