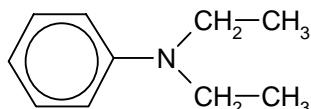


## Accelerator NL-64-100

### Product description

N,N-Diethyl aniline



CAS No. : 91-66-7  
EINECS/ELINCS No. : 202-088-8  
TSCA status : listed on inventory

### Specifications

Appearance : clear light yellow to light brown liquid  
Assay : 98.5% min.

### Characteristics

Density, 20°C : 0.935 g/cm<sup>3</sup>  
Viscosity, 20°C : 1 mPa.s  
Boiling point : 216°C  
Melting point : -38.8°C

### Storage

Accelerator NL-64-100 is stable at ambient temperatures.

When stored under these recommended storage conditions, Accelerator NL-64-100 will remain within the Akzo Nobel specifications for a period of at least six months after delivery.

### Major decomposition products

In case of fire toxic fumes of N-oxides may be formed.

### Packaging and transport

The standard packaging is a 25 kg and 190 kg drum.

Both packaging and transport meet the international regulations. For the availability of other packed quantities contact your Akzo Nobel representative.

Accelerator NL-64-100 is classified in Division 6.1; UN 2432.

### Safety and handling

Keep containers tightly closed. Store and handle Accelerator NL-64-100 in a dry well-ventilated area at ambient temperatures. Do not mix with organic peroxides.

Please refer to the Material Safety Data Sheet (MSDS) for further information on the safe storage, use and handling of Accelerator NL-64-100. This information should be thoroughly reviewed prior to acceptance of this product.  
The MSDS is available at [www.akzonobel-polymerchemicals.com](http://www.akzonobel-polymerchemicals.com).

## Applications

The curing of unsaturated polyester resins at ambient temperatures can in general not be performed by an organic peroxide alone. The radical formation, which is necessary to start the polymerisation reaction, is at ambient temperatures with most generally applied organic peroxides too slow.

To speed up the radical formation in a controllable way, organic peroxides must therefore be used in combination with a so-called accelerator. For diacyl peroxides like all Perkadox<sup>®</sup> types and *Perkadox 16*, aromatic tertiary amines have to be used as accelerator.

For this purpose, the following amines are available:

Accelerator NL-63-types	N,N-Dimethylaniline	(DMA)
Accelerator NL-64-types	N,N-Diethylaniline	(DEA)
Accelerator NL-65-types	N,N-Dimethylparatoluidine	(DMpT)

From each amine type the following formulations are available:

suffix	formulation
-100	technically pure product
-10P	10% formulation in aliphatic ester

Each amine accelerator has a different and specific influence on the decomposition of the diacyl peroxide. It is therefore possible by the proper choice of amine type and dosage level to adjust a wide variety of gel times and speed of cure. In this way a cure system can be developed for unsaturated polyester resins, which is extremely fast resulting in very short demolding times of the cured product.

The cure system dibenzoyl peroxide/amine accelerator can further be characterised as being:

- not sensitive for moisture
- practically not sensitive to pigments and fillers
- applicable at low temperatures, even at 0°C a reasonable speed of cure can be achieved.

Possible disadvantages may be:

- a limited pot life of the amine accelerator in the UP resin
- yellow to brown colour of the cured product
- poor UV light stability of the cured product
- a relatively high residual styrene content in the mouldings after a postcure at elevated temperatures, especially at high amine accelerator dosages.

A special application of the amine accelerators is their use as promoter in a ketone peroxide/cobalt accelerator cure system. For this application mainly Accelerator NL-63-100 or its lower concentrated version is used.

## Dosage

Depending on application area and working conditions the following accelerator dosage level is recommended:

Accelerator NL-64-100	0.20 - 0.50 phr <sup>*</sup>
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<sup>\*</sup> phr = parts per hundred resin

## Cure characteristics

In a high reactive standard orthophthalic resin the following application characteristics were determined.

The diacyl peroxide used for the experiments was *Perkadox* CH-50X, a fast dissolving powder formulation of dibenzoyl peroxide.

### Gel times at 20°C

3 phr <i>Perkadox</i> CH-50X + 0.10 phr Acc. NL-64-100	160 min.
3 phr <i>Perkadox</i> CH-50X + 0.25 phr Acc. NL-64-100	54 min.
3 phr <i>Perkadox</i> CH-50X + 0.50 phr Acc. NL-64-100	20 min.

### Cure of 4 mm laminates at 20°C

4 mm laminates have been made with 450 g/m<sup>2</sup> glass chopped strand mat. The glass content in the laminates is 30% (w/w).

The following parameters were determined:

- Time-temperature curve
- Speed of cure expressed as the time to achieve a Barcol hardness (934-1) of 0-5 and 25-30 respectively.
- Residual styrene content after 24h at 20°C and a subsequent postcure of 8h at 80°C.

	Gel time min.	Time to Peak min.	Peak exotherm °C
3 phr <i>Perkadox</i> CH-50X + 0.5 phr Acc.NL-64-100	21	26	140
	Barcol 0-5 h	25-30 h	Res. styrene 24 h 20°C %
3 phr <i>Perkadox</i> CH-50X + 0.5 phr Acc.NL-64-100	<<1	2.9	2.1

### Pot life at 20°C

Pot lives were determined in an UP resin at 20°C.

0.5 phr Accelerator NL-64-100	120 days
1.0 phr Accelerator NL-64-100	70 days

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