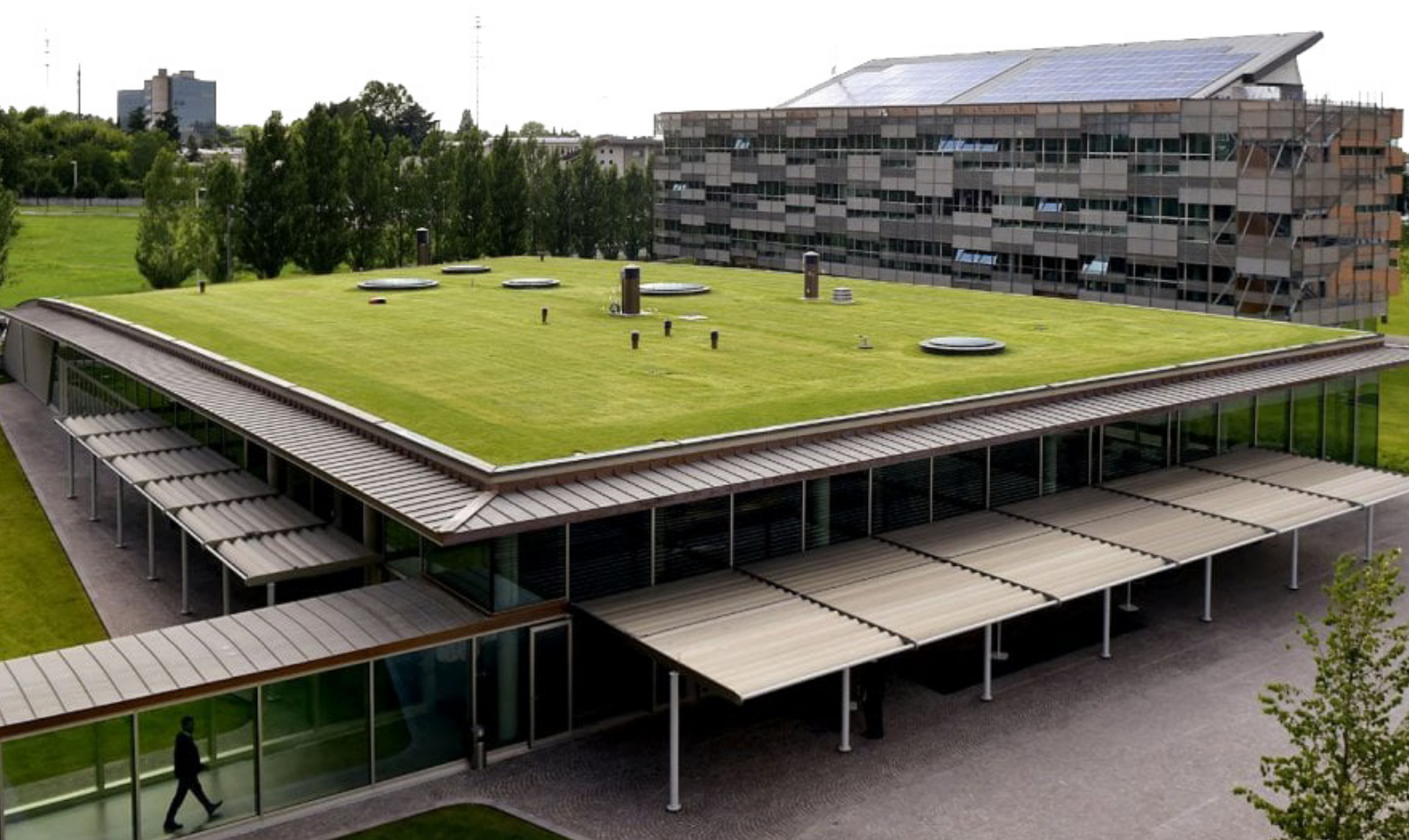


# DAKU

LA NATURA SUL TETTO

## DAKU INTENSIVE INSTALLATION MANUAL





## DAKU INTENSIVE ROOFTOP GARDEN

An intensive rooftop garden is what is commonly known as a “roof garden”. It is the replica of a ground-based garden and it develops all the aspects (aesthetic and functional) of the roof. Plants can be chosen among a vast selection and they will grow exactly like the ones in a normal garden.

Choosing a DAKU INTENSIVE garden is the ideal solution to add a green surface to your daily life, even in an urban environment, where nature is usually limited or not easy to access. DAKU INTENSIVE gardens give you the opportunity to develop spaces that would not be used otherwise, like rooftops or terraces, transforming them into walkable green surfaces.

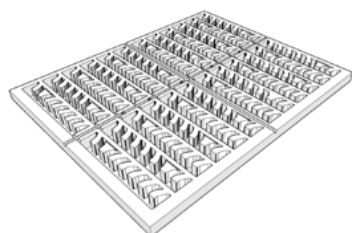


## MATERIALS



1. Lawn
2. DAKU ROOF SOIL substrate
3. DAKU STABILFILTER filtering component
4. DAKU FSD 20 panels

Thickness of the system (without plants)	cm	> 23,00
Weight when saturated (without plants)	kg/m <sup>2</sup>	> 192,00
Total amount of water for the plants	l/m <sup>2</sup>	> 69,00
Air volume at pF1	l/m <sup>2</sup>	> 64,50



**DAKU FSD 20** panels are made of expanded polystyrene, with a size of 1.25x1.00 m. They are used for water storage and drainage.



**DAKU STABILFILTER** filters are geotextiles in polypropylene and are used as a separation layer between the **DAKU FSD** panels and the **DAKU ROOF SOIL** substrate.



**DAKU ROOF SOIL** is a light substrate made of volcanic mineral materials, suitably combined with organic substances. Thanks to its features, the substrate is suited for DAKU INTENSIVE gardens with low overall thickness (15 cm minimum).



There are no specific limitations to what types of plants can be installed in the garden. The chosen plants however must be suited to the climate and to the characteristics of the surface.



**DAKU PLUS** is an additional nutrition compost for rooftop gardens. It is made of fertilizing granules, covered with a biodegradable polymeric membrane, which gradually releases nutritive substances, depending on the soil temperature.



## ACCESSORIES



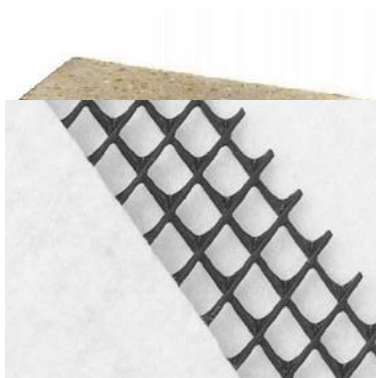
**DAKU PRO** series is a set of components, made of an aluminum-magnesium alloy, used for separation and containment. These components separate the DAKU ROOF SOIL substrates from the other materials. The components are welded to the roof, without mechanical fixing.



**DAKU CONTROLLER** components are made for inspecting easily and safely the drainage and ventilation pipes. They are made of aluminum-magnesium, are 25x25 cm wide and 10 cm tall.



DAKU CONTROLLER components can be heightened to reach the lawn surface by using the DAKU RING extensions. There are 4 different models of **DAKU RING** extensions. The extensions can be easily linked together, allowing them to reach the height needed.



DAKU TUFO are curbs made of tuff, having the shape of a parallelepiped. The curbs are available in different sizes and are used on the edges of the garden as a protective element or to delimit flowerbeds.



**DAKU DRAIN G450** geo-composites are used as protective and vertical drainage components on the waterproof edges of the garden. They are also used as a drainage element on paved areas, beneath the slabs/gravel/containment walls.

# MATERIALS HANDLING

## PACKAGING:

During productions, all the materials are packaged. The type of package depends on the dimensions and characteristics of each material.

DAKU FSD 20 panels are usually packaged i pallets made of 2 half-size pallets wrapped in polyethylene packaging film. The pallets are then put on bars made of EPS so that they can be moved with forklifts or cargo nets.

DAKU STABILFILTER geotextiles are made of rolls (dimensions: 200x30x30 cm), wrapped in a single polyethylene package. Each roll can be carried separately or, depending on the quantity needed, a set of rolls can be loaded on a pallet and wrapped in polyethylene.

DAKU ROOF SOIL substrate is usually packaged in a 1 m<sup>3</sup> polypropylene bag, with a drain valve on the bottom. There are 4 loops for lifting and moving the bag. The substrate can be packaged also in smaller bags, with a capacity of 33 l each. Bags can be put on a pallet, wrapped in a polyethylene film. The substrate can also be delivered loose.

DAKU PLUS is packaged in 5-10 kg polyethylene bags.

DAKU CONTROLLER and DAKU PRO accessories are usually packaged in cardboard boxes or in pluriballs and polyethylene films.

## SHIPMENT:

All materials are delivered to the construction sites with trucks. All materials must be loaded and unloaded by qualified workers, in compliance with the safety regulations, by using forklifts and cranes.

## STORAGE:

Store the materials on plain surfaces, on a dry indoor environment and far away from heat sources or flames. In the construction site, store the materials outdoor only for the time necessary for their installation. Store the materials in a safe area, in compliance with the safety measures of the site. Do not pile pallets or big bags.

## LIFTING AND MOVEMENT:

Use forks or cargo nets to lift the materials to the rooftop. Make sure the lifting equipment is compatible with the materials. Lift the big bags by using ALL THE 4 LOOPS that equip the bag. If the lifting is done by using forks, make sure the forks are smooth and rounded ahead, without edges, as they may damage the equipment. All workers must maintain a safe distance from suspended loads when they are being moved.



# INSTALLATION STEPS

## 1) PREPARING THE ROOFTOP SURFACE

Make sure that there is no debris and no water stagnation on the rooftop surface.



## 2) LAYING THE DAKU FSD 20 DRAINAGE AND WATER STORAGE PANELS

DAKU FSD 20 panels for drainage and water storage must be laid manually. Lay the panels starting from one side of the rooftop.

Each panel has a rabbet joint on each side to easily lay and connect it with other panels without using glue or other type of fixing.

Lay the panels putting the side with the truncated-cone feet downward, directly on the rooftop surface. The other side, with the storage cells, should be upward. (figure 1)

If needed, the panels can be shaped to fit the shape of the rooftop. Handsaws and cutters can be used, paying attention not to cut through the storage cells. (figure 2)

If a panel covers an area above a drain, make a hole on the section of the panel directly above the drain with a handsaw or a cutter. Then fix on the hole the DAKU CONTROLLER inspection component. This will make inspection easier. (figure 3)

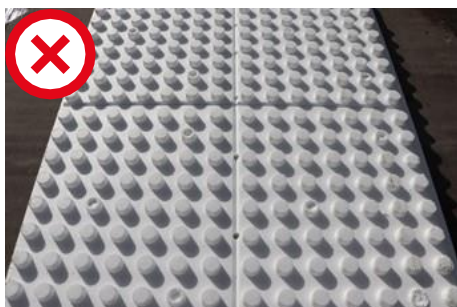
figure 1



figure 2



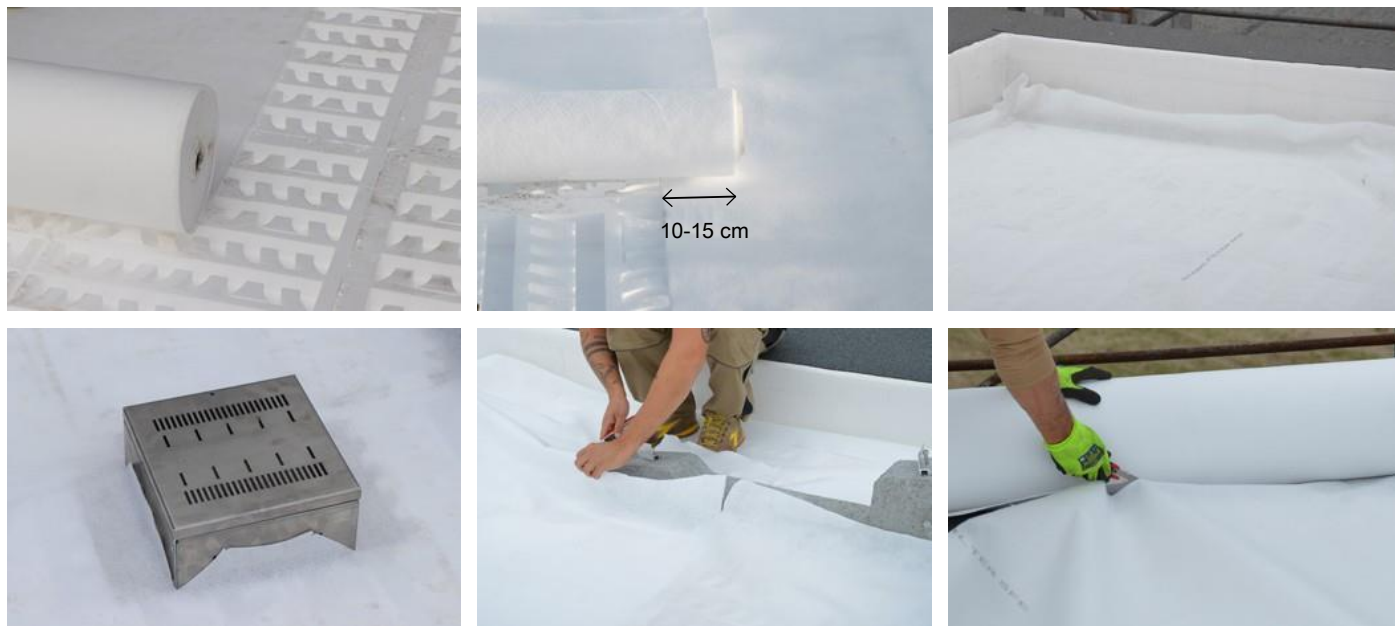
figure 3





### 3) LAYING THE DAKU STABILFILTER FILTERING SHEET

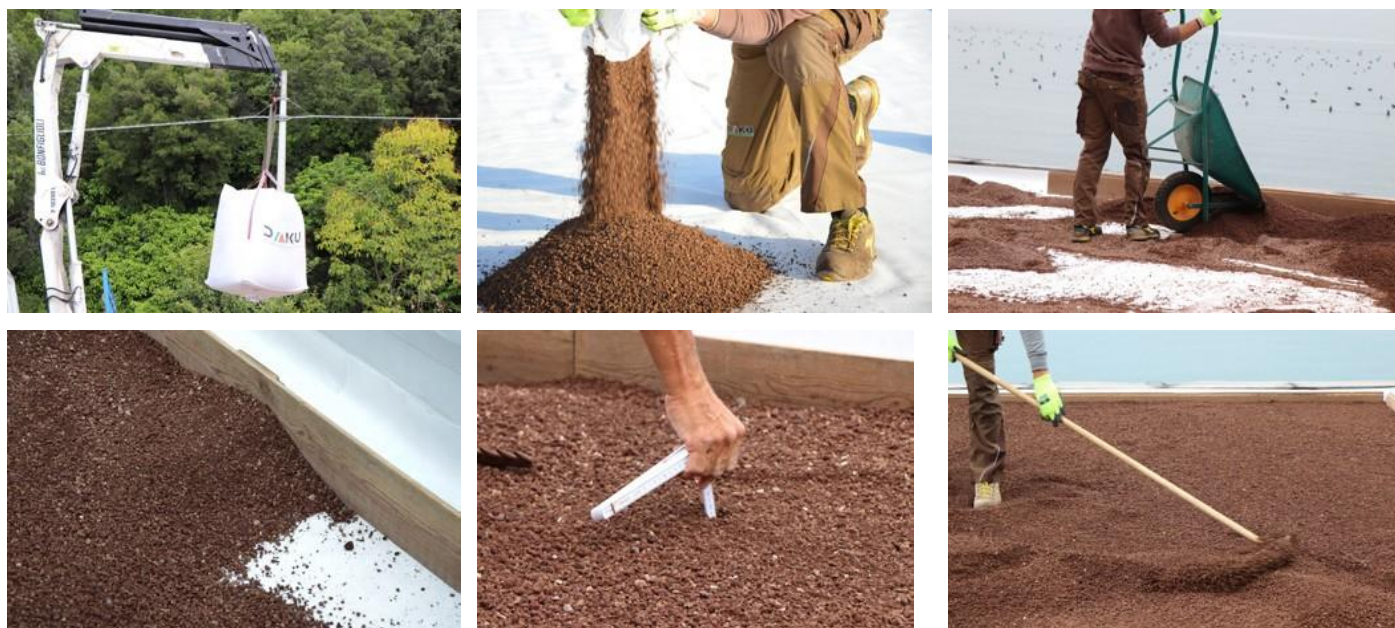
Unroll and lay the DAKU STABILFILTER filtering sheets, by covering the whole surface of the FSD panels. On the edges of the rooftop, fold the sheets upwards, with a margin of 10-15 cm. Cover with the sheets also all the vertical surfaces (edges, chimneys, et cetera), making sure the height of the vertical cover matches the thickness of the garden's substrate. DAKU STABILFILTER sheets can be cut with



cutters or scissors.

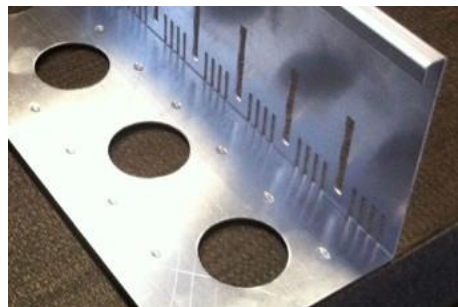
### 4) LAYING THE DAKU ROOF SOIL SUBSTRATE

Lay the DAKU ROOF SOIL substrate directly on the DAKU STABILFILTER SFI geotextile. The thickness of the substrate may change, depending on the garden's design and on the requirements for the desired plants. In a standard intensive garden, the thickness of the substrate is of 15 cm. The 3 upper centimeters of the substrate are made of DAKU MIX SEMINA compost. The substrate should be laid on the geotextile starting from the last sheet installed and going towards the first sheet installed. This procedure will prevent the substrate from penetrating into the rabbit joints. The substrate must be laid using hand tools, such as rakes and shovels. Big bags can be easily emptied by opening the drain valve. DO NOT stand under a big bag while it is being moved.



## 5) LAYING THE DAKU PRO COMPONENTS

Lay the DAKU PRO and DAKU PRO FLEX components directly on the DAKU STABILFILTER filtering sheet. To create a complete separation layer, connect the components by using the DAKU GL internal joints and the DAKU GA angular joints. The version DAKU PRO 170 FOAM of the components can be laid directly on the waterproof surfaces without protective layers. The versions DAKU PRO 170 MBP – TPO of the components can be laid directly on the polymer modified bitumen surface. The components can also be welded on all types of synthetic surfaces (PVC, TPO, EVA, et cetera).



## 6) INSTALLING THE DAKU TUFO CURBS

The curbs are installed directly on the DAKU STABILFILTER sheets. They can also be installed while the substrate is being laid or after that. The curbs can be installed both horizontally and vertically.



## 7) INSTALLING THE SPRINKLER SYSTEM

To guarantee a homogeneous and correct irrigation of the whole garden, the sprinkler system needs to be carefully designed. DAKU uses overhead systems for the lawn and drip systems for the shrubby vegetation. The systems must be designed following the latest norms and regulations. To guarantee that the systems are always efficient and operative, maintenance should be constant.





## 8) ADDING THE DAKU PLUS FERTILIZER

On gardens with a lawn, spread the DAKU PLUS fertilizer (5 gr/m<sup>2</sup> for each centimeter of thickness of the substrate). Spread the fertilizer on the DAKU ROOF SOIL before adding the DAKU MIX SEMINA or before planting the vegetation. When the garden is complete, each year after the winter, the fertilizer should be spread again on the surface with a density of 40/50 gr/m<sup>2</sup>.



## 9) PLANTING THE VEGETATION

The planting process must be completed ensuring the full safety, integrity, stability of the garden. Do not damage the components by using heavy or sharp tools that are not adequate.

Do not use plants that are not compatible with the substrate. All processes or tools used during the planting must not modify the composition and features of the substrate. Keep in mind that if the plants or pre-cultivated mats may not grow if they come from a substrate not compatible with the one used by DAKU.

During the plantation process, the clods cannot touch directly the DAKU STABILFILTER filtering sheets. There must always be a layer of substrate between the two. In addition to that, the clods must be always inside the substrate. Keep in mind that it is fundamental to have elements of structural support in the garden. The design of the garden must include them. These elements must not compromise the garden's functionality.





