



Nth-Light® ATTRIBUTES

UNIQUE FORM FACTOR:

- 1 Nth-Light is exceptionally lightweight, thin and flexible.
 - This facilitates the design of lighting fixtures with both traditional and non-traditional form factors that are a fraction of the weight and volume of traditional lighting fixtures.
- 2 Nth-Light is very robust and can absorb more shock and abuse than traditional lighting.
 - The Nth-Light contains no breakable glass or brittle plastics.
 - It's flexible, so it bends instead of breaks.
- 3 The robustness of the Nth-Light opens many design possibilities, such as eliminating the need for replaceable components like the "bulb" in old traditional lights. The Nth-Light itself becomes one with the fixture. For example:
 - A ceiling tile might have an integrated Nth-Light lighting panel.
 - Nth-Light panels may be integrated into the bottom of a shelf for under-shelf lighting.
 - A lamp shade may have any integrated lamp that can connect to a traditional Edison bulb electrical base.
- 4 Nth-Lights are flat, but need not be square. Nth-Lights can be printed in a variety of shapes. Alternatively, since Nth-Lights are flat, a blocking mask may be installed over the lamp to produce the desired lit shape. If the light must still be flexible, the blocking mask may be as flexible as the Nth-Light substrate.
 - Features like graphics or colored fluoressors can be cost effectively added to the lights as translucent overlays or even directly printing on the light.
- 5 Nth-Lights are very attractive for shelf lighting
 - Brand colors will not be impacted.
 - Light can be curved for a shaped shelf.
 - Easy to install.
 - Reduced heat.
 - Not likely to be damaged in the product restocking process.
 - No dead spots associated with LED failure.
 - The simple build (little electrical infrastructure) allows for easy inventory control.
- 6 Nth-Light's unique attributes open up opportunities for designers and architects they have never considered as even possible before.
- 7 The Nth-Light may be laminated to a radius surface or other customized surfaces or shapes.
- 8 Intelligent lighting control technologies, such as motion/occupancy detection and light harvesting, may be easily integrated into Nth-Lights.
 - Nth-Lights are readily dimmable using a variable current power supply.



DISTRIBUTED LIGHT SOURCE:

- 9 Nth-Light is a distributed light source.
 - Traditional bright LEDs are point sources that produce blindingly bright narrow beams of light. NthLight light is spread out over the entire surface of the printed lamp to provide the same amount of light as a point source LED, but with a tunable surface brightness from 10s of candela/m² to as much as 10,000 candela/m².
 - Nth-Light prints hundreds of micro-LEDs to provide the equivalent light of a single high brightness LED.
 - Native color of the Nth-Light is 450nm centered blue light. Other colors or white light in a range of warm to cool colors are available using an additional phosphor overprinted on the Nth-Light.
- 10 Nth-Light is volumetric.
 - Because Nth-Light's tiny light sources are spread across large surfaces, the light readily fills the volume of space in front of and adjacent to the lamp with a soft, diffuse, low glare light.
- 11 Nth-Light naturally emits Lambertian light from its surface to produce appealing uniform light.
 - This enables Nth-Light ceiling fixtures to fill a room with light all the way to the top of a wall, effectively using all the wall surfaces in a room as reflectors to increase lighting uniformity by reducing shadows, while keeping the Nth-Light itself razor thin.
 - Traditional LED and fluorescent lighting fixtures sources need elaborate, thick, heavy and bulky reflectors to achieve the same desirable effect.
- 12 Because the micro-LED light sources are distributed over the entire surface of the lamp, there is very little heating at the lamp surface.
 - This eliminates the need for heat sinks, which are required in traditional LED lighting systems.
- 13 A lit un-insulated, bare Nth-Light panel may be touched without concern for shock or burn. Nth-Lights operate at safe class 2 voltages.



LOWER TOTAL COST OF OWNERSHIP:

- 14 Because Nth-Light lamps are almost always smaller and lighter than existing equivalent fixtures, designing of retrofit fixtures is made easy by using Nth-Light technology.
 - Compact and light-weight retrofit designs result in simplified logistics when retrofitting because of easy and quick handling and installation.
 - Less down time in busy work place areas or where advertising is critical such as duty free stores or fast food outlets.
- 15 Nth-Light is exceptionally lightweight, thin and flexible.
 - The low mass and volume of Nth-Light translates into cost savings in both handling and installation costs of Nth-Light based lighting fixtures. Multiple Nth -Light panels can be transported in the same space required to transport a single traditional fixture.
- 16 The Nth-Light does not require a rigid support, unlike traditional LEDs that require a rigid PCB. With less to design around, there are more degrees of freedom to design.
- 17 Nth-Light offers the possibility of eliminating at least one BOM.
- 18 Any number of materials may be easily applied with adhesives to the back of the Nth-Light flexible substrate, such as laminates, foil backing or even flexible magnet tapes.
- 19 The amount of packaging required for the light is only a fraction of existing lights. This saves space and reduces shipping costs and waste disposal of the packaging.
- 20 The component parts are capable of being recycled.
- 21 The Nth-Light is single sourced, unlike other forms of lighting, which come from multiple sources and may have unequal quality levels.

Nth-Light®

PRINTING THE IMPOSSIBLE™