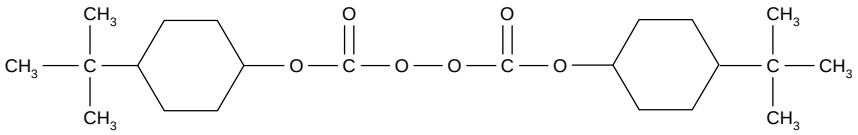
AkzoNobel
Tomorrow's Answers Today

Perkadox® 16

Product description

Di(4-tert-butylcyclohexyl) peroxydicarbonate



Molecular weight	: 398.5
Active oxygen content peroxide	: 4.01%
actual product	: 3.77-3.89%
CAS No.	: 15520-11-3
EINECS/ELINCS No.	: 239-557-1
TSCA status	: listed on inventory

Specifications

Appearance	: White powder
Assay	: 94.0-97.0%
Inorganic + organic hydrolysable chloride	: 0.4% max.

Characteristics

Density, 20°C	: 0.113 g/cm^3
Bulk density, 20°C	: 450-480 kg/m^3

Storage

Due to the relatively unstable nature of organic peroxides a loss of quality can be detected over a period of time. To minimize the loss of quality, AkzoNobel recommends a maximum storage temperature (T_s max.) for each organic peroxide product.

For *Perkadox* 16 T_s max. = 20°C

When stored under the recommended storage conditions, *Perkadox* 16 will remain within the AkzoNobel specifications for a period of at least 3 months after delivery.

Thermal stability

Organic peroxides are thermally unstable substances, which may undergo self-accelerating decomposition. The lowest temperature at which self-accelerating decomposition of a substance in the original packaging may occur is the Self-Accelerating Decomposition Temperature (SADT). The SADT is determined on the basis of the Heat Accumulation Storage Test.

For *Perkadox* 16		
	SADT	: 40°C
	Emergency temperature (T_{em})	: 35°C
	Control temperature (T_c)	: 30°C

The Heat Accumulation Storage Test is a recognized test method for the determination of the SADT of organic peroxides (see Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria - United Nations, New York and Geneva).

Major decomposition products

Carbon dioxide, 4-tert-Butyl-cyclohexanol, 4-tert-butylcyclohexanone

Packaging and transport

In North America *Perkadox* 16 is packed in non-returnable cartons containing 25 polyethylene bags of 1 lb net weightor 5 polyethylene bags of 5 lb net weight.

In other regions the standard packaging is a cardboard box for 20 kg peroxide.

Both packaging and transport meet the international regulations. For the availability of other packed quantities contact your AkzoNobel representative.

Perkadox 16 is classified as Organic peroxide type C; solid, temperature controlled; Division 5.2; UN 3114; PG II.

Safety and handling

Keep containers tightly closed. Store and handle *Perkadox* 16 in a dry well-ventilated place away from sources of heat or ignition and direct sunlight. Never weigh out in the storage room.

Avoid contact with reducing agents (e.g. amines), acids, alkalis and heavy metal compounds (e.g. accelerators, driers and metal soaps).

Please refer to the Material Safety Data Sheet (MSDS) for further information on the safe storage, use and handling of *Perkadox* 16. This information should be thoroughly reviewed prior to acceptance of this product.
The MSDS is available at www.akzonobel.com/polymer.

Applications

Perkadox 16 is a solid peroxydicarbonate which is used for the curing of unsaturated polyester resins and methacrylic resins mainly in the temperature range of 60°C and higher.

Perkadox 16 is not suitable for the production of clear - castings or - coatings, due to a slight haze in the end product. In this case, *Perkadox* 16S can be advised.

Perkadox 16 shows a high reactivity at elevated temperatures, which is demonstrated by its low activation temperature, in combination with a relatively long pot life at ambient temperatures.

Perkadox 16 is mostly used in combination with a low reactive peroxide to ensure a good final cure. Combinations of *Perkadox* 16 with e.g. Trigonox® C, *Trigonox* 29-B50, *Trigonox* 21 or *Perkadox* CH-50X can therefore successfully be used for those applications where a long gel time or production time is required at room temperature in combination with a fast cure at elevated temperatures of e.g. 60-140°C. Applications area can be: pultrusion, filament winding, manufacturing of artificial marble.

Dosing

Depending on working conditions, the following application characteristics were determined:

Perkadox 16 as such	1 - 2 phr*
Perkadox 16 as kicker	0.5 - 1 phr

* phr = parts per hundred resin

Cure Characteristics

In a high reactive standard orthophthalic polyester resin the following application characteristics were determined:

Activation temperature

1 phr *Perkadox* 16	40°C

Gel times at 100°C

1 phr *Trigonox* C	10	min.
1 phr *Trigonox* C + 0.5 phr *Perkadox* 16	2	min.
1 phr *Trigonox* C + 1.0 phr *Perkadox* 16	1.2	min.

Pot life at 20°C

1 phr *Perkadox* 16	2 days
1 phr *Trigonox* C	56 days
1 phr *Trigonox* C + 0.5 phr *Perkadox* 16	8 days
1 phr *Trigonox* C + 1.0 phr *Perkadox* 16	2 days

Time-temperature curves at elevated temperatures

Time-temperature curves have been determined at 60°C, 100°C and 140°C to demonstrate the use of *Perkadox* 16 as kicker in pultrusion applications. From the curves the time to peak was calculated as an indication for the cure speed.

	Time to Peak at		
	60°C (hours)	100°C (min.)	140°C (min.)
1 phr *Trigonox* 29-B50	5.5	7.7	2.8
1 phr *Trigonox* 29-B50 + 1 phr *Perkadox* 16	0.25	2.4	1.4
1 phr *Trigonox* C	24	13.5	3.5
1 phr T*rigonox* C + 1 phr *Perkadox* 16	0.25	2.1	1.4

Akzo Nobel Polymer Chemicals B.V.
Amersfoort, The Netherlands
Tel. +31 33 467 6767
Fax +31 33 467 6151

polymerchemicals.nl@akzonobel.com

Akzo Nobel Polymer Chemicals LLC
Chicago, U.S.A.
Tel. +1 312 544 7000
1 800 828 7929 (Toll free US only)
Fax + 1 312 544 7188
polymerchemicals.na@akzonobel.com

Akzo Nobel (Asia) Co., Ltd.
Shanghai, PR China
Tel. +86 21 6279 3399
Fax +86 21 6247 1129

polymerchemicals.ap@akzonobel.com

www.akzonobel.com/polymer