

# Alstom Transport

## The characterization of dust during braking

Thorough environmental studies are carried out on the new generation tram-train of Alstom Transport. Even the dust emissions during braking are characterized.



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### OUR CUSTOMER

**Corporate name**  
Alstom transport

**Sales turnover**  
€ 5.8 Billion (2009-2010)

**Workforce**  
26,000 people including  
8,800 in France

**Activity**  
Equipment and services  
for railway transport  
(rolling stock (tramway,  
underground railway,  
tram-train, TGV, etc.),  
infrastructures, signalling,  
services, "turnkey"  
transport systems

**C**ity dwellers would like to travel between the city centre and the neighbouring towns without having to change their mode of transportation. This is why Alstom Transport put in place the new generation tram-train able to run both on the railway network and on the tram tracks in the city.

*"Thorough environmental studies have been carried out on this tram-train: energy consumption, recyclability, lifecycle analysis, etc."*, stated Valérie Correia, ecodesign expert at Alstom Transport. It is within this framework that SNCF called on Alstom Transport to enable the characterization of the dust

and gas emissions during braking of the tram-train.

Alstom Transport consequently selected Cetim to draft the test protocol and carry out the tests.

### Simulating the tram-train on a dynamometric bench

The tests were carried out on the Knorr-Bremse dynamometric bench in Munich, a world leader in braking systems for utility vehicles and rail transport. The daily operating conditions of the tram-train were simulated on an SNCF type route and the boarding and exiting of passengers during rush hour and off-peak times as well as stops at the stations were taken into account.

*"We simulated a 52-minute journey over a distance of 63.8 km travelled at an average speed of 64 km/hr, with 9 stops of approximately 40 seconds each, explained Valérie Correia. Two months of programming at Knorr-Bremse required for the complexity of the simulated situations. This was performed in cooperation with Alstom Transport."*

The tests made it possible to determine the weight of the particles emitted during braking, their grain-size distribution as well as their chemical composition. They also provided the nature and weight of the volatile organic compounds emitted and their concentration.

### Cetim's asset



Given its know-how in the field of metal dust characterisation, in the master project management and its network of partners, Cetim is able to assist its customers throughout the project, from identification of requirements up to presentation of results to the instructing party.