

## Multifunctional 3D Specifications

Technical specifications to support press release dated 13 July 2021 from NIL Technology.

**Copenhagen, Denmark, 13 July 2021.** NIL Technology (NILT), a leader in advanced optical solutions, is launching its highly advanced flat optics technology platform for near-infrared (NIR) emitters used in 3D sensing and LiDAR. Find below the technical specification of the flat, multifunctional optics platform that is presented. Link to the press release is [here](#).

### Flat optics technology platform for near-infrared (NIR) emitters

NILT developed proprietary design algorithms to optimize optical efficiency and maximize performance.

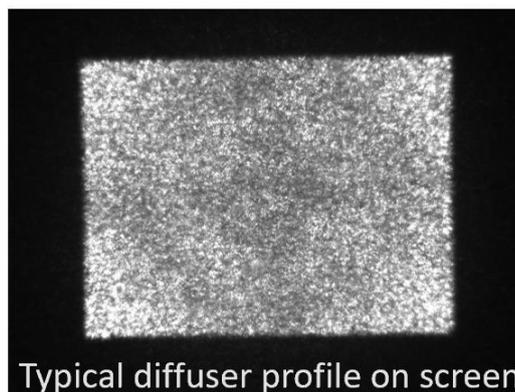
#### Diffusers for flood illumination

Field of Illumination (Fol) efficiency	Higher than 85%
Field of Illumination (Fol)	Higher than 90° diagonal possible
Control of illumination, steep edges	From 90% intensity to 10% intensity in less than 1°
Zero order transmission*	Less than 0.1%
Light profile	Customized to spec, typical batwing profile to match sensor

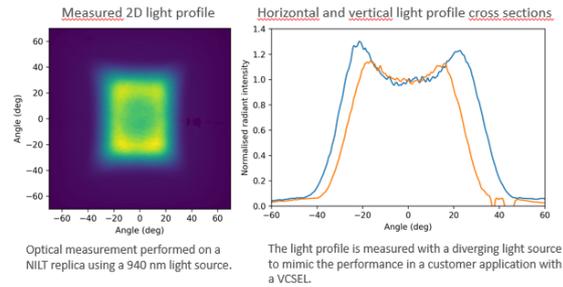
\* This means that more than 99.9% of the light passing through the diffuser is diffused, and the zero-order is fully suppressed.

#### Examples

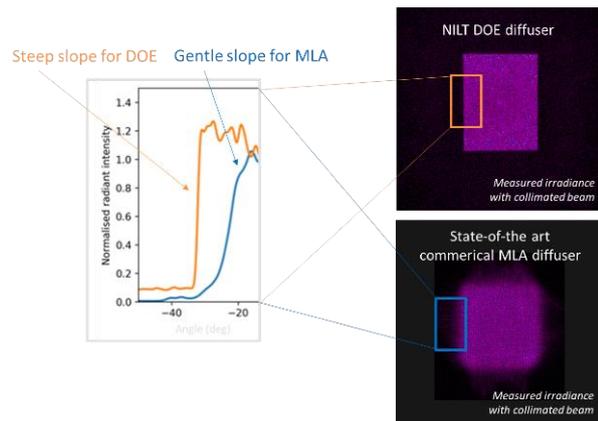
Typical diffuser profile on screen. Here is an example using a 940 nm light source



Diffuser intensity and light profile using a 940 nm diverging light source. Batwing profile diffuser performance.



Diffuser intensity and light profile using a 940 nm collimated light source. Batwing profile diffuser performance. DOE to typical MLA diffuser comparison.



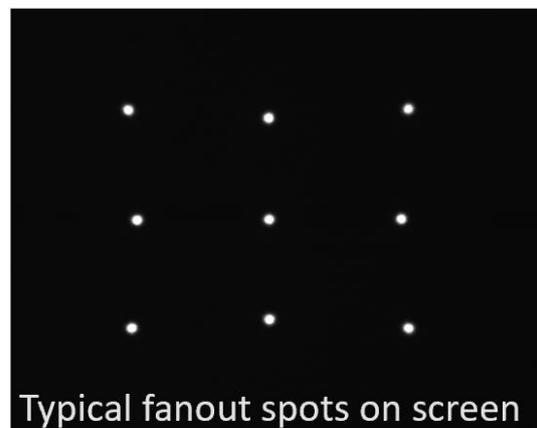
### Fan-out grating for spot illumination

Field of Illumination (Fol) efficiency	Higher than 85%
Multi-spot patterns (arrays)	MxN, M=1,2,3... and N=1,2,3...
Stitching	Not detectable
Dot/array non-uniformity	Less than 10%
Polarisation**	Controlled polarisation: Independent or dependent performance

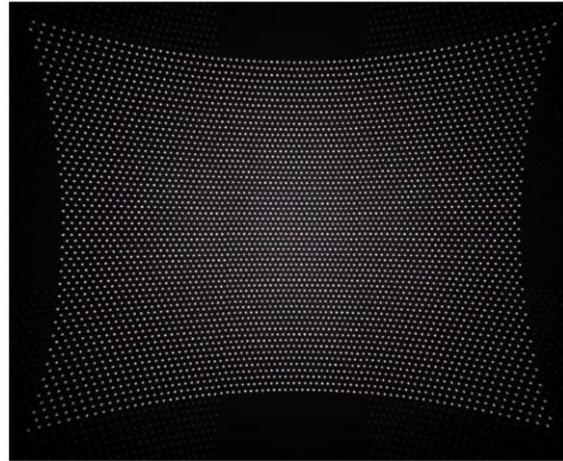
\*\* Fanouts can be made both to polarized and non-polarized light sources

### Examples

940 nm fan-out (3x3) demonstrated using a collimated light source.



Proven dot pattern of 940 nm VCSEL array project through a DOE collimator and 3 x 3 fan-out DOE.

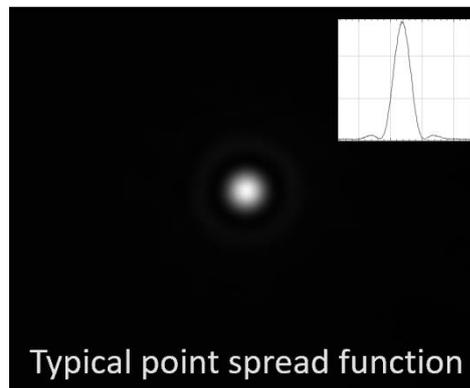


### Collimators for VCSEL sources

Collimation efficiency	Higher than 85%
Focal distance tolerance	Better than 5 $\mu\text{m}$
Beam divergence	Very low
Design	Tailored to specific VCSEL array

#### Example

Typical point spread function using a DOE collimator. Here demonstrated at 940 nm.



Read more about our diffractive optical elements [here](#)

### ABOUT NILT

NIL Technology (NILT), founded in 2006, is an optical solutions company designing, developing, and manufacturing optical elements and components using high-precision nanoscale features. The company is backed by several industry independent investors: Jolt Capital, NGP Capital, Swisscanto, Vaekstfonden, and the European Innovation Council (EIC). NILT creates competitive advantages with flat optics in optical applications for 3D sensing, consumer electronics, machine vision, autonomous vehicles, and VR/AR displays; all solutions made by diffractive optical elements (DOE) and metalenses/meta optical elements (MOE). NILT is based in Denmark and has offices in Switzerland, Sweden, and the US.

[www.nilt.com](http://www.nilt.com) | Sign up for [newsletter](#) | Follow us on [LinkedIn](#)