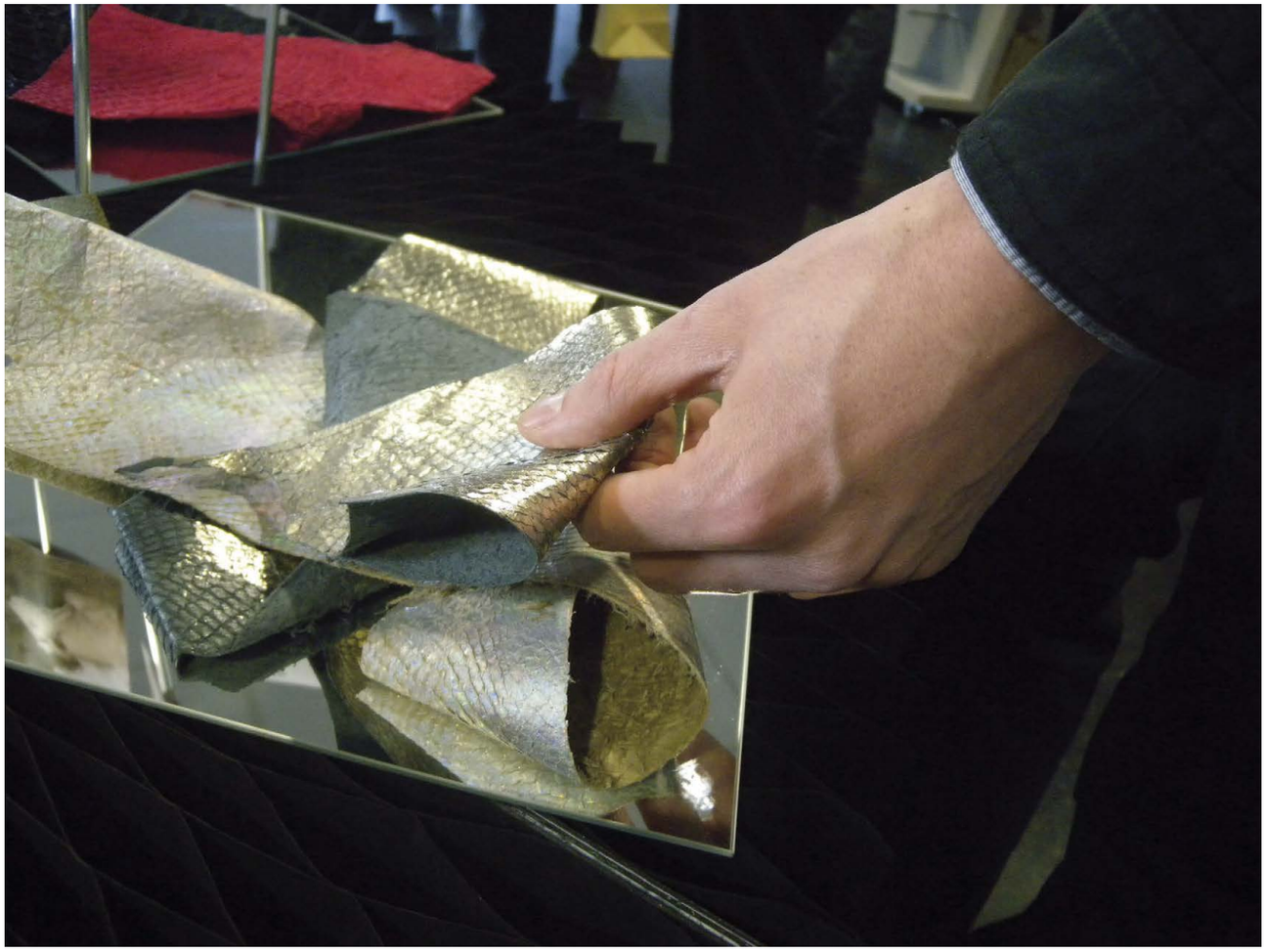
INTERIORS

CERTESENS – ENTER THE REALM OF THE SENSES



THE INTERIORS OF TOMORROW'S TRAINS ARE SET TO BECOME TRULY SENSATIONAL, YES SENSATIONAL, IF NEW RESEARCH LABORATORY CERTESENS DELIVERS ITS PROMISES. THE FACILITY, WHICH OPENED IN MARCH THIS YEAR, IN TOURS, CENTRAL FRANCE, IS DEDICATED TO STUDYING THE DELICATE RELATIONSHIP BETWEEN MATERIALS AND PEOPLE. AND CONSTRUCTOR ALSTOM IS PART OF THE ADVENTURE.

"Just as we were the first in our line of business to have an in-house design bureau, we now want to be the first to integrate the sensory into our train designs," explains Jérôme Wallut, managing director, Alstom Transport France.

Bringing together science, industry, research, and spearheaded by Régine Charvet-Pello and Jean-François Bassereau from rcp Design Global, CERTESENS (Centre d'Etudes et de Recherches sur les TEchnologies du SENSoriel) offers a range of different research facilities, and all sectors of activity lie in its sights: food, cosmetics, transport.... "The laboratory is not purely rail-orientated – not dedicated to rail, but to the role of the senses in all industries," explains Professor Marc de Ferrière from Université François-Rabelais Tours.

"Having said that, we can provide a 'sensory' offer for the rail sector. There are many things that can be done here with regards to developing materials and studying the passenger perception. We are not going to make trains run faster – this isn't the idea," he laughs, "but we can help make passengers feel even better on board."

FROM THE LEAF TO THE PLANK

Lying at the heart of the 700m² laboratory and its activities is the materials library. Long term, this modern-day *cabinet de curiosités* will house several thousand different types of materials. The content is divided into the following five categories:

- **properties:** mechanical, physical, chemical, and electric
- **origin:** synthetic, natural, or artificial
- **nature:** supple materials; ceramics; plastics; ferrous and non-ferrous metals; foams; animal and plant materials, e.g. leather, skin, paper, wood, stone
- **applications:** artisanal to industrial
- **intermediary forms** or **'part-products':** grain, tube, plank, tile or 2D shape; composites and basic 3D shapes; complex 3D materials, simple and complex 3D sandwich panels

CERTESENS firmly believes that by cross-referencing materials in this way it can make significant progress in research. "A material cannot be reduced to a name, to an abstract sum of properties. It tells a story and transforms. From the molecule then from powder to thread. From the leaf to the plank. Its appearance, smell, taste, sound, or the touch sensation procured when it comes into contact with the human skin will be assessed, classified, arranged, and mapped."

Sensory assessment booth

Next door to the library, a total of 16 **sensory assessment booths** form a platform

Sensory materials library

for testers to compare and assess materials based on the senses, as well as their dynamic sensations when manipulated. The results of the studies are being compiled to create a referential tool for sensory perception, as well as providing valuable content and data for the sensory materials library. Longer term, these findings can also be put to valuable use if/when future clients request detailed characterisations of specific materials.

An 18-metre long **colour box-corridor**, "the only one of its kind in the universe!" enthuses Mr Bassereau, is designed for viewing samples of colours and textiles from varying distances, in different lights, and from varying angles of view of observation. Indeed, it is possible to alter the sources and temperatures of light, as well the angles of reflection interacting with the surface or the item being examined. A high-precision tool, it serves two key functions:

- measuring complex colour perceptions
- assessing the visual attributes of an object or a material.

For train interiors, one can imagine the box-corridor coming into its own to engineer improvements to signage, pictograms, and other wayfinding or information panels located on board.

In the **nano-scratch test laboratory**, the *pièce de résistance* is a brand-new piece of equipment by Swiss supplier CSM Instruments. Looking like a high-tech microscope, it is designed to measure the sensations perceived on contact with a material, depending on how they have been treated and the state of the surface.

NEW AVENUES

The first, and to date the only, industrial partner to join CERTESENS, Alstom has given its seal of approval to the initiative by signing a three-year agreement (with an option for a further 24 months) and providing a contribution of €375,000. But the financial backing is not the only benefit to be had. Having a big name on board such a pioneering initiative is crucial too. "For us, to have a partner like Alstom right from the start gives us credibility and is very encouraging," said Professor de Ferrière. But can other constructors join the party or is the door now effectively closed to other rail partners, EURAILmag asked him. Here the professor was circumspect: "CERTESENS is not directly open to competitors of Alstom, but this doesn't rule out us working for them on other rail subjects."

Until recent years, train constructors were competing on the basis of technology and performance. But now that this milestone has been achieved, with all now offering products of similar standards, greater attention is now being paid to details such as the materials for seat cladding and floors, for grab rails and bars, colours and lighting. Hence the reason Alstom has joined forces with CERTESENS, seeing a new avenue for making its interior designs more appealing to prospective clients than those proposed by its rivals.

> **"We know that tomorrow, it will be necessary, and important, to focus, too, on the manner in which people perceive comfort and well-being"**

So is all this talk about integrating sensory perceptions into train interiors simply a new way of packaging rail better? Mr Wallut agrees, but prefers to word it differently, using more 'caring' terms, talking about "recreating the environment and feelings people experience elsewhere in their lives." Meanwhile Ms Charvet-Pello, the female driving force behind CERTESENS, is convinced that the sensory is one way ahead for rail design. "We know that tomorrow, it will be necessary, and important, to focus, too, on the manner in which people perceive comfort and well-being," she told EURAILmag.

THE CHANGING FACE OF DESIGN

One thing is for sure, if this sensory approach does take off in the years to come, sweeping rail into the realm of the senses, it will open chapter three in the design history of the train. Chapter 1 being purely functional – with vehicles built to transport people and goods from A to B, with little, if

Politics, industry, research, and local actors have all come together to bring CERTESENS into being. It is backed by three local firms, Université François-Rabelais, Alstom, regional bodies, and the European FEDER fund to the sum of €3 million, up to 2015

any concern for passenger comfort. Chapter 2, ongoing, is most obvious in high speed trains, i.e. TGV refurbishments and new designs for the Thalys, ICE, .italo, Tokaido Shinkansen, Sapsan... where the focus is on enhancing comfort and services to make for a better journey experience. Already, as Mr Wallut suggests, this second phase in in-train design is laying the foundations for the sensory-based approach, by, for example, creating special 'themed' areas on a train for work, rest or play (iDTGV), or by using lighting and colours to create particular atmospheres (Thalys and its boudoir red).

And the good news with CERTESENS is that the commuter train, rather than its high-speed big brother, is first in line to benefit from the sensory research and development work. "We aim to first apply this kind of approach to suburban trains," confirms Mr Wallut. "Since high-speed fleets are more recent, they are in pretty good condition, whereas suburban trains across the world, many of which have been in service for over 40 years, have skipped chapter 2 in the evolution of railcar interiors. Hence they have largely remained receptacles for transporting people, and little more."

PIONEERING PERCEPTIONS

One of the issues the CERTESENS approach is keen to tackle head-on is the restrictive influence of safety standards. "When designing for rail, we soon realise that with the standards in force we are often obliged to use the same types of materials, which obviously limits our scope," Ms Charvet-Pello sighs. "And as a consequence, the well-being of passengers comes second," she adds. In practical terms, this means designers and constructors seeking the materials that fall in line with the quality passengers are expecting. Rather than saying: "it would be nice to have wood on the seats," the CERTESENS approach is about asking the question: "what sensory experiences are we looking to rouse – soft to the touch?