



DBM REFLEX®

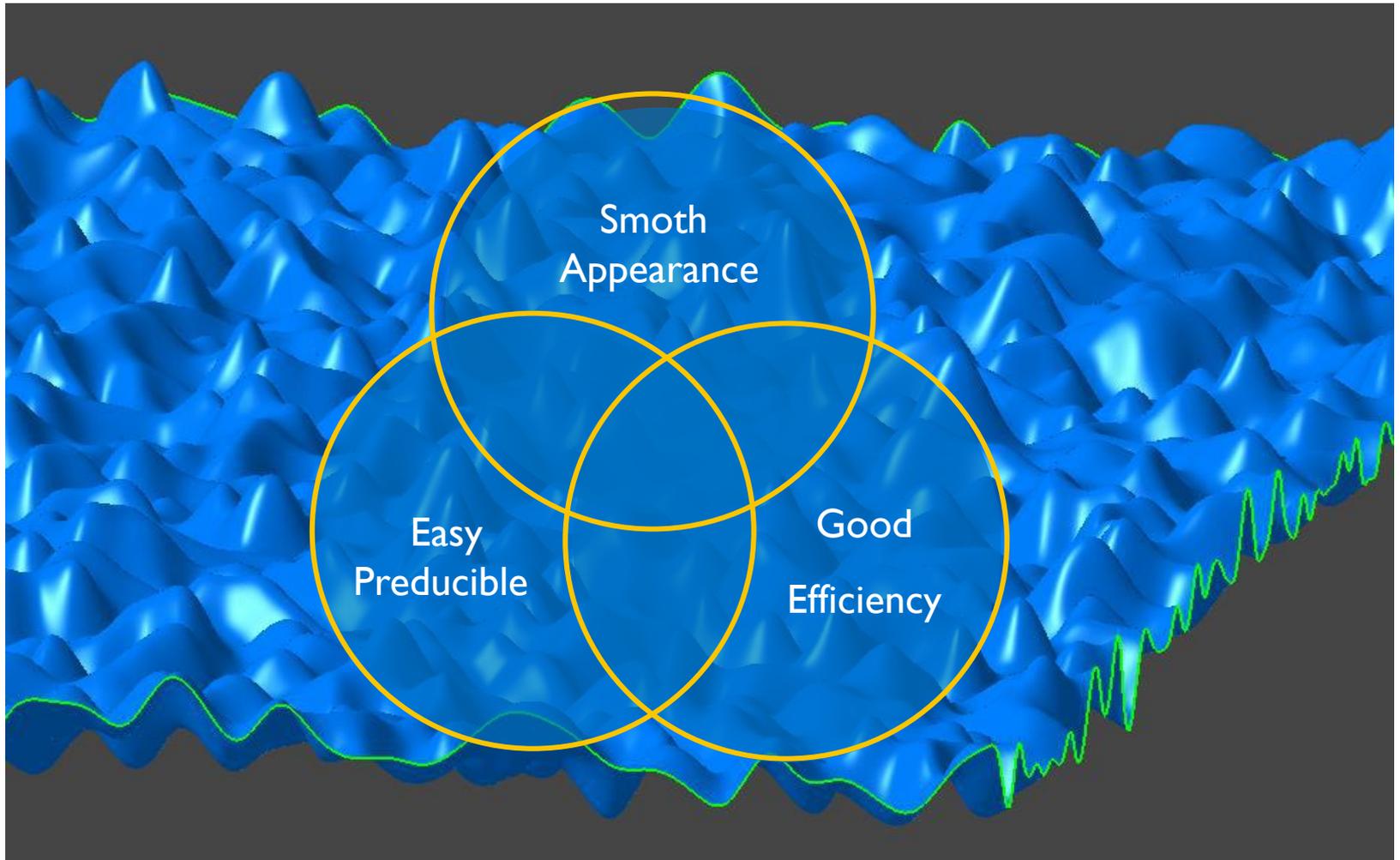
**Texilit- an engineered refractive
light diffuser, designed for
injection molding**

August 2023

Homogeneous Light Signatures



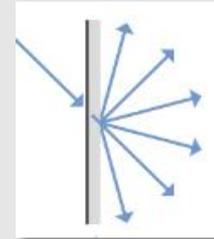
Diffuser Requirements



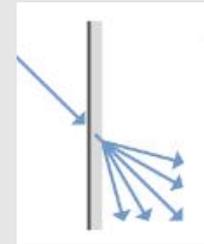
Diffusing Light

Common methods to diffuse light

- **Chemical etching / Erosion** microscopic surface irregularities created by chemical solutions. Light passing through this irregularities gets scattered resulting in a more uniform and less directional distribution.
- **Volume Scattering** light is scattered by particles inside a medium, e.g. colloidal suspensions.
- **Refractive optics** with (quasi-) randomly structured surfaces. Surfaces that scatter the light in a controlled manner. The light distribution is generated refraction in a micro-structure of several ten to hundred micrometers.
- **Diffractional diffusers**, where each light beam obtains a (quasi-)random phase change but does not undergo multiple random scatterings. The scattered light distribution can be controlled using a suitable design of the holographic pattern.



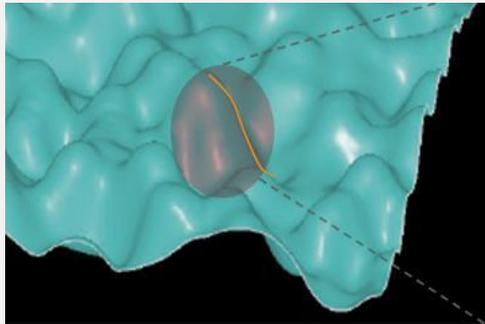
Lambert scattering



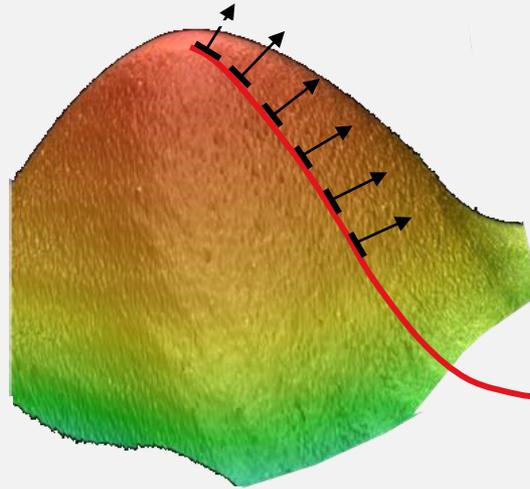
Directed scattering

Texilit Refractive Light Diffuser

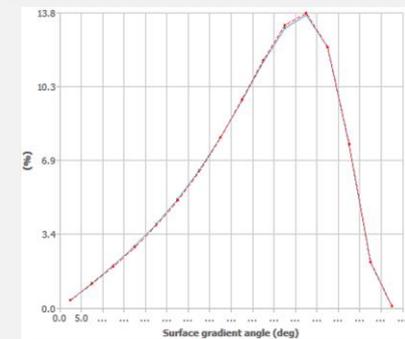
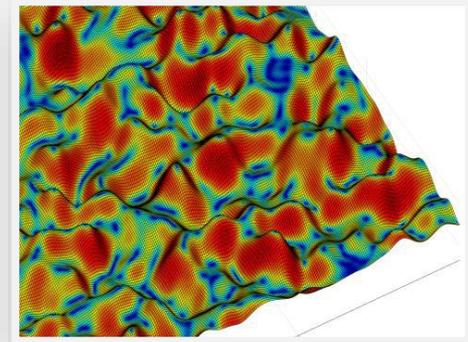
An algorithm calculates randomly distributed structures with determined slope angles. The slope refracts the light towards the desired angular distribution and thus defines the spread of the light.



Texilit Structure



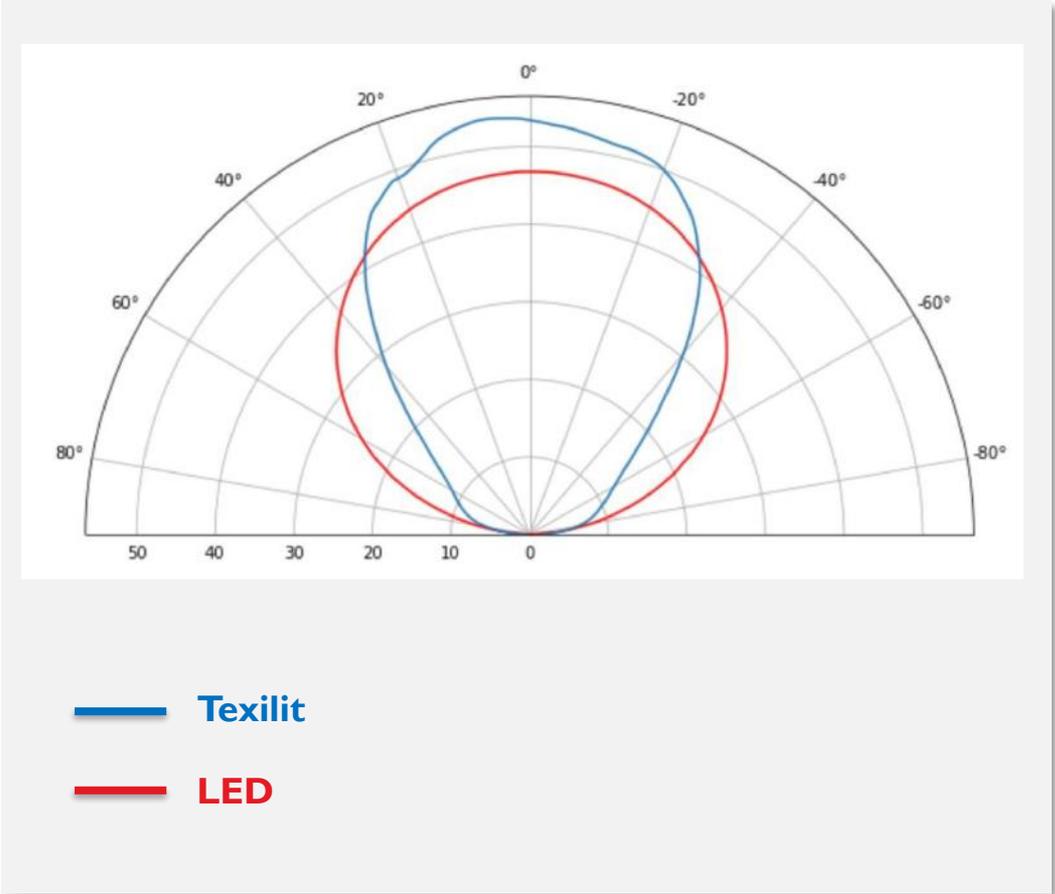
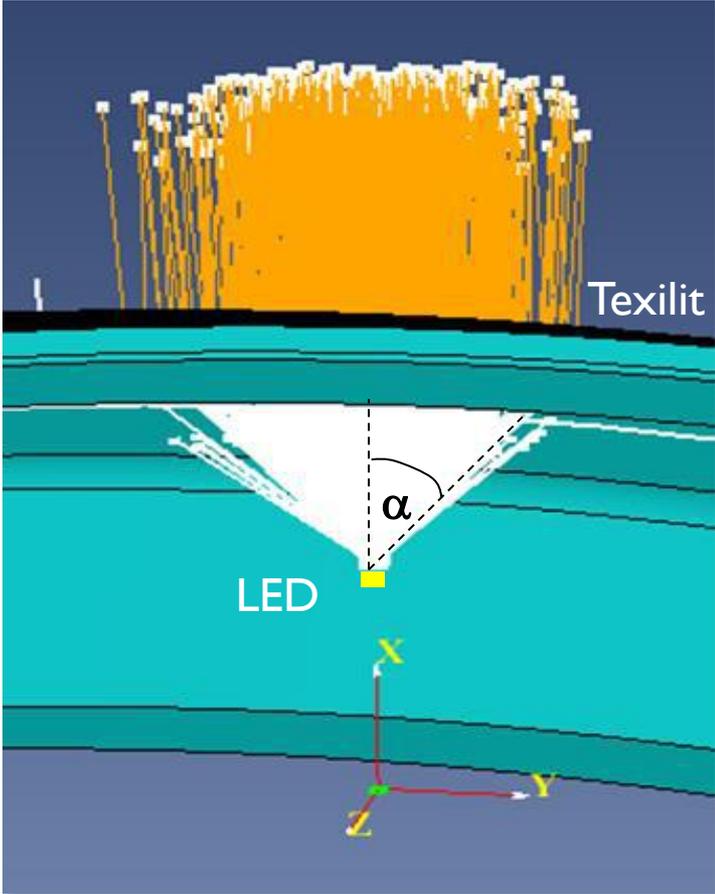
Single Structure element



Distribution of slope angles

Texilit Light Diffusion

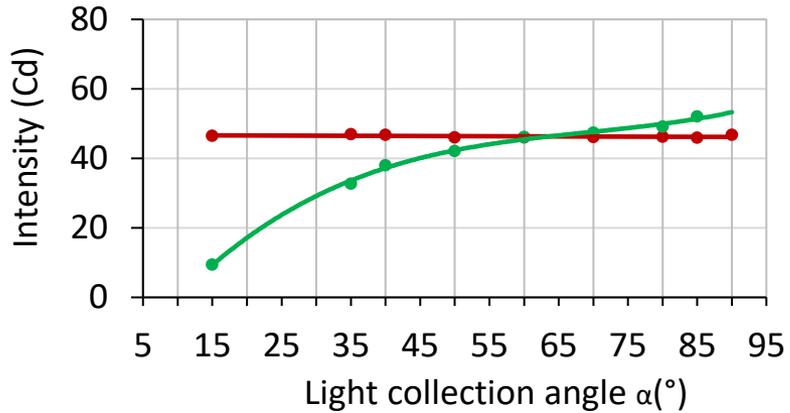
Texilit is a light guiding diffuser



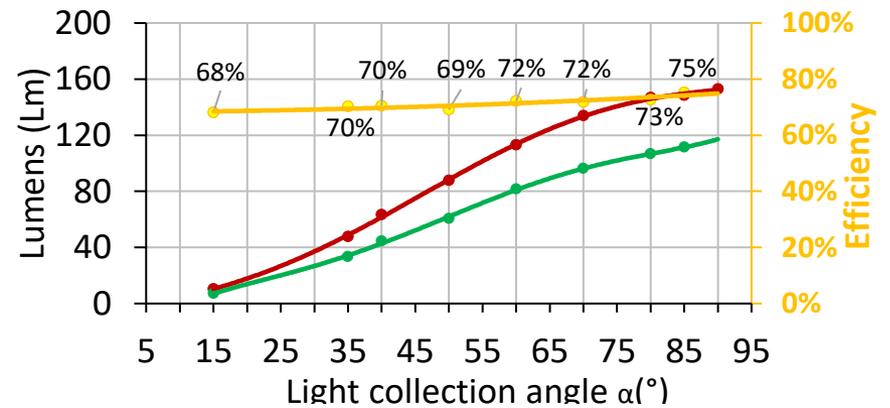
Texilit Efficiency

● Led
 ● Led+Texilit
 ● Efficiency of texilit

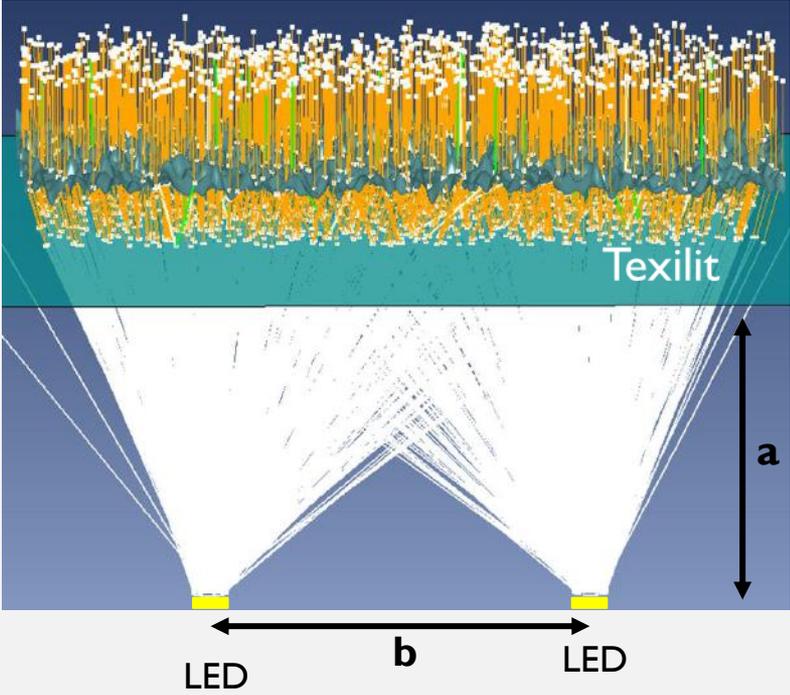
Max intensity(Cd) vs Light Collection Angle



Lumens vs Light Collection Angle



Texlilit Positioning of the Light Diffuser

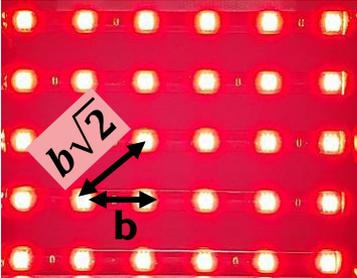


Positioning of Texlilit

$$\frac{a}{b} \geq \frac{1.5}{1}$$



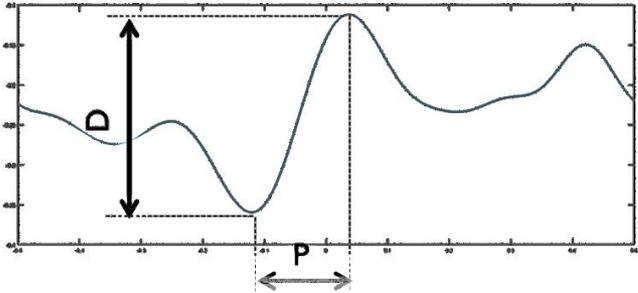
For LED Matrix configuration the diagonal LED distance has to be considered



Texilit Variability

Different Structures, Similar Optical Properties

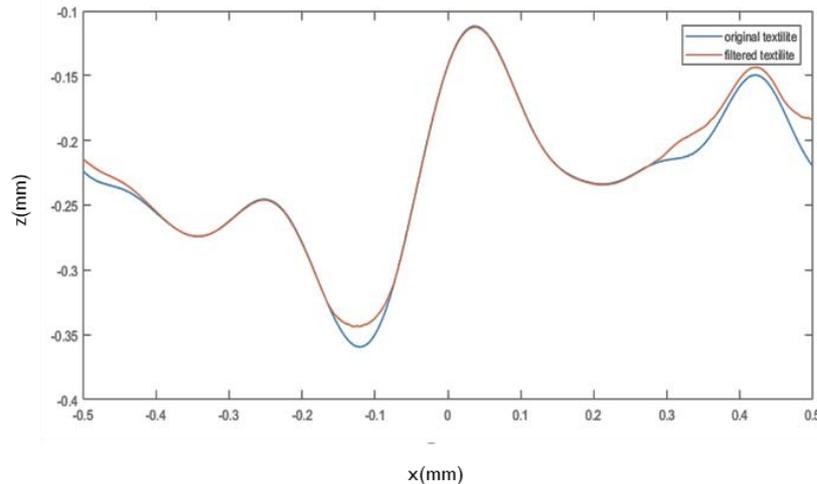
Product	Unlit Appearance
Texilit 60-65	
Texilit 60-110	
Texilit 60-340	



Product	P (Mean)	D (Mean)
DBM 60-65	65 μm	0.3 mm
DBM 60-110	110 μm	0.5 mm
DBM 60-340	340 μm	1.55 mm

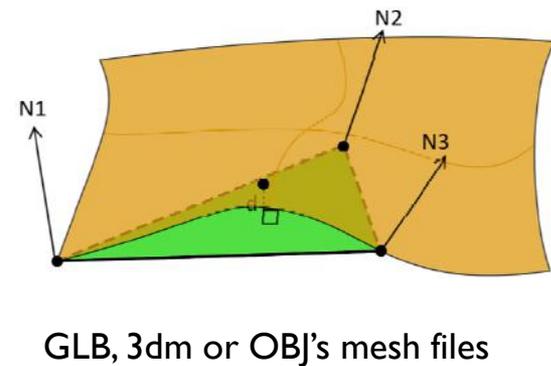
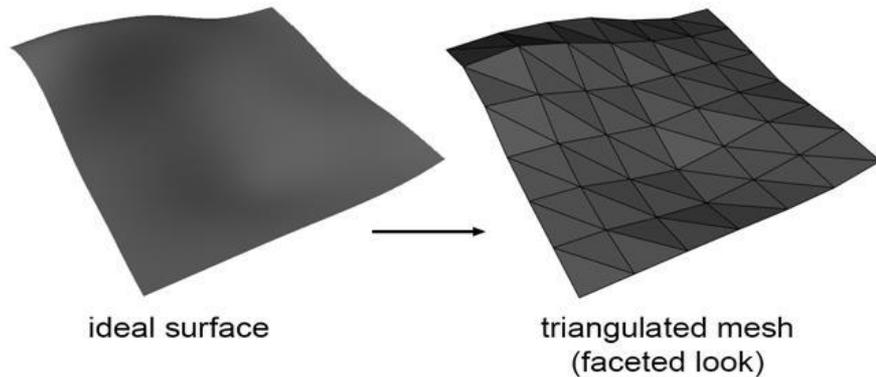
Design for Producibility

- The Texilit tool insert is manufactured by creating an electroform over a master
- Texilit is engineered based on a molding direction.
- Mathematical filters are applied during the calculation of the structure to prevent undercuts.
- Injecton molding can be performed with standard technologies:
 - No vacuum molding
 - No compression molding
 - No variotherm molding



Simulation of Texilit

- BSDF file for SPEOS and Lucidshape is available.
- The Texilit surface can be supplied as a mesh file in .glb, .obj or .3dm format (compatible with SPEOS and Lucidshape). A mesh file is highly recommended for surfaces with small curve radii.

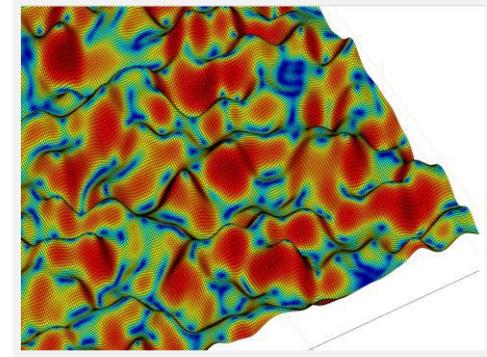


Prescription Options

Circular
Diffusion



Light Distribution

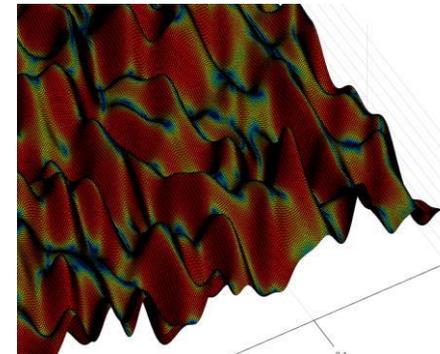


Texilit Structure

Elliptical
Diffusion

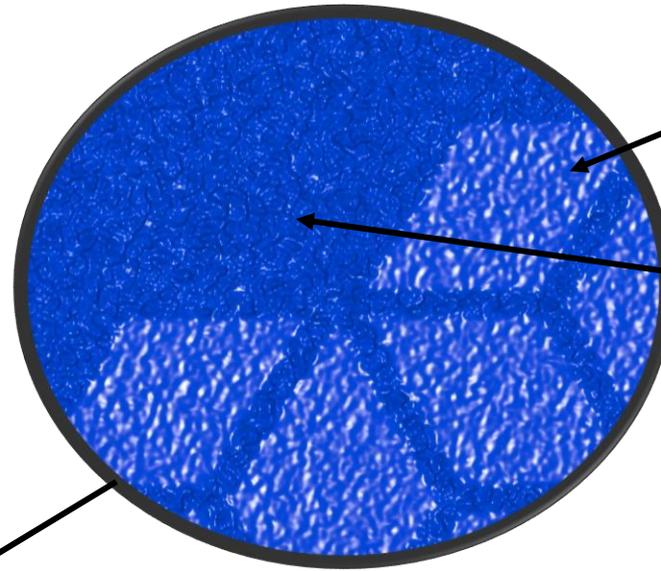


Light Distribution



Texilit Structure

Imprint Logo via Texilit Variation



Texilit 5° circular

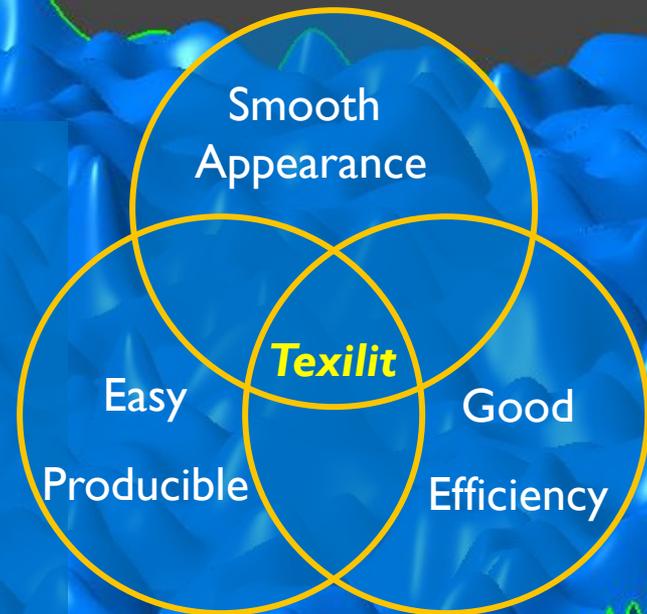
Texilit 60° circular



Diffuser Requirements - Conclusions

TEXILIT

- Generates a homogenously lit surface
- Is available in different granularity
- Good optical efficiency
- Variation in diffusing angles possible (circular, elliptic)
- Optimized for injection molding replication
- Can be simulated using by using either BSDF files or a mesh



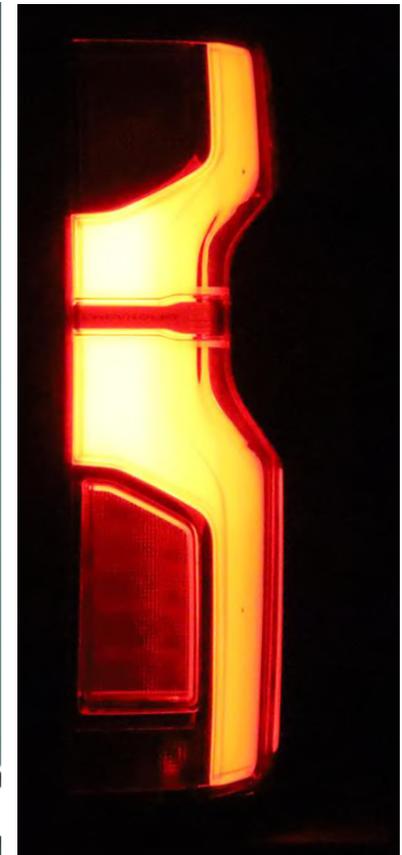
Examples for Applications

GMC Sierra HD 2024



Lamp developed by Magna

Chevrolet Silverado HD 2024



Lamp developed by Magna