



Product Data

SULFASAN DTDM

4,4'-Dithiodimorpholine

CAS Reg. No.: 103-34-4

Molecular weight: 236

FUNCTION

Sulfasan DTDM is used as a sulfur donor for natural and synthetic elastomers. It can be used in both EV and semi-EV curing systems as a partial or total replacement of free sulfur.

MAJOR APPLICATIONS AND PROPERTIES

- Major application areas for Sulfasan DTDM include truck and aircraft tires, conveyor belts, hoses, and general industrial products produced by high temperature extrusion and injection molding.
- Sulfasan DTDM is used to provide improved resistance to reversion and heat aging in sulfur curable elastomers.
- Formulations containing Sulfasan DTDM have reduced compression set and offer a means of achieving good physical properties when high temperature cures are used.
- It can be used in areas where sulfur bloom presents a problem.
- In most compounds the partial replacement of sulfur with Sulfasan DTDM gives longer scorch times and faster cure rates. These compounds will also exhibit superior green stock storage stability.
- It should be noted that in the application of Sulfasan DTDM N-nitrosomorpholine can be formed by the reaction of morpholine, a decomposition product, with nitrosating agents (nitrogen oxides).
- Sulfasan DTDM is non-staining and non-discoloring.
- Sulfasan DTDM is regulated for use in articles in contact with food as specified under FDA 21 CFR 177.2600, 175.105 and under BgVV XXI, Category 4.

COMPOUNDING INFORMATION

Sulfasan DTDM can be used as partial or total replacement of free sulfur in conjunction with sulfenamides, and thiazoles or thiurams.

As a guideline for semi-EV systems, 1.0 phr free sulfur can be replaced by 0.6 phr Sulfasan DTDM in NR and by 1.0 phr Sulfasan DTDM in SBR to achieve equal modulus.

The use of acidic compounding aids, such as pine tar, should be avoided when using Sulfasan DTDM.

For detailed information on toxicological properties and handling precautions please refer to the current Safety Data Sheet. This information sheet can be downloaded from our web site or requested from the nearest Flexsys office and should be consulted before handling this product.

STORAGE RECOMMENDATIONS

Store Sulfasan DTDM in single stacked pallets in a cool, dry, well ventilated area, avoiding exposure of the packaged product to direct sunlight. Double stacking of palletized material can result in unusual compaction of product. High humidity and/or temperature can cause degradation that may result in shorter scorch times. Do not store this product near Crystex as the amine vapors characteristically emitted from this material can cause Crystex to revert to "Rubber Maker's" sulfur.

PRODUCT INFORMATION

Sulfasan DTDM		pdr-s	pdr-d-s	
Product form		fine powder	dust suppressed powder	<u>Test method</u>
<u>PRODUCT SPECIFICATIONS</u>				
Appearance		white to yellowish white powder	white to yellowish white powder	FF97.5
Purity (HPLC)	(%)	≥95.0	94.0	FCL97.3
Melting point, initial	(°C)	120-130	117-130	FF83.9
Melting point, final	(°C)	123-131	122-130	FF83.9
Melting range	(°C) max.	6	7	FF83.9
Heat loss	(%) max.	0.5	0.5	FGr97.7
Ash	(%) max.	0.3	0.3	FGr90.9
Residue on 150 µm sieve	(%) max.	0.1	0.2	FF83.8
<u>TYPICAL PROPERTIES</u>				
Sulfur	(%)	26-29	26-29	
Density at 25°C	(kg/m ³)	1360	1360	

Sulfasan DTDM is also available as 80% masterbatch.

For further information please visit our website, www.flexsys.com or contact your local Flexsys office or regional Flexsys headquarters:

Regional Headquarters	:	Brussels	Akron
Tel.	:	+32 2 714 32 11	+1 330 666 41 11
Fax	:	+32 2 714 32 32	+1 330 668 83 45

All product names are registered trade marks.

DTDM5.SP/0204

The information and recommendations in this publication are provided without warranty as to completeness, correctness or suitability for any particular purpose. The user of this publication assumes responsibility for and Flexsys shall not be liable for any injury, loss or damage arising from any use or reliance upon its contents.

©Copyright Flexsys 2004.

page 2 of 2