

# LightGate™ – TIR Prism for DLP™ Projection

## LightGate™

LightGate™ – the Total Internal Reflection (TIR) prism from Unaxis is used to separate the illumination and imaging path in digital light processing (DLP™) based light engines particularly for rear projection TVs. The LightGate™ is a key component for maximum contrast, high light throughput and highly uniform images. It enables on-axis illumination and compact designs. The LightGate™ from Unaxis is characterized by high performance AR coatings, superior quality of blackening and a tightly controlled air gap.



## Benefits

- High performance AR allows higher acceptance angles which maximizes light throughput
- Highest contrast by excellent surface quality and superior blackening of nonactive surfaces and chamfers
- Customized masking on any surfaces offer even higher contrast
- Lowest image distortion by tightly controlled air gap
- Tight color control by neutral spectral characteristics
- High environmental durability and mechanical stability
- Further integration of lenses and additional mechanical fixtures
- Fast prototyping and customized designs

## Applications

Unaxis Optics LightGate™ is designed to meet the demanding needs of Projection Displays based on the DLP™ technology. LightGate™ can be employed in all DLP™ based 1-chip and 3-chip designs. The advantages offered by the LightGate™ compared to

other designs are especially beneficial for rear PTV applications, particularly the on-axis illumination and a compact engine design.

## Technical Data

### Dimensions

Customized, tolerances typically  $\pm 0.1$  mm

### Material

BK7 or equivalent

### Flatness

3 fringes per inch at  $\lambda$  633 nm

### Scratch/dig

60/40

### Transmission

see figure below

other specifications on request

### Assembly

Per customer requirement, including lens or complete sub assemblies

### Environmental resistance and durability

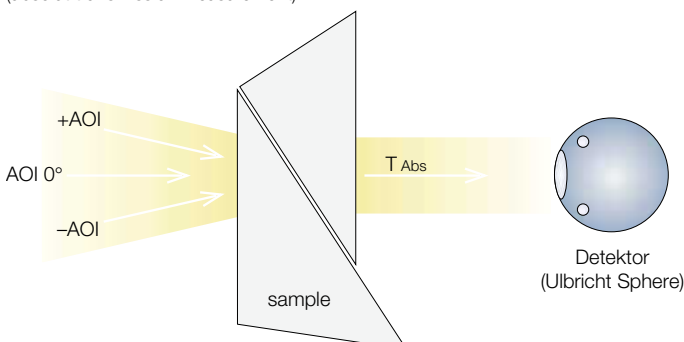
Operating temperature  $-10$  °C to  $+50$  °C

Storage temperature  $-20$  °C to  $+65$  °C

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## Description of Measurement Method

(absolut transmission measurement)

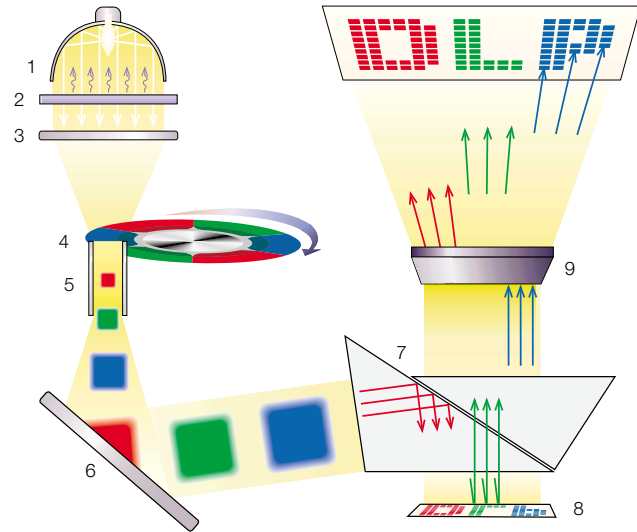


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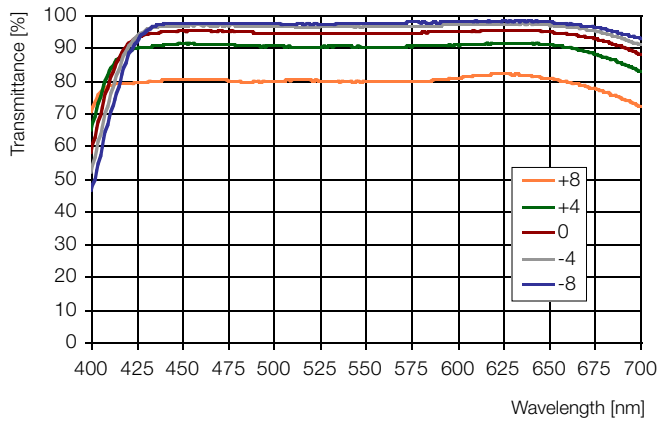
## Optics



### Schematic of DLP™ brand projector showing ColorWheel™, LightTunnel™ and LightGate™

1. Lamp with Cold Light Reflector
2. UV-Blocking Filter
3. Field Lens
4. ColorWheel™
5. LightTunnel™
6. SILFLEX-VIS™
7. LightGate™
8. DMD™ (Digital Micromirror Device™)
9. Projection Lens

### Absolut transmission of imaging path for AOI = ±8, ±4 and 0 degrees



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