



Custom-engineered Veam Power Plate connectors help Alstom provide sustainable, eco-friendly urban rail service in Rio de Janeiro for the 2016 Summer Olympics in Brazil.



Transporting hundreds of thousands of people during landmark public events like the Olympic Games takes an incredible amount of energy. Conventional urban tram systems with their overhead catenary wires can be inefficient in their energy usage, not to mention an eyesore in picturesque cities.

Finding innovative ways of using energy more efficiently while integrating transportation systems seamlessly into their environments is an ongoing challenge for the transport industry. A world leader in the field of integrated tramway systems, Alstom promotes sustainable mobility and takes energy saving seriously.

Alstom approached ITT Veam to develop a custom connector to enable an entirely catenary-free urban light rail system. These trains combine two catenary-less technologies: APS – a power supplied via a third rail positioned centrally between the running lines – and Supercapacitors – modules installed on the roof of the tram which store energy and regenerate it during braking.

Alstom was looking for a customized rail solution offering high performance, safety and reliability in a compact design. They approached ITT to deliver a custom engineered connector on a tight deadline. Veam Power Plate was the solution.

## Customer Problem

Tasked with producing a catenary-free, energy-efficient light rail system for operation during the 2016 Olympic Games in Brazil, Alstom was looking for a highly tailored connector that would enable its Ecopack regenerative power system to thrive on the streets of Rio.

Alstom needed a high-power, customized connector that would enable energy generated during traction and braking to flow to the tram's supercapacitors. By leveraging this approach Alstom offers the city an energy efficient autonomous tram system, without marring the skyline with overhead wires.

To achieve this, Alstom asked ITT Veam to engineer a high-performance, compact connector, rugged enough to deal with tough conditions, yet safe and easy to disconnect for servicing and maintenance. And they needed it within a year.

## How We Solved It

Our custom solution was the specialized Veam Power Plate connector. ITT's team in Italy created a connector for high-power applications on trains that can withstand harsh environments while delivering power dependably.

Veam Power Plate is critical to the success of Alstom's Ecopack. It connects the power equipment – which collects energy during braking – with supercapacitors, on the roof of the vehicle. Veam Power Plate thus ensures that energy flows unimpeded to power the tram, contributing to an overall decrease in energy consumption compared with other systems.

Veam Power Plate features a double screw latching mechanism that provides fast connect and disconnect, meets railway standards on smoke and fire protection, and provides space saving in harsh environment applications due to its unique receptacle and plug dimensions.

## Immediate Impact

After months of working closely with Alstom to understand their needs, the first of 32 Alstom Citadis trains was delivered to Rio de Janeiro in June 2015. Now, with Veam Power Plate having proved its effectiveness, Alstom has announced the regenerative power system will become a standard on all Alstom trains operating without catenary power.

Perhaps most importantly, Veam Power Plate will allow thousands of residents and visitors from all around the world to travel safely around Rio de Janeiro, enjoying the spectacle of the Olympic Games, the scenic beauty of the city, and safeguarding the environment while doing so.

## Looking Ahead

Veam Power Plate is emblematic of ITT's ability to respond rapidly to diverse customer requirements in the transportation sector with customized, innovative solutions that meet tomorrow's standards.

"We needed a prototype designed from scratch, and we needed it quickly," said Massimo Rigoselli, Technical Manager of trams at Alstom Transport in Sesto San Giovanni, Italy, the company's center for tram traction design. "ITT Veam delivered. Not only was their team flexible with the alterations we needed during design phase, they provided a model beyond our specifications, and they met our deadline."



### Making the impossible possible

Alstom's Ecopack system was originally intended to function without a connector because existing connectors were deemed too large for the application. ITT's team was able to engineer a small connector allowing effective energy transfer and helping reduce overall energy consumption.