



## **OPERATIONS & MAINTENANCE MANUAL**

### PROTECTO-DRAIN FOR GREEN ROOFS

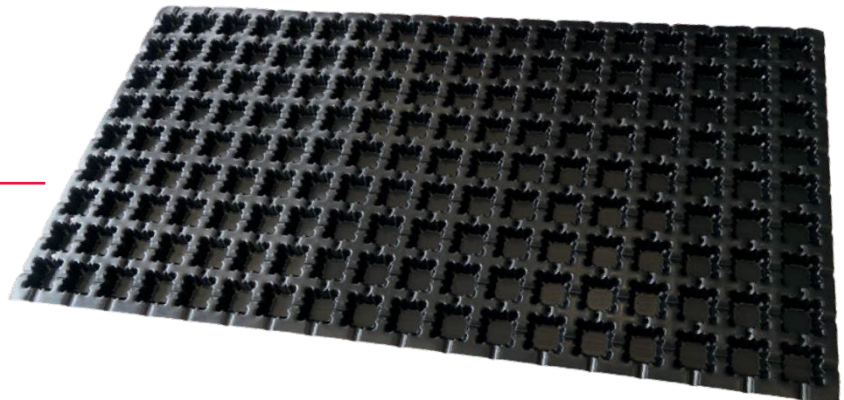


## PRODUCT DESCRIPTION

Perforated Protecto-Drain is the Green Roof Drainage Layer and is a vital component in the construction of environmentally friendly and efficient green roofs. Designed to facilitate proper water drainage and moisture management, this drainage layer ensures the long-term health and functionality of green roof systems.

Wallbarn's Green Roof Drainage Layer is available in three perforated types: 20mm, 40mm, and 60mm. Each type offers specific benefits tailored to different project requirements, allowing for flexibility and customization in green roof design.

1. **20mm Perforated Type:** The 20mm perforated drainage layer is ideal for projects where weight and height considerations are crucial. It provides efficient water drainage and retention capabilities while minimizing the overall weight load on the structure. This type is suitable for lightweight extensive green roofs or situations where space is limited. This is the most commonly used size for Sedum or Wildflower Green Roofs.
2. **40mm Perforated Type:** The 40mm perforated drainage layer strikes a balance between water retention capacity and weight load. It offers improved water storage capabilities compared to the 20mm type, making it suitable for both Extensive and Intensive Green Roofs. This type is versatile and can handle a broader range of plantings and soil depths.
3. **60mm Perforated Type:** The 60mm perforated drainage layer is designed for projects that require enhanced water retention and drainage capacity. It is particularly beneficial for Intensive Green Roofs that accommodate deeper soil profiles and a diverse range of vegetation. This type ensures efficient moisture management and supports the growth of larger plants and trees.



## TECHNICAL DATA

### 20mm Perforated Protecto-Drain

Dimpled membrane	HDPE approx. 1,000 g/m <sup>2</sup>
Dimple height	approx. 20 mm
Total weight	approx. 1,000 g/m <sup>2</sup>
Number of dimples	400 dimples/m <sup>2</sup>
Compressive strength	approx. 180 kN/m <sup>2</sup>
Colour	black
Water draining capacity	approx. 9 l/s·m
Water storage	approx. 6.0 l/m <sup>2</sup>
Roll length	20 m or on request
Roll width	0.5 / 1.0 / 1.5 / 2.0 m
Air volume between the dimples	approx. 14 l/m <sup>2</sup>
Temperature resistance	-30 °C to +80 °C
Chem. properties	chemical-resistant
Physiolog. properties	safe for drinking water
Water permeability EN ISO 11058	approx. 100 · 10 <sup>-3</sup> m/s
Fire behaviour	Class E

### 40mm Perforated Protecto-Drain

Dimpled membrane	HDPE approx. 2,200 g/m <sup>2</sup>
Dimple height	approx. 40 mm
Material thickness	approx. 1.50 mm
Total weight	approx. 2.20 kg/m <sup>2</sup>
Number of dimples	164 dimples/m <sup>2</sup>
Compressive strength	approx. 200 kN/m <sup>2</sup>
Colour	black
Water draining capacity i = 1.00	approx. 4.30 l/s·m
Water draining capacity i = 0.10	approx. 3.78 l/s·m
Water storage	approx. 15 l/m <sup>2</sup>
Sheet length	2.00 m
Sheetwidth	1.00 m
Temperature resistance	-30 °C to +80 °C
Chem. properties	chemical-resistant
Physiolog. properties	safe for drinking water
Fire behaviour	Class E

## 60mm Perforated Protecto-Drain

Dimpled membrane	HDPE approx. 2,500 g/m <sup>2</sup>
Dimple height	approx. 60 mm
Material thickness	approx. 1.50 mm
Total weight	approx. 2.50 kg/m <sup>2</sup>
Number of dimples	130 dimples/m <sup>2</sup>
Compressive strength	approx. 200 kN/m <sup>2</sup>
Colour	Black
Water draining capacity i = 1.00	approx. 4.48 l/s·m
Water draining capacity i = 0.10	approx. 3.86 l/s·m
Water storage	approx. 20 l/m <sup>2</sup>
Sheet length	2.00 m
Sheet width	1.00 m
Temperature resistance	-30 °C to +80 °C
Chem. properties	chemical-resistant
Physiolog. properties	safe for drinking water
Fire behaviour	Class E

## COMPOSITION

The three types of drainage layers are all composed of high-density polyethylene (HDPE). HDPE is a durable and versatile material that is widely used in various construction and environmental applications. The composition of these drainage layers primarily consists of recycled HDPE, making them environmentally friendly and sustainable choices for green roofs. HDPE offers excellent physical properties, such as high tensile strength, impact resistance, and flexibility, ensuring the longevity and performance of the drainage layers. Additionally, HDPE is chemically inert, meaning it is resistant to chemical degradation and does not release harmful substances into the environment. This composition ensures that the drainage layers can withstand exposure to moisture, UV radiation, and other environmental factors while effectively managing water drainage and retaining the optimal moisture levels necessary for the growth of vegetation on green roofs.

## KEY FEATURES

All three types of our Green Roof Drainage Layer feature high-quality, durable materials that are resistant to clogging and root penetration. The perforations evenly distribute excess water, preventing waterlogging and ensuring optimal moisture levels for vegetation.

Key Features:

- High-quality, durable materials
- Effective water drainage and retention
- Customizable perforated types: 20mm, 40mm, and 60mm
- Resistance to clogging and root penetration
- Suitable for extensive and intensive green roofs
- Lightweight design (20mm type)
- Enhanced water storage (40mm and 60mm types)
- Promotes healthy vegetation growth
- Supports sustainable and eco-friendly building practices



## PRODUCT INFORMATION

<https://www.wallbarn.com/protection-drainage/drainage>

## PRODUCT INSTALLATION

Protecto-drain 20P, 40P & 60P was developed for use as a reservoir and drainage layer in green roof construction. It is placed on top of the waterproofed, protected deck which has a protective geotextile laid on it and sits beneath a filter layer, the soil substrate and vegetation layers, on extensive and intensive green roof systems.

For all three types of drainage layers made from HDPE, the following guidelines should be followed during installation:

1. The waterproofed surface must be thoroughly cleaned so that no damage can occur to the waterproofing after laying the drainage membrane
2. Surface Gradient: Prior to installation, ensure that the application surface has a minimum gradient of 2% to facilitate proper water drainage.
3. Protective Geotextile: After the horizontal waterproofing layer is in place, apply the Geotextile over the surface before laying the drainage layer. This Geotextile helps prevent damage to the waterproofing layer.
4. Overlapping Rolls/Sheets: When laying these drainage layers, you should overlap the rolls/sheets. Wallbarn has a Butyl Fixing Tape (30m Roll) that can be used if required to tape the overlapping seams.
5. Vertical Edges: Along the vertical edges of the surface, the drainage membrane should be raised at least 150mm or to the upper edge of the finished substrate layer. This ensures proper water management and prevents water from seeping into undesired areas.
6. Geotextile Application: Once the drainage layer is installed, and depending on the desired finish, the geotextile or filter fleece can be applied over the surface. The geotextile acts as a protective layer and provides a foundation for the planting substrate.

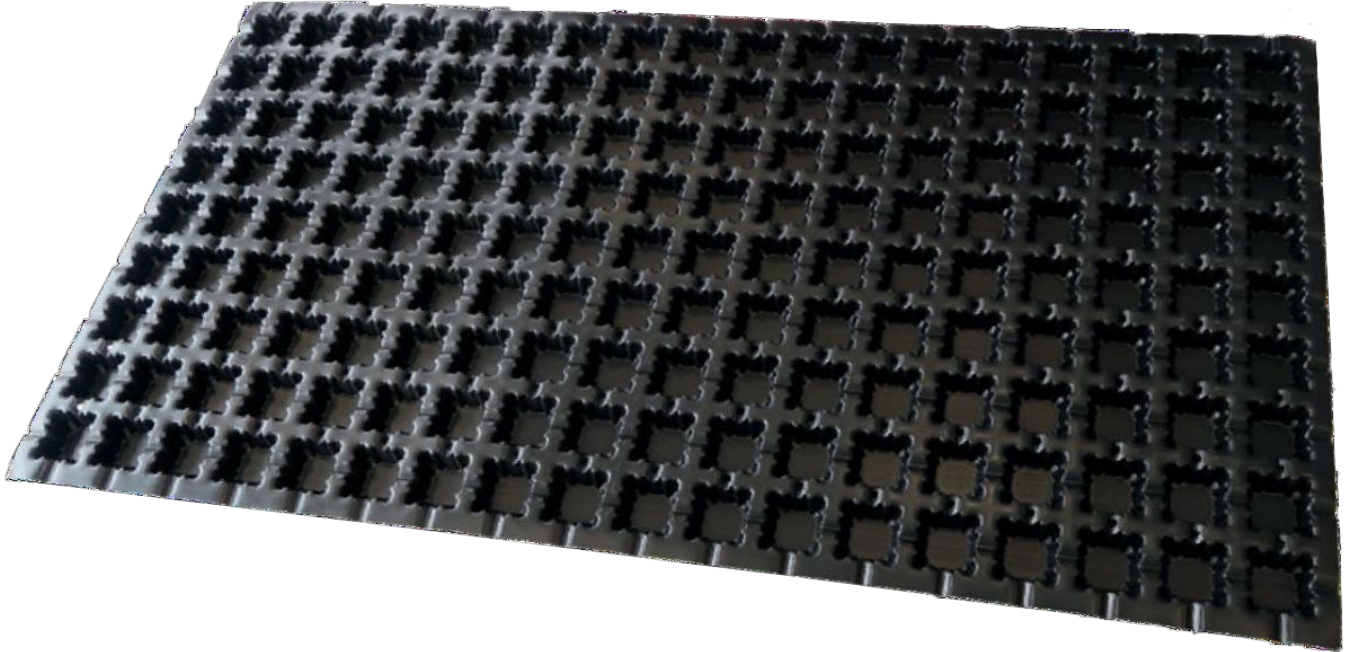
By adhering to these guidelines during the installation process, the drainage layer made from HDPE can effectively manage water drainage, prevent root penetration, and create an optimal environment for the growth and sustainability of vegetation on the green roof.

## PACKING & DELIVERY

20mm – comes in a 2 x 20m Roll with 5 rolls to a pallet



40mm and 60mm comes in a 1 x 2m Sheet



## **MAINTENANCE DETAILS**

Protecto-Drain 20P, 40P & 60P are designed to be covered and not disturbed in the long-term.

## **GENERAL HEALTH & SAFETY WITH HDPE**

When working with HDPE drainage layers for green roofs, it's important to consider the following health and safety measures:

1. **Sharp Edges:** HDPE drainage layers may have sharp edges during the installation process. Take precautions to avoid cuts or abrasions by wearing appropriate gloves and handling the materials with care.
2. **Manual Handling:** HDPE drainage layers can be bulky and heavy, especially in larger sizes. Follow proper manual handling techniques, such as lifting with the legs and seeking assistance when needed, to avoid strains or injuries.
3. **Dust and Particulate:** During cutting or installation, HDPE materials may generate dust or small particulate matter. Use respiratory protection, such as dust masks, when working in enclosed or poorly ventilated areas to minimize inhalation of particles.
4. **Fire Safety:** HDPE is a combustible material and should be kept away from open flames or high heat sources. Ensure proper fire safety precautions are in place, especially when using equipment that generates sparks or heat.
5. **Compatibility with Adhesives and Sealants:** If using adhesives or sealants during installation, follow the manufacturer's instructions and handle them in accordance with their safety guidelines. Ensure proper ventilation and use suitable PPE to protect against potential chemical exposures.
6. **Compatibility with Other Roofing Materials:** When integrating HDPE drainage layers with other roofing components, such as waterproofing membranes or root barriers, ensure compatibility between the materials to avoid potential issues or compromises in performance.
7. **Site-Specific Safety Measures:** Each construction site may have unique safety requirements

and hazards. Conduct a thorough site assessment to identify potential risks, implement appropriate safety measures, and adhere to site-specific safety protocols.

Always refer to the product-specific safety data sheets (SDS) and installation guidelines provided by the manufacturer for detailed information on handling, storage, and safety considerations related to the HDPE drainage layers being used. Additionally, comply with local health and safety regulations and guidelines to ensure a safe working environment.

## HAZARDS IDENTIFICATION

Adverse physicochemical, human health and environmental effects : To our knowledge, this product does not present any particular risk, provided it is handled in accordance with good occupational hygiene and safety practice.

## FIRST-AID MEASURES

### Description of First Aid Measures

First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	: Wash skin with plenty of water.
First-aid measures after eye contact	: Rinse eyes with water as a precaution.

## FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media:** Sand, extinguishing powder, Carbon Dioxide or Dry Foam (Macrofoam).

**Special Exposure Hazards:** Not Known.

**Special Protective Equipment:** Wear NIOSH (National Institute for Occupational Safety and Health) approved positive pressure, self-contained breathing apparatus (SCBA) and full Impervious Personal Protective Clothing

## ACCIDENTAL RELEASE MEASURES

Not usually required, However, if there are substantial amounts of dust or shavings present, it is advisable to use appropriate PPE as required.

In addition, please refer to the following sections for further guidance:

- Take precautions to avoid inhaling dust or vapors.
- Ensure adequate ventilation in the work area.
- Keep the product away from heat, hot surfaces, sparks, open flames, and other potential sources of ignition.
- No smoking should be permitted in the vicinity.

## HANDLING AND STORAGE

### Precautions for safe handling

Precautions for safe handling :Ensure good ventilation of the work station. Wear personal protective equipment.  
Hygiene measures :Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

### Conditions for safe storage

Storage conditions : Store in a well-ventilated place. Keep cool.  
Incompatible materials : None known.

## PERSONAL PROTECTIVE EQUIPMENT:

Eye protection: Where excessive dust may result, wear goggles.  
Skin protection: Wear suitable protective clothing  
Hand protection: Wear protective gloves.  
Respiratory protection: Dust formation: dust mask. In case of insufficient ventilation, wear suitable respiratory equipment (EN 136/140/145)

## TOXICOLOGICAL INFORMATION

The following toxicological assessment is based on a knowledge of the toxicity of the product's components:

### Health Effects

**On Eyes:** On account of the fact of the physical nature direct contact with eyes is unlikely.

**On Skin:** On account of the fact of the physical nature direct contact with skin is unlikely if correct PPE is worn.

**By Inhalation:** In principle owing to the physical nature of this product, inhalation is not likely.

**By Ingestion:** Due to the physical state of this product, ingestion is unlikely.

## ECOLOGICAL INFORMATION

### Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term(chronic) : Not classified

## DISPOSAL CONSIDERATIONS

Dispose of this product at any approved solid waste disposal site. Disposal of the product should be in accordance with any local or national laws and regulations.



## WARRANTIES

A limited warranty exists that the products will comply with the test data as laid out earlier in document. Warranty is limited to replacement of products which have been installed in the correct manner and for the correct purpose only. Warranty is limited to the value of the cost price of the materials only, not replacement costs or any other labour cost.

## TRANSPORT INFORMATION

Classification for conveyance: - None required.

## KEY CONTACTS

Wallbarn Ltd.

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Email:

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Web: [www.wallbarn.com](http://www.wallbarn.com)

## APPENDIX A:

The following table summarizes the documents and URLs referenced in this document.

Document Name	Location
Protecto-Drain website URL	<a href="https://www.wallbarn.com/protection-drainage/drainage/">https://www.wallbarn.com/protection-drainage/drainage/</a>
Wallbarn Ltd Terms & Conditions	<a href="https://www.wallbarn.com/terms-conditions-of-supply/">https://www.wallbarn.com/terms-conditions-of-supply/</a>



## LIMITED WARRANTY

Date: 1<sup>st</sup> January 2023

Wallbarn Ltd provides a limited warranty of 15 years for products. This Warranty corresponds to the performance and strength characteristics given in the published technical datasheets.

Wallbarn Ltd warrants that, under normal use and service conditions, and where the products have been installed in the proper manner, Wallbarn Ltd products shall be free from material defects in workmanship and materials, shall not crack, splinter, swell, rot or suffer structural damage from damp or fungal decay.

If a defect occurs within the Warranty Period, the Purchaser shall notify Wallbarn Ltd in writing and, after investigation and confirmation of the defect(s) by a Wallbarn Ltd representative, Wallbarn Ltd's sole responsibility shall be limited to replacement of the affected products or to refund the Purchaser up to the maximum value of the Sales Invoice.

This warranty is null and void if:

- The products are not installed in the proper manner as detailed in official Wallbarn Ltd product catalogues, installation guides and technical datasheets.
- The products are not used for the purposes they are intended, as detailed in official Wallbarn Ltd product catalogues, installation guides and technical datasheets.
- Excessive weights, higher than the maximum weight as detailed in official Wallbarn Ltd product catalogues, installation guides and technical datasheets are placed onto the products.
- The products are installed in contravention of any relevant building regulations, code or standards.
- Any relevant building regulations, code or standards, including fire safety regulations are breached on the project during the construction process.
- There is movement, distortion, collapse or settling of the supporting structure on which Wallbarn Ltd products are installed.
- Any abnormal natural event such as flooding, hurricane, earthquake, lightning, etc, occurs.

## Wallbarn Ltd – Limited Warranty

This limited warranty does not cover any living product or any product which sustains life. This includes sedum and other plants and substrate mixes for M-Tray® and any other green roof system. The living and growing elements of M-Tray® and other green roof systems are specifically excluded from this Warranty.

This Warranty is limited to the maximum amount of the Sales Invoice and Wallbarn Ltd is not liable for any costs of examination, removal or installation of products. Wallbarn Ltd will not be responsible for any costs or expenses incurred during removal and replacement, including labour or transport costs.

This warranty is given only if the products are used for the purposes they are intended, as detailed in official Wallbarn Ltd product catalogues, installation guides and technical datasheets and are installed in the correct manner.

To make a claim under this Limited Warranty, the Purchaser should contact Wallbarn Ltd with a full report of the defects within the Warranty Period, including photographic evidence and proof of purchase. Any claim should be made to [sales@wallbarn.com](mailto:sales@wallbarn.com) as soon as possible by the Purchaser.

Our Terms & Conditions of Supply <https://www.wallbarn.com/terms-conditions-of-supply/> can be found here.



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**[www.wallbarn.com](http://www.wallbarn.com)**