

Polycarbonate



- High strength
- Low weight
- Resistant to chemicals and weather
- Life span of >25 years
- Electrically isolating
- Self-extinguishing
- 100% recyclable

Construction

For the production of SICHERT outdoor cabinets, a special structural-foam procedure is used, the so-called TSG thermo-plastic foam processing. The moulded pieces feature a high wall thickness combined with a compact, smooth surface and an even, small-pore foam structure at the core (sandwich structure). They have an exact contour, and excellent mechanical properties.

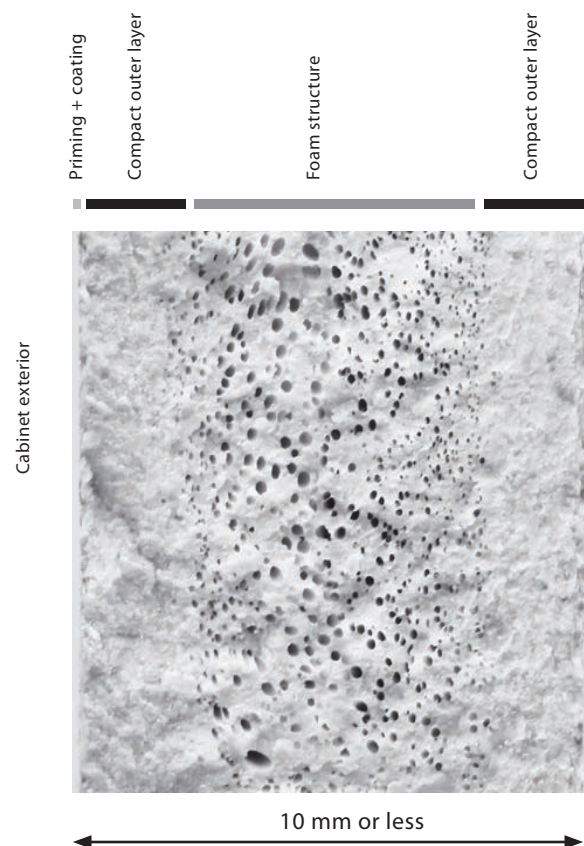
Properties

Cabinets for outdoor deployment need to offer protection against a variety of mechanical impacts, e.g. against hail, falling tree-limbs, rocks hurled, and shocks. Polycarbonate possesses the ideal mechanical properties to satisfy these requirements. By blending in low quantities of fibreglass (5%), the properties of the material are further enhanced. The specific advantage of structural-foam polycarbonate is the sandwich structure of the material: While the compact outer layers ensure a high degree of impact strength, notched-bar impact strength and rigidity, the flexible-foam core acts as shock absorber when the cabinet is exposed to mechanical stress. The material can even handle high cold deformation forces without permanently deforming or breaking. Polycarbonate has an extraordinarily good ultimate load and rigidity-to-weight ratio. At higher temperatures, polycarbonate has an excellent dimensional stability. At 120°C, the continuous operating temperature of the material substantially exceeds that of other resins such as PP, ABS, PE or PA6. Even at very low temperatures (down to -100°C), the material retains its high mechanical strength. PC is an outstanding electrical isolator, is flame resistant and self-extinguishing (fire classification B1, UL94 V0).

Resistance

Polycarbonate has a high-level resistance against chemical substances. It will not be corroded by alkaline or acidic reactants, dog droppings, urine, de-icing salt or fertiliser. This level of resistance makes polycarbonate, in addition to its excellent mechanical properties the material of choice for outdoor deployments.

- High strength
- Low weight
- Resistance to chemicals
- Weather-resistant
- Electrically isolating
- Self-extinguishing



SICHERT outdoor cabinets have an impact protection degree of IK 10 (IEC 62262, DIN EN 50102/ A1 and EC 60068-2-75) and thus the highest degree of resistance that cabinets for electrical equipment can have against impact stress. They are tested for mechanical strength (DIN 47609, EN 61439-5) and for resistance to vibrations (DIN EN 60068-2-6, VDE 0468-2-6:2008-10).

Superior Property and High-Level Resistance.

No Condensation

The excellent thermal insulation of the thick-walled polycarbonate cabinet parts is extremely advantageous. The low thermal conductivity keeps the cabinet interior from heating up due to solar radiation, and thus prevents quick fluctuations in temperature. The cabinet interior will always be slow to adjust to the ambient temperature. Through the interaction with the pressure compensation openings, humidity condensation is demonstrably prevented (in compliance with DIN 47609). Conventional, thin-walled outdoor cabinets require the installation of additional insulation on the interior cabinet walls and of pressure compensation elements.

Anti-Graffiti and Anti-Billposting Effect

The polycarbonate of SICHERT outdoor cabinets is dyed throughout in RAL 7038 (agate grey). Due to the materials superior weather resistance, additional surface coating is principally not required, unlike with metal or polyester surfaces. Naturally, it can be coated with paint for aesthetic reasons or as protection against graffiti and billposting.

Life Span and Environmental Impact

As a highly durable material, polycarbonate maintains its superior properties over a long period of time. Accordingly, there are no restrictions on the use of polycarbonate for high-quality outdoor cabinets with long durability and permanent reliability. As it is, SICHERT outdoor cabinets have demonstrable service lives of more than 25 years in roadside deployment for Deutsche Telekom. Polycarbonate is also ideal in environmental terms. Like all of the materials used by SICHERT, polycarbonate meets the RoHS and REACH EU directives for environmental protection, and may be fully reused in varietal purity.

- No humidity condensation
- Durability of >25 years
- Anti-Graffiti/Billposting Effect
- RoHS- and REACH-compliant
- Full recyclable



Stress testing (EN 60439-5) of 20-year-old CCC demonstrates: Except for some minor optical deviations, the cabinet material showed no sign of wear and fatigue. Even after 20 years (of deployment in Central European climate conditions), the cabinet remains fully functional.

Permanent Protection and Minimal Wear.

Comparing Materials

| | Polycarbonate (PC-GF) | Polyester (UP-GF) | Steel (ST 37) | Stainless Steel (1,4301) | Aluminium (AlMg3) |
|---|---|---|---|---|---|
| Typical wall thickness | ca. 6-10 mm | ca. 2-8 mm | ca. 1-2 mm | ca. 1-2 mm | ca. 2-3 mm |
| Absorption of impact energy without permanent deformation | +++ | ++ | o | o | o |
| Resistance against wear and tear (e.g. influence of airborne grit) | +++ | + | ++ | +++ | +++ |
| Electrical isolation (surface resistivity) | +++ ($10^{16} \Omega \cdot \text{cm}$) | ++ ($10^8 \Omega \cdot \text{cm}$) | - ($2 \cdot 10^1 \Omega \cdot \text{mm}^2/\text{m}$) | - ($7 \cdot 10^1 \Omega \cdot \text{mm}^2/\text{m}$) | - ($3 \cdot 10^2 \Omega \cdot \text{mm}^2/\text{m}$) |
| Resistance against water (water absorption after 24h at 23°C, DIN 53495) | +++ (max. 0,35%) | ++ (max. 0,70%) | - (-) | +++ (-) | + (-) |
| Corrosion resistance (aging resistance, weather resistance) | +++ | o | - | +++ | + |
| Resistance to seawater/ brine (declining bending strength) | +++ | ++ | - | +++ | + |
| Resistance to lubricants, grease, glue (declining bending strength) | +++ (max. 10%) | ++ (max. 20%) | +++ (-) | +++ (-) | +++ (-) |
| Surface protection required | no | yes | yes | no | yes |
| Thermal insulation – protection of cabinet interior against heating up due to solar radiation (thermal conductivity) | 100% (0,04 W/K*m) | 18% (0,22 W/K*m) | 0,08 % (43 W/K*m) | 0,08 % (15 W/K*m) | 0,03 % (130 W/K*m) |
| Additional cabinet insulation required to prevent the condensation of humidity | no | yes, e.g. PU foam | yes, e.g. PU foam | yes, e.g. PU foam | yes, e.g. PU foam |
| Weight (Comparing empty cabinet82 / DIN1) | 34,9 kg | 37,5 kg | - | - | - |
| Recycling (varietally pure recycling) | 100% | up to 20% | 100% | 100% | 100% |

More Details

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