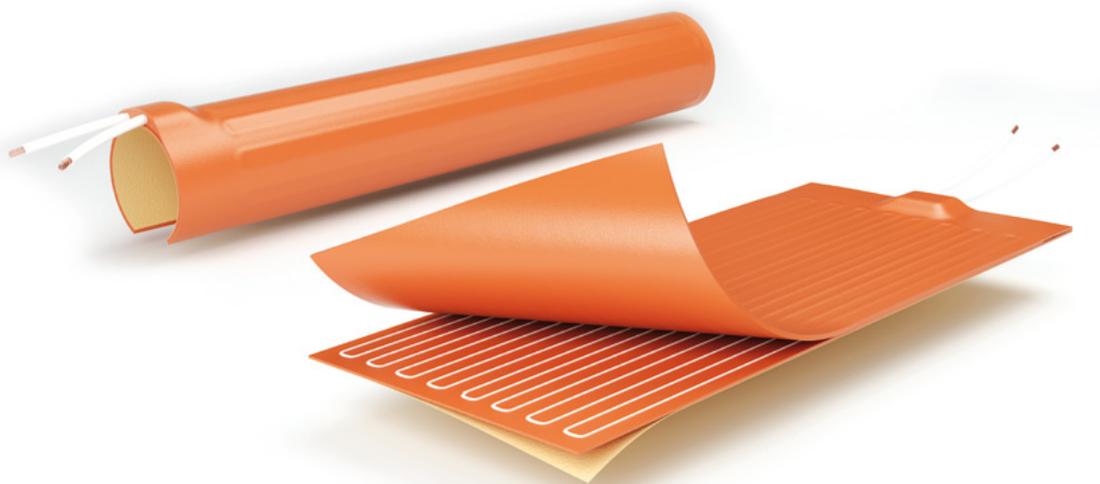




**FLEXIBLE HEATING CABLES
AND ELEMENTS FOR
TRANSPORTATION
THE METROS
THE TRAINS
INFRASTRUCTURE**

FLEXELEC SOLUTIONS

- FLEXUNIT®** Heating cables
- FLEXTRACE®** Heat tracing cables
- FLEXMAT®** Heating mats
- FLEXPLATE®** Heating plates



 **flexelec**
GROUPE **omerin**



FLEXELEC is a subsidiary of the Omerin group and takes benefit of more than 1700 collaborators which specialize in the design and production of flexible heating cables and elements for all kinds of temperature maintenance or protection against freezing of refrigeration systems.

FLEXELEC is now a key player in the market of heating solutions and cultivates a passion for performance. The company is recognized for the reliability of its products and installations.

Rail transport is one of the areas of expertise from FLEXELEC which offers innovative solutions in an environment where reliability and security are essential.

Transport, Metros, Trains, Infrastructure

DISCOVER OUR SOLUTIONS AND APPLICATIONS EXAMPLES

Avoid snow accumulation and ice in the switches, guide rails and/or traction using heating cables



Avoid accumulation of snow and ice in appliances, channel to ensure needle operation. The needles are heated with a plated heating cable with a strip composite. The counter rails and slides are heated with heating pads mounted in chains. They can be placed more or less close together so as to adapt the power necessary to the critical points. This system makes it possible to reduce the installed powers per track device. The cables and switch plates are perfectly sealed and their insulation resistance particularly high.

Installing a heating element device prevents the presence of ice or frost on the traction rail (3rd Current collection rail) which powers the motor. Poor contact can cause untimely shutdowns and security concerns.

Ensure tire grip on the rolling tracks using heating elements



Ensuring tire grip on the tracks bearing is a safety issue.

FLEXELEC SOLUTIONS for metro, tram and train infrastructures

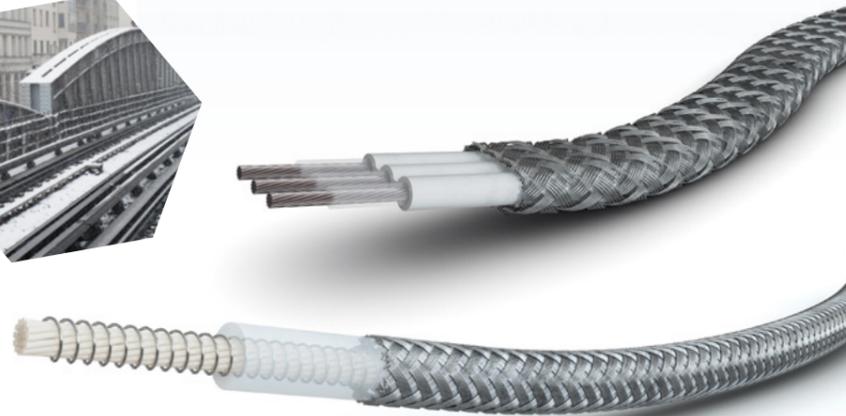
FLEXTRACE®

→ **FTS3IS - FTS3IF:** constant power cable to dissipate 100W/m to 150W/m. This cable is delivered in connection ready for installation and accompanied by mounting accessories (rail and clips) and connector on request.

→ **PLA:** 0.5m long heating plates for power of 120W and 150W, to double the metric power available where it is needed. PLA is laid in rosaries and in series to the FTS3 cable.

→ **FTS4IS:** constant power cable to dissipate 120w/m at 150w/m, for long circuit lengths and voltages up to 850V. This cable is delivered in connection ready for installation and accompanied by mounting accessories (rail and clips) and connector on request.

→ **C1FSI-C2FSI-C3FSI-C4FSI:** serial cables for long lengths circuits. Voltage up to 850V. This cable comes ready connection during installation and accompanied by mounting accessories (rail and clips) and connector on request.



Heating mats are used inside and proximity to the cockpit

Inside and near the cockpit, it is necessary to ensure warming of the feet and hands of the driver for his comfort. Heated fabrics positioned at ground level and dashboard level provide heat as close as possible to the driver, because the heating of the ambient air of the locomotive is not sufficient in many countries with a rigorous climate.

Avoid snow and ice in access to the carriages thanks to with heating cords



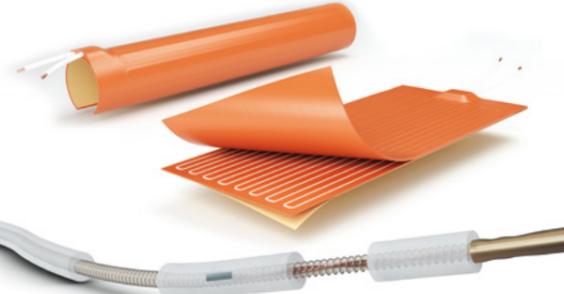
In the vestibules providing access to the carriages, the accumulation of ice and snow is a source of risk for passengers, the ground becoming slippery. Heating cords installed in the floor eliminate this danger and also makes it possible to increase the comfort of passengers who stay in the vestibules during the trip.

FLEXELEC SOLUTIONS Heating for the safety and comfort of users

FLEXMAT® A need for power to be dissipated over a large surface and avoid hot spots or areas

→ **TA-TV-TP:** Flat, adhesive, preformed or assembled silicone heating mats for maximum powers up to 0.5w/cm² depending on its use. EN45545 on request.

→ **ALU:** Maximum power self-adhesive heating mats of 0.25w/cm². Flexible and reliable, the solution for applications with low humidity and vibration constraints.



Protect pipes and tanks from the frost with heating mats

Under the train, with the effect of speed and temperature outside can cause freezing of pipes as well as tanks containing drinking or waste water. This climatic effect seriously disrupts the operation of the toilet. The installation of heated mats prevent any problems.

FLEXELEC SOLUTIONS Protecting external pipes and equipment from freezing

FLEXUNIT®

→ **CS-CST-CSI-CSTW:** Connections ready to use and reinforced sealing.

→ **CS2-CS2T-CS2I-CS2TW:** Connections ready to use for installations without ambient humidity constraints.

→ **CP-CPT:** PVC insulated connections ready to use for powers limited to 15w/m of rope.

→ **CS1:** Made of silicone, with integrated cold outlets, the right solution for medium and large series.

→ **CP1:** In PVC with limited power of 15w/m of rope. With integrated cold outlets, the right solution for medium and large series.



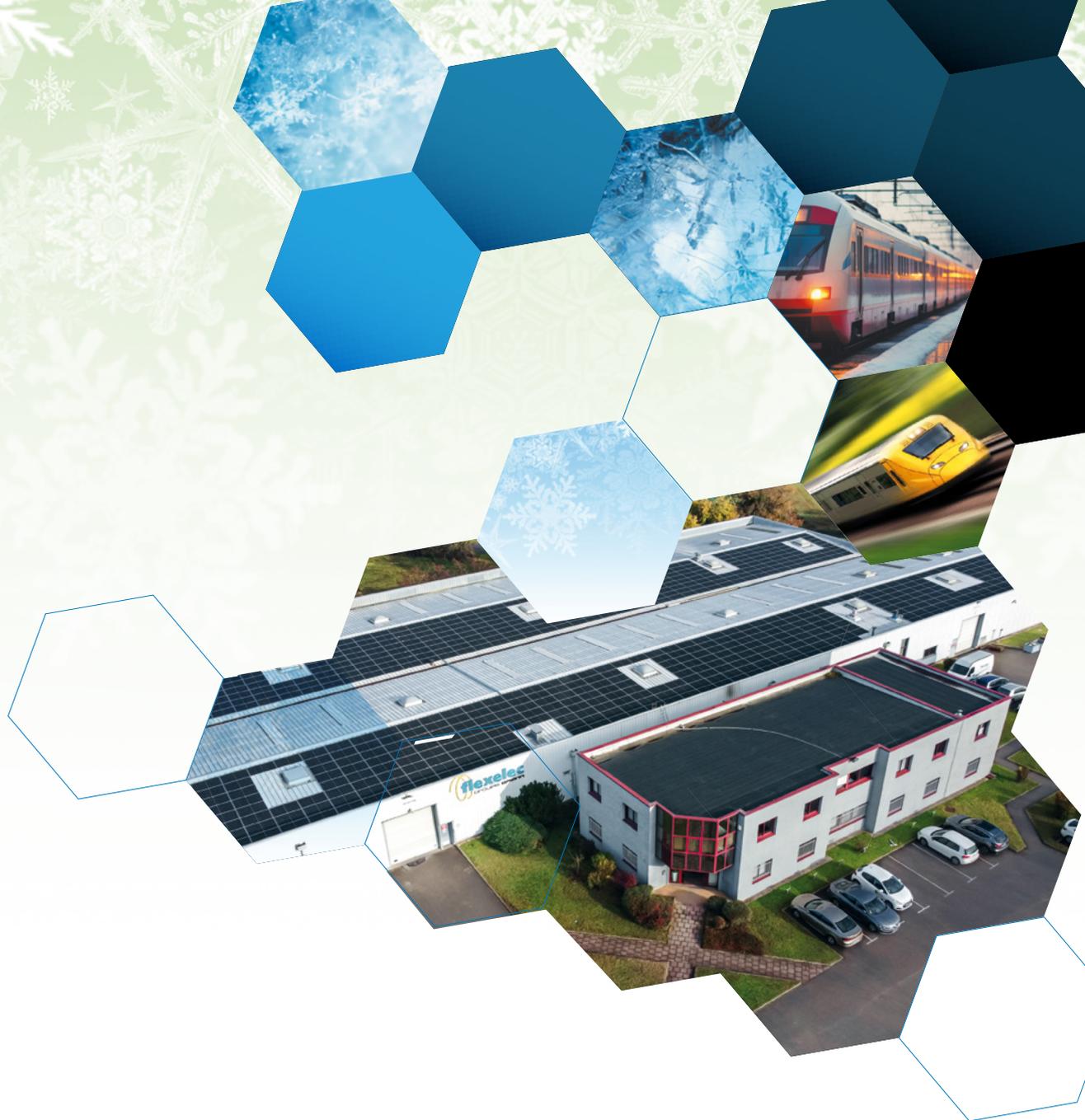
Ensure deployment of the pantograph whatever climatic conditions thanks to heating mats

The pantograph deployment system is a sensitive point of the train, since it is the key to the power supply. For this, we vulcanize directly the heating mats to the stainless steel sheet to guarantee maximum thermal transfer.

Keeping the hitch and the train hatch thanks to a heating mat



In order to make the hitch and the hatch that protects it between wagons and locomotives always maneuverable and accessible, even in winter where frost protection is essential, the installation of a heating mat is highly recommended.



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