

### voestalpine opens new “Steel Innovation Center”

- Modern laboratory complex for 70 researchers and testing engineers – investment volume of almost EUR 13 million
- Focus on surface technology and analysis – nanotechnology as a new challenge
- High level R&D funding and patents even during the crisis have reinforced technology and quality leadership.

With a new “Steel Innovation Center” at its Linz site the voestalpine Group has taken another step in the long-term strengthening of its technology and quality leadership. After one and a half years of construction representing a total investment of almost EUR 13 million, the new laboratory complex was officially opened on September 13. It is dedicated to the development of new surface technologies for high quality steel strip, including the underlying surface analysis. The building with a striking metal facade coated with a newly developed external automotive paint provides state-of-the-art work stations for 70 researchers and testing engineers.

#### Even during the crisis: R&D funding and patents at the highest level

Quality, technology, innovation and service: these are the four cornerstones of voestalpine’s successful strategy – which has clearly proved its worth in the past few challenging years. Whereas during the crisis other companies – in particular, those in the international steel industry – significantly reduced their outlay for R&D as well as the number of their researchers, the voestalpine Group deliberately increased its concentration on innovation during this period and kept its annual **R&D budget** at the high level of approximately EUR 110 million. According to the EU, this figure makes the Group the most research-intensive industrial company in Austria.

“We have continued purposefully on our path and thanks to the quality of our products, we were able to get through the worst of the crisis faster and more successfully than others,” said Wolfgang Eder, CEO of voestalpine AG, at the opening of the research center. In order to continue to grow – above and beyond saturated sales markets and volatile raw material markets – it is of decisive importance to continuously develop “new products for new markets,” he pointed out.

Peter Schwab, Head of R&D at the voestalpine Group, underlined the company's clear **commitment to research and development** over many years. "The new Innovation Center marks the current high point of this unshakable orientation."

The key reason for its construction was that not only are products and technologies continuously becoming more complex and challenging, but also the underlying **development processes**. The new "**Steel Innovation Center**" is thus not an isolated research center, but is closely linked with two other facilities that have long been in operation at the Linz site, the "**Steel Development Center**" (focus: materials research) and the "**Steel Processing Center**" (simulation and optimization of processing steps such as welding, pressing and forming).

This connection of know-how regarding materials and processing is a central element of voestalpine's strategy of "firmly establishing its technology and quality leadership for many years to come."

Just how diligently the Group works towards this goal can be seen in the number of **patents** it has obtained. Even though the number of new patent applications dropped sharply last year as a result of the crisis, both worldwide (by more than 4%) and in Europe (by over 8%), voestalpine AG again increased the number of its patents. Despite the simultaneous streamlining of the Group's patent portfolio (some 260 industrial property rights were waived), the number of voestalpine patents rose further by almost 200 to a present total of 3,470 (overall; patents received plus those applied for).

### **Brilliant high gloss laboratory building: innovation in the facade**

The Steel Innovation Center was built in the inner courtyard of Building 04, the headquarters of the R&D organization, and simply due to its **innovative architectural appearance** it presents an interesting contrast to the red brick character of the main R&D building. The new center's glossy silver metal facade was created with a recently developed four-layer complete paint system that was actually developed in cooperation with BASF Coatings as an external automotive paint. This innovation is not yet on the market and has thus become "publicly" visible for the first time in the new research center.

## Steel in new dimensions: classic R&D methods are reaching their limits

In every respect steel has become “more versatile and more diverse.” Alongside the sharp rise in possible combinations within the groups of materials and coatings from six in the 1970s to more than 100 today, the challenge now lies above all in **nanotechnology**, which makes it possible to move into new – almost atomic – dimensions.

In the area of surface technology, voestalpine is a globally recognized leader. In this connection, Eder referred to the latest successful market launch, namely that of “**phs-ultraform®**” for the automobile industry. This is a new press-hardened and hot-dip galvanized steel that was developed in cross-divisional cooperation by the voestalpine Group and is now increasingly being used in luxury models. “In these high quality models the phs grade is already used for up to 15% of the car body. Its key advantages are that it is not only lightweight, but also provides high crash safety, optimized forming properties and cathodic corrosion protection,” emphasized the head of R&D Peter Schwab.

Surface technology is primarily concerned with metallic and organic coatings, such as corrosion protection and paints. In addition to the development of the coatings themselves, it also encompasses further processing possibilities, for example, through the forming or pressing of body components.

“**Surface technology** know-how is a decisive factor in the **strategic orientation** of voestalpine in the segment of high quality flat steel,” stressed Wolfgang Eder at the opening of the new laboratory complex. In the context of the challenges facing the European steel industry – especially the increasing competition of Asian manufacturers and the strong competition posed by alternative materials – the voestalpine Group is making great efforts to continue strengthening its innovation and market leadership in technologically intensive product segments.

One of voestalpine’s top innovations is preoxidation: In the galvanization of modern-day steels, a layer of zinc several micrometers thick (which corresponds to about 1/10 of the thickness of a human hair) is applied to the steel. But decisive for the adherence of the coating is a layer between the steel and the zinc that is only 50 nanometers thick (1/1000 of the thickness of a hair). “In such challenges the classic methods of metallurgy and analysis are reaching their limits,” explained Schwab, which is the reason why the development of **new methods of measurement and**

**analysis** is necessary.

In addition to nanoanalysis this also applies to especially high levels of stress that are in turn difficult to simulate – such as those present in deep-sea environments. Steels that are, for example, eventually used in offshore pipelines where they are subject to especially corrosive conditions, can be tested in the special sour gas laboratory of the new innovation center. Clad plates for pressure vessels or refinery machinery are tested for safety under high pressure and high temperature conditions.

But it is not just a matter of understanding interrelationships and mechanisms – including combinations of several materials such as steel and aluminum or steel and plastics. This knowledge must also be implemented in **production processes**.

Thus the preoxidation process, which is the basis for the highest quality, ultra high strength, hot-dip galvanized steel strip, must be implemented in the most demanding industrial conditions – this means over an area of several square kilometers, at an ambient temperature of 1000°C and on strip moving at the speed of around 120 m/min. Furthermore, it must naturally also be possible for customers to carry out processing steps with new grades of steel in accordance with their own requirements – for example, on the production lines of car manufacturers.

## Global R&D network

The voestalpine Group's global **R&D network** should also be highlighted here. Alongside cooperative activities with customers and suppliers, this presently includes some 80 partnerships worldwide with universities, universities of applied science and research institutes affiliated with universities. More than 10% of the Group's annual R&D budget is devoted to these partnerships.

In this application-oriented basic research, a key focus is on cooperative R&D projects involving **surface technology and nanotechnology**. Recently, for example, an enormous boost in this strategically important area was the initiation of the new SteelCoatingDesign project that is being carried out by voestalpine Stahl GmbH in cooperation with the Johannes Kepler University (JKU) of Linz.

## **“Steel Innovation Center”: key facts at a glance**

Project budget:	EUR 12.8 million
Total floor space:	5,627 m <sup>2</sup> (60,568.5 ft <sup>2</sup> )
Work stations:	More than 70 work stations on 2 floors
Architect:	pbr Planungsbüro Rohling AG Architects and Engineers; DI Jörg Rasehorn, DI Anton Anneser; Magdeburg
Project development and management:	Building Management, voestalpine Stahl GmbH
Facade:	“Complete paint system in brilliant silver” metal facade of voestalpine Stahl, developed in cooperation with BASF Coatings as an external automotive paint