CONTACT: business@loomia.com for test reports or for additional information
The Loomia Electronic Layer (LEL) is a soft, flexible circuit that can easily be integrated into fabric for electronic textile applications.

We can implement several functionalities by designing the LEL using our patented patterning and integration methods.

As a specialty circuit, the LEL is ideal for applications where the integration between electronics and soft surfaces is critical such as medical wearables, automotive interiors, outdoor goods, and robotics.

The LEL is also unique because we use a highly durable, low-resistance mesh instead of traditional wires or conductive ink.

**Loomia Electronic Layer** Functionalities

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The list in the following page details the nominal performance ranges for various functionalities that we can achieve.
### Functionality

<table>
<thead>
<tr>
<th>Heating</th>
<th>HMI</th>
<th>Cabling</th>
<th>Pressure Sensing</th>
<th>Lighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>The LEL can be designed as a resistive heater. Our material has a positive thermal coefficient (PTC), which will avoid runaway heating. It can also be designed to conform to a variety of shapes, such as a foot, a hand, a steering wheel, and more.</td>
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<td>LEL cabling can be used for wearable technology applications where soft and flexible connections are needed. Our cabling will not crack or dramatically change resistance when elongated due to our unique conductor.</td>
<td>The LEL can be designed as a pressure matrix or single pressure sensor. Pressure matrices and sensors can be customized for unique shapes that will fit comfortably for specific applications. Sensor sensitivity to pressure can also be customized depending on your needs.</td>
<td>RGB and single-color LEDs can be embedded into the LEL for backlighting and point lighting applications.</td>
</tr>
</tbody>
</table>

### Key Feature

- Can avoid runaway heating as a PTC material
- Heating density example: 400W/m²
- Design can accommodate specific non-heating and heating zones for efficiency
- Performance: up to 200°F (93.3°C)
- Can often reach target temperature in under 1 min.
- Can integrate into flat surfaces, unlike wire-based heating methods
- Can be designed for up to 20% stretch.

- Mechanical switches are proprietary and flat
- Can be used while wearing gloves
- Do not risk false readings like capacitive switches
- Can be backlit
- Switch diameter can be customized
- Tested for 10,000 presses without failure (more testing possible upon request).

- Can be patterned to stretch up to 50% with minimal resistance change
- Can stretch 20% with no resistance change
- AATCC 135 wash tested for up to 50 cycles with acceptable resistance change
- Trace thickness can be adjusted to lower resistance and improve tensile strength

- Can integrate into flat surfaces, unlike wire-based heating methods
- Can be designed for up to 20% stretch.

- Pressure sensitivity can be adjusted from 0.1N to 100N depending on the application needs
- Shapes and sizes of both the sensor and leads can be customized
- Dead zones can be built into the sensor for applications where folding is necessary
- Can be customized as both single sensors and matrices.

- Voltage Range: 3.7–28 V
- Current Range: 1–6A
- Temperature Range: 140°F (60°C) – 200°F (93°C)
- Activated from 22–88 N
- Switches from 12–50mm in diameter
- Can be backlit
- Stretch up to 50% possible
- Density as low as 2.5 x 2.5 mm possible
- Compatable with I2C and SPI data speeds
- Can connect to a range of connectors from JST to USB to pogo pin
- 0.1N – 100N in readings
- Matrix density as small as 5 x 5mm possible
- 1V – 5V LEDs supported (can go higher as long as a heatsink is not needed)
- RGB Matrix as tight as 10 x 10 mm

### Example Applications

- Surface heating for Automotive Interior
- Heating for therapeutic products
- Heating for outdoor gear
- Smart surfaces for automotive interior
- User interfaces for consumer products
- Wearable Technology
- High efficiency antennas for wearable or consumer product applications
- Gloves for AR/VR
- Wearable Technology
- Robotic end effectors
- Pressure mats
- Ambient lighting for automotive interior
- HMI indication
- Safety apparel