Architen ETFE System

Two Layer ETFE Cushions

A beautifully engineered, lightweight building alternative to glazing.

2.9 W/m²K
Overall U-value

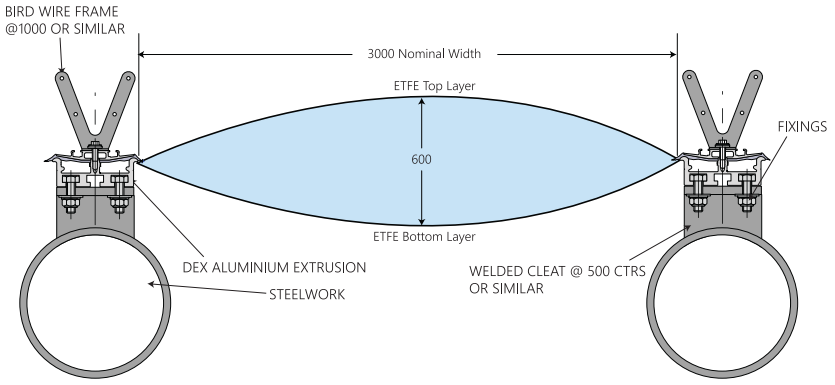
Up to 80%
Light transmission

Approx. 1%
Of the weight of glass

Up to 4 m
Typical panel width

Typical cushion section

Dimensions in mm



U-value calculation

Outer membrane	R_{se} = 0.04 m²K/W
Air chamber (<500 mm)	$R_{1–3}$ = 0.18 m²K/W
Inner membrane	R_{si} = 0.13 m²K/W
Total resistance R_T	$R_{se} + \Sigma(R_{1–3}) + R_{si}$
	0.04 + 0.18 + 0.13
	= 0.35 m²K/W
U-value	$U = 1 / R_T = 1 / 0.35$

Overall U-value **2.9 W/m²K**

ETFE foil 100–300 micron

Mass per unit area	175–525 g/m²
Tensile strength	55 MPa
Tensile strength @ 10% strain	23 MPa
Elongation at break	550%
Tear resistance	400 N/mm
Opacity	3–10%
Sample width	15 mm
Sample length	100 mm
Test speed	200 mm/min

About ETFE cushions

A two layer cushion is made of two sheets of ETFE foil, welded at the edges and inflated to form one insulating air chamber. It is the lightest and most transparent cushion configuration, with light transmission of up to 80% and a U-value of 2.9 W/m²K, at approximately 1% of the weight of glass.

Cushions are kept inflated by an Air Handling Unit (AHU), which maintains a pressure of around 250–300 Pa and uses under 60 W in normal operation (100 W maximum). The outer layer can be fritted to control solar gain and glare. Panel widths are typically up to 4 m, while lengths are unlimited.

Other configurations available

Single layer	5.9 W/m²K
3 layer cushions	1.9 W/m²K
4 layer cushions	1.4 W/m²K

How to specify

Product	Architen ETFE Cushion System
System manufacturer	Architen Landrell Manufacturing Limited
Size	As per architect's drawings
Fabric	ETFE foil
Configuration	2 layer ETFE cushions
Outer membrane	ETFE foil (fritted)
Inner layer	ETFE foil (clear)
U-value	2.9 W/m²K