



## Product Data

# Cablelite® 751 Inks

### Product Description

Cablelite® 751 Series UV-curable inks are specially formulated to color code optical fibers. These inks are designed to offer maximum processing line speeds compared to other UV-curable inks, without compromising final ink performance.

<u>Color</u>	<u>Product Code</u>
Clear	751-000
Orange	751-002
Slate	751-005
White	751-006
Red	751-007
Black	751-008
Yellow	751-009
Rose	751-011
Aqua	751-012
Blue	751-017
Green	751-018
Violet	751-019
Brown	751-020

<u>Colors</u>	<u>Supplemental Product Code</u>
Lime	751-013
Tan	751-014
Olive	751-015
Magenta	751-016
Cadet	751-021
Turmeric	751-022
Dark Green	751-024
Dark Violet	751-025

### Product Benefits

**Fast Cure:** Cablelite® 751 Series inks have demonstrated up to a 50% increase in line speed, without compromising cure results, compared to other UV curable inks. When cured using high power microwave bulbs, line speeds in excess of 1800 m/min have been demonstrated.

**Narrow Viscosity Range:** All colors within the Cablelite® 751 Series are comparable in viscosity. This allows for no or little process adjustments required between colors. The overall low viscosity allows these inks to be processed successfully on many different types of coloring lines.

**EIA-359-A Munsell Color Compliant:** Film thickness between 3 to 5 microns produces glossy, vibrant colors that satisfy the EIA-359-A color specification. Cablelite® 751 Series inks provide the required opacity to distinguish between colors in low light conditions without sacrificing LID performance.

## Physical Data

% Nonvolatile	99%
Flashpoint Range	>200°F (93°C)
Viscosity (25°C) Brookfield Model DV-III Spindle 52 @ 30rpm	1,700 – 2,500 mPa·s*

## Typical Mechanical Properties of Cured Clear Ink Film

Modulus (at 2.5% elongation)	1450-1650 MPa
Elongation	2-4%
Tensile strength	25-30 MPa

## Cablelite® 751 Series Color Specifications

Cablelite® 751 Series inks are designed to meet Munsell color values as specified by the EIA-359-A standard.

Product Color	Product Code No.	L	a	b
Clear	751-000	NA	NA	NA
Orange	751-002	58.50 - 64.10	43.80 - 49.40	42.90 - 48.50
Slate	751-005	49.16 - 54.74	-2.03 - -0.89	-4.89 - -2.25
White	751-006	89.48 - 94.94	-3.49 - -1.19	-0.87 - 4.23
Red	751-007	33.23 - 38.83	30.03 - 35.63	11.48 - 16.04
Black	751-008	25.85 - 26.85	-0.48 - 0.52	-0.98 - 0.02
Yellow	751-009	74.63 - 79.43	1.51 - 7.11	58.18 - 63.78
Rose	751-011	63.97 - 68.47	26.99 - 32.59	7.10 - 11.60
Aqua	751-012	60.50 - 65.00	-28.41 - -22.81	-19.18 - -14.68
Lime	751-013	75.25 - 80.85	-37.34 - -31.74	36.98 - 42.58
Tan	751-014	65.41 - 71.01	0.60 - 6.20	4.65 - 10.25
Olive	751-015	55.32 - 60.92	-9.82 - -4.22	35.25 - 40.85
Magenta	751-016	53.87 - 59.47	22.25 - 27.85	-5.74 - -0.14
Blue	751-017	35.27 - 40.87	-6.54 - -0.94	-37.72 - -32.12
Green	751-018	52.04 - 57.64	-53.37 - -47.77	22.63 - 28.23
Violet	751-019	50.27 - 55.87	15.00 - 20.60	-31.72 - -26.12
Brown	751-020	28.69 - 34.29	6.17 - 11.77	2.76 - 8.36
Cadet	751-021	TBD	TBD	TBD
Turmeric	751-022	TBD	TBD	TBD
Dark Green	751-024	TBD	TBD	TBD
Dark Violet	751-025	TBD	TBD	TBD

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# Cablelite® 751 Inks



## Test Methods

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Detailed test methods may be obtained through your Covestro sales representative.

## Filtration

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Cablelite® Inks and Matrix Materials are manufactured using fine filtration techniques designed to minimize particulate matter and to ensure high strength and uniform product performance.

## Storage Conditions

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Cablelite® matrix materials should be stored in their original containers at temperatures between 15° and 30°C. The bottles that are used for these are UV opaque and allow for air to diffuse through the plastic which prevents premature gelation.

## Conditioning of Inks Prior to Use

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All UV curable inks incur pigment settling over time. It is recommended that Cablelite® 751 Inks be rolled at 8 rpms in their original bottles for a minimum of 4 hours prior to use. Re-rolling of the bottles is suggested, for 4 hours at 8 rpm, if a bottle is not consumed within 24 hours.

## Shelf Life

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Cablelite® matrix materials have a shelf life of 24 months from the date of manufacture, provided recommended storage conditions are properly maintained.

## Safety Information

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This product is formulated with multifunctional acrylates which may cause skin and eye irritation and/or skin sensitization. Safety data sheets for each product are available from your Covestro sales representative. All safety and handling recommendations should be followed carefully.

## Conversions

$$N = g \cdot f \times 9.807 \times 10^{-3} \quad \text{kg} \cdot \text{mm}^{-2} = \text{MPa} \times 0.102$$
$$\text{psi} = \text{MPa} \times 145 \quad \text{mPa} \cdot \text{s} = \text{cps}$$

# Cablelite® 751 Inks



## Explanation of Graphs for Cablelite® 751 Inks

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**Viscosity vs. Temperature for clear base:** This graph represents the temperature/ viscosity relationship for the Cablelite 751 clear base used to produce the colored inks for temperatures between 25°C and 50°C.

**Viscosity vs. Temperature for Cablelite 751, Production Batches:** This graph represents the temperature/ viscosity relationship for 4 colors within the Cablelite® 751 ink series. It should be noted that the tight range in viscosity for all of the colors prevents the need to change ink processing temperature when changing from color to color.

**%RAU vs. Dosage for LTS and Cablelite 751:** This graph illustrates the comparison of Cablelite® 751 versus Cablelite® LTS for surface cure via the FTIR method. The values for Cablelite® 751 are slightly lower than Cablelite® LTS. Initially, this information can be deceiving, however this is a comparison of two different ink compositions and should be compared as such. To fully understand the amount of cure that can be achieved, you must investigate the % RAU values on a highly cured ink sample. See the graph labeled "Ink Bases: FTIR Cure Behavior, LTS and Cablelite® 751" for a clearer illustration of this concept.

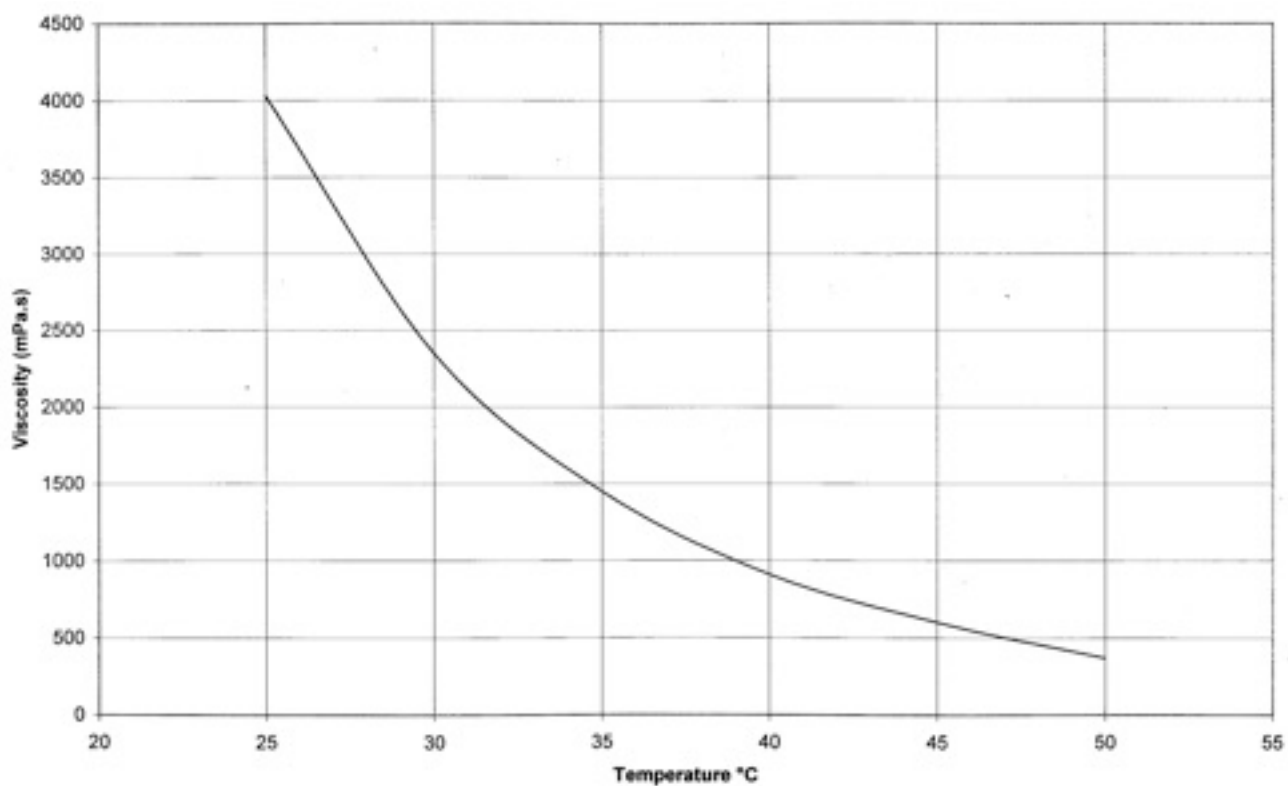
**Ink Bases: FTIR Cure Behavior, LTS and Cablelite® 751:** This graph represents the percent maximum cure based on FTIR analysis that can be achieved for these two different inks at very high doses of UV energy. It is estimated that on a fiber coloring line, UV curable inks receive between .05 and 50 J/cm<sup>2</sup> dose depending on the speed of the colored fiber passing through a UV lamp. The conclusion can be drawn from this graph that Cablelite® 751 inks are reaching their maximum cure potential much faster than Cablelite® LTS inks. It is our experience that in producing optical fiber ribbons and fiber for loose tube cable, Cablelite® 751 can be processed at higher line speeds and achieve similar or improved physical properties compared to Cablelite® LTS inks.

**Ink Bases: Dose – Modulus, LTS and Cablelite® 751:** The Cablelite® 751 is a higher modulus (harder) ink compared to Cablelite® LTS ink. Similar to the previous graph, the Cablelite® 751 inks reach their ultimate modulus much quicker than Cablelite® LTS at UV doses that are relevant in optical fiber color coding. The higher modulus nature of Cablelite® 751 inks have a positive effect on the breakout and peelability of optical fiber ribbons produced with Cablelite® 751 inks.

**Clear Base DMA:** The DMA graph of the Cablelite® 751 clear base indicates a maximum tan delta (T<sub>g</sub> approximation) of 87°C. This confirms the higher degree of hardness compared to Cablelite® LTS with a tan delta of approximately 63° C.

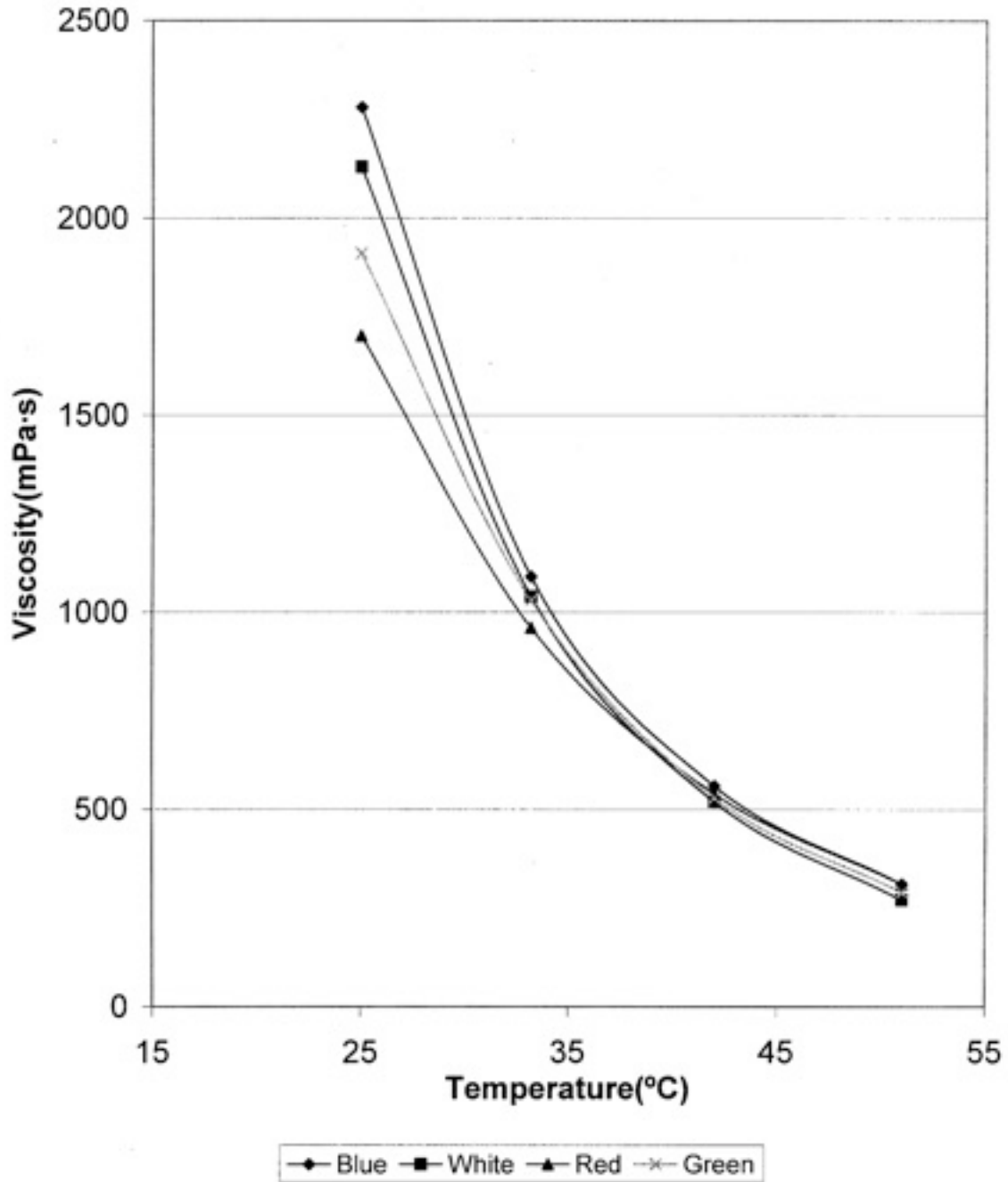


## Cablelite® 751 Clear Base Temperature Viscosity Curve (B#00J11874)



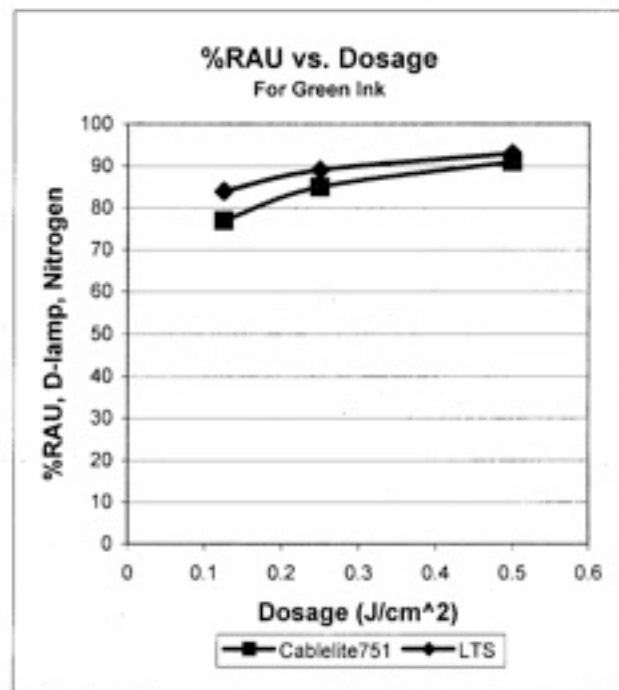
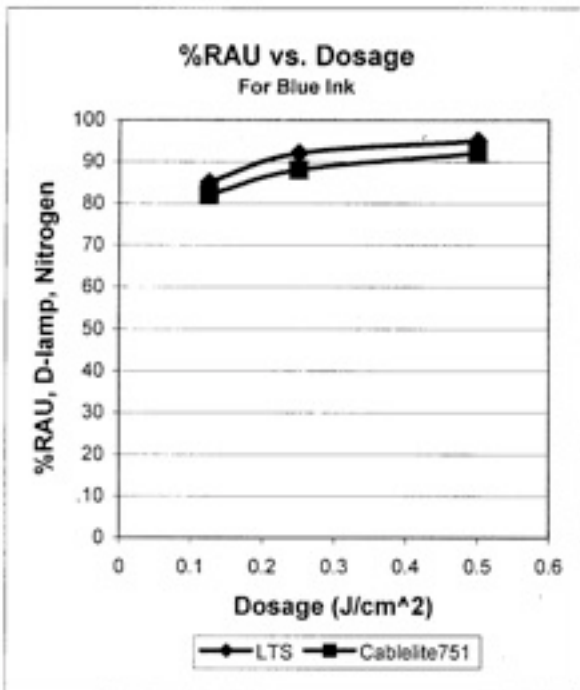
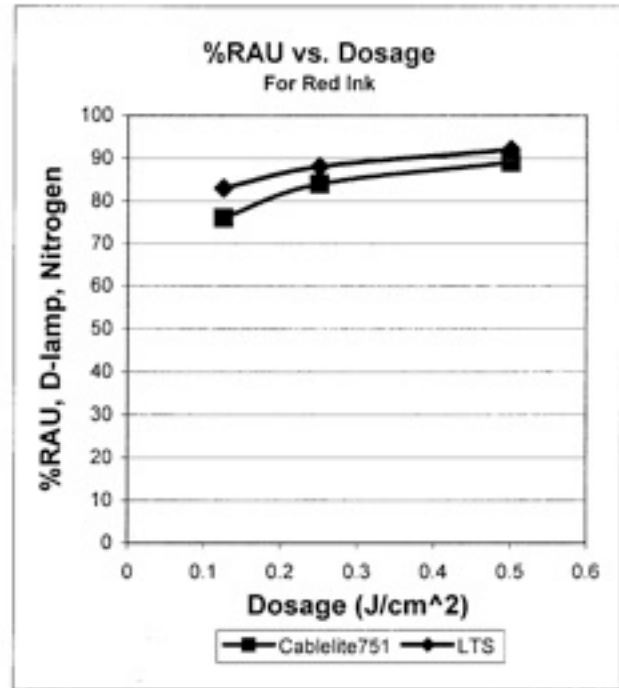
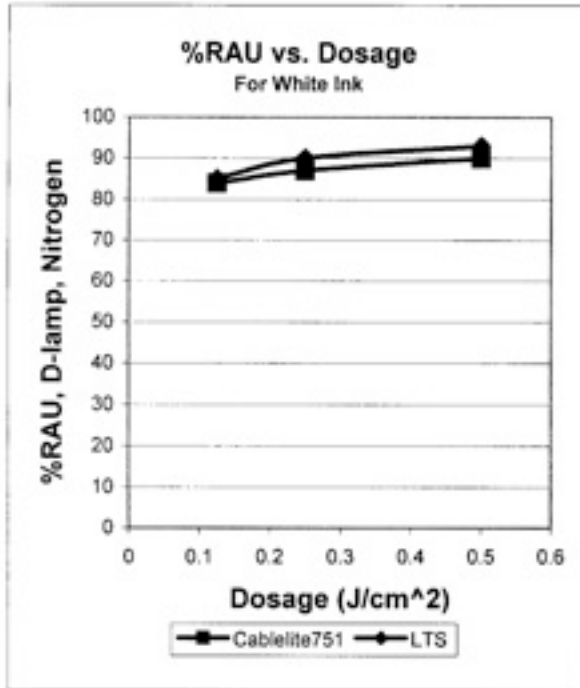


## Viscosity vs. Temperature Cablelite® 751, Production Batches





## %RAU vs. Dosage for Cablelite® LTS and 751 Inks

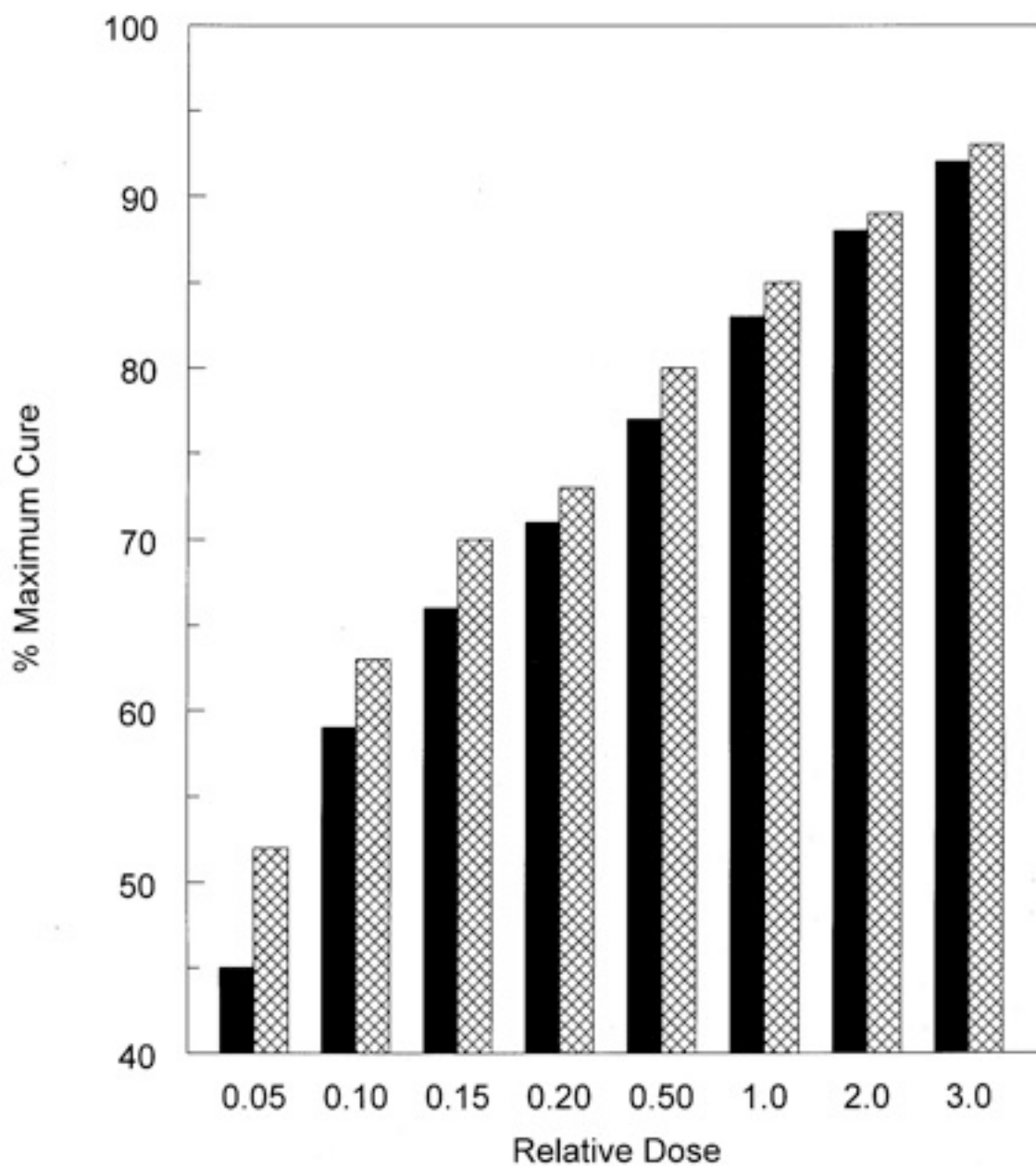




## Ink Bases: FTIR Cure Behavior

LTS and Cablelite 751

■ LTS      ▨ "751"







## Ink Bases: Dose - Modulus

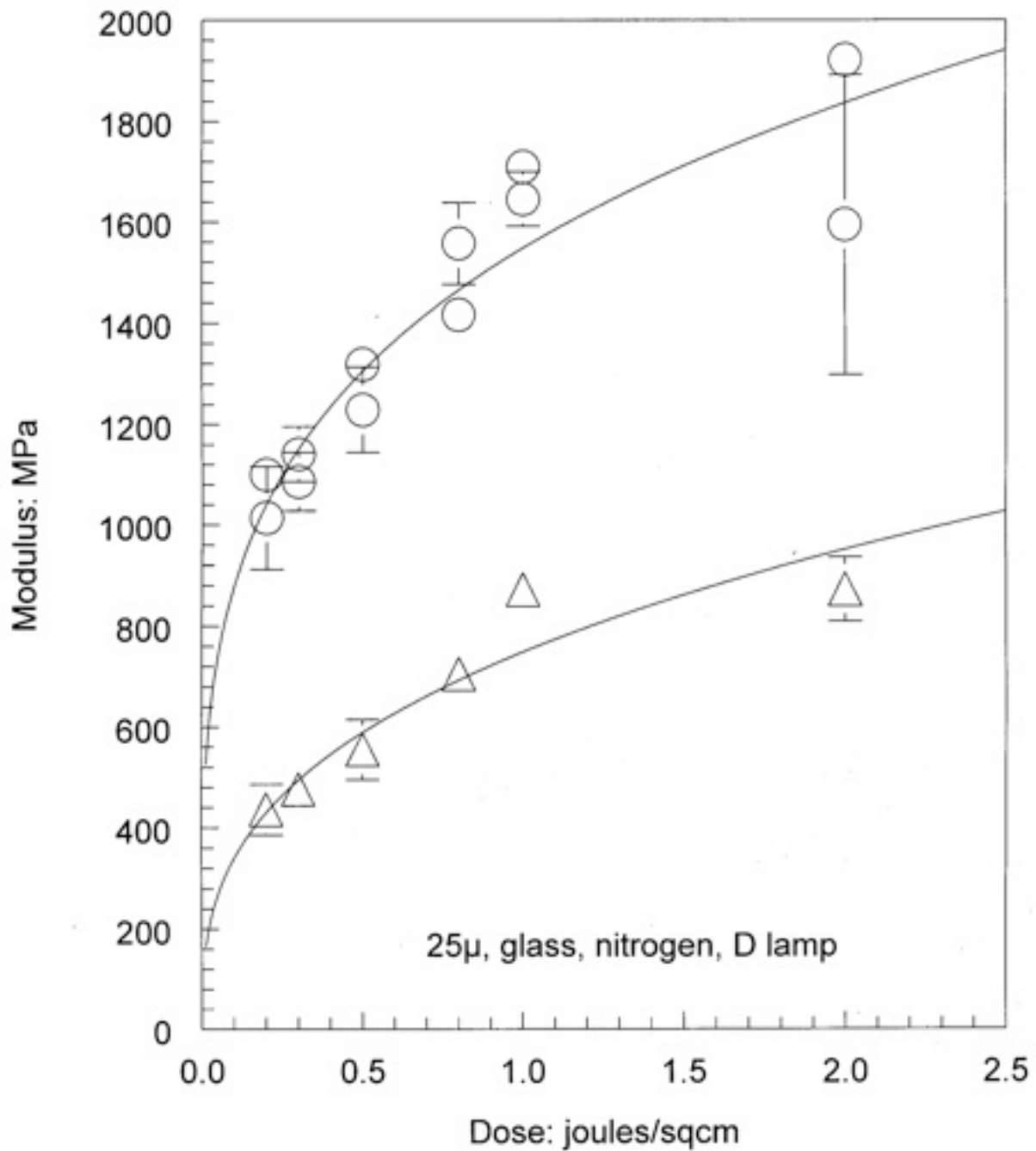
LTS and Cablelite 751



LTS



"751"





## Dynamic Mechanical Analysis

