AN INDUSTRIAL BUILDING in Grugliasco

UPGRADING THE ENERGY EFFICIENCY AND REFURBISHING THE WATERPROOFING SYSTEMS ON ROOF

An interesting intervention was carried out to renovate the roof of an industrial building in Grugliasco (Province of Turin, Northern Italy) and upgrade its energy efficiency. MAPEPLAN T M flexible polyolefin waterproofing membrane proved to be highly effective and has enabled the roof to be renovated by installing a more modern and efficient system.

THE CONDITION OF THE ROOF

The building in question is several decades old and, when it was purchased, the intention of the new owner was to upgrade it to make it more up to date and functional.

Renovation of the roof of the building was a strategically important part of the project.

The building itself has an area of around 4,500 m² and is made from precast, reinforced concrete elements. Its original waterproofing system was made up of two polymer-bitumen membranes with the upper membrane coated with aluminium foil.

The roof had already been refurbished by installing 20 mm thick polyurethane insulating panels and a PVC-P waterproof membrane over the original polymer-bitumen membrane. The panels were installed dry and had a 15 cm thick layer of loose, expanded clay aggregates over them to act as ballast.

The aims and requirements of the refurbishment and upgrading work were very clearly specified, enabling the client, along with the Polygalss Technical Services Department, to identify the key phases of the project:

- removal of the layer of expanded clay ballast;
- refurbishment of the waterproof membrane by installing a more durable system with a longer service life;
- to have a more modern and upgraded roof from an energy point of view to bring it in line with current best practices regarding energy savings and comfort in winter and summer;
- to raise the skylights on the roof to prevent any risk from heavy snowfall;
- to equip the building with a cutting-edge, modern roof with advanced ecological characteristics in order to increase the value of the entire building and then maintain its value over the years.

PHOTO 1. Condition of the roof prior to the upgrade.
PHOTO 2. The new skylights covered with MAPEPLAN T M membranes.

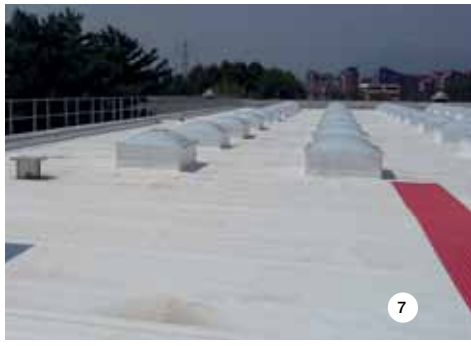

PHOTO 3. Laying and fastening MAPEPLAN T M membrane in place.
PHOTO 4. Heat-welding the overlaps in the membrane with hot air.
PHOTO 5. An expansion joint in the roof.
PHOTO 6. A view of the "cool roof" completed with MAPEPLAN T M.
PHOTO 7. A view of the MAPEPLAN T walkway for foot access.

RENOVATION OF THE ROOF

The roof was refurbished by installing a "cool roof" system with a dry-laid MAPEPLAN T M flexible polyolefin membrane anchored to the load-bearing structure with induction welded fasteners.

The first step was to remove the expanded clay ballast and the various layers of the more recent insulating and waterproofing system to expose the building's original bitumen waterproofing membrane. This was then repaired where necessary and left on the roof, but in this case to act as a vapour barrier.

The next step was to remove the skylights and the mounts for the skylights and replace them with new ones. These were compliant with current thermal insulation standards and the mounts were also taller so that the skylights would sit proud of any snowfall. Then, the original bitumen membrane was fastened around the new mounts and skylights to prevent anything accidentally leaking in while the work was being carried out and the MAPEPLAN T M waterproofing membrane and a series of small domes were installed on the roof.

The next step was to install the thermal insulation panels, in this case 120 mm thick EPS 200 kPa, which were anchored to the substrate with the same type of induction-welding fasteners as the ones used to fasten the 2 mm thick MAPEPLAN T M flexible polyolefin membrane in place. The membrane was dry-laid and left exposed and this too was fastened to the substrate using the induction-welding system. The last step was to heat-weld all the overlaps and joints to form a perfect, seamless layer impermeable to both water and snow.

The mechanical fastening system for the new waterproof membrane was calculated and designed by the Polyglass Technical Services Department. The calculations were made in compliance with the specifications of EUROCODE 1-4 and current norms and standards and were based on the actual conformity of the roof and factored in both the effect of wind lift and adequate safety coefficients.

ADVANTAGES AND CHARACTERISTICS OF THE MAPEPLAN T M SYSTEM

The MAPEPLAN T M waterproofing system used in this case has excellent characteristics and performance properties.

It ensures an upgraded and modern roof with improved energy performance characteristics and sufficient thermal resistance to combat heat loss during the winter, correct according to thermal-hygrometric considerations and with no risk of condensation forming on the surface or in the gaps and spaces.

In summer, including when exposed to direct sunlight, the high-solar reflectance "Smart White" finish of MAPEPLAN T M guarantees that the membrane has a low surface temperature and, as a result, there are more comfortable conditions inside the building, less energy is required to cool the building and running costs are much lower. Thanks to this intervention, the building now has a modern and efficient "cool roof".

The waterproofing system is a "seamless" layer welded together with hot air to remain functional and durable over the years. MAPEPLAN T M waterproofing membranes have a long life expectancy and are highly ecological, as indicated by the product EPD (Environmental Product Declaration) certified by an accredited certification body.

Apart from the advantages mentioned previously, it is also easy to maintain and only requires regular cleaning and inspection of the drainage points and the flashing around the edge and sealing with silicone mastic.

TECHNICAL DATA
Industrial building, Grugliasco (Italy)
Year of the intervention: 2017
Intervention by Polyglass: supplying products to rebuild and upgrade the roof
Client: SIF SpA
Contractor: Borgatta Emilio
Polyglass coordinators: Mauro Redemagni (Head of Technical Services), Cristian Spinazzé (Area Manager)

POLYGLASS PRODUCT
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For further information see www.polyglass.com