

Projekt **Office building Westraven**
Second skin façade made of duraskin® PTFE coated Fibreglass

Description The office building Westraven is located in Utrecht, the Netherlands and was built in 1969 as one of the first dutch buildings to the so called “bottom approach” architecture. It was called “bottom approach” as the top floor (22nd floor) was built first and then jacked up until its scheduled floor height. Then the 21st floor was built which was jagged below the top floor. In this manner floor by floor was built from building’s highest point to its lowest. Due to the reason that the building perfectly reflects the above mentioned construction method it was decided not to take it down but rather to renovate it. It was finally the design of CePeZed architects which was awarded. The design was considering an extension of the office capacity by building the so called “finger buildings” and - once having removed the old façade cladding - a new double layer façade technology which shall cover the main office tower as well as the atriums of the finger buildings. As the inner layer of the double layer façade system, a façade out of glass panels is used. As the second skin (outer façade layer) duraskin® PTFE coated mesh fibreglass combined with glass panels as balustrade is used.



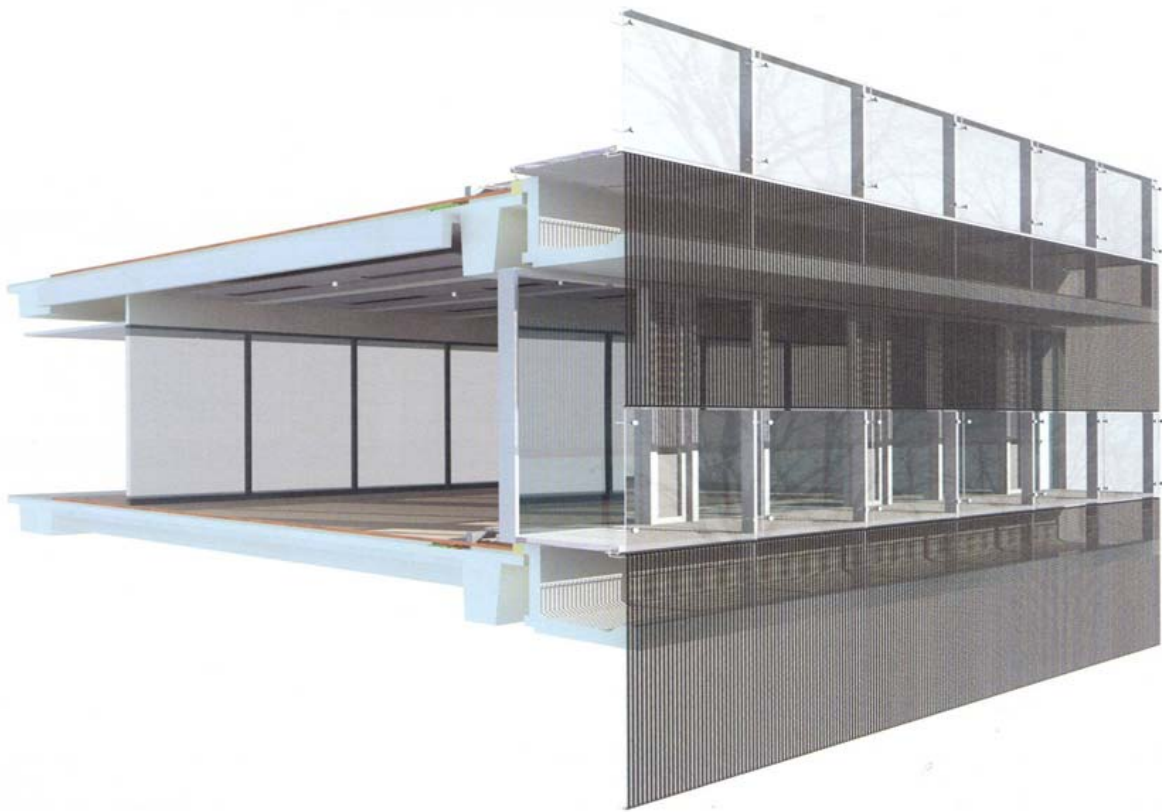
before renovation



after renovation

Façade Concept

The combination ensures perfect equilibrium between energy consumption and optimum working climate. The natural air cushion between the layers is like an intermediate climate which has insulating function and reduces loss of heat in wintertime and prevents entrance of heat in summertime. Due to the low weight of the duraskin® mesh textile the geometry of the initial façade had not to be reinforced to carry additional loads which will be caused by the new outer facade layer. Windows on higher floors can be easily opened without being affected by wind due to the wind breaking function of the second skin facade. The permeability of the textile ensures continuously fresh air circulation and the high transparency of the outer layer reduces the need of artificial light to a minimum.



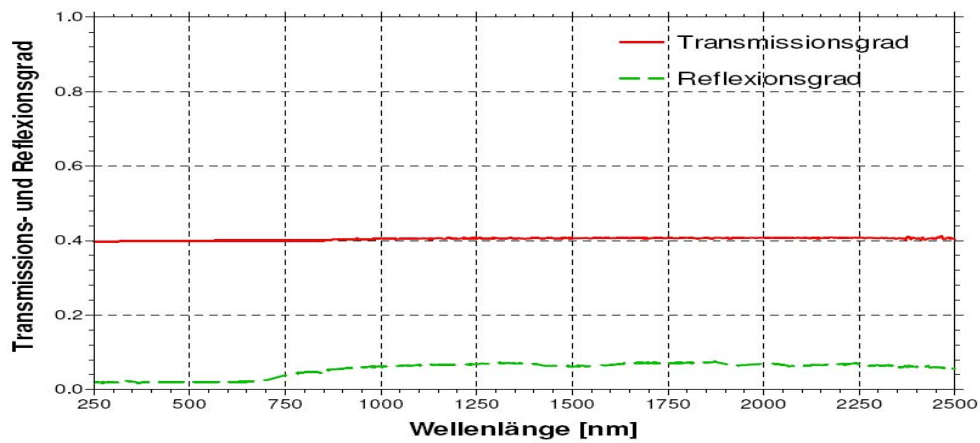
Design concept as drawing (© CePeZed architects)

Fabric

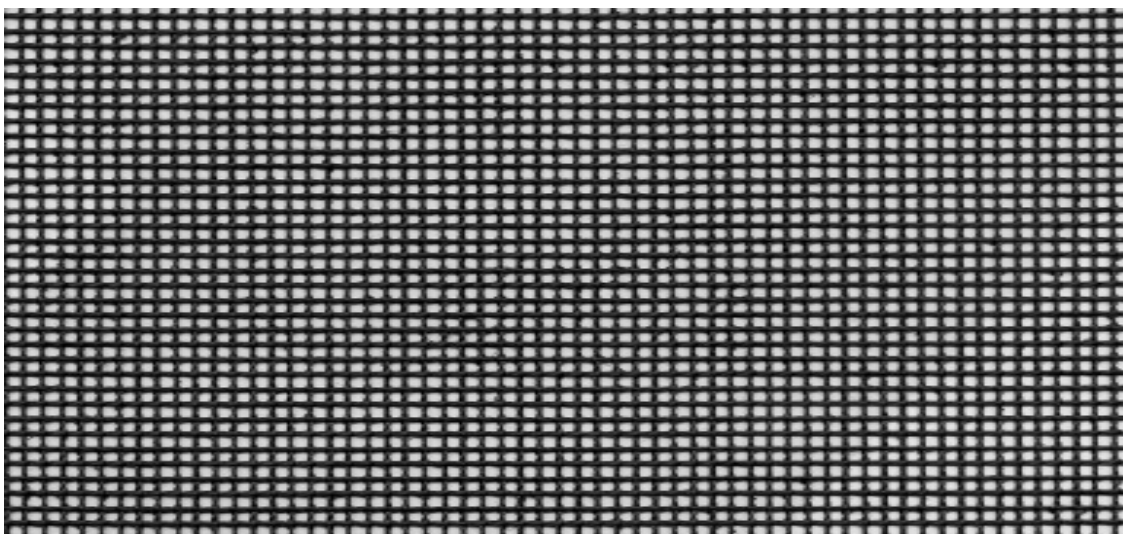
duraskin® PTFE coated mesh fiberglass made by Verseidag Indutex GmbH, coloured in black. The fabric is non-combustible accordingly to DIN 4102 A2 and the coating of Poly-Tetra-Fluor-Ethylene is resistant against environmental influences (e. g. UV).

Style no. B 18971 of Verseidag-Indutex GmbH with tensile strength of 1500/2500 N/5cm (warp/weft) and total weight of approx. 470 g/sqm.

Probe	$\tau_{nh,solar}$	$\tau_{nh,VIS}$	$\tau_{nh,UV}$	$\rho_{nh,solar}$	$\rho_{nh,VIS}$	$\rho_{nh,UV}$	α_{solar}	α_{VIS}	α_{UV}
B18971	0,40	0,40	0,40	0,04	0,02	0,02	0,56	0,58	0,58



Light & Solar Transmission



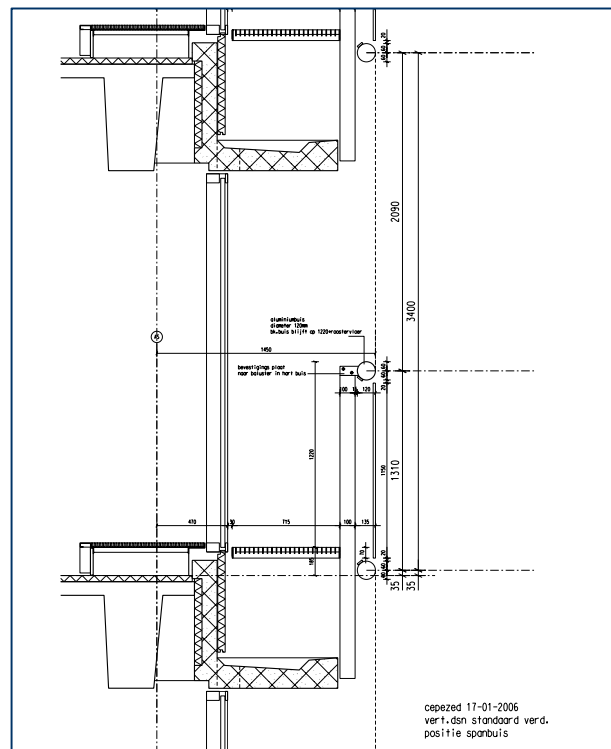
sample duraskin® B 18971

Façade Details

One façade panel of approx. 2,1 m in width and 53m in length was installed as a single piece without any welding seams. It is supported each 240cm by the balustrade. The edges in warp direction were fixed rigidly and the edges in weft direction were fixed in tube profiles via kedar system. Stretching the weft direction - by turning the tube profiles in opposite directions - is giving stiffness to the complete façade panel. Windload has been determined by wind tunnel tests. Main issue was to reduce the deflection of the fabric to max. 100mm or 3% of the span of the panel.



(© Jannes Lennart)



(© CePeZed architects)

Involved parties in Design Team of Second Skin facade

- Architect: Cepezed BV, Delft
- Contractor: Contractor combination Westraven v.o.f., consisting of Ballast Nedam Bouw and BAM Utiliteitsbouw
- Subcontractor Façade: Oskomera BV, Deurne
- Subcontractor Fabric: PolyNed BV, Steenwijk
- Consulting Fabric Engineer: Tentech BV, Delft
- Fabric supplier: Verseidag Indutex (www.vsindutex.de / info@vsindutex.de)