



Benetex® OB

Optical Brightener, Fluorescent Whitening Agent

Introduction: Benetex® OB is a heat resistant, solvent soluble, chemically stable fluorescent whitener that provides brighter looking colors. It is used to offset the yellowness of a polymer and to yield a whiter appearance. Optical brighteners create brilliance by absorbing UV light, modifying the wavelength of the light and then emitting the light in a fluorescent fashion. Benetex® OB can also be used as a tracer in various applications and as an optical brightener in thermoplastics, coatings, printing inks, dyes, man-made fibers, waxes, fats, and oils.

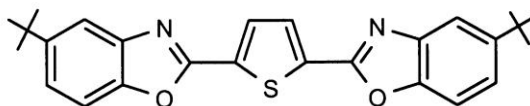
Material Description: Fluorescent Whitening Agent

Chemical Name: 2,2'-(2,5-thiophenediyl)bis(5-tert-butylbenzoxazole)

Empirical Formula: C₂₆H₂₆N₂O₂S

CAS #: 7128-64-5

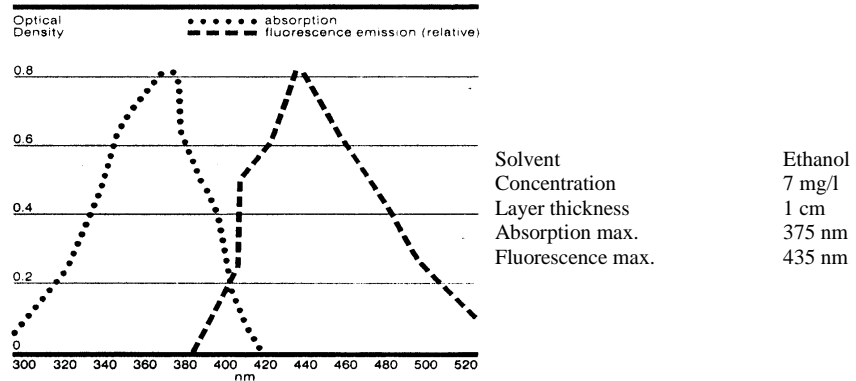
Chemical Structure:



Physical Properties:	Appearance:	Yellowish, greenish crystalline powder
	Molecular Weight:	430.6
	Melting Range:	192 - 208°C
	Flashpoint (Ignition):	662°F (Marcusson)
	Ash:	0.2% Max
	Assay:	98% Min
	Volatile Matter:	< 0.5% Max
	Solubility (1 g/100ml Chloroform):	Clear
	% Transmittance:	450nm – 93% Min 500nm – 95% Min
	Specific Gravity (20°C)	1.26 g/cm ³
	Vapor Pressure (20°C)	2.6 E-8 Pa
	Decomposition Temperature	>350°C

Absorption Spectrum:

Extinction and Fluorescence Emission Curves (Active Ingredient in powdered form)



Solubility at 25°C (g/100ml solvent):

Solvent	Solubility
Acetone	0.2%
Butanol	0.2%
Carbon tetrachloride	5%
Chlorobenzene	10%
Chloroform	14%
Cyclohexanone	3%
Dimethylformamide	0.8%
Diocetyl phthalate	0.7%
Dioxane	2%
Ethyl Acetate	1%
Ethyl glycol	0.2%
n-Hexane	0.2%
Methanol	0.05%
Methyl ethyl ketone (MEK)	1%
Methylene chloride/methanol (9:1 ratio)	2%
Tetrahydrofuran	5%
Toluene	5%
Turpentine	0.1%
Xylene	5%
Water	< 0.01%

Applications:

Thermoplastics - Benetex® OB can be used to impart excellent brightness to various thermoplastics, including: polyvinyl chloride, polyethylene, polypropylene, cellulose acetate, polystyrene, polycarbonate, acrylics, polyolefins, adhesives, polyurethane, linear polyester, and polyamides.

Coatings - Benetex® OB provides an excellent means to determine coverage of either conventional or UV cure coatings. Small amounts act as a tracer which, when viewed under a black light, indicate whether or not uniform coating coverage has been achieved. This is especially useful for clear coatings where coverage can be difficult to determine by conventional means. Benetex® OB can also be used to offset the yellowness of coatings to yield a whiter appearance.

Printing Inks - Benetex® OB may be used in printing inks to facilitate the quick identification of security bonds, and also as a safeguard against forgeries (bank notes). Benetex® OB may also be combined with dyes to produce particularly bright shades. The effect is especially pronounced in pastel shades.

Man-made fibers - Benetex® OB imparts a lightfast brightness with good textile fastness properties to both PVC and acetate fibers.

Main applications - Include fibers, molded articles, films, sheets, clear lacquers, paints, printing inks, and synthetic leather.

Advantages:

- Brilliant, bluish white effects that compensates for yellowing
- Good light fastness and low volatility
- Exceptional whitening properties
- Highly compatible with a wide range of organic substrates and solvents
- Excellent resistance to heat
- Useful as a tracer in clear coatings
- In combination with dyes, produces particularly bright shades

Loading Instructions:

The loading data and results are based on laboratory work (and field-testing) under controlled conditions and do not necessarily indicate the result that the buyer or user will attain. For this reason we strongly recommend testing of your own system under the actual conditions of processing and end-use prior to full scale testing. The recommended loading concentrations in unpigmented polyolefins range between 0.0005 % and 0.0010% and the loading levels in other plastics range between 0.005% and 0.100% depending on substrate, processing conditions, and long-term stability requirements. Benetex® OB can also be used alone or with a variety of blends including ultraviolet light absorbers (UVA). If Benetex® OB is used in combination with an UVA the loading levels must be increased. Exact loading must be determined by compositions of the specific polymer system.

Packaging:

Benetex® OB is available in powder form in a 25 kg (55.1 pound) fiber drum, net weight, with an inner PE liner. It is also available in 5-pound plastic pails with an additional surcharge.

Storage:

This product may be stored up to one year in a sealed container. Containers should be stored in a cool, dry area. Extended storage at elevated temperatures or exposure to direct heat or sunlight could reduce product life. Keep containers sealed when not in use.

Toxicity & Safety:

This material is not intended for use in products for which prolonged contact with mucous membranes or abraded skin, or implantation within the human body is specially intended, unless the finished product has been tested in accordance with the Food and Drug Administration and/or other applicable safety testing requirements. Because of wide range of such potential uses, Mayzo, Inc. is not able to recommend this material as safe and effective for such uses and assumes no liability for any such uses. Read and understand the Material Safety Data Sheet before using or handling this product.

<u>Existing Regulations</u>	<u>FDA Regulations</u>			<u>Temperatures Allowed</u>
	<u>Maximum Concentration</u>	<u>Thickness</u>	<u>Food Allowed</u>	
Fluorescent whitening agent, 175.105, 178.3297 2,2'-(2,5-Thiophenediyl) bis [5-tert-butylbenzoxazole]				
Adhesives complying with 175.105	no restrictions	no restrictions	no restrictions	No restrictions
Olefin polymers complying with 177.1520(c), items 1.1, 1.2, or 1.3	0.05%	no restrictions	nonfat foods	250°F
	0.01%	no restrictions	no restrictions	250°F
Olefin polymers complying with 177.1520(c), items 2.1, 2.3, 3.1, 3.3, or 4	0.05%	no restrictions	nonfat foods and foods containing up to 8% alcohol	room temperature or below fill and storage
Polystyrene and rubber-modified polystyrene complying with 177.1640	0.05%	no restrictions	nonfat foods and foods containing up to 8% alcohol	room temperature or below fill and storage
Polyvinyl chloride	0.05%	no restrictions	nonfat foods and foods containing up to 8% alcohol	room temperature or below fill and storage
Polyoxymethylene homopolymer complying with 177.2480	0.01%	no restrictions	No restrictions	no restrictions
Polycarbonate resins complying with 177.1580	0.15%	no restrictions	non fatty, nonalcoholic foods	212°F

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