Our curing systems for thermoset resins

Nouryon

Nouryon is your partner in essential solutions for a sustainable future

Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of approximately 7,800 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands.

Throughout our history, we built up a wealth of expertise, forged long-term partnerships, and earned a place among the best performing companies in our industry. Now that we're Nouryon, we're putting even greater focus on what it takes to be a global specialty chemicals leader

Nouryon is a responsible organization that takes its obligations seriously – to the planet, to our customers and to our own people. We believe the only way to grow is by developing sustainable, innovative solutions that benefit our customers and we're constantly looking for ways to reduce our impact on the environment.

Within our Polymer Specialties business, we produce everyday essentials for the global polymer and electronics industries. We are among the world's leading producers of organic peroxides, metal alkyls, organometallic specialties and polymer additives, which are essential ingredients for the thermoplastic, composite and rubber industries. We are widely known for our world-class products, including Trigonox®, Butanox®, Cadox®, Perkadox® and Ketjenblack®.

Butanox®

Committed to a sustainable future

Chemistry is essential for thousands of products we use every day and at Nouryon, we believe good chemistry is key to a sustainable future. Our approach to sustainability is based on three pillars: further improving our environmental footprint and safety performance; growing sales of our portfolio of sustainable solutions; and continuing to engage with our people and society to drive progress together.

Improve

We continuously work on further improving our environmental footprint and safety performance. We are a top-quartile performer in safety, and we have reduced our carbon footprint per ton of product by almost a third between 2009 and 2019. We are committed to reducing our impact on the environment even further – working with customers, suppliers and new technology start-ups to become even safer and more efficient every day.

Grow

We work together with customers, suppliers, and other partners to develop new and leading solutions that have smaller footprints or enable our customers to deliver benefits in more sustainable ways – ranging from a growing share of bio-based and biodegradable products to new, circular, raw materials. Many of our products have a lower footprint than the mainstream market alternative and over 20% of our 2019 revenue came from solutions which make our customers' products more sustainable.

Engage

We strive to have a positive impact on people's lives through our products every day. We develop, listen to, and empower our employees, partners, and local communities to make our industry safer and more sustainable in all dimensions.

Our employees are essential for our competitive edge. Therefore, we invest in learning and development at all levels of the company and are committed to create a high-performing, diverse and inclusive workplace, where our people feel valued and are engaged to perform at their best.

The first online safety training for Thermoset

We offer an interactive E-learning module with certification in 12 languages to all our customers. Please ask your Nouryon representative to be enrolled to the course.

A global partner

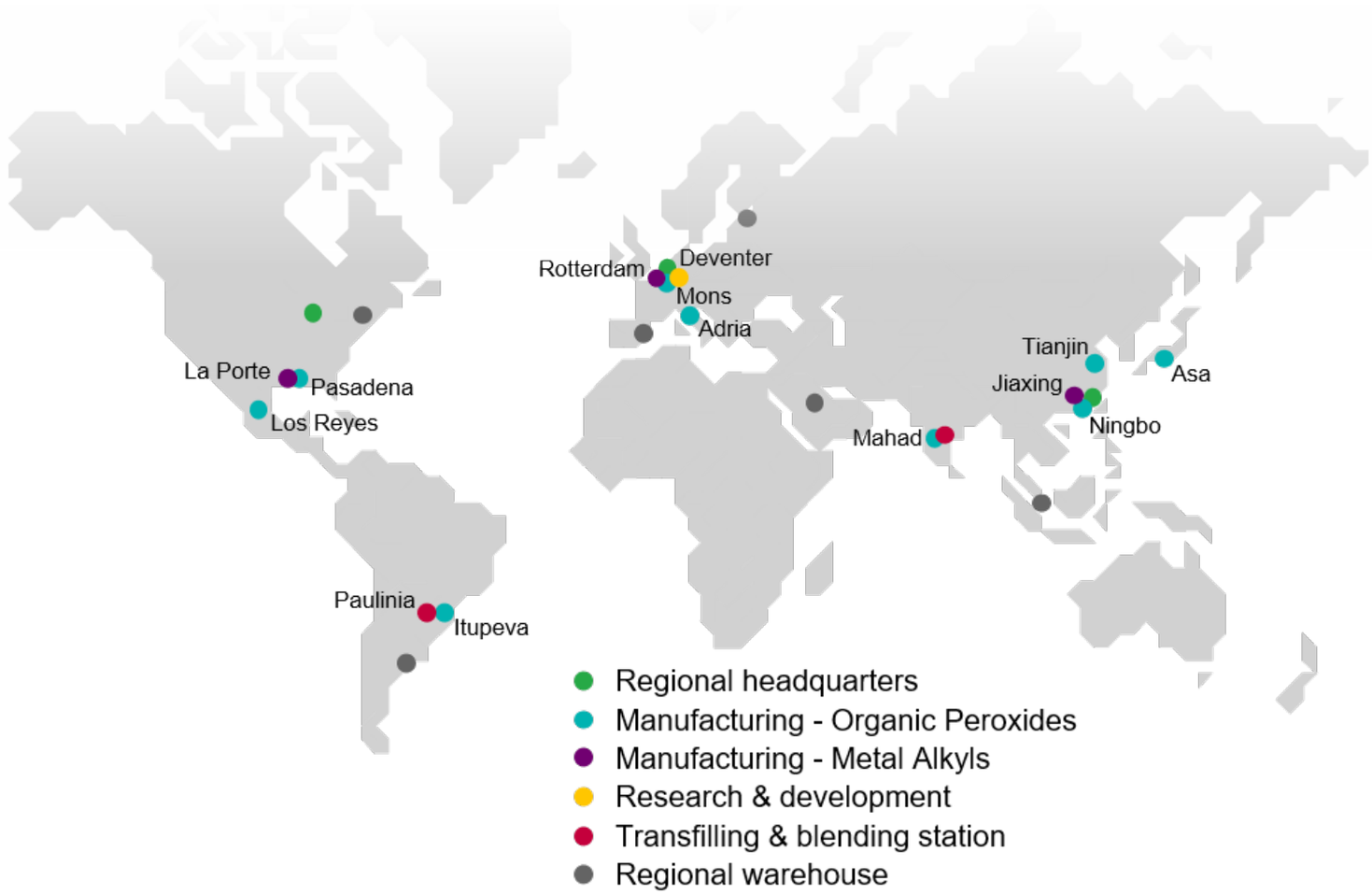
Our manufacturing sites and distribution centers are found all around the globe. Our global distribution network allows us to deliver our products to you anywhere around the world. That's how we ensure security of supply and easy access to quality products wherever you are.

All our sites are ISO 9001 and ISO 14001 certified to ensure the highest product quality and strict compliance with environmental regulations. We continually invest in new manufacturing techniques, high quality standards, safety, innovation, active technical support and a reliable supply chain.

Our expertise is your expertise

Much of our success is due to our philosophy of creating close partnerships with our customers. What do you want to achieve? From optimizing applications, improving efficiencies, resolving difficulties or even designing new curing systems, we're happy to meet with you to discuss your requirements.

From wind turbines and composite lift bridges to racing yachts and chemical storage tanks, Nouryon helps shape the world around us. Sharing our thermoset experience is one of the biggest resources we offer. Whatever your particular requirements, we can develop the product to match.



Check out our video about
Unsaturated polyester resin curing

Your safety is our priority

We are recognized as the global leader in organic peroxide safety. Our proven success in safely handling organic peroxides is due to our long-term commitment to developing and maintaining high safety standards. We always place safety as our top priority.

Sharing our experience in safety is one of the most important resources we offer. Through our safety programs we provide expert advice on the handling of our products including:

- classroom review of how to safely handle organic peroxides
- consultation on storage and dosing facility design
- demonstrations on the safe use, handling and control of organic peroxides
- online E-learning module on safe handling and use of organic peroxides

Our Safety Research Laboratory in Deventer, The Netherlands is heavily involved in R&D, ensuring the development of safe products and processes. Studies are carried out, to provide a high level of safety in the manufacturing, handling and transport of dangerous goods.

In general, organic peroxides are thermally unstable components which can decompose at relatively low temperatures. However, knowledge of proper handling techniques, carefully designed facilities and thorough training of personnel can overcome the hazards. Personnel who understand and pay proper attention will be better able to handle organic peroxides confidently and safely.

UN numbers

All products accepted for transport are assigned to generic entry numbers according to classification principles as described in the recommendations by the United Nations Committee of Experts on the Transport of Dangerous Goods. An explanation of all relevant UN numbers is given in Table 1.

Storage temperatures

SADT: Self-Accelerating Decomposition Temperature

The SADT is the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used in transport. Transportation temperatures are derived from the SADT according to the recommendations by the United Nations Committee of Experts on the Transport of Dangerous Goods.

T_s max.

The T_s max. given in the product list on pages 8-10 is the recommended maximum storage temperature at which the product is stable and quality loss will be minimal.

T_s min.

A minimum storage temperature (T_s min.) is given if phase separation, crystallization or solidification of the product is known to occur below the temperature indicated. We recommend that you store the product above the T_s min. indicated for quality and in some cases safety reasons.

T_{em}: Emergency temperature

The T_{em} is derived from the SADT and is the temperature at which emergency procedures must be triggered.

T_c: Control temperatures

The T_c is also derived from the SADT and is the maximum temperature at which the product can be safely transported. A T_c is not required if the SADT exceeds 50°C.

Both the T_{em} and T_c are related to safety and do not relate to product quality. To maintain product quality the recommended storage temperatures (T_s min. and max.) should be observed.

In case of emergency please call
+31 (0)570 679 211

Survey of thermal stability

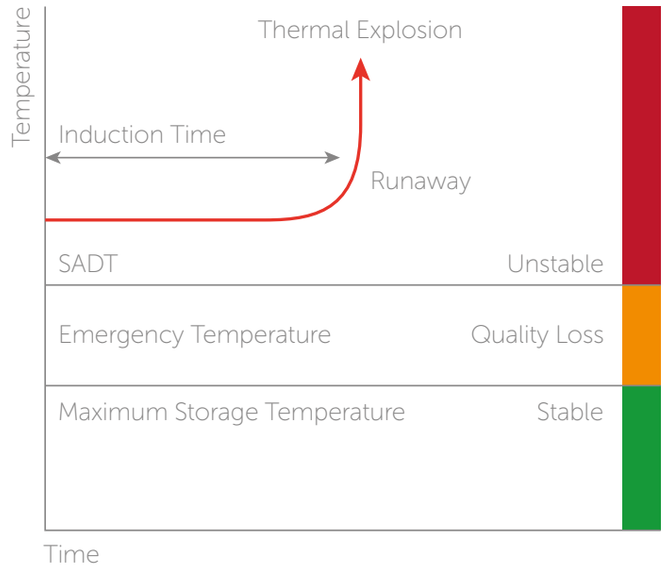


Table 1. Classification of curing agents

UN no.	Classification	Nouryon hazard rating	Maximum container size
	Organic peroxides		
3103	type C; liquid	High	50 kg
3113	type C; liquid, temperature controlled	High	50 kg
3114	type C; solid, temperature controlled	High	50 kg
3105	type D; liquid	Medium	50 kg
3106	type D; solid	Medium	50 kg
3116	type D; solid, temperature controlled	Medium	50 kg
3107	type E; liquid	Low	400 kg
3108	type E; solid	Low	400 kg
3109	type F; liquid	Very low	IBC's / Tanks
3110	type F, solid	Very low	IBC's/ Tanks
	Self-reactive substances		
3234	type C; solid, temperature controlled	High	50 kg
3236	type D; solid, temperature controlled	Medium	50 kg

Packaging - Nourytainer

Your safety our priority

We are recognized as the global leader in organic peroxides. We always place safety as our top priority. Safety does not stop with our chemicals. As a company of innovation, we also understand the need to innovate our packaging. Our Nourytainer® for example, the benchmark in safe handling, transport and storage of liquid organic peroxides.

We offer a variety of packaging options for both liquid and solid organic peroxides.

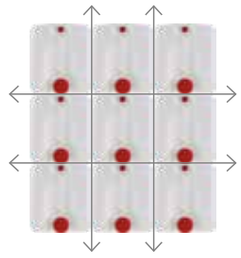
Enhanced advantages and safety features

- Easy operating, screw cap anti-glug device
- Ergonomically designed handle for ease and safety of handling
- Opaque exterior to protect contents from harmful UV rays
- Shaped for promotion of optimal air circulation while stacked
- Unique interior features allow more complete drainage

Size
20 liter: 324x324 mm
30 liter: 337x424 mm

Stable palletizing
4 interlocking points to improve palletizing

Palletization on pallets of 1000x1200mm:
20 liter: 36 per pallet
30 liter: 24 per pallet



Ventilation
Temperature control is vital. Our Nourytainer is designed to have optimal air circulation when stacked.

2 special caps
Depending on the type of organic peroxide, we have developed special caps to meet all safety requirements

Venting cap
Membrane type

Standard cap
Closed cap type

Directives for the safe handling and storage of organic proxides

Storage

Organic peroxides should be protected against all sources of heat, even direct sunlight. Storage together with other chemicals, especially accelerators, other reducing materials and inflammable products must be avoided.

Handling

Fire hazard

No smoking, no naked lights, no sparks, or other sources of ignition.

Explosion hazard

Avoid direct contact of organic peroxides with accelerators - add each component seperately to the resin. Contamination with dust, heavy metals and their compounds, as well as chemicals in general, should be avoided.

Eye and skin injury

Always wear safety goggles and protective gloves, since organic peroxides have a corrosive effect on eyes and skin.

Additional information

On request we also provide specific publications on the use and the safe handling and storage of our products.

Check out our video about our safety services

Butanox® M-50

Track record of 60 years consistency

Nouryon is home to the best-known ketone peroxide brand, Butanox M-50, the work horse of the thermoset composites industry. The material was introduced to the Thermoset composited industry in the 1960's and ever since has been the reference grade for MEKP's since. The quality of Butanox M-50 is outstanding and is the product of choice for most composite applications, such as boats, pipes, engineered stone, gelcoats and others.

Quality in every step we take

Our customers need to be able to rely on a cure system with reproducible consistent performance. They know Butanox is the safe choice for more than 60 years.

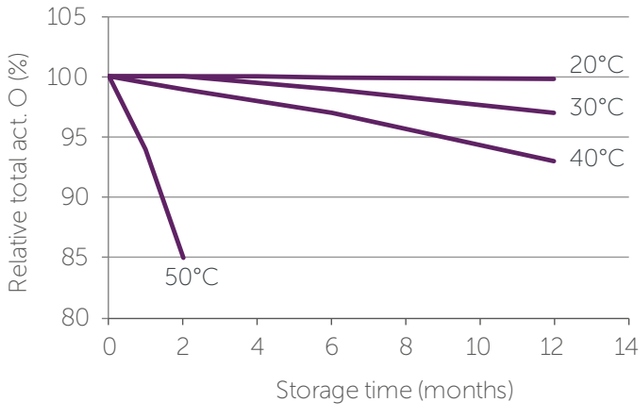
Manufacturing a safe and high-quality Ketone Peroxide with consistent curing performance requires a lot of dedication and attention to detail. From the automated process to the raw materials used through the packaging & quality control systems employed we have mastered the art of producing consistent quality.

Butanox is produced without additives and the absence of polar solvents making Butanox suitable for the most demanding applications.

We pride ourselves on being so reliable in quality that many UP Resin manufacturers use our Butanox as the calibration standard to set the reactivity of their resins.

Storage stability

The quality composition of Butanox M-50 provides excellent storage stability which supports sales across the globe including areas with high ambient temperatures such as the Middle East. The higher temperatures in certain areas have limited effect on the quality as shown in stability graph below.



When kept according to recommended storage conditions, the products will remain in specifications for an extended time. Even if the product is exposed to slightly higher temperatures for a limited amount of time there is limited influence on the stability. The graph below is representative for Butanox M-50, but not for other competitive MEKP grades on the market.

Vanishing Red, seeing is believing

Our Vanishing Red curing systems allows you to monitor the curing process without the disadvantages of red peroxides which stay red. With VR, you can visually monitor curing conditions to improve efficiency and reduce cycle times.

The Vanishing Red series of organic peroxides includes a red indicator system that literally disappears in front of your eyes. The red color vanishes during the cure and is only there when you need it to monitor. When the red color has completely disappeared, it is safe to demold the fully cured part..

Advantages include:

- Monitoring of the cure progress
- Visualize hot (peroxide or resin rish) & cold spots
- Visualize thermal effects (heat sink) from core materials

In addition they

- Initiator presence
- Good mixing
- Helps isolate dead flow zones

Scan QR code to check our video on Vanishing Red

Main applications of our curing agents

		Ketone peroxides	BUTANOX HBO-50	BUTANOX LPT-IN	BUTANOX M-50	BUTANOX M-60	BUTANOX M-50A	BUTANOX P-50	TRIGONOX 44B	Peroxide mixtures	TRIGONOX 61	TRIGONOX 65	TRIGONOX 75	TRIGONOX 82	TRIGONOX 82-30BA	TRIGONOX 249	TRIGONOX 279	TRIGONOX 524	Diacyl peroxides	PERKADOX 20S	PERKADOX 33	PERKADOX GB-50L	PERKADOX GB-50X	PERKADOX L-40 RPS	PERKADOX L-W75	Peroxyesters	TRIGONOX C	TRIGONOX 93	TRIGONOX 141	TRIGONOX 21S	TRIGONOX 21LS	TRIGONOX 42S	TRIGONOX 42PR	Peroxyketals	TRIGONOX 29-C50	TRIGONOX 29-C75	TRIGONOX 29-C90	TRIGONOX 22-C50	Hydroperoxides	TRIGONOX 239	TRIGONOX 239C	TRIGONOX K-80	TRIGONOX K-90	Peroxy(di)carbonates	PERKADOX 16	PERKADOX 16S	LAUROX	TRIGONOX BPIC-C75	TRIGONOX 117
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP		•	•	•	•	•	•	•		•	•	•	•	•	•						•	•	•																								
	RESIN TRANSFER MOLDING		•	•	•	•	•	•	•		•	•	•	•		•						•	•	•																								
	ENGINEERED STONE				•	•	•	•	•		•	•																																				
	GELCOATS			•	•	•	•	•																																									
	POLYMER CONCRETE				•	•			•		•	•																																				
	CHEMICAL ANCHORS & MINE BOLTS																			•	•	•	•		•																							
	COATINGS			•	•	•	•	•						•	•																																		
	BUTTONS		•		•	•	•	•																																								
	UP SOLID SURFACE			•	•	•		•	•		•	•				•																																
	ACRYLIC ROAD MARKING & FLOORING																					•	•	•																								
	VINYLESTERS			•	•	•	•									•						•	•				•						•							•	•	•	•						
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING			•	•	•	•	•	•		•	•					•																															
	FILAMENT WINDING			•	•	•	•	•	•		•	•	•	•		•	•	•				•	•																		•						
	RESIN TRANSFER MOLDING		•	•	•	•	•	•	•		•	•	•	•		•	•	•																							•						
	CONTINUOUS LAMINATING		•	•	•	•	•	•	•		•	•					•	•																									•					
	CURED IN PLACE PIPE (CIPP)																										•	•		•		•	•									•	•				
	ENGINEERED STONE																										•	•					•														
	ACRYLIC SOLID SURFACE																													•												•	•	•			
HIGH TEMP.	PULTRUSION																					•	•				•	•	•	•	•	•	•		•	•	•	•						•	•			
	HOT PRESS MOLDING/ SMC/BMC																										•		•	•	•	•			•	•	•	•								•	•
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Please contact us for advice on the best curing system for your specific application.

Industry standard | Available in VRN version | Added value - special purpose | • Alternative curing characteristics

Our curing agents

Product name	Assay (%)	Active Oxygen (%)	Physical form	Storage temperatures T_s max. (°C)	Storage temperatures T_s min. (°C)	SADT (°C)	UN no.	Reactivity	Features
Ketone peroxides									
Methyl ethyl ketone peroxide [1338-23-4]									
BUTANOX HBO-50		9.9	liquid, mixture in phthalate	25		65	3105	high	very short gel time
BUTANOX LPT-IN		8.5	liquid, mixture in phthalate	25		60	3105	very low	very long gel time
BUTANOX M-50		8.9	liquid, mixture in phthalate	25		65	3105	medium	standard gel time, general purpose, optimal for gelcoats (high quality)
BUTANOX M-50 VRN		8.9	liquid, mixture in phthalate	25		60	3105	medium	vanishing red version, especially for cure control
BUTANOX M-60		9.9	liquid, mixture in phthalate	25		60	3105	medium	standard gel time, general purpose, slightly higher reactive then Butanox M-50
BUTANOX M-60 VRN		9.9	liquid, mixture in phthalate	25		60	3105	medium	vanishing red version, especially for cure control
BUTANOX M-50A		8.9	liquid, mixture in aliphatic solvent	25		65	3105	medium	standard gel time, phthalate-free alternative for Butanox M-50
Methyl isopropyl ketone peroxide [33372-83-7]									
BUTANOX P-50		6.4	liquid, mixture in phthalate	25		50	3109	high	standard gel time, fast gelcoat cure, reduced VOC, good surface aspect
Acetylacetone peroxide (3,5-Dimethyl-1,2-dioxolane-3,5-diol) [37187-22-7]									
TRIGONOX 44B		4.1	liquid, mixture in solvents	25	-10	60	3107	high	standard gel time with very fast cure and hardness build-up
TRIGONOX 44B VRN		4.1	liquid, mixture in solvents	25	-10	60	3107	high	vanishing red version, especially for cure control
Peroxide mixtures									
Mixture of methyl ethyl ketone peroxide + acetylacetone peroxide [37187-22-7; 1338-23-4]									
TRIGONOX 61		7.8	liquid, mixture in phthalate	25	-10	50	3105	high	standard gel time, faster cure compared to Butanox M-50
TRIGONOX 65		5.5	liquid, mixture in phthalate	25	-10	60	3105	high	standard gel time, fast cure, reactivity between Trigonox 44B and 61
Methyl ethyl ketone peroxide and tert-butyl hydroperoxide [1338-23-4; 75-91-2]									
TRIGONOX 75 VRN		9.9	liquid, mixture in phthalate	25		60	3105	medium	standard gel time, reduced peak exotherm
TRIGONOX 82		8.5	liquid, mixture in phthalate	25	-20	60	3105	low	very long gel time, very low peak exotherm
TRIGONOX 82-30BA		8.5	liquid, mixture in phthalate	25		60	3105	low	diluted version on butyl acetate for spray application
Methyl ethyl ketone peroxide and cumyl hydroperoxide [1338-23-4; 80-15-9]									
TRIGONOX 249 VRN		8.5	liquid, mixture in phthalate	25		60	3105	low	longer gel time, reduced peak exotherm, also suitable in VE resins
Acetylacetone peroxide and tert-butyl peroxybenzoate [614-45-9; 37187-22-7]									
TRIGONOX 279		4.5	liquid, mixture in solvents	25	-5	60	3107	high	standard gel time, very fast and efficient cure
TRIGONOX 524		4.9	liquid, mixture in solvents	25	-5	60	3103	high	longer gel time, fast and efficient cure at elevated temperatures
Dibenzoyl peroxide [94-36-0]									
PERKADOX 20S	20	1.4	powder, mixture with inert fillers	25		70	3077	low	non ADR 5.2
PERKADOX 33	33	2.2	powder, mixture with inert fillers	25		60	3077	medium	non ADR 5.2
PERKADOX GB-50L	50	3.3	powder, phthalate free	25		55	3106	medium	low water content, clear applications
PERKADOX GB-50X	50	3.3	powder, phthalate free	25		55	3106	medium	general purpose, free flowing
PERKADOX L-40 RPS	40	2.6	suspension, mixture in solvents	25		50	3109	medium	low viscosity, very stable formulation, easy sprayable for road marking
PERKADOX L-W75	75	5.0	wet powder	40		80	3104	high	general purpose

Our curing agents

Product name	Assay (%)	Active Oxygen (%)	Physical form	Storage temperatures T_s max. (°C)	Storage temperatures T_s min. (°C)	SADT (°C)	UN no.	Reactivity	Features
Peroxyesters									
tert-Butyl peroxybenzoate [614-45-9]									
TRIGONOX C	98	8.0	liquid	25	10	60	3103	low	general purpose
TRIGONOX 93	79	6.5	liquid, solution with Promotor	25	-5	65	3103	medium	very efficient cure system
2,5-Dimethyl-2,5-di(2-ethylhexanoylperoxy)hexane [13052-09-0]									
TRIGONOX 141	>92	6.8	liquid	20	-20	35	3113	medium	very efficient for optimal surface aspect
tert-Butyl peroxy-2-ethylhexanoate [3006-82-4]									
TRIGONOX 21S	97	7.2	liquid	20	-30	35	3113	medium	suitable as 'kicker' peroxide
TRIGONOX 21LS	88	6.5	liquid, solution with Inhibitor	20		35	3113	medium	very long compound shelf life
tert-Butyl peroxy-3,5,5-trimethylhexanoate [13122-18-4]									
TRIGONOX 42S	97	6.7	liquid	25	-20	55	3105	medium	general purpose, non-hazardous decomposition products
TRIGONOX 42PR	89	6.2	liquid, solution with Promotor	25	-20	55	3105	medium	very efficient cure system
Peroxyketals									
1,1-Di(tert-butylperoxy)-3,3,5-trimethylcyclohexane [6731-36-8]									
TRIGONOX 29-C50	50	5.3	liquid, solution in isododecane	25		60	3107	medium	for long compound shelf life and pigmented formulations, smooth curing
TRIGONOX 29-C75	75	7.94	liquid, solution in isododecane	25		60	3103	medium	for long compound shelf life and pigmented formulations, smooth curing
TRIGONOX 29-C90	90	9.52	liquid, solution in isododecane	25		60	3103	medium	for long compound shelf life and pigmented formulations, smooth curing
TRIGONOX 77C		6.2	liquid, mixture in isododecane	25		60	3107	low	for long compound shelf life and pigmented formulations, smooth curing
1,1-Di(tert-butylperoxy)cyclohexane [3006-86-8]									
TRIGONOX 22-C50	50	6.1	liquid, solution in isododecane	25		70	3105	medium	or long compound shelf life and pigmented formulations, smooth curing
Hydroperoxides									
Cumyl hydroperoxide [80-15-9]									
TRIGONOX 239	44	4.6	liquid, mixture with Promotor	25		60	3109	high	suitable for curing VE resins, no gassing and low peak exotherm
TRIGONOX 239C		5.0	liquid, mixture with Promotor	25	-25	60	3109	high	efficient curing for VE resins at elevated temperature
TRIGONOX K-80	80	8.94	liquid, mixture in solvents	40	-30	75 (65 Bulk)	3109	low	curing VE resins for thick parts
TRIGONOX K-90	88	9.3	liquid	40	-30	70 (65 Bulk)	3109	low	curing VE resins for thick parts
tert-Butyl hydroperoxide [75-91-2]									
TRIGONOX A-W70	70	12.43	liquid, solution in water	35	0	80	3109	low	specialty peroxide for enhanced cure characteristics
Peroxy(di)carbonates									
Di(4-tert-butylcyclohexyl) peroxydicarbonate [15520-11-3]									
PERKADOX 16	94	3.9	powder	20		40	3114	high	highest reactive peroxide for UPR curing, 'kicker' peroxide
PERKADOX 16S	94	3.9	powder	20		40	3114	high	for clear and transparent acrylic applications, faster solubility
PERKADOX 16-40XPS	40	1.55	paste	15		45	3118	high	pumpable paste for safe handling, fast dissolving
Dilauroyl peroxide [105-74-8]									
LAUROX	99	4.0	flakes	30		50	3106	high	acrylic curing
TRIGONOX BPIC-C75	75	6.8	liquid, solution in isododecane	25	-20	70	3103	medium	high efficiency, smooth cure
tert-Butylperoxy 2-ethylhexyl carbonate [34443-12-4]									
TRIGONOX 117	95	6.2	liquid	20		60	3105	low	high efficiency, smooth cure, low VC

Perkadox® GB-50L/X

Our innovative phthalate free Benzoyl Peroxide (BPO) powder

- produced in North America
- phthalate free
- typical applications:
  - road marking, flooring and sealants
  - mine bolts & chemical anchors
  - acrylic composites
  - pultrusion

Nouryon

Cobalt and Cobalt-free auxiliaries

Butanox M-50® is used for room temperature cure and is used in combination with a metal accelerator, often Cobalt, like our Accelerator NL-49PN for example. Cobalt however is subject to ECHA reclassification and may become a SVHC in due course. Nouryon is prepared for more sustainable metal accelerators and offers a Cobalt-free accelerator portfolio under the name Nouryact®.

This portfolio has been thoroughly tested and proven suitable for use in combination with all standard peroxide grades and in all standard available UP/VE and acrylic modified resins.

Nouryact accelerators are ready made accelerators for direct use in a standard cure system. In case you need more freedom to formulate your resins Cobalt-free there is the option to use the base technology for making Cobalt-free resins. This is what BluCure® is about. The BluCure technology is licensed out to resin manufacturers to enable them to formulate their resins to Cobalt-free with the maximum degree of freedom to formulate. The BluCure seal is an additional option for labelling your end product and clearly mark it as Cobalt-free.

BluCure™ 100% Cobalt-Free

Check out our video about Biocomposites

Our range of auxiliaries

Product name	Chemical name [CAS number]	Assay (%)	Description
Cobalt-free accelerators			
NOURYACT CF12N	Copper complex in solvent miuxture		general use for room temperature cure, less sensitive for water
NOURYACT CF30	Iron complex in solvent mixture		for elevated temperature cure
NOURYACT CF40	Iron complex in 2-hydroxy-ethylmethacrylate		general purpose accelerator, low color
ACCELERATOR CF13	Copper complex in solvent mixture		high reactive, general use for room temperature cure
ACCELERATOR CF31	Metal complex in solvent mixture		high reactive, general use for room and elevated temperature cure
ACCELERATOR CF32	Metal complex in solvent mixture		high reactive, general use for room and elevated temperature cure
Special accelerators			
ACCELERATOR 383SN	Metal mix in solvent mixture	4	for less gel time drift in ISO/NPG resins, less sensitive to fillers
ACCELERATOR 553SN	Metal mix in solvent mixture	1.9	for non-gassing vinylester resin cure, less sensitive to fillers
ACCELERATOR 55028N	Metal mix in aliphatic solvents	2.2	less sensitive to fillers (such as ATH)
ACCELERATOR LCC9N	Cobalt based accelerator in solvent mixture	0.5	for low color cure
Cobalt accelerators			
ACCELERATOR NL-49PN	Cobalt octoate [136-52-7]	1	mixture in solvents
ACCELERATOR NL-51PN	Cobalt octoate [136-52-7]	6	mixture in solvents
ACCELERATOR NL-53N	Cobalt octoate [136-52-7]	10	mixture in solvents
Amine accelerators			
ACCELERATOR NL-64-100	Diethyl aniline [91-66-7]	99	liquid, low reactive
ACCELERATOR NL-65-100	Dimethyl-p-toluidine [99-97-8]	99	liquid, low reactive
Inhibitors			
INHIBITOR NLC-10	4-tert-Butyl-1,2-dihydroxybenzene [98-29-3]	10	in aliphatic solvents, for gel time extention, general purpose
INHIBITOR NLD-20	2,6-Di-tert-butyl-4-methylphenol [128-37-0]	20	solution in styrene, for gel time and shelf life extention, suitable for high temperature applications
Promoters			
PROMOTOR C	2,4-Pentanedione [123-54-6]	99	liquid, to increase reactivity, general purpose
PROMOTOR D	N,N-Diethylacetoacetamide [2235-46-3]	97	liquid, to increase reactivity, especially suitable for vinylesters
Release agents			
RELEASE AGENT NL-1	Mixture of waxes [64742-82-1]		in odorless mineral spirits, wax

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Additional information

Product Data Sheets (PDS), Safety Data Sheets (SDS) and ISO Certificates are available at nouryon.com and you can follow us @Nouryon and on LinkedIn.

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