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 ± 0.1 mm

**Material**
BK7 or equivalent

**Flatness**
3 fringes per inch at λ 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

Description of Measurement Method
(absolut transmission measurement)

+AOI
AOI 0°
−AOI

Sample

Detektor (Ulbricht Sphere)
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