



PRODUCT GUIDE

FLAWLESSLY EXTRUDED A-PET AND PET-G THERMOPLASTIC POLYESTER SHEETS.

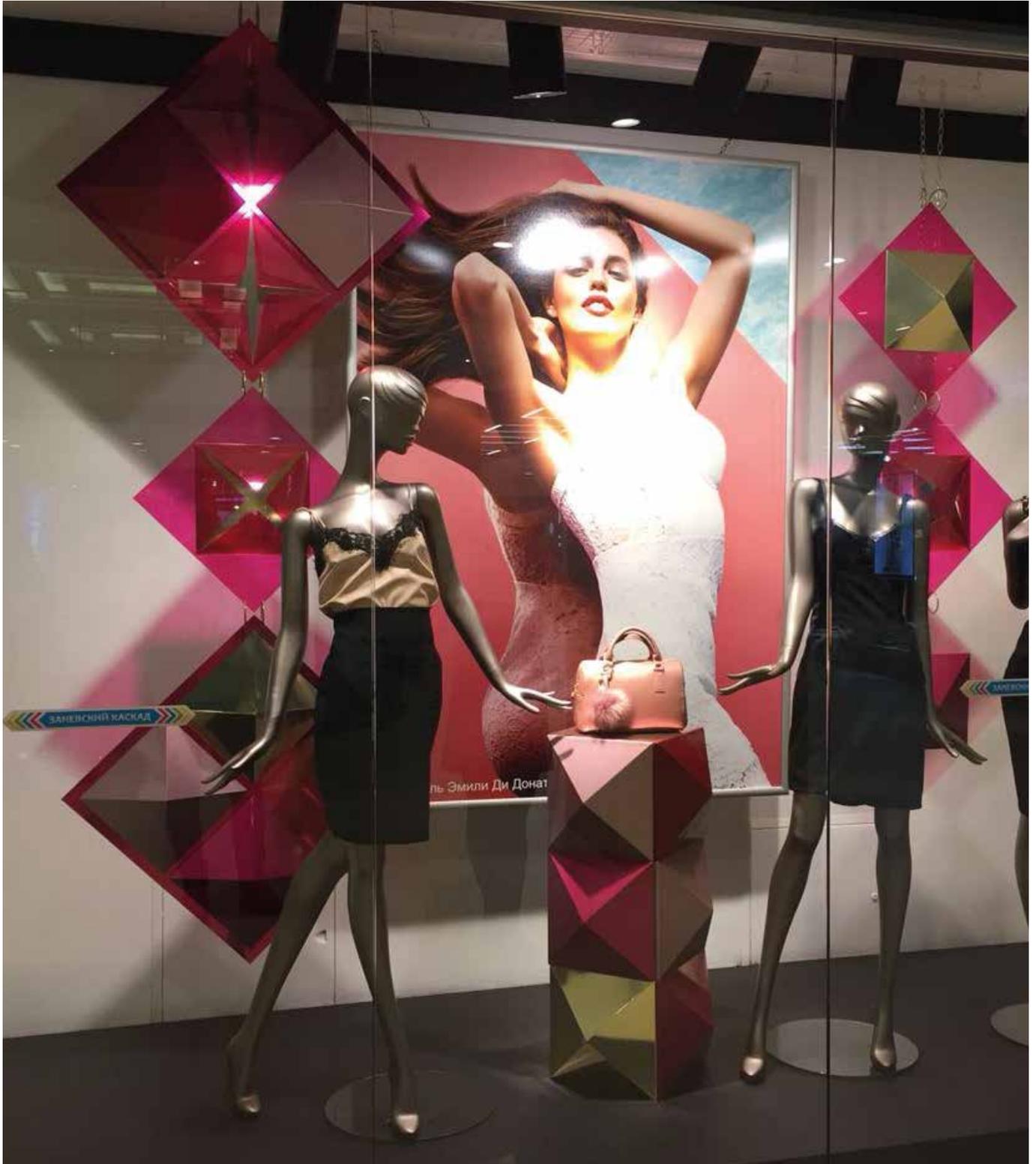




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HIPEX®

The HIPEX® product range includes extruded A-PET and PET-G thermoplastic polyester sheets. These sheets are characterized by their impressive impact strength, outstanding transparency, excellent printability with UV-resistant inks, plus their fast and easy processing options.

In addition, HIPEX® sheets are fire rated "difficult-to-ignite" meaning that they are the best possible choice for a wide range of different indoor and outdoor applications. For outdoor use, we recommend the version with UV protection.

The HIPEX® product range is ideal when it comes to forming. HIPEX® A is especially suited for cold-bending applications, HIPEX® G for complex thermoforming.

HIPEX® A is available in thicknesses of 0.5 to 6 mm, HIPEX® G in thicknesses from 0.5 to 20 mm and up to a width of 2050 mm.

Sustainable involvement and environmental protection have always been amongst the essential corporate objectives at 3A Composites. The minimisation of risks for man and environment as well as the reduction of environmental pollution through careful and efficient utilisation of resources is part of the corporate philosophy.

Our production site in Nischwitz, Germany, is certified according to the management systems for Quality (DIN EN ISO 9001) and for Energy (DIN EN ISO 50001). The site is also participating in the programme Operation Clean Sweep® (OCS), which is dedicated to preventing plastic resin loss and to ensuring that this material does not end up in the environment.

A number of energy reduction projects have been initiated since 2012. A 22% reduction in electricity consumption was achieved by changing the lighting in production to LED lights and by implementing a more energy-efficient process cooling system. Updating heating controls and making better and more efficient use of waste heat has led to an 84% reduction in gas consumption since 2018.

Read more about our commitment to sustainability starting on page 8.

HIPEX® – FLAWLESSLY EXTRUDED A-PET AND PET-G THERMOPLASTIC POLYESTER SHEETS.

HIPEX®

FLAWLESSLY EXTRUDED A-PET AND PET-G THERMOPLASTIC POLYESTER SHEETS.

CHARACTERISTICS

- High transparency
- Very high impact strength
- Good outdoor durability in the variant with UV protection
- Fire behavior according to EN 13501-1: B-s1,d0 "difficult-to-ignite"
- Very good chemical resistance
- Easy and fast to process
- Good printability thanks to optimal adhesion of UV curing inks



APPLICATION

- Displays (POS/POP)
- Signage | Lettering
- Shop design | Shop window decoration
- Interior design | Furniture
- Partitions | Cladding
- Lighting | Light boxes
- Glazing
- Food contact approved



PROCESSING

- Digital printing | Screen printing
- Laminating
- Painting | Spray painting | Lacquering
- Contour milling
- Laser cutting
- Water jet cutting
- Sawing | Punching
- Gluing
- Drilling | Screwing
- Thread cutting
- Folding (V-groove) | Cold bending
- Hot bending
- Thermoforming
- Engraving



For more details on the processing of HIPEX®, please contact our technical team.

PRODUCTS			HIPEX® A	HIPEX® G
GENERAL				
Density	ISO 1183-1	kg/m ³	1330	1270
Moisture absorption (23°C saturation in water)	ISO 62-1	%	0.5	0.6
Biocompatibility (skin contact)	ISO 10993-5	Class	not cytotoxic	not cytotoxic
MECHANICAL				
Tensile modulus	ISO 527-2	MPa	2400	2000
Tensile strength	ISO 527-2	MPa	55	50
Elongation at break	ISO 527-2	%	> 25	> 35
Flexural modulus	ISO 178	MPa	2400	2000
Flexural strength	ISO 178	MPa	80	75
Charpy impact strength, unnotched	ISO 179-1/1eU	kJ/m ²	no break	no break
Charpy impact strength, notched	ISO 179-1/1eA	kJ/m ²	4	7
Surface hardness	ISO 868	Shore D	50	40
OPTICAL				
Light transmission (3 mm)	ISO 13468-1	%	88	88
Refractive index	ISO 489	-	1.58	1.57
Haze	ISO 14782	%	< 1	< 1
Solar heat gain coefficient, g value (3 mm)	DIN EN 410	%	82	82
THERMAL				
Temperature of deflection under load (method A / B)	ISO 75-2	°C	72 / 68	72 / 68
Vicat softening temperature (method B50)	ISO 306	°C	70	70
Coefficient of linear thermal expansion	ISO 11359-2	mm/(m*K)	0.05	0.05
Service temperature continuous use	-	°C	65	65
Max. temperature short term use	-	°C	70	70
Degradation temperature	-	°C	> 280	> 280
Forming temperature	-	°C	110 – 150	110 – 150
Specific heat capacity	ISO 11357-4	J/gK	1.1	1.1
Thermal conductivity	ISO 22007-1	W/mK	0.20	0.20
Fire behavior	EN 13501-1	Class	B-s1, d0 (clear 0.5 – 6 mm, color 1 – 3 mm)	B-s1, d0 (clear 0.8 – 10 mm, opal 1.5 – 6 mm)
ELEKTRICAL				
Electric strength	IEC 60243-1	kV/mm	17	16
Volume resistivity	IEC 62631-3-1	Ω m	10 ¹⁵	10 ¹⁵
Surface resistivity	IEC 62631-3-2	Ω	10 ¹⁶	10 ¹⁶
Dielectric constant (100 Hz)	IEC 60250	-	3.4	2.6
Dissipation factor (50 Hz)	IEC 60250	-	0.02	0.01

Note: These technical data of our products are typical ones for HIPEX®. The actually measured values are subject to production variations.

SUSTAINABILITY

MISSION: TOGETHER. RESPONSIBLE.

Sustainability is at the core of everything we do. Our corporate ecological commitment is summed up by the **MISSION: TOGETHER. RESPONSIBLE.** As we also apply and comply with this mission in regard to our products, we have created a classification system. The five different categories in our **FIVE-DOT-MISSION** system indicate the factors with the greatest impact on sustainability. Our intention is to offer our partners guidance with their purchasing decision-making and to provide a transparent system. A system which focuses on the use of materials, the CO₂ content, the product life cycle and, of course, recycling, a topic of particular relevance for our products. Our FIVE-DOT-MISSION makes an assessment of a product on the basis of five categories and awards points per category, the product is then assigned to one of the five coloured DOTs. By this means we achieve a transparent, quick valuation logic which we can also use to gauge product innovation and improvement at 3A Composites.

THE FIVE-DOT CATEGORIES ARE:

1. BIOBASED CONTENT
Depending on the product, different raw materials are used to manufacture our panels. In this case, we look at the percentage of renewable raw materials used in our products. Our aim is to increase the percentage whenever possible and appropriate.

2. RECYCLED CONTENT
The industry selects recycled raw materials for use in the manufacture of new products which also fulfil requirements such as fire ratings, processing prerequisites and customer expectations in terms of functionality and appearance. This category is where we gauge the proportion of high quality recycled raw material in our products' total material input.

3. FOSSIL CO₂ BOUND IN THE MATERIAL
This category shows the weight of fossil CO₂ embedded in our panels. Differences here are principally due to the raw material type and origin, the density, the composition and the proportion of recycled content.

4. PRODUCT LIFE CYCLE
The plastic sheets and composite panels we produce are used by our customers for a longer period of time. In contrast to products used in the short term, these longer-term alternatives make an active contribution to saving resources. In this category we show our panels' average service life. Material properties result in disparities, so life cycles range from <1 year to even >30 years.

5. RECYCLABILITY
One of the most important aspects of sustainability is contributing to environmental protection by saving valuable raw materials and avoiding waste. Unlike the second category "recycled content", in this assessment category, we show options for recycling the panels after they have been in use. There are already, for instance, established recycling loops for paper and metals. At some production sites, the material can already be returned, so that material for new panels can be created from it. As a company, we came to the conclusion that thermal recycling does not seem sustainable enough, so it is not included in our FIVE-DOT classification. Instead, we are actively working with partner companies to establish a closed-loop, sustainable and future-oriented recycling economy.

As many as 3 points can be achieved in each of the categories presented, totalling a maximum of 15 points. According to the total number of points achieved (1-15), the FIVE-DOT classification is conducted using the following colour gradation.



Transparency is important to us! We will review the product assessment annually to see in which areas the product can be improved. We have set ourselves the goal of achieving the majority of our sales with products which achieve a rating of ≥ 7 points in the FIVE-DOT classification by 2030.

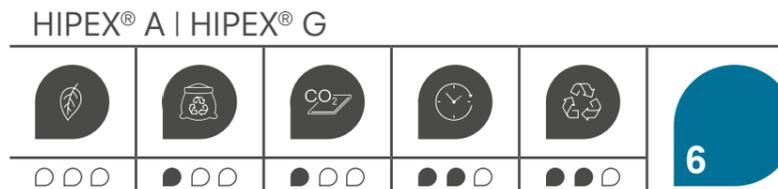
Join us on our sustainable mission!



SUSTAINABILITY

HIPEX® FIVE-DOT-MISSION

HIPEX®, flawlessly extruded A-PET and PET-G thermoplastic polyester sheets, have been assessed in line with the criteria described above. The product family currently achieves a FIVE-DOT classification of 6 points in total.



RECYCLED CONTENT
 We are already recovering and reusing our own production waste to create new material in the manufacture of HIPEX® sheets, and we aim to continue increasing the proportion of recycled regrind content in the future.

All raw materials used in our HIPEX® sheets comply with the requirements in the current version of the European Union's Chemicals Regulation (REACH). In particular, HIPEX® sheets are free of any of the substances listed in the current version of the ECHA Candidate List of Substances of Very High Concern (SVHC).

FOSSIL CO₂ BOUND IN THE MATERIAL
 HIPEX® sheets contain fossil carbon as the raw material Polyethylene Terephthalate (PET) is used in their manufacture.

PRODUCT LIFE CYCLE
 Our HIPEX® product family comprises Polyethylene Terephthalate (PET), a durable thermoplastic. In addition to good long-term properties, this material provides excellent resistance to chemicals, especially our HIPEX® A (A-PET) version. In accordance with EN 13501-1, both HIPEX® A and HIPEX® G sheets are also classified as "B-s1, d0" and are rated "difficult-to-ignite". The HIPEX® version featuring UV protection offers good weather resistance and these sheets can also be used in outdoor applications for periods of several years. HIPEX® A sheets are sturdy and robust with a high impact strength even at temperatures as low as minus 20°C.

RECYCLABILITY
 The whole HIPEX® product family can be sorted into individual types for recycling and reuse. HIPEX® A can be disposed of in category 1 (PET) plastic waste in the same way as, for example, PET plastic bottles, meaning it is extremely suitable for recycling. At 3A Composites, we are committed to processing our production waste within the company and using it again to manufacture new products.



HIPEX® A

THE BEST FOR FLAT AND COLD BENDING APPLICATIONS.

HIPEX® A is a premium quality amorphous polyethylene terephthalate (A-PET). HIPEX® A is the best choice for flat and cold bending applications. HIPEX® A shows good printability with UV curing inks and is flame retardant rated "difficult-to-ignite" (Fire behavior according to EN 13501-1: B-s1, d0) as well as suitable for food applications. Moreover, it is extremely impact resistant also at temperatures down to -20°C and shows excellent outdoor durability in the variant with UV protection.

HIPEX® A sheets offer a unique combination of excellent properties and are well suited for e.g. flexible poster covers, printed, translucent signs, small to medium sized displays, Slatwall magazine racks as well as for cold food storage elements.

CHARACTERISTICS

- 100% recyclable within its own waste category 1 (PET)
- Tough and hard with high impact strength also at temperatures down to -20°C
- Impeccable optical properties with a light transmission of nearly 90% for non-tinted types
- Good outdoor durability in the variant with UV protection
- Flame retardant rated B-s1, d0 according to EN 13501-1 (difficult-to-ignite)
- Very high chemical resistance against cleaning agents, mineral oils, solvents
- Easy and fast to process
- Good printability thanks to optimal adhesion of UV curing inks

APPLICATION

- Displays (POS/POP)
- Signage | Lettering
- Shop design | Shop window decoration
- Interior design | Furniture
- Partitions | Cladding
- Lighting | Light boxes
- Glazing
- Suitable for food applications

PROCESSING

- Digital printing | Screen printing
- Laminating
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- Engraving



Clear transparent | Opal 30% | White | Others translucent | Others opaque



Black



Bronze



HIPEX® G

THE PERFECT MATERIAL FOR VACUUM FORMING AND THERMOFORMING.

HIPEX® G are extruded polyethylene terephthalate glycol (PET-G) sheets, which are characterized by good optical properties, easy processability and very good impact resistance. Moreover, HIPEX® G sheets are flame retardant rated "difficult-to-ignite" (Fire behavior according to EN 13501-1: B-s1, d0), are suitable for food applications and can be printed with UV curing inks.

Especially for applications in the field of vacuum forming and thermoforming, HIPEX® G sheets are the best choice as they don't crystallize and can be processed without pre-drying (time and energy saving). Thanks to its easy formability, the material offers designers and fabricators various possibilities, from simple shapes to complex constructions.

The sheets are available with or without UV protection and in addition to the clear and opal white versions also in a variety of colours and design patterns.

HIPEX® G sheets are suitable e.g. for all kinds of glazing (bus shelters, posters, machines), for medical appliance packaging, displays and signs for interior and exterior use as well as for three-dimensional POS/POP displays.

CHARACTERISTICS

- Good optical properties
- Easy to fabricate
- Excellent for vacuum forming and thermoforming without pre-drying (time and energy saving)
- Good chemical resistance
- Very high impact strength
- Good outdoor durability in the variant with UV protection
- Flame retardant rated B-s1, d0 according to EN 13501-1 (difficult-to-ignite)
- Good printability thanks to optimal adhesion of UV curing inks

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APPLICATION

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- Glazing
- Food contact approved



Clear transparent | White opal J705 UV | Opal J701 | Opal J704 | Opal J705 | Opal J708 | Translucent | Opaque | Structured



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