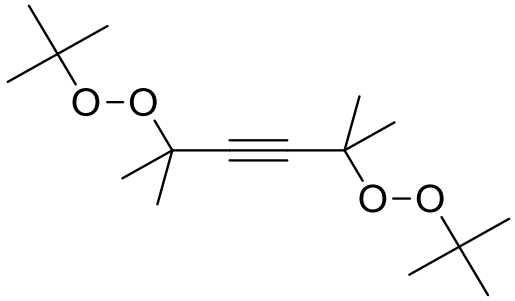
# DYBP-85-WO

**2,5-Dimethyl-2,5-di(*tert*-butylperoxy) hexine-3**
**CAS#1068-27-5**
**Yellowish liquid**

## Structural Formula



## Description

Yellowish liquid, consisting of 2,5-dimethyl-2,5-di(*tert*-butylperoxy) hexine-3 desensitised with white oil. This bifunctional dialkyl peroxide is used as a radical initiator in the crosslinking of polyethylene above 180 °C.

## Technical Data

| | |
|---|---|
| Appearance | yellowish liquid |
| Desensitising agent | white oil |
| Assay | approx. 83 % w/w |
| Density at 20 °C | approx. 0.88 g/cm$^3$ |
| Viscosity at 20 °C | approx. 11 mPa·s |
| Refractive index at 20 °C | approx. 1.436 |
| Flash point | approx. 69 °C |
| Critical temperature (SADT) | approx. 90 °C |
| Cold storage stability | freezing point below 0 °C |
| Recommended storage temperature | < 40 °C ● |
| Storage stability as from date of delivery | 12 months |

## Standard Packaging

15 kg (33 lbs) in HDPE canisters

## Half-life Data

| | |
|---|---|
| 10 h / 1 h / 1 min (benzene, 0.1 mol/L) | 128 °C / 149 °C / 195 °C |

## Application

**POLYMER-CROSSLINKING:**

Crosslinking agent for polyethylene (HDPE, LLDPE and LDPE with carbon black)
Crosslinking temperature: above 180 °C; Below 150 °C no pre-crosslinking (scorch) occurs.
Usage level: 0.2 - 2 % (w/w) of product as supplied on material to be cross-linked.
Special advantages: The DYBP-85-WO is thermally stable, not much volatile, and very efficient. The decomposition products are volatile and the final product is odour-free.

## Decomposition Products

Possible detectable decomposition products: *tert*-butyl alcohol, acetone, methane, 3-hexyne-2,5-dione

## Storage

Avoid any source of heat, light, humidity and protect the product from impurities. Keep within safe temperature limits.

## Measurements

**Table 1.** Influence of peroxide level on degree of polyethylene crosslinking (temperature: 200 °C).

| DYBP active oxygen [% w/w] | 0.03 | 0.06 | 0.09 | 0.12 | 0.15 |
|---|---|---|---|---|---|
| DYBP assay [% w/w] | 0.33 | 0.65 | 0.98 | 1.30 | 1.63 |
| Crosslinking time $t_{90}$ [min] | 6.5 | 5.1 | 5.0 | 4.6 | 4.1 |
| Torque $M_{max}$ [Nm] | 6.1 | 8.8 | 9.8 | 11 | 12 |
| *) Gel content [%] | 91 | 98 | 99 | 99 | 99 |
| *) Swelling index | 6.5 | 4.3 | 3.5 | 3.1 | 2.9 |

*) Determined by extraction in xylene for 6 h at 135 °C.

**Table 2.** Influence of the temperature on crosslinking time (0.65 % DYBP-85-WO). Crosslinking of HDPE (Lupolen 4261A) within Monsanto Rheometer 100-S (torsion angle: 3°, chamber volume: 7.3 $cm^3$).

| Temperature [°C] | 150 | 160 | 170 | 180 | 190 | 200 | 210 |
|---|---|---|---|---|---|---|---|
| Scorch time [min] | 10 | 5.5 | 3.4 | 2.3 | 1.5 | 1.2 | 1.1 |
| Crosslinking time $t_{50}$ [min] | - | 27 | 12 | 8.1 | 4.3 | 2.8 | 2.2 |
| Crosslinking time $t_{90}$ [min] | - | 80 | 40 | 22 | 10 | 5.4 | 3.7 |

**Table 3.** Comparison DYBP-85-WO and DTBP for polyethylene crosslinking.

| Peroxide type | Scorch temperature | Equivalent dose (0.06 % AO) | $t_{90}$ at 200 °C | Torque $M_{max}$ at 200 °C |
|---|---|---|---|---|
| DTBP | approx. 150 °C | 0.56 % as supplied | 4.0 min | 7.6 Nm |
| DYBP-85-WO | approx. 150 °C | 0.65 % as supplied | 5.1 min | 8.8 Nm |



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