

## Technical data sheet

### DIPLAST<sup>®</sup> TINTM/ST

Version: February 2017

#### Chemical composition

Triisononyl trimellitate,  
containing antioxidant: Pentaerythritol Tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate)

#### CAS number

53894-23-8

#### EINECS number

258-847-9

#### Specifications

Characteristics	Unit	Value	Test method	
Density at 20°C	g/ml	0.974 - 0.984	GM012	ASTM D 4052-96
Refractive index n <sup>20</sup> <sub>D</sub>		1.484 - 1.488	GM020	ASTM D 1045-95
Colour	Pt – Co	70 max.	PL02F	ASTM D 1045-95 ASTM D 1209-00
Acidity	mgKOH/g	0.1 max.	PL02C	ASTM D 1045-95
Water content	%	0.1 max.	GM010	ASTM E 203-96
Viscosity at 20°C	mPa·s	260 - 320	GM022	ASTM D 445-96
Ester content	%	99.5 min.	PL10C	G.C.

**DIPLAST<sup>®</sup> TINTM/ST** is an oily, limpid, anhydrous liquid, with a mild characteristic odour. It is soluble in common organic solvents, insoluble in water.

For further information on the characteristics and properties of **DIPLAST<sup>®</sup> TINTM/ST** in the liquid state, see the relevant EC-standard Materials Safety Data Sheet.

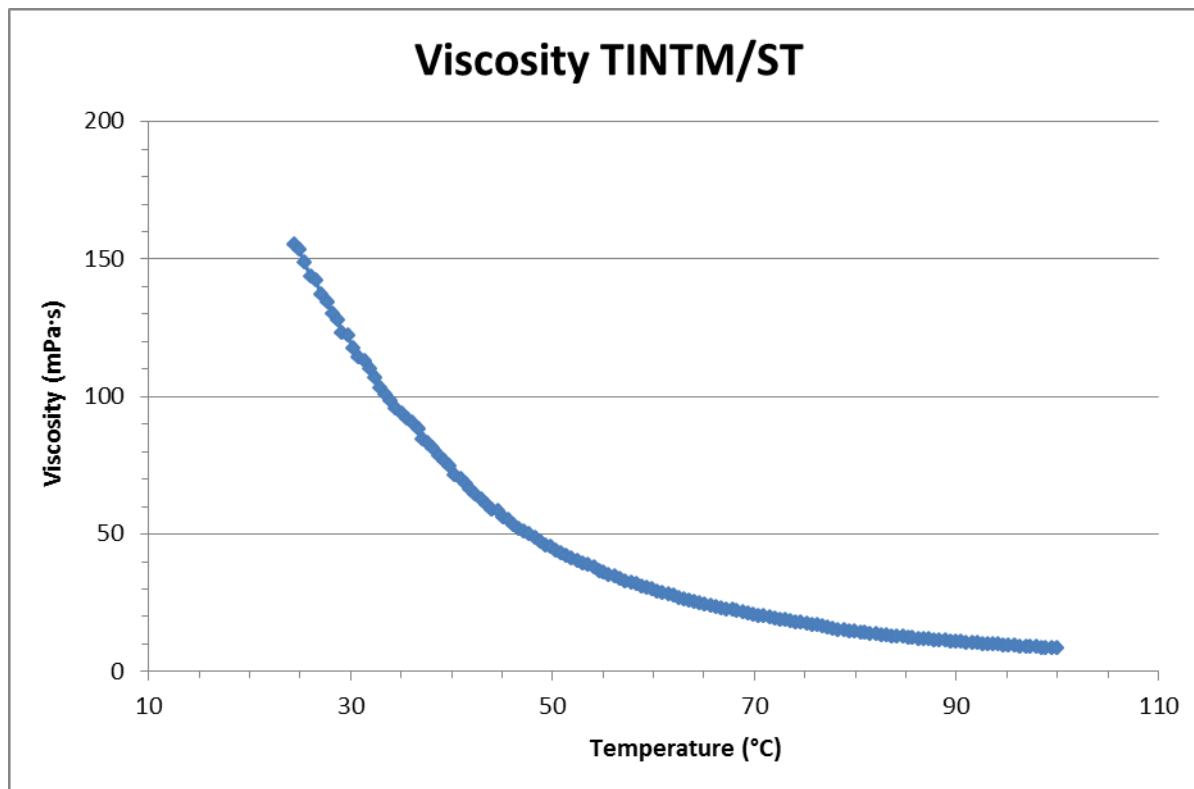
The product **DIPLAST<sup>®</sup> TINTM/ST** due to its nature does not have a shelf life. However it can be stored in appropriate containers at a temperature of approximately 25°C and the exclusion of humidity for at least 1 year, without losing its chemical properties.

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## Liquid Properties



## Characteristics and applications of trimellitates

PVC plasticizers based on Polynt Trimellitic Anhydride (Trimellitate plasticizers) offer to users and compounders many of the performance advantages of both Polyester and Phthalate plasticizers. Trimellitate plasticizers show a unique balance of properties that can be summarized as follows:

- **Processability and efficiency**  
Comparable with those of many Phthalate plasticizers and better than most Polyester plasticizers.
- **Permanence at high temperatures and retention of mechanical properties.**  
Trimellitate plasticizers provide the same or even better performances than Polyester plasticizers.
- **Low temperature flexibility**  
Unlike Polyester plasticizers, Trimellitate plasticizers provide good flexibility at low temperatures.
- **Permanence and compatibility**  
Trimellitate plasticizers are more permanent than many other plasticizers. They are extremely resistant to extraction by aqueous soap and have an excellent compatibility under high humidity. The migration resistance in PVC compounds when in contact with a wide range of materials is much better than phthalates and other monomeric plasticizers and comparable to Polyester plasticizers.

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## Characteristics and applications of DIPLAST® TINTM/ST

DIPLAST® TINTM/ST can be used in a wide range of applications for such as:

- PVC compounds for the production of high temperature cables according to European and International standards like BS 6746, VDE 0207, UL 62 etc.;
- vinyl sheets for car interior components required to meet stringent “windscreen fogging” specifications. The easy processability of DIPLAST® TINTM/ST can be exploited for manufacturing articles by slush moulding technology;
- various compounds: foils, profiles, shoes, gaskets, etc. which have to exhibit special requirements such as heat resistance, low volatility, low migration tendency.

### General properties in PVC compounds

The properties of DIPLAST® TINTM/ST were evaluated in PVC compounds in comparison with DIPLAST® TM/ST (TOTM) and diisotridecyl phthalate (DTDP) using the following formulation:

	PVC K70	Plasticizer	Ca/Zn	Stearic acid	Calcium carbonate	Calcium stearate
<b>Formulation 1 parts by weight</b>	100	50	1.2	0.3		--
<b>Formulation 2 parts by weight</b>	100	47	8	--	15	0.5

The specimens were prepared by calendering and moulding to obtain the thickness required for the different test methods.

### Results formulation 1:

	Test method	DIPLAST® TINTM/ST	DIPLAST® TM/ST	DTDP(**)
<b>Shore “A” hardness</b>	ISO 868	92.5	89.5	94
<b>Cold flex °C (Clash &amp; Berg)</b>	ISO/R 458	-23.5	-17	--25
<b>Solution Temperature °C (*)</b>	DIN 53408	147	140.5	--
<b>Volatility (7days at 100°C) %</b>	ISO 176	-0.82	-0.97	-1.39
<b>Rheological properties</b>				
• Dryblending time 83°C (Mixer P-600 : 100 RPM)	Brabender Plasticorder	7'08"	5'16"	8'10"
• Gel time 88°C (at max torque) (Mixer W-50; 40 rpm; 48gr)	Brabender Plasticorder	28'46"	10'16"	>60'
• Fusion Temperature (°C) (Mixer W-50, 5°C/min, 40Rpm)	Brabender Plasticorder	131.7	119.6	156

(\*) Solution temperature determined with dispersion of resin: two grams of PVC are placed in 48 grams of plasticizer and the solution is heated at 1°C/min.

(\*\*) it contains 0.3% di 1,1,3 – Tris (2-methyl-4-hydroxy-5-t-butyl phenyl) butane

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## Properties in PVC compounds for cables

**DIPLAST® TINTM/ST** enables high temperature cables to be produced.  
As a technical information, the following results are quoted:

### Results formulation 2 , thickness 1mm.

Test conditions (	DIPLAST® TINTM/ST	DIPLAST® TM/ST	DTDP(**)
<b>ORIGINAL SPECIMENS:</b>			
Tensile strength MPa	21.9	23.1	21.4
Elongation at break %	314	331	306
Modulus 100%	13.6	13.5	13.5
<b>AFTER AGEING CONDITIONS: SPECIMENS AGED 10 days at 100°C Accelerated ageing test for class II ISO 6722</b>			
Tensile strength Variation % (± 25% max.)	-5.5	-4.8	-0.9
Elong at break Variation % (± 25% max.)	-1.9	-7.9	-10.1
Modulus 100% Variation %	-3.7	3.7	19.3
Weight loss (mg/cm <sup>2</sup> )	-0.54	-1.21	-3.79

(\*\*) it contains 0.3% di 1,1,3 – Tris (2-methyl-4-hydroxy-5-t-butyl phenyl) butane

In the tests, compounds were aged in an oven with forced ventilation.

In case of more severe requirements, we suggest the use of **DIPLAST®8-10/ST**, trimellitate obtained by a blend of linear alcohols C<sub>8</sub>-C<sub>10</sub>.

*The information contained here is correct and accurate and is based on our technical and scientific knowledge at the date of going to press.*

*Such information is, in all cases, relevant only with respect to the product as used in its pure state and only for the uses referred to in this publication.*

*Nothing stated here may be taken or construed as implying a breach of existing patents.*

*No warranty, either expressed or implicit, is given with regard to the results to be obtained from using this information.*

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