

Impact protection from HÜBNER now safer than ever

3P Front End Systems

The first polyurethane tram front end meeting EU fire safety standards

Kassel, Germany (23 May 2019). They are the face that a tram presents to the world and they offer optimal protection for both the vehicle and pedestrians: HÜBNER's new 3P Front End Systems made of flexible polyurethane foam (PUR). The railway supplier HÜBNER – global market leader for gangway systems for railway vehicles – is the first manufacturer worldwide to offer the innovation of tram front ends that meet the new EU fire safety standard EN45545. This standard applies throughout Europe and specifies the materials and components to be used in railway vehicles in connection with characteristics such as flammability or fire behavior.

"The HÜBNER Group has more than 30 years of experience in the production of tram front ends made of PUR foam. Working on the basis of individual customer wishes, a multitude of projects have already been completed around the world," says Ralf Schmidt, sales engineer at HÜBNER. Trams with the 3P Front End Systems from HÜBNER are already running in Berlin, Adelaide and Seattle. 3P stands for "People, Protection, Products".

The front ends are distinguished by being at once highly robust and at the same time remarkably flexible. This benefit comes from the fact that polyurethane foam they are made of has a cell structure. This makes it so that the material deforms on impact and then in a short time returns to its original form again. Within just a few seconds after impact the front bumper regains its original contours.

Significantly improved pedestrian protection

This characteristic brings about a nearly complete reset in the material so that damages to the bumper are less severe or can be avoided entirely. This makes the front ends tougher. But even more impressive are the improvements in pedestrian protection as documented in the so-called HIC value (Head Injury Criterion).

This value represents the degree of head injury to be expected in the event of impact with a given material. A value of under 850 means only slight injuries, while a value above 1300 could entail fatal injuries. Traditional fiber reinforced plastic front ends in trams have an HIC value of 1200 and more. The value for PUR foam by contrast is between 600 and 650. At the same time, the polyurethane foam does not splinter and thus there are no injuries from flying fragments.



From an optical standpoint, these high performance 3P Front End Systems look like other high-quality materials. They can be adjusted to fit to any vehicle design concept. Even complex construction and functional elements can be integrated. HÜBNER does not only design and produce the new tram front end systems but has also developed the PUR material itself. With this development, the company has succeeded in being the first in the industry to provide this level of fire protection and thus to offer even more safety than before.

The challenge was to find a way to be able to paint the material in accordance with customer wishes. In the past, combining polyurethane foam with a painted coating made it too inflammable," explains Schmidt. "We have now been able to solve this problem."

On the one hand, HÜBNER offers the optimized tram front ends for new vehicles. On the other hand, thanks to the services of the company's in-house design and development department, the front ends are also available for retrofitting on older vehicles.

The HÜBNER Group

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As a global system supplier for the mobility industry, for manufacturing and for life sciences and research applications, the HÜBNER Group is the worldwide leader in gangway systems for buses and railway vehicles (**Mobility**), a prominent solution provider for rubber products, plastics technologies and elastomer-coated industrial textiles (**Material Solutions**) as well as a rising supplier for applications in the field of laser, terahertz and high-frequency technologies (**Photonics**). The HÜBNER Group employs more than 3,300 people around the world. In addition to the headquarters in Kassel, Germany, HÜBNER has built up more than 25 locations around the world in the preceding years and decades.

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