



Eco-friendly Plastic Panel for Water Retention

Ground reinforcement system without sealing

Made from recycled plastic



Installation instructions for civil engineering,
gardening and landscaping



EKOPRD

Ground reinforcement system without sealing in three load classes

Rainwater management

Residents and public authorities in urban and rural areas have to contend with the dramatic consequences of soil sealing (flooding, landslide, water contamination from runoff, formation of heat islands, destruction of biodiversity, etc.). In view of these issues, sustainable water management has become an important challenge in the planning of land use projects. In contrast to the conventional method using concrete and pipelines, a new vision for spatial planning has emerged, which recognizes water and vegetation as important resources.

Combating soil sealing, the promoting of seepage into the ground, and the reintroducing of green areas in urban areas have become essential elements of modern land use planning. These intentions are underscored by the introduction of the HQE label (Haute Qualité Environnementale – high environmental quality) for ecological construction projects and are increasingly being applied in various regulations (especially in the inter-municipal construction management (Plan Local d'Urbanisme Intercommunal, PLUI)).

Among the alternative approaches to rainwater management, covering permeable ground with honeycomb panels seems to be the perfect solution for letting rainwater seep into the ground at the point of impact. Simple design, fewer connectivity expenditures, perfect integration into the landscape, and high load-bearing capacity: The EKOPRD meets the requirements of your "green" planning projects.

With EKOPRD you can look forward to a stable, paved surface to walk or drive on! Put an end to all-concrete surface areas! Create sustainable green spaces with EKOPRD that combine load-bearing capacity, drainage and harmonious integration into the landscape.



Advantages of EKOPRD

- > Natural seepage of rainwater into the ground, without drainage runoff
- > 95% of the soil surface without sealing
- > Dense grid for aesthetic, green landscape design
- > Year-round quick and easy installation, very low maintenance
- > 44% of the surface area touches the ground, resulting in higher load-bearing capacity

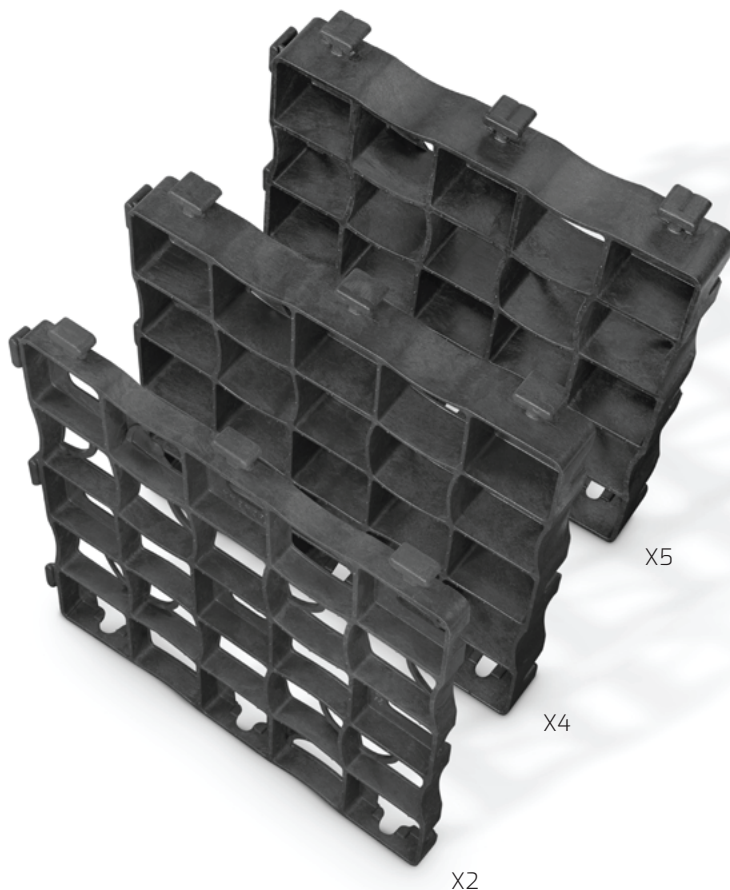
The right EKOPRD for any load

			<p>EKOPRD provides optimum surface load distribution thanks to the large contact area (42%) of the underside.</p>
			
EKOPRD X2	EKOPRD X4	EKOPRD X5	
<ul style="list-style-type: none"> • Walkways • Bicycle paths • Green roofs 	<ul style="list-style-type: none"> • For cars up to 3.5 t • Parking spaces • Driveways • Event venues • Camp-grounds 	<ul style="list-style-type: none"> • Fire lanes • Areas for trucks • Dirt roads for agricultural vehicles • Small airports • Helicopter landing sites 	

Two filling variants: grassed or graveled

Grass	Gravel	<p>The EKOPRD can be either grassed or filled with gravel for all areas of application listed.</p>
		
For areas with low frequency of use.	For areas with high frequency of use.	
<ul style="list-style-type: none"> • Parking lots which are occupied for brief periods only (under five hours per day), e.g. sports facilities, tourist areas, cemeteries • Fire lanes • Camp-grounds • Tracks for golf carts 	<ul style="list-style-type: none"> • Parking lots occupied for longer periods (more than 10 hours per day), e.g. shopping centers, office buildings, industrial parks • Travel and access roads (on green parking spots) • Storage areas 	
Regular maintenance	Very low maintenance	

Properties and technical specifications



- The panels are pre-assembled in modules of 1.3 m² (12 panels). These are easily connected by simple foot pressure.
- The surface load distribution is optimal due to the large contact area (42%) of the underside.
- The panels feature anti-slip nubs on both sides.
- The plug-in system ensures good hold between the panels and prevents gaps.
- The panels are easy to cut with a circular saw or a cutting grinder.
- EKOPRD is UV and weather resistant (no deformation).
- EKOPRD, made of recycled and recyclable plastic, is sustainable and environmentally friendly.



EKOPRD is made of 100% recycled plastic. It is demonstrably environmentally neutral and harmless to soil and ground water.



EKOPRD is TÜV certified and meets the requirements for load-bearing capacities up to heavy loads.



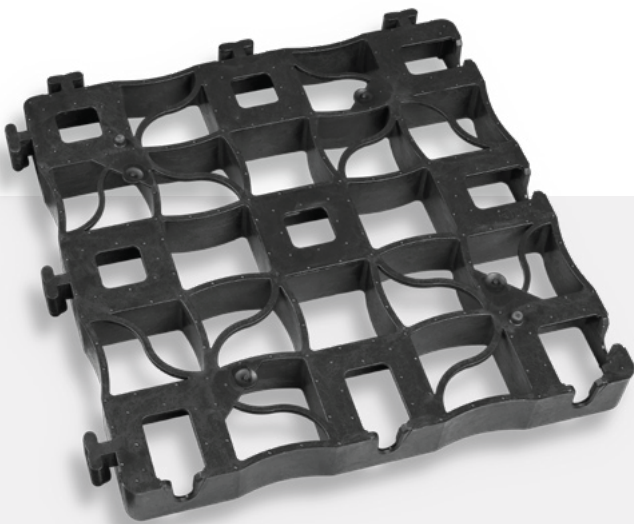
Technical specifications

Types	X2	X4	X5
Suitable for	Sidewalks, bike paths and green roofs	Parking spaces, driveways, event venues, camp grounds for cars up to 3.5 t	Fire lanes, dirt roads and parking spaces for trucks, small airports and helicopter landing sites
Natural load-bearing*	50 t/m ²	75 t/m ²	175 t/m ²
Dimensions [mm]	330 x 330 mm (9 grids ≈ 1 m ²)		
Height in use [mm]	20	38	48
Wall thickness [mm]	3	3	5
Sealed surface area	42 %		
Weight per m ² [kg]	3,31	5,39	8,65
Material	PE/PP		
Temperature range	-50°C bis 90°C		
Shape changes	1,3 % when room temperature increases to 80°C		
Resistance to	Exhaust, diesel fuel, gasoline, oil leaching, de-icing salt, alcohol, organic solvents, ammonia, urine, and others		
Test results TÜV Süd, Institut für Kunststoffe (Institute for plastics)	Bridge capacity 16 for vehicles up to 16 t total weight permitted in accordance with DIN EN 1072	Bridge capacity 16 for vehicles up to 16 t total weight permitted in accordance with DIN EN 1072	Bridge capacity 60/30 for heavy-duty vehicles up to 60 t in accordance with DIN EN 1072
	DIN 14090 Access for Fire Engines		
	Suitable as surfaces for playgrounds in accordance with the Federal Soil Protection Act (Bundesbodenschutzverordnung)		

* When the ground is stable

We reserve the right to modify the information provided here without advance notice.

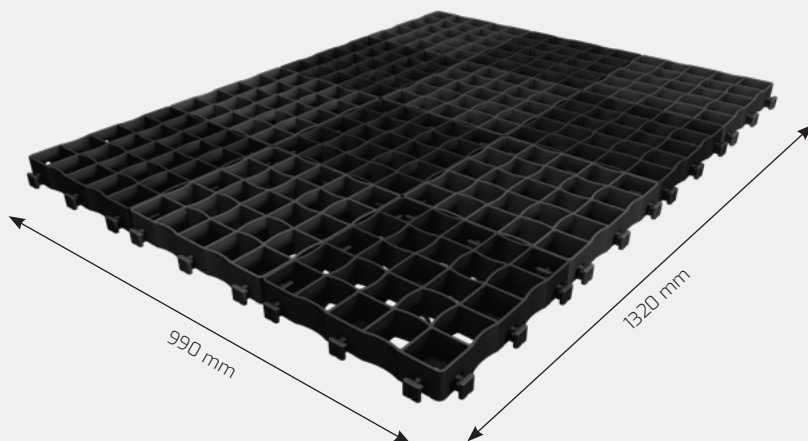
Installation and processing



Large support surface

The extra large contact surface on the bottom of EKOPRD offers optimal surface-load distribution without unwanted subsidence. Forty-four percent of the entire surface touches the ground.

Pre-assembled delivery



EKOPRD is delivered in preassembled modules consisting of 12 pieces (4 x 3 pieces, equivalent to 1.3 m²). This means that large areas can be installed very quickly.

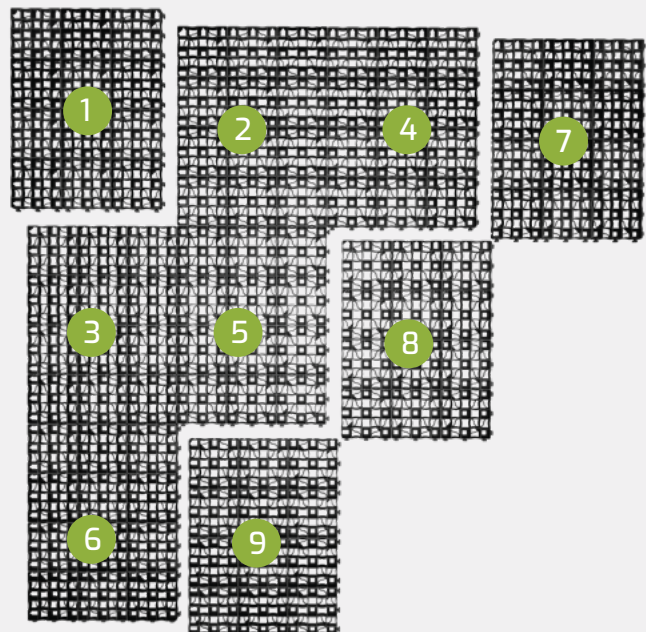
The modules can be easily separated, if needed. Place the module you wish to separate over a raised edge and push it out of the composite system by stepping on it.



Diagonal installation

Place the first module in a corner and align it so that the connecting pins face the desired direction of installation. We recommend laying the modules along a plumb line and in diagonal order. This prevents unintended shifting.

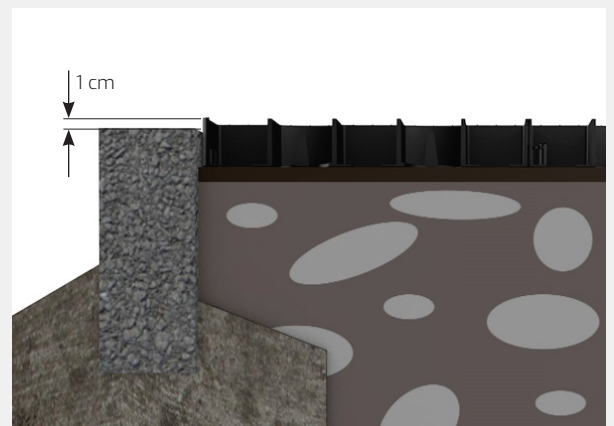
The stable plug-in system firmly and reliably links the EKOPRD modules together. The components can be connected to one another simply by using foot pressure or a rubber hammer.



Edging

To make sure the edging is flush, install EKOPRD with a 1 cm overhang over the edging. To avoid offsets, check the angle accuracy of the edging.

EKOPRD modules can easily be cut to the desired size using a hand-held circular saw or angle grinder.

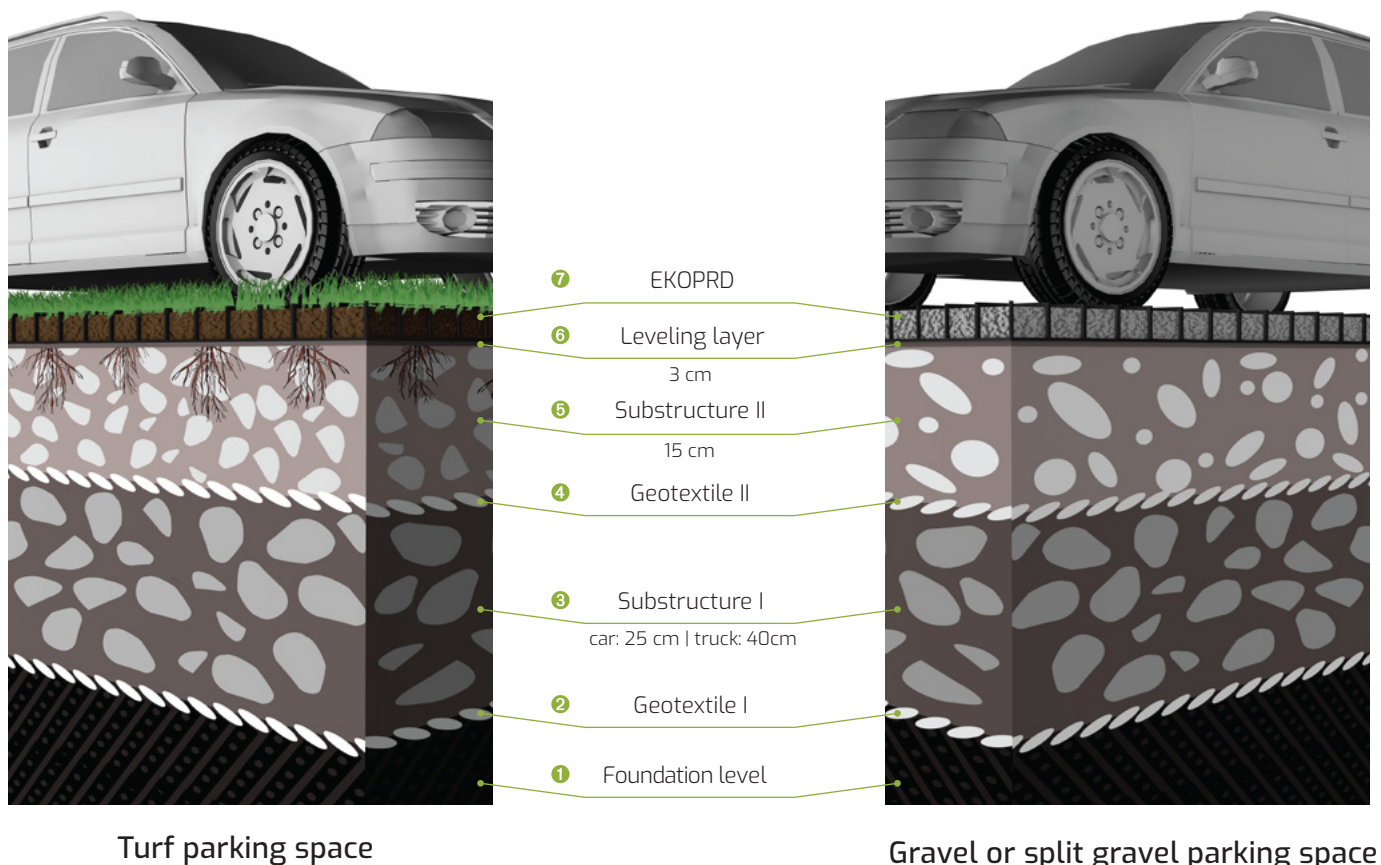


Substructure and filling

For seal-free parking spaces

Composition of the substructure

	Turf parking space	Gravel or split gravel parking space	
		for cars	for trucks
7 EKOPRD Type	x4	x4	x5
filled with:	Humus soil	Gravel / split gravel (grain size 6/10)	Gravel / split gravel (grain size 6/10)
6 Leveling layer Height	approx. 3 cm	approx. 3 cm	approx. 3 cm
consisting of:	Gravel / split gravel (3/8) 75% Humus soil 25% Alternatively: Gravel / split gravel (3/8) 50% Pozzolan 25% Soil/compost mixture 25%	Gravel / split gravel (grain size 2/4 or 4/6)	Gravel / split gravel (grain size 2/4 or 4/6)
5 Substructure II Height	approx. 15 cm	approx. 15 cm	approx. 15 cm
consisting of:	Gravel (20/40) 70 % Soil/compost mixture 30 %	Gravel (grain size 0/32)	Gravel (grain size 0/32)
4 Geotextile II	with drainage effect		
3 Substructure I Height	approx. 25 cm	approx. 25 cm	approx. 40 cm
consisting of:	Gravel (grain size 20/40 or 30/60)	Gravel (grain size 20/40 or 30/60)	Gravel (grain size 20/40 or 30/60)
2 Geotextile I	pollutant-repellent		
1 Foundation level	natural ground ($K = 10^{-6}$ m/s)*		



Step by step instructions

1. Remove the surface and create a fundament with a slope of approx. 1%.
2. Lay pollutant-repellent geotextile on foundation level.
3. Place the foundation layer (substructure I) and compact it (roller / vibrating plate). The height and thus the load-bearing capacity of the foundation layer can be individually adjusted.
4. Lay the second geotextile with drainage effect.
5. Place foundation II (see composition) and compact it.
6. Place the leveling layer (see composition), draw it level, and compact. For lawn parking areas, this leveling layer should be watered before installing EKOPRD.
7. Install EKOPRD (see Chapter 5 "Processing of EKOPRD"), and fill it (see composition).
8. A) Sow seeds, fertilize, and water abundantly until the vegetation grows. The parking area may be used 8-10 weeks after mowing for the first time. Regular lawn care is necessary to keep the area green.
9. B) Brush off the surface of the filling with gravel and roll without vibration. The parking areas can be driven over immediately.

The steps described are suitable for soils with a water permeability of $K > 10^{-6}$ m/s (fast seepage). Additional safety drains are required for particularly clayey soils with very low water permeability ($K < 10^{-6}$ m / s).



The EKOPRD can also be installed without a substructure thanks to the safety interlocking system and outstanding load distribution. If a substructure is foregone, surface drainage is not guaranteed. Moreover, changes in the ground can result in unevenness and varying load-bearing capacities. However, this does not result in edges or dints due to the safety interlocking system.

Special applications



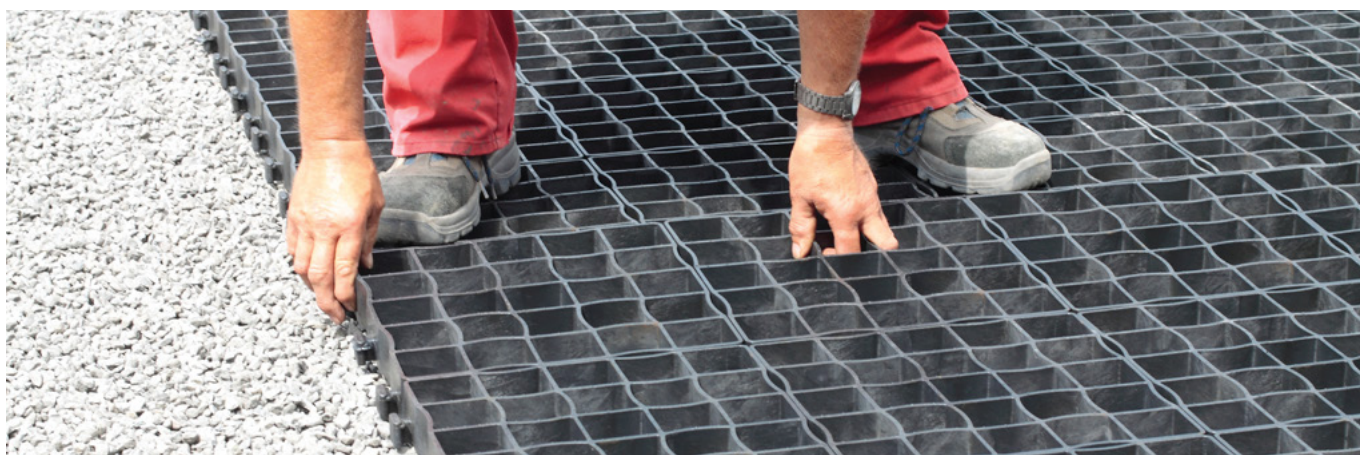
Fire service areas

Fire service areas are access roads and areas that are located in the immediate vicinity of buildings. These are used by fire services for quick and safe fire fighting and for setting up turntable ladders for secondary escape routes.

Access, set-up, and movement areas must provide a load-bearing capacity of at least 800 kN per square meter, a maximum weight of 16 t, and an axle load of 10 t.

EKOPRD can reinforce these areas and ensures that rain and especially extinguishing water can seep unimpeded. Elaborate drainage in the substructure is usually not required.

Applicable state building regulations must be observed for the construction of surface areas for fire services.



Erosion protection

EKOPRD can be used on hillsides for erosion protection and also for lake and river shoring. Large-area greening and strong root-growth is decisive for stabilizing the soil.

Depending on the requirements, it may be necessary to apply a sufficiently load-bearing base material or compensating layer. In order to achieve a certain water storage capacity for the greenery and ensure water permeability, the filling material should have a small proportion of fine material.



Equine sports

Many horse owners are struggling with sludge and mud in open stables and on paddock floors. This is unpleasant for the owners and the horses - and sometimes even dangerous. With EKOPRD, open stables remain mud-free even in bad weather.



