

Palatinol[®] M

Edition dated July 2019

Valid for product produced in Ludwigshafen only

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® = Registered trademark of BASF SE

Light-stable plasticizer with very good solvent power for cellulose acetate and cellulose nitrate. Auxiliary plasticizer for surface coatings. Inhibitor for peroxides.

Chemical nature

Dimethyl phthalate, phthalic acid dimethyl ester

Molecular formula	C ₁₀ H ₁₀ O ₄
CAS number	131-11-3
EC number	205-011-6
Abbreviation (DIN EN ISO 1043-3)	DMP

Delivery specification

Property	Value	Unit	Test method DIN/ASTM
Dynamic viscosity* at 20 °C	16 – 19	mPa · s	ASTM D 7042
Density* at 20 °C	1.190 – 1.194	g/cm ³	DIN 51757 ASTM D 4052
Platinum-cobalt color	10 max.		DIN EN ISO 6271 ASTM D 1209
Refractive index* n_D^{20}	1.515 – 1.516		DIN 51423-2 ASTM D 1045
Acid value	0.04 max.	mg KOH/g	DIN EN ISO 2114 ASTM D 1045
Ester content	99.5 min.	% by area	GC-method BASF
Water content	0.1 max.	% by weight	DIN 51777, Part 1 ASTM E 203

*These properties are not measured routinely.

Properties

Palatino[®] M is a nearly colorless, clear and practically anhydrous liquid with a hardly noticeable odor. It is soluble in the usual organic solvents and is miscible and compatible with all of the monomeric plasticizers commonly used in PVC. Palatino[®] M is almost insoluble in water and aliphatic hydrocarbons.

Physical data

The following physical data were measured in the BASF SE laboratories. They do not represent any legally-binding guarantee of properties for our sales product.

Molar mass 194.2 g/mol

Pour point (DIN ISO 3016) -42 °C

Surface tension 20 °C (DIN EN 14370) 41.9 mN/m

The crystallization point of Palatino[®] M can occur at temperatures much higher than the pour point (even at 0 °C). This must be taken into account for storage in winter. Even at 0 °C, Palatino[®] M may crystallize completely and become solid.

Vapor pressure	T [°C]	p [hPa]
	50	0.03
	60	0.07
	70	0.15
	80	0.3
	90	0.6
	100	1.2
	120	3.6
	140	9.9
	160	23.8
	180	52.2
	200	105
	220	198
	240	350
	260	588
	280	945
Antoine constants for (p in bar; T in °C)	ln (p) = A + B / (C + T)	
	A = 10.4098	
	B = - 4827.10	
	C = 181.22	

(The Antoine constants were determined from vapor pressure data measured in the temperature range of 87 °C to 283 °C by a dynamic method in an argon atmosphere. The values in the table were calculated using the Antoine equation. The data serve only as a rough guide.)

Density and viscosity

Temperature [°C]	Density* ρ [g/cm ³]	Dyn. Viscosity η [mPa · s]
5	1.2056	45
10	1.2010	32
20	1.1917	18
30	1.1823	11
40	1.1730	7.5
50	1.1637	5.4

* Calculated using the following equation: $\rho = (-0.00093 \cdot t + 1.2103)$ from data measured by BASF SE. (ρ = Density (g/cm³), t = Temperature (°C))

Solubility parameters according to Hansen
at 25 °C [1]

Conversion factor:
1 (cal/cm³)^{1/2} = 2.0455 (MPa)^{1/2}

δ_d = 18,6 (MPa)^{1/2}
δ_p = 10,8 (MPa)^{1/2}
δ_h = 4,9 (MPa)^{1/2}
δ_t = 22,1 (MPa)^{1/2}

Storage & Handling

Palatino[®] M can be stored in tanks and drums constructed from normal carbon steel, e. g. A 283 grade. If severe demands are imposed on the product quality, we recommend to store it in tanks constructed from stainless steel, e. g. AISI TP 316 Ti (German steel No. 1.4541) or aluminum (AlMg3).

It is recommended to take steps to ensure the exclusion of atmospheric moisture, e. g. by storing under a blanket of dry nitrogen, as otherwise the product quality may deteriorate, e. g. the water fraction may rise, or the Palatino[®] M may be discolored by rust in normal steel tanks.

Drums containing the product should be kept tightly closed in a well-ventilated place.

Palatino[®] M can be stored for one year at temperatures below 40 °C, if moisture is excluded.

The tendency to crystallization at low temperatures must be taken into account. (See remark at pour point)

Pumps:

Cast-steel centrifugal pumps with a simple slip-ring seal are suitable.

Flange seals:

An example of a suitable material for seals is chemical-resistant Polytetrafluoroethylene (PTFE). Other plastics should be checked for suitability before they are taken into use.

Literature

[1] Barton, A.F.M.
"CRC Handbook of Solubility Parameters and Other Cohesion Parameters",
Second Edition, 1991, CRC Press, Inc., Boca Raton, Florida/USA, page 99

Safety

When using this product, the information and advice given in our **Safety Data Sheet** should be observed. Due attention should also be given to the **precautions** necessary for handling chemicals.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

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