

# The advantages of the Pardak® system



Pardak® is Zoontjens parking system which create rooftop car parks. multi-layer roof. Zoontjens has nearly **40 years of experience** in this field and has constructed at least **2 million square meters of rooftop parking in Europe**. Uniquely the Pardak® system has been tested for their load-bearing capacity, concrete quality, service life, noise minimisation and fire safety in collaboration with: **BDA, Güteschutz Beton, TU München, TU Braunschweig, Peutz and Warrington.**



✓ Maximum use of the rooftop area

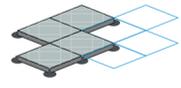


✓ Optimum accessibility



✓ Less high-cost land is needed

## Modular and independent of the weather



✓ Modular and capable of being disassembled



✓ Can be installed in all weathers



✓ Maintenance friendly

## A major role for the tensioning element

The **Pardak®** system consists of concrete slabs, pressure distributors, tensioning elements and corner or cross elements. This yields a stable rooftop car park in which **the tensioning element plays the major role**. The slabs are tensioned to absorb the vertical and horizontal forces that are imposed by moving vehicles and distribute these forces among the slabs.

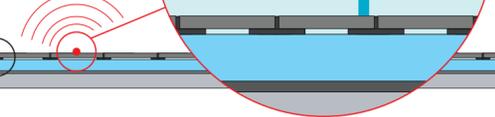
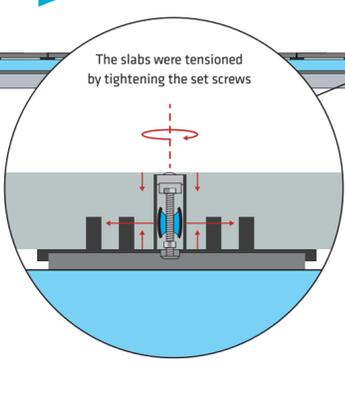
## Tested under extreme loads

Extreme loads were simulated on a tensioned rooftop parking system and on a non-tensioned one: 62 x 3,500 kg and 62 x 4,000 kg, which equals 62 vehicles in the same location every day for 44 years. This equates to 1,000,000 load changes.

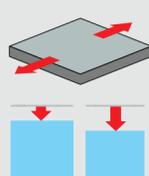
**1.000.000** load changes:

44 years  
365 days

daily 62 x 3500/4000 KG



**Result:** Better pressure distribution compared to the non-tensioned parking system



**Horizontal displacement is greater by a factor of 4-5** on a non-tensioned parking system

**60% more vertical depression** on a non-tensioned parking system

## A lifetime of 30 years

2016 ————— 2046

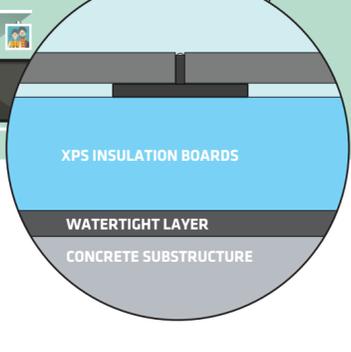


The first roofs with **Pardak®** date from the early 1980s and are still in use. Based on the results of studies, the actual lifetime of the **Pardak®** parking roof systems can be estimated to be at least 30 years. However, this assumes that regular maintenance is performed.

## Multi-layer roof structure

Unlike plastic or asphalt surfaces, the watertight layer of a rooftop car park with **Pardak®** is isolated from the driving surface. This multi-layer roof structure quickly and permanently protects the load-bearing structure and the interior of the building against rain and water penetration.

**Watertight layer isolated from the traffic floor**



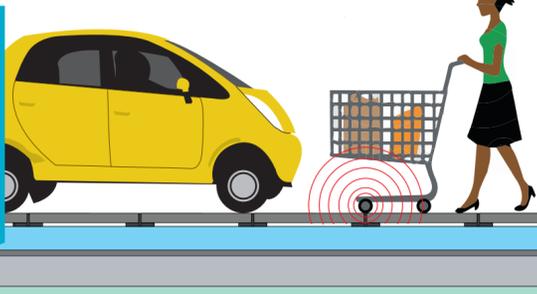
## Water

The rainwater outflow can be controlled with Stormwater management requirements.



## Noise minimisation

The **Pardak®** system **minimises noise nuisance** in the homes, offices and shops on the lower floors. Comparative measurements by Peutz of the noise levels of shopping carts and passenger cars on **Pardak®** pavement revealed the noise levels to be well below the maximum noise levels allowed.



✓ Noise levels well below the maximum noise levels allowed.

## Extensive fire test

Test with 8 litres of petrol in the joints

## Fire safety

Test with 2 stacks of wood and 5 litres of petrol



Various fire tests on the **Pardak®** system have demonstrated this to be a **fire-safe system**. Even though there are joints between the slabs, the insulation and other materials on the slabs did not catch fire, nor did the fire spread under the slabs.

No fire spread under the slabs

