



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

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

Filtration

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

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

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

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

Safety Information

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

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.

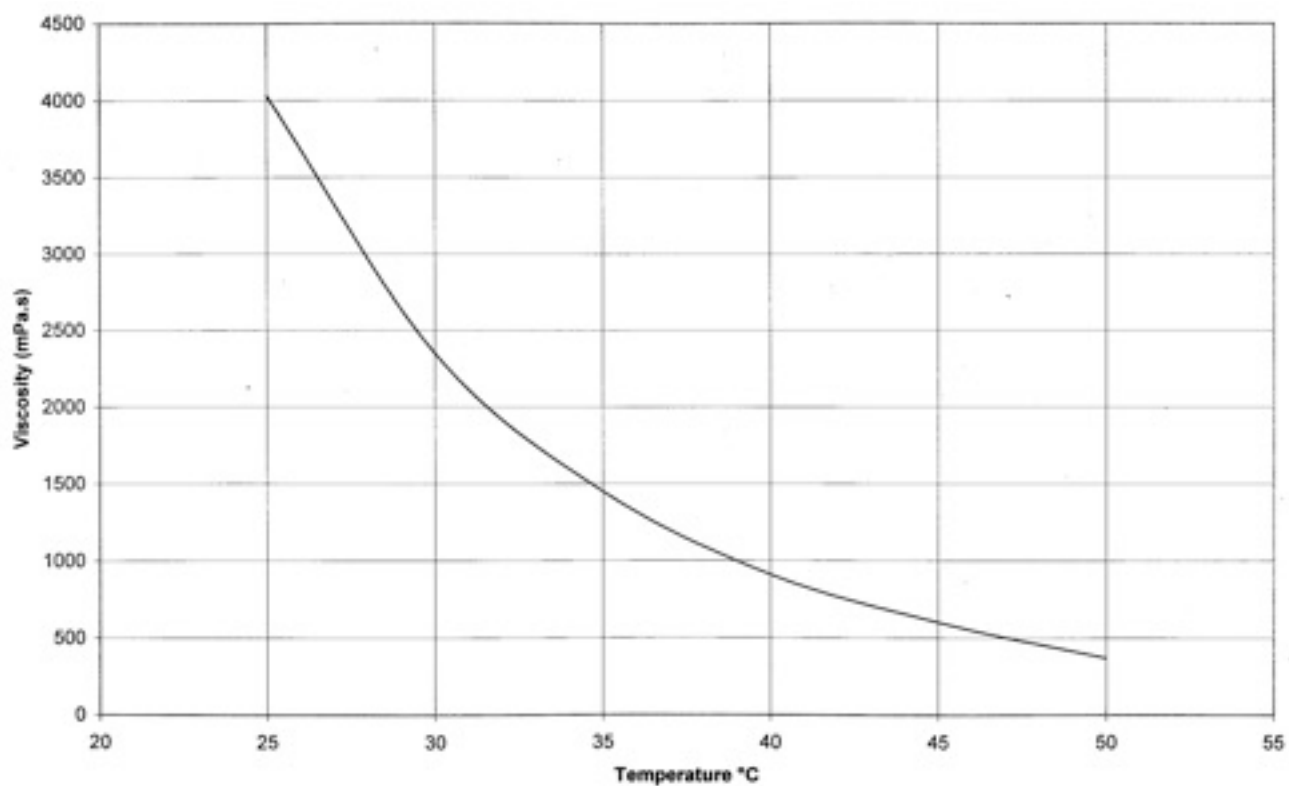
Ink Bases: FTIR Cure Behavior, LTS and Cablelite® 751: This graph represents the percent maximum cure based on FTIR analysis that can be achieved for these two different inks at very high doses of UV energy. It is estimated that on a fiber coloring line, UV curable inks receive between .05 and 50 J/cm² 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_g approximation) of 87°C. This confirms the higher degree of hardness compared to Cablelite® LTS with a tan delta of approximately 63° C.

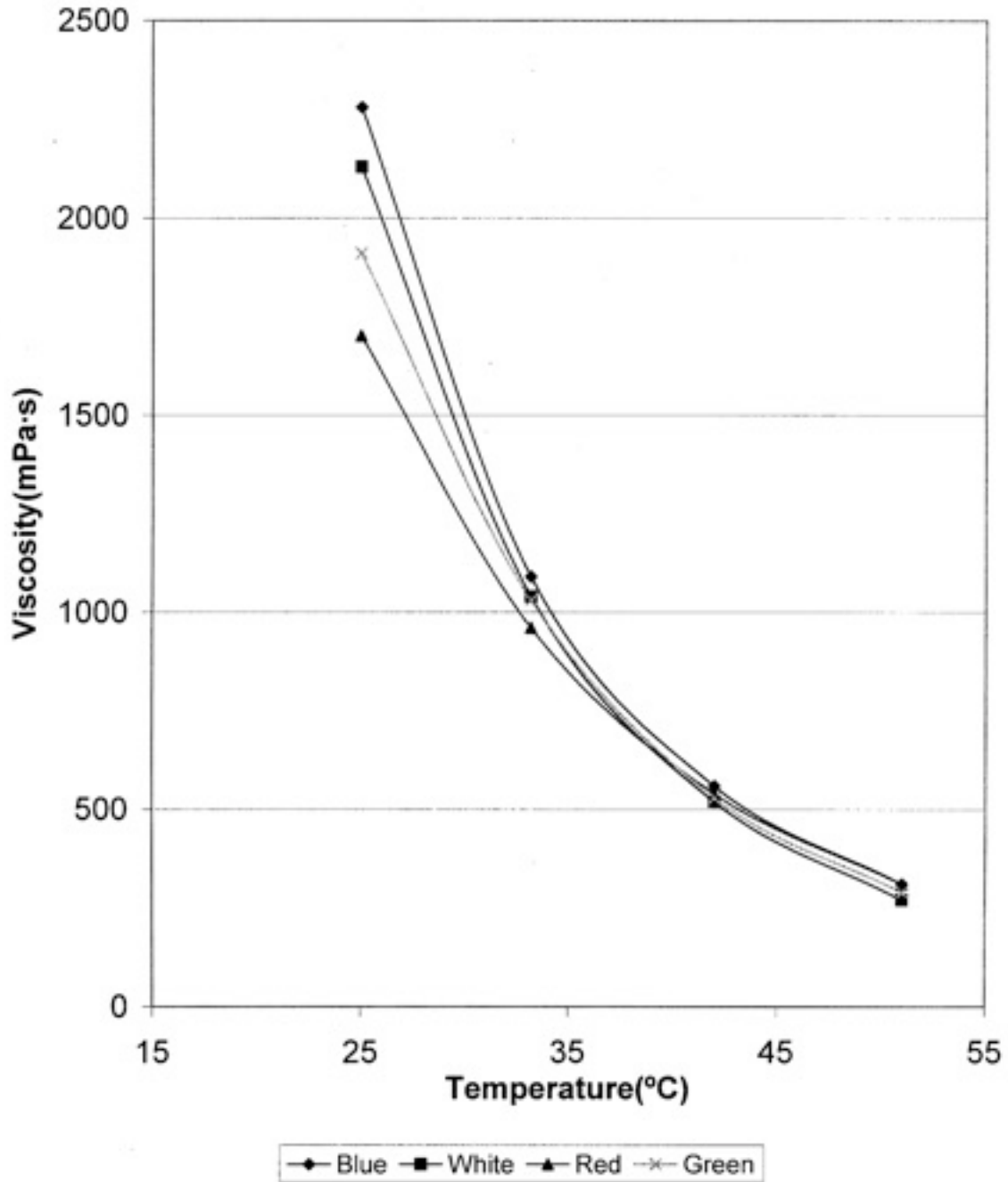


Cablelite® 751 Clear Base Temperature Viscosity Curve (B#00J11874)



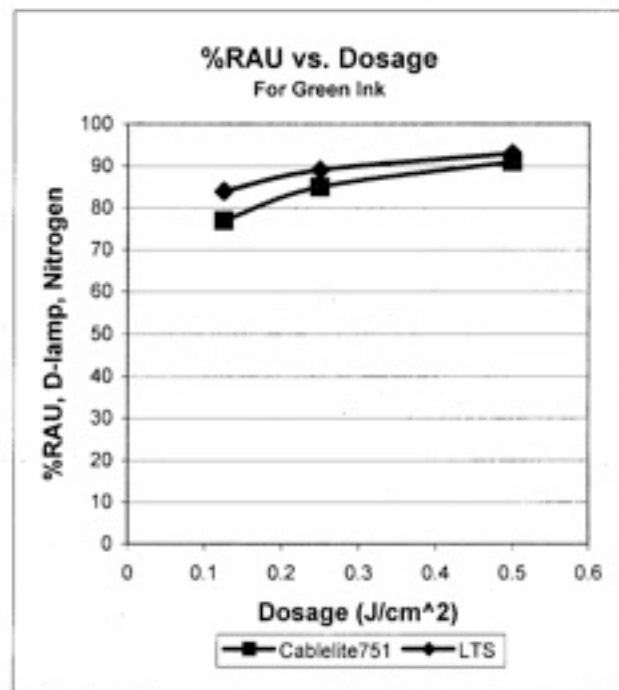
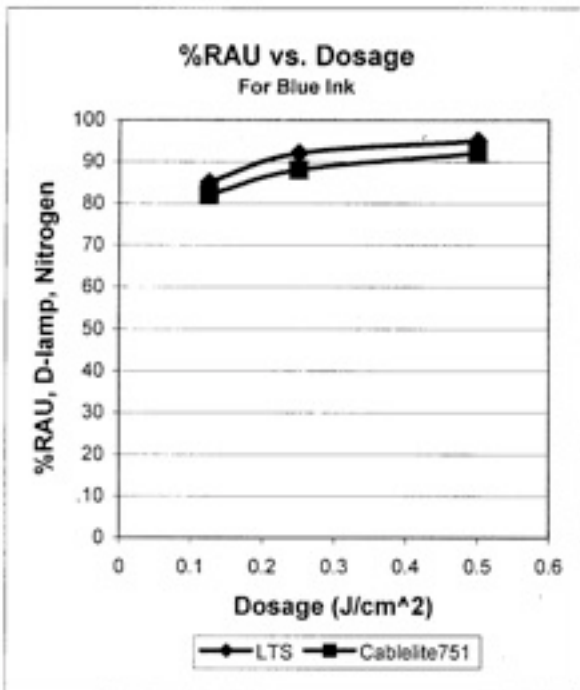
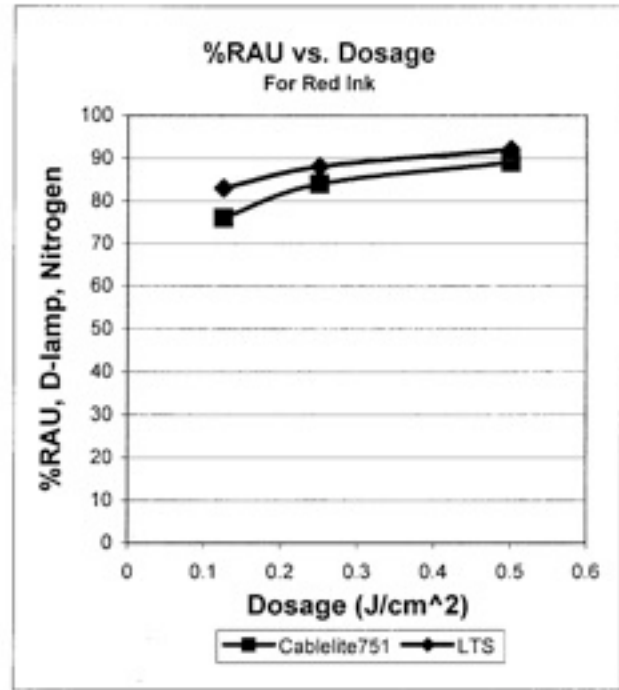
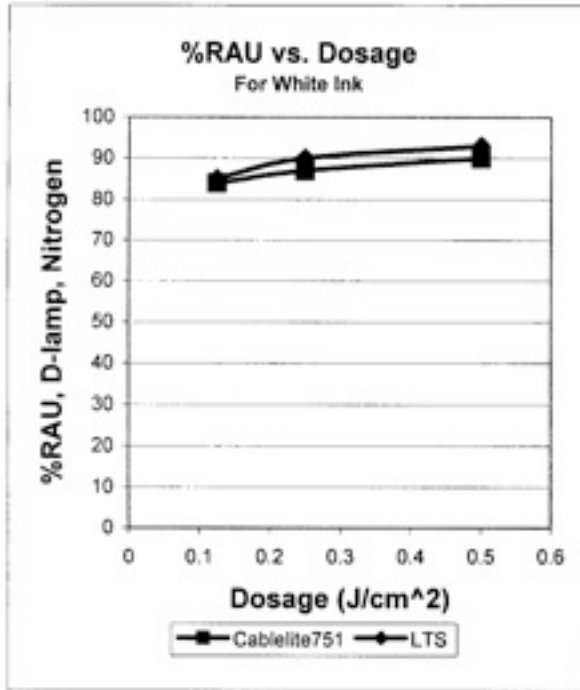


Viscosity vs. Temperature Cablelite® 751, Production Batches





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

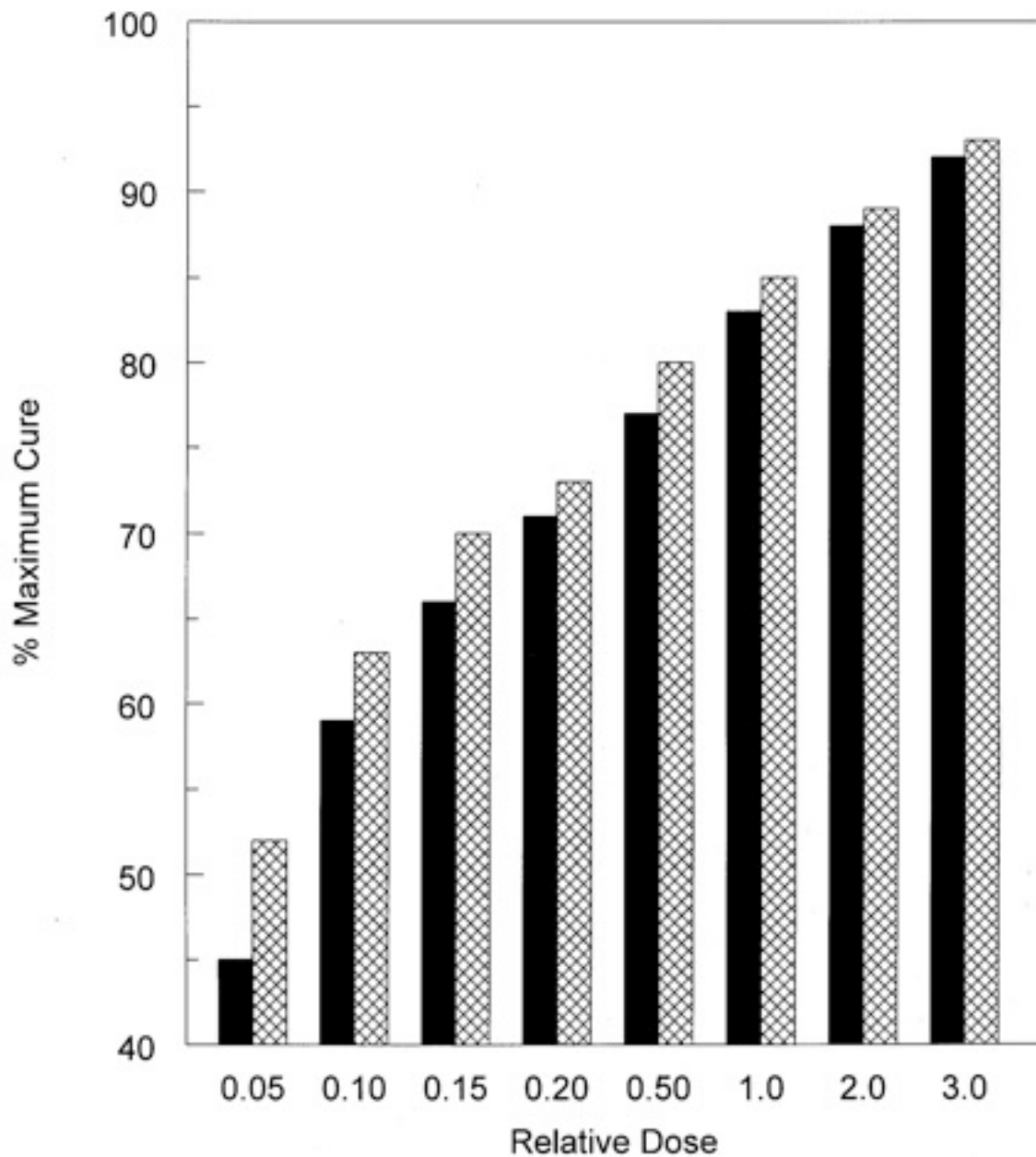




Ink Bases: FTIR Cure Behavior

LTS and Cablelite 751

■ LTS ▨ "751"





Ink Bases: Dose - Modulus

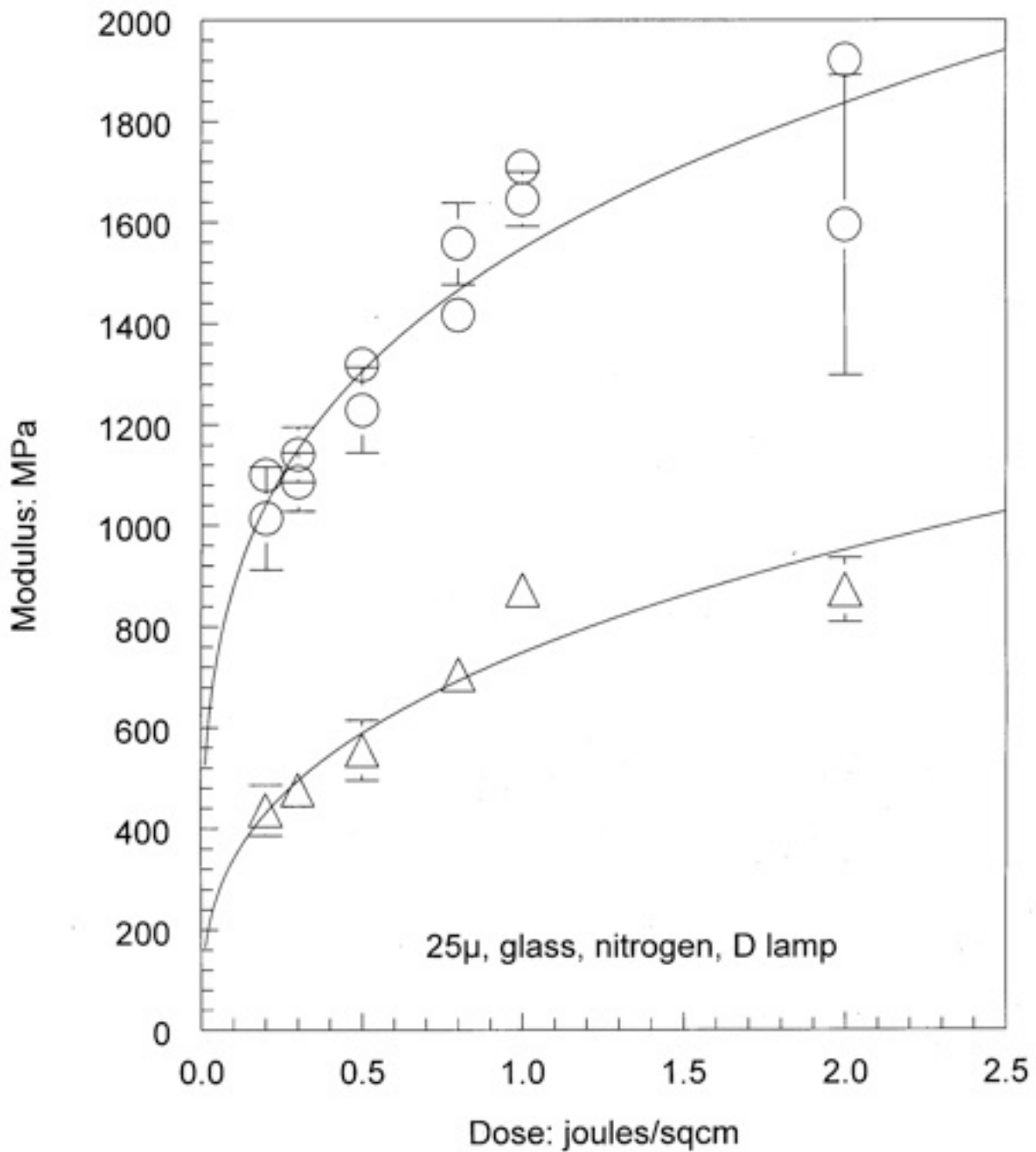
LTS and Cablelite 751



LTS



"751"





Dynamic Mechanical Analysis

