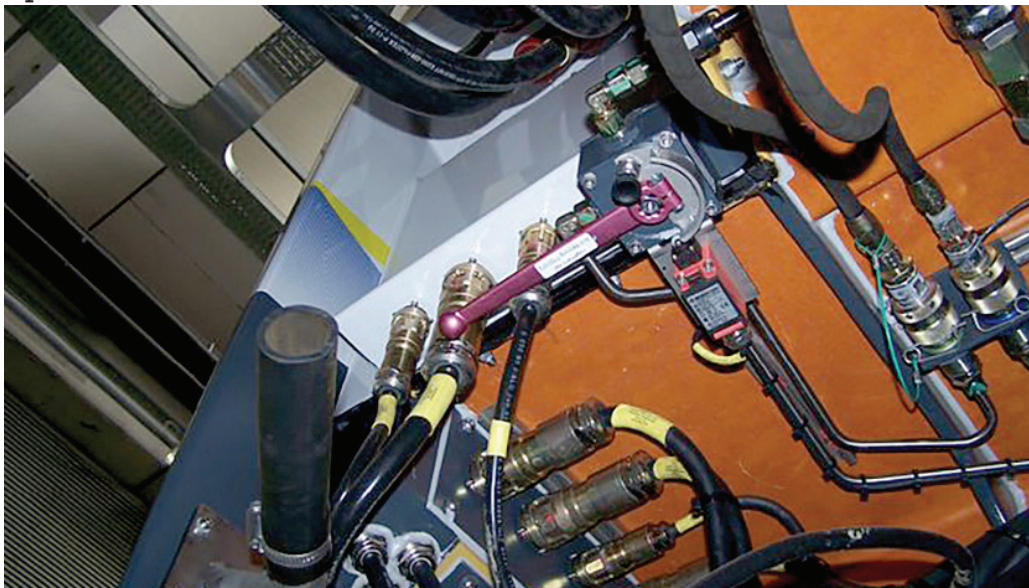


Tisseo Hoses approved Cetim and LRCCP

As part of the overhaul of its trains, the company operating the Toulouse metro system entrusted Cetim with analysing and testing the hoses which the braking systems are equipped with. Conclusion : these hoses are in good condition and their operation can continue.



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OUR CUSTOMER

Corporate name

Tisseo

Activity

Operation of the public transport network, greater Toulouse

Workforce

approximately 2 700 employees

The Toulouse underground trains are designed to be fully overhauled after approximately 800,000 km, i.e. approximately once every decade. « *In order to prepare this overhaul, we wanted to check the condition of the hydraulic hoses which the braking system of the trains is equipped with* », explains Sébastien Duffort, method technician in charge of the rolling stock at Tisseo, the operator of the Toulouse transport network. These hoses, made of an inner NBR elastomer tube and a steel reinforcement braid, were planned to be systematically

replaced during the overhaul, but these components have not posed any specific problem yet, which raises the question of a possible extension of their service life.

Proof and cycling tests

« *We sampled the 13 hoses from two trains and 7 new hoses from our stock, and we entrusted them to Cetim for analysis* ». A test protocol was jointly drawn up: the condition of the hoses and the metal couplings was inspected, the used and new hoses were subjected to proof tests (at 350 bar) and some of them were subjected to burst tests. Others were subjected to

pressure cycling tests (50 000 cycles at 0 to 280 bar) and burst tests. For the elastomer contained in the hoses, Cetim relied on the LRCCP (*Laboratoire de recherches et de contrôle du caoutchouc et des plastiques* – rubber and plastics research and testing laboratory), which is part of the « Institut Carnot Cetim ». « *Upon completion of the tests, no noteworthy difference was found between the characteristics of new and used hoses, except light local damage which did not evolve during the tests* », reports Sébastien Duffort. Further to this expert's analysis, it was decided to extend the service life of these hoses from 800 000 km to 1 200 000 km. This decision was approved by Certifer, the French railway certification agency.

Cetim's asset

Cetim offers a comprehensive range of technical services and skills, in partnership with such laboratories as LRCCP, if required :
mechanical



and chemical characterisation, endurance tests, non-destructive tests, leak detection, equipment integrity, etc.