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AMIRAN® – the glass you can't see



AMIRAN® by
SCHOTT provides
optimum freedom
from reflections

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SCHOTT
glass made of ideas



Normal glass with severe reflections



Glazed with AMIRAN®: Optimum presentation of the goods

AMIRAN® – for the best view – in or out

When there is a significant difference in the light levels in front of and behind glass, the view from the brighter side to the darker side is adversely affected by reflection. To achieve a clear and virtually reflection-free view, many architects and designers recommend SCHOTT's AMIRAN®.



AMIRAN® is an optical interference anti-reflective glass, dip-coated on both sides, with a residual reflection of approximately 1%. AMIRAN® is commercially available in large sheet sizes (3800 mm x 1770 mm / 149.6" x 69.7").

AMIRAN® is used to enhance the view – either looking in or looking out – in shop windows, panoramic restaurants, sports stadiums, glass atriums, museums, zoos and anywhere where a clear view is desirable.

AMIRAN® – benefits at a glance

Virtually reflection-free:

Ordinary window glass has a reflection of approximately 8%. AMIRAN® reduces reflection to approximately 1% or one-eighth that of ordinary glass.

Wherever high transparency is called for, there is a use for AMIRAN®.

Easily processed:

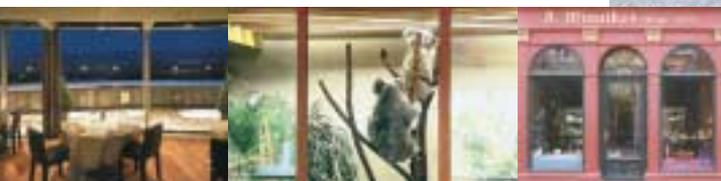
AMIRAN® can be further processed to thermally toughened safety glass, laminated safety glass, glass with integral UV protection as laminated glass, insulating glass or thermally insulating glass. Additional possibilities are applications with bent glass, thermally toughened glass or screen-printed glass.

Energy-saving:

The high initial investment costs are quickly accounted for by the savings made on lighting.

Aesthetically compelling:

The beauty of transparency in architectural design is enhanced by the large sizes and optimum transparency of AMIRAN®. AMIRAN® merges the boundaries between inside and outside and provides the possibility of implementing innovative architectural concepts.





Create an architectural showcase using AMIRAN®

Wherever high transparency is required, AMIRAN® provides the optimum solution.



- UBS Tower facade, Chicago
- Architect Steve Nilles of Lohan Associates glazed the entire lobby area of the 50-story tower with AMIRAN®.
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Panoramic restaurant, Las Vegas

The colourful views of the city are not lost thanks to the use of AMIRAN®.





The center window is AMIRAN® and ordinary glass is on the left and right.

Zoos, exhibitions and museums

The comparison between normal glass and AMIRAN® is perfectly clear when viewing animals, exhibits or rare works of art.



Ordinary glass:
Reflections block
the view.



Private residence, Düsseldorf

Even when it is dark outside, you can enjoy the view of the garden with AMIRAN®. Compare the difference!



Subway station, Hong Kong

AMIRAN® provides transparency in customer-friendly ticket booths, making it easier for customers and staff to see each other. AMIRAN® was used in a bent form in this installation.





Ann Taylor, San Francisco

This window of the Ann Taylor store is glazed with AMIRAN®, inspiring passers-by to view the exclusive fashions.



ABC studio, New York

AMIRAN® in the ABC television studio complies with special soundproofing and safety requirements. It is possible to see in and out freely, even under intense lighting conditions.





Normal glass is used in the upper section of this glass facade and AMIRAN® is used below.

BMW showroom, Istanbul

Designed by Karl Schlamming, this high-tech, 40,000-square meter building glazed with AMIRAN® impresses customers and visitors alike.



Neydon Stadium, Tennessee

Sports stadiums around the world are using AMIRAN® in their luxury boxes, restaurants and press boxes to provide the best possible view of the action.



Technical information



Stock sizes (Approximately)

3800 mm x 1770 mm / 149.6" x 69.7"

3210 mm x 1770 mm / 126.4" x 69.7"

Glass thicknesses

4, 5, 6, 8, 10, 12 mm

(5/32", 3/16", 1/4", 5/16", 3/8", 1/2")

Other thicknesses are available on request



Luminous transmittance τ_{vD65}

AMIRAN® clear float glass (standard):	94 %
Ordinary clear float glass (standard):	88 %
AMIRAN® extra clear low-iron float glass:	97 %
Extra clear low-iron float glass:	91 %
(Glass thickness 6 mm / 1/4")	

Residual reflection

(with incident light perpendicular to the surface)

AMIRAN® anti-reflective single glazed and laminated glass respectively:
approximately 1 % (ordinary clear float glass: approx. 8 %)
Double-glazing with 2-AMIRAN® sheets:
approximately 2 % (ordinary clear float glass: approx. 15 %)
Double-glazing with AMIRAN®/AMIRAN® low-e glass:
approximately 3 % (ordinary clear float glass: approx. 15 %)

Glass type

AMIRAN® is coated on both sides using the dip coating process. However, laminated glass and float glass with LowE-coating are coated only on the outside surface. The base glass can be clear float glass, extra clear low-iron float glass or tinted float glass.

Coating system

Reduction of reflections in the visible spectral range is achieved through the use of an optical interference multi-layer system.

Colour rendering

AMIRAN® extra clear low-iron does not affect the true colour rendition of objects displayed.

UV transmittance

UV transmittance is significantly lower with AMIRAN® anti-reflective single-glazed and double-glazed units than with ordinary clear float glass units. High UV protection is achieved with laminated AMIRAN®.

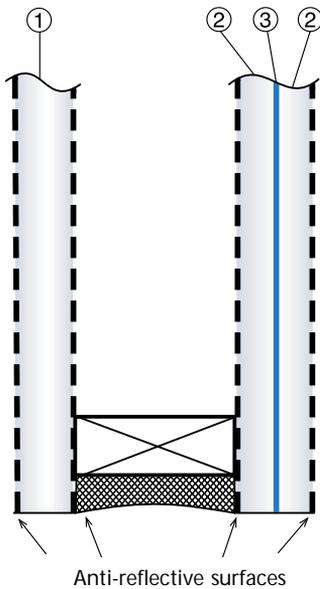
UV transmittance of AMIRAN® laminated with double PVB-interlayer:
approximately 1%

Processing options

AMIRAN® can be drilled, edge-worked, screen printed, bent and processed in a variety of ways. AMIRAN® can be used to produce glasses with enhanced acoustic insulating properties, as well as toughened safety glass, laminated safety glass, bullet-resistant glass and anti-vandal glasses.

AMIRAN® can be used to make thermally insulated glass using low-e coating glass units: $U_g = 1.1 \text{ W/m}^2 \cdot \text{K}$ (0.19 BTU/hr.sf °F).

Example: AMIRAN® in an insulated glass unit with laminated glass on front side

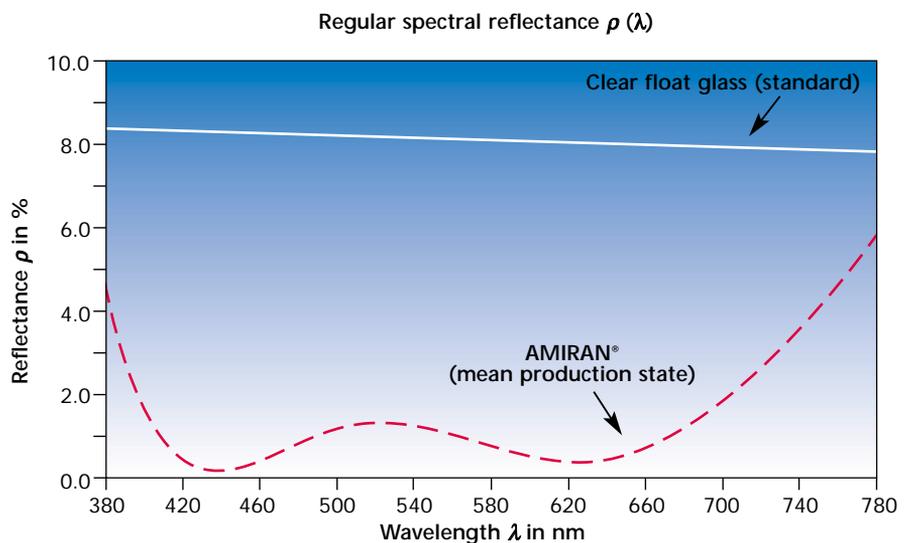


- ① AMIRAN® coated on both sides
Clear float glass (standard)/extra clear low-iron float glass
- ② AMIRAN® coated on one side
Clear float glass (standard)/extra clear low-iron float glass
- ③ PVB – interlayer or resin respectively

Post-processing

Laminated glass must use glass with an anti-reflective coating on only one side, and only authorized laminators may carry out the lamination. The non-coated side must be on the laminated side, i.e. in contact with the film or resin. Maximum sizes are available on request.

With these laminated glasses it is possible to produce anti-reflective versions of special security glazing (resistance classes, for example, to DIN EN 1063 and VdS) and fire-resistant glass in conjunction with SCHOTT's PYRAN®S.



Cleaning

AMIRAN® can be cleaned using appropriate methods similar to ordinary float glass. Even stubborn marks can be removed with suitable non-abrasive cleaners. Please refer to AMIRAN® Handling Instructions No. 2002, and pass on Cleaning Instructions No. 2001 to the building or shop owners.

Instructions for use

It is recommended that AMIRAN® be protected on the building site with protective film, and cannot be installed until just before completion of the construction phase in order to avoid damage by other work being done, e.g. plastering. AMIRAN® should be protected from rainwater running off the facade. Concrete and brick facades should be designed in such a way that plaster, mortar or concrete that leaches out of the facade by rainwater does not wash over the glass. Protective films can also be used for this purpose. No firmly bonded adhesive stickers or decorative film should be applied to AMIRAN®. Damage can occur when they are subsequently removed.

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SCHOTT
glass made of ideas