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# 3M™ DF100L Uniformity Tape

## Technical Data Sheet

Release B, October 2013



### Product Description

3M™ Uniformity Tape ("UT" or "Product") is a clear, microstructured thin-film that mixes and diffuses light generated by LEDs in edge-lit lighting. UT is applied directly to the injection edge of a Light Guide Plate (LGP), which faces the LED light sources. The Product has adhesive on one side, a micro-replicated optical pattern on the other.

UT's microstructure reduces dark zones and improves brightness uniformity by inducing lateral light spreading in the plane of the light guide near the light source.

### Recommended End Uses

LED solid light guides and wave guides for architectural and commercial lighting.

### Key Attributes

- Improves brightness uniformity and light spreading near light source
- Reduces head-lighting effect
- Enables uniformity at increased LED spacing, potentially reducing LED costs
- Potential for improved thermal management
- Simple tape application to light injection edge(s) of LGP
- Registration to LEDs not required

### Product Characteristics

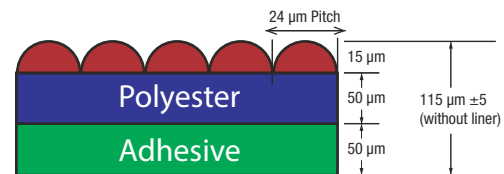
Values in this section are typical values for UT, based on test data deemed reliable, but not warranted, except for the Warranted Characteristics identified on Page 4.

### Material

Substrate	Polyester Film
Prism Layer	Acrylic Resin
Adhesive	Acrylic PSA

### Structure

Prism-shaped acrylic resin optical features formed on polyester film substrate.



Cross section image not to scale. Values in this section are typical values, but not property limits.

### Part Dimension

UT Tape Width	Strips Per Roll	Roll Length
2.8 mm (0.111 inch)	15	50 meters (54.68 yds)
3.8 mm (0.150 inch)	11	50 meters (54.68 yds)
4.8 mm (0.189 inch)	9	50 meters (54.68 yds)
5.8 mm (0.228 inch)	7	50 meters (54.68 yds)
7.8 mm (0.307 inch)	5	50 meters (54.68 yds)

### Optical

Transmission	Greater than 90%
Color Shift 0°	$\Delta x$ : -0.003 to 0.003 $\Delta y$ : -0.003 to 0.003
Color Shift 60°	$\Delta x$ : -0.003 to 0.003 $\Delta y$ : -0.003 to 0.003
Lighting Panel Uniformity	Greater than 80%
Light Spread Angle	$\pm 70^\circ$ from the normal



## Adhesion

No delamination.

Item (adhesion to acrylic light guide)		Adhesion (g/0.5")
Initial adhesion		1048
Adhesion after thermal shock (100 cycles)		1740
After 85° C	1000 hours	1630
After 65° C at 95%RH	1000 hours	1320

## Environmental

Test	Condition
Humidity resistance	65°C, 95% relative humidity for 1000 hours
Heat resistance	85°C for 1000 hours
Cold resistance	-40°C for 1000 hours
Thermal shock	85°C for 1 hr to -40°C for 1 hr, 100 cycles
Appearance	No significant appearance change in application
Spread angle	No significant difference in spread angle
Change of transmission	Minimum 80% vs. initial value
Change of color	Maximum 2.0 in DE vs. initial value

- Wear gloves to prevent fingerprints or nail marks.
- Hold UT by the edges.
- Do not rest objects on UT.
- Do not slide UT.

## Warranted Characteristics

Characteristic	Value	Test
Transmission	> 90%	ASTM D1003-00
Color change - Color shift 0° Color shift 60°	$\Delta x$ : -0.003 to 0.003 $\Delta y$ : -0.003 to 0.003 $\Delta x$ : -0.003 to 0.003 $\Delta y$ : -0.003 to 0.003	ASTM E 1164
Light spread	$\pm 70^\circ$ horizontally	3M Test

## Cleaning

Do not dust or clean the UT. The prisms are easily damaged.

## Recommended Storage and Handling

UT should be stored flat, in its original packaging, away from direct sunlight. If UT is dedicated to LEDs, there should be no UV damage. UT is stored at a temperature of  $20 \pm 10^\circ\text{C}$ , relative humidity  $45 \pm 15\%$ . The recommended temperature range during application is  $20 \pm 10^\circ\text{C}$ , relative humidity  $45 \pm 15\%$ .

To prevent marking, denting, or deforming of the UT surface:



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