

PMMA DOMES (ACRYLIC)

Technical Data Sheet

PRODUCT DESCRIPTION

Shams PMMA domes are manufactured from polymethyl methacrylate (PMMA), a synthetic material that stands out from other transparent plastics thanks to its excellent weather resistance, high light transmission and good scratch resistance.

These domes are highly transparent and particularly resistant to impact. The impact resistance of PMMA is approximately 10 times higher than that of glass of the same thickness. Shams PMMA domes also offer excellent UV stability: even after years of outdoor exposure they maintain their optical properties, and they incorporate UV protection on both faces.

Shams multi-shell PMMA domes comply with the requirements of energy-efficient rooflight installations. They are designed to be installed together with the different types of Shams upstands (galvanized steel, PVC and FRP) and with the full range of Shams opening systems.

FIRE CLASSIFICATION

According to the European standard UNE-EN 13501-2:2009+A1:2010, which specifies the classification of construction products and building elements based on their fire performance, Shams PMMA domes are classified as:

Euroclass E: Combustible – high contribution to fire.

MECHANICAL PROPERTIES

- Density: 1.19 g/cm³ (UNE 1183 / ASTM D792)
- Tensile strength: 83 MPa (UNE 527 / ASTM D638)
- Compressive strength: 1500 kg/cm² (UNE 604)
- Flexural strength: 3200 MPa (UNE 527 / ASTM D638)
- Impact strength (Izod): 1.5 kJ/m² (UNE 180 / ASTM D256)
- Abrasion: 70 mg (UNE 438-7)
- Rockwell hardness: 95 M-scale
- Elongation at break: 4 % (UNE 527 / ASTM D638)
- Water absorption (24 h): 0.3 % (ASTM D570)

THERMAL PROPERTIES

• Specific heat: 0.35 cal/g·°C

• Thermal conductivity: 0.19 W/m·°C (ASTM C177)

• Coefficient of thermal expansion: 65 × 10^{-6} m/(m·°C) (UNE 53126)

• Deflection temperature under load: 95 °C (UNE 75-1)

OPTICAL PROPERTIES

• Light transmission – transparent: 92 % (ASTM D1003)

• Light transmission – opal/ice: 73 % (ASTM D1003)

• Light transmission – single-wall dome: 92 % (UNE 13468)

• Light transmission – double-wall dome: 81 % (UNE 13468)

• Light transmission – triple-wall dome: 73 % (UNE 13468)

• Reflection loss: 4 %

• Refractive index: 1.49 (R489 / ASTM D542)

THERMAL INSULATION CHARACTERISTICS

• Solar factor – transparent and opal: 77–85 % (UNE-EN 1873:2015+A1:2016)

• U-value (thermal transmittance) – single-wall dome: 5.40 W/m²·°C (UNE-EN 1873:2015+A1:2016)

• U-value (thermal transmittance) – double-wall dome: 2.97 W/m²·°C (UNE-EN 1873:2015+A1:2016)

• U-value (thermal transmittance) – triple-wall dome: 1.89 W/m²·°C (UNE-EN 1873:2015+A1:2016)

ACOUSTIC INSULATION CHARACTERISTICS

• Sound reduction index – single-wall dome: 12 dB

• Sound reduction index – double-wall dome: 20 dB

• Sound reduction index – triple-wall dome: 22 dB

CHEMICAL RESISTANCE

Shams PMMA domes offer excellent resistance to weathering. They are not attacked by weak or strong acids. They are not attacked by weak alkalis, but can be attacked by strong alkalis and by oxidising agents. For cleaning, it is recommended to use a solution of neutral detergent and water.

The values shown are based on the technical data provided by the raw material supplier and correspond to tests carried out under standard conditions. Shams reserves the right to introduce modifications derived from product development and improvement.