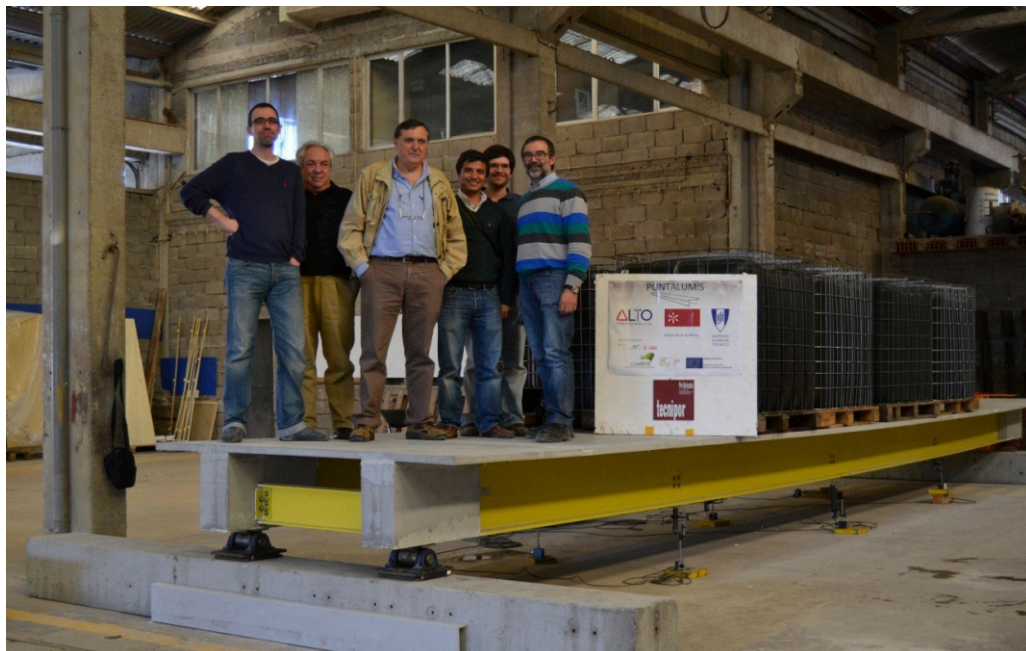




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ALTO Perfis Pultrudidos, Lda, in association with the University of Minho and the Lisbon's Superior Technic Institute, with the collaboration of Tecnipor in the supply of reinforced concrete plates with metal fibers, developed and manufactured a pedestrian bridge for the PONTALUMIS project. This project funded by QREN, which ended in April 2013, allowed ALTO developing skills in this area.



This bridge composed of structural pultruded profiles, in particular the I400x200x15mm profile and prefabricated concrete floor; has a total length of 11 meters and 2 meters wide and was scaled in order to cover the length without recourse to additional structural reinforcements.

After the construction of it, load tests were carried out to bending, that revealed that the structure supports an estimated charge of 44 tons. This bridge remains to be tested, in particular to fluency, and as main feature shown in the tests is the total elastic recovery after requested significant loads. For the construction of the bridge, ALTO has invested in a pultruded profile I400x200x15mm, who represented the production of a section about three times higher than the highest produced on ALTO. This profile with about 21.5 kg/m is one of the largest structural pultruded profiles produced in Europe until now. This profile will bring a new opportunity in large lengths and columns for buildings.





In partnership with the company NORCAM-Engenharia e Design Industrial, Lda, ALTO has developed a support for an artefact of the castle of S. Jorge. The EGEAC, Lisbon City municipal company responsible for the management of equipment and cultural animation, recovered parts of a historical artefact for the castle of S. Jorge and with the purpose of the exhibit it at the Museum of the Castle, requested us to manufacture a support for this artefact. The development of support was made by NORCAM and ALTO. This support has been designed and engineered according to the parts recovered (about 1/4 of the entire artefact) and so that all the pieces were properly accommodated and highlighted. The support, which has the shape of the original artefact but with the clipping of

the part found, was manufactured in polyurethane, machined by the robot that the ALTO has and the finish was done with matte painting to give emphasis to the piece that it will bear. This artefact and respective support, so the restore operation is completed, will be exhibited at the Museum of the castle of S. Jorge, contributing ALTO in this way, to help preserve the historic Portuguese heritage.

To face the growing increase in the theft of sanitation caps in cast iron and following several requests from entities that are reinstalling new devices with some frequency, ALTO has developed a manhole cover in composite material. This material, nonmetallic, has no commercial value for the receptors, thus reducing its thefts.

These covers, class D400 of norm NP EN 124: 1995, were tested by an official entity that showed its strength and so are approved for installation on the public way.



ALTO developed doors, in glass fiber reinforced plastic for box valves installed on the public way. These doors produced by the VARTM process have identical resistance to traditional steel doors and have the great advantage of low maintenance. Produced in gelcoat with the requested color, have resistance to exposure to ultraviolet radiation.

Not being a metallic material, it becomes little attraction for the thieves, given that it has no commercial value for the upturn.



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