



EVOLUTION  
OF  
SILENCE

NOISE  
BARRIERS  
FOR  
WIDE  
VIEW

# TRANSPARENT



Noise is a worldwide environmental problem. Noise levels caused by road and rail traffic, but also by other sources, reduce quality of life and cause damage to health. We at KOHLHAUER are doing something about it. With vision, innovation and know-how, we create **transparent** noise protection elements that as an active contribution to environmental protection improve the quality of life and increase traffic safety.

**Welcome** to the solution specialist for noise protection with a sustainable outlook.

# WHO WE ARE

**R. KOHLHAUER GmbH, based in Gaggenau, is one of the leading service providers for noise and environmental protection technology in Germany and Europe.**


As market-shaping specialists, we develop and produce innovative noise control elements with added value for the environment, climate and resource utilization. At the same time, we drive the progress of noise control. To this end, accomplished experts at our headquarters in Gaggenau and at our subsidiaries in other European countries work with great passion and technical know-how.

With our European production sites, we have a total of 4,000 sqm of production space and 7,000 sqm of storage capacity. Here, noise barriers are developed and produced that fit the needs of our customers and comply with our "Made in Germany" quality philosophy.

That is why we offer the full service package from a single source:

- Detailed, customer-oriented consulting
- Competent planning assistance
- Objective profitability analysis
- Project-specific processing





**Discover the best perspectives  
with a clear view**

Noise protection from the experts  
for transparent solutions



**Room for more quality of life.** In conurbations, the choice of the right material for noise barriers is influenced by many factors. Particularly high noise barriers represent a major intrusion into the landscape – with direct effects on the environment, human perception and traffic safety.

**Sound absorption and transparency create added value.** It is no longer necessary to sacrifice transparency when sound absorption is required. This opens up new perspectives. Noise protection without obstructing the view allows residents to continue to enjoy an unobstructed view of the landscape, reduces shadows on adjacent properties or the roadway, lets travelers enjoy inviting sights, and at the same time helps to avoid tiring tunnel vision.

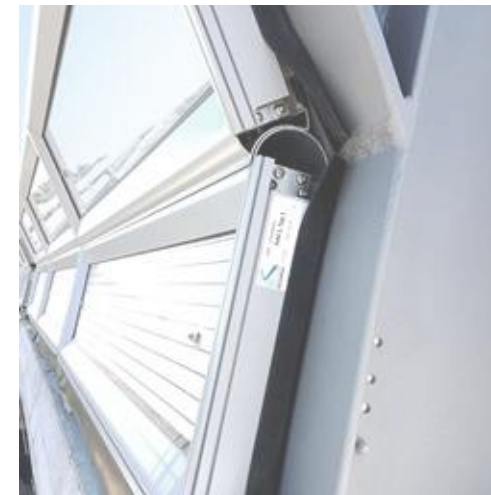
**Know-how for clear results.** As a system provider in the field of noise control and environmental management, R. Kohlhauer GmbH develops innovative noise control solutions with maximum transparency. Decades of experience and comprehensive know-how flow into a high-quality and efficient product range. It is synergetically complemented by the areas of planning, logistics, production and sales. The result is solutions that make both roads and railroad tracks safer and more environmentally compatible.

**Materials for every requirement.** The range of possibilities at KOHLHAUER also includes suitable materials. For example, extruded (XT) or cast (GS) acrylic is available as a high-quality and proven solution. In addition, a special silicate glass is part of our portfolio – an innovative pane material that meets all requirements to ensure sustainable noise protection.

## Transparent

Good prospects for quality of life and safety

*D-Talbrücke Heidingsfeld,  
A3, Nuremberg-Frankfurt,  
KOHLHAUER SCORSA® FLEX*



*D-Talbrücke Heidingsfeld,  
A3, Nuremberg-Frankfurt,  
KOHLHAUER SCORSA® FLEX*

## Highest functionality for the best perspectives

Modular, efficient solutions with KOHLHAUER SCORSA®

**KOHLHAUER SCORSA®** is a well thought-out and individually designable, transparent product group. Thanks to the modular principle, different project dimensions can be efficiently managed. First, the appropriate element filling is selected according to the modular principle, KOHLHAUER procures these from various suppliers worldwide. Then, by selecting the appropriate frame solution, the individual, transparent noise protection element is created. The choice of filling and frame solution is always based on the customer-specific requirements, so not all element

fillings or frame solutions are always equally suitable for a project.

SCORSA FRAME, for example, is the inconspicuous, transparent standard solution, while SCORSA CLEARWALL is both transparent and absorbent, SCORSA FLEX the basis for futuristic design, SCORSA POINT FIX a mounting concept that eliminates visibility restrictions caused by frames, and the wind protection product KOHLHAUER SCORSA® BORA optimally suited for use on bridges.

Further advantages at a glance:

- Stable profile frames made of coated aluminum
- Available with different pane materials
- Optional bird protection strips
- Extensive color options for individual design
- CE certifications available

# SCORSA



// **Innovative and effective** frameless solution  
for transparent sound insulation.

Shown here: D-Munich, Freiam, A8,  
KOHHLHAUER SCORSA® POINT FIX





## Materials\* for noise protection with vision

Variety of products for every requirement

### KOHLHAUER SCORSA® made of XT

KOHLHAUER SCORSA® can be filled with XT, a highly transparent, extruded acrylic glass. The material has excellent optical properties and has already proven itself many times over. It offers an economical solution. /// [p. 14](#)

### KOHLHAUER SCORSA® made of GS

Another option is to fill KOHLHAUER SCORSA® with GS material, a cast acrylic glass. It has an excellent surface quality with high grade and optical quality. It is characterized by a wide processing range. /// [p. 16](#)

### KOHLHAUER SCORSA® made of TSG/LSG

KOHLHAUER SCORSA® can also be designed with a silicate glass filling as a single-pane (TSG) or laminated safety glass (LSG) solution. The material shows excellent transparency and efficiency. It has high impact and shock resistance and is insensitive to high temperature fluctuations. /// [p. 18](#)

### KOHLHAUER SCORSA® made of XT-BG

KOHLHAUER SCORSA® can also be filled with XT Bird Guard, another highly transparent extruded material. This also has incorporated strips that help prevent birds from hitting it, thus serving to protect nature. /// [p. 15](#)

### KOHLHAUER SCORSA® made of GS-CC

The filling of KOHLHAUER SCORSA® with GS-CC, a highly transparent cast acrylic with embedded polyamide threads, provides additional binding of splinters to prevent falling fragments and also acts as bird protection. /// [p. 17](#)

### KOHLHAUER SCORSA® made of LNP\*\*

As an alternative, KOHLHAUER SCORSA® can also be filled with a special laminated safety glass of the LNP brand. This consists of fully thermally toughened silicate glass (TSG). This results in a laminated safety glass with defined properties. LNP also meets the requirements for fall protection of fragments. /// [p. 19](#)

\* All materials are not products of R. Kohlhauser GmbH, they are purchased from different manufacturers worldwide. The material designations used here correspond to the designations known on the market and are not intended to favor or exclude any supplier.

\*\* LNP (LAMEX NOISE PROTECT) is a trademark of Glas Trösch Holding AG.



**Extruded acrylic XT** is characterized by excellent optical properties, durability as well as best sound insulation properties. It is manufactured in an extrusion process in which the thermoplastic acrylic granulate is melted and formed into sheet shape by means of cylinder rollers. This process produces solid sheets up to 25 mm thick with very low thickness tolerances.

The weather resistance of extruded acrylic, which has been used as a noise barrier material for over 30 years, is enormous. KOHLHAUER provides a 10-year warranty on the product. Acrylic glass XT opens up a wide range of possibilities for requirement-specific individualization. For this purpose, different formats, pane thicknesses, various colors, bird protection decors and special designs are available.

#### Advantages at a glance

- Low weight
- High light transmission and sound insulation
- Complies with EN 1793 and EN 1794 as well as the German standard ZTV-Lsw
- Highly resistant to UV light, weather and chemicals
- Excellent impact strength and stone throw resistance

**Acrylglas XT BG** is a highly transparent extruded noise barrier sheet with integrated bird protection. Noise barriers made of transparent materials are a permanent source of danger for birds. Research has shown that with transparent materials there is a need for protective measures. At the same time,

however, the transparency should be largely preserved. Acrylglas XT BG solves this task by means of 2 mm wide black strips, which are incorporated at 30 mm intervals. A top layer of acrylic glass prevents them from being affected during routine cleaning or graffiti removal. The stripes are proven to be highly

effective and highly visible to birds. At the same time the transparency of the wall is maintained. Acrylic XT BG also offers all the advantages of XT, it also meets the requirements of EN 1793 and EN 1794 as well as the German standard ZTV-Lsw.

## KOHLHAUER SCORSA® made of XT

Noise protection with the best prospects

*F-Le Bourget,  
KOHLHAUER SCORSA® CLEARWALL VS  
(absorbent) made of XT*



## KOHLHAUER SCORSA® made of XT BIRD GUARD (BG)

Makes the world a better place to live for everyone

*D-Tollwitz, A9,  
KOHLHAUER SCORSA® CLEARWALL VS  
(absorbent) made of XT BG*





**Cast acrylic GS** has excellent surface quality. It resists weathering and aging for years, does not yellow, and does not become rough. The material is manufactured by casting the basic materials into a mold or, for example, by bringing them together between two sheets of mirror glass.

Acrylic glass GS has particular advantages in processing: It offers a wide range of processing options and is particularly well suited to one-off production and for small series. It is also well suited for the production of difficult parts with optically flawless and heavy-duty bonding and is somewhat better than acrylic glass XT. Acrylic GS meets the requirements for airborne sound insulation of the highest class B3 according to EN 1793, EN 1974 and also all requirements of EN 1794.

#### Advantages at a glance

- Low weight
- High light transmission
- High sound insulation
- High weather resistance
- Easy to process
- High surface hardness
- High chemical resistance
- 100 % recyclable

**The highly transparent cast acrylic GS CC** gets its special properties from polyamide threads embedded in the material. In the event of breakage, these hold fragments in place, preventing them from falling (and possible damage to property and personal injury).

Areas of application therefore include noise barriers on bridges without additional safety nets and high-speed rail lines. Another advantage is the recognizability of the threads for birds, which provides better protection against accidental flying against them. Acrylic GS CC meets the requirements for airborne

sound insulation of the highest class B3 according to EN 1793, EN 1974 and also all requirements of EN 1794, additionally it complies with RIL 804.5501 (railroad bridges and other engineering structures).

## KOHLHAUER SCORSA® made of GS

For noise protection that fits like a glove

*D-PPP A94,  
Mühldorf, Forstinning-Marktl,  
KOHLHAUER SCORSA® FRAME  
made of GS*



## KOHLHAUER SCORSA® made of GS CC

Noise protection that holds together

*D-PPP A94,  
Mühldorf, Forstinning-Marktl,  
KOHLHAUER SCORSA® FRAME made of GS CC  
combined with concrete elements*





**Silicate glass** is becoming increasingly important for transparent noise barriers. Thanks to the diverse selection, all requirements for sustainable noise protection can be met.

Kohlhauer also offers **toughened safety glass (TSG)** as an economical alternative to other transparent materials.

During the manufacturing process, heating the material to over 600° creates tensile stresses in the core and compressive stresses on the surface. These give the glass high impact and shock resistance. In the event of breakage, only small, blunt fragments are produced. In addition, the material is insensitive to temperature fluctuations.

Thanks to a multi-layer structure using film bonding, several glasses can be laminated to form a **laminated safety glass (LSG)**. Different glasses, foils, material thicknesses and edges are produced on a project-specific basis, as well as the ceramic screen printing between the panes. For this reason, special requirements for loads, temperatures and formats can be met here.

**Laminated safety glass of the "LNP" brand** consists of two thermally fully tempered sheets of toughened safety glass. These panes are joined together by means of a special foil interlayer in such a way that even high impact loads with a 400 kg cone are withstood to the extent that no dangerous fragments are released. The material complies with EN 1794-2

and can also be installed on bridges. An individual bird protection decoration between the glasses protects against bird impact. On request, an additional surface coating (SIGNA-PUR) can be applied at the factory to further improve the self-cleaning effect.

- Advantages at a glance**
- Meets high optical & architectural demands
  - Enormous resistance to chemicals
  - Stability in case of breakage guaranteed by LSG LNP made of 2 x TSG
  - Insensitive to weathering in all climatic zones
  - Digital photo print design possibilities
  - High load capacity as well as high sound insulation
  - Impact resistance according to EN 1794-2

## KOHLHAUER SCORSA® made of TSG/LSG

Innovative pane material with an economic plus

*F-La Roche sur Yon,  
KOHLHAUER SCORSA® FRAME  
made of LSG*



## KOHLHAUER SCORSA® made of LNP\*

Noise protection material for special requirements

*\* LNP (LAMEX NOISE PROTECT)  
is a trademark of  
Glas Trösch Holding AG*



*D-Aschaffenburg-East,  
Ringschluss,  
KOHLHAUER SCORSA® FRAME  
made of LNP\**



// **Differently colored panes** in order to be able to realize the wave within the noise barrier required by the planner.

*Shown here: D-Grabow, A14, Eldetalbrücke,  
KOHLHAUER SCORSA® FRAME*

# UN OBT RU SIVE





**KOHLHAUER SCORSA® FRAME** stands world-wide for innovative, durable and economical noise protection that is characterized by its unobtrusive design. The sophisticated element construction and clever system components make the noise barriers particularly easy to install and always a budget-friendly, transparent solution.

**Application**  
 KOHLHAUER SCORSA® FRAME noise barriers combine an attractive appearance, simple installation and high technical requirements. They provide an unobstructed view and help to avoid annoying tunnel vision – a contribution to a better quality of life and increased traffic safety.

- Advantages at a glance**
- High stability and load-bearing capacity of aluminum frame and element statics
  - Optionally with bird protection strips
  - High sound insulation effect as well as tested stone throw resistance of all transparent materials
  - UV and weather resistant, very high aging and corrosion resistance

- Pane fillings made of acrylic (PMMA), silicate glass (TSG)
- CE certifications available
- Color variants for individual design
- 100 % recyclable

- Modular standard elements for cost-effective realization of projects of all sizes
- Combinations with other KOHLHAUER noise control systems combine high sound insulation and high sound absorption

- Combination variants**
- 1 KOHLHAUER SCORSA® FRAME on KOHLHAUER SCORSA® FRAME
  - 2 KOHLHAUER SCORSA® FRAME on concrete plinth
  - 3 KOHLHAUER SCORSA® FRAME on KOHLHAUER ALUFERA®

*All materials can be selected as frame infill (subject to specific technical requirements).*

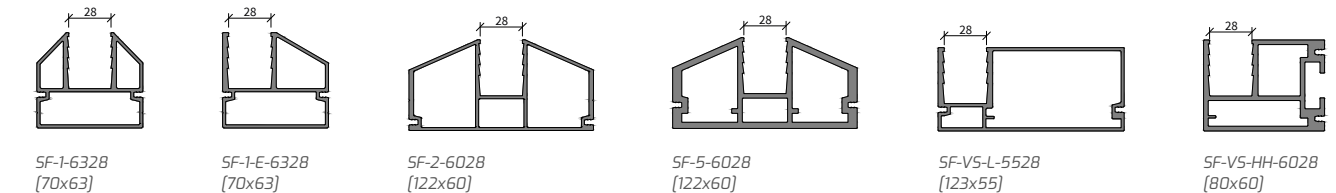
## KOHLHAUER SCORSA® FRAME

### Highest functionality in standard format

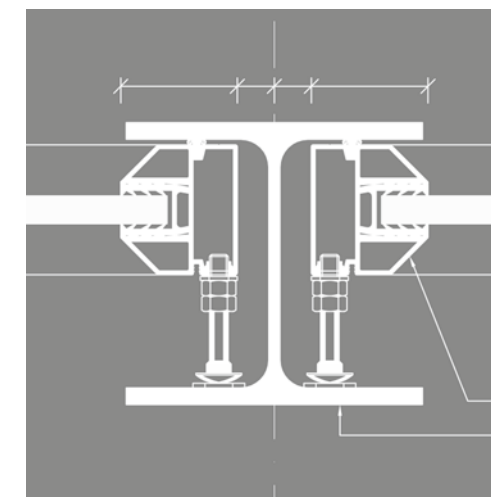
D-Grabow,  
 A14, Eldetalbrücke,  
 KOHLHAUER SCORSA® FRAME



#### Frame solutions //



Example drawing  
 KOHLHAUER SCORSA® FRAME SF-1



KOHLHAUER SCORSA® FRAME (pane material)	THICKNESS	R <sub>w</sub> (C;C <sub>v</sub> )	DL <sub>R</sub>	GROUP
<b>acrylic glass</b> (PMMA)	15 mm	32 (-1;-2) dB	30 dB	B3
	20 mm	33 (-2;-2) dB	31 dB	B3
	25 mm	34 (-1;-2) dB	32 dB	B3
<b>LAMEX NOISE PROTECT</b> (LSG)	2 x 10 mm	35 (-1;-2) dB	33 dB	B3 B3
<b>toughened safety glass</b> (TSG)	12 mm	30 (-1;-1) dB	29 dB	B3

**CLASSIFICATION OF ACOUSTIC PROPERTIES ACCORDING TO EN ISO 717-1 AS WELL AS EN 1793**



# FLEX IBL E

// **Articulated frames placed** on top of each other at different radii demonstrate KOHLHAUER's flexibility.

*Shown here: PL-Wroclaw, A8, KOHLHAUER SCORSA® FLEX*





With the SCORSA® FLEX system, transparent frame systems can now also be used on curved noise barriers. They allow better noise attenuation with simultaneous wall height reduction. The KOHLHAUER SCORSA® FLEX system offers the solution for this: from the support to the flexible hinged frame to the fastening by means of a special clamping construction. The uncomplicated and quick installation also ensures excellent cost-effectiveness.

### Application

KOHLHAUER SCORSA® FLEX noise barriers allow an unobstructed view of the landscape and sights and avoid the restriction of the view and the associated risks for the vehicle driver. The system impresses with its straightforward character without appearing

oppressive to drivers. In addition, the different heights without disturbing posts are perceived as pleasant by road users. Residents, too, perceive a flat, lively band of light and shadow effect.

## KOHLHAUER SCORSA® FLEX

Innovative design and convincing cost-effectiveness

### Advantages at a glance

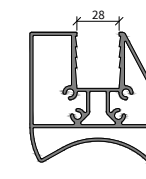
- High stability and load-bearing capacity of aluminum hinged frame and element structure
- High sound insulation effect as well as tested stone throw resistance of the transparent materials
- UV and weather resistant, very high resistance to aging and corrosion
- CE certifications are available
- Meets the requirements of EN 1793 and EN 1794 and ZTV-Lsw
- Modular standard elements for cost-effective realization of different project sizes
- 100 % recyclable

### Basic elements

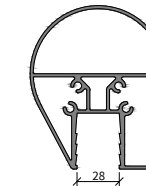
- Posts as curved T-profile with optimized use of materials
- Aluminum hinged frame, cast clamps
- Type-specific EPDM for soundproof connections
- 3.96 x 1.00 m and modular design
- Base variants (reflective) or with KOHLHAUER ALUFERA® (highly absorbent on both sides)

*All materials can be selected as frame infill (subject to specific technical requirements).*

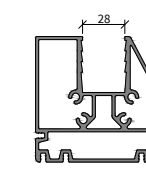
### Frame solutions //



SF-FLEX-60-B-6328  
(90x85,76)



SF-FLEX-60-T-6328  
(90x108)

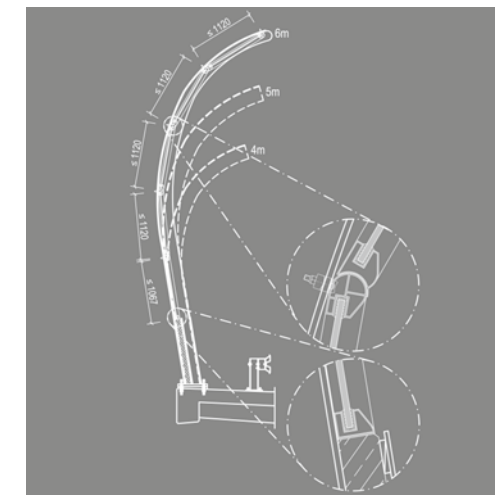


SF-FLEX-60-S-6328  
(90x83)

Example drawing  
KOHLHAUER SCORSA® FLEX

D-Talbrücke Heidingsfeld,  
A3, Nuremberg-Frankfurt,  
KOHLHAUER SCORSA® FLEX

AZ-Baku,  
Eurogames,  
KOHLHAUER SCORSA® FLEX





// **Large-format**, transparent panes with absorbent elements combined with concrete.

*Shown here: D-Tollwitz, A9,  
KOHLHAUER SCORSA® CLEARWALL VS*

# ABSORBENT





**KOHLHAUER SCORSA® CLEARWALL** is a modular frame system that combines transparent noise protection with integrated absorbing elements. Depending on the design, absorption values of 4-8 dB can be achieved. It is therefore no longer necessary to dispense with transparent materials when sound absorption is required. In this way, the unobstructed view of the landscape is preserved and the perception of the noise barrier as an optical barrier is reduced. KOHLHAUER

offers two systems for this purpose:

**KOHLHAUER SCORSA® CLEARWALL VS** is transparent and absorbing noise protection based on a sophisticated design with vertical slats, integrated into a frame system. All elements can be placed on top of each other in a modular way in the 4-sided frame. The screw connection of the lamellas with the pane and frame provides the stability of a room framework.

At the same time the vertical arrangement prevents glare to the front, to the side the view is free. Thus, this system can also serve as an alternative to opaque systems in glare protection areas. The vertical louvers provide protection against graffiti and soiling.

**KOHLHAUER SCORSA® CLEARWALL HS** is a transparent frame system with absorbent properties, in which highly active absorber elements are integrated into the frame structure and the central web. Its absorption values are 4 dB and can be increased to 8 dB (class A3) for the entire system by adding a highly absorbent base. The integrated absorber elements are covered by perforated plates. This creates a very harmonious frame system, which can be colored as desired.

All modular elements can be easily stacked on top of each other: 2-m elements without a central web, 4-m elements with one central web, 5-m elements with two central webs. The clear structure of the elements is usually perceived by road users as more pleasant and less oppressive. At the same time, it provides absorbent protection with transparency.

*All materials can be selected as frame infill (subject to specific technical requirements).*

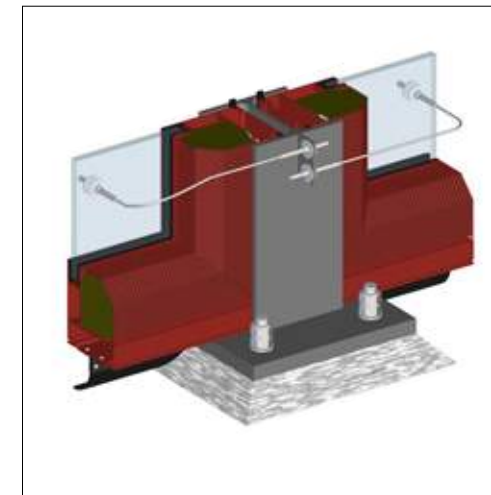
## KOHLHAUER SCORSA® CLEARWALL

Transparency and absorption skilfully combined

*F-Le Bourget,  
KOHLHAUER SCORSA®  
CLEARWALL VS*



*Exemplary visualization/cross-section  
of a KOHLHAUER SCORSA® CLEARWALL HS  
element in the mullion with additional  
retaining elements for fall protection.*



*D-Gornau,  
Chemnitzer Straße,  
KOHLHAUER SCORSA®  
CLEARWALL HS*





// **KOHLHAUER** demonstrates its excellent technical understanding with frameless, transparent elements with point holder fixings.

*Shown here: KOR-SEOUL, Highway,  
KOHLHAUER SCORSA® POINT FIX*

# EXC ELL ENT





**The fixation** of transparent noise protection elements via anchor points is an innovative top solution from KOHLHAUER. The patented and proven effective technology elastically connects transparent elements via spring elements to a slim support structure.

The decisive advantage lies in the combination of maximum structural stability and almost complete freedom of view. Solid posts or frames that stabilize transparent noise barriers in the conventional way impair the free view of the environment to a greater or lesser extent.

**KOHLHAUER SCORSA® POINT FIX** offers a well thought-out and durable quality solution. With it, the potential of transparency in noise protection can be exploited even more effectively. The spring point holder allows mobility in all directions. It absorbs part of the vibration energy generated in the noise

protection elements, which thus does not affect the supports. The noise protection elements themselves are secured against falling fragments by incorporated polyamide threads in accordance with EN 1794-2. The polyamide threads also act reliably as markers visible to birds.

#### Advantages at a glance

- Unique freedom of view without being impaired by frames
- Very high light transmission
- High resistance to chemicals
- Can be used with various transparent materials
- Fulfills high design requirements
- Low weight
- Resistant to stone throwing and vandalism
- Different printings as bird protection possible
- Safety due to integrated threads

*Only GS CC can be selected as frame filling (subject to specific technical requirements).*

## KOHLHAUER SCORSA® POINT FIX

Unique fixation for an undisturbed view

D-Munich-Freiham, A8,  
KOHLHAUER SCORSA®  
POINT FIX



D-München-Freimann,  
KOHLHAUER SCORSA®  
POINT FIX



KOR-Seoul, Highway,  
KOHLHAUER SCORSA®  
POINT FIX





// **KOHLHAUER** can combine safety, wind protection and design even at lofty heights.

*Shown here: D-Zeltingen-Rachtig, B50,  
Hochmoselbrücke, KOHLHAUER SCORSA® BORA*

# SA FE TY Y





**Wind loads** are among the climatically variable effects on structures. They result from the pressure distribution around a structure that is exposed to strong wind currents. This includes numerous bridges in sometimes very exposed locations, e.g. over valleys. Storms, wind gusts or crosswinds pose a great danger to road users if they are strong enough.

**KOHLHAUER SCORSA® BORA** offers a transparent solution here. It ensures directional stability of vehicles and at the same time avoids the dreaded tunnel vision. Wind speeds increase with rising height above the ground. Wind barriers reduce the wind flow or direct it to the side, thus significantly minimizing the impact on traffic. Accident hazards,

due to tipping and sliding of road vehicles, especially those with large contact surfaces, are thus significantly reduced. Therefore, KOHLHAUER's product KOHLHAUER SCORSA® BORA also meets the requirements of climate change with increasingly frequent storms.

To ensure that the wind pressure on the structure itself is not significantly increased by the windbreak wall, various design measures can be taken: For example, a louvered design takes the force of the wind away from vehicles without the lateral pressure overloading the structure. In addition, incorporated protective strips can prevent birds from hitting the structure.

#### Advantages at a glance

- Wind protection without obstructing visibility
- Modular standard elements for cost-effective project implementation
- Directional stability of vehicles is ensured
- Various designs for individual project requirements e.g. design in lamella form or also with thermoformed panes to increase stability.
- Very high resistance to aging and corrosion
- Optional bird protection strips
- Materials used are 100% recyclable

*Only GS CC can be selected as frame filling (subject to specific technical requirements).*

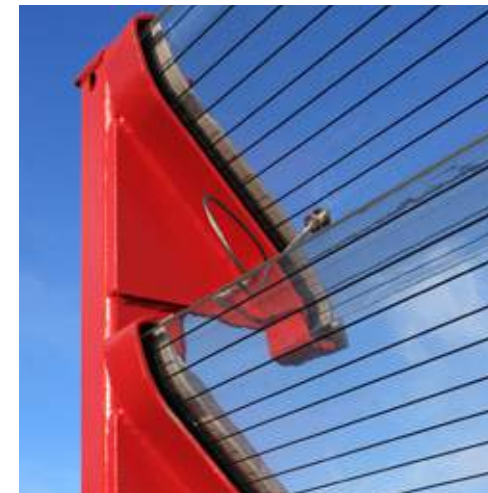
## KOHLHAUER SCORSA® BORA

Wind protection solutions that withstand all requirements

*D-Ilmenau,  
A71, Reichenbachtalbrücke,  
KOHLHAUER SCORSA® BORA*



*D-Ilmenau,  
A71, Reichenbachtalbrücke,  
KOHLHAUER SCORSA® BORA*



*D-Zeltingen-Rachtig,  
B50, Hochmoselbrücke,  
KOHLHAUER SCORSA® BORA*







## HOW TO REACH US

The way to us is shorter than you think – and it saves you a lot of detours.

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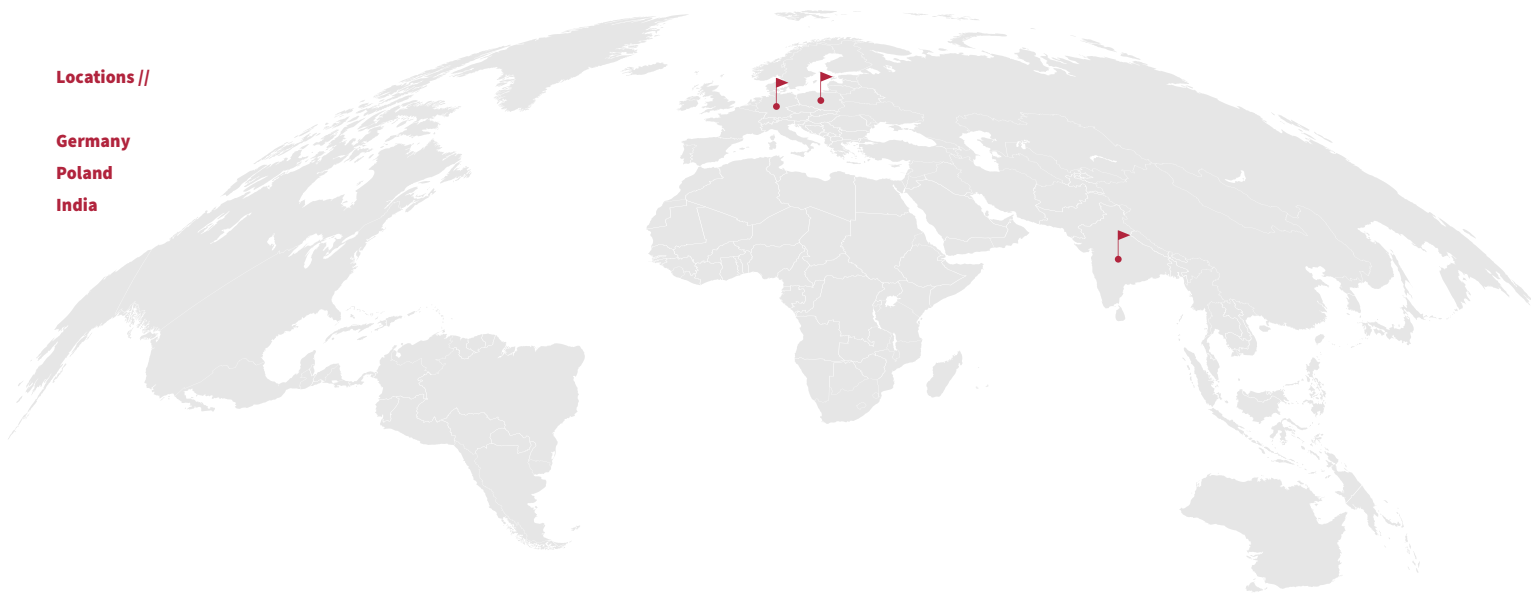
[www.kohlhauer.com](http://www.kohlhauer.com)

### Locations //

Germany

Poland

India



The transparent solution from KOHLHAUER works with proven materials such as acrylic or silicate glass in various aluminum frame systems.

The grid-insulation-system is highly absorbent on both sides as well as resource-saving and offers many design possibilities as well as acoustic advantages.

The modular, greenable solution is sustainable and environmentally friendly. It also opens up habitat for small animals and plants.

The solar integration solution in a wide range of system combinations, safe and with high yield due to standard modules.

High-quality aluminum elements, which can be designed to be absorbent on one or both sides, represent industrial style.

The unique wood systems convey naturalness. A boiler pressure impregnation or the material choice of larch heartwood give durability.

A modular frame system combines the necessary absorption with transparency. Specially tested for railroad lines, it offers unobstructed views and the best prospects despite noise protection.

The complete system that adapts to urban conditions and offers a wide range of design options – quick and easy to install, sleek in appearance.

