



# 'The Donjon' Amsterdam

Case Study

# Clear backsheet material withstands nearly two decades of continuous service

DuPont™ Tedlar® PVF backsheet film lends transparency—and performance—to Amsterdam solar installation

## Summary

The backsheet plays a vital role in the performance and longevity of photovoltaic modules, serving as an electrical insulator and protecting inner components from ambient stresses. Backsheets made of DuPont™ Tedlar® PVF have been in service for more than 35 years in some of the world's harshest climates, with a minimum of defects.

Tedlar® backsheet films are typically white (opaque), but DuPont has also produced a clear (transparent) version of its Tedlar® film for two decades. With clear backsheet materials receiving considerable attention in recent years as interest grows in bifacial solar modules, it raises the question: How does clear Tedlar® film perform over time? A recent inspection of a nearly 20-year solar installation in Amsterdam provided some answers.

## Challenge

Solar installations typically are built with functional, not aesthetic, considerations in mind. However, when he was drafting plans for his “Donjon” project in Amsterdam, sustainability-minded architect Tjerk Rejeinka decided he wanted to show how solar power generation could be integrated into the building itself as an architectural feature.

A former principal at BEAR Architecten in Gouda and founder of BEAR-iD Sustainable Urban Planners + Architects in Rotterdam, Rejeinka has decades of expertise in eco-design—from green walls to the integration of photovoltaic systems into buildings.

“I wanted to show that you have a lot of freedom in the application of PV systems,” said Rejeinka of his Donjon project. “The easy way, of course, is to put tilted modules on the flat roof. Instead, by adding the glass cover on the edge of the building, I made it part of the overall architectural design.”

## Solution

Rejeinka specified transparent panels for his Donjon installation for their ability to let light pass through. The custom-made panels were sourced from CreaGlas, a German firm. The panels were frameless and featured a glass topside and a clear Tedlar®-based backsheet.

Rejeinka designed the 6.2 kW installation to cover the perimeter of the building's roof line, leaving the flat roof entirely available for potential future power-production capacity. In operation since 2000, the installation caters to the electricity needs of the building, with surplus electricity produced fed back into the grid.

"The low tilt of 9° on each orientation showed that you can still get a good output in the Netherlands because of the amount of diffuse light," Rejeinka said.

## Results

Detailed inspection in November 2018 revealed that, after nearly 20 years in service, the Donjon installation was still producing power reliably and according to expectations. In their report, inspectors noted the installation's "very good health considering the time of exposure and the fact that it features transparent panels."

While the modules did show very slight signs of aging, including a degree of delamination of the cells' anti-reflective coating, EVA yellowing and yellowing of the insert, they showed no signs of other expected age-related defects, including backsheet delamination, corrosion and cell cracking.



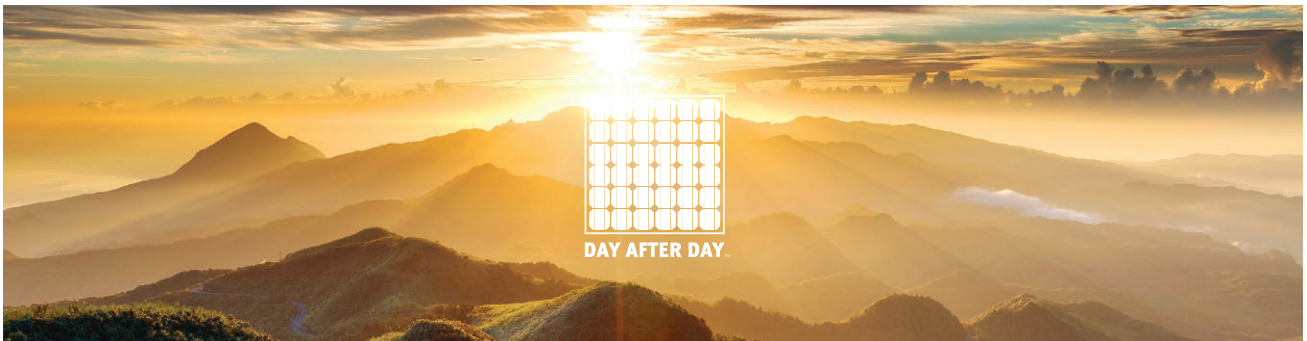
**Top: The Donjon's frameless glass panels with clear Tedlar®-based backsheets allow light to pass through.**

**Bottom: The solar installation features building-applied PV panels.**

### Location: Amsterdam

<b>First year of operation</b>	2000
<b>Date of inspection</b>	November 2018
<b>Number of modules</b>	51 full-size panels
<b>Output</b>	6.228 kWp
<b>Inverter type</b>	Fronius Sunrise Midi
<b>Mounting style</b>	BAPV
<b>Racking</b>	Metallic structure
<b>Module technology</b>	Polycrystalline
<b>Backsheet material</b>	Clear DuPont™ Tedlar®





## Day after day

For more than 40 years, DuPont has been an industry leader in the research and manufacture of high-performance materials for photovoltaic panels. DuPont manufactures Tedlar® PVF, a film for panel backsheets that has been proven over 30+ years to deliver long module lifetimes, and Solamet® photovoltaic metallization paste materials, which optimize efficiency and yield for today's solar cell designs.

Our materials have been repeatedly verified by field-testing to perform over time—which means reliable investment returns for you and a supply of clean energy the world can count on into the future.

Whatever your material needs, you can count on quality DuPont Photovoltaic Solutions to deliver the performance, efficiency and value you require, day after day after day.

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