

Press release // Novego – from idea to product

From concept to product – how weighing modules Novego consistently meet customer requirements

With its weighing modules in the Novego range, Minebea Intec has experienced sustained success in recent years. Since being launched two years ago, the high-precision solutions with hygienic design have firmly established themselves in, amongst others, application areas such as the pharmaceutical and food industries. Where does the idea for an innovative product development like this come from and what steps are crucial for it to succeed?

The key to good marketing lies in identifying your customers' problems and challenges and offering them appropriate solutions. For this reason, Minebea Intec's sales team has traditionally placed top priority on gaining a comprehensive understanding of the systems that use its products and on maintaining a close dialogue with those who use the technology. As one of the world's leading manufacturers of industrial weighing and inspection technologies for the food and drinks industry, chemical, pharmaceutical, plastics and cosmetics production and many other sectors, Minebea Intec offers a unique product and service portfolio for the diverse range of applications found in these industry segments.

Precise weighing of a wide range of materials is among the company's key focuses. The range includes various designs of load cells and scales, which have made a huge contribution to the success of Minebea Intec for many years. However, the company's employees did not see positive performance in this product area as an excuse to rest on their laurels. On the contrary, as Holger Nichelmann, Product Manager at Minebea Intec explains: "Based on many conversations with our customers, we identified that there was an ever changing and more stringent requirement from our customers in the practical application of our weighing systems that could lead to easier handling and more precise measuring results in the long term."

All components used need to comply with strict hygiene standards, particularly in fields of application such as the food, pharmaceutical and process industries. That is just a basic requirement but quite often it is the mechanical stresses that can pose challenges for customers. Understanding technical details such as maximum lift loads or horizontal shear forces are therefore crucial in successfully implementing weighing solutions and, in certain regions, even seismic forces need to be taken into account to ensure safe operation. Mistakes are often made when constructing systems, too: once containers reach a certain size, adjusting designs with four legs and the corresponding constrainers is a major issue, which it has not always been possible to resolve in the past.

One common user request was for easy height adjustment of the weighing systems, so that they are easier to adapt to the conditions in the respective plant. Many customers also mentioned the need for a simple angle adjustment option for the load cells, to compensate for uneven floors, which are often sloped for cleaning reasons. Alongside further suggestions for improvement, Product Manager Nichelmann also received feedback from Sales that the impact of shear forces on the measuring accuracy of weighing processes should be reduced. "These forces can be generated when switching on rotating mixing devices or by wind forces and

Press release // Novego – from idea to product

result in measuring inaccuracies, which can in turn lead to unacceptable errors and reduced efficiency, primarily in food and drug manufacture, but also in other application areas,” stresses Nichelmann.

Minebea Intec’s international sales team collected customer requests of this kind and passed them on to Product Management. “We then analysed these requests in detail and in close cooperation with Sales and our in-house Development department and used this as a starting point to design an entirely new generation of weighing modules.” In mid-2018, the company presented the result: weighing modules in the Novego range boast some innovative industry-first features that are perfectly tailored to the needs of everyday practical use.

Precisely positioned strain gauge

According to Klaus Vayhinger, it was particularly challenging for Minebea Intec’s Development department to find suitable solutions for implementing all the customer requests. Vayhinger’s duties in the company include devising new types of load cells. In the case of Novego, some fundamental considerations needed to be taken into account first, recalls the developer: “The Novego family is based on ‘plate spring geometry’, which can be considered to be standard in this sector. However, previous versions were sensitive to shear forces and the principle is typically not very accurate when implemented in load cells. We had already developed products with plate springs at Minebea Intec in the past. Our task was to build on that and significantly improve the accuracy that could be achieved while at the same time modifying the geometry so as to absorb shear forces without affecting the measurement.”

According to Vayhinger, one possible solution could lie in the optimised use of strain gauges. With that in mind, the team of developers at Minebea Intec set about examining the capabilities of strain gauges in much greater depth with the help of complex calculations as per the finite element method (FEM). “First, we assessed the ideas on a theoretical level and then built mechanical prototypes of the more promising approaches and subjected them to intensive testing. In order to bring theory and practice into harmony, we continually refined the model for the FEM calculations on an iterative basis until the result met our expectations.” Increasing the number of strain gauges on the measuring body and positioning them with extreme precision were two key steps in developing the new weighing modules Novego.

Vayhinger and his team also drew on their extensive expertise to find some constructive solutions to the requested details such as height and angle adjustment options, as well as the equally important issue of lifting protection, which are among Novego’s numerous USPs. “Parallel to actually developing the weighing modules, we also had to develop solutions for series production of this new product generation, in order to enable them to be produced economically and to a high quality standard later on,” stresses Vayhinger.

Outstanding customer feedback

Uwe Kummetz, Area Sales Manager Process OEM of Minebea Intec, is certain that these efforts have paid off: “We have received excellent feedback from customers who are already using Novego. These users mention the reduced effort required to install this innovative and simple solution as a key criterion, which is particularly evident when constructing systems with large containers. For constructions like this, Novego rules out any

Press release // Novego – from idea to product

errors in aligning the integrated constrainers right from the outset.” Another advantage, according to Kummetz, is the design of the lifting protection on the new weighing modules: “From a hygiene perspective, too, the current market standard with a threaded bolt for process containers is far from an optimal solution. For this reason, some external solutions are also designed with high mechanical effort; none of this additional effort is required when using Novego.”

When developing the new product, Minebea Intec also took into account the exacting practical requirements in relation to easy cleaning options, hermetic sealing of the measuring chamber, the high corrosion resistance required and protection classes IP68 and IP69, which are crucial in many applications. The developers pulled out all the stops to meet this wide range of objectives: for example, they used a brand-new corrosion-resistant steel for the weighing technology and were thus able to design an extremely successful solution which also looks great: “The design is an important issue in terms of hygienic and structural aspects. However, not only does every customer want a functional product to use, it also needs to look good. The rounded design of the weighing modules Novego is perfectly suited for these requirements,” adds Kummetz, summarizing how the customers feel.

Positive experiences from usage

Some selected Minebea Intec customers were able to gain some practical experience with prototypes of Novego during the development phase, providing some key insights for the final optimisation. The new generation of weighing modules is now successfully in use in many applications. For example, Italian company Logica Progetti was commissioned by a major pharmaceuticals company to plan and implement a project for a mobile container with 350 litre capacity for the production of pharmaceutical syrups. The whole application, and therefore the weighing system, required a precise, reliable, hygienic and secure solution, which was successfully implemented with the help of three weighing modules Novego of accuracy class C3, each with a capacity of 500 kg, as well as a diverse range of accessories such as adapter plates, adjustable feet for the frame assembly, a cable junction box made from stainless steel, and a weight indicator X3 from Minebea Intec. Logica Progetti’s Managing Director Livio Cornelli and owner Valerio Spino were delighted with the result: “The container was installed on three stainless steel supports and equipped with compression weighing modules Novego as well as an anti-tipping device. Our mobile weighing system thus ensures optimal measuring accuracy even when the magnetic agitator is in use, effortlessly absorbs lateral forces and, thanks to its hygienic design, also enables fast and efficient cleaning without residues for optimal sterility.” Cornelli and Spino also see the fact that Minebea Intec’s technical personnel carried out the acceptance and verification at Logica Progetti and at the end customer as another reason to highly recommend purchasing a Novego.

The high precision and flexibility of Novego were also crucial criteria for selecting Minebea Intec as the supplier of the weighing solution in another application in the pharmaceuticals industry. While planning the construction of a plant to produce liquid pharmaceuticals in the Kingdom of Bahrain, systems constructor Pharmatec was faced with a particularly challenging problem: they needed to dose tiny quantities with millimetre precision from tanks with a capacity of several tonnes. They also needed to ensure reliable

Press release // Novego – from idea to product

repeatability of measurement results, as even the smallest deviations when manufacturing pharmaceuticals can have adverse effects on health.

Pharmatec GmbH is part of Robert Bosch Packaging Technology GmbH and is the competence centre for pharmaceutical process systems in the group. The company is a technology leader in the sector of plant manufacturing for the production of liquid substances and medicines. Pharmatec emphasised the key role played by Minebea Intec's weighing modules Novego in overcoming this difficult challenge: "Alongside the complete weighing reliability and the significance of ensuring that the weighing solution could deliver repeatable results, complying with the hygienic design directives was also a fundamental requirement for this application. An awkwardly positioned pump also added to the challenges in construction. This is where the weighing modules Novego's integrated infinitely variable height adjustment of up to 8 cm came in, enabling the installation height to be adapted to the current requirements with no hassle." The successful implementation of six vessel scales into the production process enabled compliance with the customer requests for high process reliability and precision in accordance with accuracy class C3 as set out by the OIML. Novego's ability to withstand shear forces, the integrated mounting kit consisting of 360° conainer, lifting protection and tilt protection as well as the hygienic design to ensure efficient cleaning processes and the high resistance to cleaning agents and corrosion were all key decision criteria for Pharmatec. "Minebea Intec provided support throughout the design process as well as the installation and calibration. We are convinced that, with Minebea Intec's components, we have found an extremely precise and durable weighing solution for our process containers. The weighing module Novego was simply the perfect solution for us," summarised Pharmatec.

In the view of Novego Product Manager Holger Nichelmann, the work put into developing the new generation of load cells has more than paid off: "In many areas new ideas merely represent small improvements or optimisations. This is not the case with Novego – here Minebea Intec has created a genuine innovation and an entirely new concept in process container weighing. We have had 100% positive feedback from our customers, which we are, of course, delighted about." Nonetheless, according to Nichelmann, there are already ideas on how to enhance the weighing module: "Novego currently has a maximum capacity of 2 tonnes. This only covers a small number of the possible applications, so we are considering how we can continue to develop this unique principle and adapt the design for higher mechanical forces." The success story of Novego is therefore far from over.

Press release // Novego - from idea to product



Novego_single.jpg

The weighing modules Novego from Minebea Intec have firmly established themselves in application areas like the pharmaceuticals and food industries among others



PIC_logica_progetti_Novego.jpg

The weighing modules Novego are installed using an intuitive mounting kit

Press release // Novego - from idea to product



PIC_PR_Novego_high_CMYK_300dpi

The installation of the weighing module couldn't be easier thanks to the integrated height and tilt angle adjustment



Novego_process.jpg

Hygienic design is vital in the pharmaceutical industry in order to enable maximum sterility

Please send us a PDF of your publication.

When publishing the article online, please link to
www.minebea-intec.com