



## Brilliant Soluble Toners for Solvent Systems

### BSTS SERIES

Brilliant® fluorescent soluble toners are high-strength, transparent colorants. They are suitable in flexographic and gravure printing inks used on flexible packaging papers, films, and foils, and UV-cure inks. Fluorescent inks made with these Brilliant® fluorescent soluble printing toners are excellent for gift wraps, label stocks, tissue coating, corrugated containers, plastics, glass, metal, wood and other specialty coatings.

All BSTS series Brilliant® fluorescent soluble toners dissolve easily in lacquer solvents, using high-speed mixers. They perform well for indoor applications, but should not be used on products exposed to direct sunlight.

#### Physical and Chemical Properties

<b>Form</b>		granular powder
<b>Melting Point</b>		73 - 76°C
<b>Solubility</b>		
	Ethyl acetate	excellent
	Isopropyl acetate	excellent
	N-propyl acetate	excellent
	2-Nitropropane	excellent
	Diethylene glycol	excellent
	Dipropylene glycol	excellent
	Monochlorobenzene	good
	Orthodichlorobenzene	good
	Ethylene glycol monoethyl ether	use as cosolvent
	Ethanol	use as cosolvent
	Isopropanol	use as cosolvent
	Propylene glycol	use as cosolvent
	Ethylene glycol	nonsolvent

### Resin & Plasticizer Compatibility

Ketjenflex 8 (Axcentive)	excellent
Santicizer 141 (Monsanto)	excellent
Polyamide	limited

### Film-former compatibility

SS™ nitrocellulose (Hercules)	excellent
Ethyl cellulose (Hercules)	excellent
Alcohol-soluble butyrate (Eastman)	excellent

### Light stability

Indoors	good
Outdoors	poor

The BSTS series of Brilliant® fluorescent colors may be used with most flexographic ink binders, including nitrocellulose, cellulose acetate butyrate, acrylics, ketone resins, and maleic resins. High-solids-content starting point formulations may be prepared as shown. Polyamide resins, because of their limited compatibility, have been blended with more compatible modifiers such as Ketjenflex 8 and Santicizer 141. Waxes and/or polyethylene dispersion additives at two percent based on total solids may be incorporated to improve mar-, rub-, water-, and slip-resistance. A formula for an unmodified gloss solution follows. Stir with a cowles-type disperser at high speeds to achieve a clear solution:

### BSTS Series Starting Point Formulations<sup>1</sup>

<u>Formulation A</u>	
<u>Unmodified Gloss Solution</u>	<u>Percent by Weight</u>
Brilliant® BSTS soluble toner	45.0
Denatured ethyl alcohol	33.0
Ethyl acetate	<u>22.0</u>
<b>Total</b>	<b>100.0</b>
Viscosity (cps); Brookfield, No. 1 spindle	20
<u>Formulation B</u>	
<u>Nitrocellulose Modification</u>	<u>Percent by Weight</u>
Brilliant® BSTS soluble toner	36.3
SS nitrocellulose	4.2



Brilliant® BSTS soluble toner	40.0
Ethoxylated Trimethylol Propane Triacrylate (TMPTA)	25.0
Urethane Acrylate Oligomer	<u>35.0</u>
<b>Total</b>	<b>100.0</b>

Flexographic inks prepared with Brilliant® fluorescent soluble toners can be formulated with better cellophane tape resistant adhesion and crinkle resistance than a commercial control, as shown in Table I. Formulation 1 and 9, in particular, show substantial property improvement over both the commercial control and the other experimental ink formulations tested. The stir-in addition of 1 percent microcrystalline wax also has a beneficial effect on ink properties without loss of gloss. This improvement was most obvious in block and abrasion resistance. Moderate to poor performance usually improved to good performance.

### BRILLIANT® FLUORESCENT SOLUBLE TONERS IN FLEXOGRAPHIC INKS

A) Various soluble toner formulations									
FORMULATION #	1	2	3	4	5	6	7	8	9
Brilliant® BSTS	35.0	36.3	35.0	36.3	36.3	35.0	35.0	-	35.0
Commercial control	-	-	-	-	-	-	-	100 <sup>a</sup>	-
SS nitrocellulose 1/4 sec.	3.0	-	-	4.2	8.4	3.5	2.0	-	6.0
Santicizer 141	8.0	2.1	-	2.1	4.2	-	1.0	-	8.0
Versamid 750	12.0	4.2	7.0	-	-	3.5	4.0	-	12.0
Ethyl acetate	12.6	17.2	17.4	17.2	15.3	17.4	17.4	-	22.9
Ethanol	29.4	40.2	40.6	40.2	35.8	40.6	40.6	-	53.4
Nonvolatile, %	50.2	42.6	42.0	42.6	34.8	42.0	42.0	53.3	44.3
Viscosity (sec) No. 2 Zahn cup	27.0	23.0	21.0	21.5	28.0	26.2	17.2	24.5	27.0

B) Film tests: 1-mil corona-treated polyethylene film/No. 3 Meyer rod drawdown									
Crinkle adhesion <sup>b</sup>	9	5	7	5	1	5	7	5	10
Block - 2 psi Face to Face % removal	10	30	50	90	100	20	50	25	0
Block - 2 psi Face to Back % removal	0	0	0	0	0	0	0	0	0
Cellophane tape <sup>b</sup>	10	8	7	5	2	4	7	7	10
Visual Gloss	E	G	E	E	E	E	E	E	E

Sutherland rub % removal after 120 cycles	20	20	--	40	--	30	--	50	--
Legend: E = Excellent G = Good									
<sup>a</sup> Composition unknown.									
<sup>b</sup> Complete removal of coating - 0									
No removal of coating - 10									

**Test Procedures**

Please refer to Flexography Principles and Practices, Fourth Edition, 2nd printing, 1992 for updated test procedures. This book is published by the Foundation of Flexographic Technical Association, 900 Marconi Avenue, Ronkonkoma, New York 11779-7212.

**Storage**

When stored in a cool, dry environment, Brilliant® fluorescent BSTS soluble toners have an indefinite shelf life. Colorant containers should be kept closed to minimize contamination.

**Toxicity**

Test conducted through independent laboratories have found Brilliant® BSTS series fluorescent soluble toner to be "essentially non-toxic". A summary of test data is listed on the MSDS, which is available upon request. Good industrial hygiene and handling methods are essential in the use of all products whether or not they are determined to be hazardous.

**Important**

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