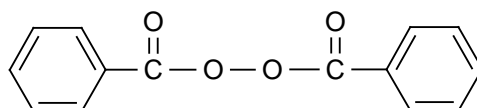




Perkadox[®] BTW-50

Product description Dibenzoyl peroxide, paste, 50% in dipropylene glycol dibenzoate and water



Molecular weight	: 242.2
Active oxygen content peroxide	: 6.61%
actual product	: 3.20-3.37%
CAS No.	: 94-36-0
EINECS/ELINCS No.	: 202-327-6
TSCA status	: listed on inventory

Specifications	Appearance	: White homogeneous paste
	Assay	: 48.5-51.0%

Characteristics	Density, 20°C	: 1.200 g/cm ³
	Viscosity, 20°C	: thixotropic paste

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* BTW-50 T_s max. = 25°C (77°F)

When stored under the recommended storage conditions, *Perkadox* BTW-50 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 <i>Perkadox</i> BTW-50	SADT	: 50°C (122°F)
	Emergency temperature (T _{em})	: 45°C (113°F)
	Control temperature (T _c)	: 40°C (104°F)

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, benzoic acid, benzene, diphenyl, phenyl benzoate
-------------------------------------	--

Packaging and transport

In North America *Perkadox* BTW-50 is packed in 45 lb. plastic pails.

In other regions the standard packaging is plastic pails for 20 kg peroxide.

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

Perkadox BTW-50 is classified as Organic peroxide type E; solid; Division 5.2; UN 3108.

Safety and handling

Keep containers tightly closed. Store and handle *Perkadox* BTW-50 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* BTW-50. This information should be thoroughly reviewed prior to acceptance of this product.

The MSDS is available at www.akzonobel.com/polymer.

Applications

Perkadox BTW-50 is a paste containing 50% dibenzoyl peroxide without phthalate for the curing of unsaturated polyester resins at ambient and elevated temperatures. At temperatures up to 80°C, *Perkadox* BTW-50 should be used in combination with an aromatic tertiary amine accelerator, above 80°C the use of an accelerator is not required.

Perkadox BTW-50 has primarily been developed for the putty market. For non-filled systems, *Perkadox* CH-50X or *Perkadox* 40E are better applicable with respect to miscibility with the UP resin.

Perkadox BTW-50 shows a very good chemical and physical stability and is therefore very suitable for tube filling.

The curing system *Perkadox* BTW-50/amine accelerator shows a very fast cure that is hardly influenced by humidity and fillers. Even at low temperatures a relatively good cure will be obtained. A disadvantage may be the yellow color and poor light resistance of the moulded product.

For ambient temperature curing the following amine accelerators are available to adjust the gel time and speed of cure of the cure system based on *Perkadox* BTW-50:

Accelerator NL-65-100 (N,N-Dimethyl-p-toluidine) for short gel times

Accelerator NL-63-100 (N,N-Dimethylaniline) for medium gel times

Accelerator NL-64-100 (N,N-Diethylaniline) for long gel times.

Dosing

Depending on working conditions, the following peroxide and accelerator dosage levels are recommended:

<i>Perkadox</i> BTW-50	2 - 5 phr [*]
Amine accelerator	0.05 - 0.5 phr

^{*} phr = parts per hundred resin = weight% on 100 grams of UP resin

Cure Characteristics

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

Gel times at 20°C

UP resin	100	100	100	100	100	100	100
<i>Perkadox</i> BTW-50	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Accelerator NL-63-100	0.1	0.4					
Accelerator NL-64-100			0.1	0.5			
Accelerator NL-65-100					0.05	0.1	0.4
Gel time (minutes)	22	6	160	20	20	5	1

Cure of 1 mm pure resin layer at 20°C

The speed of cure is expressed as the time to reach a Persoz hardness of respectively 30, 60 and 120 s.

	Persoz: 30	60	120	s
3 phr <i>Perkadox</i> BTW-50 + 0.1 phr Acc. NL-63-100	0.5	0.8	2	h
3 phr <i>Perkadox</i> BTW-50 + 0.4 phr Acc. NL-63-100			<0.5	h
3 phr <i>Perkadox</i> BTW-50 + 0.5 phr Acc. NL-64-100		0.5	1	h
3 phr <i>Perkadox</i> BTW-50 + 0.05 phr Acc. NL-65-100	1	2.5	14	h
3 phr <i>Perkadox</i> BTW-50 + 0.1 phr Acc. NL-65-100			0.5	h

Cure of 4 mm laminates at 20°C

4 mm laminates have been made with 450 g/m² glass chopped strand mat. The glass content in the laminates is 30% (w/w).

The following parameters were determined:

- Time-temperature curve
- Speed of cure expressed as the time to achieve a Barcol hardness (934-1) of 0-5 and 25-30 respectively.
- Residual styrene content after 24h at 20°C and a subsequent postcure of 8 h at 80°C.

	Gel time min.	Time to peak min.	Peak exotherm °C
3 phr <i>Perkadox</i> BTW-50 + 0.1 phr Acc. NL-63-100	24	31	99
3 phr <i>Perkadox</i> BTW-50 + 0.5 phr Acc. NL-64-100	21	26	140
3 phr <i>Perkadox</i> BTW-50 + 0.05 phr Acc. NL-65-100	28	35	64

	Barcol 0-5	Barcol 25-30	Res. styrene 24 h 20°C	Res. styrene +8 h 80°C
	h	h	%	%
3 phr <i>Perkadox</i> BTW-50 + 0.1 phr Acc. NL-63-100	<1		3.2	1.0
3 phr <i>Perkadox</i> BTW-50 + 0.5 phr Acc. NL-64-100	<<1		2.9	2.1
3 phr <i>Perkadox</i> BTW-50 + 0.05 phr Acc. NL-65-100	<1	8.5	6.6	0.8

Pot life at 20°C

Pot lives were determined of a mixture of *Perkadox* BTW-50 and a non-preaccelerated UP resin at 20°C.

3 phr *Perkadox* BTW-50

21 days

Perkadox is a registered trademark of Akzo Nobel Chemicals B.V. or affiliates in one or more territories.

All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable. AkzoNobel Functional Chemicals, however, makes no warranty as to accuracy and/or sufficiency of such information and/or suggestions, as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes. The information contained herein supersedes all previously issued bulletins on the subject matter covered. The user may forward, distribute, and/or photocopy this document only if unaltered and complete, including all of its headers and footers, and should refrain from any unauthorized use. You may not copy this document to a website.

AkzoNobel Functional Chemicals
Amersfoort, The Netherlands
T +31 33 467 6767
F +31 33 467 6151
E polymerchemicals.nl@akzonobel.com

AkzoNobel Functional Chemicals
Chicago, U.S.A.
T +1 312 544 7000
1 800 828 7929 (Toll free US only)
F +1 312 544 7188
E polymerchemicals.na@akzonobel.com

Akzo Nobel (Asia) Co., Ltd.
Shanghai, PR China
T +86 21 2216 3600
F +86 21 3360 7739
E polymerchemicals.ap@akzonobel.com

www.akzonobel.com/polymer