LE POLYGONE MONTPELLIER SHOPPING CENTRE

PROJECT DESCRIPTION

The refurbishment of the Polygone Shopping Centre in Montpellier includes a complete replacement of the roof to bring natural light into the complex while ensuring the necessary protection against bad weather.

Terefore a large roof with length of 150m and width varying between 16 and 24m has been incorporated, consisting of a lightweight metal structure supporting a total of 49 diamond-shaped ETFE cushions and 57 triangular-shaped cushions. In the transverse section, the cushions are placed on arcs of variable radii, while in the longitudinal section the structure describes various waves that are reproduced by the cushions. This configuration is devided into 5 blocks separated by expansion joints, covering an area of more than 3.000m².

The ETFE cushions consist of 3 layers, with an IR-CUT treatment on the top layer that prevents the passage of infrared rays, as well as a variable in density surface screen printing that filters the passage of light. The dynamic night-time lighting system incorporated in the project further enhances the translucent-transparent nature of the ETFE cushions in the shopping center.

CHARACTERISTICS

Material	ETFE
Application	Comercial centre
Surface	3.044m²
Measures	150m length x width between 15.6m and 23.6m
Location	Montpellier
Architect	EIFFAGE MÉTAL
Year	2020

TECHNICAL DATA

This work has been carried out under IASO's AVIS TECHNIQUE approved system for ETFE cushions supplemented by a specific ATEX for this project.

The ETFE cushions are made up of 3 layers, the upper layer of 200 microns, the lower layer of 250 or 300 microns and the intermediate layer of 100 microns with a deformation close to the lower layer imposed by calculation. The upper ETFE membrane incorporates an IR-CUT treatment that prevents the passage of infrared rays in accordance with the thermal requirements of the project. This same upper layer is printed with an aluminum-colored

16mm diameter dot pattern, with a variable percentage of printing on the surface of each cushion (0%-20%-50%-60%) according to the light transmission and solar factor criteria imposed. The aluminum profiles are lacquered in white RAL9006, as in the rest of the metal structure of the project.

Between the different ETFE cushions, a sealing package has been designed between the aluminum profiles to allow the passage of the tension braces of the metal structure supporting the roof. This system consists of a sandwich of lacquered aluminum sheet, rock wool insulation and a galvanized steel sheet manufactured to the specific dimensions of the project. This sandwich is finished with a polymethyl methacrylate-based waterproofing resin reinforced with a polyester mesh and pigmented in white like the aluminum profiles, which ensures the watertightness of the roof as a whole.

The expansion joints between each of the 5 blocks of the roof are made with a sandwich package like the one described above but with two superimposed elements that allow free movement of each block while ensuring water and air tightness.

The perimeter of the roof is finished with galvanized steel flashings and a watertight membrane integrated into the system profiles to ensure the perimeter watertightness of the roof.