LED LINEAR TAPES - THE NEW STANDARD
LED Linear offers the world’s highest quality LED tapes
Other tapes use resistors and lose more than 25% of light at the end of the run. The light fades along the tape.

LED Linear uses IC drivers that guarantee 100% consistent light over the full specified length of the products.
ADVANTAGE 1

It is easy to identify the difference. Just look at the tape!

Resistor Controlled DC Circuits
- Voltage drop is not balanced along the tape
- Light output decreases over the length
- Resistors heat up and affects lifetime negatively

IC Controlled DC Circuits
- Current is regulated on each step
- Light Output is stable over the entire length
- 3V built-in buffer to compensate for voltage drops
- Reverse polarity protection for fool-proof installations

OTHERS

https://www.ledlinearusa.com
LED Linear tapes are produced with Reel-to-Reel (R2R) Technology in Germany

State of the art custom designed R2R tape manufacturing facility
100% automation
High production capacity - up to 2500 miles of tape annually
Precise batch control through QR coding
Low production failure rate (0.1 ppm)

https://www.ledlinearusa.com
LED Linear tapes are produced with Reel-to-Reel (R2R) Technology in Germany

**Advantage 2**

- Fully automated continuous process with in-line inspection
- No stairway-effect between cut-lengths
- Excellent thermal contact to heat sink
- Precision pick and place process
- Thin and homogeneous flexible material

- 18” tape sections are cut and soldered by hand
- Each solder point is a potential break point
- Poor thermal contact to heat sink
- Thicker and less flexible sheet material

https://www.ledlinearusa.com
The Tj-Away® (Thermal Junction Away) Technology is characterized by large copper areas below the LED, which ensure rapid heat dissipation and heat spread away from the LED.

Due to Tj-Away® we achieve thermal power densities less than 2.7 W/in² with electrical input power of 12.5 W/ft. This is 30% cooler than other’s tapes. Thin adhesive tape with superior heat conduction guarantees rapid heat transfer into aluminum profiles.
ADVANTAGE 3

LED Linear tapes have patented TjAway® thermal management technology

OTHERS

Copper Layer
Plastic
Adhesive Tape

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>70 µm</td>
</tr>
<tr>
<td>Plastic</td>
<td>120 µm</td>
</tr>
<tr>
<td>Adhesive Tape</td>
<td>50 µm</td>
</tr>
</tbody>
</table>

LED LINEAR™

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary* Material</td>
<td>170 µm</td>
</tr>
</tbody>
</table>

TjAway® Thermal Management

*No plastic used

LED-Junction Temperature Tj > 95°C

LED-Junction Temperature Tj < 65°C

https://www.ledlinearusa.com
One Bin Only stands for true color consistency within a 3 step MacAdams Ellipse located in the center ANSI bin.

During the standardized LM80 test cycle time of 10,000 hours the maximum color shift $\Delta u'v'$ is better than 0.001 (< 1 SDCM) which guarantees impressive color consistency over time.

The absolute CIE (x,y) drift stays well within a 3 step MacAdams ellipse and cannot be recognized by the human eye.
**ADVANTAGE 4**

LED Linear tapes have One Bin Only Technology for color consistency

### OTHERS 1

<table>
<thead>
<tr>
<th>CCT</th>
<th>Reported CCT Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,200 K</td>
<td>+/- 96 K</td>
</tr>
<tr>
<td>3,000 K</td>
<td>+/- 126 K</td>
</tr>
<tr>
<td>4,000 K</td>
<td>+/- 164 K</td>
</tr>
</tbody>
</table>

CIE (x,y) = +/- 0.005

### OTHERS 2

<table>
<thead>
<tr>
<th>CCT</th>
<th>Reported CCT Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,200 K</td>
<td>+/- 192 K</td>
</tr>
<tr>
<td>3,000 K</td>
<td>+/- 252 K</td>
</tr>
<tr>
<td>4,000 K</td>
<td>+/- 328 K</td>
</tr>
</tbody>
</table>

CIE (x,y) = +/- 0.010

### LED LINEAR™

<table>
<thead>
<tr>
<th>CCT</th>
<th>Reported CCT Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,200 K</td>
<td>+/- 39 K</td>
</tr>
<tr>
<td>3,000 K</td>
<td>+/- 56 K</td>
</tr>
<tr>
<td>4,000 K</td>
<td>+/- 78 K</td>
</tr>
</tbody>
</table>

CIE (x,y) = +/- 0.003

LED Color Initial Measuring Tolerance

https://www.ledlinearusa.com
**ADVANTAGE 5**

LED Linear spec sheets publish L/B Lifetime values for all tape products

**L Value**
Percentage of LED chips with initial lumen output at rated lifetime

**B Value**
Percentage of LED chips that will not deliver L value at rated lifetime

If a manufacturer does not state B Value, they accept at least 50% of the chips will fail to deliver L value at rated lifetime.

*The HYDRA series has a luminous flux of minimum 90% (L90) of the initial luminous flux within 60,000h, with 10% (B10) of the LEDs can be lower and thus consequently 90% are above at specification based conditions

https://www.ledlinearusa.com
ADVANTAGE 6

LED Linear spec sheets publish 6 Digit Photometric Code for all tape products

6 DIGIT PHOTOMETRIC CODE (IEC/PAS 62717):

Initial CRI: 77 – 86: 8
87 – 100: 9
Initial CCT: 2700 K: 27

Initial chromaticity spread within:
3 step MacAdams: 3
5 step MacAdams: 5

Lumen maintenance after 25% of rated lifetime, max. 6,000h

Chromaticity spread after 25% of rated lifetime, max. 6,000h

https://www.ledlinearusa.com
LED Linear tapes have minimal color shift over time

https://www.ledlinearusa.com
The LED LINEAR™ Advantages

LED Linear tapes are controlled by Integrated Circuit (IC) drivers.

LED Linear tapes are produced with Reel-to-Reel (R2R) Technology in Germany.

LED Linear tapes have patented TjAway Thermal Management Technology.

LED Linear tapes have One Bin Only Technology for color consistency.

LED Linear spec sheets publish L/B Lifetime values for all tape products.

LED Linear spec sheets publish 6 Digit Photometric Code for all tape products.

https://www.ledlinearusa.com