

Plastomoll[®] DNA

Edition dated July 2019

Valid for product produced in Ludwigshafen only

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® = Registered trademark of BASF SE

Plasticizer for PVC products with good low-temperature properties.

Chemical nature

Adipic acid ester with less branched isononanols; diisononyl adipate

Molecular formula	C ₂₄ H ₄₆ O ₄
CAS number	33703-08-1
EC number	251-646-7
Abbreviation (DIN EN ISO 1043-3)	DINA

Delivery specification

Property	Value	Unit	Test method DIN/ASTM
Dynamic viscosity* at 20 °C	17 – 21	mPa · s	ASTM D 7042
Density* at 20 °C	0.918 – 0.922	g/cm ³	DIN 51757 ASTM D 4052
Platinum-cobalt color	40 max.		DIN EN ISO 6271 ASTM D 1209
Refractive index* n_D^{20}	1.448 – 1.451		DIN 51423-2 ASTM D 1045
Acid value	0.07 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

Plastomoll® DNA 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. In water, Plastomoll® DNA is soluble only in very small amounts.

Owing to its chemical structure, Plastomoll® DNA permits – preferably, in combination with phthalates and polymeric plasticizers – the production of plasticized PVC products with exceptionally good low temperature properties.

PVC plasticized with Plastomoll® DNA has far less volatility than, for example, PVC plasticized with DOA.

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	398.6 g/mol
Pour point (DIN ISO 3016)	< -60 °C
Solution temperature at the clear point (5 % S-PVC, K-value 71; DIN 53408)	156°C
Surface tension 20 °C (DIN EN 14370)	30.2 mN/m

Vapor pressure	T [°C]	p [hPa]
	20	approx. $7 \cdot 10^{-9}$
	50	approx. $2 \cdot 10^{-6}$
	180	0.4
	200	1.2
	220	3.2
	240	7.9
	260	17.5
	280	36.1
	300	70.0
Antoine constants for (p in bar; T in °C)	$\ln(p) = A + B / (C + T)$ A = 11.7602 B = - 6564.15 C = 155.24	

(The Antoine constants were determined from vapor pressure data measured in the temperature range of 180 °C to 300 °C by a dynamic method in a nitrogen atmosphere. The values in the table were calculated using the Antoine equation. The data serve only as a rough guide.)

Density and viscosity dependent on temperature

Temperature [°C]	Density* ρ [g/cm ³]	Dyn. Viscosity** η [mPa · s]
-10	0.9423	84.3
0	0.9350	48.7
10	0.9277	29.7
20	0.9204	19.2
30	0.9131	13.3
40	0.9058	9.6
50	0.8985	7.2

* Calculated using the following equation: $\rho = (-0.00073 \cdot t + 0.9350)$ from data measured by BASF SE. (ρ = Density in g/cm³, t = Temperature in °C)

** Calculated according to Schwen and Puhl ([1], Formula 7) from data measured by BASF SE.

Specific heat C_p (DSC) according to DIN 51007

Temperature [°C]	Specific heat C_p [J/(g · K)]
25	1.93
60	2.05
100	2.16

Storage & Handling

Plastomoll® DNA 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 Plastomoll® DNA may be discolored by rust in normal steel tanks.

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

Plastomoll® DNA can be stored for one year at temperatures below 40 °C, if moisture is excluded.

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] Schwen, R. and Puhl, H.

“Fehlersuche bei Viskosität-Temperatur-Messungen”, Erdöl und Kohle-Erdgas-Petrochemie, Vol. 45, April 1992:

Part A: “Problematik, Formelpaket und mathematisches Procedere”, issue 4, pages 161 ff.

Part B: “Resultate, Nuetzlichkeit”, issue 6, pages 253 ff.

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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