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R	Republicate.	Estar nom	CTIME OF TOP	Rodot Content	erien /	Real Land	(3	asting Mind	PolymerCo	gelcosts	BodyFille	te Chedica Program	Cogringe	Resintin	Cureding	Artificial Inf	Continuous	Pultrusian	SW. Buc.	The Fig.	, gesti
	KETONE PEROXIDES		%	% °C	°C					AMBI	ENT				ELEV	ATED		HIG	5H		
	Methyl ethyl ketone peroxic (CAS No. 1338-23-4)	de																			
	CUROX M-303*	General purpose MEKP with medium reactivity	9,1	30	60	•			•	•	•	•		•			•				
	CUROX M-403*	Faster gel & cure than CUROX M-303	9,7	30	60	•		•	•	•	•	•		•			•				
	CUROX M-404*	Faster gel than CUROX M-403	9,7	30	60	•			•								•				
	CUROX M-503*	Faster gel than CUROX M-403	9,5	30	60	•		•	•												
	CUROX M-103*	MEKP designed for VE resins, less foaming	8,9	30	60	•				•		•		•			•			•	
	CUROX M-104*	MEKP for VE, UP & gelcoats	8,9	30	60	•				•		•	•	•						•	
	CUROX M-370	Mixture with similar gel time but faster cure than CUROX M-312	7,7	30	60	•			•			•		•			•				
	Methyl ethyl ketone peroxic (CAS No. 1338-23-4)	de (phthalatefree)																			
	CUROX M-312*	General purpose MEKP with medium reactivity, approved gelcoat type	8,9	30	60	•		•	•	•	•	•		•			•				
	CUROX M-302*	General purpose MEKP with medium reactivity	9,5	30	60	•			•	•	•			•			•				
	CUROX M-102	MEKP designed for UP, VE resins, less foaming	8,6	30	60	•				•		•		•			•			•	
	CUROX M-202	General purpose MEKP	9,1	30	60	•		•	•	•	•	•		•			•				
	CUROX M-402*	Faster gel than CUROX M-403	9,8	30	60	•			•												
	CUROX M-372	Mixture with similar gel time but faster cure than M-312	7,4	30	60	•			•			•		•			•				
	Acetylacetone peroxide (CAS No. 37187-22-7)																				
	CUROX A-300*	Standard AAP	4,1	10 - 25	>65	•			•			•		•			•				
	CUROX A-140	Low exotherm temp AAP, longer gel & cure than A-300, for thicker laminates	3,1	5 - 25	>65	•		•	•			•		•							
	CUROX A-335	Two step AAP for RTM at elevated temperature with cobalt	4,7	5 - 25	60									•			•				
	CUROX A-390	AAP with improved cure performance	4,5	0 – 25	>60	•		•				•		•			•				
	CUROX A-390W	AAP for potable water application, improved cure performance	3,9	5 – 25	60	•						•		•			•				
	Methyl isobutyl ketone pero (CAS No. 37206-20-5)	oxide																			
	CUROX I-200	MIBKP in aliphatic hydrocarbons	10,7	max 25	50	•		•	•	•			•				•	•		•	
	CUROX I-300	High reactive MIBKP in aliphatic hydrocarbons	10,5	max 25	50			•	•				•				•	•		•	
	Others (CAS No. 1338-23-4)																				
	CUROX MCH	Similar gel time but faster cure than M-303, premium initiator for gelcoats	9,7	30	60	•		•		•		•	•	•							
	HYDROPEROXIDES																				
	Cumyl hydroperoxide (CAS No. 80-15-9)																				
	CUROX CP-50*	Promoted CHP for fast curing of some VE resins	4,5	30	>55	•		•				•		•			•			•	
	CUROX CM-50*/CM-70*	Lower exotherm temp, longer gel & cure than CM-75, for thicker laminates	8,8/9,3	30/30	60/60	•		•				•		•						•	
	CUROX CM-75*	Lower exotherm temp, long gel time, good final cure, for thicker laminates	8,9	30	60	•		•				•		•						•	
	CUROX CM-85*	Lower exotherm temperature for thicker laminates, similar geltime as M-303	8,8	30	60	•		•				•		•							

^{2 *} Available as colored-discolorizing system for improved homogenization during mixing. Natural resin color is restored during curing (optional).

PRODUCT CODE	b£5chprion*					APRILATION LENGT OF ST	JP Polynet C			chenical denical	Rith, Jacob	dits nithtigen coatings	Resinta			Rable Continuo			Can Tan Can Can Can Can Can Can Can Can Can C	, kedile Re	, sin's
DIACYL PEROXIDES Dibenzoyl peroxide		%	%	°C	°C			AMB	IENT					ELE\	/ATED		HIG	iH .			
(CAS No. 94-36-0)																					
BENOX L-40LV	40%, sprayable BPO dispersion	2,6	40	0-25	>50	•	•		•	•	•	•	•						•	•	
BP-50-FT (FT1)	50% BPO powder with phthalate (free flowing)	3,3	50	30	60	•	•		•	•		•							•	•	
BP-30-FT1	30% BPO powder with phthalate, free flowing	2,2	30	30	60		•		•											•	
PERESTERS																					
tert-Butylperbenzoate (CAS No. 614-45-9)																					
ТВРВ	High efficient perester, lowest residual styrene	8,1	>98	10 - 30	60								•	•	•		•	•	•		
TBPB-HA-M1	Promoted TBPB for elevated/high temperature processes	7,4	90	10 - 30	60						•		•	•	•				•		
TBPB-HA-M3	Higher promoted TBPB for elevated/high temperature processes	6,6	80	10 – 30	60						•		•	•	•		•	•	•		
tert-Butylperoxy-2-ethyll (CAS No. 34443-12-4)	nexylcarbonate																				
ТВРЕНС	High efficient, low TOC-emission	6,4	97	max 30	70												•	•	•		
tert-Butylperoxy-2-ethyll (CAS No. 3006-82-4)	nexanoate	'			'			,									,				
ТВРЕН	Fast perester, reduced cycle times	7,3	99	max 10	40									•			•	•			
TBPEH-LA-M3	Longer prepreg shelflife	6,7	90	max 15	40									•			•	•			
tert-Amylperoxy-2-ethylh (CAS No. 686-31-7)	exanoate	'			'					l.											
TAPEH	Fast perester, reduced cycle times	6,9	99	max 10	40									•			•	•			
tert-Butylperoxy-3,5,5-tr (CAS No. 13122-18-4)		'		,				,	·	l l					ı		,				
TBPIN	High efficient perester, drinking water application	6,9	99	max 30	60									•	•		•	•	•		
TBPIN-HA-M1	Promoted TBPIN for elevated temperature processes	6,3	90	max 30	55						•		•	•	•						
PEROXYDICARBONATES																					
Di(4-tert.butylcyclohexyl) (CAS No. 3006-86-8)	peroxydicarbonate																				
ВСНРС	Fast kick off peroxide for two step curing	3,8	>96	max 20	45									•			•	•		•	
PERKETALS									·	·	·			•							
1,1-Di(tert.amylperoxy)cyc (CAS No. 15667-10-4)	clohexane																				
ACH-80-AL3	Improved SMC surface properties	8,8	80	30	>50												•	•			
1,1-Di(tert.butylperoxy)cy (CAS No. 3006-86-8)	yclohexane	·																			
CH-80-AL	Higher concentrated version, moderate exothermal reaction	9,7	80	30	60												•	•			
1,1-Di(tert.butylperoxy)-3, (CAS No. 6731-36-8)	3,5-trimethylcyclohexane	·					,	·									·				
TMCH-90-AL	Most efficient perketale	9,5	90	30	60												•	•			
TMCH-HA-M1	Accelerated curing performance	5,8	mix	max 20	50												•	•			

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Safety Information

Half-life

Decomposition rates of peroxides are commonly reported in terms of half-life time. The half-life time is a measure of a peroxide's rate of decomposition at a certain temperature. It indicates the time when 50% of the peroxide has decomposed. The thermal stability of organic peroxides is commonly characterised by giving the temperature at which the half-life time of the product is 10 hours, 1 hour and 1 minute. 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.

The half-life time can be derived from the Arrhenius equation:

$$k_d = A \cdot e^{-E_A/RT}$$
 and $t_{1/2} = \ln(2/k_d)$

k_d: Rate constant of the peroxide dissociation

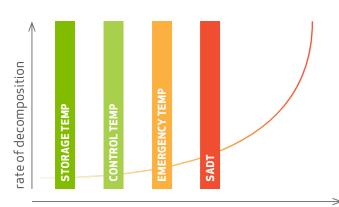
A: Arrhenius frequency factor

E_A: Activation energy for the dissociation

R: Ideal gas constant

T: Temperature

t_{1/2}: Half-life time



product temperature/time

No single parameter is as important as the control of the temperature. Whether shipping, handling or storing, if the temperature is maintained well below its self-accelerating decomposition temperature (SADT), most hazards are avoided. For storage over a longer period of time, the manufacturer's recommended temperature for storage should be rigorously followed.

Self-Accelerating Decomposition Temperature (SADT)

The SADT is the lowest temperature at which selfaccelerating decomposition occurs for a peroxide formulation in its packaging used for transport when held at that temperature. At the SADT, the rate of evolution of heat from decomposition exceeds the rate of heat loss to the surroundings so that the peroxide's temperature increases with time and the decomposition becomes increasingly more rapid or selfaccelerating. The final decomposition may be uncontrollable.

Minimum/Maximum recommended storage temperatures

The maximum recommended storage temperature is lower than the control temperature, not for safety, but to maintain product quality. On the other hand, some liquid or paste organic peroxides must not be stored below a certain minimum temperature as turbidity, phase separation, crystal deposits or solidification can occur.

Control Temperature T_C

The T_c is the maximum temperature at which the product can be safely transported for an extended period of time. T_c is not required if the SADT exceeds 50°C (122°F). Generally the T_c is derived from the SADT as shown for canisters:

 T_c = SADT minus 20°C if SADT < 20°C

 $T_c = SADT minus 15°C if SADT < 35°C$

 $T_C = SADT minus 10^{\circ}C if SADT < 50^{\circ}C$

Transportation temperatures are derived from the SADT according to the recommendations by the UN Committee of Experts on the Transport of Dangerous Goods.

Emergency Temperature Te

The Control Temperature T_C is supplemented by an Emergency Temperature T_e which is higher than the T_c but still well below the SADT. The T_c may be exceeded if maintenance is necessary or until alternative cooling (e.g. dry ice or wet ice) is available. However, if the Emergency Temperature T_e is reached, emergency procedures must be implemented immediately, e.g. cooling down the organic peroxides.

PRODUCT CODE	CHEMICAL NAME	STORAGE	EA [KJ/MOL]		F LIFE TIME		
		TEMP	[KJ/MUL]	10 H	1 H	1 MIN	
DIPND	Di(2-neodecanoylperoxy-isopropyl)benzene	•	114	37	54	85	
CUPND	Cumylperoxy-neodecanoate	•	115	38	55	90	
TOPND	1,1,3,3-Tetramethylbutylperoxy-neodecanoate	•	117	40	57	92	
TAPND	tert. Amylperoxy-neodecanoate	•	113	44	62	100	
*)	Peroxydicarbonates	•	144	47	61	90	
TBPND	tert. Butylperoxy-neodecanoate	•	121	47	64	100	
TBPNH	tert. Butylperoxy-neoheptanoate	•	116	51	69	107	
TAPPI	tert. Amylperoxy-pivalate	•	121	53	71	110	
DCLBP	Di(2,4-dichlorobenzoyl)peroxide	•	121	54	72	110	
TBPPI	tert. Butylperoxy-pivalate	•	121	56	74	110	
INP	Di(3,5,5-trimethyl-hexanoyl)peroxide	•	117	59	78	120	
DP	Didecanoyl-peroxide	•	126	62	80	120	
LP	Dilauroyl-peroxide	•	126	62	80	120	
AIBN	2,2'Azobis(isobutyronitrile)	•	130	62	80	120	
DHPEH	2,5-Dimethyl-2,5-di(2-ethylhexanoylperoxy)hexane	•	137	67	84	125	
APS	Ammoniumperoxodisulfate	•	135	69	87	125	
PMBP	Di(4-methylbenzoyl)peroxide	•	125	70	89	130	
BP	Dibenzoyl-peroxide	•	126	72	91	130	
TAPEH	tert.Amylperoxy-2-ethylhexanoate	•	126	72	91	130	
ТВРЕН	tert.Butylperoxy-2-ethylhexanoate	•	135	74	92	130	
TBPIB	tert.Butylperoxy-isobutyrate	•	130	77	96	135	
TBPM	tert.Butyl-monoperoxy-maleate		116	82	104	150	
ACH	1,1-Di(tert.amylperoxy)cyclohexane		135	87	106	152	
CUROXI	Methylisobutylketoneperoxide		125	90	110	155	
TAPEHC	tert.Amylperoxy-(2-ethylhexyl)carbonate		151	95	113	150	
TMCH	1,1-Di(tert.butylperoxy)-3,5,5-trimethyl-cyclohexane		143	95	114	155	
CH	1,1-Di(tert.butylperoxy) 5,5,5 trimetriyi cyclonexane		138	97	117	160	
TBPIC	tert.Butylperoxy-isopropylcarbonate		138	97	117	160	
TBPIN	tert.Butylperoxy-3,5,5-trimethyl-hexanoate		147	100	119	160	
DHPBZ	2,5-Dimethyl-2,5-di(benzoylperoxy)hexane		147	100	119	160	
TBPEHC	tert.Butylperoxy-(2-ethylhexyl)carbonate		128	100	122	175	
TBPA	tert.Butylperoxy-acetate		149	100	121	160	
TAPB	tert.Amylperoxy-benzoate		143	102	121	160	
TBPB	tert.Butylperoxy-benzoate 2,2-Di(tert.butylperoxy)butane		143	104	124	165	
BU			143	104	124	165	
NBV	n-Butyl-4,4-di(tert.butylperoxy)valerate		141	110	131	175	
EBU	Ethyl-3,3-di(tert.butylperoxy)butyrate		144	114	135	180	
DCUP	Dicumyl-peroxide		152	116	136	175	
BCUP	tert.Butylcumyl-peroxide		154	118	138	180	
DTAP	Di(tert.amyl)peroxide	•	129	118	142	190	
DIPP	Di(2-tert.butylperoxy-isopropyl)benzene	•	142	120	142	190	
DHBP	2,5-Dimethyl-2,5-di(tert.butylperoxy)hexane		142	120	142	190	
DTBP	Di(tert.butyl)peroxide	•	152	125	146	190	
DYBP	2,5-Dimethyl-2,5-di(tert.butylperoxy)hexyne-3	•	154	128	149	195	
HMCN	3,3,6,6,9,9,-Hexamethyl-1,2,4,5-tetraoxa-cyclononane	•	146	135	158	205	
ТВНР	tert.Butyl-hydroperoxide	•	149	173	200	260	
CUROX CC-DC	2,3-Dimethyl-2,3-diphenylbutane	•	195	210	234	285	
*) PEROXYDICARE	BONATES						
EHPC	Di(2-ethylhexyl)peroxydicarbonate	•	CHPC	Dicyclohex	ylperoxydica	arbonate	
SBPC	Di(sec-butyl)peroxydicarbonate	•	NBPC	-	peroxydicarl		
BCHPC	Di(4-tert.butylcyclohexyl)peroxydicarbonate	•	MYPC		peroxydicarb		
CEPC	Dicetylperoxydicarbonate	•			·		

Colour code for storage temperature:

= Deep refrigeration
= Moderate refrigeration
= Ambient temperature For precise values see specific product data sheets

UNITED INITIATORS - CUROX 7





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