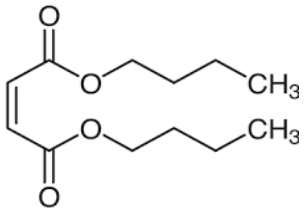
Dibutyl Maleate (DBM)
Product Quality, Regulatory & Technical Information Package
June 2025

Product Name: **Dibutyl Maleate (DBM)**



Chemical Name:	Maleic acid dibutyl ester
CAS number:	105-76-0
Celanese (bulk) Material number:	50000873

The Product is also available from Celanese as packed goods in IBC and drums.

Disclaimer

Celanese is supplying Dibutyl Maleate as a technical grade product.

This document provides information about technical grade Dibutyl Maleate ("Product") produced by Celanese and its affiliates ("Celanese" or "we"). The information presented in this document is based on our present state of knowledge and is intended to provide general notes on the Product and its intended uses. It does not constitute a guarantee of any specific properties of the Products described herein or its suitability for a particular application. The customer must make the sole determination whether the Product is suitable for the desired use. Celanese undertakes no obligation to update the information in this document.

The practice of providing this information to customers is for their convenience and is not legally binding. It does not alter the terms and conditions of sale, including without limitation, any limits of liability, applicable to the underlying commercial transaction involving the Product(s) to which this information applies. The Information is intended for use by persons having skill with respect to the subject matter involved.

Celanese makes no warranties, express or implied, and assumes no liability for the accuracy or completeness or in connection with any use of this information. Nothing herein is intended as a license to operate under or a recommendation to infringe any patents.

General

Further literature to the Product, such as Safety Data Sheet, Brochures and Specifications can be retrieved from Celanese website www.celanese.com.

Table of Contents

Product Description

Maleic acid dibutyl ester is a clear, virtually colourless liquid with an ester-like odour. It is miscible with, for example, methanol, ethanol, acetone, diethylether, N, N-dimethyl formamide and toluene, immiscible with aliphatic hydrocarbons and slightly miscible with water.

Maleic acid dibutyl ester contains about 1-5 % fumaric acid dialkyl ester. Under the action of heat and in the presence of acids or bases, Maleic acid dibutyl ester transposes into fumaric acid dialkyl ester.

Maleic acid dibutyl ester is a suitable intermediate for use in the production of paints and adhesives, copolymers and films. As co-monomer used with Vinyl Acetate (VAM) in emulsion polymers (latexes) Maleic acid dibutyl ester leads to the following performance improvements:

- Lower the glass transition temperature (Tg) and the minimum film forming temperature (MFFT)
- Reduce the excessive hardness and brittleness of VAM homopolymers
- Improve flexibility of the final films
- Improve the hydrolytic stability

To reduce the Tg of a VAM based latex to 7 °C, about 25 % of DBM related to VAM is used.
DBM can be a substitute for Acrylates Esters or VeoVa esters as co-monomers.

Maleic acid dibutyl ester permits the addition reactions normally possible with compounds having olefinic double bonds and is suitable, for example, as a dienophile for diene syntheses using the Diels-Alder reaction. By hydrogenation or acetylation, valuable intermediates can be obtained, e.g. derivatives of succinic acid, which are employed in many different areas of organic synthesis.

Physical properties

Data are intended for the purpose of product description and are not the subject of continuous monitoring. Further physical properties and characteristic data as well as information on safety and handling are listed in the safety data sheet and the sales specifications. Please consult www.celanese.com.

Property		Metric Units	English Units
Boiling Point	@1013 hPa (14.69 psi)	280 °C	536 °F
	@30 hPa (0.435 psi)	163 – 166 °C	325 – 331 °F
Density @20 °C (68°F)		0.993 – 0.995 g/cm³	8.287 – 8.304 lb/gal
Melting Point		- 85 °C	- 121 °F
Molar Mass		228.3 g/mole	
Refractive Index n_D^{20} (68 °F)		1.445 – 1.446	
Vapor Density (Air = 1)		7.87	
Vapor Pressure	@20 °C (68 °F)	0.0027 hPa	0.000039 psia
	@50 °C (122 °F)	0.039 hPa	0.00057 psia
Viscosity @20 °C (68 °F) (calculated)		2.51 mPa · s	
Water solubility @20 °C (68 °F)		0.17 g/l	

Storage and Handling Recommendations

Storage

Recommended Blanketing	Air[a,b] or Dry Nitrogen[a,b,c]
Recommended Temperature	
Maximum	37.8 °C (100 °F)
Recommended pressure	Atmospheric
Bulk Quantities	Outside, detached tanks
Small Containers	Cool, dry, well ventilated area

a. Refer to National Fire Protection Agency (NFPA) #77 "Static Electricity" or the respective national technical code for proper electrical grounding procedures.
b. See the National Fire Protection Agency (NFPA) #30 "Flammable and Combustible Liquids Code" or the respective national technical code and consult with qualified fire protection specialists to determine specific storage tank design requirements.
c. Blanketing may be used to retain quality in long-term storage conditions.

Handling

- Thoroughly review Safety Data Sheet before handling product.
- Protect small containers from physical damage. Keep containers closed when not in use. Open containers slowly to allow any excess pressure to vent.
- Keep away from heat, sparks, flame or other sources of ignition. Use spark-resistant tools.
- See the National Fire Protection Agency (NFPA) #30 "Flammable and Combustible Liquids Code" or the respective national technical code and consult with qualified fire protection specialists to determine specific storage tank design requirements.
- Use proper electrical grounding and bonding procedures when loading, unloading and transferring. Refer to the National Fire Protection Agency (NFPA) #77 "Recommended Practice for Static Electricity" or the respective national technical code for proper electrical grounding procedures.
- Electrical equipment and circuits in all storage and handling areas must conform to requirements of national electrical code (Articles 500 and 501) or the respective national technical code for hazardous location.
- For further information on safety and handling, please use the following link: https://www.celanese.com/sds-search

Materials of Construction

Unit / element	Acceptable Material	Alternate Material
Tank	Carbon Steel (rust free)	Stainless Steel [a] Aluminum Lined Carbon Steel [b]
Piping	Carbon Steel	Stainless Steel [a] Aluminum
Valves	Carbon Steel	Stainless Steel [a] Aluminum
Pumps	Cast Iron, Carbon Steel	Stainless Steel [a]
Relief Valves	Carbon Steel	Stainless Steel [a]
Gaskets	Glass filled PTFE [c]	PTFE [c]
Pump Seals	Single Mechanical Seal: Stainless Steel / Hastelloy C-276 metallic components, Kalrez O-rings	–
Valve Packing	PTFE [c]	Braided PTFE [c]
Pipe End Connections	Welded and flanged system	Threaded with PTFE [c] tape thread lubricant
Heat Exchanger	Product side: Carbon Steel	Product side: Stainless Steel [a]
Hoses	Stainless Steel [a]	Butyl Rubber, Aluminum
Tank Truck	Stainless Steel [a]	Aluminum
Tank Car	Carbon Steel	Aluminum Stainless Steel [a]
ISO Tank	Carbon Steel	Stainless Steel [a]
Barge	Zinc Silicate or Epoxy Lined Carbon Steel	Stainless Steel [a] Carbon Steel
Ship Tank	Zinc Silicate or Epoxy Lined Carbon Steel	Stainless Steel [a]

a. Type 304 or 316 Stainless Steel
b. Lining refers to high baked phenolic resin
c. Polytetrafluoroethylene

Product Quality Statements

Manufacturing Locations

The Product is produced at manufacturing location in Frankfurt (Germany).

- Industrial Park Frankfurt-Hoechst
  Brueningstr. 50
  65926 Frankfurt
  Germany

ISO Certification

The Product is a technical grade material produced under ISO 9001 rules. Certificates are available at Celanese web page (Select Filter "Intermediate Chemistry" and additional filters to retrieve the Certificate from the respective Manufacturing site):
https://www.celanese.com/certificate-search

Specification

The Product is supplied according to Celanese Sales Specification. A copy of the Sales Specification is attached to this dossier.

1. Celanese has a product traceability and withdrawal/recall program in place which we believe is appropriate for technical grade products.
2. The Product is not manufactured under GMP rules.
3. Celanese makes no nutrition statement.
4. There is no food or pharmaceutical grade hazard assessment program available for the Product.

Analytical Methods

Applied analytical methods according to the sales specifications provided as attachment.

Specifications	Analytical Methods [1]
Dibutyl Maleate and Dibutyl Fumarate	DIN 51 405 (GC)
Dibutyl Fumarate	DIN 51 405 (GC)
Water	DIN 51 777 / ASTM D 1364 (mod. Karl-Fischer-Method)
Acid Number	DIN EN ISO 2114 / ASTM D 1613
Color	DIN EN 1557 / DIN ISO 6271 / ASTM D 1209 / ASTM 5386
Density at 20 °C	DIN 51 757 Method D
Appearance	Visual Examination

[1] Alternative equivalent methods can be used at Celanese Terminals.

Manufacturing Process & Raw Materials

The production of the Product relies on chemical synthesis. Butanol and Maleic Anhydride are being used as raw materials for the synthesis according to the chemical equation:

Maleic Anhydride + 2 * Butanol → Dibutyl Maleate + Water

The crude Product is purified via distillation.

Celanese does not use raw materials of animal origin. During the manufacturing process, the material does not come into contact with materials of animal origin.

Shelf Life

The shelf life of the Product is one year.

The shelf life dates from the date of packaging, and for bulk deliveries this is the date of loading. This period is in general applicable to material

- packaged in discrete containers such as drums or bulk containers and
- stored under conditions recommended by Celanese.

For the Product this entails storage at ambient temperatures in tightly sealed, undamaged containers in a cool and well-ventilated place under dry air or dry nitrogen blanket. Blanketing may be used to retain quality in long term storage conditions, especially to prevent access of humidity.

Most products will have a longer useful life, but should be examined by the owner at its sole responsibility at the end of the recommended storage life to determine purity and condition of product. Bulk storage life, under recommended storage conditions, may be longer if the Product is routinely monitored for specific indications of the condition of the material, or if the Product in the tank is removed and replenished with fresh material on a routine basis. Any use of the Product after expiration of the shelf life is the sole responsibility of the buyer.

Kosher

A Kosher grade is available in some countries. Special shipping arrangements must be made in advance. Contact your Sales Representative for more information.

Halal

The Product is not available as a certified Halal grade.

Celanese supplies basic chemicals. Our production technology relies on a continuous production process, and the raw materials are of petrochemical origin. All catalysts and processing aids are of synthetic origin; we do not use any raw materials having an animal (diary) origin, nor is our process likely to be contaminated by such. Ethanol is not used as raw material or processing aid.

ICH Guidelines

The Product does not, based on Celanese's knowledge, contain solvents in the concentration limits specified by the ICH Guideline Q3C(R9) for residual solvents.

The Product does not contain intentionally added sources of biological substances as described in ICH: Q5A (R2): Viral safety evaluation of biotechnology products derived from cell lines of human or animal origin.

Radiation

The Product is not subjected to any artificial radiation.

Regulatory Statements

The Product is not listed in:

- California Proposition 65 (as of December 2023 list)

Animal Testing

The Product was not subject of animal testing for cosmetic purposes by or on behalf of Celanese in order to meet the requirements of Regulation (EC) No 1223/2009 on cosmetic products.

As a chemical products manufacturer and importer, Celanese is required to participate in the chemical industry's efforts to ensure the protection of human health and the environment, and also has obligations under the REACH regulation (Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals).

Celanese practice is to extensively search internally and externally for existing toxicological information before initiating testing. Where existing information does not exist for relevant endpoints, a comprehensive effort will be made to avoid the use of animals by employing alternative methods. When other means have been exhausted and animal testing may be required to develop data to ensure the protection of health and the environment, scientifically sound techniques to reduce the numbers of animals will be used. All applicable animal welfare laws will be followed to ensure care and compassion are exercised.

BSE/TSE

The Product is not derived from human or animal sources and thus we are not aware of any BSE/TSE.

Genetically Modified Organisms (GMO)

The chemistry to manufacture the Product does not use genetically modified or engineered organisms or biomaterials. No GMO/GME substances are added to the Product.

Global Country Inventories

The substance is listed in the following country inventories:

Chemical Inventory Status	listed	comments
Australia (AIIC)	yes	
Canada (DSL)	yes	
China (IECSC)	yes	
Japan (ENCS)	yes	
New Zealand (NZIOC)	yes	
Philippines (PICCS)	yes	
USA (TSCA)*	yes	active
Korea (KECI)	yes	
Taiwan (TCSI)	yes	
Mexico (INSQ)	yes	

* It is not subject to any action under TSCA Section 4, 5, 6, 8a, 8d, or 12b

Allergens

The Product does not, based on Celanese's knowledge, contain the following substances and products thereof commonly associated with food allergens:

- Peanut
- Soya
- Bean
- Milk
- Egg
- Fish
- Peas
- Barley
- Lupine
- Molluscs
- Sulfur Dioxide
- Sulphites
- Tree nuts
- Wheat
- Crustaceans
- Gluten
- Glycerol
- Mustard

Excluded substances

These substances are not, based on Celanese's knowledge, present in the Product. They are not known to be generated in the production process, nor are we aware of such substances appearing as impurities in the raw materials. However, we do not have a specification for those substances, nor do we analyze for them.

No metals are intentionally added to the Product or the production process. Normal trace levels of metals however may be found in the Product.2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP)

- Aflatoxins
- Algaecide / biocide
- Nanomaterials per US EPA definition
- Naphthalene

- Alkyl phenol ethoxylates (APEO)
- Anti-oxidants, such as BHT, BHA, TNPP
- Aromatic amines
- Aromatic hydrocarbons
- Asbestos
- Azo compounds
- BADGE (2,2-bis(4-hydroxyphenyl)propane bis(2,3-epoxypropyl) ether)
- BFDGE (bis(hydroxyphenyl)methane bis(2,3-epoxypropyl) ethers)
- Bisphenol A
- Bisphenol F
- Brominated flame retardants
- Butylated hydroxytoluene (BHT)
- Coloring Agents / Dyes
- Cytokines
- Decabromodiphenyl ether (DecaBDE)
- Dioxins
- Epoxy compounds
- Ethylene oxide
- Flame retardants
- Fluorochemicals
- Formaldehyde and Formaldehyde releasers
- Fragrances
- Glycol ethers
- Gold
- Halogens / Halogenated compounds
- Heavy metals
- Hexachlorobutadiene (HCBD)
- Hybridoma cells
- Jatropha
- Melamine
- Microplastics
- Mineral Oil Aromatic Hydrocarbons (MOAH)
- Mineral Oil Saturated Hydrocarbons (MOSH)
- Monoclonal antibodies
- Nanomaterials
- Nanoparticle-based protein Therapeutics
- Natural Latex
- Nitrates
- Nitrogen oxide
- Nitrosamines
- Nitrosating agents
- NOGE (novolac glycidyl ether)
- Organotin compounds
- Ortho phenyl phenol (OPP)
- Ozone depleting substances
- Palm Oils / Palm Kernel Oils
- Paradichlorobenzene (PDCB)
- Pentachlorothiophenol (PCTP)
- Per- and polyfluoroalkyl substances (PFAS)[2]
- Pesticides
- Phenol, isopropylated phosphate (PIP 3:1)
- Phosphates
- Pigments
- Plasticizers
- Polybrominated substances
- Polychlorinated substances
- Polycyclic Aromatic Hydrocarbons (PAH)
- Polyvinyl chloride (PVC)
- Protein subunits
- Radioactive substances
- Sewer sludge
- Silicones
- Subunit vaccines from in-vitro cell culture
- Sulfites, Sulfur dioxide, sulfates
- Talc
- Tantalum
- Tin
- Tribromophenol
- Triclosan
- Tungsten
- Viral vectors and Viral vector derived products

EU REACH

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Celanese is aware of the obligations imposed by REACH on EU manufacturers and importers as well as on downstream users.

[2] PFAS as defined by the OECD: PFAS definition published by Organization for Economic Co-operation and Development (OECD) provided at this LINK (last accessed on 25 July 2024) or via DOI 10.1787/e458e796-en

We are obliged to comply with the requirements of the REACH legislation relating to our European manufacturing facilities, our own imports as well as our obligations as a downstream user in the European chemical industry.
Should you require additional information on REACH and SVHC, please contact Celanese at REACH@celanese.com.

Food & Food Contact

Celanese produces and offers the Product exclusively as a technical product. The Product is not of a Food or Food contact grade. Any suitability for use is the sole responsibility of the buyer to verify fitness of the Product for the intended use and fitness of the final good for introduction into the market and to ensure compliance of the final goods with the relevant regulations.

Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food

Status: 21st January 2021

Regulation 10/2011/EU applies to the materials and articles specified in Article 2 of this regulation.
Since the Product is a technical grade material as sold by Celanese, it does not fall under the scope of this regulation.
The Product is not listed in Commission Regulation (EU) No 10/2011.
It cannot be evaluated by Celanese whether Article 6 *Derogations for substances not included in the Union* list might apply for the customer's use of the Product.

Dual Use Additives (Food)

Status: 21st January 2021

"Certain substances used in food contact plastics are, at the same time, authorised food additives or authorised flavourings respectively by Regulation (EC) No 1333/2008 or Regulation (EC) No1334/2008 or their implementing measures. These substances are called dual-use additives.
To decide if a substance can be considered as a dual-use additive, it is sufficient that the chemical identity of the plastic additive matches that of an authorised food additive or flavouring, regardless of its purity or whether or not the substance is subject to a restriction in food and/or in the plastic." [a]

Food Additives
Regulation (EC) No 1333/2008 on food additives
The Product is not listed.

Flavourings
Regulation (EC) No 1334/2008 on flavourings and certain food ingredients with flavouring properties for use in and on foods and amending Council Regulation (EEC) No 1601/91, Regulations (EC) No 2232/96 and (EC) No 110/2008 and Directive 2000/13/EC
The Product is not listed.

[a] Quote from "Union Guidelines on Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food"(published by the European Commission Health And Consumers Directorate-General, 21.02.2014)
http://ec.europa.eu/food/food/chemicalsafety/foodcontact/docs/10-2011_plastic_guidance_en.pdf

Packaging Inks in Swiss Ordinance of the FDHA on Materials and Articles (817.023.21)

Status: 21st January 2021

Packaging inks are regulated in the section 12 of the Ordinance of the FDHA on Materials and Articles, and the provisions of this Section apply to packaging inks as specific constituent elements of materials and articles.
General listings in Annex 2 and Annex 10 to the Swiss Ordinance of the FDHA on Materials and Articles (817.023.21):

Annex 2
Not listed

Annex 10

1	Nr.	366
2	Bezeichnung des Stoffes	Maleic acid, dibutyl ester
3	CAS-Nr.	0000105-76-0
4	Ref-Nr.	19600
5	Verwendung	M
6	Teil	B
7	SML [mg/kg]	
8		
9	Beschränkungen und Spezifikationen	

Restriction of Hazardous Substances (RoHS)

Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) (RoHS)

Status: 21st January 2021

The Product as supplied by Celanese does not fall within the scope of directive 2011/65/EU, since it applies to electrical and electronic equipment (EEE) "falling within the categories set out in Annex I." (Art. 2)
Annex II of Directive 2011/65/EU lists "Restricted substances […] and maximum concentration values tolerated by weight in homogeneous materials"

- Lead (0.1 %)
- Mercury (0.1 %)
- Cadmium (0.01 %)
- Hexavalent chromium (0.1 %)
- Polybrominated biphenyls (PBB) (0.1 %)
- Polybrominated diphenyl ethers (PBDE) (0.1 %)
- Bis(2-ethylhexyl) phthalate (DEHP) (0,1 %)
- Butyl benzyl phthalate (BBP) (0,1 %)
- Dibutyl phthalate (DBP) (0,1 %)
- Diisobutyl phthalate (DIBP) (0,1 %)

The Product, based on Celanese's knowledge, does not contain these substances at the required limits.

However, these substances are not routinely tested in our analytical procedures and quality control system, therefore, analytical data on the existence/non-existence of these substances cannot be provided.

Volatile Organic Compounds (VOC)

Status: 21st January 2021

The Product does not fulfill the criteria and is not considered a VOC according to

- 2010/75/EU on industrial emissions (integrated pollution prevention and control) (Recast)
- 2004/42/CE on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (Paints Directive)
- 2014/312/EU on the Commission Decision of 28 May 2014 establishing the ecological criteria for the award of the EU Ecolabel for indoor and outdoor paints and varnishes
- Swiss OVOC, Ordinance on the Incentive Tax on Volatile Organic Compounds 814.018

Attachment I: Sales Specifications

Celanese
The chemistry inside innovation™

Dibutyl Maleate (Maleic acid di-n-butyl ester) CAS-No. 105-76-0

Sales Specification

Specifications (1)		Limit	Unit
Dibutyl Maleate and Dibutyl Fumarate	min.	98.5	wt. %
Dibutyl Fumarate	max.	5.0	wt. %
Water	max.	500	ppm
Acid Number	max.	0.20	mg KOH/g
Color	max.	25	Pt-Co
Density at 20 °C	-	0.993 – 0.995	g/cm³
Appearance	-	CFSM (2)	-

(1) Test methods available upon request.
(2) Clear and Free from Suspended Matter.

Product Numbers: 50000873

Additional Product numbers in use for other packaging. Please contact your Sales Support.

Spec. DBM-001-Global-Jun25

Supersedes: Dibutylmaleate_50000873_SLS_e_V5 of November 15, 2016 (Version-No. 5)

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