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What is
Exolon® AR

PC AR (abrasion-resistant) – polycarbonate solid sheet with two-sided scratch-resistant coating

Exolon® AR is a solid polycarbonate sheet whose two surfaces carry an abrasion-resistant, scratch-resistant coating. It combines the high impact strength of polycarbonate with a surface hardness that comes close to that of glass, making it the choice wherever transparent components must withstand years of cleaning, contact and mechanical stress.

Construction and Properties

Exolon® AR is based on standard polycarbonate with the well-known mechanical properties of this material – high tensile modulus, high elongation at break and practically unbreakable impact strength (Charpy, unnotched: no break). Both sheet surfaces additionally carry a thin, firmly adhering coating that markedly reduces the scratch sensitivity otherwise typical of polycarbonate.

The effectiveness of the coating is demonstrated by the Taber abrasion test: after 100 test cycles with the CS-10F abrasive wheel (500 g load, ASTM D1044), haze increases by only 1 to 4%; after 500 cycles (ANSI Z26.1) by 4 to 9%. Uncoated polycarbonate would haze considerably more under the same loading.

In clear finish, Exolon® AR achieves a light transmission of up to 88% (3 mm) and still stays at around 80% at greater thicknesses up to 15 mm. In bronze (8850), light transmission is around 50% regardless of thickness, which – combined with high impact strength – enables glare-reduced yet see-through glazing.

Advantages and Limitations

Advantages

- Glass-like, scratch-resistant surface on both sides
- High impact strength, practically unbreakable
- High light transmission at low weight compared with glass
- Chemical resistant
- Building material class B2 to DIN 4102 (thickness 3–12 mm, clear)

Disadvantages

- Coating not suitable for thermoforming
- Edge finishing mechanical only (no hot bending)
- Coating not verified for food contact

Processing

Exolon® AR can be sawn, routed and drilled like standard polycarbonate; naturally, the coating is removed at machined edges. Hot forming (thermoforming, hot bending) of the coated sheet is not possible – the coating would crack or delaminate. Applications that require forming should therefore be planned with uncoated Exolon® GP, not with Exolon® AR.

The chemical resistance of the coating also allows use where cleaning agents, disinfectants or occasional contact with solvents are expected – an advantage over uncoated polycarbonate, whose surface ages faster under such conditions.

Typical Applications

Because it combines scratch resistance, impact strength and optical clarity, Exolon® AR is preferred wherever glazing is cleaned frequently, must withstand high footfall, or needs protection against deliberate damage: in noise barriers, in educational and healthcare facilities, in correctional and psychiatric facilities, and as a chemical-resistant machine guard in plant engineering.

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How Exolon® AR Compares to Other Exolon® Variants

Exolon® AR extends the Exolon® product family with an abrasion-resistant variant. Exolon® GP is the uncoated standard grade and is the choice for applications that require thermoforming. Exolon® FR is designed for elevated fire-protection requirements. Exolon® AR, in turn, is the preferred choice wherever scratch and abrasion resistance over years of use is decisive – for example in high-traffic or frequently cleaned glazing – while thermoforming is not required.

Installation and Glazing

As with any plastic glazing, installation of Exolon® AR must allow for its linear thermal expansion of 0.065 mm / (m·°C): rebates, clamping strips and fixing holes should be dimensioned with sufficient clearance so the sheet can move freely with temperature changes. Sealants and adhesives should be checked for compatibility with the coating beforehand. Detailed guidance on storage, machining, installation and cleaning is provided in the Product Handling Information Sheet for Exolon® AR.

Care During Service Life

The abrasion-resistant coating is designed for a long service life under regular cleaning, but it does not replace careful handling: abrasive cleaners, dry wiping over dust or sand deposits, and solvent- or ammonia-based glass cleaners can prematurely damage the surface. Visible scratches on the coating itself cannot be locally repaired; affected sheets must be replaced in that case. Following the recommended cleaning method – mild soap solution, soft cloth, clean rinsing – preserves the scratch resistance over the entire service life.

Sourcing from Liedtke

Liedtke Kunststofftechnik supplies Exolon® AR from stock in the standard sizes listed and, on request, produces custom-cut panels, holes and edges from it – taking into account the processing guidance in the Product Handling Information Sheet for Exolon® AR, in particular that thermoforming is not possible and that expansion clearance is required during installation. Our team is happy to advise on choosing the right thickness, colour or processing method.

Typical Properties

- Solid PC sheet with two-sided scratch-resistant coating
- High abrasion resistance (Taber test)
- Glass-like surface hardness combined with high impact strength
- High light transmission (up to 88%)
- Chemical resistant
- Not suitable for thermoforming (coating)

Product Examples

- Clear (099), thicknesses 3–15 mm
- Bronze (8850), thicknesses 3–15 mm
- Standard size 3000 × 2000 mm

Typical Industries

- Noise barriers / sound protection walls
- Glazing in educational facilities
- Glazing in healthcare facilities
- Correctional and psychiatric facilities
- Machine guards (chemical-resistant)

	Test Method	Unit	Value
Key Data at a Glance			
Density	ISO 1183-1	g / cm³	1.20
Tensile modulus	ISO 527-2/1B/1	MPa	2400
Elongation at break	ISO 527-2/1B/50	%	≥70
Vicat softening temperature (B50)	ISO 306	°C	148
Haze increase after 100 Taber cycles	ASTM D1044	%	1 … 4

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	Test Method	Unit	Value
Light transmission, clear, 3 mm	DIN 5036	%	88
Building material class (thickness 3–12 mm, clear)	DIN 4102		B2
Rail vehicle fire behaviour (thickness 8–12 mm, clear)	DIN 5510		S3 SR2 ST2

This information describes the typical properties of Exolon® AR and serves as an aid to material selection. It is not a legally binding assurance of specific properties; for all values including further thicknesses and test methods please refer to the Technical Data Sheet. The surface coating is not verified for food contact suitability.

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