Architen ETFE System

Four Layer ETFE Cushions

A beautifully engineered, lightweight building alternative to glazing.

1.4 W/m²K
Overall U-value

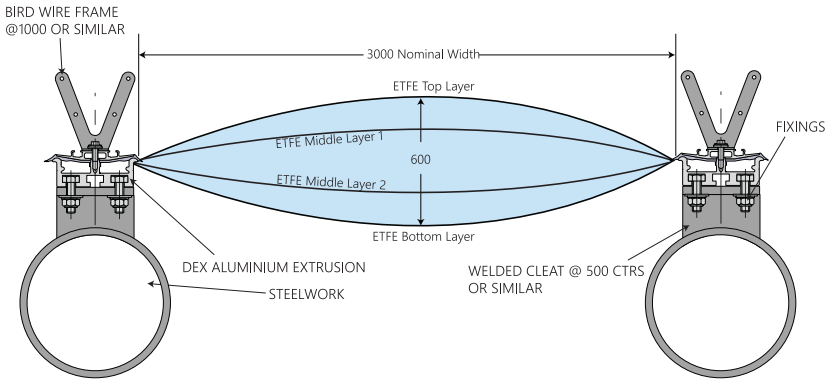
Up to 70%
Light transmission

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 chambers (<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 + (3 × 0.18) + 0.13
	= 0.71 m²K/W
U-value	$U = 1 / R_T = 1 / 0.71$

Overall U-value **1.4 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 four layer cushion has two middle layers of ETFE foil, creating three air chambers for our highest level of insulation: a U-value of 1.4 W/m²K, with light transmission of up to 70%. It suits enclosed, heated spaces where thermal performance is the priority, and still weighs approximately 1% as much as 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
2 layer cushions	2.9 W/m²K
3 layer cushions	1.9 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	4 layer ETFE cushions
Outer membrane	ETFE foil (fritted)
Middle & inner layers	ETFE foil (clear)
U-value	1.4 W/m²K