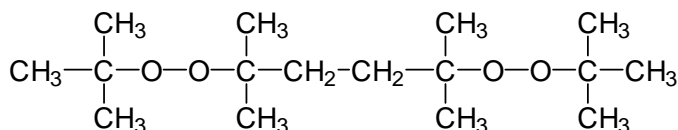


Chemical Name(s) and Structure

- Peroxide, (1,1,4,4-tetramethyl-1,4-butanediyl)bis[(1,1-dimethylethyl)
- 2,5-dimethyl-2,5-di(tert-butylperoxy)hexane
- ASTM Abbreviation: DBPH
- Others: Luperox® 101; Luperox® 101XL45



Introduction

Luperox® EZD-SP2 is a Scorch Protected DBPH type peroxide. It is a room-temperature stable, Dialkyl class of organic peroxide, pre-dispersed on inert filler with a proprietary scorch protection package.

EZD = “Easy to Disperse” DBPH (Luperox 101) type peroxide formulation; SP2 = “Enhanced Scorch Time Protection”

Properties

% Active Oxygen:	4.96% to 5.29%
% Assay:	45%- 48%
CAS No.	78-63-7
Color & Form:	white solid powder
Molecular Weight:	290.44 g/mole
National Fire Protection Association Codes:	Health =1; Reactivity=2 Flammability =1
Self-Accelerating Decomposition Temperature (SADT):	180°C (356°F)
Max. Storage Temperature to Maintain % Assay listed on the CoA for 12 months	37.7°C (100.0°F)

Half-Life Time versus Temperature Data

Time	Degrees Celsius	Degrees Fahrenheit
100 hrs	102.1	215.8
10 hrs	120.3	248.5
1 hr	140.3	284.5
6 mins	162.4	324.4
1 min	181.4	358.5
1 sec	231.6	448.9

Benefits of Luperox® EZD-SP2

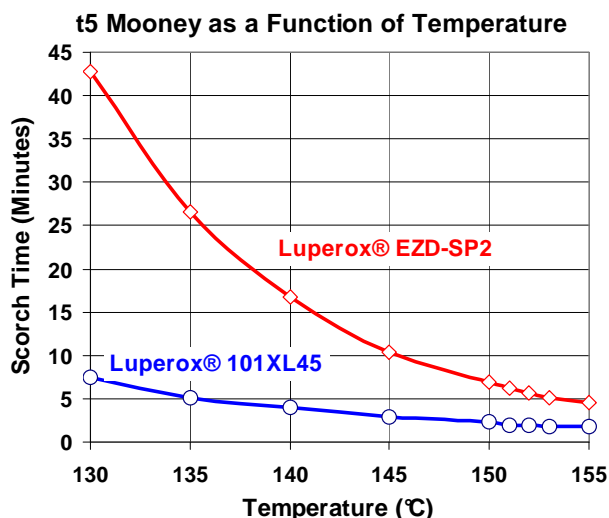
- Fast and uniform dispersion of the peroxide via open mill or Banbury compounding for batch to batch, uniform final physical properties.
- Superior scorch time performance during compounding and crosslinking provides:
 - Trouble-free and complete mold filling for commercial elastomer molding operations
 - Thinner tear-trim and equal to lower % compression set, due to the significant scorch protection resulting in lower elastomer compound viscosity during mold filling.
 - Better adhesion of rubber to fillers, fibers and metal belting due to improved wet-out (flow) of the rubber onto reinforcements during the cure process.
 - Uniform crosslink density for thick and thin walled parts.
 - A 20°C higher compounding “drop temp.” vs standard DBPH (150°C vs 130°C) is possible. This permits faster mixer rpm to reduce cycle time (greater productivity) or longer mixing cycles to incorporate more filler(s) to reduce compound cost.
- Eliminates the problem of poorly dispersed filler particles in very soft, low Mooney viscosity and/or high oil content elastomer formulations.
- Provides translucent cross-sections in non-filled formulations. It is an excellent replacement for the pure liquid DBPH in VMQ.
- Equivalent cure time to the standard DPBH.
- Aliphatic peroxide with no bloom or odor issues.
- Designed for crosslinking “peroxide curable” type elastomers including but not limited to EVA, EPM, EOM, EPDM, SBR, BR, NBR, HNBR, NR, IR, BIIR, VMQ, FKM, AEM, CPE and CSM.
- Can be used with and without various monomeric coagents. The “SP2” type peroxides blended with crosslinking coagents often provides synergistic benefits of longer scorch protection, increased cure state with a faster cure time. This helps to tailor physical properties while reducing overall peroxide loadings

Compounding EPDM with Luperox® EZD-SP2

Compared to Luperox® 101XL45 (DBPH type) peroxide; Luperox® EZD-SP2 provides a six-fold increase in scorch time at the standard drop temperature of 130°C. This amounts to an increase from 7 minutes to 42 minutes for the t5 Mooney at 130°C.

After mixing, the EPDM compound viscosity will be lower when using Luperox® EZD-SP2 to provide complete and uniform mold filling.

Luperox® EZD-SP2 provides the same protection at 150°C that Luperox 101XL45 provides at 130°C. Thus Luperox® EZD-SP2 provides a ~20°C higher drop temperature. This provides a wider processing window for the compounder to enable either faster processing or further compounding or processing operations without fear of premature crosslinking.



Curing EPDM with Luperox® EZD-SP2

The compounding benefits of Luperox® EZD-SP2 described above are achieved without sacrificing the degree of crosslinking or cure productivity, i.e., MH-ML (dN-m) crosslink density or tc90 (min) cure time at 190°C, based upon data generated using an Alpha Technologies RPA rheometer, as per the following bar graphs.

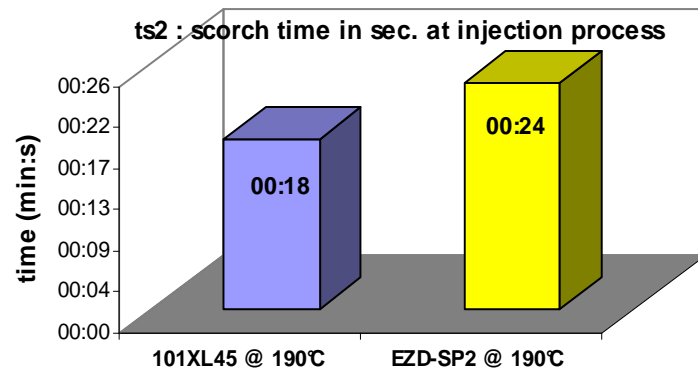
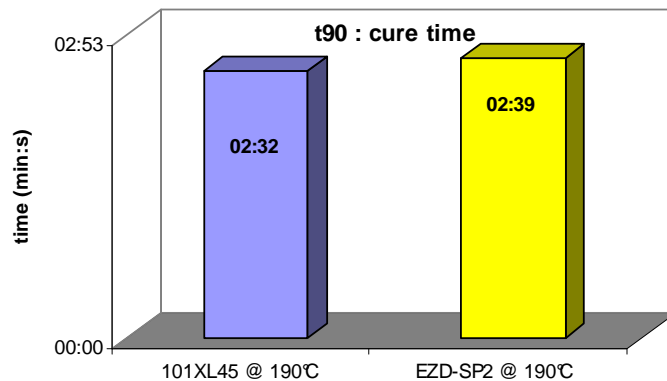
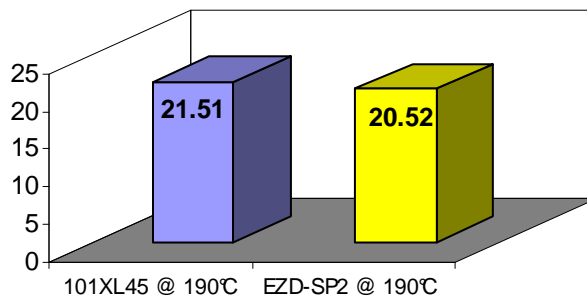
Furthermore, a 33% increase in the ts2 (minutes) scorch time was obtained (an increase from 18 to 24 seconds of scorch time) as determined via an Alpha Technologies RPA rheometer at 190°C. This is a dramatic increase in scorch time, considering the peroxide has a half-life of 28 seconds at that temperature. The longer scorch time at 190°C significantly improves mold-filling and increases

productivity by permitting more prints per mold per cycle, aids in product quality via a more uniform crosslink density, and reduces production costs by eliminating scrap.

The SP2 scorch protected peroxide grade was designed for superior scorch time protection and not equal weight cure performance to the standard peroxide grade.

Depending upon the elastomer formulation Luperox® EZD-SP2 may be used at equal weight to 15-20wt% more to obtain the same degree of crosslinking as Luperox® 101XL45.

Crosslink density MH-ML (dNm)



For additional information, or to place an order or sample request, call 1.800.331.7654.

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