Our curing systems for thermoset resins

Nouryon

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, 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 Catalysts 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®

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.

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 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.

- Headquarters
- Manufacturing
- Manufacturing - Metal Alkyls/HPMO
- Research, Development & Innovation
- Transfilling & blending stations
- Warehouses

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.

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.

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 10-14 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 (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 T_s min. indicated for quality and in some cases safety reasons.

T_{em}: Emergency temperature

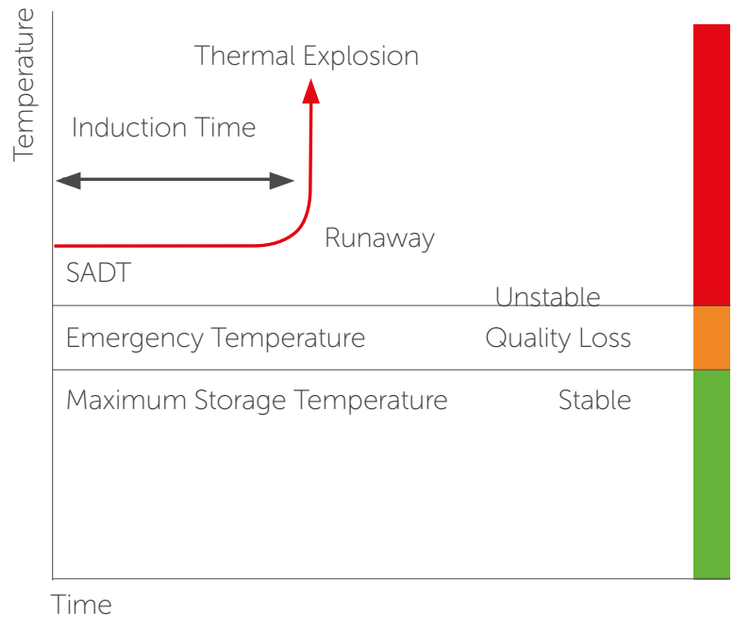
The T_{em} is derived from the SADT and is the temperature at which emergency procedures must be triggered.

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 (Ts min. and max.) have to be observed.

Thermal stability of organic peroxides



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.

Table 1. Classification of curing agents

UN NO.	CLASSIFICATION	NOURYON HAZARD RATING	MAXIMUM CONTAINER SIZE
Organic Peroxides			
3102	type B; solid	Very High	25 kg (55 lb)
3103	type C; liquid		
3104	type C; solid	High	50 kg (110 lb)
3113	type C; liquid, temperature controlled		
3114	type C; solid, temperature controlled		
3105	type D; liquid		
3106	type D; solid	Medium	50 kg (110 lb)
3115	type D; liquid, temperature controlled		
3116	type D; solid, temperature controlled		
3107	type E; liquid		
3108	type E; solid	Low	400 kg (880 lb)
3117	type E; liquid, temperature controlled		
3109	type F; liquid		
3110	type F; solid	Very Low	IBC's / Tanks
3119	type F; liquid, temperature controlled		
Self-reactive Substances			
3234	type C; solid, temperature controlled	High	50 kg (110 lb)
3236	type D; solid, temperature controlled	Medium	50 kg (110 lb)

NFPA classification system for organic peroxide formulations	
Class I	Formulations that are capable of deflagration but not detonation.
Class II	Formulations that burn very rapidly and that present a severe reactivity hazard.
Class III	Formulations that burn rapidly and that present a moderate reactivity hazard.
Class IV	Formulations that burn in the same manner as ordinary combustibles and that present a minimal reactivity hazard.
Class V	Formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that present no reactivity hazard.

NFPA Class

The NFPA Code 400, Hazardous Materials Code for the Storage of Organic Peroxides Formulations is set by the US National Fire Protection Association to provide enhanced fire protection and storage requirements for organic peroxides.

The system is based on the behavior of certain specific formulations in their US Department of Transportation- or Canadian Ministry of Transport-approved shipping containers and under conditions of fire exposure.

As one of the US recognized standards, we have included all classifications that were available at the time of publication of this product catalog. We encourage you to obtain a copy NFPA Code 400 from the NFPA website at www.nfpa.org.

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 6.

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	3.8 liter (1 gallon)	3.2-3.6 kg (7-7.9 lb)	packaged as 4 polyethylene bottles per non-returnable carton
Pail	18.9 liter (5 gallon)	20.4 kg (45 lb)	polyethylene bucket
HDPE can	20-30 liter (5.3-7.9 gallon)	15-25 kg (33-55 lb)	single component, polyethylene container (Nourytainer®)
Drum	57-208 liter (15-55 gallon) 208 liter (55 gallon) 208 liter (55 gallon)	45-204 kg (99-450 lb) 159 kg (350 lb) 186 kg (410 lb)	lined steel drum fiber drum polyethylene drum

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

PACKAGE	NET WEIGHT	COMMENTS
Carton	varies with product	polyethylene bags inside non-returnable cardboard box
Drum	20-25 kg (44-55 lb)	fiber drum

Main applications of our curing agents

Ketone Peroxides

Category	Application	CADOX D-50*	CADOX L-30A*	CADOX L-50A*	CADOX M-30A*	CADOX M-50A* (BUTANOX M-50A*)	BUTANOX M-50	TRIGONOX 44B*
SPECIAL RESINS	cipp							
SPECIAL RESINS	acrylics							
SPECIAL RESINS	vinylesters		1	1				
HIGH TEMPERATURE	hot press molding							
HIGH TEMPERATURE	pultrusion							
ELEVATED TEMPERATURES	gelcoats			1				
ELEVATED TEMPERATURES	continuous laminating	1		1		1		2
ELEVATED TEMPERATURES	resin transfer molding	1		1				2
ELEVATED TEMPERATURES	filament winding		1	1				
ELEVATED TEMPERATURES	centrifugal casting	1	1	1	1	1	1	1
AMBIENT TEMPERATURE	coatings	1		1		1	1	
AMBIENT TEMPERATURE	chemical anchors & mine bolts							
AMBIENT TEMPERATURE	body fillers	1		1		1	1	
AMBIENT TEMPERATURE	gelcoats	1	1	1				
AMBIENT TEMPERATURE	polymer concrete & marble	1		1	1	1	1	2
AMBIENT TEMPERATURE	resin transfer molding	1	1	1		1	1	2
AMBIENT TEMPERATURE	hand lay-up and spray-up	1	1	1	1	1	1	1
	page	10	10	10	10	10	10	10

Ketone Peroxide mixtures

Category	Application	TRIGONOX 44K*	TRIGONOX 63A*	TRIGONOX 178*	TRIGONOX 263*
SPECIAL RESINS	cipp				
SPECIAL RESINS	acrylics				
SPECIAL RESINS	vinylesters				
HIGH TEMPERATURE	hot press molding				
HIGH TEMPERATURE	pultrusion				
ELEVATED TEMPERATURES	gelcoats				
ELEVATED TEMPERATURES	continuous laminating	1	1		
ELEVATED TEMPERATURES	resin transfer molding	2	2	3	3
ELEVATED TEMPERATURES	filament winding	3	2	2	2
ELEVATED TEMPERATURES	centrifugal casting		2	2	2
AMBIENT TEMPERATURE	coatings				
AMBIENT TEMPERATURE	chemical anchors & mine bolts				
AMBIENT TEMPERATURE	body fillers				
AMBIENT TEMPERATURE	gelcoats				
AMBIENT TEMPERATURE	polymer concrete & marble	2	2	3	3
AMBIENT TEMPERATURE	resin transfer molding	3	1	2	2
AMBIENT TEMPERATURE	hand lay-up and spray-up		2	3	3
	page	10	10	10	10

Diacyl peroxides

Category	Application	PERKADOX BTW-55	PERKADOX L-40 RPS	PERKADOX CH-50	PERKADOX GB-50	PERKADOX L-W75	PERKADOX L-W78	PERKADOX L-W78 Powder USP Grade	PERKADOX BTW-50
SPECIAL RESINS	cipp			1	1				
SPECIAL RESINS	acrylics		1	1	1	1	1	1	
SPECIAL RESINS	vinylesters			1	1				
HIGH TEMPERATURE	hot press molding			1	1	1	1		1
HIGH TEMPERATURE	pultrusion			1	1				
ELEVATED TEMPERATURES	gelcoats								
ELEVATED TEMPERATURES	continuous laminating								
ELEVATED TEMPERATURES	resin transfer molding								
ELEVATED TEMPERATURES	filament winding		1	1	1				
ELEVATED TEMPERATURES	centrifugal casting								
AMBIENT TEMPERATURE	coatings		1	3	3				3
AMBIENT TEMPERATURE	chemical anchors & mine bolts	1		2	2				1
AMBIENT TEMPERATURE	body fillers		1	1	1				1
AMBIENT TEMPERATURE	gelcoats								
AMBIENT TEMPERATURE	polymer concrete & marble	1	1	1	1	1	1	1	1
AMBIENT TEMPERATURE	resin transfer molding		1						
AMBIENT TEMPERATURE	hand lay-up and spray-up		1	1	1				1
	page	10	10	10	10	10	10	10	10

Peroxyesters

Category	Application	TRIGONOX 23-C75	TRIGONOX 141	TRIGONOX 121	TRIGONOX 121-C75	TRIGONOX 21-C50	TRIGONOX 21S	TRIGONOX 131	TRIGONOX 42S	TRIGONOX 93	TRIGONOX C
SPECIAL RESINS	cipp					1	1	1	1		1
SPECIAL RESINS	acrylics		3						2		1
SPECIAL RESINS	vinylesters		1		1	1	1	1	1		1
HIGH TEMPERATURE	hot press molding		1		1	1	1	1	1		1
HIGH TEMPERATURE	pultrusion	1	1	1	1	1	1	1	1		1
ELEVATED TEMPERATURES	gelcoats									1	
ELEVATED TEMPERATURES	continuous laminating					1		2	1	1	1
ELEVATED TEMPERATURES	resin transfer molding								1	1	1
ELEVATED TEMPERATURES	filament winding								3	3	
ELEVATED TEMPERATURES	centrifugal casting								3	3	
AMBIENT TEMPERATURE	coatings										
AMBIENT TEMPERATURE	chemical anchors & mine bolts										
AMBIENT TEMPERATURE	body fillers										
AMBIENT TEMPERATURE	gelcoats										
AMBIENT TEMPERATURE	polymer concrete & marble										
AMBIENT TEMPERATURE	resin transfer molding										
AMBIENT TEMPERATURE	hand lay-up and spray-up										
	page	11	11	11	11	11	11	11	11	11	11

Dialkyl Peroxides / Peroxyketals / Peroxyketal mixtures

Category	Application	LAUROX	PERKADOX BC-FF	TRIGONOX 101	TRIGONOX 122-C80	TRIGONOX 29-C75	TRIGONOX 22-C80	TRIGONOX 161-C65	TRIGONOX KSM-C75
SPECIAL RESINS	cipp								
SPECIAL RESINS	acrylics	1	1	1					
SPECIAL RESINS	vinylesters					1			
HIGH TEMPERATURE	hot press molding				1	1	1	1	3
HIGH TEMPERATURE	pultrusion				3	3	3		1
ELEVATED TEMPERATURES	gelcoats								
ELEVATED TEMPERATURES	continuous laminating					1	1		1
ELEVATED TEMPERATURES	resin transfer molding				1	1	1	1	
ELEVATED TEMPERATURES	filament winding								
ELEVATED TEMPERATURES	centrifugal casting								
AMBIENT TEMPERATURE	coatings								
AMBIENT TEMPERATURE	chemical anchors & mine bolts								
AMBIENT TEMPERATURE	body fillers								
AMBIENT TEMPERATURE	gelcoats								
AMBIENT TEMPERATURE	polymer concrete & marble								
AMBIENT TEMPERATURE	resin transfer molding								
AMBIENT TEMPERATURE	hand lay-up and spray-up								
	page	12	12	12	12	12	12	12	12

Hydroperoxides

Category	Application	TRIGONOX 239	TRIGONOX K-90	TRIGONOX A-W70
SPECIAL RESINS	cipp	2	1	
SPECIAL RESINS	acrylics			
SPECIAL RESINS	vinylesters	2	1	
HIGH TEMPERATURE	hot press molding			
HIGH TEMPERATURE	pultrusion			
ELEVATED TEMPERATURES	gelcoats			
ELEVATED TEMPERATURES	continuous laminating	1	1	
ELEVATED TEMPERATURES	resin transfer molding			
ELEVATED TEMPERATURES	filament winding		1	
ELEVATED TEMPERATURES	centrifugal casting		1	
AMBIENT TEMPERATURE	coatings	1	1	
AMBIENT TEMPERATURE	chemical anchors & mine bolts			
AMBIENT TEMPERATURE	body fillers			
AMBIENT TEMPERATURE	gelcoats			
AMBIENT TEMPERATURE	polymer concrete & marble			
AMBIENT TEMPERATURE	resin transfer molding	2	1	
AMBIENT TEMPERATURE	hand lay-up and spray-up	2	1	
	page	12	12	12

Peroxy(di)carbonates

Category	Application	PERKADOX 16	PERKADOX 16-40XPS	TRIGONOX EHP-C75	TRIGONOX EHPTS	PERKADOX 26	TRIGONOX 117	TRIGONOX BPIC-C75
SPECIAL RESINS	cipp	1	1			1		
SPECIAL RESINS	acrylics	1	1			1		
SPECIAL RESINS	vinylesters	1	1		1	1	1	1
HIGH TEMPERATURE	hot press molding			1			1	1
HIGH TEMPERATURE	pultrusion	1	1		1		1	1
ELEVATED TEMPERATURES	gelcoats						3	3
ELEVATED TEMPERATURES	continuous laminating	1	1			1		3
ELEVATED TEMPERATURES	resin transfer molding							
ELEVATED TEMPERATURES	filament winding							
ELEVATED TEMPERATURES	centrifugal casting							
AMBIENT TEMPERATURE	coatings							
AMBIENT TEMPERATURE	chemical anchors & mine bolts							
AMBIENT TEMPERATURE	body fillers							
AMBIENT TEMPERATURE	gelcoats							
AMBIENT TEMPERATURE	polymer concrete & marble							
AMBIENT TEMPERATURE	resin transfer molding							
AMBIENT TEMPERATURE	hand lay-up and spray-up							
	page	13	13	13	13	13	13	13

Others

Category	Application	PERKADOX AIBN	PERKADOX AMBN	PERKADOX PF-MT40
SPECIAL RESINS	cipp			
SPECIAL RESINS	acrylics	1	1	1
SPECIAL RESINS	vinylesters			
HIGH TEMPERATURE	hot press molding			
HIGH TEMPERATURE	pultrusion			
ELEVATED TEMPERATURES	gelcoats			
ELEVATED TEMPERATURES	continuous laminating			
ELEVATED TEMPERATURES	resin transfer molding			
ELEVATED TEMPERATURES	filament winding			
ELEVATED TEMPERATURES	centrifugal casting			
AMBIENT TEMPERATURE	coatings			
AMBIENT TEMPERATURE	chemical anchors & mine bolts			
AMBIENT TEMPERATURE	body fillers			
AMBIENT TEMPERATURE	gelcoats			
AMBIENT TEMPERATURE	polymer concrete & marble			
AMBIENT TEMPERATURE	resin transfer molding			
AMBIENT TEMPERATURE	hand lay-up and spray-up			
	page	14	14	14

* Vanishing Red (VR) and Red versions available on request
Please contact us for advice on the best curing system for your specific application.

1 Industry Standard 2 Added Value / Special purpose 3 Alternative curing Characteristics

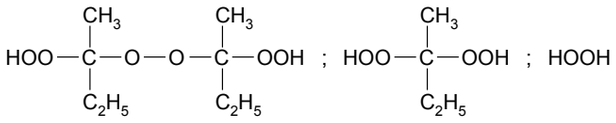
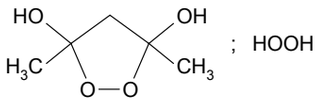
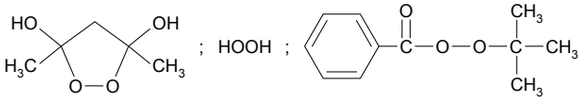
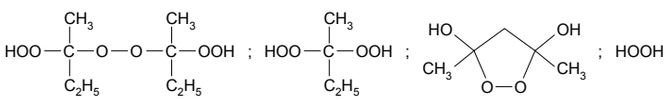
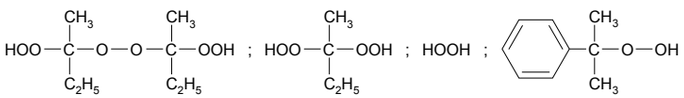
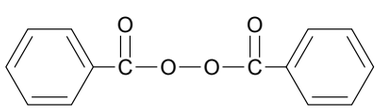
Perkadox® GB-50

Our innovative phthalate free Benzoyl Peroxide (BPO) powder

- produced in North America
- phthalate free
- typical applications:
  - road marking
  - flooring
  - adhesives
  - acrylic composites

Nouryon

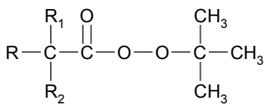
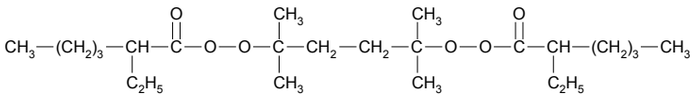
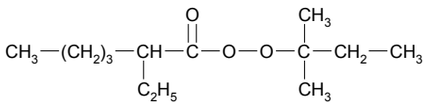
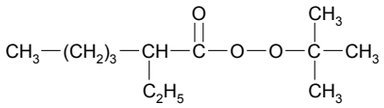
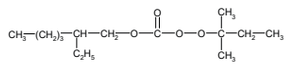
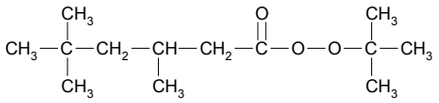
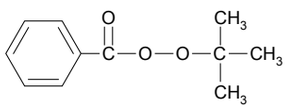
Our curing agents

PRODUCT NAME	CHEMICAL NAME [CAS NUMBER]	ASSAY (%)	ACTIVE OXYGEN (%)	PHYSICAL FORM	STORAGE TEMPERATURES Ts max. (°C)	Ts min. (°C)	HALF-LIFE TEMPERATURES 1.0 hr [°C(°F)]	0.1 hr [°C(°F)]	ACTIVATION SADT [°C(°F)]	temp. [°C(°F)]	NFPA CLASS	UN NO.	FEATURES
Ketone peroxides													
	Methyl ethyl ketone peroxide [1338-23-4]												
CADOX D-50			8.9	solution in TXIB	30 (86)				60 (140)	50 (122)	III*	3105	general purpose MEKP
CADOX L-30A			5.3	solution in TXIB	30 (86)				60 (140)	50 (122)	IV*	3107	low concentration for summer
CADOX L-50A			8.9	solution in TXIB	30 (86)				60 (140)	50 (122)	III*	3105	low H_2O_2 for gel coats & VE resins
CADOX M-30A			5.3	solution in TXIB	30 (86)				60 (140)	50 (122)	IV*	3107	low concentration for summer
CADOX M-50A			8.9	solution in TXIB	30 (86)				60 (140)	50 (122)	III*	3105	fast reactive MEKP
BUTANOX L-50			8.9	solution in DMP	30 (86)				60 (140)	50 (122)	II*	3105	low H2O2 for gel coats & VE resins
BUTANOX M-50			8.9	solution in DMP	30 (86)				60 (140)	50 (122)	II*	3105	fast reactive MEKP
BUTANOX M-50A*			8.9	solution in TXIB	30 (86)				60 (140)	50 (122)	III*	3105	standard, medium reactivity
	Acetylacetone peroxide [37187-22-7]												
TRIGONOX 44B			4.1	in solvent mixture	30 (86)	-10 (14)			60 (140)	50 (122)	IV	3107	delayed gel with fast GTP
Ketone peroxide mixtures													
	Acetylacetone peroxide and tert-butyl peroxybenzoate [37187-22-7]												
TRIGONOX 44K			3.5	in solvent mixture	30 (86)	-10 (14)			60 (140)	50 (122)	III*	3107	modified for through cure
	Mixture of methyl ethyl ketone peroxide and acetylacetone peroxide [37187-22-7; 1338-23-4]												
TRIGONOX 63A			6.5	in solvent mixture	30 (86)				55 (131)	50 (122)	III*	3105	for balanced gel & GTP
	Methyl ethyl ketone peroxide and cumyl hydroperoxide [1338-23-4; 80-15-9]												
TRIGONOX 178			9.1	solution in TXIB	30 (86)				60 (140)	50 (122)	III*	3105	for suppressing very high exotherms
TRIGONOX 263			9.0	solution in TXIB	30 (86)				60 (140)	50 (122)		3105	for suppressing exotherm
Diacyl Peroxides													
	Dibenzoyl peroxide [94-36-0]												
PERKADOX L-40 RPS		40	2.6	suspension in proprietary solvents	25 (77)				50 (122)	70 (158)	IV	3107	sprayable suspension
PERKADOX BTW-55		55	3.6	paste in dipropylene glycol dibenzoate	25 (77)	0 (32)			50 (122)	70 (158)	IV	3108	high viscosity
PERKADOX CH-50		50	3.3	powder with dicyclohexyl phthalate	25 (77)				55 (131)	70 (158)	III*	3106	low water
PERKADOX GB-50		50	3.3	powder with ethylene glycol dibenzoate	25 (77)				55 (131)	70 (158)	III*	3106	low water
PERKADOX L-W75		75	5.0	suspension in water	40 (104)				80 (176)	70 (158)	III	3104	standard granular
PERKADOX L-W78		78	5.2	suspension in water	40 (104)				80 (176)	70 (158)	II	3102	granular
PERKADOX L-W78 Powder USP Grade		78	5.2	suspension in water	40 (104)				80 (176)	70 (158)	II	3102	micronized powder

* Cadox & Butanox products are available in RED and Vanishing Red versions

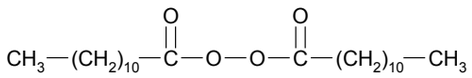
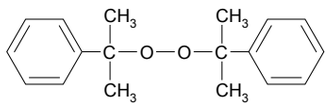
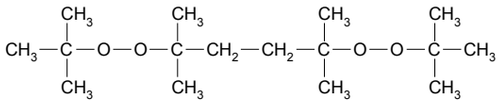
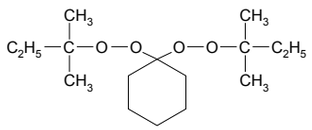
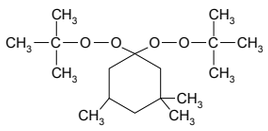
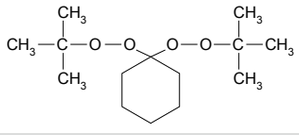
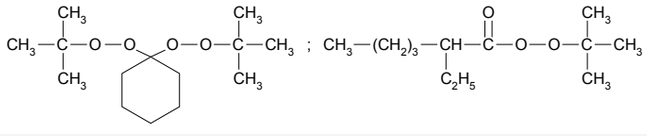
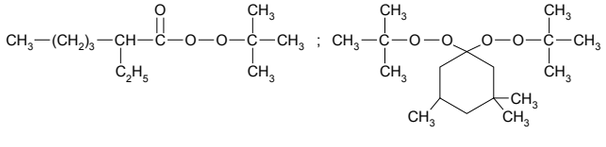
** Estimated from NFPA 400 based on similar formulations

Our curing agents

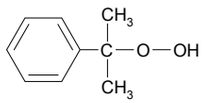
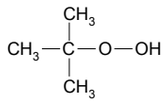
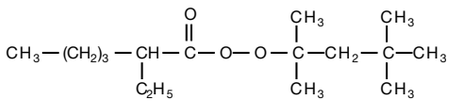
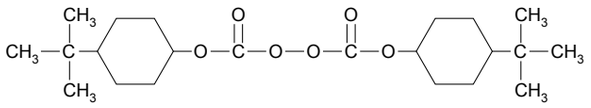
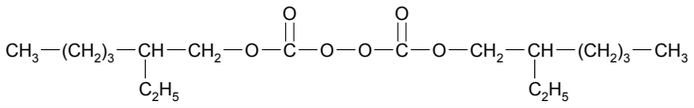
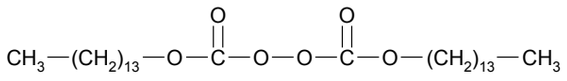
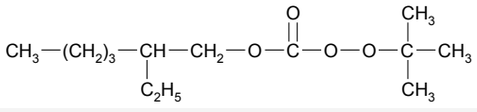
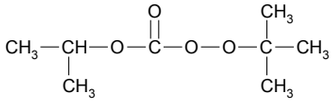
PRODUCT NAME	CHEMICAL NAME [CAS NUMBER]	ASSAY (%)	ACTIVE OXYGEN (%)	PHYSICAL FORM	STORAGE TEMPERATURES Ts max. (°C)	Ts min. (°C)	HALF-LIFE TEMPERATURES 1.0 hr [°C(°F)]	0.1 hr [°C(°F)]	ACTIVATION SADT [°C(°F)]	temp. [°C(°F)]	NFPA CLASS	UN NO.	FEATURES
Peroxyesters													
	tert-Butyl peroxyneodecanoate [26748-41-4]												
TRIGONOX 23-C75	 R + R_1 + R_2 = C_8H_{19}	75	4.9	solution in odorless mineral spirits	-10 (14)	-20 (-4)	64 (147)	84 (183)	20 (68)	40 (104)	III	3115	fast primary, needs cold storage
	2,5-Dimethyl-2,5-di(2-ethylhexanoylperoxy)hexane [13052-09-0]												
TRIGONOX 141		90	6.8	liquid	20 (68)	-20 (-4)	86 (187)	106 (223)	35 (95)	60 (140)	III	3113	primary, good with Br-resins
	tert-Amyl peroxy-2-ethylhexanoate [686-31-7]												
TRIGONOX 121		95	6.6	liquid	5 (41)	-20 (-4)	91 (196)	111 (232)	35 (95)	60 (140)	III	3115	fast secondary, needs colder storage
TRIGONOX 121-C75		75	5.2	solution in odorless mineral spirits	10 (50)		91 (196)	111 (232)	35 (95)	60 (140)	III	3115	fast phthalate free secondary
	tert-Butyl peroxy-2-ethylhexanoate [3006-82-4]												
TRIGONOX 21-C50		50	3.7	solution in odorless mineral spirits	10 (50)	-30 (-22)	91 (196)	113 (235)	40 (104)	60 (140)	IV	3117	phthalate free secondary
TRIGONOX 21S		97	7.2	liquid	10 (50)	-30 (-22)	91 (196)	113 (235)	35 (95)	60 (140)	III	3113	needs colder storage
	tert-Amylperoxy 2-ethylhexyl carbonate [70833-40-8]												
TRIGONOX 131		94	5.8	liquid	20 (68)		113 (235)	134 (273)	55 (131)	60 (140)		3105	high efficiency for HPM
	tert-Butyl peroxy-3,5,5-trimethylhexanoate [13122-18-4]												
TRIGONOX 42S		97	6.7	liquid	25 (77)	-20 (-4)	114 (237)	135 (275)	55 (131)	80 (176)		3105	lowest ambient storage peroxyester
TRIGONOX 42PR		90	6.2	solution with acetylacetone	25 (77)	-20 (-4)				70 (158)			pre-promoted for elevated ambient cure
	tert-Butyl peroxybenzoate [614-45-9]												
TRIGONOX 93		79	6.5	solution with acetylacetone	25 (77)		122 (252)	142 (288)	55 (131)	70 (158)	II*	3103	pre-promoted for elevated ambient cure
TRIGONOX C		98	8.0	liquid	25 (77)	10 (50)	122 (252)	142 (288)	60 (140)	80 (176)	II	3103	standard finishing

* Estimated from NFPA 400 based on similar formulations

Our curing agents

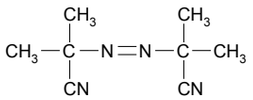
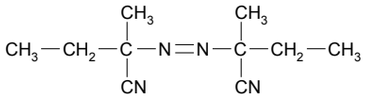
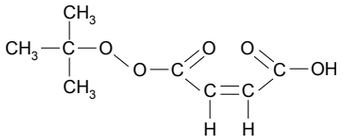
PRODUCT NAME	CHEMICAL NAME [CAS NUMBER]	ASSAY (%)	ACTIVE OXYGEN (%)	PHYSICAL FORM	STORAGE TEMPERATURES Ts max. (°C)	Ts min. (°C)	HALF-LIFE TEMPERATURES 1.0 hr [°C(°F)]	0.1 hr [°C(°F)]	ACTIVATION SADT [°C(°F)]	temp. [°C(°F)]	NFPA CLASS	UN NO.	FEATURES
Dialkyl peroxides													
	Dilauroyl peroxide [105-74-8]												
LAUROX		99	4.0	flakes	30 (86)		79 (174)	99 (210)	50 (122)		IV	3106	acrylic curing
	Dicumyl peroxide [80-43-3]												
PERKADOX BC-FF		99	5.9	crystals	30 (86)		132 (270)	154 (309)	75 (167)		IV	3110	olefinic crosslinking
	2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane [78-63-7]												
TRIGONOX 101		92	10.1	liquid	40 (104)	10 (50)	134 (273)	156 (313)	80 (176)		III	3105	olefinic crosslinking
Peroxyketals													
	1,1-Di(tert-amylperoxy)cyclohexane [15667-10-4]												
TRIGONOX 122-C80		80	8.9	solution in odorless mineral spirits	30 (86)		106 (223)	126 (259)	55 (131)	70 (158)	III	3103	intermediate/finishing
	1,1-Di(tert-butylperoxy)-3,3,5-trimethylcyclohexane [6731-36-8]												
TRIGONOX 29-C75		75	7.9	solution in odorless mineral spirits	25 (77)		105 (221)	128 (262)	60 (140)	70 (158)	II	3103	standard finishing phthalate free
	1,1-Di(tert-butylperoxy)cyclohexane [3006-86-8]												
TRIGONOX 22-C80		80	9.8	solution in odorless mineral spirits	25 (77)		113 (235)	134 (273)	60 (140)	70 (158)	II	3103	phthalate free for thin parts
Peroxyketal mixtures													
	1,1-Di(tert-butylperoxy)cyclohexane and tert-butyl peroxy-2-ethylhexanoate [3006-86-8; 3006-82-4]												
TRIGONOX 161-C65		65	6.8	solution in odorless mineral spirits	10 (50)	-30 (-22)			40 (104)	50 (122)	III*	3113	special blend
	Mixture of tert-butyl peroxy-2-ethylhexanoate and 1,1-Di(tert-butylperoxy)-3,3,5-trimethylcyclohexane [3006-82-4; 6731-36-8]												
TRIGONOX KSM-C75		75	6.3	solution in odorless mineral spirits	20 (68)	-20 (-4)			40 (104)	50 (122)	III*	3117	foregiving phthalate free blend for colors

Our curing agents

PRODUCT NAME	CHEMICAL NAME [CAS NUMBER]	ASSAY (%)	ACTIVE OXYGEN (%)	PHYSICAL FORM	STORAGE TEMPERATURES Ts max. (°C)	Ts min. (°C)	HALF-LIFE TEMPERATURES 1.0 hr [°C(°F)]	0.1 hr [°C(°F)]	ACTIVATION SADT [°C(°F)]	temp. [°C(°F)]	NFPA CLASS	UN NO.	FEATURES
Hydroperoxides													
	Cumyl hydroperoxide (80-15-9)												
TRIGONOX 239		46	4.8	in solvent mixture	25 (77)		166 (331)	195 (383)	55 (131)	135 (275)	III*	3109	pre-promoted CHP for VE resins
TRIGONOX K-90		90	9.5	solution in aromatic solvent mixture	40 (104)	-30 (-22)	166 (331)	195 (383)	70 (158)	135 (275)	III	3109	standard CHP
	tert-Butyl hydroperoxide [75-91-2]												
TRIGONOX A-W70		70	12.4	solution in water	35 (95)	0 (32)	185 (365)	207 (405)	80 (176)		IV	3109	standard for adhesives
	1,1,3,3-tetrametylbutyl peroxy-2-ethylhexanoate												
TRIGONOX 421		90	5.87	solution in water	5 (49)	-20 (4)	109 (228)	88 (190)	30 (86)		III	3115	for acrylate/methacrylate
Peroxy(di)carbonates													
	Di(4-tert-butylcyclohexyl) peroxydicarbonate [15520-11-3]												
PERKADOX 16		96	3.9	powder	20 (68)		64 (147)	82 (180)	40 (104)	40 (104)	I	3114	best all around primary
PERKADOX 16-GB70		70	2.81	powder	20 (68)		64 (147)	82 (180)	40 (104)		II	3116	easy to dissolve powder
PERKADOX 16-40 XPS		40	1.55	paste	20 (68)		64 (147)	82 (180)	45 (113)	40 (104)	III	3116	pumpable paste
	Di(2-ethylhexyl) peroxydicarbonate [16111-62-9]												
TRIGONOX EHP-C75		76	3.5	solution in odorless mineral spirits	-15 (5)	-25 (-13)	64 (147)	82 (180)	5 (41)	40 (104)	II	3115	primary, needs cold storage
TRIGONOX EHPTS		96	4.4	stabilized	-5 (23)		64 (147)	83 (181)	15 (59)	40 (104)		3113	safer primary, cold storage
	Dimyristyl peroxydicarbonate [53220-22-7]												
PERKADOX 26		96	3.0	flakes	15 (59)		65 (149)	84 (183)	35 (95)	45 (113)	II	3116	alternate primary option
	tert-Butylperoxy 2-ethylhexyl carbonate [34443-12-4]												
TRIGONOX 117		95	6.2	liquid	20 (68)		117 (243)	137 (279)	60 (140)	80 (170)	III	3105	higher efficiency
	tert-Butylperoxy isopropyl carbonate [2372-21-6]												
TRIGONOX BPIC-C75		75	6.8	solution in odorless mineral spirits	25 (77)	-20 (-4)	117 (243)	137 (279)	70 (158)		II	3103	most efficient styrene scavenger

* Estimated from NFPA 400 based on similar formulations

Our curing agents

PRODUCT NAME	CHEMICAL NAME [CAS NUMBER]	ASSAY (%)	ACTIVE OXYGEN (%)	PHYSICAL FORM	STORAGE TEMPERATURES Ts max. (°C)	Ts min. (°C)	HALF-LIFE TEMPERATURES 1.0 hr [°C(°F)]	0.1 hr [°C(°F)]	ACTIVATION SADT [°C(°F)]	temp. [°C(°F)]	NFPA CLASS	UN NO.	FEATURES
Others													
	2,2'-Azodi(isobutyronitrile) [78-67-1]												
PERKADOX AIBN		98		solid	25 (77)		82 (180)	101 (214)	50 (122)			3234	special purpose azo for acrylics
	2,2'-Azodi(2-methylbutyronitrile) [13472-08-7]												
PERKADOX AMBN		98		solid	25 (77)		84 (183)	104 (219)	45 (113)			3236	special purpose azo for acrylics
	tert-Butyl monoperoxymaleate [1931-62-0]												
PERKADOX PF-MT40		40	3.4	paste in dibutyl maleate	25 (77)		117 (243)	142 (288)	50 (122)			3108	standard non-yellowing for clear ccrylic

Auxiliaries

PRODUCT NAME	CHEMICAL NAME [CAS NUMBER]	ASSAY (%)	PHYSICAL FORM	STANDARD PACKAGE
Cobalt-free accelerators				
NOURYACT CF12N	Copper complex [142-71-2]		in solvent mixture	25 kg HDPE can
NOURYACT CF30	Iron complex		in solvent mixture	25 kg HDPE can
NOURYACT CF40	Iron complex		in hydroxyehtylmethacrylates (HEMA)	25 kg HDPE can

Auxiliaries may be available upon request.

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For product inquiry and ordering information, please contact your Nouryon account manager or regional Nouryon sales office.

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Additional information
Product Data Sheets (PDS) and Safety Data Sheets (SDS) for our polymerization initiators are available at polymerchemistry.nouryon.com

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