



# INNOVATION IN POWER TRANSMISSION



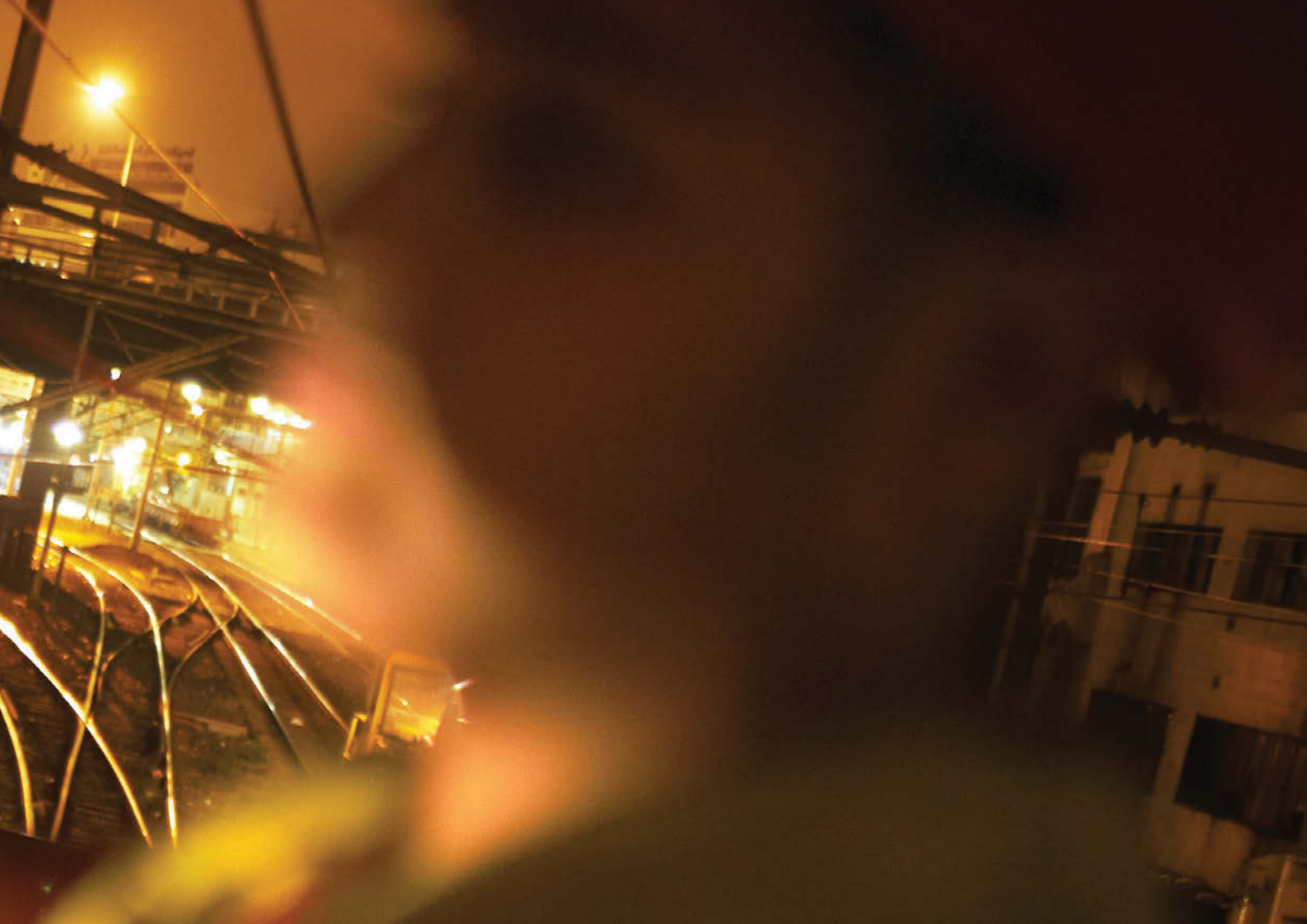


## INNOVATION IN POWER TRANSMISSION

Cariboni, an Alstom company since 2008, is a leading European player in the design and manufacturing of materials for power transmission.

Established in 1908, with about 85 employees operating in the surroundings of Lake Como – one of the main industrialised areas of Northern Italy – the company specialises in:

- Design and manufacturing of components for railways, tramways and trolley bus contact lines
- Bus-bar ducts for power plants
- HV/MV connectors and fittings
- Power supply systems for overhead cranes and hoists



Our excellent workforce is committed in the seamless effort to manage the most demanding projects aiming at achieving top notch customer satisfaction.

Nowadays, we can offer our customers all kinds of products and services, ranging from the design, engineering, testing and manufacturing of complete sets for the above products. Our mission is to meet our customers' expectations, both when they need an integrated service or when they need products manufactured on time and according to the highest quality level.

Cariboni is proud of being included in the list of the most important European manufacturers for all the products in portfolio.



## OUR MANUFACTURING CAPABILITIES

We can manufacture every component of electro-mechanical applications based on:

- Reliable expertise and know-how
- Severe quality tests in fully-equipped testing rooms
- Teamwork attitude
- Seamless professional training courses
- Specialised technical department
- R & D department

Manufacturing processes are organised in the following departments:

- Tooling
- Foundry casting
- Machining
- Carpentry
- Assembly
- Testing
- Storage areas





## OUR PRODUCTS





## 1 - RAILWAY AND TRAMWAY CONTACT LINES

We are specialists in the design and manufacturing of contact lines for :

- Railways
- Tram-ways
- Underground railways
- Trolley buses

We supply the following components:

- CANTILEVERS for high speed and low speed systems made with steel or aluminium pipes, clamps and insulators for open-lines and tunnels.
- ANCHORING AND TENSION DEVICES such as counterweights,

clamps, tensioning devices, accessories.

- SECTION INSULATORS: from 25kV 200 km/h, to 3kV 30 km/h.
- RIGID CATENARY SYSTEMS: in standard systems, catenary contact wires are supported by droppers; in rigid catenary systems, the contact wire is inserted in the lower part of a special aluminum profile without any additional supporting wires, which translates into a decreased tunnel height and a lower cost for civil works.
- THIRD RAIL SYSTEM: The third rail system is designed to conduct the high traction currents with low voltage systems between 600V DC and



1,500V DC.

The conductor rail is made of highly conductive extruded aluminium alloy and coupled with wear-resistant





stainless steel to withstand friction. The big cross section of the aluminium section bar of the conductor system allows to minimise voltage drop and - in general - also load losses.

The stainless steel surface is hard enough to withstand the sliding of the collectors' shoes.

- APS: this is an innovative power supply system for tramway lines which draws electricity from the soil. This solution makes it unnecessary to install unpleasant-to-see overhead contact lines in old town centres, still ensuring the same performance of a tramway.



## 2 - BUS BAR DUCTS

The main applications of bus bar ducts are the interconnections between generators & power transformers in power production systems and distribution plants as well as - in general – in all those applications where cable connections are not possible.

Power production plants may be:

- Hydroelectric
- Combined-cycle
- Thermoelectric
- Nuclear

Our production range covers MV power connectors, up to 36 kV and currents up to 24 kA.

- NON-SEGREGATED PHASE BUS DUCTS: all conductors are in a common metal enclosure without barriers, UP TO 5,000 A.
- SEGREGATED PHASE BUS DUCTS: all conductors are in a common metal enclosure but segregated by metal barriers, up to 5,000 A.
- ISOLATED PHASE BUS DUCTS: each phase conductor comes in an individual metal housing, up to 24,000 A with natural cooling.







### 3 - HV/MV CONNECTORS AND FITTINGS

We supply high and medium voltage sub-station connectors and fittings used for conductors, energy distribution cables and for the connection of electrical stations. They are made of different materials, such as aluminum, bronze, bi-metallic (bronze and aluminum) or steel.

Our long experience in the manufacturing of products in compliance with the strictest international standards has led us to optimise the quality of our products, which are developed to prevent all interference-related problems.





## 4 - POWER SUPPLY SYSTEMS FOR MOBILE APPLICATIONS

A complete range of feeding and control lines of mobile machines for loads up to 2,200 A.

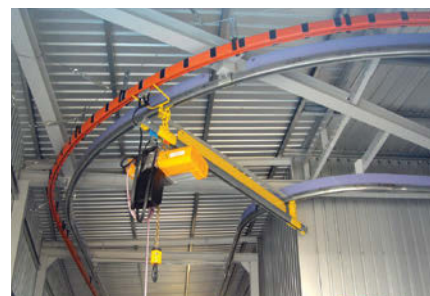
Our range covers every power supply demand for cranes, hoists as well as handling and stocking systems.

Our manufacturing range includes:

- SPEED: Electrical multipolar contact lines to supply power to hoists, cranes and assembly lines.
- POWERLINE 14: Electrical contact lines with data and signal transmission for insulated single-

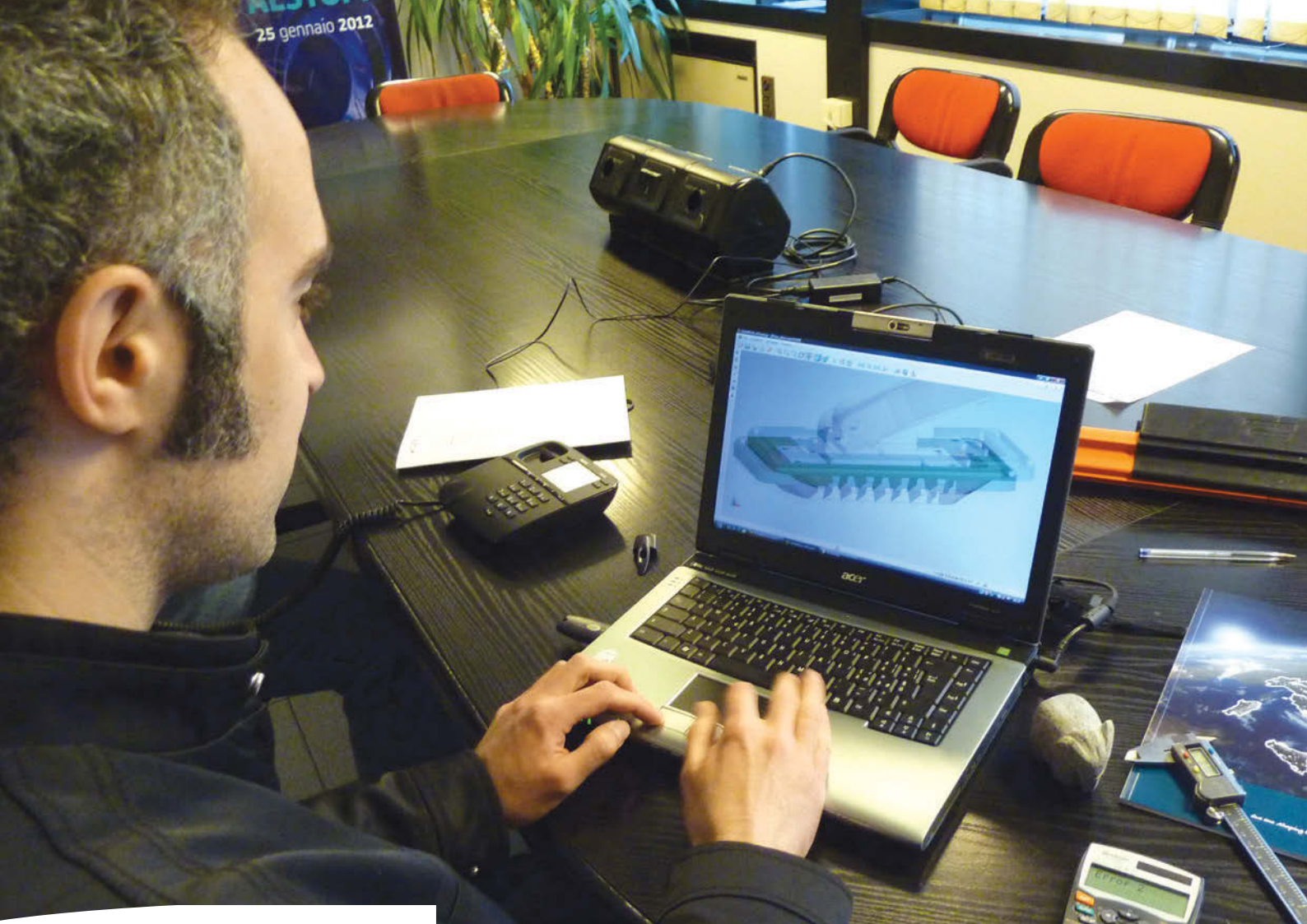
phase conductor rails, hoists, cranes and automated warehouses.

- ATOLLO: Insulated electrical contact lines consisting of copper conductors insulated in a plastic profile to supply power to overhead bridge cranes and standard gantry cranes.
- ISOLCAR/ISOLCAR92: This insulated single-phase conductor rail system is used for cranes when high amperage is needed. It is suitable for installation in very aggressive environments, such as cement works, galvanisation plants, steel works, etc.
- BIME: bimetallic (copper and steel) rail contact lines mainly used in steel plants and also near furnaces due to its resistance to high temperatures.



- ALINOX: Cariboni developed a new conductor rail system made of aluminum-steel conductors that ensure money savings of over 40% compared to traditional copper rails. Alinox ensures safety and excellent operating reliability.
- FESTOON SYSTEM: Cariboni's festoon systems are preferred in most heavy-duty applications, such as container stacker cranes and heavy industry.





## ENGINEERING AND R&D

A team of specialised engineers with excellent mechanical and electrical skills works in our technical department with qualified and specific technical staff for each product sector. This department fully focused on market requests, offers:

- Products totally designed and developed in-house, with the support of specific software programs (Solid Works, 3D Modelling, Fem Analysis) and in co-operation with our manufacturing department.
- Product Engineering according to customer's drawings and/or in compliance with their standards.



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