



**THE WORLD'S MOST
TRUSTED BUILDING CHEMICALS**

Project Infrastructure



**INFRASTRUCTURE WATERPROOFING
TUNNELS - CUT & COVER
Fast train line Paris-Barcelona**



ALCHIMICA's advanced and safe solutions for Tunnel Below ground waterproofing applications. Paris - Barcelona, First class by train.

One of the greatest projects in the railway industry which connects two beautiful and historic cities, Barcelona and Paris, is the high-speed train that was launched in 2013. The project was a joint venture between France's state rail operator SNCF and its Spanish state rail operator Renfe. Since then, the TGV which is one of the highest speed trains in the world, along with the Spanish ones runs between the French capital and the Catalan city each day.

Project Requirements

Considering structural waterproofing and especially for tunnel structural applications, the waterproofing systems must be sustainable and deal with severe strict requirements for both the internal and external surface environments. The long – term durability of the structures is closely related with a water tightness plan in order to prevent water ingress and the deterioration of the concrete.

The External Waterproofing systems are dealing with a lot of issues. They must seal and secure the concrete and ensure the stability and longevity of the construction by minimizing the future maintenance expenses. In tunnels the waterproofing layers are so important because they literally are in the middle of the structure that makes it difficult to fix in case of no good application. Without waterproofing, water penetration can cause structure deterioration and concrete corrosion which means future intervention for expensive repair works, increasing the maintenance costs. Thus, the long-term durability of the tunnel structure is related to a water-tightness plan that is why the selection of a high quality waterproofing solution is essential.

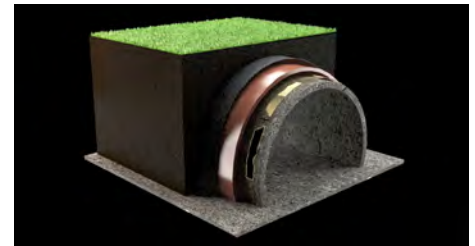


Paris-Barcelona

Project size: 70,000 m²

ALCHIMICA products used:

- Priming - AQUADUR
- Sealing - HYPERSEAL®-EXPERT-150
- Waterproofing - HYPERDESMO®-PB-1K FC
- Waterproofing - HYPERDESMO®-PB-2K



ALCHIMICA SOLUTIONS

In our case the fast train line project from Barcelona to Paris included several cut and cover tunnels in the domestic areas. In those application fields the need for external below the ground waterproofing of the tunnels and foundations were necessary for the long-term stability of the structural bonds.

ALCHIMICA's detailed external below the ground waterproofing and protection system based on HYPERDESMO®-PB-2K meets all the necessary requirements that engineers, architects and the involving shareholders on a tunnel site need for waterproofing specific demanding areas. Our complete range of products includes highly flexible bituminous liquid membranes primers, joint sealants which are designed and fully tested for structural waterproofing applications.



Priming

AQUADUR is a two-component, water based, epoxy coating. It has a track record of more than 20 years of successful use as primer for the HYPERDESMO® line of products, as well as other ALCHIMICA polyurethane based products. It is certified as "Class III" water and humidity barrier, which makes it ideal for applications subject to negative pressure / rising humidity.



Sealing

Taking into consideration the critical point to deal with threats as unequal static forces, water ingress, aggressive chemicals, gas penetration, external mechanical pressures, and temperature variations we used HYPERDESMO®-PB-1K FC to treat and seal the concrete dilatation joints, prime with AQUADUR primer and follow with the HYPERDESMO®-PB-2K application in one single coat at the total required thickness.



Waterproofing

HYPERDESMO®-PB-2K bitumen-extended - polyurethane membrane was the most advanced and safe solution for the waterproofing of the slabs and decks as it has been

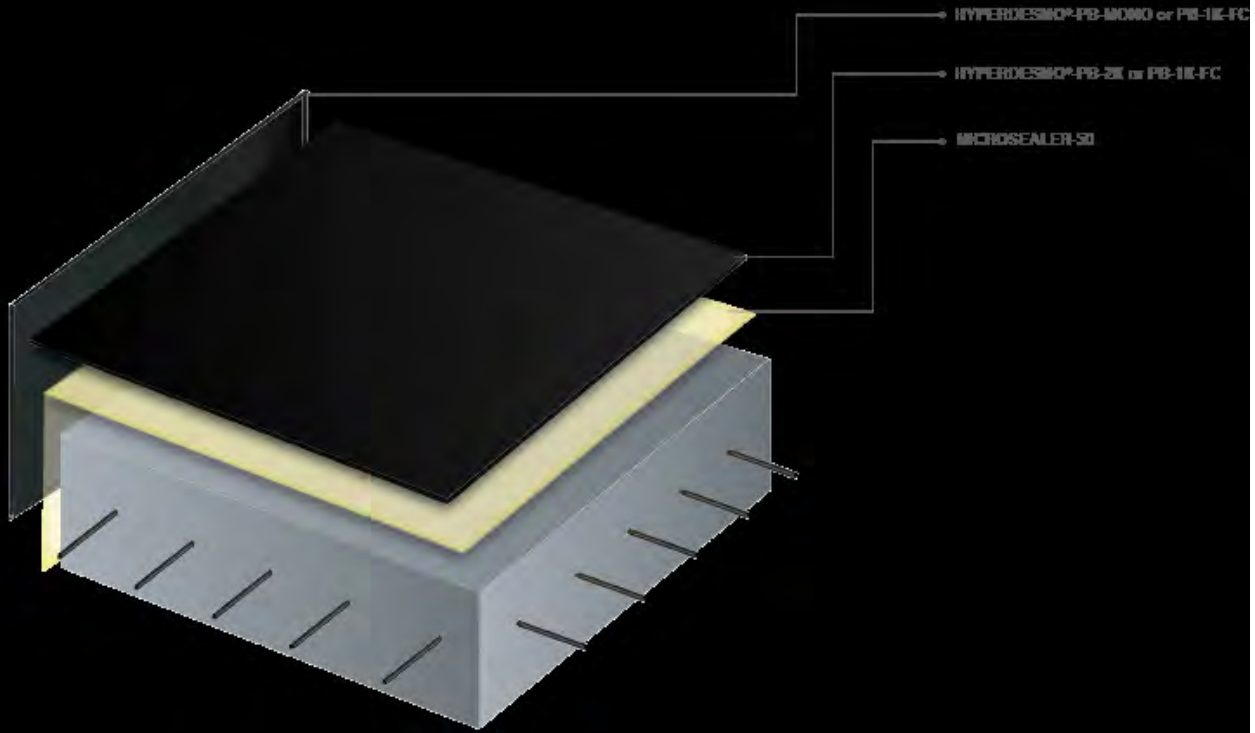
used for the waterproofing of new and existing constructions in major projects around the world.

It is the industry standard in bitumen extended polyurethane products for more than 15

years, certified by the EAD 030350-00-0402 (former ETAG 005). It offers advanced concrete roof waterproofing and protection performance in below ground applications.

HYPERDESMO®-PB-2K applied in one single coat at the total required thickness. With its great anti-root resistance properties, fast curing, strong adhesion, self - levelling allowing easy of application, excellent elastic (elongation >2000%) acting as well as a very effective vapor barrier was the ideal solution.

BELOW GROUND WATERPROOFING





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