Ref: BIO-BROWN-100
V1 31/05/2025

Bitumen Waterproofing
Hot Melt Waterproofing
Liquid Waterproofing

Product Data Sheet

HYDRO-BIODIVERSE BROWN LIVING ROOF

Comprising a water retention and drainage layer with bonded filter fleece and contoured growing medium

Axter's living or green roof systems are designed to accommodate the most varied ecological and environmental requirements.

The combination of long-term system performance with horticultural expertise ensures full compliance with national, local and project specific environmental biodiversity and attenuation criteria.

A living roof, as well as being an aesthetically pleasing addition to a building, offers many other advantages:

- Increased biodiversity, creating habitat for birds, bees and invertebrates.
- More usable space on the roof (e.g. for gardens, amenity, play and educational areas).
- Less urban heat island effect.
- Reduced rainwater run off flow rates.
- Better air filtration.
- Increased sound insulation and thermal efficiency.

Biodiverse living roofs are designed to create a habitat for a specific requirement of flora and fauna and are generally designed as part of an extensive green roof. Also referred to as brown roofs sometimes, they are often designed to replicate the original footprint of the building or are created to enhance the pre-development habitat with additional plant species.

Axter supplies specialist growing medium to suit the requirements of the planting regime but in many cases soil and spoil from the development site can be recycled and used on the roof. In an Axter Hydro-Biodiverse Brown roof the biodiverse substrate is not purposefully planted but is selected to allow indigenous plant species to inhabit the roof over time. Various habitats can be created and biodiversity enhanced by contouring the soil, providing different substrates, soil, rocks, sand, gravel, crushed concrete and by adding features such as rotting wood and ponds.

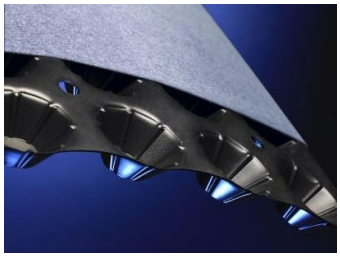
Key benefits

- Landscaped areas with different contour levels attract different wildlife.
- Increases indigenous biodiversity of the development site.
- Logs provide habitat for invertebrates.
- Wetland areas and ponds provide ecosystems for wildlife
- Reclaimed or recycled materials from the building site itself can be used.

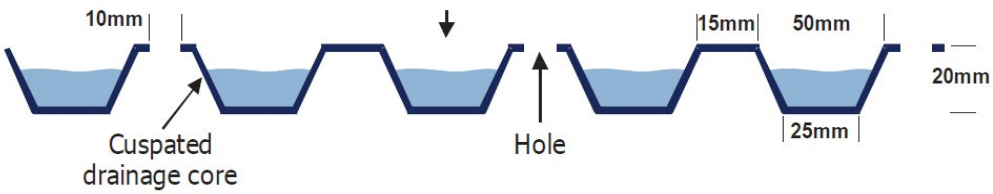
Hydro-Biodiverse Brown Living Roof

- Water retention and drainage layer (20mm).
- Filter layer (1mm).
- Biodiverse substrate layer 100mm (substrate surface contour +/- 20mm) fauna biodiversity.
- Optional biodiverse seed and/or micro habitat creation.

Water retention and drainage layer (20mm)



High compressive strength, rigid HDPE board acting as both drainage and water retention layer, with a geotextile filter layer bonded to one side. The board contains high capacity dimples (height approx. 20mm) for water retention and perforations to drain surplus water. It is resistant to root penetration and to chemicals.



Drainage sheet (cuspated, perforated)	Test Standard	Units	Value
Polymer	High Density Polyethylene		
Cuspate height		mm	20
Compressive strength	EN ISO 25619-2	kPa	115
Tensile strength (MD/CMD)	EN ISO 10319	kN/m	17
Static Puncture (CBR)	EN ISO 12236	kN	2.6
Perforations per m^2			49
Perforations diameter		mm	10
Thickness @ 2kPa	EN ISO 9863-1	mm	21
Water flow through perforations	EN ISO 11058	l/(m^2.s)	24
Water storage capacity		l/m^2	4
Roll dimensions		m	0.97 x 50
Roll diameter (approx.)		m	1.1
Roll weight (approx.)		kg	60
Geotextile			
Polymer	Polypropylene		
Water permeability (VH50)	EN ISO 11058	l/(m^2.s)	100
Apparent opening size	EN ISO 12956	µm	80

Filter layer (1mm)

Fleece filter layer for use on all sedum and biodiverse living roof systems. Manufactured using UV stabilised polypropylene, it provides high tensile properties and excellent durability. Its high density and strength, resulting from re-orientation of the molecules within the fibres during manufacturing, increase its environmental resistance and mechanical properties. It is resistant to root penetration and to chemicals.

The filter layer should be covered within one month of installation.

Expected durable service life of the material is up to 50 years in soils with $4 \leq pH \leq 9$ and soil temperatures $\leq 25^{\circ}C$, based on a durability assessment.

Physical properties	
Composition	Non-woven geotextile made from 100% virgin polypropylene high tenacity fibres, heat treated, needle punched, containing UV inhibitor
Weight (g/m²)	123
Colour	White
Unit supplied	Rolls: Unit width (lm) 1.13 x Unit length (lm) 100
Roll weight (kg)	14
Thickness @ 2kPa (mm)	0.8

Technical properties	Value	Standard
Tensile strength (kN/m) – MD/CMD	9.0 – 9.8	EN ISO 10319
Elongation at max load (%) MD/CMD	60 / 65	EN ISO 10319
CBR static puncture (kN)	1.4	EN ISO 12236
Cone drop penetration (mm)	32	EN ISO 13433
Apparent opening size (µm)	80	EN ISO 12956
Water permeability (l/m2.s)	100	EN ISO 11058
Weathering 50 Mj/m2 (1 month)	>90% retained strength	EN ISO 12224

Substrate layer (100mm)

Moisture retentive, low nutrient, free draining when saturated, allows root penetration. A special mix of organic material with clean and screened aggregates recycled from certifiable building industry waste products. Suitable for use on extensive wildflower and biodiverse roof systems. Green waste meets PAS 100 standards.

Physical properties	
Composition	Recycled crushed brick/mineral and composted green waste (certified PAS 100)
Brick grading	Various sizes of graded brick to promote a more biodiverse environment
Colour	Dark brown
Suggested depth	80 - 150mm
Sizes	25 litre sacks and bulk bags
Technical properties	
Weight (dry)	790kg/m³
Weight (saturated)	970kg/m³
Compaction	Approx 15% (+/-3%)
pH	7.5 – 8.5

Recommended minimum substrate depth is 100mm.

Microhabitat creation

Seasoned logs, rocks and a variety of substrates (sand, gravel, crushed concrete, etc) used to create different roof top environments each supporting a different species, to maximise biodiversity.

Maintenance

An annual maintenance programme for wildflower living roofs is recommended, to include two visits per year, one in the Spring (remedial) and one in the Autumn (cutting), when vegetation should be strimmed after flowers have seeded.

The substrate must be watered before and after planting and system kept moist for at least three months after installation and as weather conditions require. Further information is available in the Axter Living Roof Maintenance Guide.

Design considerations

A living roof calls for a robust waterproofing system able to withstand the increased loads and suitable for the building structure.

The waterproofing for biodiverse and brown roofs can be either of a warm or inverted construction. Recommended Axter BBA / ETA certified, high performance waterproofing systems designed to fulfil this function are Cityflor® and Wilotekt®-Plus.

Each living roof is different, so we design bespoke solutions drawing on our many waterproofing options and including in the specification the living finishes best suited to the environment to ensure all roof and surrounding area criteria are met.

The following points must be included in the living roof design:

- Roof to be capable of supporting the design load.
- Adequate provision to drain excess rainwater.
- Safe access for maintenance.
- Robust and durable roof waterproofing.
- Root resistant membranes must be considered.

Axter Hydro-biodiverse Living Roof options:

HYDRO-BIODIVERSE BROWN

HYDRO-BIODIVERSE SEED

HYDRO-BIODIVERSE WILDFLOWER

HYDRO-BIODIVERSE PLUG PLANT

For full information on these and other Axter living roof designs, specification, installation and maintenance, contact Axter.