

Technical Data Sheet

Eastman™ DMCD

Chemical Synonym

Dimethyl 1,4-Cyclohexanedicarboxylate

Applications

- Auto oem
- Automotive
- General industrial coatings
- Process additives

Key Attributes

- Excellent hardness/flexibility balance
- Excellent weathering
- Good hydrolytic stability
- Improved chemical, stain, corrosion, and humidity resistance
- Low color
- Lower resin solution viscosity compared to aromatic acids

Product Description

IUPAC: Dimethyl 1,4-Cyclohexanedicarboxylate

Eastman™ DMCD (Dimethyl 1,4-Cyclohexanedicarboxylate) is a low melting, cycloaliphatic diester used for the synthesis of polyester resins, polyamides, alkyds, and plasticizers. Coatings formulated with DMCD bring excellent hardness/flexibility balance and good chemical, stain, humidity, and corrosion resistance to polyester-melamine baking enamels for appliance, general metal, and automotive applications. Its outstanding hydrolytic stability makes it a good choice in waterborne polyester resins for automotive, industrial maintenance, and general metal applications. DMCD can be used to make polyester polyols for polyurethane coatings for automotive, industrial maintenance, transportation, and aerospace applications as well.

Many of these unique performance properties are similar to those offered by Eastman™ 1,4 CHDA, but unlike CHDA, the reaction of DMCD with glycols or polyols is a transesterification. Methanol, rather than water, evolves from the reaction. DMCD must be reacted in the first stage of a cook with glycols and polyols only. The first stage is processed until methanol no longer evolves, which indicates the reaction is complete. Diacid components are then added in the second stage.

Eastman™ DMCD is a mixture of cis and trans isomers. It is available as a partially crystallized liquid in drums or in molten form via tank truck.

Typical Properties

Property	Typical Value, Units
General	
Molecular Weight	200.23
Empirical Formula	C ₁₀ H ₁₆ O ₄
Appearance	Partially Crystallized Liquid
Assay	93 wt % min.
Acid Number (mg KOH/g)	20 max.
Color, Pt-Co Scale	10 max.
Methyl 4-methylcyclohexanecarboxylate	1.6 %
Methyl 4-hydroxymethylcyclohexanecarboxylate	0.7 %
Aromatics, as Dimethyl Terephthalate	0.1 wt % max.
Water	0.6 wt % max.
Stereoisomer Ratio	67 cis/33 trans
Boiling Point	

@ 100 mm Hg	176 °C (349 °F)
@ 760 mm Hg	259 °C (498 °F)
Viscosity, Brookfield	
@ 20°C (68°F)	8 cP
@ 31.5 °C (88.7°F)	3.9 cP
@ 44°C (111.2°F)	3.3 cP
@ 60°C (140°F)	2.2 cP
Vapor Pressure	
@ 170.8°C (339.4°F)	50 mm Hg
@ 228.2°C (442.8°F)	300 mm Hg
@ 247.7°C (477.9°F)	500 mm Hg
@ 265°C (509°F)	760 mm Hg
@ 85.1°C (185.2°F)	1 mm Hg
Melting Point	
Cis Stereoisomer	14 °C (57.2 °F)
Trans Stereoisomer	71 °C (159.8 °F)
Specific Gravity	
@ 35°C/4°C	1.102
Solubility	
In Water, g/100g Solvent, @ 25°C (77°F)	1.2 g
Water In, g/100g Solvent, @ 25°C (77°F)	1.6 g
Heat of Combustion	26.69 mJ/kg (11494 Btu/lb)
Heat of Fusion, Trans-isomer	0.11 mJ/kg (47.74 Btu/lb)
Flash Point	
Tag Open Cup	132 °C (270 °F)
Fire Point	
Tag Open Cup	142 °C (287 °F)
Autoignition Temperature	388 °C (730 °F)
Flammability Limits in Air, % by Volume	
Lower @ 150°C (302°F)	0.77 Vol %
Upper @ 184°C (363.2°F)	5.6 Vol %

Comments

Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

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