

Antivibration technology



Milan World Expo 2015: A witness to an intensive partnership

A city is making history. A city is bringing the world together. Milan is building for the 2015 World Exposition. AnsaldoBreda S.p.A. supplied state-of-the-art rolling stock for the extended Milan Metro lines M1 and M2, while Bellotti S.p.A. provided vibration-absorbing flooring for the subway trains and Angst+Pfister supplied the antivibration elements. The partnership between Bellotti and Angst+Pfister has its own history: a fast-paced and exciting one that spans multiple continents and is continually evolving.

Pietro Bellotti remembers it exactly. It was at the 2012 InnoTrans exhibition. The world's leading trade fair for transportation technology is a permanent fixture in the professional agenda of the chief executive officer of Bellotti S.p.A. So it was in Berlin, in September 2012, that he personally encountered Angst+Pfister for the first time. Bellotti S.p.A., which was founded in 1927 as a company anchored in the timber industry and specialized in the production of plywoods, had already long since gotten involved in additional lines of business. "Our firm has been supplying the railway industry with floor panels for around 30 years now," Mr. Bellotti explains. But mere floor panels alone are not enough. That's why he enlisted the Rome-based AGT Engineering group several years ago as a partner to design the entire floor construction. And here's where the contact with Angst+Pfister comes in. A new vibration-damping concept is needed. Mr. Bellotti's initial contact person, Angst+Pfister Italy's managing director Jean-Pierre Baroni,

shows him examples of work done for railway technology suppliers like Siemens and Bombardier. The chemistry between Bellotti and Angst+Pfister resonates, and the companies start to collaborate shortly after the 2012 InnoTrans show.

The Copenhagen Metro: New solution for new trains The timing is ideal because Mr. Baroni is already in contact anyway with AnsaldoBreda S.p.A.; specifically, in a matter concerning vibration isolation, one of Angst+Pfister's many specialties. The rolling-stock engineering specialist with production facilities in Naples, Reggio Calabria, Pistoia and Palermo is a subsidiary of Finmeccanica, one of the largest industrial groups in Italy, with 75,000 employees. AnsaldoBreda is gearing up to build 28 subway trains for the Metro in Denmark's capital city of Copenhagen. The trains consist of three articulated cars and, like all of the trains employed in Copenhagen's Metro system, will operate fully automatically without any drivers. AnsaldoBreda has awarded the order for the carriage flooring along with the antivibration system to Bellotti.

Embarking on the next chapter

"The vibration-absorbing floor construction concept used in the trains also lends itself to yachts and cruise liners, and is suitable in general for boats, barges and ships. By isolating vibrations and noise, we enhance passenger comfort, on land and soon also on water.

So together with Angst+Pfister, we are embarking on a new chapter in our partnership and creating possibilities that benefit the customer. Angst+Pfister's engineering solutions help us not only to penetrate the manufacturing sector of the railway technology industry more deeply, but also to develop new markets. Ultimately, it's a win-win situation."

Pietro Bellotti, Managing Director,
Director of Transportation Sector, Bellotti
S.p.A., Cermenate, Italy

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Within the span of just one year, a partnership grows between Bellotti and Angst+Pfister based on mutual profound expertise and trust. This lays the foundation for their collaborative work for the Copenhagen Metro: The antivibration system from Angst+Pfister is integrated into the flooring supplied by Bellotti. The plywood floor panels with an integrated elastic, vibration-absorbing core layer rest on aluminum/vulcanized chloroprene rubber conical mounts that isolate the vibrations of the moving train and absorb shocks caused by wheel and rail surface irregularities. The conical mounts are screwed to the plywood floor panels and are adhesively bonded to an underlying metal frame. The floor panels effectively isolated this way are covered with a rugged rubber mat.

"Be it conical mounts or pads, chloroprene or polyurethane – we find the right technically sound solution for isolating vibrations."

Jean-Pierre Baroni, Managing Director,
Angst+Pfister, Italy

High fire and smoke resistance guaranteed

The solution proposed by Bellotti, AGT Engineering and Angst+Pfister meets all of AnsaldoBreda's specifications. It is also fire- and smoke-resistant in compliance with the new European standard EN 45-545, which has replaced the respective national safety regulations of the individual EU member states.

Milano Metro: Vibration insulation for 30 trains

Parallel to the order for the Copenhagen Metro, the modernization of Milan's Metro lines M1 and M2 has moved onto the radar screen. The city in northern Italy is starting to get ready for Expo 2015. AnsaldoBreda is building 30 six-car subway trains and holds an option for 30 more. And once again, Bellotti is manufacturing the floor construction. So, whoever travels on the Metro through Milan to the Expo grounds

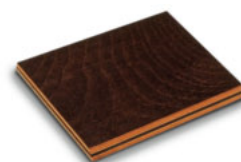
between May 1 and October 31, 2015, will assuredly be setting foot on a floor that provides smooth ride comfort with the help of antivibration elements from Angst+Pfister.

Work on Milan's M4 Metro line is also already underway, with 47 four-car subway trains envisaged for the line. AnsaldoBreda will once again leverage its expertise in building fully automated, driverless trains. And Bellotti, together with Angst+Pfister, will once again contribute its state-of-the-art solution. Meanwhile, Pietro Bellotti is already putting out feelers to South America. In the beginning, floor constructions accounted for only a small percentage of Bellotti S.p.A.'s total sales, but today they generate one fifth to a quarter of the company's consolidated revenue.

Supply chain: Delivery to the deep south with-

in 48 hours Jean-Pierre Baroni and his team frequently double-check the supply chain because that is also a part of Angst+Pfister's product and service offerings. As a precaution, Angst+Pfister's international logistics center in Embrach, Switzerland, always maintains a reserve stock of conical antivibration mounts, which are manufactured at the group's own factory in Bursa, Turkey. Pietro Bellotti can thus always rest assured

that Angst+Pfister is capable of delivering them within 48 hours to Reggio Calabria in the deep south of Italy where, at the AnsaldoBreda plant facility there, a Bellotti team installs the flooring systems in the trains.



Spaced at points or planar

"Society's mobility is directly linked to damping vibrations and noise: no tram, no subway, no regional train, and certainly no high-speed train can do without vibration isolation. The need for sophisticated, highly effective solutions will increase further in the years ahead as mobility further expands.

While some railway technology companies favor vibration isolators spaced at points, others prefer planar isolation elements. Be it conical mounts or pads, chloroprene or polyurethane – our engineering department devises the right technically sound solution in accordance with customers' wishes, as in the case of AnsaldoBreda. We team up with the customer's engineering department right from the start, thus also minimizing development costs. Furthermore, Angst+Pfister staffs experts who are specialists in adhesive bonding of railway vehicles and parts, such as bonding elastomeric materials to aluminum, and we have the DIN 6701-2 certification to prove it."

Jean-Pierre Baroni, Managing Director,
Angst+Pfister, Italy

