PLEXIGLAS® & EUROPLEX® films for Self-Adhesive Tapes

Do not loose your face!

SEPT, 2013
Version 1
Many synthetic polymers are attacked by UV radiation and products made using these materials may crack or disintegrate. The problem is known as *UV degradation*, and is a common problem in products exposed to sunlight.

**PLEXIGLAS® films & EUROPLEX® films**

Boost the performance of your tapes in outdoor applications!
Do not lose your face!

**PLEXIGLAS® films**

**Acrylic film**

- **Durability**: High UV and Weather Resistant
- **Protection**: UV blocking
- **Functionality**: Aesthetic, High Transparency, Lightning, Safety, Good Printability, Easy Processability

**EUROPLEX® films**

**Co-extruded PVDF/Acrylic film**

- **Durability**: High UV and Weather Resistant
- **Protection**: UV blocking, Chemical resistance
- **Functionality**: Easy to clean, Good Back side Printability, Easy Processability
Do not loose your face!

PLEXIGLAS® films
EUROPLEX® films

Durability
High UV and Weather Resistance

High durability in outdoor applications
No color change, yellowing or color fading under long term outdoor exposure.

Accelerated weathering resistance (ISO 4892-2 method A, cycle 1, 65% RH)

| PLEXIGLAS® 0F014 | Clear, Glossy | 5.000 hs | aprox. 5 years |
| PLEXIGLAS® 0F041 | Clear, Glossy | 5.000 hs | aprox. 5 years |
| PLEXIGLAS® 0F016 | Clear, Glossy | 8.000 hs | aprox. 8 years |
| PLEXIGLAS® 0F040 | Clear, Glossy | 8.000 hs | aprox. 8 years |
| PLEXIGLAS® WF002 | White | 10.000 hs | aprox. 10 years |
| PLEXIGLAS® 0F032 | Matt | 12.000 hs | aprox. 12 years |
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PLEXIGLAS® films
EUROPLEX® films

Durability
High UV and Weather Resistance

High durability under temperature changing
Service Temperature in between -40°C and +85°C without fading or color changing.

Yellowing Index  (ISO EN 410)

<table>
<thead>
<tr>
<th>Material</th>
<th>After 2,000hs 38°C, 55-65% rh</th>
<th>After 1,750hs 85°C, 85% rh</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLEXIGLAS® 0F016</td>
<td>0,80</td>
<td>3,04</td>
</tr>
<tr>
<td>PLEXIGLAS® 0F014</td>
<td>0,90</td>
<td>3,04</td>
</tr>
</tbody>
</table>
Do not lose your face!

PLEXIGLAS® films
EUROPLEX® films

Protection
UV Blocking

PLEXIGLAS® and EUROPLEX® are able to block UV radiation in between 98% up to 99.8% at wavelength 280 – 380 nm.

Substrate protection
PLEXIGLAS® and EUROPLEX® protect other polymeric substrates against degradation caused by UV radiation.
Do not loose your face!

Protection - UV blocking

Spectral transmittance from PLEXIGLAS® film 0F008, thickness: 53 µm

~99%
Do not lose your face!

**Protection - UV blocking**

Calendered PVC Film protected by EUROPLEX® Film HC 99710

<table>
<thead>
<tr>
<th>Exposure time (h)</th>
<th>0</th>
<th>48</th>
<th>96</th>
<th>144</th>
<th>192</th>
<th>240</th>
<th>288</th>
<th>336</th>
<th>384</th>
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</thead>
<tbody>
<tr>
<td>PVC-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>PVC-1/HC 50 μm</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PVC-1/HC 30 μm</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC-2</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PVC-2/HC 50 μm</td>
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<td></td>
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</tr>
<tr>
<td>PVC-2/HC 30 μm</td>
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</tr>
</tbody>
</table>

**Weathering Test**

Super UV-Tester SUV-W11
Black Panel Temperature: 63°C
Intensity: 83mW/cm²; 300-400 nm
Relative Humidity: 60% rh
Do not lose your face!

Protection - UV blocking

High Pressure Laminates protected with PLEXIGLAS® 99836

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>1.000hs</th>
<th>2.500hs</th>
<th>5.000hs</th>
<th>7.500hs</th>
<th>10.000hs</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protected by PLEXIGLAS® 99836</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Test method:

Xenotest® BETA LM
DIN EN ISO 4892-2, method A, cycle 1
60 W/m² +/- 2 W/m² energy (300 – 400 nm)
65 °C +/- 3 °C black standard temperature
102 / 18 minutes dry / wet cycle
65% +/- 10% rel. humidity (during dry cycle)
38 °C +/- 3 °C sample room temperature
PLEXIGLAS® and EUROPLEX® are able to block UV radiation at wavelength in between 280 – 380nm therefore pigments not stable at low light will be attacked.

Pigments >6 on blue scale or >5 on grey scale are recommended.

High Pressure Laminates protected by EUROPLEX® HC 99716

Non low light stable pigments

![Initial Sample](image1) ![2.000hs](image2)

Low light stable pigments

![Initial sample](image3) ![2.000hs](image4)
Functionality

Aesthetic

Color Stability
No color change or fade out for long term under UV light exposure.

Coatings & Metallization
The films can be coated by a wide variety of coatings methods or metallization by roll-to-roll process.

Different colors and surface finishing available
- High transparent
- Gloss, Matt, One side matt / One side gloss
- Transparent or Colored
- Light Scattering
- Embossed structures
- Opaque or Translucent
Colorless PLEXIGLAS® has a light transmission of up to 92%. Clear Optical Quality.

Spectral transmittance from PLEXIGLAS® film 0F008, thickness = 53 µm

~92%
Do not loose your face!

Functionality

Lightning

Light Guide film

PLEXIGLAS® 0F058 is able to guide the light coming from small LED’s sources for long distances.

Thicknesses: 200 µm, 375µm and 500µm
Width: 1.270 mm
PLEXIGLAS® films

Functionality

Safety

Holograms
PLEXIGLAS® films provides a high optical quality for holograms.

Coatings & Metallization
The films can be coated by a wide variety of coatings methods or metallization by roll-to-roll process.

Destructible
Brittle acrylic films can be produced in order to be used as destructible material.

Destructible and UV Resistant Acrylic Films  (ISO 527-3)

<table>
<thead>
<tr>
<th>PLEXIGLAS® WF006 white</th>
<th>Elongation MD</th>
<th>Tensile Strength MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLEXIGLAS® WF007 white</td>
<td>7%</td>
<td>49 Mpa</td>
</tr>
<tr>
<td>PLEXIGLAS® 0F058</td>
<td>25%</td>
<td>41 Mpa</td>
</tr>
<tr>
<td></td>
<td>6%</td>
<td>88 Mpa</td>
</tr>
</tbody>
</table>
**EUROPLEX® films**

**Functionality**

**Easy to Clean**

PVDF Polyvinylidene Fluoride Top Layer
Surface Tension: 23mN/m (DIN 53364)
Due to its very low surface tension, PVDF provides:

- Easy to clean or “Anti-graffiti” effect
- Anti-Soiling effect

EUROPLEX® HC 99710 50µm 45µm PMMA layer + 5µm PVDF top layer
EUROPLEX® HC 0F052 80µm 72µm PMMA layer + 8µm PVDF top layer
**EUROPLEX® films**

**Functionality**

**Chemical Resistance**

PVDF Polyvinylidene Fluoride Top Layer

<table>
<thead>
<tr>
<th>Substance</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inorganic Acids</td>
<td>Excellent</td>
</tr>
<tr>
<td>Organic Acids</td>
<td>Excellent - Moderate for Acetic Anhydride</td>
</tr>
<tr>
<td>Alkali</td>
<td>Excellent</td>
</tr>
<tr>
<td>Hydrocarbons</td>
<td>Excellent - Very Good for Benzene</td>
</tr>
<tr>
<td>Halogenated HC</td>
<td>Excellent</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Excellent</td>
</tr>
<tr>
<td>Ester</td>
<td>Very Good - Good</td>
</tr>
<tr>
<td>Ketone</td>
<td>Good</td>
</tr>
<tr>
<td>Amine</td>
<td>Very Good - Good</td>
</tr>
<tr>
<td>Aldehyde</td>
<td>Very Good</td>
</tr>
<tr>
<td>Ether</td>
<td>Very Good - Good</td>
</tr>
<tr>
<td>Cyanide</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

1: Excellent  
2: Very Good  
3: Good  
4: Moderate
Do not lose your face!

PLEXIGLAS® films
EUROPLEX® films

Functionality
Easy Processability

No plasticizer
No migration over the time!

Roll-to-roll processability
Pressure Sensitive Adhesives can be applied directly onto the films by roll-to-roll process.
Do not loose your face!

**Functionality**

**Easy to Print**

High Quality and Graphic Printings
PLEXIGLAS® has a Surface Tension of 50mN/m (DIN 53364)

PLEXIGLAS® films can be printed by roll-to-roll technologies such as:
- Digital printing
- Flexography
- Gravure printing
- Screenprinting

EUROPLEX® is suitable only for back-side printing – on PMMA side.
Do not loose your face!

UV Flexography printing on PLEXIGLAS® 0F016  60µm

Gallus Printing Machine
Do not loose your face!

PLEXIGLAS® films
EUROPLEX® films

Functionality
Easy to Cut

PLEXIGLAS® and EUROPLEX® films can be cut by:
- Roll-to-roll die-cutting
- Laser cutting
- Slitting
We love outdoor activities!

Add performance to your tape

**Standard Tapes**

<table>
<thead>
<tr>
<th>PE, PP, PVC, PET, etc</th>
<th>film backing</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Adhesive (PSA)</td>
</tr>
<tr>
<td></td>
<td>Release coating</td>
</tr>
<tr>
<td></td>
<td>Liner</td>
</tr>
</tbody>
</table>

**Performance Tapes**

<table>
<thead>
<tr>
<th>PLEXIGLAS® &amp; EUROPLEX® films</th>
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<tr>
<td>Liner</td>
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**Performance Tapes based on PLEXIGLAS® and EUROPLEX®:**

- No yellowing or color changing under long term weathering and UV exposure.
- Weather and Chemical Resistance.
- Easy to clean or “Anti-Graffiti” effect.
- Light Guide.
- High Transparency - Optically clear.
- High Light Transmission – 92%.
- UV Blocking.
Do not lose your face!

Possible Applications:

- Optically Clear Tapes
- Anti-Counterfeting Tapes
- Tamper Evident Tapes
- Surface Protection Tapes
- Marking Tapes
- Safety & Warning Tapes
- Reflective Tapes
- Electronics Mounting Tapes
Do not loose your face over the time!

Be protected by

PLEXIGLAS® films
EUROPLEX® films