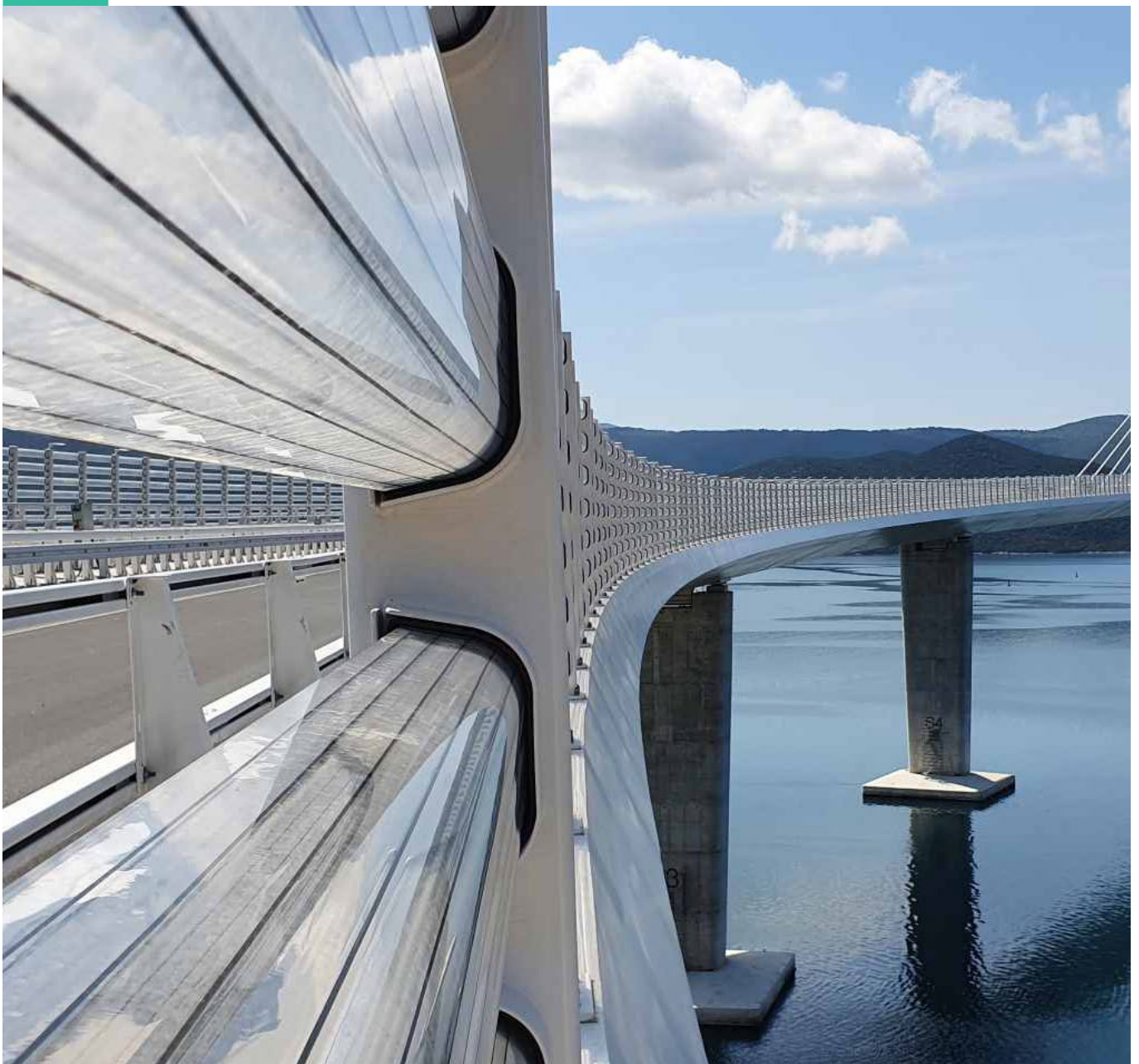


PLEXIGLAS®

PLEXIGLAS® Soundstop
for Noise and Windbarriers



POLYVANTIS

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Noise and the Environment

The growing noise level of rail and road traffic is detrimental to our health in the long term.

Noise is the term we give to a sound we subjectively feel to be a nuisance. A good example is music, which may be “pleasant” or “obtrusive”, depending on the listener. On the other hand, noise is also a physical factor that can be precisely measured in the form of sound pressure, sound frequency and sound level.

Noise is a complex phenomenon in our modern, mobile society.

The effects of noise on society and the physical burden imposed by noise have been the focus of numerous scientific studies in the recent past. Noise and its consequences are also the subject of a special report by the German experts' council on environmental issues “Umwelt und Gesundheit” (Health and the Environment). Noise on our roads, for example, continues to rise and has long become one of the gravest problems in industrialized countries.



In densely populated industrialized countries, more people are affected by noise than by any other form of environmental pollution.

Road traffic is clearly responsible for most noise in cities, before air and rail traffic.

An estimated 20% of the population in the European Union (some 80 million people) are exposed to daily traffic noise of more than 65 dB(A). The main source of noise is road traffic (approx. 70%), followed by air traffic (50%) and rail traffic (20%*).

According to a field study by HAINES et al (1998) on whether people become accustomed to traffic noise, our perception of noise remains the same at constant noise levels. The study gives no indication that the human ear gets used to noise.

If exposure to noise endures for a prolonged period, this is classified as negative stress that is often accompanied by physical reactions. One result of stress through noise are hormone reactions, including the release of adrenaline, noradrenaline and cortisone. These hormones act on the cardiovascular system, the metabolism, the blood fat level and blood pressure. A long-term increase in cortisone levels may lead to arteriosclerosis and higher cholesterol levels. Sleeping disorders may be one of the secondary results.

* Proportion of persons affected by noise among all those interviewed



Noise prevention and noise control have the highest priority.

Noise barriers along heavily frequented traffic routes reduce the load on the environment without taking up too much space.

The limiting value for the risk of heart attack due to noise is a level of 60 dB(A) during the day and 50 dB(A) at night, because this level provokes the release of higher quantities of stress hormones even while people sleep, and even if they are not wakened by the noise. At this noise level, the risk of heart attack goes up by 20%.

Noise is therefore a serious health risk to which we are exposed and to which we must react.

Despite a variety of steps, such as the noise limits for motor vehicles spelled out in EU Directive 2001/43/EG, the development of quieter tires and noise-reducing road surfaces, noise cannot be prevented completely.



Noise control along traffic routes is increasingly gaining in importance to control noise levels in the face of rising traffic volume.

Functional and aesthetic noise control with PLEXIGLAS® Soundstop

Earthberms and noise barriers of sufficient height are the number one noise control instrument. Since earthberms (usually landscaped) take up a lot of space, noise barriers are normally given preference in built-up areas. As the space between buildings and roads is becoming ever smaller, these barriers need to be attractive-looking as well as functional. Transparent sections in noise barriers help to avoid the tiring tunnel effect for drivers, and offer a better view without casting shadows on the road surface or neighbouring properties. Noise barriers

made from PLEXIGLAS® Soundstop combine functionality and attractiveness with protection for residents. At the same time, they create a more interesting environment for road users, and successfully dispel the impression of driving through a tunnel.

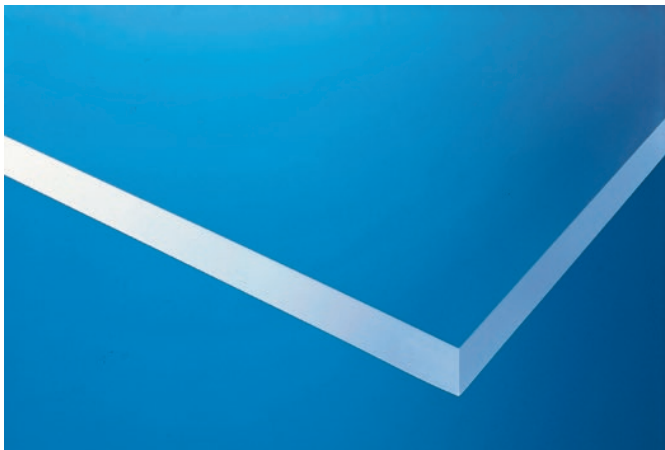
When noise barriers are installed along bridges, the inherent weight of the structure, its resistance to bridge vibrations and lightweight architecture play an important role in addition to space saving. Here too, highly transparent PLEXIGLAS® Soundstop, which is much lighter than silicate glass, and above all, much more break-resistant, has proved increasingly suitable in recent years.



Product Overview

PLEXIGLAS® Soundstop is a grade of acrylic specially developed for use in transparent noise barriers. This material developed by the POLYVANTIS GmbH was first employed in 1980.

That means 40 years of world-wide experience in the use of PLEXIGLAS® Soundstop. PLEXIGLAS® Soundstop is available in different variants to meet a wide range of requirements.



PLEXIGLAS® Soundstop transparent

Large-sized, highly transparent cast (GS) or extruded (XT) sheets. The clear grade offers a light transmission of over 90 percent. PLEXIGLAS® Soundstop is available in clear color and in a series of transparent colors.



PLEXIGLAS® Soundstop GS CC transparent with integrated filament retention

PLEXIGLAS® Soundstop GS CC with integrated black threads are very easy for birds to make out. The bird deterrent can also be further improved by a variety of measures. The most commonly used solutions are matte brushed stripes, stripes applied by screen printing, dots or symbols and foil stickers, with bird symbols, for example. Brushed stripes and screen-printed markings offer long-term durability and are included in the delivery package.



PLEXIGLAS® Soundstop XT BirdGuard

Transparent acrylic sheet for noise barriers with printed 2 mm wide black stripes in a distance of 30 mm which are protected by a top layer made of PLEXIGLAS®. As these stripes are applied inside the material, they cannot be washed off by cleaning agents or graffiti removal procedures. These stripes are visible obstacles for birds while assuring the maximum transparency of the element.



PLEXIGLAS® Soundstop SC with antireflective surfaces

This product variant has a surface texture that diffuses light and reduces reflections. Distracting reflections like the lights of other vehicles are reliably prevented. Although the texture reduces the transparency of the sheets, light transmission is retained on both sides of the barrier.



**PLEXIGLAS® Soundstop GS Opaque
PLEXIGLAS® Soundstop GS CC Opaque**

Homogeneously solid-colored cast sheets in two shades of gray enable an extremely wide range of design variants. These sheets are also available with embedded polyamide threads that prevent dangerous fragments from falling if and when an accident occurs.

Product Properties

PLEXIGLAS® Soundstop sheets (in transparent grades)

are highly light-transmitting and transparent

The transparent grade has a light transmission of over 90 percent and is thus vastly superior to sheets of glass or other transparent plastics, such as polycarbonate. The light transmission is measured according to DIN 5036, Part 3 (illuminant C). The extremely good weather resistance of PLEXIGLAS® also ensures that the high transmission is retained for many years. On delivery, the measured values are 90% minimum, and still 88% minimum even after 30 years of use outdoors.

offer extremely high resistance to weathering and aging.

PLEXIGLAS® acrylic material is well-known for its unsurpassed resistance to weathering and aging. International vehicle manufacturers prescribe the use of this material for reverse and signal lights, because only acrylic offers the long-term brilliance and color fastness required to retain the luminous intensity and signal effect of automotive lights.

In signage too, PLEXIGLAS® proves its extreme longevity without its surface becoming matte, without turning yellow or brittle, and without the colors fading. Even after many years of outdoor exposure, the surfaces of PLEXIGLAS® stay just as smooth as when they left the factory.

are break-resistant.

PLEXIGLAS® Soundstop is about 11 times more break-resistant than window glass of comparable thickness. That makes it superior even to safety glass, and meets all the safety requirements for noise barrier materials.

The strength of the sheets plays a significant role when it comes to resisting impact as well as structural vibrations, e.g. on bridges.

are lightweight.

PLEXIGLAS® Soundstop has a specific gravity of 1.19 g/cm³ and weighs only half as much as silicate glass. A 20 mm thick sheet therefore weighs only 24 kg per square meter. That makes it much easier to handle large sheets, in particular. The low weight of PLEXIGLAS® Soundstop also enables more lightweight construction, especially when installed on bridges

are easy to form in a versatile manner.

PLEXIGLAS® Soundstop sheets can be installed flat, cold-curved or thermoformed. The minimum bending radius for installing cold-curved elements is 330 times the sheet thickness. The possible radius for 20 mm thick sheets is therefore 6600 mm. The structure must be sufficiently stable to maintain the cold-curved sheets in form. The sheets can be thermoformed into almost any imaginable configuration. They are heated to forming temperature and shaped as desired using suitable molds. After cooling, the sheets retain the given shape and are ready for installation.

The most frequent type of forming is line bending, e.g. of the upper, unsupported edge of the noise barrier facing the road. This increases the rigidity of the sheets that are not clamped along the top edge, and improves the noise protection offered by the elements.

has excellent sound-insulating properties.

The weighted sound reduction index DLR according to EN 1793-2 is up to 33 dB. The sound reduction index DLSI when using the free-field measurement according to EN 1793-6 is 34 dB.

Guarantees

We are convinced of the durable quality of our high-quality products that have proved their worth in practical experience. That is why we offer extensive guarantees for a number of properties:

Playing it safe with PLEXIGLAS® Soundstop— 30-year guarantee

The yellowing power of UV rays can't impact PLEXIGLAS® Soundstop, thanks to the NATURALLY UV STABLE technology. And because we're so certain, we give the following guarantees:

- 30-year no yellowing guarantee
- 30-year maximum light transmission guarantee



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® = registered trademark

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Certified to DIN EN ISO 9001 (Quality) and DIN EN ISO 14001 (Environment)

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