

BUSAN ASIAD MAIN STADIUM · BUSAN, SOUTH KOREA

Tensile fabric roofs

Fabric roofs for stadia, venues and large spaces

Tensile fabric roofs for stadiums, indoor pitches, amphitheatres, markets and malls, in PTFE glass, PVC polyester or silicone glass. Designed, engineered, made and installed by one team, from our factory in Chepstow, UK.

architen.com · +44 (0) 1291 638 200

INSPIRE · INNOVATE · PERFORM

ARCHITEN LANDRELL



LORD'S CRICKET GROUND · LONDON, UK

Who we are

Tensile fabric and ETFE structures, designed and made in the UK

Architen Landrell designs, engineers, fabricates, installs and maintains tensile membrane structures. Since 1983 we have built fabric roofs over stadiums, pitches, concert venues, markets and malls on six continents.

We work hand in hand with architects, engineers and contractors, from the first sketch to maintenance. Every membrane is cut and welded in our own factory, and our group company, Metafab Structures, makes the steelwork that holds it up.

Inspire

We draw on our experience, other industries and the natural world to create inspiring designs.

Innovate

We challenge existing ways of doing things to push boundaries, improve structural and environmental performance, and make the seemingly impossible possible.

Perform

We deliver high-quality products that meet the design and performance requirements of every project.

1983
founded in Chepstow, South Wales

6 continents
where our structures stand

2,000 m²
of production space in our Chepstow factory

In-house
design, engineering, manufacture, installation and maintenance

Company information

The Architen Landrell Group

Four specialist companies, one integrated offer: from bespoke landmark roofs to modular structures, steelwork, coatings and the keder that holds it all together.

Bringing these capabilities together under one group means clients, architects and contractors can come to a single partner for the membrane, the structure that supports it and the components that fix it.

Architen Landrell

ARCHITECTURAL TENSILE FABRIC AND ETFE

Tensile fabric and ETFE architectural structures. Complex and bespoke projects around the world.

architen.com

Metafab Structures

STEELWORK AND COATINGS

Advanced architectural and structural steelwork fabrication for strong modular buildings, tensile structures and rapid construction. Advanced coatings with Metacoatings.

metafabs.com

Fabric Architecture

MODULAR AND SMALL-SCALE STRUCTURES

A standard range of tensile fabric canopies and shade structures, popular with schools and colleges. Full turnkey solution including groundworks.

fabricarchitecture.com

UK Keder

KEDER PRODUCTS

Supply of high-quality keder products for a wide range of applications, from tensile structures to caravans.

uk-keder.com

Our services

From concept all the way through to handover, then maintained

We design, engineer, make, install and maintain every roof ourselves, so one accountable team carries the design intent from the first sketch to the finished roof and beyond.

Runs through every stage — Project management — One dedicated project manager and a single point of contact, from design to maintenance

Design
Beautiful, buildable concepts

Engineering
For wind, snow and extreme weather

Manufacturing
2,000 m² in-house production

Support structures
Steel, aluminium or timber

Installation
Safe, skilled site teams worldwide

Maintenance
Inspection, cleaning and repair



BUTLIN'S SKYLINE PAVILION · MINEHEAD, UK

Overview

What is a tensile fabric roof?

A tensile fabric roof is a membrane, usually PTFE-coated glass fibre or PVC-coated polyester, pre-stressed between masts, arches or cables into a curved shape, so the fabric carries its loads in tension. It spans large spaces with far less steel than a conventional roof, and lets daylight through.

A single skin shelters stands, markets and outdoor venues. Add an inner lining and insulation, and the same roof can enclose a heated building such as a gallery, restaurant or sports hall. The membrane is pre-stressed into double curves so it stays taut under wind and snow, and does not pond.

30+ years
design life of PTFE glass

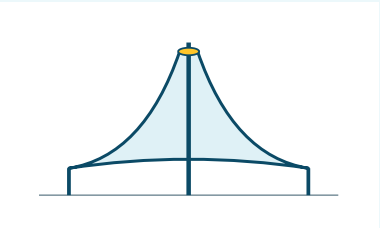
15–30
years' life for PVC polyester, depending on the grade

Up to 64%
of daylight through high-translucency PVC

0.18 W/m²K
U-value of an insulated Thermal roof

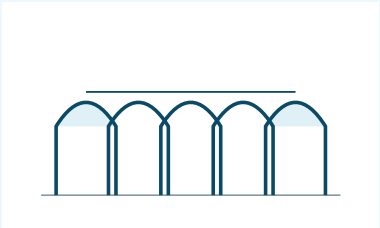
About 40%
less heat lost through a twin-skin roof than through a single skin

How fabric roofs work · three basic shapes, used alone or joined together



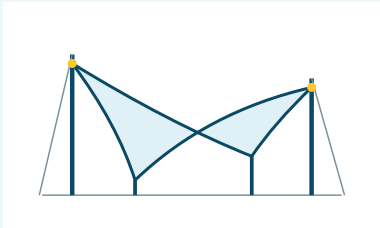
Cone

Fabric pulled up to a ring at the top of a mast, with cable edges between low anchor points. Repeated cones cover large areas, as at the Riyadh camel racing track.



Arch

Fabric stretched over a row of steel arches. It gives long clear spans with no columns, which suits indoor pitches such as St George's Park.



Saddle

Corners alternately high and low, held by masts and cable edges. The twist keeps the fabric taut, and the shape repeats easily for canopies and shade.

Build-ups and insulation

What sits beneath the outer membrane decides how the space feels to the people using it: warm enough to stay in through winter, bright with daylight and quiet when it rains. U-value in W/m²K: the lower the number, the less heat escapes.

Single skin

about 4.5 W/m²K

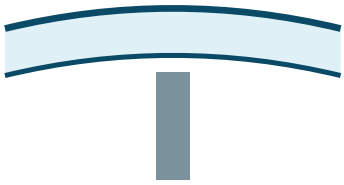


1. Fabric membrane, PTFE glass or PVC polyester
2. Steel support: arch, mast, beam or cable

One tensioned membrane. Right for stands, canopies, markets and other spaces that need shelter from sun and rain but are not heated.

Twin skin

about 2.6 W/m²K



1. Outer membrane
2. Air gap, about 200 mm
3. Inner membrane

A second membrane beneath the first traps a layer of air and cuts heat loss by about 40%. With an acoustic quilt between the layers, it also absorbs sound.

Thermal

0.18 W/m²K



1. Outer membrane
2. Multi-foil insulation, suspended beneath
3. Light inner lining, smooth underside

Our insulated system meets Part L, so fabric can enclose heated buildings, as at the Serpentine Sackler Gallery.

Heat loss by build-up · a shorter bar means better insulation



Option for any build-up

LowE coating

A metallic coating that works a bit like a thermos: in winter it reflects heat back down into the space, in summer it keeps solar gain out. We used it on 238 fabric hoods at the Doha Showcase Stadium.

Option for any build-up

Acoustic lining

Ecoustic is a dense, fire-rated soundproofing membrane hung beneath the roof, following its curve. It improves the sound in halls and venues, and suits demountable structures too.

Option for any build-up

Rain noise suppression

Heavy rain can drum on a single skin of fabric. A suppression layer over the roof dampens the noise, and it can be added to an existing roof.

Materials

Choosing a fabric for your roof

The fabric sets the roof's life, light, look and cost. We work in all the main architectural membranes, and our engineers will recommend one for your project.

Fabric	Design life	Light and look	Best for
PTFE glass	30+ years	White or coloured; sunlight keeps white PTFE white and rain washes it clean	Stadiums, landmark and long-life roofs, transport hubs
PVC polyester	15–30 years, by grade	Up to 64% light in high-translucency grades; many colours; printable	Stands, indoor pitches, venues, markets; folds for temporary and retractable roofs
Silicone glass	20–25 years	Up to 42% light in white; blocks UV-B but lets plants grow	Bright covers, planted spaces, insulated skins
ETFE foil	30+ years	Up to 95% light; about 1% of the weight of glass	Atria, rooflights, pools

Source: Architen Landrell materials pages.

Performance

U-value, single skin	About 4.5 W/m²K
U-value, twin skin with 200 mm air gap	About 2.6 W/m²K
U-value, Thermal insulated system	Down to 0.18 W/m²K, meets Part L
Light transmission	Up to 64% (high-translucency PVC) · up to 42% (white silicone glass)
Fire tests, Europe and UK	EN 13501-1 reaction to fire; DIN 4102-1 in Germany; NF P92-503 in France; BS 7837 for textile structures in the UK
Fire tests, USA	ASTM E84 / UL 723; NFPA 701; ASTM E108 / UL 790
Fire class of a fabric	Depends on the fabric and grade: we send the test certificates for the one we propose
Maintenance	Inspection and cleaning; yearly re-tension check on very exposed sites

Source: Architen Landrell, Tensile fabric structures and performance; materials pages.

Wind and snow

Wind uplift is usually as great as the snow load, and every roof is engineered for both at its site. Our 32 m conical canopy in Mauritius is designed for, and regularly sees, 150 mph winds. Snowy sites get steeper profiles and shorter spans.

Daylight and sound

High-translucency PVC lets through up to 64% of daylight, cutting the need for lights by day. A single skin does little to stop sound; a double skin with an acoustic quilt absorbs it, and fabric linings cut echo.

In a fire

PVC fabric puts itself out when the flame is removed. PTFE glass seams part at about 270 °C, letting smoke and heat escape through the roof.



SERPENTINE SACKLER GALLERY · LONDON, UK · PHOTO © LUKE HAYES

Featured project

Serpentine Sackler Gallery: a fully insulated fabric roof

Zaha Hadid Architects' £14.5 million extension to the Serpentine Gallery opened in September 2013. The flowing white roof sits beside a 19th-century building, joining old and new, and covers a restaurant and social space designed to be a destination in its own right. We had worked with Zaha Hadid Architects before, on the London 2012 Aquatics Centre.

The free-flowing form curves in every direction, rests on five tapered columns and appears to touch the ground at just two points. Five elliptical glazed rings bring daylight in, and frameless glass walls make the roof seem to float above the space.

It is a permanent, fully enclosed building. The roof has three layers: PTFE glass outside, chosen for its long life, fire rating and self-cleaning surface; a fireproof insulation layer; and a silicone glass inner lining. Each layer covers about 538 m², and together they reach a U-value of 0.18 W/m²K, meeting Part L.



0.18 W/m²K

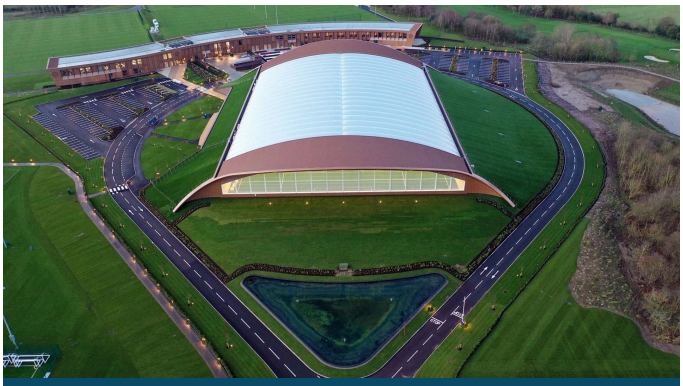
U-value of the triple-layer roof, meeting Part L

538 m²

of fabric in each of the three layers

Stadium roofs and indoor pitches

From grandstands to all-weather pitches



Leicester City FC Training Ground

SEAGRAVE, LEICESTERSHIRE · ETFE

A full-size indoor pitch, 75 m × 112 m, under a roof of 40 two-layer ETFE cushions that lets in enough daylight for natural grass to grow.



Riyadh Camel Racing Track

RIYADH, SAUDI ARABIA · PTFE GLASS

A grandstand roof shaped like a Bedouin tent, in PTFE glass that stays bright white in the desert sun.



Hampshire Rose Bowl

SOUTHAMPTON, UK

Now the Utilita Bowl. White fabric canopies over the pavilion and a 12,000-seat stand, with Hopkins Architects.



Kensington Oval

BRIDGETOWN, BARBADOS

Translucent fabric ceiling panels and sight screens for the ICC Cricket World Cup 2007.



BRDC Clubhouse

SILVERSTONE, UK · PTFE GLASS

A wing-like PTFE glass roof over the clubhouse terrace, designed by Ridge Architects.



St George's Park

BURTON UPON TRENT, UK · PVC POLYESTER

The indoor pitch at England's National Football Centre, under 13,500 m² of fabric: nearly two full-size football pitches.



Oriam

EDINBURGH, UK · PVC POLYESTER

16 PVC polyester panels stretch over diagonal arches spanning 116 m by 76 m: Europe's largest-span fabric roof over an indoor 3G pitch.

Amphitheatres and performance venues

Cover for the crowd, and a clear view of the stage



Darien Lake Amphitheater

NEW YORK STATE, USA · PVC POLYESTER

A 5,000 m² PVC polyester canopy for the performing arts centre at Darien Lake, near Buffalo, covering almost four times the space of the original amphitheatre, with an unobstructed view of the stage from every seat. Engineered and made in South Wales, then installed under our supervision.

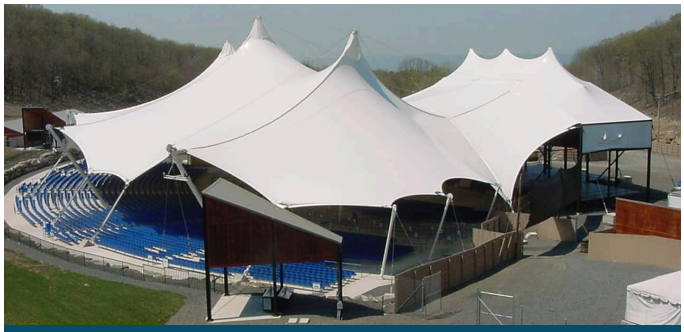
Canopy	5,000 m² PVC polyester
Covers	6,000 seats
Made in	Chepstow, UK



Chene Park (Aretha Franklin Amphitheatre)

DETROIT, MICHIGAN, USA · PTFE GLASS

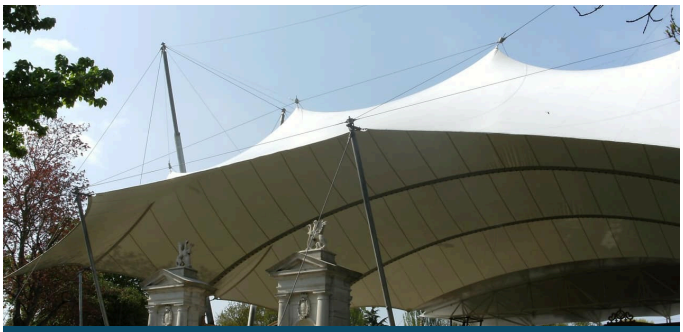
We rebuilt the ridge-and-valley roof in PTFE glass, then added acoustic baffles for clearer speech and music.



Montage Mountain Amphitheatre

SCRANTON, PENNSYLVANIA, USA

Our concert pavilion roof first went up in 2000. We keep the patterns of every roof on file, and we replaced this one again in 2026.



Opera Holland Park

LONDON, UK

A competition-winning canopy over the stage and seating for the summer opera season, replacing the 1988 original.



London 2012 Water Polo Arena

LONDON, UK · INFLATED PVC

5,000 Olympic spectators under an inflated fabric cushion roof, built to be taken down after the Games. IAA Award of Excellence 2013.

Markets, malls and insulated buildings

Large, bright covered spaces

Fabric roofs make big, daylit covered spaces, often built against existing buildings. With our Thermal system, fabric can be the whole envelope of a heated building.



McArthurGlen Designer Outlet

ASHFORD, KENT, UK · PVC POLYESTER

A fabric roof a kilometre long over the shops of Richard Rogers Partnership's outlet village. Each cone depends on its neighbours for stability; on completion it was the largest continuous tensile membrane structure in the world.

35,000 m²
of PVC polyester roof

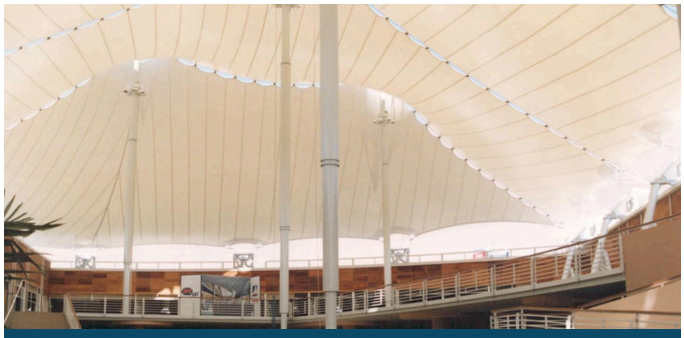
1 km
of continuous fabric roof



Gracechurch Shopping Centre

SUTTON COLDFIELD, BIRMINGHAM, UK

A 300 m² double cone, 10 m tall on two angled masts, covers the heart of the shopping centre, fixed to the buildings around it. Lights built into the steelwork take over after dark.



Iquique Mall

IQUIQUE, CHILE · PVC POLYESTER

A 5,500 m² food court roof that keeps off the desert sun with passive ventilation. International Fabric Association Outstanding Achievement award, 1998.



Food Court, Chatham Maritime

CHATHAM, KENT, UK

Fabric draped from a 60 m steel arch beside a listed Victorian boiler shop: the first use of our insulated Thermal system.



Château La Coste art pavilion

PROVENCE, FRANCE · PVC POLYESTER

Ten fabric sails on steel arches float over Renzo Piano's gallery in the vineyard, aligned with the vines.

Photo © WE ARE CONTENTS

For architects and clients

Planning and specifying a fabric roof

The earlier we are involved, the lighter the structure and the simpler the details. These are the questions our engineers will ask, so it helps to have a view on them.

01
What will the roof cover?
A stand, an indoor pitch, a market, a courtyard or a whole venue, and the clear span you need.

02
Open-sided, or a heated building?
A single skin suits open structures; a twin skin or Thermal (0.18 W/m²K) encloses heated buildings.

03
Which fabric?
PTFE glass, PVC polyester or silicone glass, for life, light, colour and cost, or we can guide you.

04
Wind, snow and rain
The loads at the site, and where the rainwater and snow will go: gutters, downpipes or off the edges.

05
The supporting structure
Steel or timber masts and arches, cables or an existing building. Metafab makes the steelwork.

06
Light, sound and fire
How much daylight should come through, any acoustic lining, and the building's fire strategy.

07
Access and maintenance
How the roof will be reached for inspection, cleaning and repairs.

Specification

Architen Thermal Tensile Fabric System
Outer membrane, multi-foil insulation, inner membrane. U-value 0.18 W/m²K. H90 clause available.

Frequently asked questions

How long does a tensile fabric roof last?
PTFE glass has a design life of more than 30 years. PVC polyester lasts 15 to 30 years, depending on the grade. With inspection and cleaning both can last longer: the PVC roof over our own factory lasted 30 years.

Can a fabric roof be insulated?
Yes. Our Thermal system adds multi-foil insulation and an inner lining beneath the outer membrane. It reaches 0.18 W/m²K, which meets the Part L limit for the roofs of non-domestic buildings.

PTFE or PVC: which fabric should I choose?
PTFE glass suits permanent landmark roofs that need a long life and a white finish. PVC polyester costs less, comes in colours and can be folded for temporary or retractable roofs.

How much daylight does a fabric roof let in?
High-translucency PVC lets through up to 64% of light and white silicone glass up to 42%. Insulation reduces the light that gets through.

Is a fabric roof noisy in the rain?
Heavy rain can drum on a single skin. A rain noise suppression layer over the roof, or an acoustic lining beneath it, reduces the noise.

How does a fabric roof behave in a fire?
PVC fabric puts itself out when the flame is removed and does not drip. PTFE glass seams part at about 270 °C, letting smoke and heat out.

Can you repair or re-skin an existing roof?
Yes. Small repairs are made on site and larger sections in our factory. At the end of the fabric's life we fit new fabric to the existing structure, and can add insulation at the same time.

How much does a fabric roof cost?
It depends on the material, the design and how long it takes to make, so we don't publish a budget price per m²: a single figure could be misleading. Send us drawings or a sketch and we will price your project.



HAMPSHIRE ROSE BOWL · SOUTHAMPTON, UK

Let's talk about your roof

Working hand in hand with design and engineering teams to find solutions

Maintenance and repairs

Already have a fabric roof?

We inspect, clean, repair and re-skin tensile fabric roofs around the world, including roofs built by other companies, with a 24-hour emergency response. After 30 years we re-skinned the 12 fabric cones over our own factory and insulated nine of them to 0.18 W/m²K.

- Inspections and condition surveys
- Professional cleaning and re-tensioning
- Repairs on site, or new sections from our factory
- New fabric fitted to the existing structure
- Upgrades: insulation, LowE or acoustic linings

Maintenance team: maintenance@architen.com

Contact

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Head office and factory

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ARCHITEN LANDRELL

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