FONOCON

NOISE CONTROL

RAIL

SOLUTIONS FOR RAILWAY TRACKS

FORSTER FF

NOISE CONTROL SYSTEMS GO BACK A LONG WAY WITH FORSTER

Forster, a family enterprise founded in 1956, can turn to more than 45 years of experience in the production of aluminium noise screens. Thanks to its competence and know-how, Forster has become a leading expert in the development of noise protection systems along roads and railway tracks.

1980

1991

2005

2017

1978 **MORE THAN 45 YEARS OF COMPETENCE, KNOW-HOW AND EXPERIENCE**

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RESPONSIBILITY VIS-À-VIS PEOPLE AND THE ENVIRONMENT

Developing and producing sustainable products is a particular concern of Forster. We insist on using materials and energy without exploiting resources, and we consider sustainability across the entire life cycle of a product to be essential.

2024

For these reasons, we have extended our certified integrated management systems (IMS) for quality (ISO 9001), environmental management (ISO 14001) and occupational health and safety (ISO 45001) by a sustainability management system (ONR 192500). And quite clearly, we closely observe our CO_2 footprint, which has led to our company becoming certified as a **carbon-neutral operation** in November 2024.

TÜVNORD
TÜV NORD Austria GmbH
Carbon Neutral Company
Certification acc. to TN-Standard TN-CC 020
tuv-nord.com/at

FONOCON® Rail
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DEVELOPED FOR TRAIN TRACKS

BUILT FOR THEIR NEIGHBOURS

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Trains get faster all the time, noise barriers are built ever higher and are set to move ever closer towards the tracks. With its **FONOCON Rail,** Forster has responded to the challenge and developed suitable and economical noise control systems for all applications in the track systems of national railway operations.

A PROPER SOLUTION FOR EVERY LOCATION

FONOCON Rail noise control systems suit all rail situations. We supply noise barriers for overland tracks and railway stations, panels for tunnels and waterproofing structures, as well as solutions for bridges and other special structures.

THE MANY BENEFITS OF ALUMINIUM:

- *High stability*
- *Long life*
- *Individual design*
- *Combinability with transparent noise control elements*
- *Easy and quick to instal*
- *Large range of accessories*
- *Safety because of easy access*
- *Certified for high-speed tracks*
- *Integrated earthing system*

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FULL-SCALE NOISE CONTROL

TARGETED USE OF VARIABLE DESIGN OPTIONS

In its railway solutions, Forster applies the high technological standard of classical aluminium noise screens to transparent systems, noise barrier panels and service doors.

HIGH ABSORBENT WALL CLADDING PANELS

High-absorbent wall panels are used for high-stress situations in tunnels and are suitable for high-speed railway tracks. Rear-ventilation slits and individually removable panels facilitate checking the structure. The visible and freely accessible attachments guarantee effective checking.

THE BENEFITS:

- *Certified für tunnel use*
- *High dynamic stability*
- *Suitable for high-speed tracks*
- *Facilitates structural checks (visual checks)*
- *Better checking (for interval checks)*
- *Easy to remove and reinstal individual panels*

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FREEDOM OF DESIGN

DESIGNING WITH NOISE BARRIERS – HIGH QUALITY AND VISUAL APPEAL

Noise control structures need superior acoustic as well as optical features in order to provide a successful performance. The multiple colouring schemes available for aluminium elements and their unlimited combination with transparent elements open up new vistas in the design of noise barriers.


(Photo: ProRail)

POST COVERING DESIGN

This design produces an almost overlapping barrier appearance. Overlaps are available as single- and double-sided designs. In this way, a single noise control panel may feature a standard element on the side facing the tracks and an overlapping design on the other side.

MULTICOLOURED

Whether laid-back or consciously orchestrated: an individual element can bear several colours and colour nuances can shift across slanting segues.

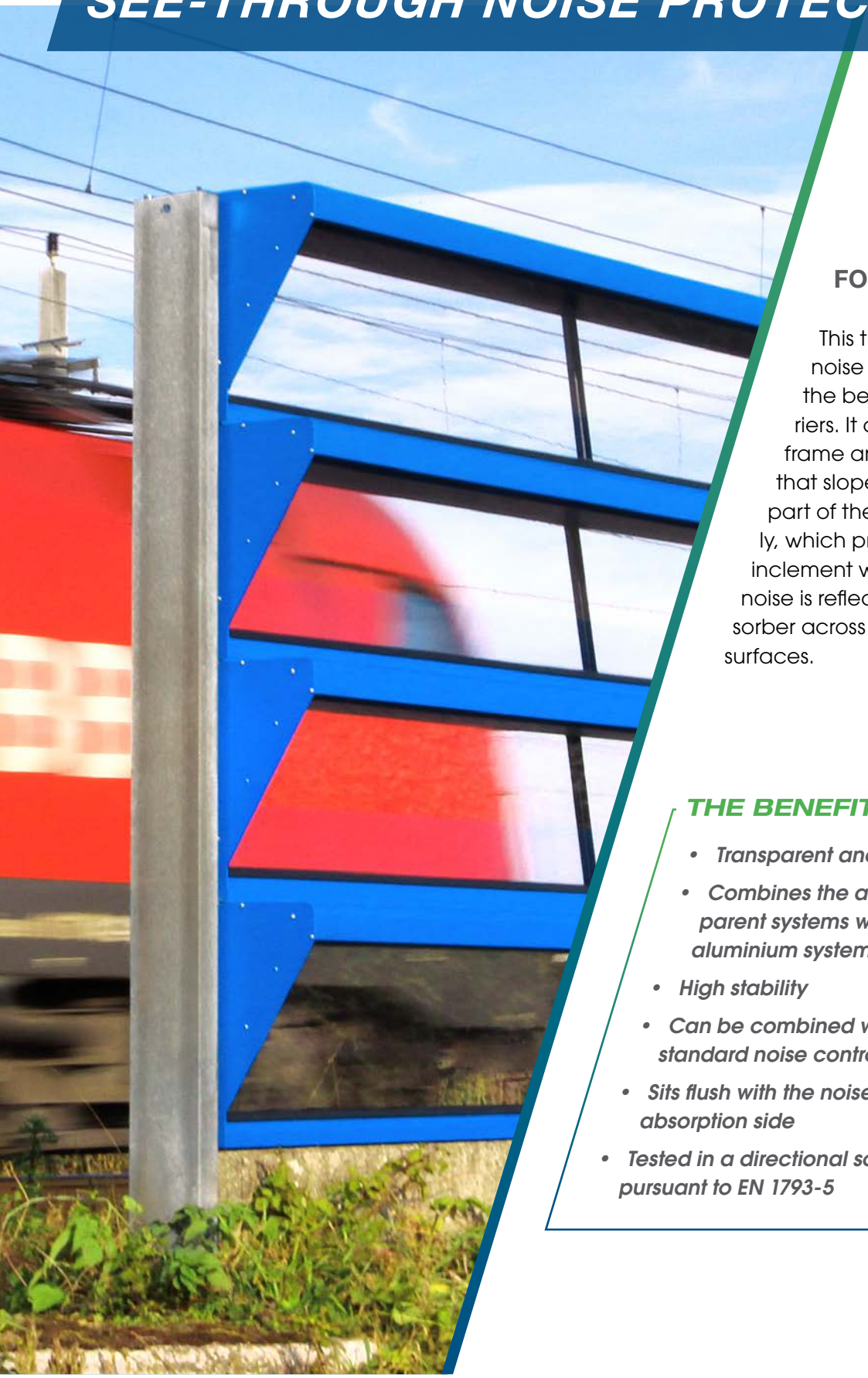
PRINTED NOISE BARRIERS

Using digital imprints, we apply images, art designs and symbols directly onto the noise screens. Whether the object is integration in the landscape, advertising or artistic impressions – noise protection becomes a design element.

ACOUSTIC CROWN ELEMENTS

The DELTA top provides designers with additional accents for the barrier. Positive acoustic effects vie with the spatial impact and a new freedom of design.

SEE-THROUGH NOISE PROTECTION

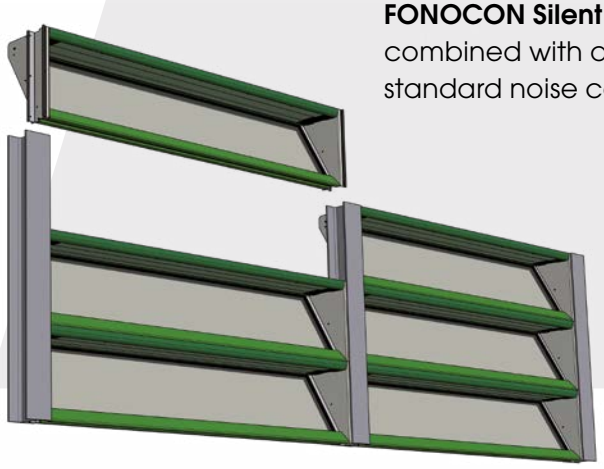


FONOCON SILENT VIEW

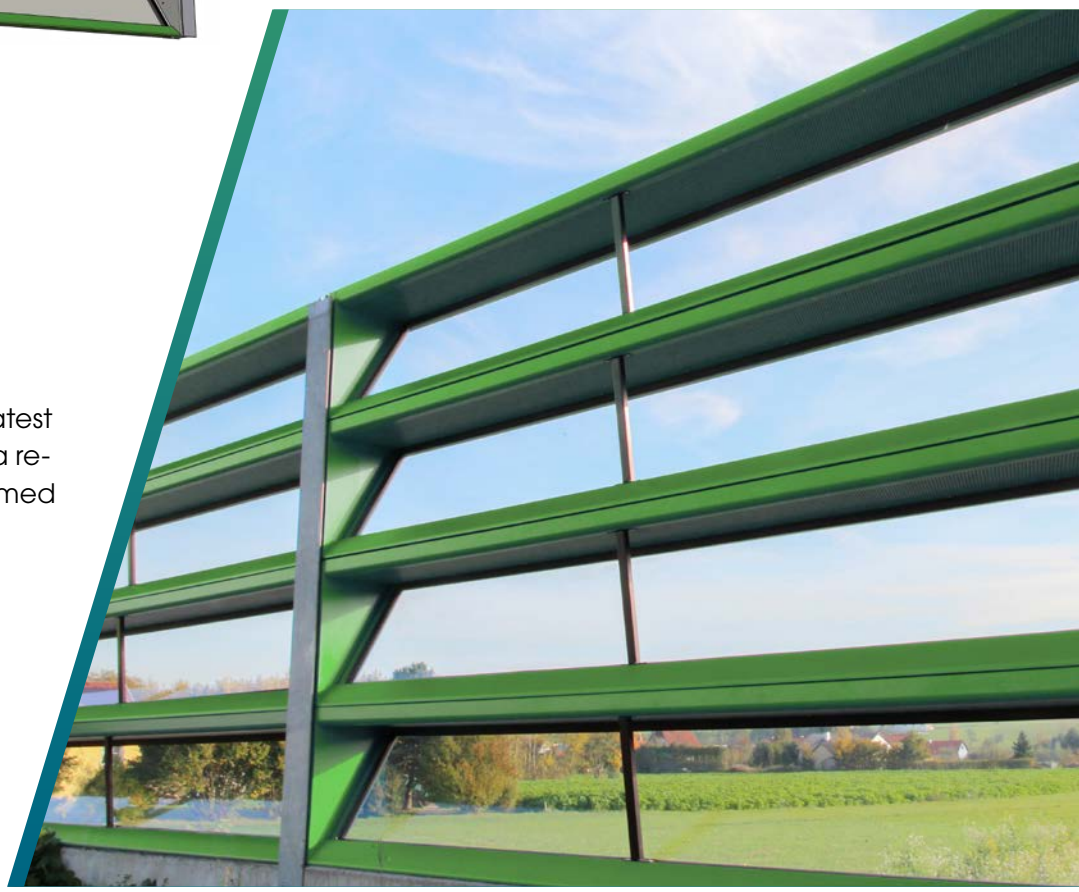
This transparent and absorbing noise control system combines the benefits of two types of barriers. It consists of an aluminium frame and a transparent filling that slopes by 30°. The absorbing part of the element is set horizontally, which protects its surface against inclement weather. The impinging noise is reflected upwards to the absorber across the inclined transparent surfaces.

THE BENEFITS:

- *Transparent and absorbing*
- *Combines the advantages of transparent systems with the absorbing aluminium systems*
- *High stability*
- *Can be combined with all Forster standard noise control systems*
- *Sits flush with the noise barrier on the absorption side*
- *Tested in a directional sound field pursuant to EN 1793-5*



FONOCON Silent View may be combined with all of Forster's standard noise control systems.



Detailed tests in line with the latest standards, both in-situ and in a reverberation room, have confirmed the absorbing capacity of our new transparent noise barrier. The tests included procedures pursuant to EN 1793-5 which defines the in-situ values of sound reflection in directional sound fields.

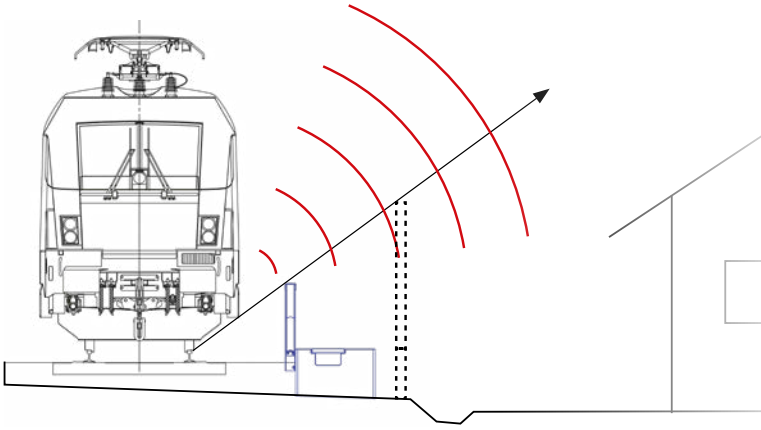
Discover the effect and benefits on video:
forster.at/en/noise-control/silent-view

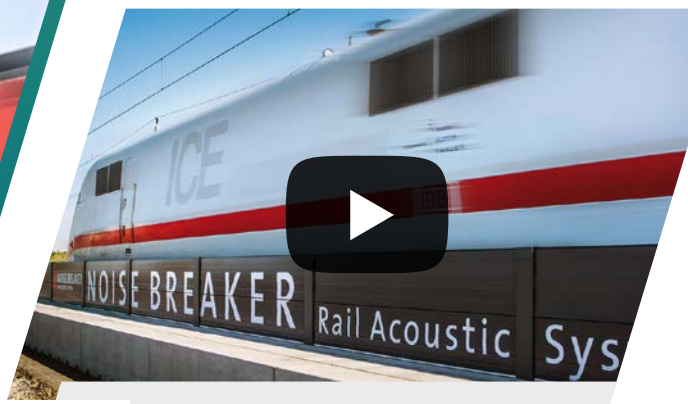
NOISE BREAKER
RAIL ACOUSTIC SYSTEM

LOW AND CLOSE-TO-TRACK

A BARRIER SYSTEM WITH HIGH EFFICIENCY

Noise Breaker, Forster's innovative noise control system, offers new ways to obtain efficient noise protection. Especially in locations where conventional noise barriers are difficult and expensive to instal, whether for lack of space or due to inaccessibility, the low near-track barrier system offers new options.





Discover the benefits on video:
forster.at/en/noise-breaker

THE FEATURES:

- *Noise is absorbed as near to its source as possible*
- *High efficiency*
- *No visual obstruction for rail passengers*
- *No shadows and cutoff feeling for neighbours*
- *Low space requirements*
- *Simple logistics for retrofitting*
- *Easy access for rescue teams*

Noise Breaker helps at existing tracks (noise elimination) as well as new tracks, mostly due its flexibility of installation. The low near-track barrier is placed directly onto the subgrade, with no need for any additional foundation. As a result, the space consumption is reduced to a minimum and the installation logistics are easy to handle.

FONOCON® Silent Solar
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NOISE BARRIER TRANSFORMED INTO SOLAR POWER PLANT

PHOTOVOLTAICS

With **FONOCON Silent Solar,** noise screens provide double benefits for the environment: they protect against noise and the barrier serves as a substructure for environmentally friendly energy generators. Existing screens can be retrofitted simply by replacing individual elements or increasing the height of the barrier.

The sun has always been and will always be our mightiest source of energy – **FONOCON Silent Solar** exploits this source without building up any further land.

THE BENEFITS:

- *Double gain: noise protection and energy generation*
- *No additional land consumption*
- *Retrofittable – same screening effect by highly absorbent surface*
- *Cost-cutting by adding a photovoltaic project*
- *Simple installation of solar modules*
- *Compatible with all standard photovoltaic module types*
- *Easy cable-laying in integrated cable trays*

FONOCON® Rail
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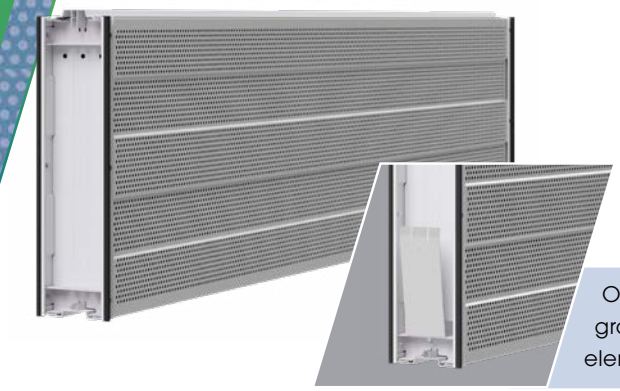
ELEMENTS FOR THE RAILWAY



NOISE SCREEN ELEMENT

highly absorbent on one or both sides

aluminium, polyester powder-coated

Airborne sound insulation
DL_R = 30 – 35 dB (EN 16272)
DL_R = 25 – 31 dB (EN 1793)

Sound absorption
DL_α = 12 – 15 dB (EN 16272)
$DL_{\alpha NRD}$ = 11 dB (EN 1793)

Optional earthing sheet to ground the noise screen elements against the track

TRANSPARENT RAILWAY ELEMENT

reflecting

aluminium, polyester powder-coated

transparent materials:
plexiglass Soundstop XT, GSCC;
laminated glass
glass thickness: 12–20 mm

Airborne sound insulation
DL_R = 32 – 35 dB (EN 16272)
DL_R = 26 – 33 dB (EN 1793)
(depending on the type of glass used)

SOUND RESONATOR

Top panel with λ/4 resonator
Sound diffraction index difference $DL_{R\Delta DI,\ SITU}$ = 2 dB

DELTA TOP

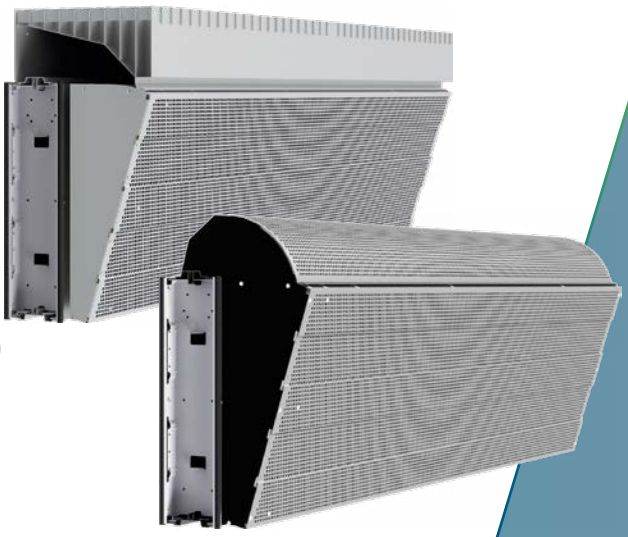
Top panel

highly absorbent on one or both sides

aluminium, polyester powder-coated

Airborne sound insulation
DL_R = 30 dB (EN 16272)
DL_R = 25 – 26 dB (EN 1793)

Sound absorption
DL_α = 12 – 15 dB (EN 16272)
$DL_{\alpha NRD}$ = 11 dB (EN 1793)



PHOTOVOLTAIC ELEMENT SILENT SOLAR

highly absorbent on one or both sides

aluminium, polyester powder-coated

Airborne sound insulation
DL_R = 30 dB (EN 16272)
DL_R = 25 – 26 dB (EN 1793)

Sound absorption
DL_α = 12 – 15 dB (EN 16272)
$DL_{\alpha NRD}$ = 8 – 11 dB (EN 1793)

SILENT VIEW

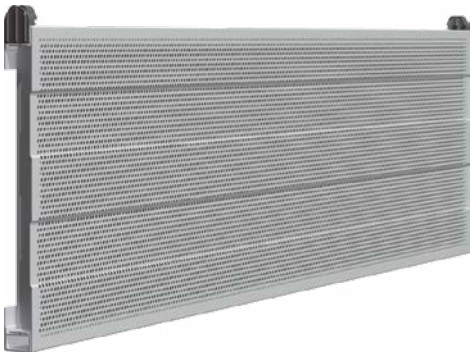
transparent AND absorbent

aluminium, polyester powder-coated

transparent materials:
plexiglass Soundstop XT, GSCC;
glass thickness: 15 mm

Airborne sound insulation
DL_R = 31 dB (EN 16272)
DL_R = 27 dB (EN 1793)

Sound absorption
DL_α = 4 dB (EN 16272)
$DL_{\alpha NRD}$ = 4 dB (EN 1793)



CLADDING PANELS

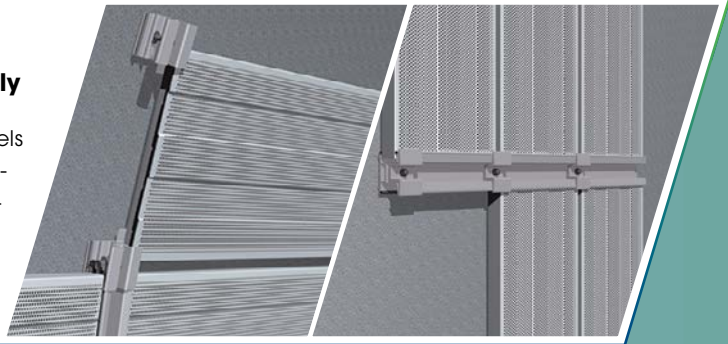
highly absorbent

aluminium, polyester powder-coated

Sound absorption
DL_α = 12 dB (EN 16272)
$DL_{\alpha NRD}$ = 11 dB (EN 1793)

Can be installed horizontally and vertically

The highly absorbent wall panels cope with maximum load situations in tunnels. Optionally available with integrated earthing.



Single values pursuant to EN 16272-3 (railway noise spectrum) and EN 1793-3 (road noise spectrum)

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SYSTEM ACCESSORIES

EMERGENCY EXIT AND SERVICE DOOR, ESCAPE ROUTE SIGNS

Direct access to maintenance or emergency exits improves safety on roads and tracks. Such doors have the same exacting acoustic performance rates as the adjoining noise barriers. A different colour scheme increases their visibility and indicates possible escape routes. The range of Forster products includes angular signs to mark escape routes and flag-type signs to indicate escape doors.

NOISE-SCREENING SLIDING DOOR

Where space at the centre is at a premium, sliding doors can be a solution.

NOISE-SCREENING ESCAPE DOOR

The double-leaf emergency door is a version of the escape and service doors. Where necessary, an adjustable additional wing extends the width of passage.

NOISE-SCREENING SIDE-HUNG GATE

Ideal for locations where emergency vehicles need to enter. Its robust design allows the gate to be used also at high-speed tracks. With low barriers and low train speeds there is no need for a top transom, so that no height limit applies when the gate is open.

CLIMBING AID FOR GREENERY

We offer various types of trellises to help climbing plants. Simple greening is possible without the need for trellises.

CAPS

Caps are normally used to top-cover steel uprights. Their harmonic design makes for a conscious highlight in a noise barrier. Their colour schemes provide a choice from laid-back to emphatic accents.

ROPE SECURITY

Rope security for bridges across roads and streets.

ANTI-GRAFFITI COATING

Optionally, FONOCON noise protection elements can be supplied with a special anti-graffiti coat that enables spraying paint and scribblings to be removed repeatedly and without any residues.

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SIMPLE AND SAFE INSPECTION

INSPECTION CATWALK

The **FONOCON inspection catwalk** ensures safe access for scheduled inspections of raised levels or out-of-reach areas along the tracks. It offers sufficient room for specialists and their tools and is fitted with a non-slip surface and railing.
The inspection platform complies with all current safety standards and regulations.

(application example)

The FONOCON inspection catwalk facilitates access to out-of-reach areas along tracks.

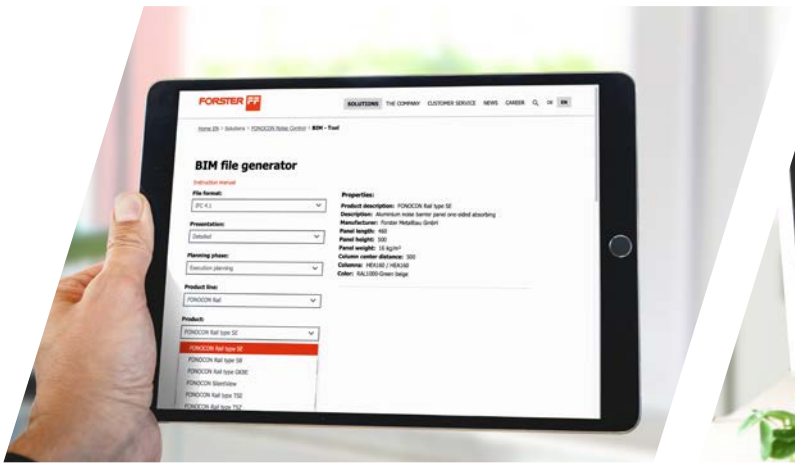
PLANNING MADE EASY

APPLIED PRACTICAL EXPERIENCE: THE BIM-GENERATOR

The future is digital – also on building sites. Using BIM (Building Information Modelling), interlinked planning can be digitalised also for noise control projects. Forster has developed a service-oriented BIM generator which is available for free as a service tool on the Forster homepage.

forster.at/en/noise-control/bim-tool

In addition to the "standard elements", special components such as emergency and service doors or the FONOCON Silent View noise screen element can be configured with the BIM tool.



INTUITIVE, INNOVATIVE AND INDIVIDUAL

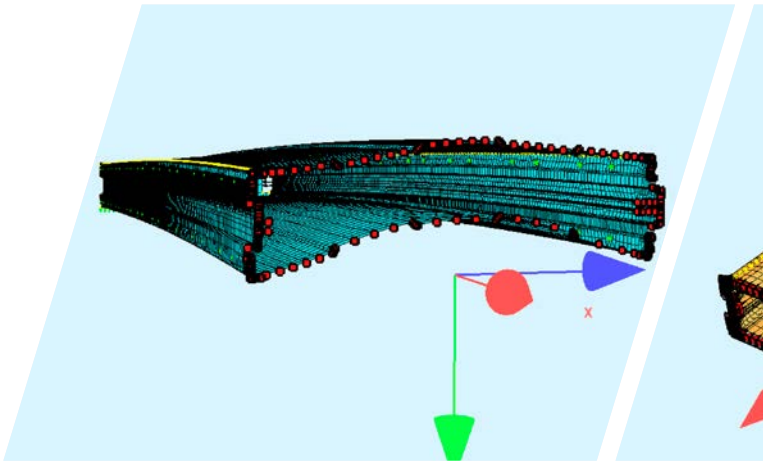
Intuitive operation, a wide range of settings and a live preview combine to cover every angle when planning noise control elements.

Once the settings have been chosen, the data are just a mouse click away from the digital inbox.

RESEARCH AND DEVELOPMENT

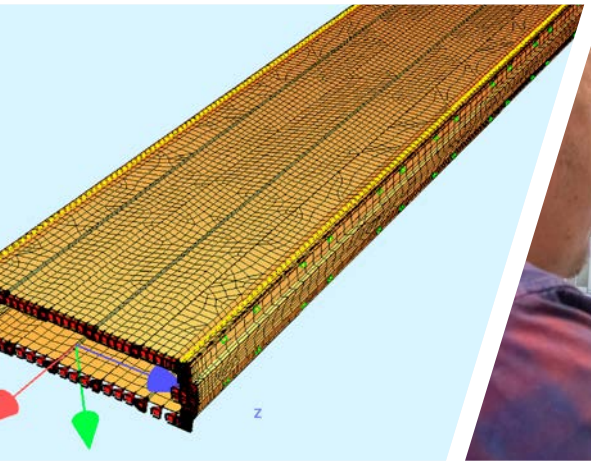
NOISE CONTROL COMPETENCE

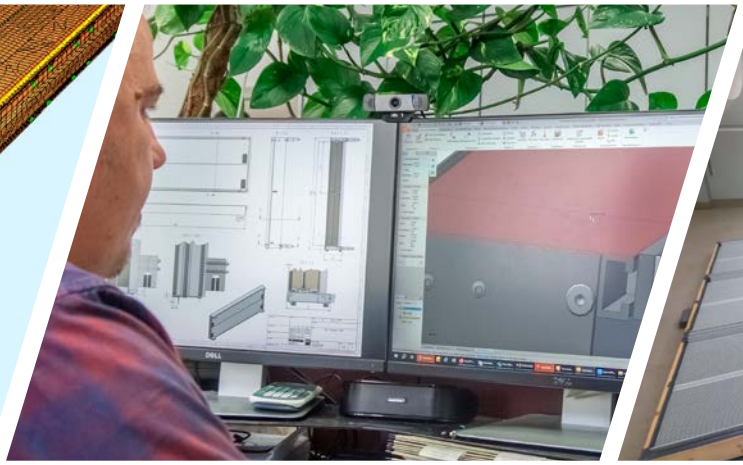
Groundbreaking developments and innovative solutions for maximised noise control provide the basis for the success of our products. Patented products, collaboration with experts, universities and testing bodies, as well as membership in professional associations help us deliver tailored noise protection systems that meet global requirements and standards.

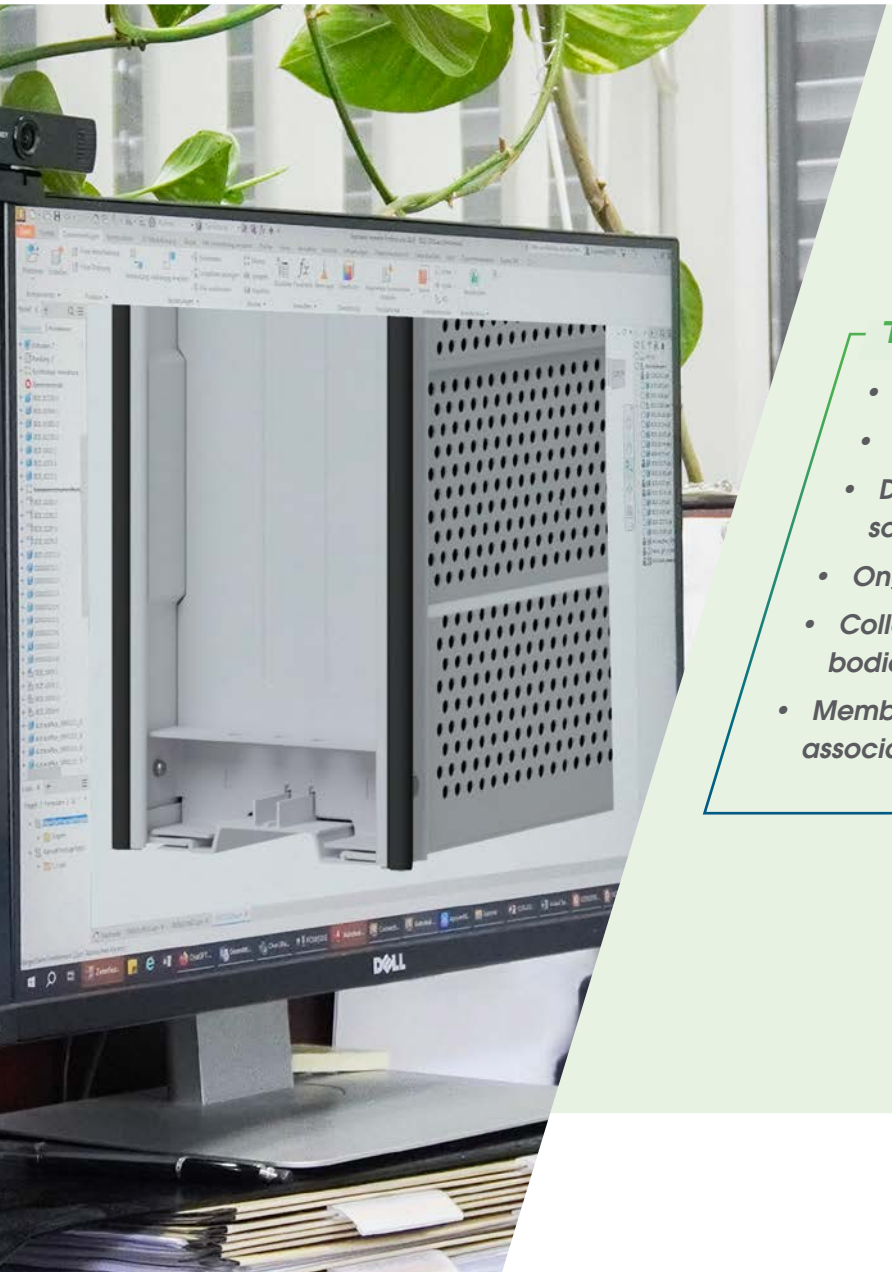


TESTING, ANALYSIS AND TRIALS

In its R&D work, Forster uses the latest software to generate, analyse and implement all relevant parts down to their smallest detail. Comprehensive testing of individual components and the overall system guarantee a noise control element that meets all current criteria with regard to structural analysis, dynamic endurance limits and maximum acoustic performance.







The R&D department at Forster draws on the latest scientific methods, creates complex computer FEM models, builds prototypes and submits them to comprehensive testing.

THE GREAT PLUS:

- *Long years of know-how*
- *Innovation leader*
- *Direct contact for project-oriented solutions*
- *Ongoing optimation and development*
- *Collaboration with experts, testing bodies and universities*
- *Membership in professional associations*

FEELING SAFE WITH A FORSTER PRODUCT

THE LATEST ENGINEERING TO ACHIEVE MAXIMUM VERTICAL INTEGRATION

The extraordinary ratio of internal production and use of the most modern manufacturing technologies characterise what is typical about the FORSTER Group.

The high degree of automation allows planning cycle times and increases the flexibility of production. As a result we continue to deliver the high quality that our customers have come to expect and appreciate.

COMPACT NOISE CONTROL

PERFECT FOR SHIPPING AND INSTALLATION

Compact packing units and low weight enable us to provide low-cost transport to the site. Optimised product features ensure simple handling of the FONOCON elements at the site. The compatible modular system makes for easy and cheap installation of the noise barrier.

YOUR BENEFITS AT A GLANCE:

- *Production completely in-house*
- *Full-service provider*
- *Large-scale vertical integration*
- *Resource-sparing production*
- *Long-term availability of components*
- *Excellent and constant product quality*

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GLOBAL REACH OF FORSTER PROJECTS


NL · HSL Zuid - high-speed line
(Photo: ProRail)


CA · Lynn Creek Sound Wall


BE · R8 Ringlaan Kortrijk


DE · Mittelrheintal railway line


CH · Obfelden, Ottenbach


IT · Trento Centro


DE · Marienhofplatz Munich

SE · *Sverige-syd railway line*

PARTNERS - TRUST MAKES FOR A RUNNING START

Forster operates all over the world, supported by a network of distributors and partners. For decades, noise control systems have been at the focus of the portfolio of the Forster Group. We are your competent partner and have the know-how to offer attractive, high-quality solutions against noise emissions.

RO · *CFR-Railway Aeroport Otopeni Gara de Nord*

SK · *Púchov railway bridge*

HK · *Macao Light Rail - Hong Kong*

AU · *Townsville Ring Road*

THE LARGE RANGE OF FONOCON PRODUCTS

The best product for every sector and every application!

FONOCON ROAD

NOISE CONTROL FOR ROADS AND THE RESIDENTIAL SECTOR

FONOCON URBAN

NOISE CONTROL FOR INDUSTRIAL USE

Find your contact at: ***www.forster.at/en/noise-control***

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Products subject to changes.

Forster Metallbau Gesellschaft m.b.H.
A-3340 Waidhofen a. d. Ybbs, Weyrer Strasse 135, tel. +43 7442 501-0
E-mail: foncon@forster.at, www.forster.at

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