

Creating complete solutions

**Thermal edge bond solutions
for insulating glass**



**We are your partner
for durable thermally
optimized edge bond
solutions – worldwide.**

Content

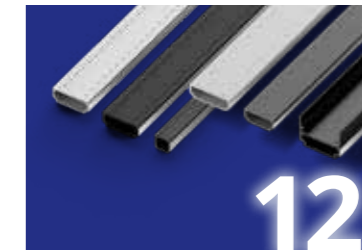
- Hello, it's us, Technoform! 4
- Cooperation and partnership 6
- Warm edge 8
- Edge bond solutions 10
- Our edge bond components 12
- Thermal values 22
- Tests and services 24
- Building certificates 26
- Success story 28
- Your challenges – our solutions 34
- Sustainability – thinking ahead 36
- Associations and organizations 38
- Contacts 39
- New article IDs 40



Hello, it's us, Technoform!



Warm edge



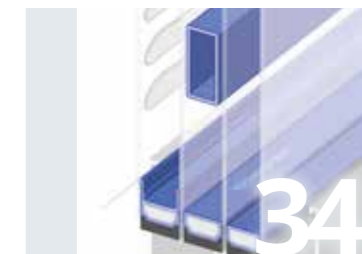
Our edge bond components



Building certificates



Success story



Your challenges – our solutions

Picture on front page:
St George Wharf Tower, London, United Kingdom, 2014

Hello, it's us, Technoform!

As a family company, we know that people empower every business. We firmly believe that the best ideas are always born together. We are Technoform – 1,600 and growing, dedicated innovators that work for our customers worldwide.

Understanding what drives customers and markets since 1969, we develop leading solutions collaboratively. Providing 100% reliability and quality on all levels, we offer the same level of high-quality services and solutions all around the world. 45 sites in over 40 countries ensure continuous supply wherever you are.

Performing 360° precision and 1,000+ skills, our highly trained team turns individual needs into tailored technological solutions. Delivering quantities from 1 to 1,000,000 our customers can rely on receiving the best available package of quality, quantity, time, and value.



We invite you to browse through this brochure and find out how we can support your personal vision.



Our everyday business? Finding solutions for you

In a fast-paced industry landscape new ideas and solutions are the currency that matters. Markets emerge, businesses transform, processes change. At Technoform, we unleash the full potential of people and their ideas across a global network to meet today's challenges collaboratively. We are people with a passion for plastics solutions. And in plastics extrusion we excel.

Our unique high-precision extrusion process allows us to form the most complex plastics – including those typically only suitable for injection molding. As a result, we are proud to offer outstanding technical characteristics that go far beyond the ordinary: extremely smooth surfaces, uniquely sharp contours, the lowest tolerances, the highest precision, and various custom material properties you would not usually expect from a plastic solution. In a nutshell: we always look for the perfect solution for you.

Take a look around – we are closer than you may think

Providing holistic knowledge and technical expertise, we are the can-do partner and problem solver for various industries. This spans from thermal edge bond solutions for architects, building planners, and manufacturers of insulating glass units to a vast range of insulation solutions for aluminum windows, doors, and facades. This also includes high-precision plastic profile solutions and system components for the automotive, aviation, and electrical engineering industries – just to name a few.



It's our true belief in a strong partnership with our customers that makes the difference.



Your cooperation with us – a true partnership



Know-how

We offer you more than 50 years of experience and knowledge in the high-precision extrusion of plastics and in the development of innovative warm edge solutions.



Service

We don't consider you a customer, but a partner. With a global network of customer support and our three production sites, we are always near you and happy to advise you on all requests relating to the edge bond.



Quality

Zero-defect performance and standardized processes ensure our consistent quality. We are certified in accordance with DIN EN ISO 9001. Our products also comply with the requirements of applicable standards such as EN 1279, DTA, ASTM E2190 and help to obtain the RAL quality mark for windows, doors, and facades.



Customer-specific solutions

We continuously analyze the requirements of our customers and markets to find solutions to current topics and to identify future trends. We can meet your individual requirements and propose solutions within the shortest possible time thanks to our unique production process.



Support and tests

At Technoform, we test and evaluate our products based on applicable standards such as EN 1279, DTA, ASTM E2190 and also on your individual requirements.



Fields of application

Due to the perfect combination of material and form, our products significantly reduce the heat flow via the edge bond and are ideally suited for use in windows, doors, and facades. They are also suited for fire-resistant glass (E, EI, and EW). Our wide range of widths guarantees that our products make a decisive contribution towards sound insulation.

Warm edge – insulating glass performance at its best

When it comes to building sustainably, high energy efficiency, durability, and indoor comfort are key factors. To achieve this, durable thermally optimized edge bond solutions for insulating glass are what it takes. With our warm edge spacers between the glass panes, we improve the thermal performance of the edge bond and ensure gas tightness. This leads to optimized energy performance and a visible reduction in condensation at the edge of the window, thereby preventing the formation of mold. A warm edge significantly reduces the circulation of air near the window which makes life more comfortable inside your home.

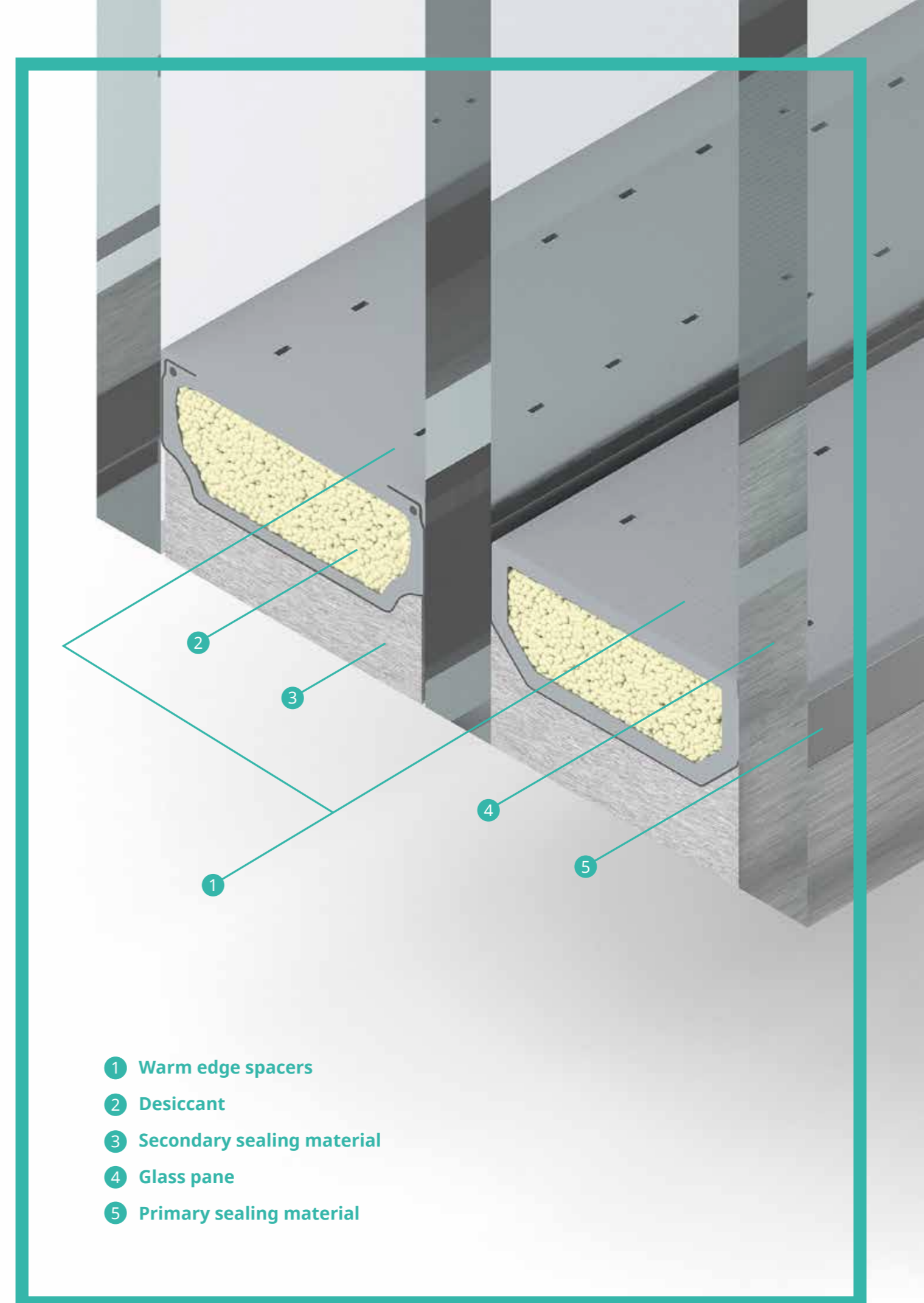
Our warm edge solutions set new standards in surface quality and match the highest requirements of architects and building designers.

Contact us if you want to increase the quality and durability of your window, door, and facade systems through an optimized glass edge bond.



Warm edge – why?

To understand the importance of warm edge, take a standard window with triple glazing, aluminum frame and an average aluminum spacer. Using our high thermal performance spacer instead, results in a 13% improvement of the window U-value. Multiply this effect by 200,000 (the size of an average town) and you achieve an annual savings equivalent to almost 1.5 million liters of heating oil. This makes warm edge a smart and sustainable solution.



- 1 Warm edge spacers
- 2 Desiccant
- 3 Secondary sealing material
- 4 Glass pane
- 5 Primary sealing material

Edge bond solutions – focusing on the next level of excellence

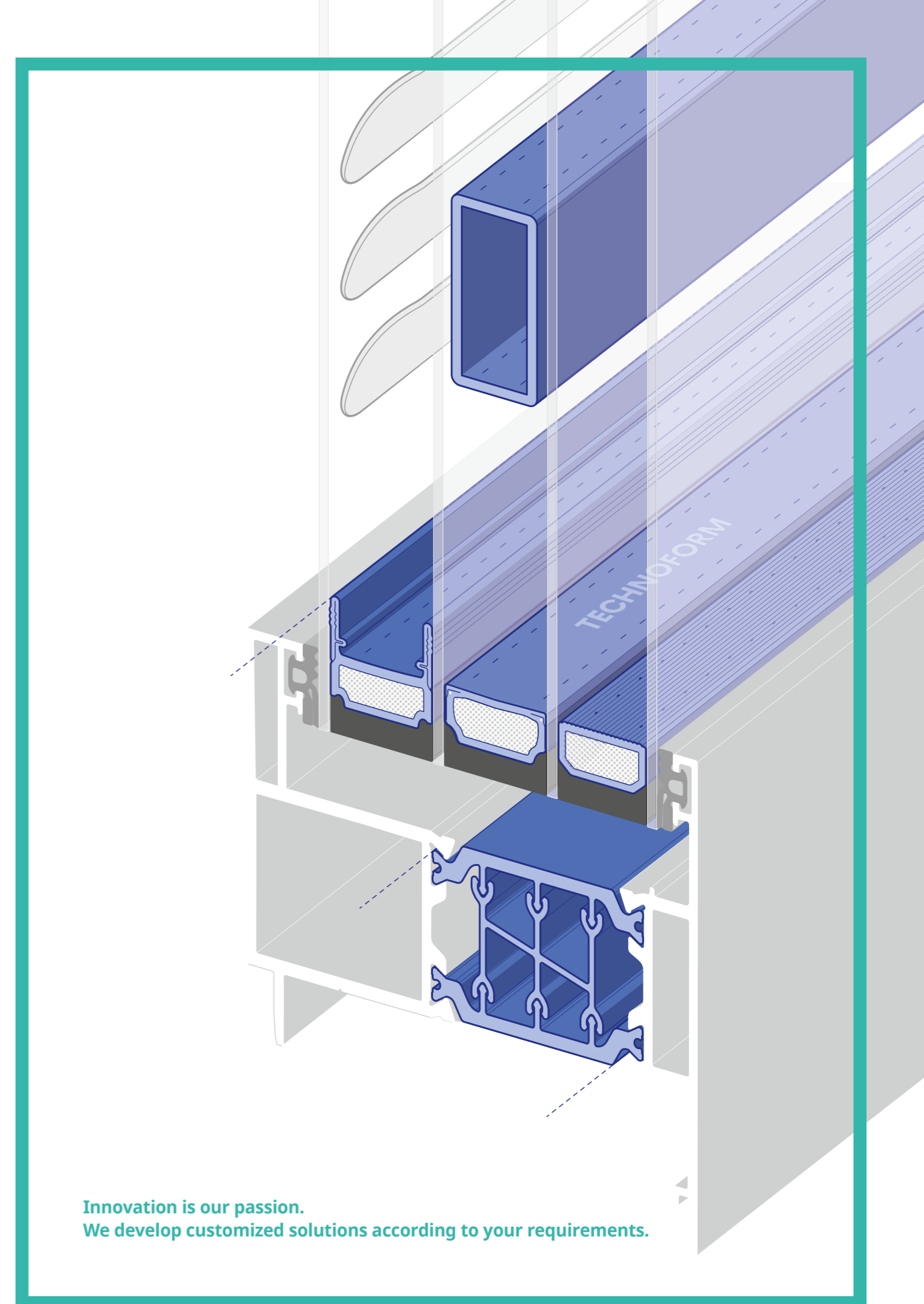
Technoform provides the best solutions: a high level of aesthetics and optimized thermal values, as well as perfect stability of the insulating glass unit. We focus on the core factors at the heart of every window: the edge bond of the insulating glass.

A well-designed and carefully manufactured edge bond determines the durability and service life of an insulating glass unit. Only when the individual components such as spacers, sealants, desiccants, connectors, and glass interplay perfectly, can we achieve optimal performance.

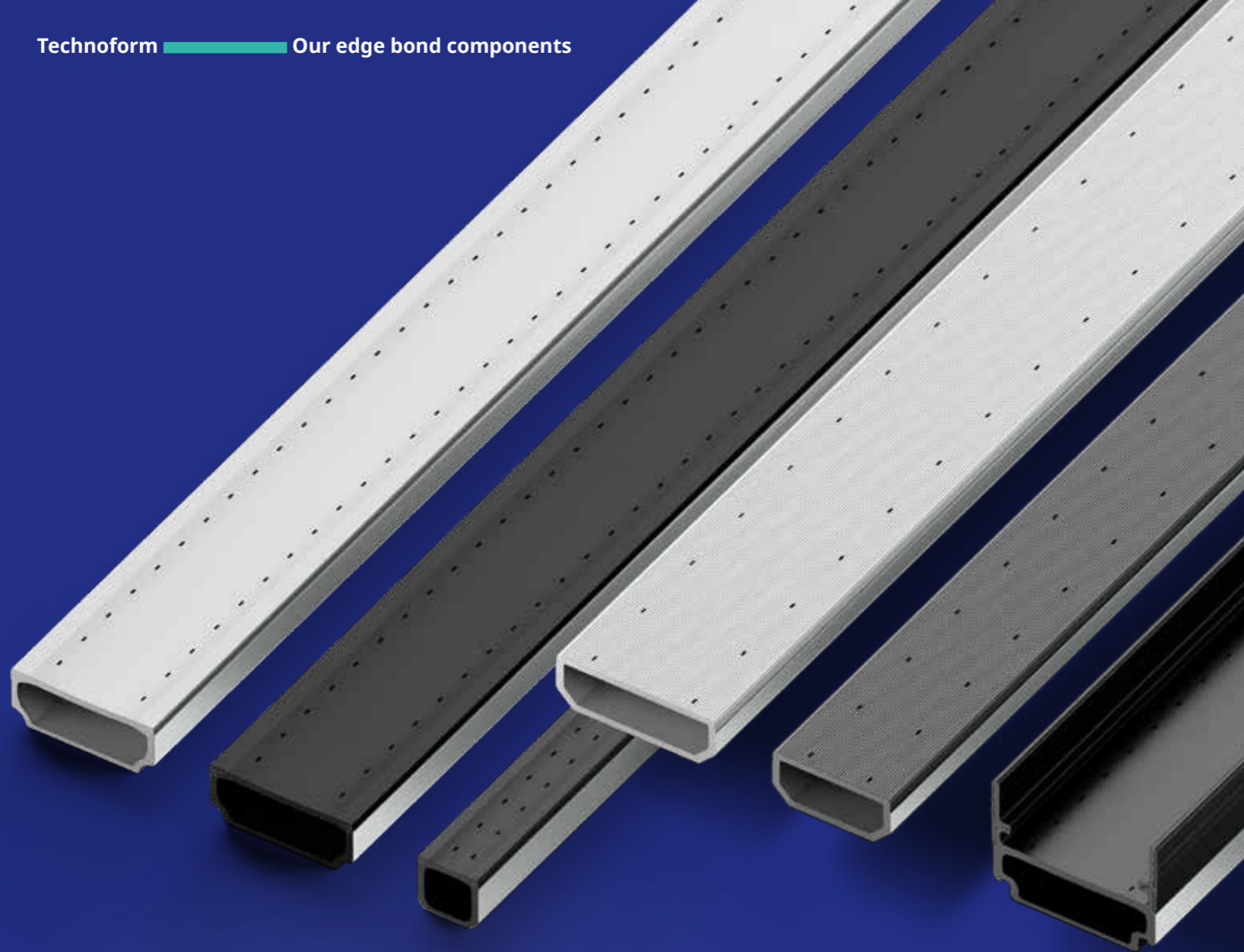
In order to deliver optimal performance, the edge bond must simultaneously fulfill multiple needs. It must stay flexible, even in extreme cold and heat, to avoid glass breakage. The edge bond must also minimize moisture ingress into the insulating cavity to prevent failure and maximize the insulating glass unit's service life. The edge bond must also manage gas retention to maintain insulation performance over the lifetime of the sealed unit.

The edge bond should be considered as a high-performing system, not a collection of components – spacer, desiccant, sealants, connectors, etc. – that can be interchanged without consequence. The service life of an insulating glass unit depends significantly on its edge bond design, particularly on the type, quality and quantity of materials used and their interactions.

At Technoform, we create high-performance edge bond systems, including components which are optimized for use with our spacers. The result: higher insulating glass durability and optimized service life – an advantage for insulating glass fabricators, window manufacturers and end-users alike, who can rely on sustainable solutions of excellent quality.



Innovation is our passion.
We develop customized solutions according to your requirements.



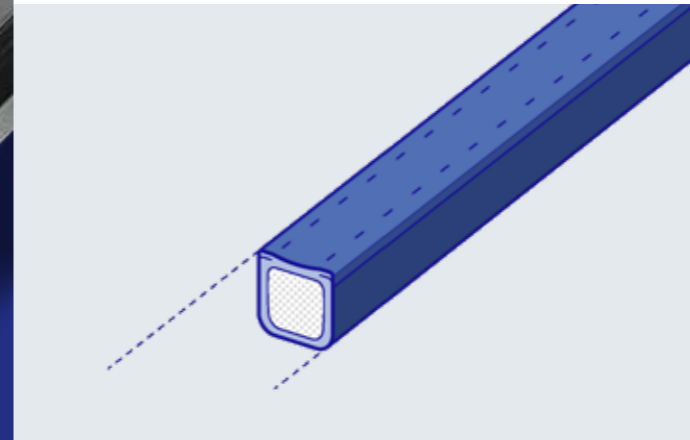
Thermal edge bond solutions for insulating glass

Our solutions combine peak performance with appealing design – wherever you want to use them.

Designed for small spaces

For thin insulating glass units this warm edge spacer fits seamlessly. This spacer is ideal for retrofits on historic buildings where a smaller thickness of insulating glass must be maintained. This spacer can be used for triple glazing, especially when high thermal performance is needed while still maintaining a similar thickness as double glazed insulating glass. In addition, the solid metal back prevents moisture-vapor transmission.

It complies with EN 1279-2, 3 & 6, DTA and ASTM E2190.



SP12

You can benefit from the following advantages:

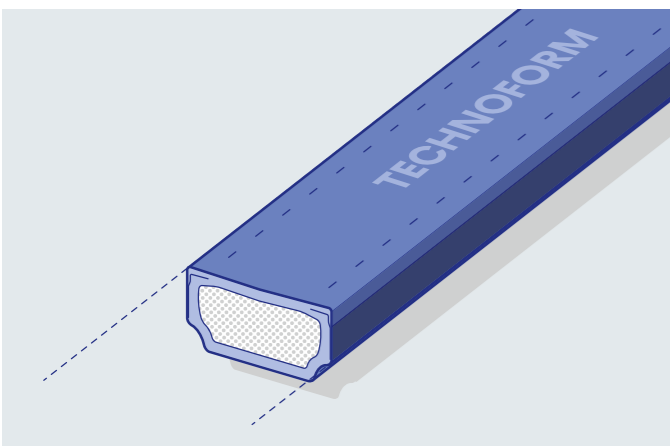
- Ability to maintain existing building aesthetics while increasing thermal performance
- High level of design flexibility in any form
- Ideal for thin frames where an air space of less than 10 millimeters is needed

Mason Square Apartments at Indian Motorcycle
Springfield, Massachusetts, U.S.A.
Photo courtesy Diamond Windows & Doors MFG Inc.



Equipped for every challenge

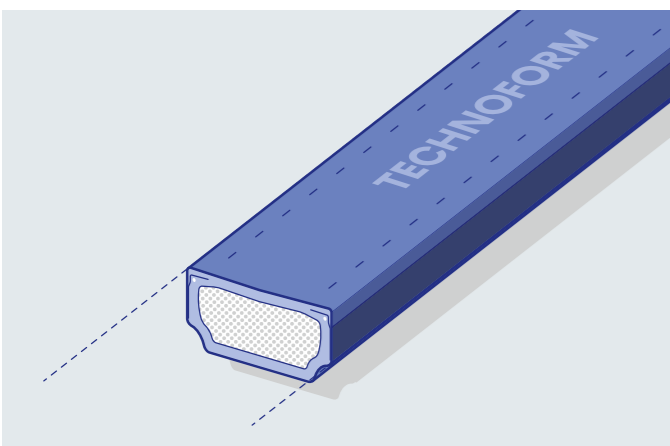
This warm edge spacer was designed to meet the numerous requirements which apply to the modern glass edge seal. It is available in a range of options, specially matched to the intended applications. While some of the details of the designs may differ from each other, they all provide low thermal conductivity values, high productivity, high process reliability and high-quality appearance. In addition, the solid metal back prevents moisture-vapor transmission. It complies with the requirements of EN 1279-2, 3 & 6, DTA and ASTM E2190. It is a certified Passive House Component Class pHB for Cool, Temperate Climate.



SP13

You can benefit from the following advantages:

- High level of design flexibility in any form
- Enables the bending of the smallest radii
- Allows negative bending (e.g. for capillary tubes)
- Can be used in curved glass



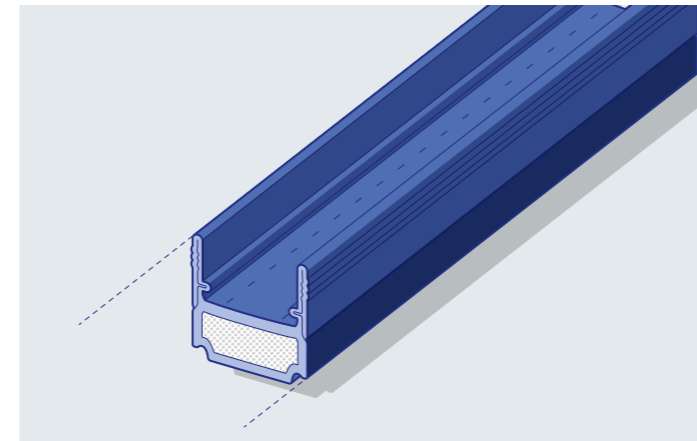
SP14

You can benefit from the following advantages:

- High profile stability due to patented reinforcing steel wires
- Ideal for medium to large frames
- Reduces frame readjustment
- Rigid corners

Designed for integral blinds

This solution for internal blinds is a spacer with integrated locating and guiding elements and is specially designed for use with internal blinds while keeping thermal conductivity values low within the whole system.



SP15

You can benefit from the following advantages:

- No noise or damage to the surface of the glass
- Low thermal conductivity values
- High-quality appearance

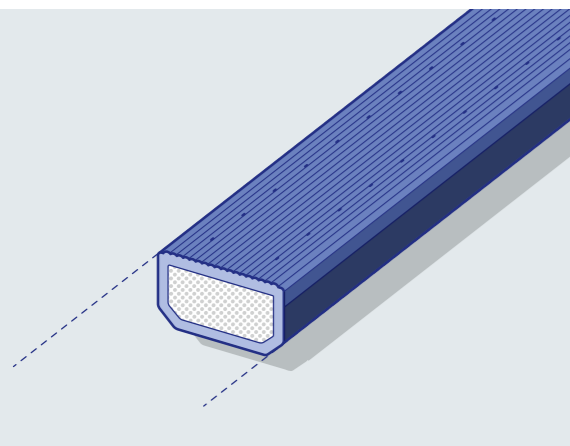
The movement of the blind, for manual or motorized systems, does not compromise the insulating properties of the insulating glass unit and is performed in a totally sealed environment. Our spacers for integral blinds help protect against dirt, dust or weather conditions, and therefore blinds do not require any maintenance.



Designed for highest thermal performance

Our developments in thermal performance fit in perfectly with the trend towards zero-energy buildings. Due to our innovative production process, the optimum combination of materials in this spacer enables the lowest possible U-values to be achieved in the system as a whole. As a result, fluctuations in thermal values are minimized. This ensures a reliable basis for your calculations. The spacer is processable on automatic butyl extruders for small, medium, and large frames. It shows no memory effect, making straight butyl application possible while avoiding the need of a manual adjustments of the frame after assembling on the glass.

It complies with the requirements of EN 1279-2, 3, 4 and 6, CAN/CGSB-12.8, DTA, and the RAL quality and test regulations. It is certified by Cekal and CSTB.



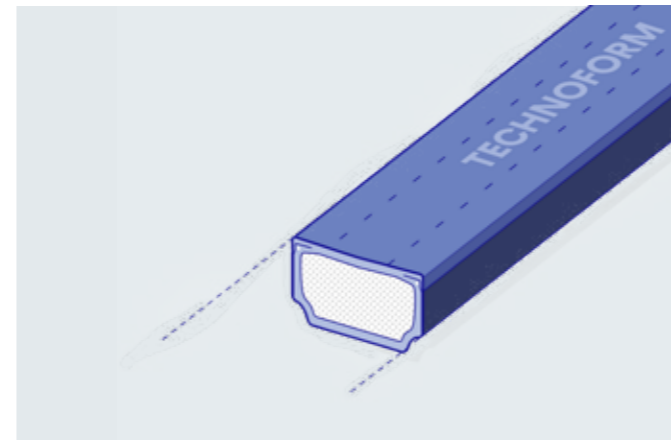
SP16

You can benefit from the following advantages:

- High quality of the edge bond and consistent Lambda-equivalent values due to lowest possible product tolerances within the range of $\pm 0,05$ mm (while $\pm 0,1$ mm is usual on the market)
- Optimum process capability due to high fracture strength
- The plastic body does not crack during proper process handling or while inserting connectors.
- High-quality look: Smooth and bright surface. The slight rills on the surface protect the spacer from scratches and dust pollution.
- The multilayer barrier foil has a significant impact on the durability of the edge bond and the Lambda-equivalent of the spacer.
- Certified Passive House Component Class pH A (Arctic Climate)
- Eudermic: The spacer does not cause any skin irritations thanks to the orientation of glass fibres in the profile.

Optimized for improved processing

These warm edge spacers have increased rigidity, making it even easier to process and handle the spacer frame, especially for large sizes. Each of these spacers have specific features that increase insulating glazing manufacturing capacities while improving quality and maintaining thermal performance. In addition, the solid metal back prevents moisture-vapor transmission.

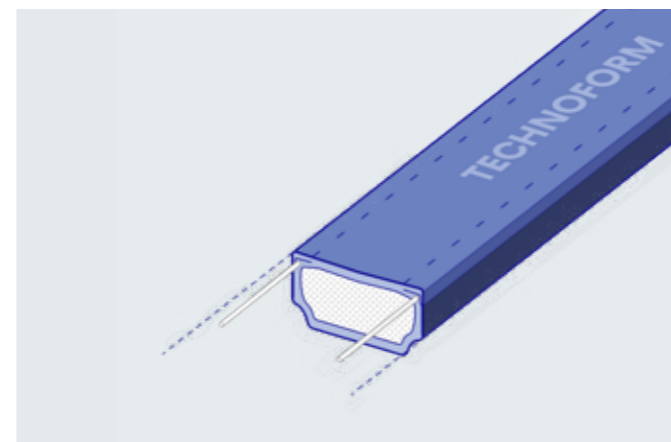


SP17

You can benefit from the following advantages:

- Taller 8mm height improves handling and placement of spacer frames
- Drop-in replacement for 8mm tall aluminum or stainless-steel spacers
- Highest desiccant capacity and longest primary seal length for best in class durability

It complies with the requirements of ASTM E2190.

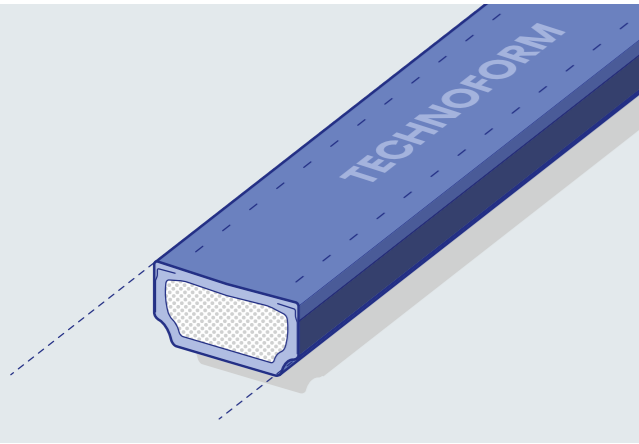


SP18

You can benefit from the following advantages:

- Larger wire diameter improves rigidity
- Increases the production efficiency and quality
- High reliability and durability of the glazing
- Optimum adaptation to automatic machines

It complies with the requirements of EN 1279-2, 3, 4 and 6, DTA, and the RAL quality and test regulations. It is certified by Cekal and CSTB.



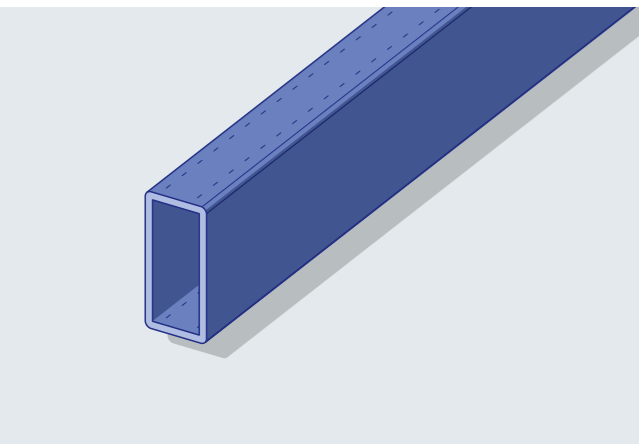
SP19

You can benefit from the following advantages:

- Mid-range conductivity of 0,50 W/mK
- High level of design flexibility in any form
- Designed for manufacturers who cut and connect the profile with corners keys

Designed as a first step

Start your transition from aluminum with this beginner warm edge spacer. This spacer is perfect for making the transition to thermally optimized edge bonds. Using a more basic steel grade than our other spacers, allows ductility for shapes, offers mid-range thermal performance, and still prevents moisture-vapor transmission with the solid metal back. It complies with the requirements of EN 1279-2, 3, and 4.



MU10

You can benefit from the following advantages:

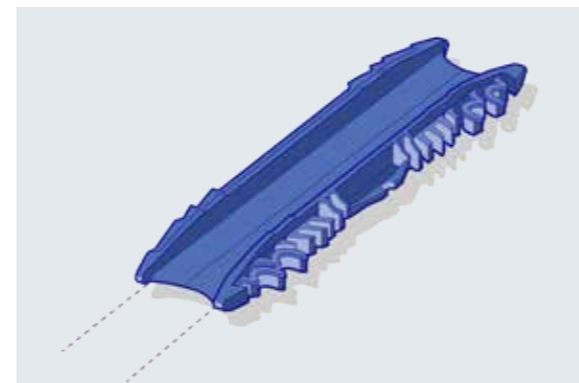
- Low heat conductivity of just 0.25 W/mK
- Very high profile stability and low coefficient of linear expansion due to integrated glass fibres
- Perfect processability together with our warm edge spacers

Less contact, more performance

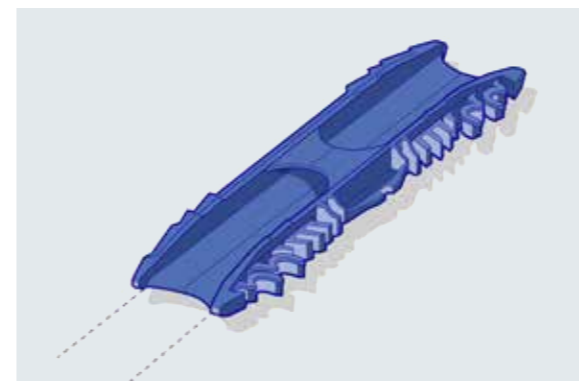
Our muntin bar system can be positioned within an insulating glass unit without any direct contact with the glass. It is aesthetically identical to our warm edge spacers, giving insulating glazing manufacturers a complete thermally optimized system that meets current thermal insulation requirements and will also meet the tighter requirements of tomorrow. Cross-shaped muntin bar connectors are used to connect profiles and are matched to the exact profile width in each case.

The excellent connection

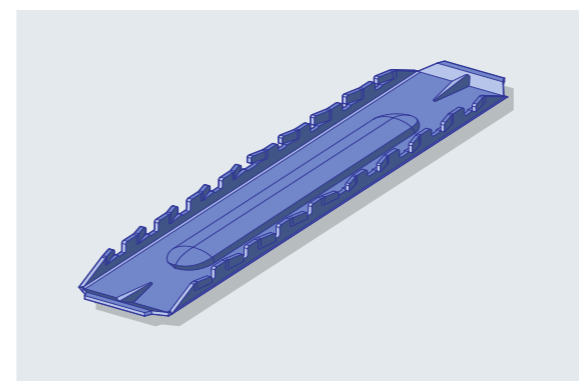
Within the glass edge bond, a functional secure frame has a significant impact on the performance of the entire glass edge bond system. Technoform connectors convince with an improvement in quality and durability of the insulating glass unit and offer dimensional stability at the connection points even with larger frames. The connectors are ideally suited for manual and automated processing and fit perfectly to our spacer geometry. Thus, we ensure the best composition of the components in the glass edge bond.



CN53



CN54



CN66

You can benefit from the following advantages:

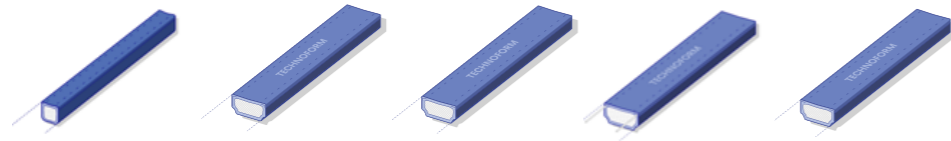
- Improved quality and durability of the insulating glass unit
- Process reliability
- Dimensional stability at the connection points, even for larger frames
- Prevention of gap formation and avoidance of desiccant leakage
- No deformation of the spacer geometry
- Reliable molecular sieving due to asymmetry and special inlet ramp
- Larger interior cross section for a reduced flow resistance
- Guaranteed barrier for gas and moisture diffusion
- Simple and easy handling

We elevate your glass edge bond through seamless spacer-connector integration.

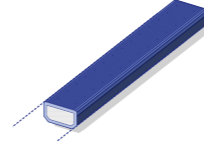
Colors and sizes

Warm edge spacers

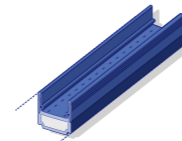
■ Produced in Singapore



High thermal performance spacer



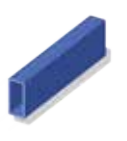
Spacers for integral blinds



Connectors



Muntin bar



Width	SP12	SP13	SP14	SP18	SP19
Former product brand name:	TGI-Spacer	TGI-Spacer M without wire	TGI-Spacer M with wire		
6.2 mm	■				
8 mm	■				
9 mm	■				
10 mm		■	■		■
11 mm			■		
12 mm		■	■	■	■
13 mm		■	■		
14 mm		■	■	■	■
15 mm		■	■	■	■
16 mm		■	■	■	■
17 mm		■	■		
18 mm		■	■	■	■
19 mm		■			
20 mm		■	■	■	■
22 mm		■	■		
24 mm		■	■		
26 mm		■	■		
28 mm		■	■		
30 mm		■	■		




SP16
TGI-Spacer Precision

SP15
TGI-Spacer Pellini

CN53 CN54 CN66

Width	Height	MU10
9.5 mm	21.5 mm	■
9.5 mm	25.5 mm	■
9.5 mm	31.5 mm	■
11.5 mm	21.5 mm	■
11.5 mm	25.5 mm	■
11.5 mm	31.5 mm	■
13.5 mm	21.5 mm	■
13.5 mm	31.5 mm	■

Colors

 Similar to RAL 9016 White	 Similar to RAL 7035 Light grey	 Similar to RAL 7040 Dark grey
 Similar to RAL 8003 Light brown	 Similar to RAL 8016 Dark brown	 Similar to RAL 9005 Black

Customised options can be produced according to your specification. Please contact us at info.tesg@ap.technoform.com

Thermal values

A comparison of thermal values (according to Bundesverband Flachglas e.V.):

$$U_w = \frac{U_f \cdot A_f + U_g \cdot A_g + \psi \cdot l_f}{A_w}$$

$$T_{oi} = T_{ia} + f_{Rsi} \cdot (T_{li} - T_{ia})$$

l_f = Length of edge, frame-glass
 ψ = Linear thermal coefficient, composite edge
 T_{oi} = Inner surface temperature
 T_{li} = Indoor air temperature +20 °C
 T_{ia} = Outdoor air temperature -10 °C
 f_{Rsi} = Temperature factor at $R_{Si} = 0.20 \text{ m}^2 \text{ K/W}$

Frame	Wood			Plastic			Aluminum			Wood/Aluminum		
Double glazing	2 IG			2 IG			2 IG			2 IG		
Spacer	Aluminum	SP13/SP14	SP16	Aluminum	SP13/SP14	SP16	Aluminum	SP13/SP14	SP16	Aluminum	SP13/SP14	SP16
ψ value	0.074 W/mK	0.040 W/mK	0.031 W/mK	0.068 W/mK	0.040 W/mK	0.032 W/mK	0.100 W/mK	0.049 W/mK	0.036 W/mK	0.084 W/mK	0.044 W/mK	0.032 W/mK
U _w window	1.37 W/m ² K	1.29 W/m ² K	1.27 W/m ² K	1.30 W/m ² K	1.23 W/m ² K	1.21 W/m ² K	1.52 W/m ² K	1.39 W/m ² K	1.36 W/m ² K	1.40 W/m ² K	1.31 W/m ² K	1.28 W/m ² K
Temperature factor f _{Rsi}	0.50	0.62	0.66	0.54	0.65	0.68	0.53	0.66	0.69	0.45	0.59	0.63
Surface temperature T _{oi} at -10 °C, +20 °C	7.6	10.6	11.4	8.6	11.3	12.0	8.3	11.5	12.4	6.2	9.7	10.7

Frame	Wood			Plastic			Aluminum			Wood/Aluminum		
Triple glazing	3 IG			3 IG			3 IG			3 IG		
Spacer	Aluminum	SP13/SP14	SP16	Aluminum	SP13/SP14	SP16	Aluminum	SP13/SP14	SP16	Aluminum	SP13/SP14	SP16
ψ value	0.078 W/mK	0.039 W/mK	0.029 W/mK	0.069 W/mK	0.038 W/mK	0.030 W/mK	0.100 W/mK	0.044 W/mK	0.031 W/mK	0.090 W/mK	0.042 W/mK	0.030 W/mK
U _w window	1.08 W/m ² K	0.98 W/m ² K	0.95 W/m ² K	1.00 W/m ² K	0.92 W/m ² K	0.90 W/m ² K	1.26 W/m ² K	1.12 W/m ² K	1.09 W/m ² K	1.15 W/m ² K	1.03 W/m ² K	1.00 W/m ² K
Temperature factor f _{Rsi}	0.57	0.70	0.74	0.59	0.70	0.73	0.60	0.73	0.76	0.53	0.59	0.71
Surface temperature T _{oi} at -10 °C, +20 °C	9.3	12.5	13.4	9.8	12.9	13.3	10.1	13.3	14.1	8.2	11.9	12.8

Tests and services

We have always been dedicated to testing our products to the core. And as a true partner, we like to give our customers and partners the opportunity to gain an in-depth insight into the extensive competences of Technoform.

Service, support, and testing

- Insulating glass weathering (EN 1279-2 | ASTM E2188)
- Climate test for determining gas leakage rate (EN 1279-3)
- Analysis of the fogging characteristics of the whole insulated glazing system and individual components (EN 1279-4 | ASTM E2189)
- Testing of colour fastness after exposure to UV radiation (EN 4892-2)
- Creation of microsections with microscopic analysis
- Material selection by means of differential scanning calorimetry and infrared spectroscopy
- Quantification of shore hardness D, glass-fibre content, and density of thermoplastics
- Determination of bending properties of spacers
- Determination of thermal conductivity
- Adhesion tests on elastomers
- Measurement of gas content
- Performance of computer-aided simulation for the purpose of analyzing mechanical and thermal properties

Organization of external tests

- Determination of material properties
- Quantification of mechanical properties
- Determination of weathering behavior under different climatic conditions

Building certificates

A spacer can make a difference

Our solutions have helped design teams to gain valuable points in several credit categories and move closer to the goal of receiving a high building certification.



University of Central Missouri, Warrensburg, USA, 2011, LEED Gold

Driven by global developments such as climate change, dwindling resources, and demographic change, sustainability is becoming increasingly important in the construction industry. In recent years, various building evaluation

systems have been developed throughout the world, for example BREEAM, LEED, HQE, Green Star, and Passive House. Our solutions can positively influence a building's rating.



BREEAM

BREEAM (Building Research Establishment Environmental Assessment Method) has been active since 1990 in over 75 countries. It is the world's leading sustainability assessment method with more than 565,000 certified buildings. Its aim is to develop customized rating systems for every type of building and building use. Different sustainability categories for new construction sum up to the final building rating. Being a building product our warm edge spacers can influence the BREEAM categories of Health and Wellbeing, Materials, and Innovation.



Passive House

The Passive House Institute (PHI) is an independent research institute in Germany. The Passive House standard is characterized by a very high level of energy savings compared with conventional new buildings. Certifications are awarded to buildings, products, and detailed solutions, as well as to planners, specialist engineers, craftsmen, and consultants. A Passive House is a building that, as a rule, does not require a

conventional heating system on account of its effective thermal insulation and functional principle for avoiding ventilation heat losses by using heat exchangers. Our SP13 and SP14 are Passive House certified for Cool, Temperate Climate (phB), our SP16 is even certified for Artic Climate (phA).



LEED

LEED (Leadership in Energy and Environmental Design) was developed by the US Green Building Council (USGBC) in 1998. It provides practical and measurable strategies on how to plan, erect, and operate buildings. With almost 94,000 certified projects in over 165 countries, LEED is a widespread certification scheme for sustainable buildings. The current LEEDv4 version is organized to promote action in six credit categories, of which our warm edge solutions can influence "Materials and Resources", "Indoor and Environmental Quality", and "Energy and Atmosphere".



BCA Green Mark Scheme

The BCA Green Mark Certification Scheme is a green building rating system

designed to evaluate a building's environmental impact and performance. It provides a comprehensive framework for assessing the overall environmental performance of new and existing buildings to promote sustainable design, and best practices in construction and operations in buildings. Certified in accordance with the Singapore Green Building Product (SGBP), our thermal break (3 ticks) and warm edge spacer (3 ticks) contribute to a building's sustainability rating and allow stakeholders to accrue points under the Green Mark Scheme.



The DGNB System

The DGNB Certification System (German Sustainable Building Council) provides an objective description and assessment of the sustainability of buildings and urban districts. It assesses quality comprehensively over the entire life cycle of the building and can be applied internationally. Due to its flexibility it can be tailored to various uses of building applications. The DGNB System does not evaluate individual measures, but the overall performance of a building. As a building product, our warm edge spacers can influence the DGNB criteria of "Environmental quality" and "Sociocultural and functional quality". (www.dgnb-system.de)

From the desert of Dubai to the Rocky Mountains of Canada – at Technoform, we unleash the full potential of people and their ideas across a global network to create the solutions of tomorrow.

CITIC Tower/Zhongguo Zun, tallest building in Beijing, China, 2018, LEED Gold – equipped with warm edge solutions and thermally broken unitized curtain wall systems by Technoform.



Space Needle, Seattle, Washington, USA – LEED Gold

The 2018 renovation of this iconic structure resulted in a 196 % increase in glazed area for enhanced views of the city. Technoform's warm edge solutions solved the energy performance challenges without compromising durability or structural performance.

**Our edge bond solutions
and special components
work together to greatly
reduce heat loss and
make a positive impact
on the reduction of
global CO₂ emissions.**

Sealed units that helped seal the deal



“Once we’d shown the architect our sealed units with spacers from Technoform, he was convinced that they looked far more appealing than other systems he’d seen on the market – and this decision saved around £150 per unit.”

Ian Short, MD Morley Glass & Glazing Ltd.

The challenge:

Combining functionality with aesthetic looks is not an easy task when it comes to insulating windows and facades. For a new two-storey Acute Mental Health Inpatient Unit within the Belfast City Hospital estate, our British partner Morley Glass & Glazing was approached to find a special solution for sealed units with integrated blinds that would match both requirements.

The solution:

Morley supplied the hospital with its SL20 MB system equipped with warm edge spacers from Technoform. It uses motorized blinds that were specially developed with two operating mechanisms – one for the patients to control inside their room, and a key operated override system for nursing personnel to operate from the corridor. The electric brushless motor quietly raises, lowers, and tilts the integral blinds safely, smoothly, and with precision.

The result:

The double-glazed sealed units with integral blinds provided by Morley Glass & Glazing were not only far more appealing, but saved the hospital thousands of pounds due to a cost-efficient construction that outmatched other systems. Thus, Technoform helped Morley win a contract with Belfast City Hospital.

Your challenges – our solutions



Material

Challenge:

A spacer is exposed to UV radiation 365 days a year and to extreme variations in temperature. Its surface quality must remain constant. In addition, there must be no interactions between the various materials in the edge bond.

Our solution:

With our high-quality raw materials, most of which have been tried and tested for more than 20 years, combined with the optimum profile geometry, our products improve the service life of your insulating glass.

Challenge:

The growing importance of building certification, such as BREEAM or LEED, and the increasing shortage of raw materials have led to a rise in the demand for sustainably produced and recyclable materials.

Our solution:

Our products reduce the thermal conductivity of the system to a minimum.



Precision

Challenge:

Insulating glass tolerances, gas tightness, and secure installation are particularly critical issues as they have a significant influence on the quality and durability of window, door, and facade systems.

Our solution:

Our innovative production process enables the lowest possible product tolerances for accuracy in window, door, and facade systems. We can guarantee the high quality of the edge bond.



Reinforcing element

Challenge:

High process reliability for different formats and for parallelism in triple glazing.

Our solution:

Reinforcing elements like wires significantly increase profile stability and the force required to cause plastic deformation.



Fire protection glazing units

Challenge:

To provide high temperature resistance and guarantee the basic function of separating the panes, according to the relevant fire protection class, without limiting the thermal values.

Our solution:

The ideal combination of materials means that our spacers are suitable for use in E, EI, and EW fire-resistance class glazing units.



Decorative elements

Challenge:

To visually divide larger pane formats into smaller window units with a high-quality look.

Our solution:

A muntin bar in a high-quality design to match the surface of the spacer while ensuring low thermal conductivity and high profile rigidity at the same time.



Gas barrier

Challenge:

To maintain the thermal performance of the window throughout its life cycle.

Our solution:

A gastight barrier with low heat conductivity and 100 % adhesion to common sealants.



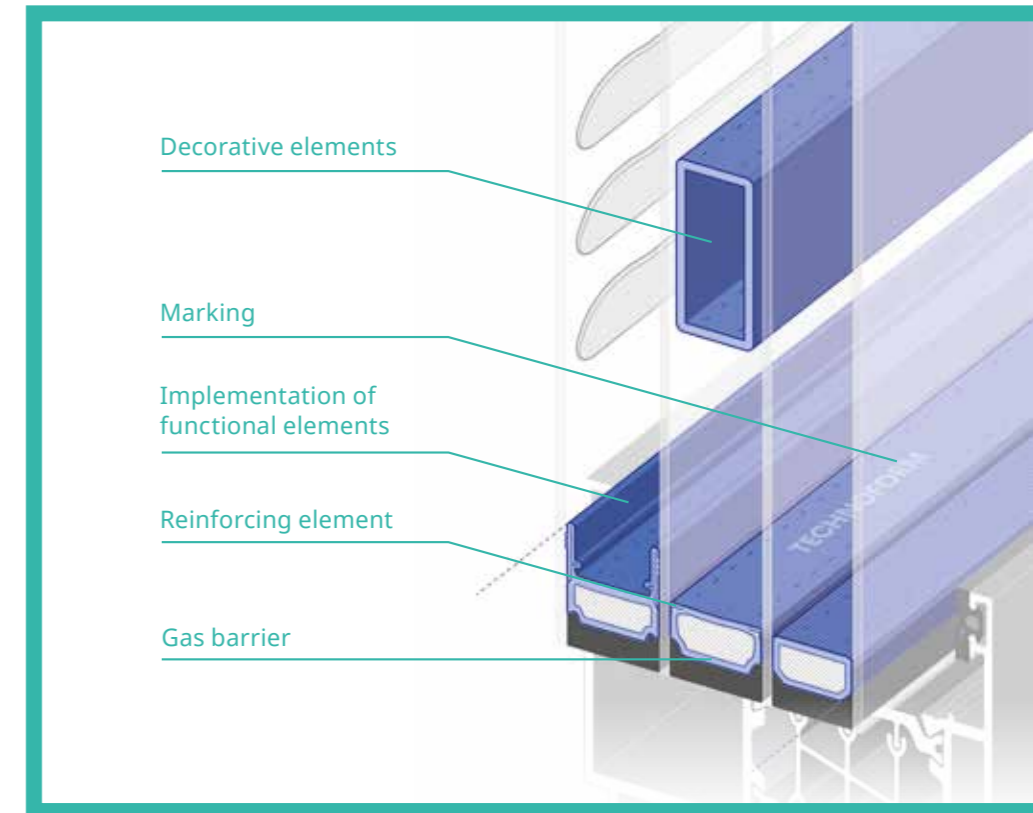
Marking

Challenge:

The increasing internationalization of the markets and growing competition mean that the quality of products and your own brand need to stand out.

Our solution:

Our laser marking system can individualize our spacers by marking the surface with their chosen text and logo. High-resolution markings don't affect the thermal properties of the spacer, are resistant to UV, do not cause abrasion or fogging, and are environmentally-friendly.



Implementation of functional elements

Challenge:

To provide locating and guiding elements for internal blinds to avoid noise and damage to the surface of the glass while keeping thermal conductivity values low.

Our solution:

Integrated locating and guiding elements in the thermally optimized spacer for integral blinds.



Sound insulation

Challenge:

Components for different noise sources and varying noise intensity need.

Our solution:

A wide range of widths, e.g. the Technoform spacer in 30 mm, complements the individual sound-insulating asymmetric pane construction, enabling the whole glazing structure to be optimally coordinated.

Sustainability – thinking ahead for future generations

For us, sustainability is not just an empty phrase. It's our commitment and obligation to the generations to come. That's why we include economic, ecological, and social factors in our vision and management strategies. That means going the extra mile to create the best possible solutions that not only fit our customers' needs of today, but also guarantee the best durability and energy efficiency.

Sustainable work practices

Sustainability is not limited to the output of our work but includes our everyday practice of how we work. Occupational health and safety, environmental protection and energy efficiency play a vital part in our daily work. Since 2013, we have been certified in accordance with DIN ISO 14001 and DIN ISO 45001 in Germany and Great Britain and in accordance with DIN ISO 50001 in Germany.

Keep an on it.



Industrial safety



Environmental protection



Health protection



Energy efficiency

Responsibility

We can all contribute to a careful use of our resources. To live up to this statement, we at Technoform take responsibility by recycling and separating waste – both in the office and at our production sites. To take it a step further, we always try to improve our production processes. This includes reduced energy consumption as well as the newest standards for our machines to make them quieter, more comfortable to operate, and safer for our health.

Climate neutrality

We have set up a cooperation with the “Plant-for-the-Planet Foundation”: By planting trees we compensate the CO₂ that is emitted due to the production of our packaging material and the truck deliveries in Germany.

REACH compliance

A safe and chemically innocuous product is what our customers require and what we want to create. Therefore, we do not use any of the substances defined as harmful in REACH, the European Regulation on Chemicals, in our production process.

Reliability of supply

Sometimes unforeseeable events occur that may cause difficulties for a scheduled delivery. To avoid this, we have installed a comprehensive occupational safety and fire protection concept. This allows us to carry on even in exceptional circumstances. Our three production sites in different parts of the world also guarantee a reliable supply – wherever you are.

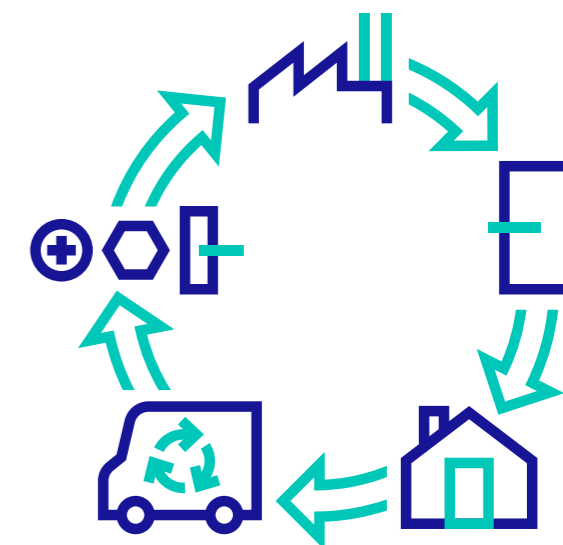
Sustainable products

Guaranteeing sustainability is at the core of what we do – every single day. Our products constantly insulate windows, doors, and facades to the highest degree, thus conserving valuable global resources in the process.

To put it in numbers: To date, we have produced around 1 billion metres of warm edge spacers worldwide. Our products have been used in around 350 million windows and have helped to save approximately 1.5 billion kWh of energy per year. And we are not finished yet.

In addition, we use materials which are made from renewable resources and can be recycled in an environmentally-friendly manner. Thus, we bring sustainability to a new level as we combine the advantages of the thermal break with enhanced environmental value. The effect: we meet even the highest requirements in the market.

You want to know more about our processes and products? Feel free to contact us, we are happy to hear from you!



Associations and organizations

Germany

- ift Rosenheim – Institut für Fenstertechnik e.V.
- Member of the “Warm Edge” working committee of the Bundesverband Flachglas e.V.
- Verband Fenster + Fassade
- Passive House Institute

France

- CSTB – Centre Scientifique et Technique du Bâtiment
- CEBTP – Centre d’Expertise du Bâtiment et des Travaux Publics
- Bureau Veritas
- FFPV – Fédération Française des Professionnels du Verre
- Glassalia

Great Britain

- Member of the British Fenestration Rating Council (BFRC)

Italy

- SSV – Stazione Sperimentale del Vetro
- UNICMI – Unione Nazionale delle Industrie delle Costruzioni Metalliche e dell’Involucro dei serramenti
- UNI – Ente Italiano di Normazione

Southeast Asia

- malaysiaGBC - Malaysia Green Building Council
- SGA – Singapore Glass Association
- SGBC – Singapore Green Building Council
- VGBC – Vietnam Green Building Council

Spain

- ASEFAVE – Asociación Española de fabricantes de fachadas ligeras y ventanas

USA

- NFRC – National Fenestration Rating Council
- AIA – American Institute of Architects
- FGIA – Fenestration & Glazing Industry Alliance (formerly IGMA & AAMA)
- NGA – National Glass Association with GANA
- FTI – Façade Tectonics Institute

Certifications

We are certified in accordance with:

ISO 14001:2015
ISO 45001:2018
ISO 9001:2015

Our spacers are certified Passive House Components and Singapore Green Building Product 3 ticks (Excellent):



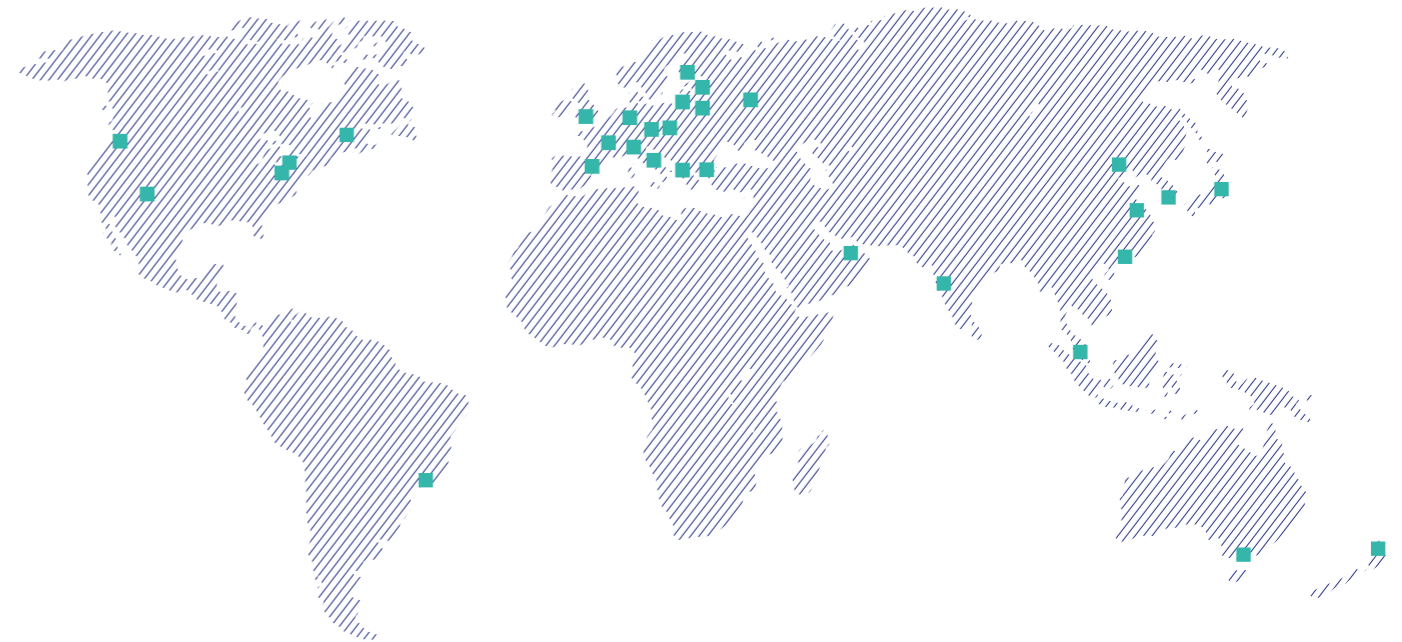
SP12 | SP13 | SP14



SP16

We have an Environmental Product Declaration (EPD) available as well.

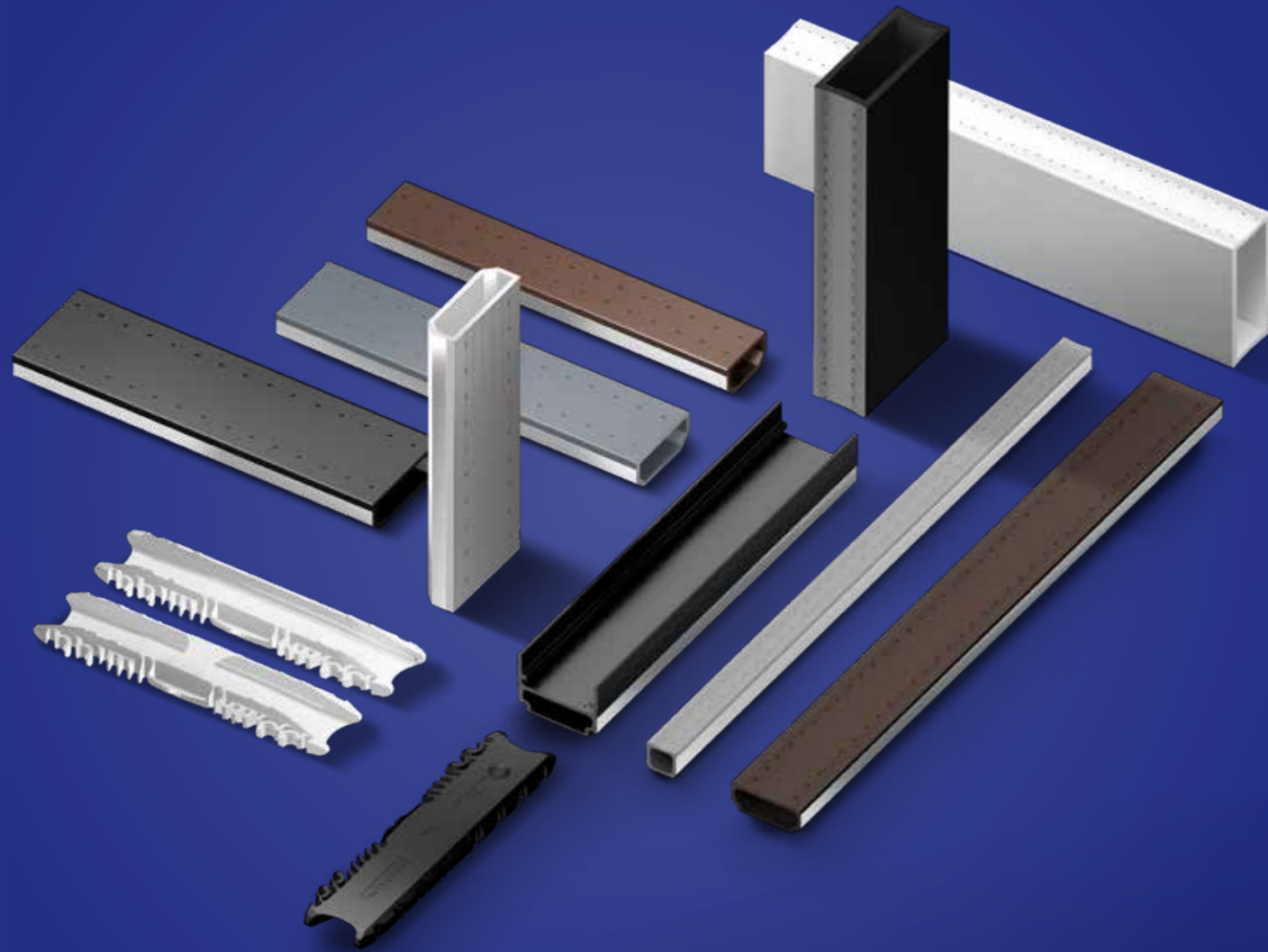
Closer than you may think – find us all over the world



Australia	Melbourne +61 3 8844 5582	Greece	Thessalonica +30 231 072 0286	Poland	Krakow +48 12 210 08 96
China	Suzhou +86 0512 6283 3188	Russia	Moscow +7 495 933 71 5	Singapore	Singapore +65 6273 9595
	Shenzhen +86 0755 2672 7912	India	Mumbai +91 96 1933 3880	South America	São Paulo +55 11 9925 22708
	Shanghai +86 021 6261 1991	Italy	Milan +39 02 901 6561	Spain	Barcelona +34 932 386 438
	Beijing +86 010 6590 7177	Japan	Tokyo +81 3 5579 9454	Taiwan	Taipei City +886 955-900-727
France	Genas +33 043 791 1000	Korea	Seoul +82 2 501 7357	USA	Twinsburg (OH) +1 330 487 6600
Germany	Kassel / Lohfelden +49 561 9583 100	Middle East	Dubai, UAE +971 4 321 5615		
Great Britain	Birmingham +44 156 433 3304	New Zealand	Auckland +64 9 415 9050		

We are Technoform, formerly known as TGI

We are transitioning all our existing products and their brand names to article IDs.



Former product brand names	New article ID
TGI-Spacer	SP12
TGI-Spacer M without wire	SP13
TGI-Spacer M with wire	SP14
TGI-Spacer Precision	SP16
TGI-Spacer Pellini	SP15
TGI-Muntin	MU10

TECHNOFORM

Thermal edge bond solutions
for insulating glass

info.tesg@ap.technoform.com
www.technoform.com