Our curing systems for thermoset resins

Nouryon

Formerly AkzoNobel
SPECIALTY CHEMICALS

Nouryon is your partner in essential chemistry for a sustainable future

Nouryon is a global specialty chemicals leader. Markets worldwide rely on our essential chemistry for the manufacture of everyday products such as paper, plastics, building materials, food, pharmaceuticals, and personal care items. Building on our nearly 400-year history, the dedication of our 10,000 employees, and our shared commitment to safety, business growth, strong financial performance, sustainability, and innovation, we have established a world-class business and built strong partnerships with our customers. We operate in more than 80 countries around the world.

Throughout our history as AkzoNobel Specialty Chemicals, 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 Chemistry 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, Perkadox and Ketjenblack.

Sustainability is at the heart of everything we do

We are committed to making all our products, services and partnerships as sustainable as possible. It's one of the company's strategic reputation builders, as well as being one of our core principles.

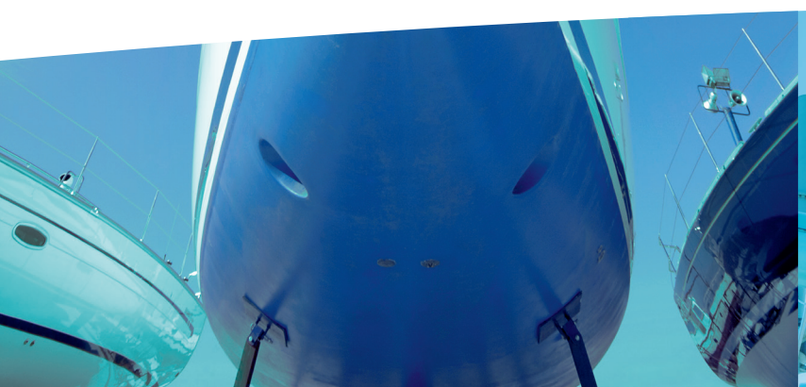
Sustainability is critical for the future success of our company, our society and our planet. We are committed to doing more with less by creating more value from fewer resources. We strive to increase our resource efficiency across the entire value chain.

We engage our employees, suppliers and customers on sustainability and form partnerships to drive the agenda. By working closely with our key stakeholders, we can ensure that our value chain delivers business benefits for all. Together, we can help make life more livable, healthy and inspiring.

Our researchers are part of our dedicated, customer-focused business teams. They perform research, product and process development and technical support in order to translate market needs into new products. They understand the needs of our customers and are committed to their success.

The first online safety training for Thermoset

We offer an interactive E-learning module with certification in 10 languages to all our customers. Please ask Nouryon representative to be enrolled for the course.



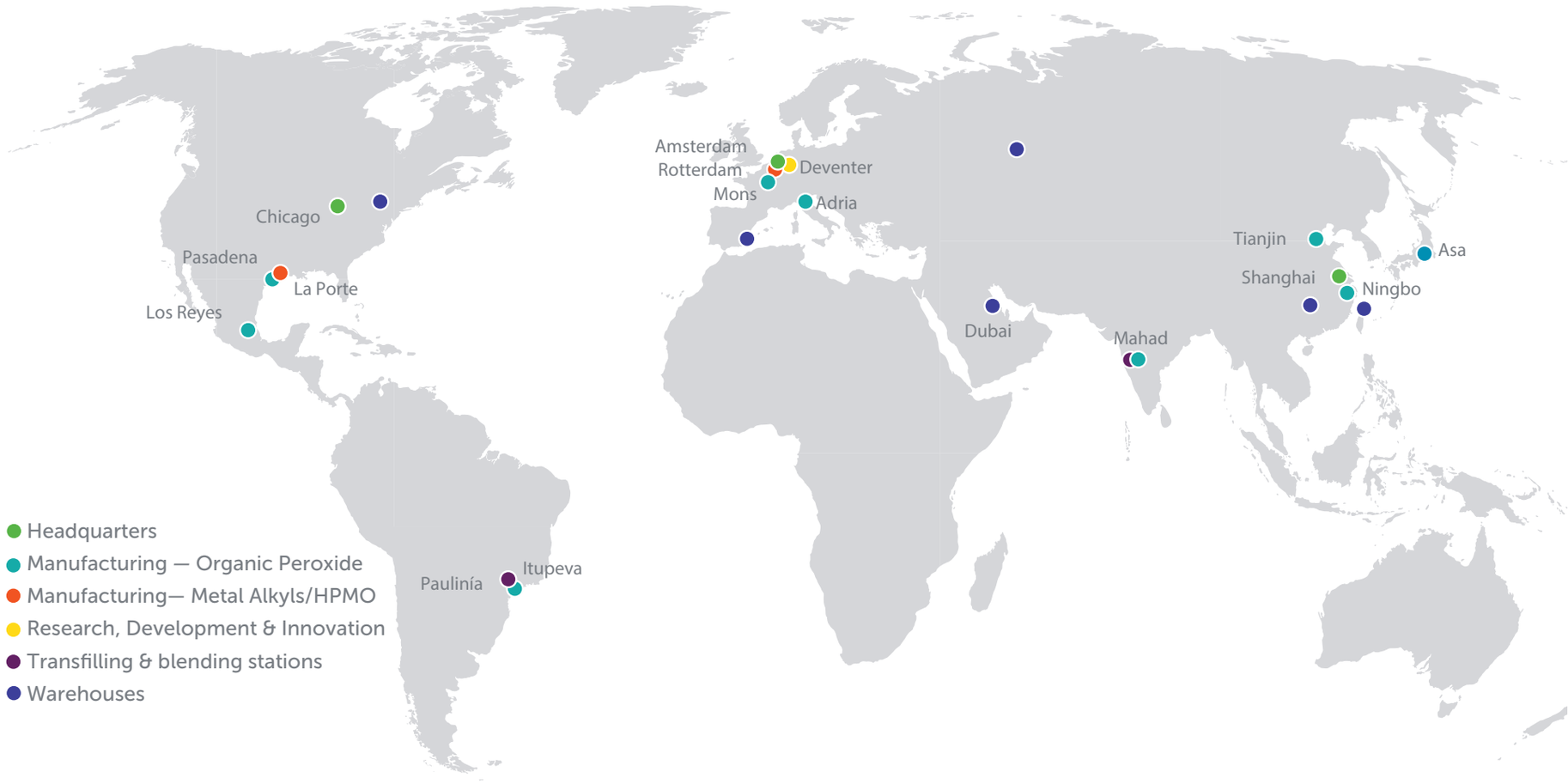
Our manufacturing sites and distribution centers are found all around the globe. Our global distribution network allows us to deliver our products to you anywhere around the world. That's how we ensure security of supply and easy access to quality products wherever you are.

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 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.



A global partner

Innovation

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.

Our thorough understanding and knowledge of free radical chemistry and thermoset technology is the basis for the development of innovative and sustainable products, designed with you in mind.

As a company of innovation we have a stream of new, high-value products to maintain our leadership. In the recent period we have introduced cure systems based on copper and iron under the brandname Nouryact which are targeted for a long term sustainable alternative of Cobalt. Interestingly our Nouryact accelerators proved to be non-sensitive to the presence of water in a cure system and therefore allow for using wet (i.e. non-dried) fillers. This is of particular interest when using biofibers as these contain high amounts of water which hampers the cure in traditional Cobalt based cure systems.

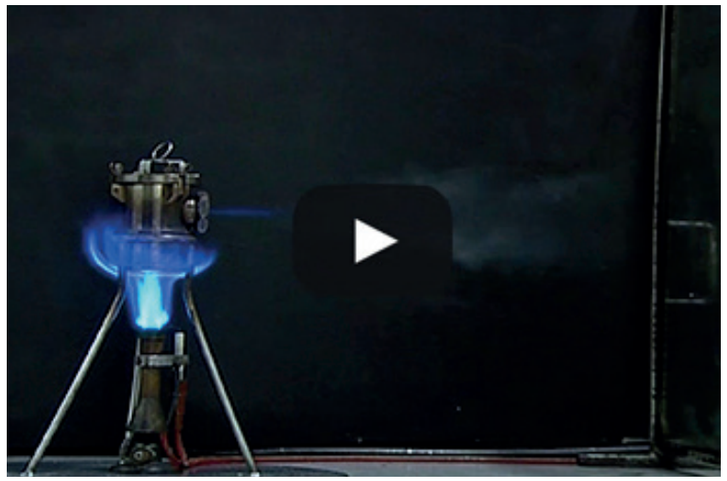
We've also led the way with new peroxide formulations.

Such as for instance our Perkadox 16-40XPS. This pumpable, paste-form peroxydicarbonate offers you savings in operational costs as the peroxide dissolves in less than a minute in the UP or acrylic resin. The product can ideally be used in combination with liquid dosing pumps in, for example, RTM, CIPP and pultrusion processes.

On top op our innovative products we also have an obligation to keep strengthening our existing portfolio such as Nouryon's Butanox M-50. This low water-content methyl ethyl ketone peroxide contains no polar components and is the best possible answer to the problem of osmosis in boat building.

In addition we provide safety and technical support from our laboratories in Deventer - The Netherlands, the site of Nouryon's fundamental peroxide R&D, Pasadena (TX) - USA, Los Reyes - Mexico, Tianjin and China. Our researchers are based in dedicated customer-focused business teams. They perform research, product and process development and technical support in order to translate market needs into new innovative products. They understand the needs of our customers and are committed to their success.

Watch our short video on our biofiber reinforced composites.



Watch our short video on our safety services.

Survey of thermal stability

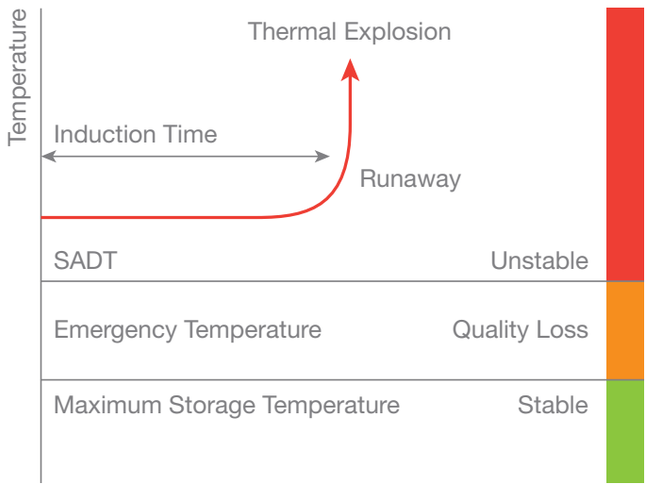


Table 1. Classification of curing agents

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
	Self-reactive Substances		
3234	type C; solid, temperature controlled	High	50 kg
3236	type D; solid, temperature controlled	Medium	50 kg

Your safety our priority

Nouryon is 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. At Nouryon 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, in order to provide a high level of safety in the manufacturing, handling and transport of dangerous goods.

In general organic peroxides are thermally unstable components, decomposing 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 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.

Ts max.

The Ts max. given in the product list on pages 8-13 is the recommended maximum storage temperature at which the product is stable and quality loss will be minimal.

Ts min.

A minimum storage temperature (Ts 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 Ts min. indicated for quality and in some cases safety reasons.

Tem: Emergency temperature

The Tem is derived from the SADT and is the temperature at which emergency procedures must be triggered.

Tc: Control temperatures

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

Both the Tem and Tc are related to safety and do not relate to product quality. To maintain product quality the recommended storage temperatures (Ts min. and max.) have to be observed.

Packaging

We offer a variety of packaging options for both liquid and solid organic peroxides. The maximum package size for each organic peroxide is regulated by the United Nations, based on the hazard classification of the peroxide as shown in table 1 on page 5.

Liquid organic peroxides

Liquid peroxides from Nouryon are available in packages shown in table 2.

We also understand the need to innovate our packaging. For instance our Nourytainer®. Developed by Nouryon it is recognized as the world's benchmark in liquid organic peroxide handling. And we're continually looking for new ways to optimize safe transport, handling and storage of organic peroxides.

Solid organic peroxides

Standard packages for our solid and paste-form peroxides are shown in table 3.

For the availability of our products in non-standard packages, please consult your Nouryon account manager.

Table 2. Standard packages for liquid peroxides

Package	Volume	Net Weight	Comments
Bottle	0.5 - 1 liter	0.5 - 1 kg	packaged as 12 or 28 polyethylene bottles per non-returnable carton
HDPE can	20 - 30 liter	15 - 30 kg	single component, polyethylene container (Nourytainer®)

Table 3. Standard packages for solid and paste-form peroxides

Package	Net Weight	Comments
Bag	25 - 5000 g	for Perkadox powder formulations
Pail	15 - 20 kg	for Perkadox paste products
Pastebox	15 - 25 kg	for Perkadox paste products
Carton	varies with product	polyethylene bags inside non-returnable cardboard box

Main Applications of our Curing Agents

Ketone peroxides

	Application	BUTANOX HBO-50	BUTANOX LPT-IN (orange)	BUTANOX LA-IN	BUTANOX L-50	BUTANOX M-50 (orange)	BUTANOX M-60 (orange)	BUTANOX M-50A	BUTANOX P-50	TRIGONOX 44B (orange)	TRIGONOX HMA	CYCLONOX 1000P	CYCLONOX LE-50	CYCLONOX LR
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP	●	● (green)	●	●	● (green)	●	● (blue)	● (blue)	● (green)			●	●
AMBIENT TEMPERATURE	RESIN TRANSFER MOLDING	●	●	●	●	● (green)	●	●	●	● (green)				
AMBIENT TEMPERATURE	ENGINEERED STONE					●	●	●	●	● (green)				
AMBIENT TEMPERATURE	GELCOATS		● (green)	● (green)	●	● (green)	●	●	● (blue)					
AMBIENT TEMPERATURE	SPRAY FILLERS											●	●	●
AMBIENT TEMPERATURE	CHEMICAL ANCHORS & MINE BOLTS													
AMBIENT TEMPERATURE	COATINGS		●	●	●	● (green)	●	● (blue)	● (blue)				●	●
AMBIENT TEMPERATURE	BUTTONS	● (green)				●	●	● (green)	●				●	
AMBIENT TEMPERATURE	ACRYLIC ROAD MARKING & FLOORING													
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING					● (light green)	●	● (yellow)		● (light green)	●			
ELEVATED TEMPERATURE	FILAMENT WINDING		●	●	●	● (green)	● (green)	●	●	●	●			
ELEVATED TEMPERATURE	RESIN TRANSFER MOLDING	●	●	●	●	● (green)	●	● (green)	●	●	● (green)			
ELEVATED TEMPERATURE	CONTINUOUS LAMINATING	● (green)	●	●	●	●	●	●	●	●	● (green)			
ELEVATED TEMPERATURE	CIPP (CURED IN PLACE PIPE)													
ELEVATED TEMPERATURE	ENGINEERED STONE													
ELEVATED TEMPERATURE	ACRYLIC SOLID SURFACE													
HIGH TEMP.	PULTRUSION										● (green)			
HIGH TEMP.	HOT PRESS MOLDING													
	VINYLESTERS		● (light green)	●	●	● (light green)	●	●	●					
	PAGE	9	9	9	9	9	9	9	9	9	9	9	9	9

Peroxide mixtures

	Application	TRIGONOX 51	TRIGONOX 61	TRIGONOX 63	TRIGONOX 65	TRIGONOX 75	TRIGONOX 82	TRIGONOX 82-30BA	TRIGONOX 249 VR (orange)	TRIGONOX 279	TRIGONOX 524
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP	● (blue)	●	●	●	● (blue)	● (blue)		●		
AMBIENT TEMPERATURE	RESIN TRANSFER MOLDING	● (blue)	●	●	●	● (blue)	● (blue)		●		
AMBIENT TEMPERATURE	ENGINEERED STONE	●	● (blue)	● (blue)	● (blue)						
AMBIENT TEMPERATURE	GELCOATS										
AMBIENT TEMPERATURE	SPRAY FILLERS										
AMBIENT TEMPERATURE	CHEMICAL ANCHORS & MINE BOLTS										
AMBIENT TEMPERATURE	COATINGS						●	●			
AMBIENT TEMPERATURE	BUTTONS										
AMBIENT TEMPERATURE	ACRYLIC ROAD MARKING & FLOORING										
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING		● (blue)	● (blue)	● (blue)					●	
ELEVATED TEMPERATURE	FILAMENT WINDING	● (yellow)	●	●	●	● (blue)	● (blue)		● (blue)	● (green)	●
ELEVATED TEMPERATURE	RESIN TRANSFER MOLDING	●	●	●	●	●	●			● (blue)	● (blue)
ELEVATED TEMPERATURE	CONTINUOUS LAMINATING		●	●	●					●	
ELEVATED TEMPERATURE	CIPP (CURED IN PLACE PIPE)										
ELEVATED TEMPERATURE	ENGINEERED STONE										
ELEVATED TEMPERATURE	ACRYLIC SOLID SURFACE										
HIGH TEMP.	PULTRUSION										
HIGH TEMP.	HOT PRESS MOLDING										
	VINYLESTERS								● (yellow)		
	PAGE	9	9	9	9	9	9	9	10	10	10

Diacyl peroxides

	Application	PERKADOX 20S	PERKADOX 33	PERKADOX CH-50	PERKADOX CH-50L	PERKADOX CH-50X	PERKADOX CH-34RP	PERKADOX L-40 RPS	PERKADOX L-W40 SN	PERKADOX L-W75
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP			●	●	●		●	●	
AMBIENT TEMPERATURE	RESIN TRANSFER MOLDING			●	●	●		●	●	
AMBIENT TEMPERATURE	ENGINEERED STONE			●	●	●		●	●	
AMBIENT TEMPERATURE	GELCOATS									
AMBIENT TEMPERATURE	SPRAY FILLERS									●
AMBIENT TEMPERATURE	CHEMICAL ANCHORS & MINE BOLTS	● (green)	● (green)	●	●	● (green)				●
AMBIENT TEMPERATURE	COATINGS									
AMBIENT TEMPERATURE	BUTTONS									
AMBIENT TEMPERATURE	ACRYLIC ROAD MARKING & FLOORING			●	● (green)	● (green)	● (blue)	● (blue)	●	
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING									
ELEVATED TEMPERATURE	FILAMENT WINDING			●	●	●				
ELEVATED TEMPERATURE	RESIN TRANSFER MOLDING			●	●	●		●		
ELEVATED TEMPERATURE	CONTINUOUS LAMINATING									
ELEVATED TEMPERATURE	CIPP (CURED IN PLACE PIPE)									
ELEVATED TEMPERATURE	ENGINEERED STONE									
ELEVATED TEMPERATURE	ACRYLIC SOLID SURFACE									
HIGH TEMP.	PULTRUSION			●	●	●				
HIGH TEMP.	HOT PRESS MOLDING									
	VINYLESTERS			●	●	●				
	PAGE	10	10	10	10	10	10	10	10	10

Peroxyesters

	Application	TRIGONOX C	TRIGONOX 93	TRIGONOX 141	TRIGONOX 21S	TRIGONOX 21LS	TRIGONOX 42S	TRIGONOX 42PR
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP							
AMBIENT TEMPERATURE	RESIN TRANSFER MOLDING							
AMBIENT TEMPERATURE	ENGINEERED STONE							
AMBIENT TEMPERATURE	GELCOATS							
AMBIENT TEMPERATURE	SPRAY FILLERS							
AMBIENT TEMPERATURE	CHEMICAL ANCHORS & MINE BOLTS							
AMBIENT TEMPERATURE	COATINGS							
AMBIENT TEMPERATURE	BUTTONS							
AMBIENT TEMPERATURE	ACRYLIC ROAD MARKING & FLOORING							
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING							
ELEVATED TEMPERATURE	FILAMENT WINDING							
ELEVATED TEMPERATURE	RESIN TRANSFER MOLDING							
ELEVATED TEMPERATURE	CONTINUOUS LAMINATING							
ELEVATED TEMPERATURE	CIPP (CURED IN PLACE PIPE)	● (light green)	● (yellow)		● (green)		●	
ELEVATED TEMPERATURE	ENGINEERED STONE	●	● (light green)					● (blue)
ELEVATED TEMPERATURE	ACRYLIC SOLID SURFACE				● (light green)			
HIGH TEMP.	PULTRUSION	● (green)	●	●	●	●	●	●
HIGH TEMP.	HOT PRESS MOLDING	● (green)		● (yellow)	● (light green)	● (yellow)	●	
	VINYLESTERS		●		●			●
	PAGE	10	10	10	10	10	10	10

Peroxyketals and Hydroperoxides

	Application	TRIGONOX 29-C50	TRIGONOX 29-IN50	TRIGONOX 77C	TRIGONOX 22-C50	TRIGONOX 239	TRIGONOX K-90
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP						
AMBIENT TEMPERATURE	RESIN TRANSFER MOLDING						
AMBIENT TEMPERATURE	ENGINEERED STONE						
AMBIENT TEMPERATURE	GELCOATS						
AMBIENT TEMPERATURE	SPRAY FILLERS						
AMBIENT TEMPERATURE	CHEMICAL ANCHORS & MINE BOLTS						
AMBIENT TEMPERATURE	COATINGS						
AMBIENT TEMPERATURE	BUTTONS						
AMBIENT TEMPERATURE	ACRYLIC ROAD MARKING & FLOORING						
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING						
ELEVATED TEMPERATURE	FILAMENT WINDING						
ELEVATED TEMPERATURE	RESIN TRANSFER MOLDING			●			
ELEVATED TEMPERATURE	CONTINUOUS LAMINATING						●
ELEVATED TEMPERATURE	CIPP (CURED IN PLACE PIPE)						
ELEVATED TEMPERATURE	ENGINEERED STONE						
ELEVATED TEMPERATURE	ACRYLIC SOLID SURFACE						
HIGH TEMP.	PULTRUSION	● (blue)	● (blue)		● (yellow)		
HIGH TEMP.	HOT PRESS MOLDING	●	●		●		
	VINYLESTERS					● (light green)	●
	PAGE	10	10	10	11	11	11

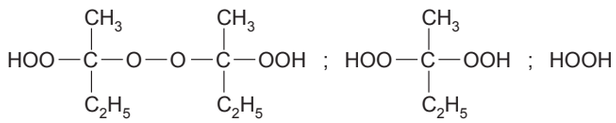
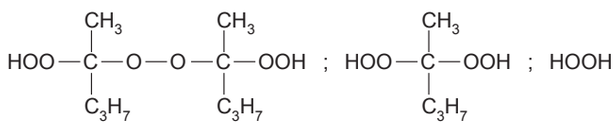
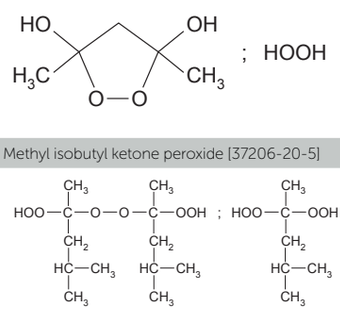
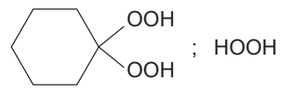
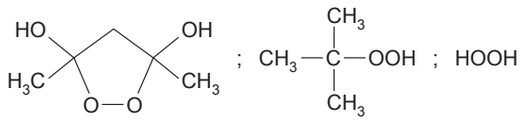
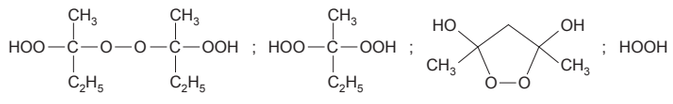
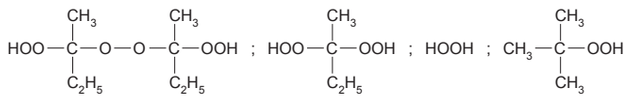
Peroxy(di)carbonates and Others

	Application	PERKADOX 16	PERKADOX 16S	PERKADOX 16-40XPS	LAUROX	TRIGONOX BPIC-C75	TRIGONOX 117	PERKADOX AIBN	PERKADOX AMBN
AMBIENT TEMPERATURE	HAND LAY-UP AND SPRAY-UP								
AMBIENT TEMPERATURE	RESIN TRANSFER MOLDING								
AMBIENT TEMPERATURE	ENGINEERED STONE								
AMBIENT TEMPERATURE	GELCOATS								
AMBIENT TEMPERATURE	SPRAY FILLERS								
AMBIENT TEMPERATURE	CHEMICAL ANCHORS & MINE BOLTS								
AMBIENT TEMPERATURE	COATINGS								
AMBIENT TEMPERATURE	BUTTONS								
AMBIENT TEMPERATURE	ACRYLIC ROAD MARKING & FLOORING								
ELEVATED TEMPERATURE	CENTRIFUGAL CASTING								
ELEVATED TEMPERATURE	FILAMENT WINDING								
ELEVATED TEMPERATURE	RESIN TRANSFER MOLDING								
ELEVATED TEMPERATURE	CONTINUOUS LAMINATING				●				
ELEVATED TEMPERATURE	CIPP (CURED IN PLACE PIPE)	● (light green)		● (yellow)					
ELEVATED TEMPERATURE	ENGINEERED STONE								
ELEVATED TEMPERATURE	ACRYLIC SOLID SURFACE	● (green)	● (green)	● (yellow)	●			● (green)	● (green)
HIGH TEMP.	PULTRUSION	● (green)	● (green)	● (green)					
HIGH TEMP.	HOT PRESS MOLDING					●	● (light green)		
	VINYLESTERS	●							
	PAGE	12	11	11	11	11	11	11	11

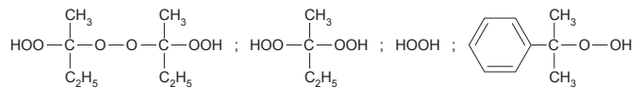
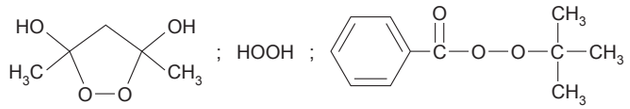
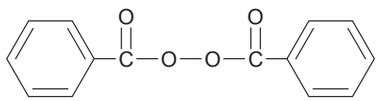
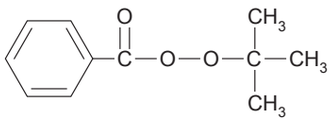
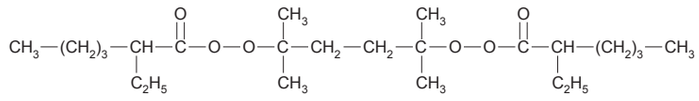
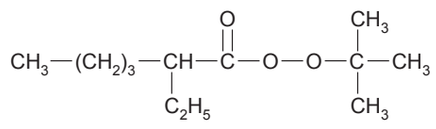
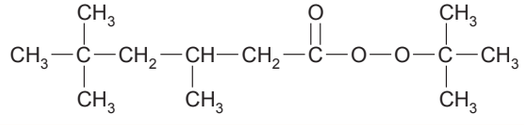
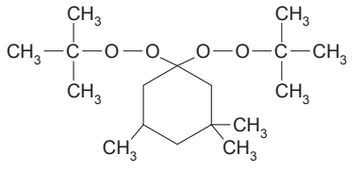
Please contact us for advice on the best curing system for your specific application.

Green: Industry standard — Orange: Available in Vanishing Red (VR) version — Yellow: Added value - special purpose — ● Alternative curing characteristics

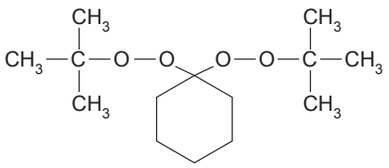
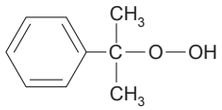
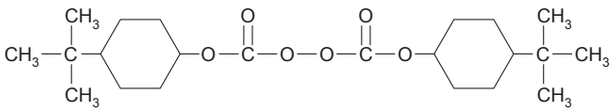
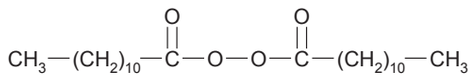
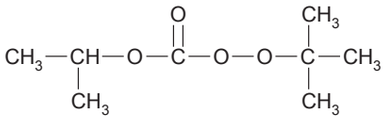
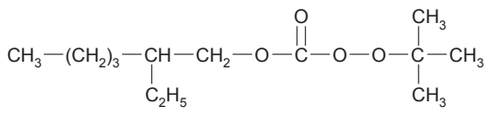
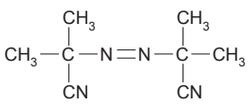
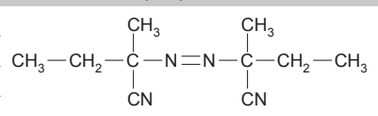
Our curing agents

Product name	Chemical name [cas number]	Assay (%)	Active Oxygen (%)	Physical form	Storage temperatures Ts max. (°C)	Ts min. (°C)	Sadt (°C)	Un no.	Features
Ketone peroxides									
	Methyl ethyl ketone peroxide [1338-23-4]								
BUTANOX HBO-50			9.9	solution in phthalate	25		60	3105	high reactivity, long geltime
BUTANOX LPT-IN			8.5	solution in phthalate	25		60	3105	very low reactivity, long geltime
BUTANOX LA-IN			8.7	solution in phthalate mixture	25		60	3105	low reactivity, for smooth gelcoat curing
BUTANOX L-50			8.9	solution in phthalate	30		60	3105	low H_2O_2 for gelcoats
BUTANOX M-50			8.9	solution in phthalate	25		60	3105	medium reactivity, general purpose, optimal for gelcoats (high quality)
BUTANOX M-50VR			8.9	solution in phthalate	25		60	3105	vanishing red version especially for cure control
BUTANOX M-60			9.9	solution in phthalate	25		60	3105	medium reactivity, general purpose
BUTANOX M-60VRD			9.9	solution in phthalate	25		60	3105	vanishing red version especially for cure control
BUTANOX M-50A			8.9	in aliphatic solvent	25		60	3105	medium reactivity, phthalate free
	Methyl isopropyl ketone peroxide [33372-83-7]								
BUTANOX P-50			6.4	solution in phthalate	25		50	3109	fast cure for gelcoats, reducing styrene emission
	Acetylacetone peroxide [37187-22-7]								
TRIGONOX 44B			4.1	in solvent mixture	25	-10	60	3107	standard geltime with fast cure and hardness build-up
TRIGONOX 44B VRE			4.1	in solvent mixture	25	-10	60	3107	vanishing red version especially for cure control
	Methyl isobutyl ketone peroxide [37206-20-5]								
TRIGONOX HMa			10.2	in solvent mixture	25		55	3105	high reactivity at slightly elevated temperatures
	Cyclohexanone peroxide [12262-58-7]								
CYCLONOX 1000P			6.8	gel with phlegmatizers	25	10	50	3106	medium reactivity for body fillers with reduced peak exotherm
CYCLONOX LE-50			5.3	in solvent mixture	25		50	3105	medium reactivity, smooth cure
CYCLONOX LR			5.1	in solvent mixture	25		60	3105	low reactivity
Peroxide mixtures									
	Acetylacetone peroxide and tert-butyl hydroperoxide [37187-22-7; 75-91-2]								
TRIGONOX 51			5.8	in solvent mixture	25	-10	60	3105	low peak exotherm and fast cure for thin and thick parts
	Mixture of methyl ethyl ketone peroxide and acetylacetone peroxide [37187-22-7; 1338-23-4]								
TRIGONOX 61			7.8	in solvent mixture	25	-10	50	3105	fast cure, and hardness build-up
TRIGONOX 63			6.6	in solvent mixture	25	-10	55	3105	faster cure, and hardness build-up
TRIGONOX 65			5.5	in solvent mixture	25	-10	60	3105	fastest cure, and hardness build-up
	Methyl ethyl ketone peroxide and tert-butyl hydroperoxide [1338-23-4; 75-91-2]								
TRIGONOX 75			9.9	solution in phthalate	25		60	3105	medium reactivity, reduced peak exotherm
TRIGONOX 82			8.5	in solvent mixture	25		60	3105	low reactivity, very low peak exotherm
TRIGONOX 82-30BA			2.4	solution in butyl acetate	25		70	3105	low reactivity, very low peak exotherm, special dilution for coating appl.

Our curing agents

Product name	Chemical name [cas number]	Assay (%)	Active Oxygen (%)	Physical form	Storage temperatures Ts max. (°C)	Ts min. (°C)	Sadt (°C)	Un no.	Features
	Methyl ethyl ketone peroxide and cumyl hydroperoxide [1338-23-4; 80-15-9]								
TRIGONOX 249 VR			8.5	solution in phthalate	25		60	3105	medium reactivity, reduced peak exotherm
	Acetylacetone peroxide and tert-butyl peroxybenzoate [614-45-9; 37187-22-7]								
TRIGONOX 279			4.5	in solvent mixture	25	-5	60	3105	high reactivity, fastest and most efficient peroxide blend
TRIGONOX 524			4.9	in solvent mixture	25	-5	60	3103	efficient cure for RTM at elevated temperatures
Diacyl peroxides									
	Dibenzoyl peroxide [94-36-0]								
PERKADOX 20S		20	1.4	powder with inert fillers	25		70	3077	low reactivity, non ADR 5.2
PERKADOX 33		33	2.2	powder with inert filler	25		60	3077	medium reactivity, non ADR 5.2
PERKADOX CH-50		50	3.3	powder with phthalate	25		55	3106	for standard applications, excellent solubility
PERKADOX CH-50L		50	3.3	powder with phthalate	25		55	3106	for transparent applications, excellent solubility
PERKADOX CH-50X		50	3.3	powder with phthalate	25		55	3106	standard, free flowing, excellent solubility
PERKADOX CH-34RP		33	2.2	powder with phthalate and inert filler	25		55	3077	for roadpaints, non ADR 5.2
PERKADOX L-40 RPS		40	2.6	suspension in solvent mixture	25		50	3109	low viscosity, very stable formulation, easy sprayable for road marking
PERKADOX L-W40 SN		40	2.6	suspension in water	30	0	60	3109	low viscosity, very stable formulation, easy sprayable for road marking
PERKADOX L-W75		75	5.0	wet powder	40		80	3104	standard granular
Peroxyesters									
	tert-Butyl peroxybenzoate [614-45-9]								
TRIGONOX C		98	8.0	liquid	25	10	60	3103	medium reactivity
TRIGONOX 93		79	6.5	solution with promoter	25		55	3103	high reactivity, efficient cure system, promoted peroxide
	2,5-Dimethyl-2,5-di(2-ethylhexanoylperoxy)hexane [13052-09-0]								
TRIGONOX 141		>92	6.8	liquid	20	-20	35	3113	high reactivity and efficiency for optimal improved surface cure
	tert-Butyl peroxy-2-ethylhexanoate [3006-82-4]								
TRIGONOX 21S		97	7.2	liquid	20	-30	35	3113	high reactivity, used as 'kicker' peroxide
TRIGONOX 21LS		88	6.5	solution with stabilizer	20		35	3113	for very long shelf life of BMC and SMC
	tert-Butyl peroxy-3,5,5-trimethylhexanoate [13122-18-4]								
TRIGONOX 42S		97	6.7	liquid	25	-20	55	3105	medium reactivity, aliphatic non-hazardous decomposition products
TRIGONOX 42PR		89	6.2	solution with promoter	25	-20	55	3105	high reactivity, promoted peroxide
Peroxyketals									
	1,1-Di(tert-butylperoxy)-3,3,5-trimethylcyclohexane [6731-36-8]								
TRIGONOX 29-C50		50	5.3	solution in odorless mineral spirits	25		60	3107	for long compound shelf life, fast and smooth curing
TRIGONOX 29-IN50		50	5.3	solution in phthalate	25		60	3107	for long compound shelf life, fast and smooth curing
TRIGONOX 77C			6.2	solution in odorless mineral spirits	25		60	3107	for fast and smooth curing

Our curing agents

Product name	Chemical name [cas number]	Assay (%)	Active Oxygen (%)	Physical form	Storage temperatures Ts max. (°C)	Ts min. (°C)	Sadt (°C)	Un no.	Features
	1,1-Di(tert-butylperoxy)cyclohexane [3006-86-8]								
TRIGONOX 22-C50		50	6.1	solution in odorless mineral spirits	25		70	3105	for long compound shelf life, fast and smooth curing for thin parts
Hydroperoxides									
	Cumyl hydroperoxide [80-15-9]								
TRIGONOX 239		44	4.6	in solvent mixture	25		55	3109	high reactivity for curing vinyl ester resins with low peak exotherm
TRIGONOX K-90		88	9.3	in aromatic solvent mixture	40	-30	70	3109	low reactivity for curing vinyl ester resins for thick parts
Peroxy(di)carbonates									
	Di(4-tert-butylcyclohexyl) peroxydicarbonate [15520-11-3]								
PERKADOX 16		94	3.9	powder	20		40	3114	high reactivity, 'kicker' peroxide
PERKADOX 16S		94	3.9	powder	20		40	3114	for clear and transparent applications in acrylics
PERKADOX 16-40XPS		40	1.55	paste	15		45	3118	pumpable paste for safe handling and processing, fast dissolving
	Dilauroyl peroxide [105-74-8]								
LAUROX		99	4.0	flakes	30		50	3106	acrylic curing
	tert-Butylperoxy isopropyl carbonate [2372-21-6]								
TRIGONOX BPIC-C75		75	6.8	solution in odorless mineral spirits	25	-20	70	3103	high efficiency and smooth cure
	tert-Butylperoxy 2-ethylhexyl carbonate [34443-12-4]								
TRIGONOX 117		95	6.2	liquid	20		60	3105	high efficiency, smooth cure and low VC
Others									
	2,2'-Azodi(isobutyronitrile) [78-67-1]								
PERKADOX AIBN		98		solid	25		50	3234	special purpose azo for acrylics
	2,2'-Azodi(2-methylbutyronitrile) [13472-08-7]								
PERKADOX AMBN		98		solid	25		45	3236	special purpose azo for acrylics

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Our range of auxiliaries

Product name	Chemical name [cas number]	Assay (%)	Description	Standard Package
Cobalt-free accelerators				
NOURYACT CF12N	Copper complex [142-71-2]		general use for room temperature cure, less sensitive for water	25 kg HDPE can
NOURYACT CF30	Iron complex		in solvent mixture, elevated temperature cure	25 kg HDPE can
NOURYACT CF40	Iron complex		in 2-hydroxy-ethylmethacrylate, multi-purpose accelerator, low color	25 kg HDPE can
BORCHI® OXY-CURE-10%	Iron ligand	10	solution in propylene glycol for pre-accelerating resins	200 kg drum
Special accelerators				
ACCELERATOR CF13	Copper complex in solvent mixture		high reactive, general use for room temperature cure	25 kg HDPE can
ACCELERATOR CF31	Metal complex in solvent mixture		high reactive, general use for room and elevated temperature cure	25 kg HDPE can
ACCELERATOR CF32	Metal complex in solvent mixture		high reactive, general use for room and elevated temperature cure	25 kg HDPE can
ACCELERATOR 383SN	Cobalt octoate [136-52-7] in solvent mixture	4	for ow geltime drift in ISO/NPG resins, less sensitive to fillers	25 kg HDPE can
ACCELERATOR 553SN	Cobalt octoate [136-52-7] in solvent mixture	1.9	for non-gassing vinylester resin cure, less sensitive to fillers	25 kg HDPE can
ACCELERATOR 55028N	Metal mix [2457-01-4; 136-52-7]	2.2	in aliphatic solvents, less sensitive to fillers (such as ATH)	25 kg HDPE can
ACCELERATOR LCC9N	Cobalt octoate [136-52-7]	0.5	in solvent mixture, low color in clear castings	25 kg HDPE can
Cobalt accelerators				
ACCELERATOR NL-49PN	Cobalt octoate [136-52-7]	1	in solvent mixture	25 kg HDPE can
ACCELERATOR NL-51PN	Cobalt octoate [136-52-7]	6	in solvent mixture	25 kg HDPE can
ACCELERATOR NL-53N	Cobalt octoate [136-52-7]	10	in aliphatic solvents	25 kg HDPE can
ACCELERATOR C1ND	Cobalt neodecanoate []	1	in solvent mixture	25 kg HDPE can
ACCELERATOR C6ND	Cobalt neodecanoate []	6	in solvent mixture	25 kg HDPE can
ACCELERATOR C10ND	Cobalt neodecanoate []	10	in aliphatic solvents	25 kg HDPE can
Amine accelerators				
ACCELERATOR NL-64-100	Diethyl aniline [91-66-7]	99	liquid, low reactive	25 kg HDPE can
ACCELERATOR NL-67	Ethoxylated-para-toluidine	99	liquid, medium reactive, non-toxic	25 kg HDPE can
ACCELERATOR NL-65-100	Dimethyl-p-toluidine [99-97-8]	99	liquid, high reactive	25 kg HDPE can
Inhibitors				
INHIBITOR NLC-10	4-tert-Butyl-1,2-dihydroxybenzene [98-29-3]	10	in aliphatic solvents, general use	25 kg drum
INHIBITOR NLD-20	2,6-Di-tert-butyl-4-methylphenol [128-37-0]	20	solution in styrene, less effect on reactivity at higher temperarure	25 kg drum
Promoters				
PROMOTOR C	2,4-Pentanedione [123-54-6]	99	liquid, increase reactivity, general purpose	25 kg HDPE can
PROMOTOR D	N,N-Diethylacetoacetamide [2235-46-3]	97	liquid, increase reactivity, especially suitable for vinylesters	25 kg HDPE can
Release agents				
RELEASE AGENT NL-1	Mixture of waxes [64742-82-1]		in odorless mineral spirits, wax	20 kg drum

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