Technical Data Sheet

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NOROX® AZOX

acetyl acetone peroxide (AAP)/ 2, 4-Pentanedione peroxide
CAS# 37187-22-7
Liquid mixture

Description

NOROX®AZOX is a colorless solution of acetyl acetone peroxide (AAP), or 2, 4-Pentanedione peroxide in a phlegmatizer. NOROX®AZOX is a very effective polymerization initiator for the room temperature cure of unsaturated polyester resins and gives exceptionally fast cure times without significantly affecting gel times in most resin systems. This performance characteristic is especially beneficial in resin transfer molding (RTM), cast polymers, and other applications requiring fast mold turnaround for production efficiencies.

NOROX®AZOX has the added advantage of being a low fire or explosion hazard. In the U.S., the precautionary organic peroxide yellow label is not required for shipping..

Technical Data

Active oxygen	4.4
Form:	Liquid
Color:	Colorless
Specific Gravity @ 25°C:	1.15
Viscosity:	16.0 cps
Flash point (C.O.C.):	200°F/93°C, min
Flash point (SETA C.C.)	150°F/66°C, min.
Soluble in:	Water, ethers, ketones, and alcohols
Insoluble in:	Aromatic, chlorinated, and aliphatic hydrocarbons

Application

NOROX®AZOX is an extremely effective initiator for an accelerated cure without significantly shortening the gel time in many resin systems. NOROX®AZOX is best suited for singly promoted resins using cobalt promotion alone. Levels of cobalt (naphthenate or octoate in 6% solutions) should be in the range of 0.1 to 0.5%. In some cases, the addition of 0.1% to 0.3% diethyl- or dimethylaniline speeds the resin further and gives extremely high exothermic cures. The resin inhibitor type and the level also have an important effect on the performance of NOROX®AZOX. In general, high inhibitor levels are usually not desirable, and some quaternary ammonium salts can cause significantly yellowing of the resin. Also, quaternary ammonium compounds can have an inhibiting effect on the resin system gel and cure properties.

Excellent final cure and dimensional stability have been observed in tooling and RTM applications using NOROX®AZOX cure initiator.

APPLICATION RESULTS

Tables I & II demonstrate results that can be obtained using NOROX®AZOX compared to a standard MEKP formulation.

TABLE I
Gel & Cure Data – Marble Resin
10g mass with 1% Peroxide @ 77°F/ 25°C
Cure defined as 10 (935 Impressor)

	Time (min)			935 / 934 Hardness				
	Gel	Gel to Cure	Peak Exotherm(1)	1hr	2hrs	3hrs	4hrs	24hrs
NOROX®MEKP-9	15.6	70	292°F	0(5)	20(5)	60(5)	70(5)	16(4)
NOROX®AZOX	15.6	10	300°F	32(4)	34(4)	36(4)	37(4)	38(4)

(1) 100g Mass @ 77°F

TABLE II
Gel & Cure Data – Laminating Resin
10g mass with 1% Peroxide @ 77°F/ 25°C
Cure defined as 10 (935 Impressor)

	Time (min)			935 / 934 Hardness				
Product Name	Gel	Gel to Cure	Peak Exotherm(1)	1hr	2hrs	3hrs	4hrs	24hrs
NOROX®MEKP-9	15.6	70	292°F	0(5)	20(5)	60(5)	70(5)	16(4)
NOROX®AZOX	15.6	10	300°F	32(4)	34(4)	36(4)	37(4)	38(4)

(1) 100g Mass @ 77°F

While NOROX®AZOX is a very effective initiator when used by itself, this peroxide is often used in combination with standard MEKP formulations. This blend will give intermediate results between the two products, depending on the mixing ratio. Tables III & IV compare gel and cure properties of several AAP/MEKP mixtures in cast polymer and laminating resins.

TABLE III
Gel & Cure Data – Onyx Resin
120g mass (33% resin/ 67% filler)
2% Peroxide @ 77°F/ 25°C
Cure defined as 10 (935 Impressor)

	Time (min)		935 / 934 Hardness				
Product Name	Gel	Gel to Cure	2hrs	3hrs	4hrs	5hrs	24hrs
NOROX®MEKP-9	14.8	76	38(5)	58(5)	64(5)	8(4)	27(4)
NOROX®AZOX	10.5	16	66(5)	10(4)	12(4)	20(4)	30(4)
(3:1) MEKP/AZOX	13.1	53	58(5)	1(4)	5(4)	12(4)	30(4)
(1:1) MEKP/AZOX	11.8	32	62(5)	5(4)	9(4)	15(4)	30(4)

(1) 100g Mass @ 77°F

TABLE IV
Gel & Cure Data – Laminating Resin
20g mass with 1% Peroxide @ 77°F/ 25°C
Cure defined as 10 (935 Impressor)

	Time (min)		935 / 934 Hardness				
Product Name	Gel	Gel to Cure	2 hrs	3 hrs	4 hrs	5 hrs	24 hrs
NOROX®MEKP-9	14.8	76	38(5)	58(5)	64(5)	8(4)	27(4)
NOROX®AZOX	10.5	16	66(5)	10(4)	12(4)	20(4)	30(4)
(3:1) MEKP/AZOX	13.1	53	58(5)	1(4)	5(4)	12(4)	30(4)
(1:1) MEKP/AZOX	11.8	32	62(5)	5(4)	9(4)	15(4)	30(4)

PACKAGING, SHIPPING & AVAILABILITY

- The standard package sizes of NOROX®AZOX are 4x8 lb and 44 lb (20 kg) polyethylene bottles.
- Classification – Please refer to the specific NOROX®AZOX Safety Data Sheet (SDS) under section 14 & 15, shipping & regulatory information. **NOTE:** SDS's for all United Initiators, Inc. products may be requested by contacting the company.
- NOROX®AZOX is available through a global network. Call United Initiators, Inc. for the name of the distributor in your area

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