DI-CUP® VUL-CUP®
LUPEROX®

ORGANIC PEROXIDES
General Catalog • Americas

ARKEMA
The world is our inspiration

Count on an industry leader to meet your Organic Peroxides needs. Arkema offers a complete line of high quality organic peroxides worldwide.

Extensive Product Line

We offer a full line of products to meet your needs in multiple formulations and package configurations. Our extensive line of products will provide you with the choice and flexibility you want, along with the quality you need.

Security of Supply

With manufacturing sites covering the Americas, Europe and Asia, we are able to supply large global customers in many locations. You won't have to worry about availability or consistency of product because most of our products are made in two or more plants, significantly reducing the risk of a supply disruption.

Technical Application Support

Our technical support groups in King of Prussia, Pennsylvania, USA and Lyon, France, offer outstanding experience and technical know-how to ensure you select the best products for your needs.

Availability of Technical Information

Technical information, such as bulletins for each peroxide group which detail specifications, physical properties and safety data, can be found by logging onto our website, www.arkema-inc.com/organicperoxides.

Product Stewardship

To ensure our products are used safely, we will train your employees, assist you in designing storage facilities that meet all codes, and perform periodic safety audits. We also assist you with handling and disposal issues by offering a program to recycle empty packaging materials.

The Newest Product Developments

We continue to introduce new products to the market thanks to our extensive research and development facilities; which in turn improves your profitability by reducing production costs and helping to manufacture more valuable products. Contact your local Arkema representative for more information on our developmental products.

Real Customer Service

When you need answers or technical help, we have people with the knowledge, experience, and training to give you what you need.

It may be just a question about logistics, or new product advice on how to speed up or cool down your process to make it more productive for you.

Wherever you are in your product development or whatever kind of technical assistance you may need, you'll find you will get through to people who really can make a positive difference for you.

Quality...The Final Word

We define quality as a customer-focused approach to everything we do: providing consistent product; the best selection of products; dependable delivery; outstanding product performance; and excellent sales and technical support.

Ultimately, our measure of quality is your complete satisfaction. We are committed to:

- Unequaled experience and technical know-how
- Ready availability and consistency of product around the world
- Leading technology and manufacturing capabilities
- The sustainable development of products
- Comprehensive safe handling and storage programs
- ISO-9000 driven total quality programs

At Arkema, quality is an attitude that can be found in everything we do – from research & development and manufacturing to marketing, sales and order entry, to packaging and distribution.

For literature, MSDS, or technical information: Visit our website at **www.arkema-inc.com/organicperoxides** or call us at **1-800-331-7654**.

Selecting Your Organic Peroxide

Commercially available peroxides from seven different structural groups provide a broad range of reactivity. Polymerization initiators, from very fast hydroxy peresters for rapid kinetics in vinyl polymerization, through high temperature dialkyl peroxides used as finishing catalysts, are available. Crosslinking reactions are possible in polyethylene and elastomers using dialkyl peroxides and peroxyketals. By making use of promotion systems in polyester resins, ketone peroxides and benzoyl peroxide can be used at room temperature.

The following tables describe Arkema commercially available peroxides sorted into structural groups. Column headings include the chemical name as well as trade names for each product, a brief description of the product, an indication of the product's reactivity as percent active oxygen by weight, temperatures for ten and one hour half-lives and critical safety and storage requirements.

Many parameters must be considered when choosing a peroxide for a given application. Two of the more important ones are provided in this catalog: the SADT and the half-life temperature. The SADT is officially recognized as the lowest temperature at which the product, in the commercial package and concentration, will undergo a self-accelerating decomposition. It is determined in the largest commercially offered package or using the Heat Accumulation Storage Test (HAST). **The SADT is the temperature that must not be reached during transport, storage, and handling of the peroxide in order to be safe.** Ideally, products should be kept at the Control Temperature, which is 20°C below the SADT, and should not reach the Emergency Temperature, which is 10°C below the SADT. Half-life data is provided for comparison purposes to select among different peroxides for use.

Half-life

Half-life is defined as the time it takes for one half of a given quantity of peroxide in dilute solution to decompose at a given temperature. The decomposition rate is first order and is characterized at a given temperature by the equation $-dC/dt = kC$ where C is peroxide concentration, t is time and k is the first-order rate constant. For convenience in comparing the stability of peroxides in dilute solutions, peroxides are commonly listed according to the temperatures at which they have half-lives of 10 hours or 1 hour. The higher the temperature corresponding to the half-life, the more stable the peroxide. Half-life temperatures can vary based on the manner in which they are determined, especially the solvent used. More detailed information about half-life can be found in other product bulletins available from our website at www.arkema-inc.com/organicperoxides, or by calling 1-800-331-7654.

GLOSSARY OF TERMS

OMS - Odorless Mineral Spirits
NA - Not Applicable
NE - Not Evaluated
Ctn - Container
Pref - Preferred
EPR - Ethylene Propylene Rubber

Highlighted products require refrigerated (temperature controlled) shipment and storage

Diacyl Peroxides

General Formula: R-C(=O)-O-O-C(=O)-R

Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
Decanoyl Peroxide (762-12-9)	Luperox® DEC	65	83	≥4.60	43 (50# ctn)	15°C/60°F	≥98.5% Flaked Solid
Lauroyl Peroxide (105-74-8)	Luperox® LP	64	81	≥3.95	51 (65# ctn)	27°C/80°F	≥98.0% Flaked Lump-Free Solid
Succinic Acid Peroxide (123-23-9)	Luperox® SAP	66	90	3.96-4.85	66 (1# bag)	0°C/32°F	58-71% Frozen, Wet Solid
Benzoyl Peroxide (94-36-0)	Luperox® A98	73	92	≥6.47	68 (1# ctn)	38°C/100°F	≥98% Granular Dry Solid
	Luperox® A75	73	92	4.82-5.08	71 (25# ctn)	38°C/100°F	73-77% Granular Wet Solid
	Luperox® A70S	73	92	4.36-4.76	82 (2 x 25# ctn)	38°C/100°F	66-72% Granular Wet Solid, USP Grade
	Luperox® A75FP	73	92	4.82-5.09	71 (25# ctn)	38°C/100°F	73-77% Fine Particle Granular Wet Solid, USP Grade
	Luperox® AFR40	73	92	2.64-2.77	55 (40# ctn)	38°C/100°F	40-42% Pourable Paste
	Luperox® AGR55	73	92	3.56-3.73	>50 (HAST)	38°C/100°F	54-56.5% Paste
	Luperox® ANS55	73	92	3.63-3.83	54 (50# ctn)	38°C/100°F	55-58% Paste with Plasticizer
	Luperox® ATC50	73	92	3.30-3.44	NE	38°C/100°F	50-20% Paste with Tricresyl Phosphate
	Luperox® ACP35	73	92	2.31-2.44	NE	38°C/100°F	35-37% Powder, Blend with Inorganic Phosphates

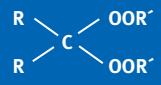
Dialkyl Peroxides

General Formula: $(R\text{-}OO)_nR'$ n = 1 or 2

Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. - T1/2°C	1 hr. - T1/2°C				
Dicumyl Peroxide (80-43-3)	Di-Cup® R	117	137	≥5.86	NE	38°C/100°F	≥99.0% Crystal
	Di-Cup® 40C	117	137	2.34-2.46	NE	38°C/100°F	39.5-41.5% Solid with Inert Filler, Powder
	Di-Cup® 40KE	117	137	2.34-2.46	NE	38°C/100°F	39.5-41.5% Solid with Kaoliln Clay, Powder
	Di-Cup® 40MB	117	137	2.34-2.46	NE	38°C/100°F	39.5-41.5% Solid with EPR, Pellets
2,5-Di(t-butylperoxy)-2,5-dimethylhexane (78-63-7)	Luperox® 101	120	140	10.25-10.47	86 (30# cube)	38°C/100°F	93-95% Liquid[1]
	Luperox® 101XL45	120	140	4.96-5.29	82 (100# drum)	38°C/100°F	45-48% Solid on Inert Filler, Powder
	Luperox® HP101XLP	120	140	4.68-5.01	NE	38°C/100°F	42.5-45.5% with Solid Inert Filler and Scorch-Reducing Additives, Powder
	Luperox® 101PP20	120	140	2.09-2.31	NE	38°C/100°F	19-21% Dispersion on Polypropylene Powder
t-Butyl Cumyl Peroxide (3457-61-2)	Luperox® D-16	124	144	≥7.30	85 (35# ctn)	38°C/100°F	≥96.0% Liquid
α, ά-bis (t-butylperoxy) diisopropylbenzene (25155-25-3)	Luperox® F40M-SP	119	139	3.59-3.97	NE	38°C/100°F	38-42% Solid with EPR & Scorch-Reducing Additives, Off White Pellets
	Vul-Cup® R	119	139	≥9,07	90 (HAST)	38°C/100°F	≥96% Semi-Solid or Crushed
	Vul-Cup® 40C	119	139	3.59-3.97	NE	38°C/100°F	39-5-41.5% Solid with Calcium Carbonate Powder
	Vul-Cup® 40KE	119	139	3.59-3.97	NE	38°C/100°F	38-42% White Pellets with Clay
	Vul-Cup® 40MB	119	139	3.59-3.97	NE	38°C/100°F	39.5-41.5% Solid with EPR, Sheets
	Vul-Cup® 40SI	117	137	2.34-2.46	NE	38°C/100°F	39.5-41.5% Solid with Kaolin Clay, smaller Particle size
	Vul-Cup® 20XP	119	139	1.6-2.0	NE	38°C/100°F	20% on Polypropylene
Di(t-amyl) Peroxide (10508-09-5)	Luperox® DTA	123	143	≥8.81	75 (30# ctn)	38°C/100°F	≥96% Liquid
Di(t-butyl) Peroxide (110-05-4)	Luperox® DI	129	149	≥10.78	82 (30# cube)	38°C/100°F	≥98.5% Liquid
2,5-Di(t-butylperoxy) 2,5-dimethyl-3-hexyne (1068-27-5)	Luperox® 130XL45	131	152	5.03-5.36	88 (100# drum)	38°C/100°F	45-48% Solid on Inert Filler, Powder
Peroxide Blends	Luperox® D-68	121	141	6.0-6.7	NE	38°C/100°F	Liquid Peroxide Blend
	Luperox® D-446B	120	140	> = 8.72	NE	38°C/100°F	Liquid Peroxide Blend
	Luperox® MIX	119	139	3.40-3.59	NE	38°C/100°F	36-38% Meltable Tan Paste

Notes: [1]Also available diluted in OMS or mineral oil
EPR - Ethylene Propylene Copolymer

Diperoxyketals

General Formula: 

Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
1,1-Di(t-butylperoxy)-3,3,5-trimethylcyclohexane (6731-36-8)	Luperox® 231	96	115	≥9.73	60 (HAST)	32°C/90°F	≥92% Liquid
	Luperox® 231XL40	96	115	4.07-4.39	60 (100# ctn)	32°C/90°F	38.5-41.5% on Solid Inert Filler
	Luperox® 231XL40-SP	96	115	4.02-4.23	NE	32°C/90°F	38-40% on Solid Inert Filler & Scorch-Reducing Additives, Powder
1,1-Di(t-butylperoxy)-cyclohexane (3006-86-8)	Luperox® 331M80	97	116	9.59-9.83	NE	32°C/90°F	78-80% in OMS
1,1-Di(t-amylperoxy)-cyclohexane (15667-10-4)	Luperox® 531M80	93	112	8.76-8.99	60 (30# ctn)	32°C/90°F	79-81% in OMS
n-Butyl 4,4-Di (t-butylperoxy)valerate (995-33-5)	Luperox® 230XL40	109	129	3.78-3.97	60 (20# ctn)	38°C/100°F	38.5-41.5% on Solid Inert Filler, Powder
	Luperox® 230XL40-SP	109	129	3.68-4.02	NE	38°C/100°F	38-40% on Solid Inert Filler & Scorch-Reducing Additives, Powder
Ethyl 3,3-Di-(t-amylperoxy) butyrate (67567-23-1)	Luperox® 533M75	112	132	7.39-7.59	80 (35# ctn)	38°C/100°F	74-76% in OMS
Blend of 40% 1,1-Di(t-butylperoxy)-cyclohexane, (3006-86-8) & 25% t-Butyl Peroxy-2-ethylhexanoate, (3006-82-4)	Luperox® M33	N/A	N/A	6.70-6.97	NE	15°C/59°F	OMS Diluent
Ethyl 3,3-Di-(t-butylperoxy)butyrate (55794-20-2)	Luperox® 233M75	114	134	8.21-8.42	80 (35# ctn)	38°C/100°F	75-77% in OMS

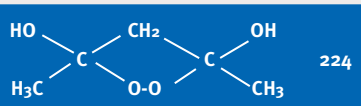
Hydroperoxides

General Formula: R - OOH

Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
Cumene Hydroperoxide (80-15-9)	Luperox® CU80	158	188	8.41-8.83	NE	38°C/100°F	80-84% Liquid
Diisopropylbenzene Hydroperoxide (26762-93-6)	Luperox® DIBHP	150	182	4.62-5.44	NE	38°C/100°F	51.0-55.0% Liquid
t-Butyl Hydroperoxide (75-91-2)	Luperox® TBH70X	172	201	12.25-12.61	~88 (35# ctn)	38°C/100°F	69-71% in Water
t-Amyl Hydroperoxide (3425-61-4)	Luperox® TAH85	165	183	12.29-13.53	75 (35# ctn)	38°C/100°F	80-88% Liquid

Ketone Peroxides

General Formula:



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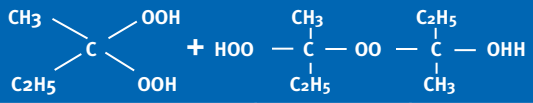


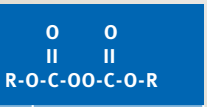
DDM-9, DDM-30, DHD-9, Delta-x-9

Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
Methyl Ethyl Ketone Peroxide mixture (1338-23-4)	Luperox® DDM-9	NA	NA	8.70-9.0	75 (45# ctn)	38°C/100°F	Mixture in Organic Diluent[1]
	Luperox DDM-30	NA	NA	5.50-6.05	>85 (8# ctn)	38°C/100°F	Mixture in Organic Diluent[1]
	Luperox DHD-9	NA	NA	8.70-9.0	85 (8# ctn)	38°C/100°F	Mixture in Organic Diluent[1]
	Luperox Delta-X-9	NA	NA	8.70-9.0	85 (8# ctn)	38°C/100°F	Mixture in Organic Diluent[1]
2, 4-Pentanedione Peroxide (37187-22-7)	Luperox 224	NA	NA	4.00-4.15	54 (42# ctn)	38°C/100°F	Proprietary F.R. Formulation in Mixed Organic Diluent
Blend of Methyl Ethyl Ketone Peroxide (1338-23-4) & Cumene Hydroperoxide (80-15-9)	Luperox KC70	NA	NA	8.86-9.17	NE	38°C/100°F	Mixed Organic Diluent[1]

Notes: [1]Red dyed product also available

Peroxydicarbonates

General Formula:



Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
Di(n-Propyl) Peroxydicarbonate (16066-38-9)	Luperox® 221	50	66	≥7.68	-7 (9# ctn)	-23°C/-10°F	≥99% Liquid
Di(sec-Butyl) Peroxydicarbonate (19910-65-7)	Luperox® 225V60	51	69	4.03-4.17	20 (35# ctn)	-10°C/14°F	59-61% In Proprietary Stabilizing Diluent
Di(2-Ethylhexyl) Peroxydicarbonate (16111-62-9)	Luperox® 223V75	49	66	3.46-3.56	25 (7# ctn)	-5°C/23°F	75-77% In Proprietary Stabilizing Diluent
	Luperox® 223S	49	66	≥4.52	15 (40# ctn)	-18°C/0°F	≥98% Liquid, Stabilized

Peroxyesters

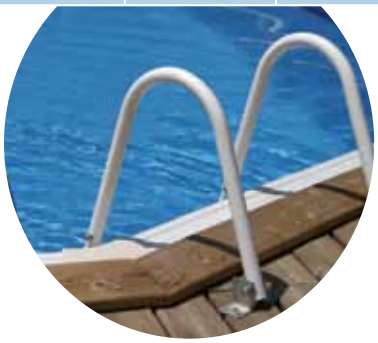
General Formula: O II R-OOC-R´ | O II R-OOC-OR´ | O II [R-OOC-]$_2$R´ | O II [R-OOCO-]$_n$R´

Chemical Name (CAS Registry)	Trade Name	Half-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
α-Cumyl Peroxyneodecanoate (26748-47-0)	Luperox® 188M75	38	56	3.86-3.99	15 (37# ctn)	-18°C/0°F	74-76% in OMS
t-Amyl Peroxyneodecanoate (68299-16-1)	Luperox® 546M75	46	64	4.58-4.71	25 (30# ctn)	-10°C/14°F	
t-Butyl Peroxyneodecanoate (26748-41-4)	Luperox® 10M75	48	66	4.85-4.98	27 (35# ctn)	-10°C/14°F	74-76% in OMS
	Luperox® 10	48	66	≥6.22	21 (30# ctn)	-10°C/14°F	≥95% Liquid
t-Amyl Peroxypivalate (29240-17-3)	Luperox® 554M75	55	74	6.29-6.46	30 (30# ctn)	-7°C/20°F	74-76% in OMS
t-Butyl Peroxypivalate (927-07-1)	Luperox® 11M75	58	76	6.80-6.98	29 (30# ctn)	0°C/32°F[1]	74-76% in OMS
2,5-Di(2-ethylhexanoylperoxy) 2,5-dimethylhexane (13052-09-0)	Luperox® 256	73	91	≥6.69	40 (35# ctn)	15°C/60°F	≥90% Liquid
t-Amyl Peroxy 2-ethylhexanoate (686-31-7)	Luperox® 575	75	92	≥6.67	40 (HAST)	10°C/50°F	≥96% Liquid
	Luperox® 575M75	75	92	5.14-5.28	45 (35# ctn)	10°C/50°F	74-76% in OMS
t-Butyl Peroxy 2-ethylhexanoate (3006-82-4)	Luperox® 26	77	95	≥7.18	42 (35# ctn)	10°C/50°F	≥97% Liquid
	Luperox® 26M50	77	95	3.70-3.85	54 (35# ctn)	15°C/60°F	50-54% in OMS
t-Amyl Peroxyacetate (690-83-5)	Luperox® 555M60	100	120	6.46-6.68	75 (35# ctn)	38°C/100°F	59-61% in OMS
t-Butyl Peroxyacetate (107-71-1)	Luperox® 7M75	102	123	8.96-9.20	79 (7# ctn)	38°C/100°F	74-76% in OMS
	Luperox® 7M50	102	123	5.93-6.18	85 (7# ctn)	38°C/100°F	49-51% in OMS
t-Butyl Peroxybenzoate (614-45-9)	Luperox® P	104	125	≥8.07	60 (HAST)	38°C/100°F	≥98% Liquid
OO-(t-Amyl) O-(2-Ethylhexyl) Monoperoxycarbonate (70833-40-8)	Luperox® TAEC	99	117	≥5.65	65 (35# ctn)	30°C/86°F (<85°F pref)	≥92% Liquid
OO-(t-Butyl) O-Isopropyl Monoperoxycarbonate (2372-21-6)	Luperox® TBICM75	99	118	6.72-6.90	60 (35# ctn)	38°C/100°F	74-76% in OMS
OO-(t-Butyl) O-(2-Ethylhexyl) Monoperoxycarbonate (34443-12-4)	Luperox® TBEC	100	121	≥6.17	65 (35# ctn)	32°C/90°F (<85°F pref)	≥95% Liquid
Polyether Poly-t-butylperoxy Carbonate	Luperox® JWEB50	100	119	3.32-3.45	70 (HAST)	30°C/86°F	50-52% in Ethylbenzene

Notes: [1]Must also be stored above -18°C/0°F

Thiadiazole Esters

Chemical Name (CAS Registry)	Trade Name	Halt-Life Data		% Active Oxygen (by weight)	SADT, °C	Maximum Storage Temperature	% Assay/ Description
		10 hr. -T1/2°C	1 hr. - T1/2°C				
Blend of Thiadiazole Esters	ECHO® A	NA	NA	0	NA	30°C/86°F	≥95% Powder



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