

# Sanden Manufacturing Europe

## Reducing noise in car air conditioners

The manufacturer of compressors of air conditioning systems commissioned Cetim to predict the noise of its equipment. The goal was to assist its customers in redefining specifications to achieve better integration on their vehicles.



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### OUR CUSTOMER

**Corporate name**  
Sanden Manufacturing Europe

**Turnover**  
EUR 273 million (in 2017)  
for the Tinténiac site

**Workforce**  
885 people

**Business activity**  
The Tinténiac Sanden plant (Ille-et-Vilaine, France) produces compressors for vehicle air conditioning systems. The main business of the Sanden Holdings Corp. group based in Iseaki-shi (Japan) is the manufacture of automotive equipment (compressors, heat exchangers, etc.) and distribution systems (refrigerated display cases, automatic beverage dispensers, etc.).

**S**anden strives to reduce noise inside cars! The Tinténiac plant of the Sanden Manufacturing Europe group located in Brittany (France) designs and manufactures compressors for vehicle air conditioning systems. In keeping with the procedures determined in the customer specifications to measure the level of vibrations, the company tests its products on test benches. However, these measurements do not convey the actual vibratory behaviour of the compressor on the vehicle as this also depends on the mounting bracket used by the customer. Sanden Manufacturing Europe asked Cetim to carry out a study to determine the forces

“blocked” in the compressor at each attachment point with a view to more fully characterise the vibratory source of the compressor and its integration on the car. “The knowledge of the compressor’s blocked forces will allow us, for any mounting bracket used, to predict the forces transmitted to the vehicle and consequently the noise in the vehicle interior”, stated Olivier Aubry, acoustics and vibration specialists at Sanden Manufacturing Europe.

### Work based on a standard

The methodology used by Cetim was taken from the ISO 21955 standard which is currently being prepared: “Vehicles - experimental method for transposition of dynamic forces generated by an active component from a test bench to a vehicle”. This method uses the characterisation of the mounting bracket in order to eliminate them. All that remains is to input the data

(acceleration, forces, etc.) into the tool used to estimate the blocked forces. “Cetim helped us to adapt the protocol proposed in the standard to our products then to apply it by outlining the whole of the require experimental system (number and location of the accelerometers) for the measurements on our bench”, stated Olivier Aubry.

Once the work was completed, the methodology was implanted in the form of automated routines in the Sanden measurement acquisition programme. The ultimate goal is to “redefine specifications which rely on the blocked forces in order to guarantee better integration of the compressor onto the vehicle”, added Olivier Aubry.

### Cetim's asset

Leveraging on its involvement in standardisation work and its vibration and acoustic expertise, Cetim supports industrial manufacturers in the development of their products and equipment.

