Introduction of WGF™
Wire grid polarizer film

Asahi Kasei E-materials Corporation
Electronics & Functional Products Division
WGF Project
What is WGF™?

"WGF™" is the world's first wire grid polarizer based plastic films. It has a high polarization separation performance in the broad wavelength range by using metal nano-size wires. Furthermore, it has excellent heat resistance compared to a typical absorption polarizer.

Asahi’s Original Technology

- Continuous roll to roll nano-imprint process
- Nano-size structure (100nm pitch Al wire grid)

P wave: Transmitted
S wave: Reflected

Substrate: TAC (Tri-Acetate Cellulose) 80um

100nm-size Aluminum wire pitch

SEM image (plane view)
SEM image (cross section view)
Optical performance of HC & HT grade

You can choose either standard grade, HC (High Contrast) or HT (High Transmittance) to suite your need. The Adhesive on a backside of substrate is also available.

<table>
<thead>
<tr>
<th>Type</th>
<th>grade</th>
<th>450nm</th>
<th>550nm</th>
<th>650nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Transmittance</td>
<td>HTN (no-adhesive)</td>
<td>89%</td>
<td>90%</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>HTU (with adhesive)</td>
<td>0.27%</td>
<td>0.13%</td>
<td>0.08%</td>
</tr>
<tr>
<td>High Contrast</td>
<td>HCN (no-adhesive)</td>
<td>82%</td>
<td>85%</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>HCU (with adhesive)</td>
<td>0.04%</td>
<td>0.02%</td>
<td>0.01%</td>
</tr>
</tbody>
</table>

* Incident angle 0 deg  * No AR coating on WGF
Product size & Composition

Sheet size

Type. 1  Standard model  240x80mmx2windows

Type.2  developing 120x180mmx2windows

Composition

XXN grade; no-adhesive

<table>
<thead>
<tr>
<th>Protection film(for TAC)</th>
<th>110μm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate(TAC)</td>
<td>80μm</td>
</tr>
<tr>
<td>WG layer</td>
<td>&lt;1μm</td>
</tr>
<tr>
<td>Protection film(for Al)</td>
<td>110μm</td>
</tr>
</tbody>
</table>

XXU grade; with-adhesive

<table>
<thead>
<tr>
<th>Separator</th>
<th>110μm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesive</td>
<td>25μm</td>
</tr>
<tr>
<td>Substrate(TAC)</td>
<td>80μm</td>
</tr>
<tr>
<td>WG layer</td>
<td>&lt;1μm</td>
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</table>
Optical performance of HC at oblique incident

Tp & Ts, Rp & Rs at oblique incident
Reliability

Optical performance of WGF before and after environmental tests

Heat and humid resistance @60degC/90%RH/1500hr)

Heat resistance (105degC/dry/1000hr)
Reliability

Optical performance of WGF before and after light resistance test

Sunshine weather meter 255W/m²/BPT63degC/spray free

Graphs showing optical performance of WGF.
Optical performance in NIR range

WGF can polarize effectively in a wide range from Visible to NIR.
Summary

Feature

- Reflective polarization film without absorption loss
- Flexible & excellent processability for cutting and laminating
- Less incidence dependence
- Effective in a wide range from Visible to NIR
- Excellent durability in a hard environment as high temperature (105degC/dry/1000hr) and humidity (60degC/90%RH/1500hr)

Applications

- EVF (Electric View Finder)
- Optical parts for HMD, head mounted display)
- HUD, Head-up display
- Noise reduction and anti-reflection of IR sensor
Contact us

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