

The Real World of Fluorescent Lightfastness

Historically

When a recently appointed technical art director was confronted with wide-ranging fade requirements for fluorescent colors, he was astounded. His company, a leading manufacturer of packaged goods located in southwestern Ohio, seemed to have unrealistic fade requirements for all printing processes and those requirements appeared inconsistent with the end use—store shelves.

The ink maker has historically been at the receiving end of what he considers unfair and unrealistic lightfastness requirements in the formulation of his flexographic, gravure and lithographic inks. The technical staff at DayGlo Color Corp. saw the art director's dilemma as an opportunity to prove what really happens to fluorescent inks under real world lighting conditions and at the same time come up with a fair correlation with existing fade testing equipment.

The WAL-MART Requirements

It was resolved that the lighting conditions in Wal-Mart stores fairly represented store lighting conditions found throughout this country. Besides, they (Wal-Mart) also move a great amount of the art director's product. The other test condition was the length of time on the shelf. **It was acknowledged that no product his company marketed should ever be on the shelf more than eight weeks.**

Armed with their requirements we contacted the Wal-Mart people responsible for the store design and lighting and came up with their lighting specifications which are as follows:

Two 60-watt cool light fluorescent lamps 11 feet on center and 10 feet from the floor.

During subsequent meetings with our clients we resolved the remaining test conditions, which included the following:

Test materials were arranged vertically 3 to 6 feet from the floor and 2 inches from the shelf edge. Print and actual packaged products were segmented into 7 blocks and exposed to the light source from 12 weeks to 0 weeks (standard) at a constant 24 hours a day.

In order to create as unbiased a test possible virtually every packaged product currently using fluorescent color was purchased in the consumer marketplace. In addition, gravure prints of our entire color palette on clay coated news-back were supplied by a leading gravure manufacturer. Another leading flexographic ink manufacturer. Another leading flexographic ink manufacturer contributed prints of our HM soluble toners. We also tested all of our color guides for StarFire lithographic inks.



One hour in a Xenon represents what really happens during 12 weeks on the shelf.

Chart 1	12 Week – Real Life Color Shift		
	A Type Gravure	Flexographic HM Toner	Lithographic StarFire
Color	% Color Shift	% Color Shift	% Color Shift
Saturn Yellow	-0.18%	-0.82%	3.19%
Blaze Orange	-1.08%	-2.60%	-5.12%
Corona Magenta	-6.17%	-7.23%	-5.25%

Now you can correlate these findings to their equivalent color shifts as developed on Xenon Arc Fadeometer.

Chart 2	Accelerated Color Shift in Xenon Arc Fadeometer					
	A Type Gravure		Flexographic HM Toner		Lithographic StarFire	
Color	Time	% Shift	Time	% Shift	Time	% Shift
Saturn Yellow	1.0 HR	-0.15%	1.5 HR	-0.80%	1.5 HR	-2.64%
Blaze Orange	1.0 HR	-1.17%	0.5 HR	-3.53%	0.5 HR	-5.09%
Corona Magenta	1.5 HR	-6.70%	1.5 HR	-6.36%	0.5 HR	-5.75%

Consistency of Results

The results were remarkable and consistent across every printing process. The bottom line statement that can be concluded from all of the testing that was conducted is, fluorescent color on packaging exhibits very slight darkening during the initial two weeks of exposure, after which color changes are imperceptible to the human eye. No visible color shift occurs in yellows, while reds display slight initial two weeks marking. Chart 1 is based on results gained from out Datacolor International Spectraflash 500 Spectrophotometer.

What about those 10-hour fade tests for fluorescent gravure or 20-hour fade requirement for an in-store holiday banner for a greeting card company? Fluorescent colors displayed under fluorescent lighting conditions do not fade and are exhibited under the most ideal lighting conditions.

Isn't it time to tell packaged goods marketers what really happens when they use fluorescent color in their packaging? Isn't it time to convince them that 10- and 20-hour fadeometer tests are unrealistic and that less than one hour in a Xenon Arc represents what really happens during 12 weeks on the shelf?

As the world's leading fluorescent color manufacturer we have come a long way in the stabilization of the fluorescent phenomenon. DayGlo Color Corp. stand ready to support the ink maker in the process of educating customers.

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