

**PLEXIGLAS®
AND
EUROPLEX®
FILMS**

**ALWAYS ON
TOP.**



PLEXIGLAS® 
The Original.

PLEXIGLAS® AND EUROPLEX® FILMS

YOU MEET PLEXIGLAS® EVERY DAY, ALL YOUR LIFE. IT PROVIDES A CLEAR VIEW, LENS SHAPE AND BRILLIANCE TO A VARIETY OF OBJECTS; IT PROTECTS AGAINST RAIN, HAIL AND STORMY WEATHER, CAN WITHSTAND EXTREME PRESSURE AND STRONG SOLAR IRRADIATION, IS IMPACT-RESISTANT AND FAITHFULLY REFLECTS THE WORLD IN ALL ITS COLORS.

Besides these properties, it is environmentally friendly and can be recycled after careful separation from other materials. Thanks to its high functionality and many special grades, PLEXIGLAS® is surprisingly adaptable to new applications that call for novel properties. PLEXIGLAS® has made a name for itself in items that make life easier and safer, more varied and exciting, and that need to meet very stringent requirements.

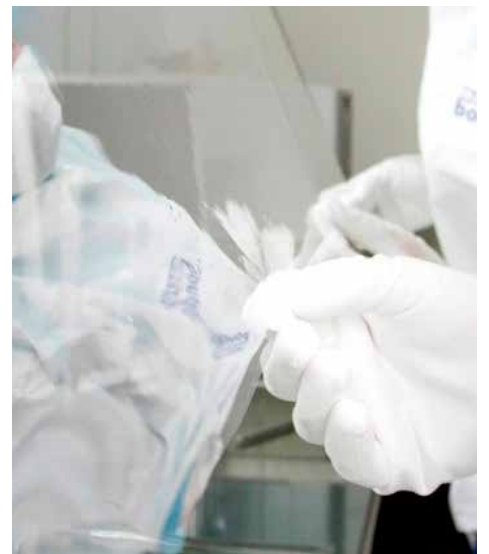
For these extensive functionalities, Evonik is offering a wide product portfolio of PLEXIGLAS® and EUROPLEX® films. EUROPLEX® HC Films combine excellent weathering performance with outstanding chemical resistance due to the polyvinylidene fluoride (PVDF) surface.





EVONIK IS OFFERING A WIDE VARIETY OF FILM SOLUTIONS TO MAKE YOUR PRODUCT LOOK OR PERFORM BETTER.

- PLEXIGLAS® films are polymethyl methacrylate (PMMA) films, with different loadings of UV-absorbers.
- EUROPLEX® films are PMMA films co-extruded with Polyvinylidene fluoride (PVDF), the fluoro-polymer facing outside.
- PLEXIGLAS® and EUROPLEX® films are produced in thicknesses typically between 50 µm and 1000 µm, both for decorative and protective end-use.
- Our state-of-the-art cutting center allows for the delivery of custom-length rolls as well as cut to size sheets.





CHILL-ROLL-FILMS

PLEXIGLAS® and EUROPLEX® chill-roll films are typically produced between 50 µm and 125 µm thick. The films manufactured by this process show a high-glossy surface. Films with a matt surface are also available with this process.

CALENDERED-FILMS

PLEXIGLAS® pure PMMA films in thicknesses of 175 µm to 1000 µm are typically made using a calender stack. As the melt leaves the die, the film is formed in the roll nip, transferring the mirror-like gloss of the calender rolls onto the film surface. This process makes it possible to obtain PLEXIGLAS® films with a high-gloss surface.

**UV-PROTECTIVE
FILMS IMPROVE
EXTERIOR
WEATHERING
ON POLYMERIC
SUBSTRATES.**

**WHY DO YOU NEED IMPROVED
MATERIAL PERFORMANCE?**

- There is a clear drive in the market for longer warranties.

WHAT CAN YOU DO?

- Boost the performance of your products.
- Outperform the competition.

HOW CAN YOU DO IT?

- Protect your products with PLEXIGLAS® or EUROPLEX® films

PLEXIGLAS® AND EUROPLEX® HC PROTECT GLASS-FIBER REINFORCED POLYESTER SHEETS AGAINST YELLOWING.

THANKS TO THEIR EXCELLENT UV ABSORPTION, PLEXIGLAS® AND EUROPLEX® HC FILMS OFFER PROTECTION AGAINST YELLOWING AND DEGRADATION OF GLASS-FIBER REINFORCED POLYESTERS (GFRP).

Furthermore, the excellent UV and weathering stability of the films means that the glass-fibers cannot delaminate

from the surface, even after years of use in outdoor applications. This ensures an attractive visual appearance and high light transmission over the entire life cycle of GFRP sheets.

EUROPLEX® HC films have an additional PVDF layer as part of the co-extruded film; this provides high chemical resistance to aggressive substances as well as a dirt-repellent and

therefore easy-to-clean surface on which even graffiti can be easily removed.

EUROPLEX® HC films are co-extruded with the PMMA layer on the back side ensuring the excellent bonding to glass-fiber reinforced polyesters as PLEXIGLAS® films.



**PLEXIGLAS® AND EUROPLEX® FILMS OPTIMIZE
LONGTERM WEATHERING PROTECTION
OF PRINTED AND COLORED PVC SUBSTRATES.**



THE EXCELLENT WEATHERING RESISTANCE OF OUR UV PROTECTIVE FILMS SIGNIFICANTLY IMPROVES THE SERVICE LIFE OF DECORATIVE FILMS IN OUTDOOR APPLICATIONS.

PLEXIGLAS® FILM 0F011

is an impact-modified polymethyl methacrylate (PMMA) film. The film is transparent, glossy, and weather resistant. It protects polymer substrates, particularly PVC decorative films, against environmental effects and UV radiation.

low tension surface properties. The PMMA side allows good bonding to suitable substrates and printing inks.

The protective films described above allow the requirements of RAL GZ 716 to be satisfied.

PLEXIGLAS® FILM 0F032, MATT

If a matte surface is required for the laminate, PLEXIGLAS® Film 0F032 offers a silky surface that remains unchanged even after forming. Weathering performance is at the same level as for PLEXIGLAS® Film 0F011.

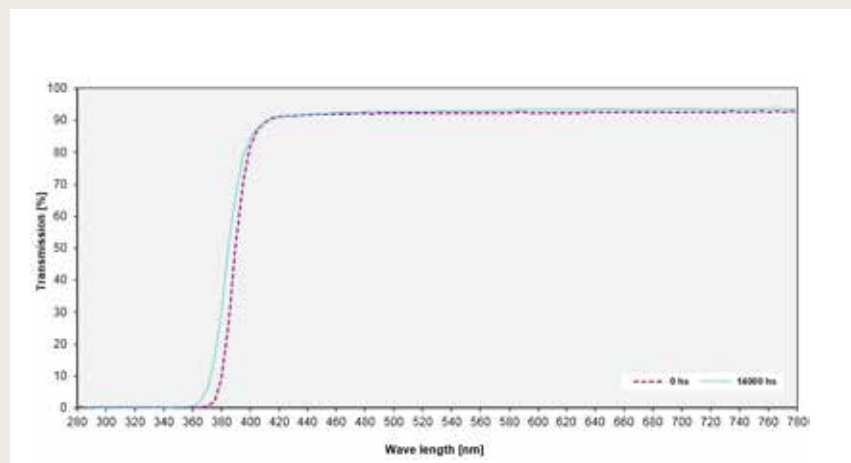
PROCESSING

Laminating PLEXIGLAS® or EUROPLEX® films onto your polymeric substrates – films or sheets – is relatively easy. The most common technology for binding them to another substrate is the in-line heat lamination (heat-fusing). The bond between PVC/ABS/ASA and PMMA is a melt bond. Typical lamination temperatures are between 140 °C – 180 °C. Most suitable grades for these lamination applications are PLEXIGLAS® Film 0F011 or 0F032 matt. For laminates with optical surfaces, like retro reflective traffic signs, PLEXIGLAS® Film 0F072 is the right grade. Bonding to polyolefins is possible through an adhesive.

EUROPLEX® HC FILM 99710

is a film made with polymethyl methacrylate (PMMA) and coextruded with polyvinylidene fluoride (PVDF) providing outstanding weathering resistance. It can also be used in a very wide range of climate zones. The PVDF layer ensures excellent chemical resistance as well as a dirt-repellent effect due to its

Fig. 1: Transmission spectrum of of PLEXIGLAS® Film 0F011 before and after accelerated weathering as in DIN EN ISO 4892-2, method A, cycle 1



UV PROTECTIVE FILMS IMPROVE EXTERIOR WEATHERABLE HIGH-PRESSURE LAMINATES (HPL).



PLEXIGLAS® FILM 99836

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is our standard UV protective film for exterior grade compact laminates. It absorbs over 98 % of UV radiation and shows optimal performance in long-term outdoor weathering. Its standard thickness is 50µm and is available in a width of up to 1650 mm. The Film can also be produced in 75µm and 90µm thickness and in a width up to 1900 mm.

PLEXIGLAS® FILM 0F043

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is our adhesive film that has been developed with a special formulation that makes it chemically compatible with melamine on both of its sides. It is available in 50µm and 75µm.

EUROPLEX® HC FILM 99716

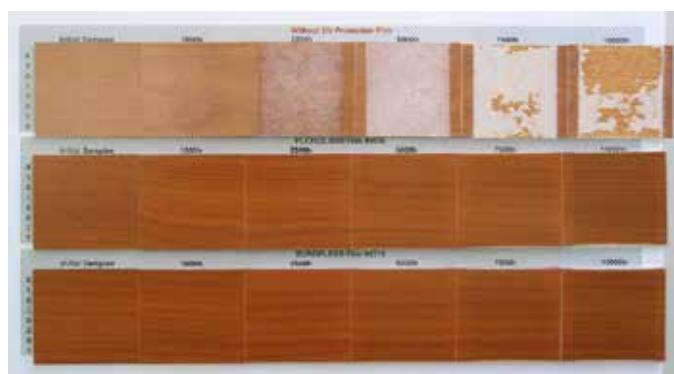
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is our premium film for the HPL market segment. Virtually exceeding the UV protection performance of PLEXIGLAS® 99836, it has PVDF added to its top layer. The PVDF provides superior chemical resistance and an anti-soiling/easy-to-clean surface. Even graffiti can be easily removed using suitable cleaning agents. Its standard thickness is 50µm and is available in a width of up to 1640 mm.

All of the above products include a tailored formulation of the PMMA base layer to chemically bond them onto your panels.



Fig. 2

Accelerated weathering using as an example laminated HPL, without and with PLEXIGLAS® Film 99836 / EUROPLEX® Film 99716 as in DIN EN ISO 4892-2, method A, cycle 1



0h 1000h 2500h 5000h 7500h 10000h

PROCESSING

Our UV protective films PLEXIGLAS® Film 99836, EUROPLEX® HC Film 99716 and our adhesive film PLEXIGLAS® Film 0F043 are directly applied during the panel manufacturing process. No additional equipment, process step or adhesive is necessary. Standard process temperatures of 145°C to 155°C as well as standard process pressures of 70 bars to 100 bars are perfectly compatible when it comes to incorporating our films and achieving proper chemical bonding. Our special service is to provide technical support in the preparation and application-oriented investigation of your high-pressure laminates (HPL). Films with a matt surface are also available with this process.

WHETHER LIGHT-DIFFUSING OR LIGHT-GUIDING, PLEXIGLAS® FILMS PRESENT THEIR APPLICATION IN THE BEST LIGHT.

PLEXIGLAS® FILM WHITE 99532

is an impact and light-diffusion modified polymethyl methacrylate (PMMA) film for lighting applications that offers an optimal ratio of light transmission to light diffusion.

In contrast to other films used for lighting purposes, this one is distinguished by a pure white color and very good weathering and UV resistance.

Whereas, for example, white PVC, PET, and other PC films show color changes from the effects of UV radiation after even brief exposure, hardly any yellowing is seen in PLEXIGLAS® Film White 99532. This lighting film is resistant to weak acids and alkalis as well as nonpolar solvents. In back-lit applications it ensures uniform illumination without hotspots from the light source.





PLEXIGLAS® FILM CLEAR 0F058

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is based on pure polymethyl methacrylate (PMMA) without further additives; thanks to its high purity and low optical damping it is particularly well suited to light guiding applications.

Edge lighting the film results in an almost loss-free and color-neutral light guiding even over long distances, resulting in high light yield compared with other plastics. The light extraction structures required for front- and back-

lit applications can be produced by all the commonly used methods such as hot embossing, printing, and laser engraving.

One particular method is the embossing of micro- and nanostructures into a UV-curable coating; this allows for production of structures almost invisible to the naked eye, such as the UV-curable lacquer used nowadays in front lighting of e-readers.

PLEXIGLAS® Film 0F058 is supplied as rolls in standard thicknesses of 200 μm , 375 μm , and 500 μm and can therefore be processed extremely efficiently in a roll-to-roll process.

Thanks to our advanced techniques of film cutting and winding it is possible to produce customer-specific rolls for processing in clean rooms.

PLEXIGLAS® FILMS ALLOW PRODUCTION OF DURABLE AND ECO-FRIENDLY LABELS.

PLEXIGLAS® FOR TEMPEREVIDENT LABELS

Brand protection becomes more and more important in many applications because counterfeit products negatively impact sales figures, brand perception, and product value. Due to their brittleness, labels based on easily torn destructible PLEXIGLAS® film are irreparably destroyed by any attempt to remove them.

In both the transparent and the white highly reflective variants of the film, the degree of brittleness can be widely varied; this allows for servicing of the entire range of applications in the security sector.

In addition, PLEXIGLAS® films consist of acrylic polymers and are therefore halogen- and plasticizer-free as well as odorless.





PLEXIGLAS® FILM AS A PROTECTIVE LAYER FOR DURABLE LABELS

In the consumer goods sector labels convey very important information about brands, safety, conformity to standards, and instructions for use of the product. This information must remain legible over the entire lifetime of the product.

A PLEXIGLAS® or EUROPLEX® HC overlaminated film effectively protects labels and printed substrates of this type against attack by UV light and weathering. The combination of UV

protection and high transparency ensures a visual appearance of the highest quality. Moreover, the films also allow a no-label look. Both properties are retained even after many years of outdoor use. Our EUROPLEX® HC film also lends the surface improved chemical resistance, allowing any fouling to be rapidly and cost-effectively removed.

The outstanding optical surface and direct printability of our films enable

the printing of high-quality images of high resolution, so that durable labels can be produced even without an overlaminated. Due to their outer PVDF layer, EUROPLEX® HC films are suitable only for printing on the reverse (PMMA) side.

PLEXIGLAS® AND EUROPLEX® FILMS COMBINE PRECISION IN OPTICAL CHARACTERISTICS AND DESIGN.



OUR PLEXIGLAS® FILMS AND THE PMMA-BASED REVERSE SIDE OF EUROPLEX® HC FILMS

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are very easily printed by screen, digital, and flexographic processes. Images of the highest resolution can be realized on these high-quality surfaces. In addition to PLEXIGLAS® films with smooth and glossy surfaces, others with a matte surface structure, such as PLEXIGLAS® Film 0F032, are also available.



PLEXIGLAS® 99524 and PLEXIGLAS® 0F003 are calendared films well suited for film insert molding. With PLEXIGLAS® Film 99524 in particular, high-gloss surfaces with a brilliant depth of image effect can be obtained.

The excellent compatibility of PMMA allows our films to be combined with other plastics by lamination.

And PLEXIGLAS® and EUROPLEX® HC films can easily be formed into many different shapes using high-pressure forming or deep drawing processes. The smooth surface of PLEXIGLAS® film is suitable for scratch-resistant coatings and conforms to the highest visual requirements. PLEXIGLAS® films for graphic applications can be processed with commonly used dies or cut with a CO₂

laser to produce extremely precise cut and stamped edges of high visual quality, even with pure PMMA film.

PLEXIGLAS® FILMS FOR RETROREFLECTIVE LAMINATES CONTRIBUTE TO SECURITY.

THE EXCELLENT WEATHERING RESISTANCE OF PLEXIGLAS® FILMS

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ensures that color changes or yellowing do not occur, even after many years of outdoor use.

Used as an overlay in a retro-reflective laminates, PLEXIGLAS® Film OF072 protects the less weathering-resistant underlying substrate. The base film material can be easily colored allowing precise conformity with legally prescribed color coordinates.

The colorants are specially selected for high light- and weather-fastness.

The colors available are transparent blue, yellow, green, red, orange, and brown.

For lettering applications, films in black color are available as well.





° = registered trademark

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Certified to DIN EN ISO 9001 (Quality) and DIN EN ISO 14001 (Environment).

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EVONIK PERFORMANCE MATERIALS GMBH

Acrylic Products
Riedbahnstraße 70
64331 Weiterstadt
Germany

www.plexiglas.net
films@evonik.com
www.evonik.com