



EASTOBRITE

optical brighteners

Optical Brighteners for Polymers



EASTMAN

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Optical Brighteners for Polymers

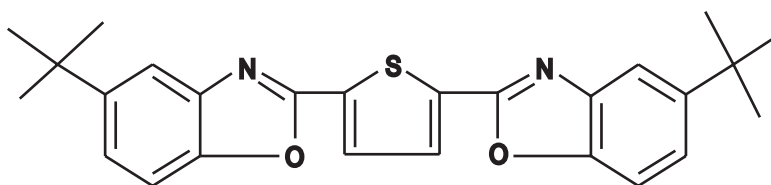
Introduction

Eastobrite OB optical brightener is a fluorescent whitening agent of the thiophenediyl benzoxazole class. The product is useful in plastics, man-made fibers, printing inks, and coatings.

Table 1

Typical Properties

Molecular Formula	C ₂₆ H ₂₆ SO ₂ N ₂
Assay by LC	99% Minimum
Molecular Weight	430.6 g/mole
Appearance	Yellow powder
T _m Melt Point	202°C
Volatile Matter	<0.15%
Particle Size	<50 (mean micron)
TGA (in air @ 20°C/min. rate)	90% Retention @ 335.9°C
Solubility (1g/100 ml in N,N-dimethyl acetamide)	Visually clear
Transmittance @ 450 nm	>93%
Transmittance @ 500 nm	>95%



CAS: 7128-64-5

Chemical Name: 2,5-thiophenediylbis(5-tert-butyl-1,3-benzoxazole)

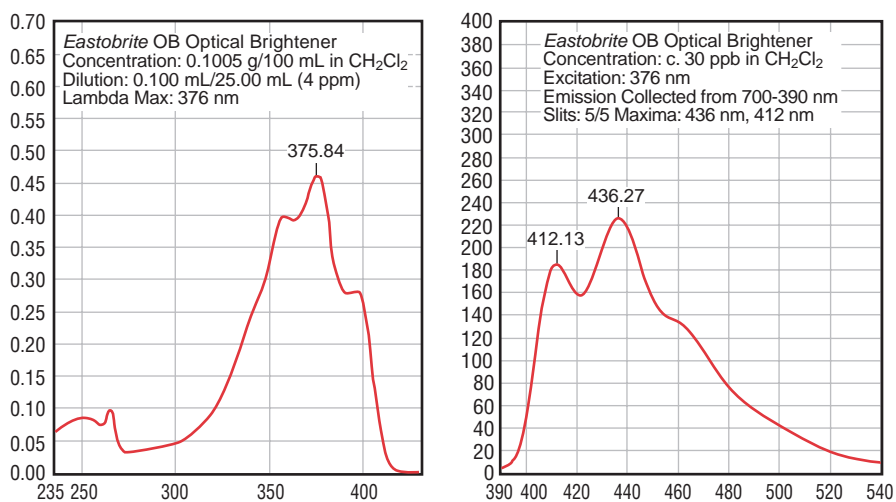
Table 2

Solubility @ 21°C (grams/100 ml)

Acetone	0.23
Butanol	0.16
Cyclohexanone	1.9
Diethyl adipate	0.5
Diethyl phthalate	0.4
Ethanol	0.06
Ethyl acetate	1.05
Methanol	0.04
Methyl ethyl ketone	0.98
Xylene	4.18

Figure 1

Absorption and Emission Spectra
of *Eastobrite* OB Optical Brightener



Usage

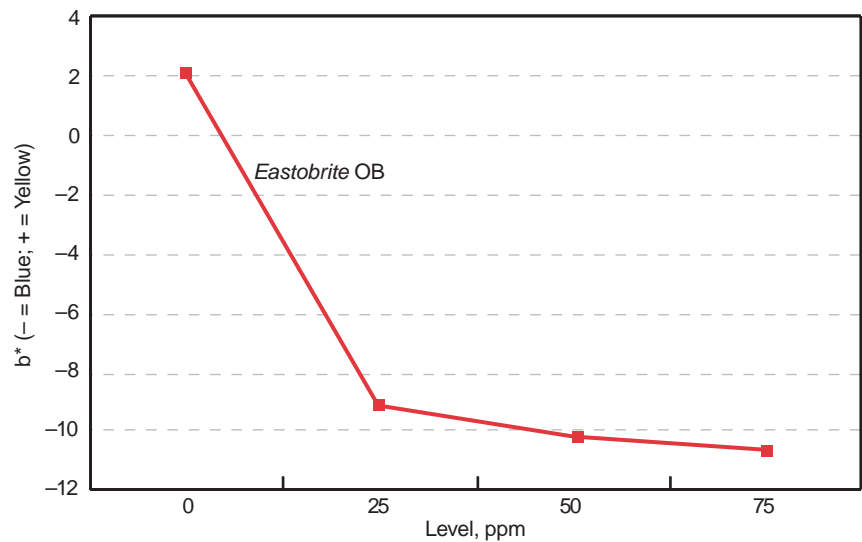
Eastobrite OB optical brightener is typically used at levels ranging from 25–75 ppm in nonpigmented polymers and from 75–225 ppm in polymers pigmented with titanium dioxide. Levels outside these ranges may be needed depending on the type of polymer, pigment, and/or filler used. Lower levels (5 ppm) may be used, when the optical brightener is used as a tracer.

Figures 2–7 illustrate the use of *Eastobrite* OB optical brightener to reduce yellowness in both natural and white polyethylene. The brightener is effective in high-density, low-density, and linear low-density polyethylene, as exemplified by lower b^* chromaticity.

Figures 8–9 illustrate the use of *Eastobrite* OB optical brightener in white, flexible polyvinyl chloride. Again, the brightener effectively reduces yellowness by lowering b^* chromaticity.

Figure 2

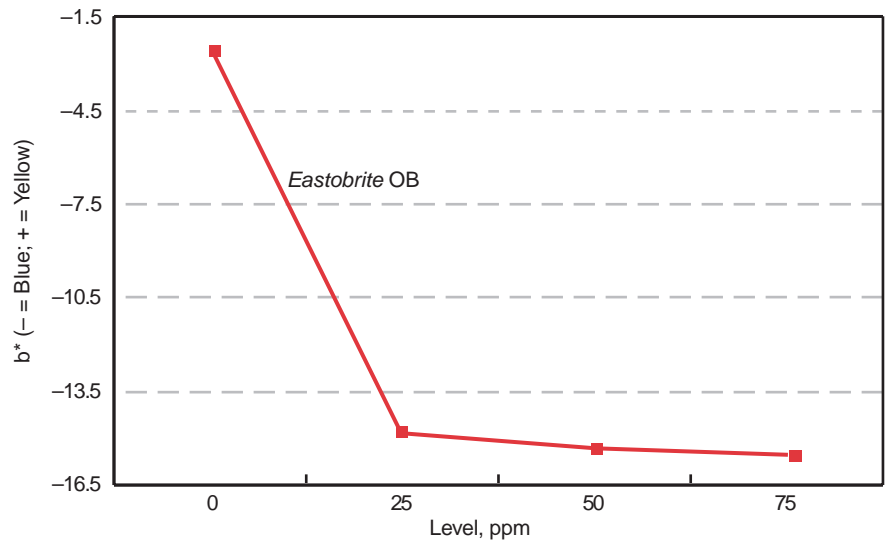
b^* Values of Natural High-Density Polyethylene Plaques



Note: Optical brightener levels are based on total formula weight.

Figure 3

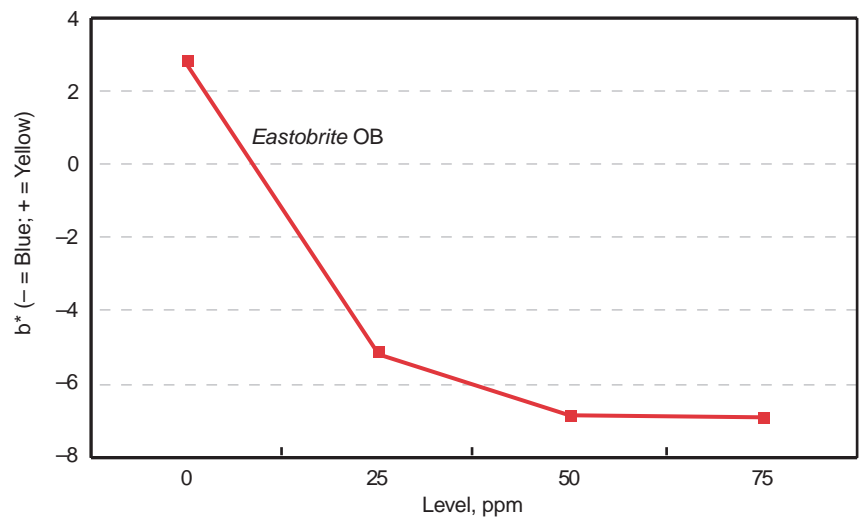
b* Values of Natural Low-Density Polyethylene Plaques



Note: Optical brightener levels are based on total formula weight.

Figure 4

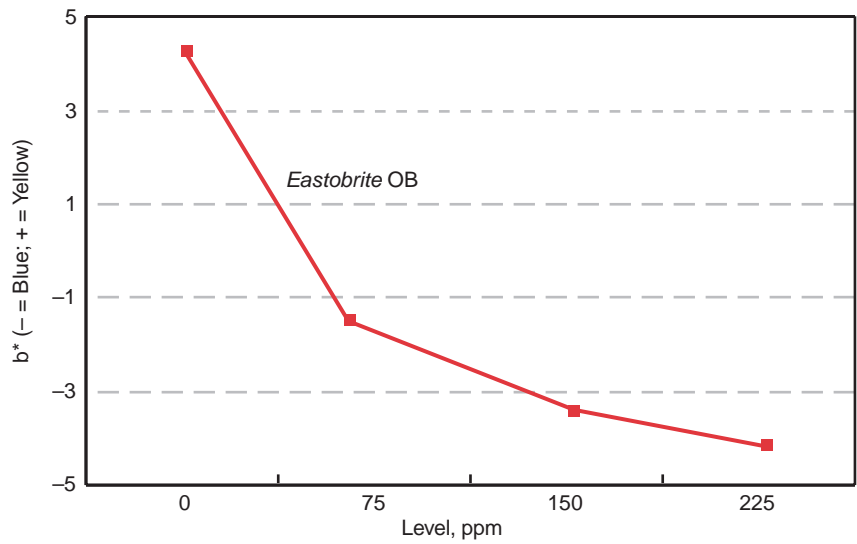
b* Values of Natural Linear Low-Density Polyethylene Plaques



Note: Optical brightener levels are based on total formula weight.

Figure 5

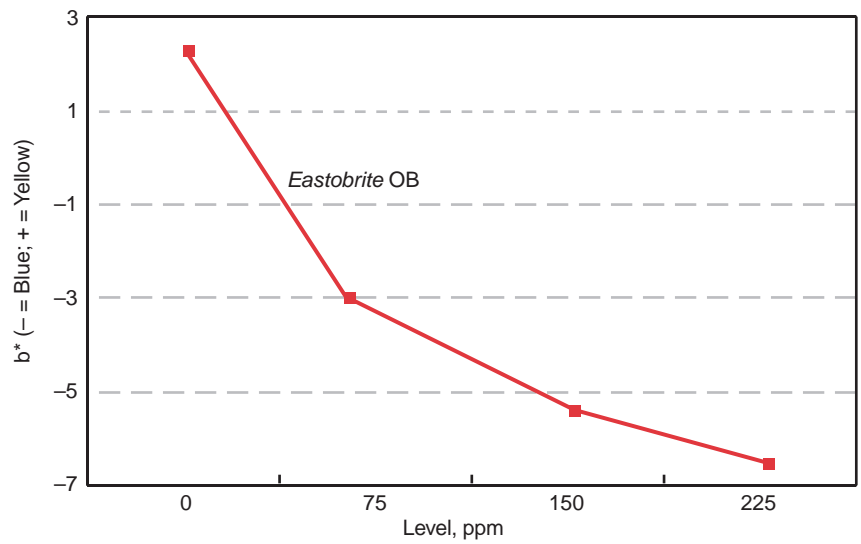
b* Values of White High-Density Polyethylene Plaques



Note: Optical brightener levels are based on total formula weight.

Figure 6

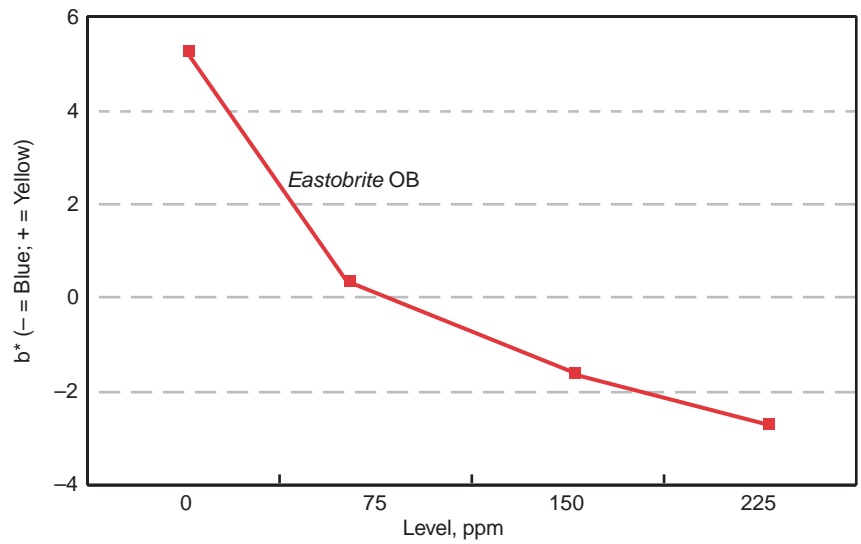
b* Values of White Low-Density Polyethylene Plaques



Note: Optical brightener levels are based on total formula weight.

Figure 7

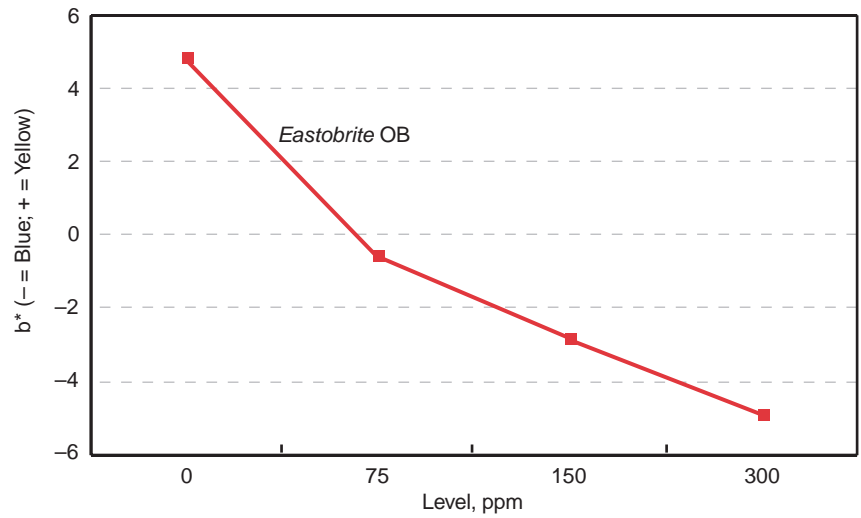
b* Values of White Linear Low-Density Polyethylene Plaques



Note: Optical brightener levels are based on total formula weight.

Figure 8

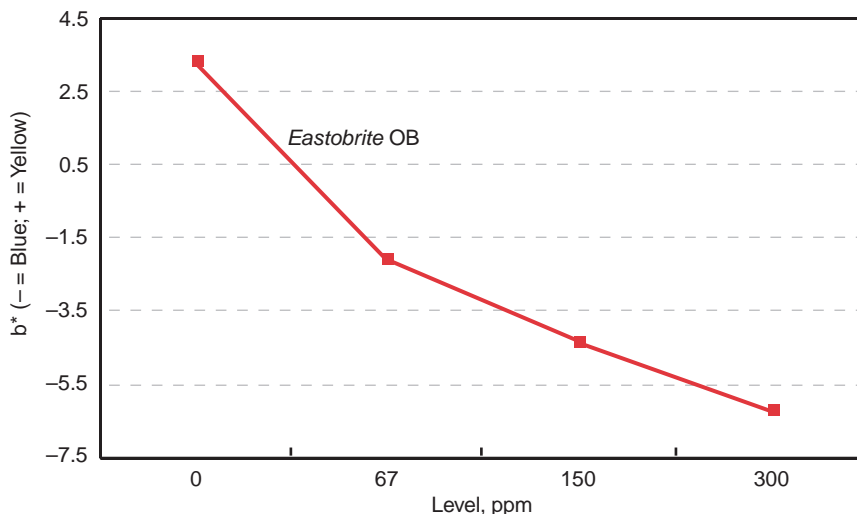
**b* Values of White Flexible PVC Sheet
(Oxy 240 F with 80 phr DOP)**



Note: Optical brightener levels are based on total formula weight.

Figure 9

**b* Values of White PVC Plastisol
(Oxy 80 HC with 100 phr DOP)**



Note: Optical brightener levels are based on total formula weight.

Availability

Complimentary samples (8 ounces) of *Eastobrite* OB optical brightener are available for your evaluation. The standard packages are 2 kg and 25 kg fiber drum with a polyethylene liner.

Safety

Material Safety Data Sheets providing safety precautions that should be observed in handling and storing Eastman products are available online or on request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

FDA Status

Eastobrite OB Optical Brightener (CAS No. 7128-64-5), as supplied by Eastman Chemical Company, may be used in compliance with the United States Federal Food, Drug, and Cosmetic Act subject to the limitations in 21 CFR 178.3297 (*Colorants for Polymers*), including the following conditions:

For use as an optical brightener:

- (1) In all polymers at levels not to exceed 0.015% by weight of the polymer. The finished articles are to contact food only under conditions of use A through H described in Table 2 of 21 CFR 176.170(c).
- (2) In all polymers at levels not to exceed 0.05% by weight of the polymer. The finished articles shall contact foods only of the types identified in Table 1 of 21 CFR 176.170(c), under Categories I, II, IV-B, VI-A, VI-B, VI-C, VII-B, and VIII under conditions of use A through H described in Table 2 of 21 CFR 176.170(c).
- (3) In adhesives complying with 21 CFR 175.105 and in pressure-sensitive adhesives complying with 21 CFR 175.125.

It is the responsibility of our customers to determine that their use of our product(s) is safe, lawful, and technically suitable in their intended applications. Because of possible changes in the law and in regulations, as well as possible changes in our products, we cannot guarantee that the status of this product will remain unchanged. We, therefore, recommend that customers continuing to use this product verify its status periodically.

European Union Directive

European Union Directive 2002/72/EC is a consolidation of 90/128/EEC, “Relating to Plastic Materials and Articles Intended to Come into Contact with Foodstuffs” and its subsequent amendments. It has been amended by Directive 2004/19/EC. These Directives provide a positive list of permissible monomers and additives for use in food-contact plastic materials. *Eastobrite* OB optical brightener, as supplied by Eastman Chemical Company, is listed as 2,5-Bis(5-tert-butyl-2-benzoxazolyl)thiophene, PM/Ref No. 38560.

Eastobrite OB optical brightener has a specific migration limit (SML) in food or in food simulants of 0.06 mg/kg. For the purpose of the Directives, SML means that the specific migration of the substance should be determined by a validated method of analysis at the specified limit. If such a method does not exist, an analytical method with appropriate performance characteristics at the specified limit may be used, pending the development of a validated method. A method for analyzing migration of *Eastobrite* OB in various food simulants is available from Eastman on request.

All EU Member States are required to incorporate the amended EU Directives into their national legislation. It is the responsibility of our customers to determine that their use of our product(s) is safe, lawful, and technically suitable in their intended applications. Because of possible changes in the law and in regulations, as well as possible changes in our products, we cannot guarantee that the status of this product will remain unchanged. We, therefore, recommend that customers continuing to use this product verify its status periodically.

For additional information about compliance food additive regulations, please contact your Eastman sales representative or visit our website at www.eastman.com.

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Publication AP-51
August 2004

Printed in U.S.A.