Dureflex® Platilon®

Thermoplastic polyurethane films
for automotive applications

covestro

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Exceptional standards require exceptional materials. That's why at Covestro, we have been able to maintain a long and successful history as a supplier to the automotive and transportation industry. Our line of Dureflex® and Platilon® thermoplastic polyurethane (TPU) films meet the high-quality standards and performance criteria that the automotive market requires.

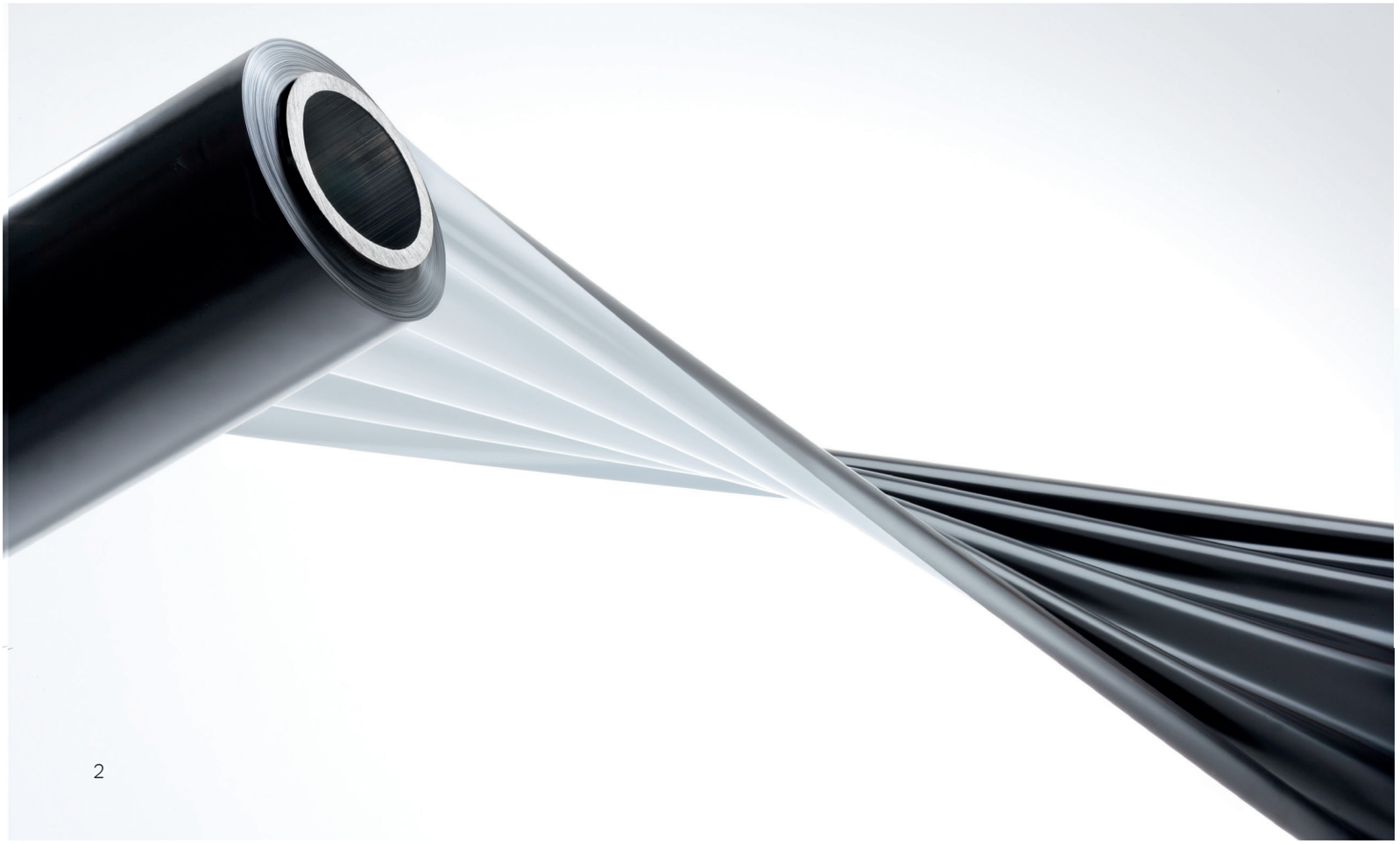
Why TPU?

Thermoplastic polyurethanes are high-tech materials with a unique combination of versatile properties. TPU bridges the gap between hard thermoplastics and rubber. For instance, it can be deformed under tensile load, yet still return back to its original shape afterwards. Thanks to its molecular structure, TPU can be stretched when heated, and melted and molded all over again.

TPU films for automotive applications

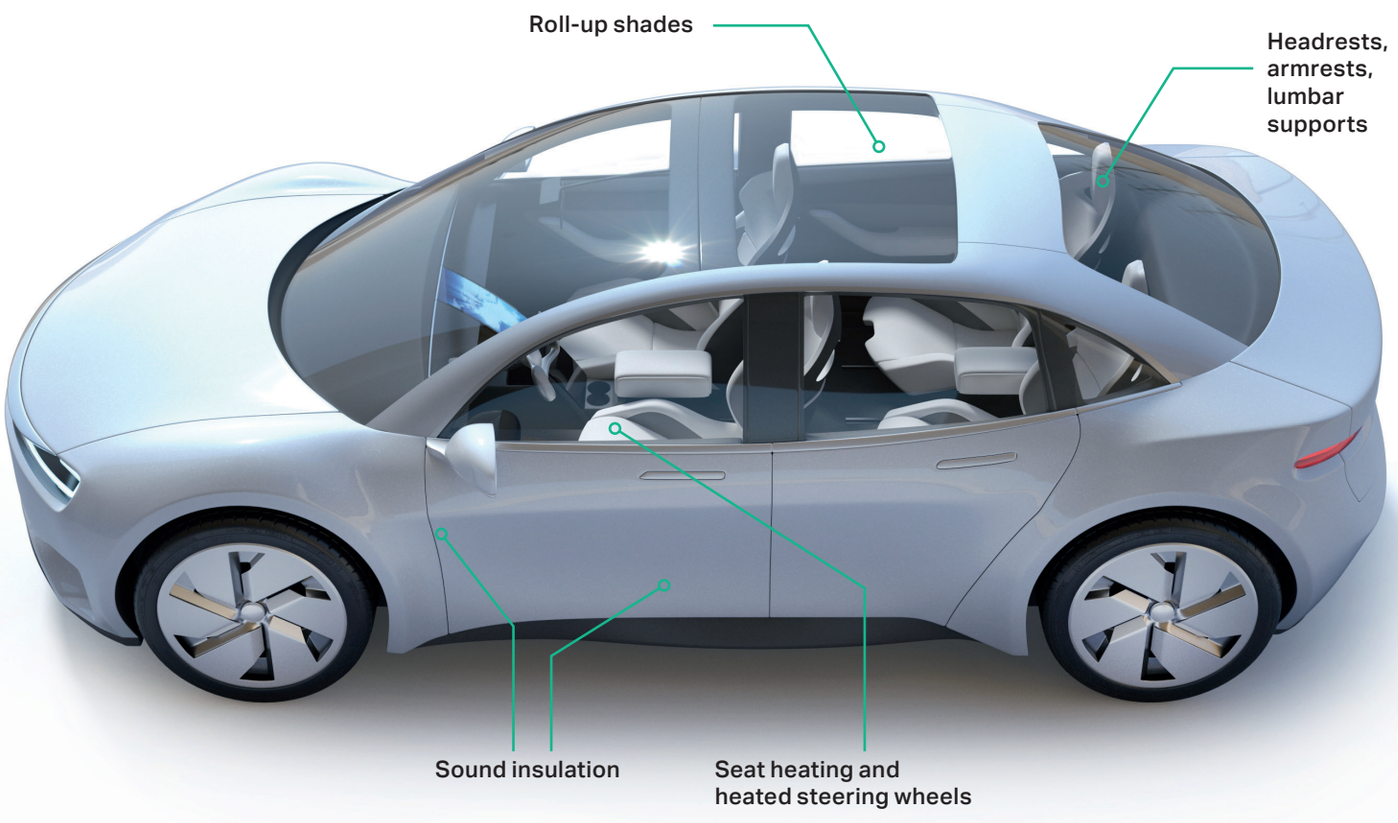
Tailored to the automotive industry, Covestro TPU films offer custom solutions for overcoming processing and design challenges, while also enhancing passenger safety, comfort and convenience. These films may be laminated to other materials or fabrics to achieve additional benefits. With our 5 layer blown film capability, we can combine the attributes of different types of TPU along with other polymer films. Our portfolio of TPU films includes a variety of Dureflex® and Platilon® product grades.

Product	Chemistry
Dureflex®	Aromatic & aliphatic polyester- & polyether-urethane films
Platilon® BO	Aromatic polyester multilayer TPU films with blackout function
Platilon® H	Hot melt films: TPU, copolyamide, copolyester
Platilon® M	Breathable films: polyurethane, PEBA
Platilon® U	Aromatic & aliphatic polyester- & polyether-urethane, copolyester & multilayer films



Dureflex® and Platilon® TPU films offer the following properties and benefits:

- Can meet the Federal Motor Vehicle Safety Standard (FMVSS) 302 for burn resistance
- Tough, durable, abrasion resistant
- No out-gassing
- No plasticizers
- Good gas barrier properties
- Puncture and tear resistance
- Hydrolysis resistance
- Thermoformable
- Wide temperature operating range
- Bondable/weldable to a wide variety of substrates including PU foams and textiles
- Colorable, printable
- Flexibility over a wide temperature range (no plasticizers)
- High elasticity, tensile strength and elongation
- Aliphatic grades offer good resistance to weathering and UV stability



Sunroof Shades

TPU films can be used as textile laminates for sun protection curtains in automotive sunroofs. These soft and elastic films are easily laminated to fabric, manage light, save weight and decrease volume. Covestro offers both flame retardant and non-flame retardant TPU films suited for different lamination processes. In addition, developmental grades are available that combine a high shading black layer with white or grey for more desirable aesthetics to match interior color schemes.

Covestro TPU Films for Sunroof Applications*

Film Grade	Film Type	Color	Shore A Hardness	Tensile Strength (MPa)	Tear Strength (kN/m)	Ultimate Elongation (%)	TMA Onset Softening Temp (° C)	Specific Gravity	Standard Gauge (µm)	Flame Retardant
Dureflex®										
PS8010	Ester	Black or Grey	92	76	105	500	142	1.21	75	No
Platilon®										
BO 9029 (multilayer)	Ester	Black/Grey	93	70	75	450	150	1.21	50	No
BO 9141 T (multilayer)	Ester	Black/Grey	88	30	65	550	125	1.29	50	Yes
U 4180 DK	Ester	Black	94	75	80	450	150	1.21	50	No
U 4281 AF	Ether	Black	87	30	42	450	155	1.25	29	Yes
Developmental Grades										
LPT 9029 (multilayer)	Ester	Black/White	93	70	75	450	150	1.21	50	No

*The product data listed is provided as general information only. They are approximate values and are not considered part of the product specifications.

Seating

TPU films are especially suitable for a number of automotive seating applications such as:

- **Lumbar support bladders:** TPU films ensure good air retention properties
- **Headrests and armrests:** TPU film bonds well to polyurethane foam, making it an excellent choice for headrest and armrest applications. The film acts as a barrier between the foam and the fabric, creating a much more accurate production process and preventing moisture from getting into the foam.
- **Seat heating systems:** TPU film bonds well to a number of non-woven materials, making it especially suited for automotive seat heating systems. Heating wires can be embedded into hotmelt film and sandwiched between two nonwovens for optimum heat management.

Covestro TPU Films for Seating Applications*

Film Grade	Film Type	Color	Shore A Hardness	Tensile Strength (MPa)	Tear Strength (kN/m)	100% Modulus (MPa)	Ultimate Elongation (%)	TMA Onset Softening Temp (° C)	Specific Gravity	Standard Gauge (µm)
Dureflex®										
PS8010	Ester	Black or Grey	92	76	105	11.7	500	142	1.21	305 µm
PT5000S	Ether	Black	87	57	79	8.3	550	132	1.12	50 µm
PT7500	Ether	Black	90	67	88	8.3	550	151	1.13	305 µm
PT9200US	Ether	Black or Grey	85	64	88	7.6	625	148	1.21	305 µm
X2300	Ether	Black or Grey	90	68	96	10.3	450	157	1.13	38 µm

Film Grade	Film Type	Color	Shore A Hardness	Tensile Strength (MPa)	Tear Strength (kN/m)	Ultimate Elongation (%)	TMA Onset Softening Temp (° C)	Specific Gravity	Standard Gauge (µm)
Platilon®									
HL 9007	Ester	Black	93	78	75	450	155	1.21	80-130 µm
U04/PE	Ester PE-Carrier	Natural	86	55	70	650	—	1.17	≥ 50 µm
U 2181 A	Ether	Black	93	75	75	450	150	1.21	400 – 500 µm
U 4100 DK	Ester	Natural	94	75	80	450	155	1.21	≥ 50 µm
U 4271 AU	Ether	Grey	87	65	60	650	155	1.15	250 µm

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Sound Insulation

Sound insulation becomes increasingly important as vehicle designs incorporate light-weighting and start to use thinner materials. TPU films can be used for sound insulation applications throughout vehicles such as door panels, fender walls, engine covers, pump covers, fire walls and more. They adhere well to polyurethane foam and can be applied in a variety of methods including lamination, flame bonding, thermobonding and back foaming. Not only do TPU films protect polyurethane foam from absorbing moisture, but they keep the foam from chafing and falling apart.

Covestro TPU Films for Sound Insulation Applications*

Film Grade	Film Type	Shore A Hardness	Tensile Strength (MPa)	Tear Strength (kN/m)	100% Modulus (MPa)	Ultimate Elongation (%)	TMA Onset Softening Temp (° C)	Specific Gravity	Standard Gauge (µm)
Dureflex®									
PS8010	Ester	92	76	105	11.72	500	142	1.21	38
PT7500	Ether	90	67	88	8.3	550	151	1.13	65
Platilon®									
HL 9007	Ester	93	78	75	6-9**	450	155	1.21	80 / 130
U 2182 AK	Ester	92	75	75	6 – 10**	450	150	1.25	25 / 50
U 4180 DK	Ester	93	75	80	7 – 10**	450	155	1.21	25 / 50
U 4281 AU	Ether	87	65	60	5-7	650	155	1.15	25 / 50

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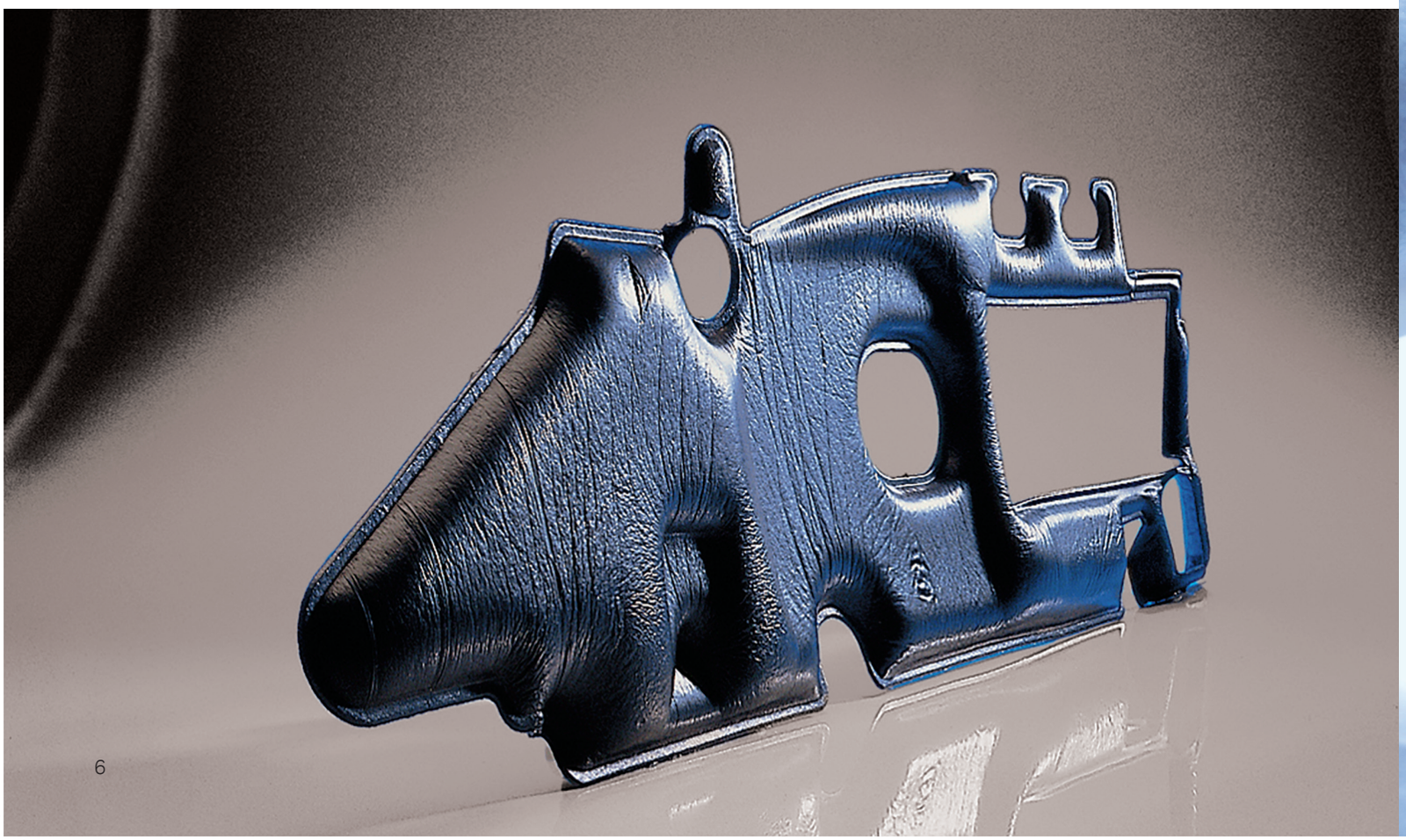
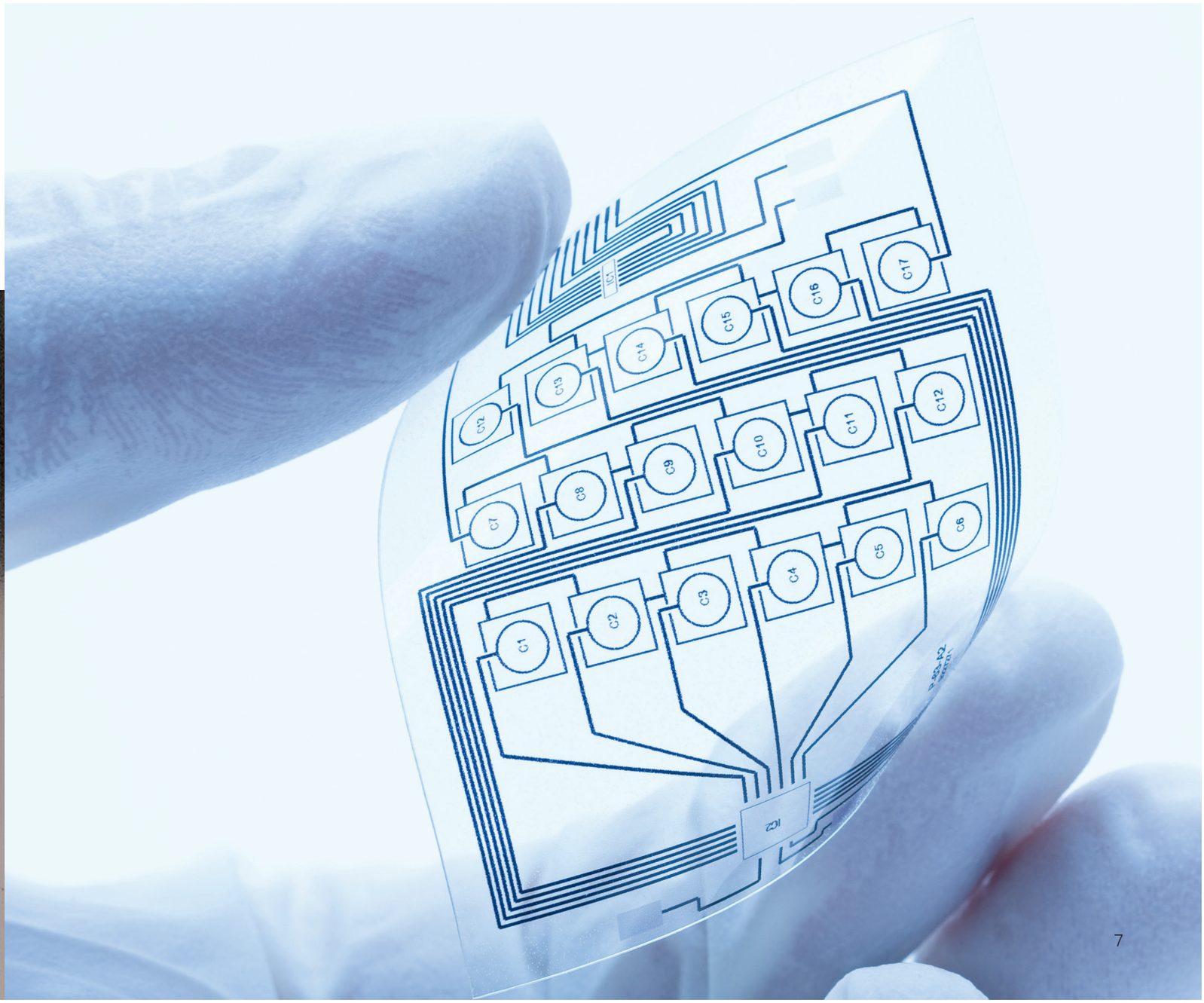
** Values listed as 50% modulus



Emerging applications: Flexible electronics

Flexbile electronics allow you to bend and stretch the conductor board. This technology can be achieved by laminating copper film with TPU film and incorporating photolithography and chemical etching into it. The result is flexible circuit paths with up to 300% elongation. LEDs and circuit paths can be embedded into TPU films for in-mold electronic applications, proving to be a highly innovative technology particularly for trends in futuristic automotive interior applications. Customized materials from Covestro are available for future application developments.



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Edition: 2019-01 · Order-No.: COV00087839 · Printed in Germany