SMC WORKS ON KNOWLEDGE-INTENSIVE PROJECTS IN THE SEMICONDUCTOR INDUSTRY

COOPERATION WITH SPECIALISTS IN JAPAN

Many people know SMC for its extensive pneumatics portfolio. A global leader in this technology, the company has also been making waves in the semiconductor industry for some time. In addition, the Research & Development Centre in Tokyo and the SMC Technology Center in Eindhoven provide the necessary support when technical innovations are needed.

BY MARJOLEIN DE WIT-BLOK

Founded in 1959, SMC was initially a manufacturer and supplier of pneumatic products. The company now includes more than 500 offices in more than 80 countries worldwide, employing over 20,000 people. The number of different products and markets expanded steadily over the years: from pneumatic products for a diversity of industries to innovations for the demanding semiconductor industry. Silvester Engelen, Electronics Industry Manager at SMC Netherlands, comments: 'This growth is still ongoing. We turned over 7 billion euros last year and expect to add another 2 billion for the coming year. One reason for this is the growth precisely in that semiconductor industry. Remarkably, despite this growth, SMC is still a family business with the various associated characteristics. Above all, we are aware of the times we live in and therefore focus on solutions to make the world a little better. Sustainability, for example, has had our attention for many years and resulted in the development not only of energy-efficient products but also of products that are more compact and lighter. This is how we save raw materials and CO_2 emissions. Other areas of focus in recent years have been sharing knowledge with customers, machine safety and Industry 4.0.'

Silvester Engelen: 'It is a real challenge to help large, important parties find solutions to a specific problem. Keeping up keeps you on your toes. After all, today's specials are tomorrow's standards.' Photos: SMC

TECHNOLOGY CENTER

From its headquarters in Amsterdam, SMC Netherlands is a representative and supplier of the products developed in Japan. The team of specialists in the Netherlands therefore assumes the delivery of solutions based on standard products. 'That means that there is extensive knowledge and experience here to choose the right "building blocks" from the vast SMC range for a specific application, and with this to offer the customer an optimal solution, in terms of effectiveness, efficiency, safety and energy consumption. But if standard products do not achieve the desired result, we enlist the help of engineers who work in the Netherlands but often also in Japan', Engelen says. The Dutch engineers work largely at the SMC Technology Center in Eindhoven, which – because of current growth in the semiconductor industry – will soon expand. It is a 'versatile' centre that also houses a professional Chiller Service Center for maintenance and repair of SMC Thermo Chillers from all over Europe. In addition, this is the location where training sessions are held and all facilities are available to conduct tests or make prototypes with and for customers. 'The centre also plays an important role in making easy modifications to standard products. For this purpose, we have professional machinery there. Our specialists know exactly which modifications result in a solution that accurately meets the customer's requirements and wishes.'

UNPRECEDENTED DEMANDS

Last but not least, the Technology Center is the place where developments take place that are significant for SMC's growing role in the semiconductor industry, Engelen says. 'This market has become so important that we commissioned an ISO 6 validated cross flow clean room in March 2018. With this we offer the high-tech region of Eindhoven a complete service; including with the production of Grade 4 assemblies.'

He continues: 'In the semiconductor industry in particular, the accuracy requirements are unprecedentedly high. Using that clean room to develop, test and assemble products and subassemblies for this industry. We want to make the most of that. For example, specific ISO classes have been established that apply to a certain amount of solid particles in a specific space. But there are companies in the Netherlands that raise the bar some more and also have requirements for existing gases and cleanliness of surfaces. In the future, we also want to meet these requirements.'

COOPERATION WITH JAPAN

Despite its size, the possibilities in Eindhoven and the large amount of knowledge and experience available in the Netherlands, SMC Netherlands works a lot with Japan for the more complex issues, especially when it comes to work for the semicon industry. Tokyo is home to the innovative heart of the company,

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VACUUM-VALVE PRODUCT DEVELOPMENT

One product with which SMC created significant added value for its customer is a special vacuum valve ('base frame gate valve') that divides a vacuum chamber in a larger machine into two. When maintenance needs to be performed on this machine, this valve eliminates the need to pump out the entire room, saving a significant number of hours during the maintenance process. Silvester Engelen: 'When you work for sectors like the semiconductor industry, you know that every hour of downtime is extremely costly. So it pays to think about all possible solutions to minimise both unplanned and planned downtime – as in this example for performing maintenance.'

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where high technology is developed with the future in mind. Engelen: 'We almost always call on Japanese engineering because of a question we cannot fill with standard products or simple modifications to the existing range. The modifications then go so far that it is better to invest in developing a completely new product.'

A first important step in these processes is to determine the exact requirements and wishes of the customer. 'For this, we put together our own development team in the Netherlands that, in close consultation with the customer's specialists, defines these requirements as precisely as possible. This information is then transferred to the Japanese engineers, mostly on site in Japan.'

SMC sits at the table with different people, each with their own 'interests,' continues Engelen. 'In case of complex, capital-intensive projects, everyone with their requirements naturally wants to be "safe". That means that sometimes you have to deal with requirements that lead to overdimensioning in any area. Therefore, it is important to continually assess carefully whether certain requirements are really necessary. Does it really have to be so clean, so small or so fast? Or is it also possible to do a little less without problems while maintaining quality?'

TESTING TO THE MAX

After the transfer of information, the actual development of the product and continuous communication of progress and intermediate results begins. One of the regular parts of the design process is testing the final solution. This involves destructive testing: the solution is burdened as often or as heavily until it finally fails. By doing this a number of times, SMC can make a reliable statement about the expected lifetime under certain conditions. Engelen explains: 'When gathering information, we focus heavily on the environment in which a particular solution is to be applied. Indeed, the environment determines the guidelines according to which we must work. For example, what should be the cleanliness class of the environment in which the product is assembled.'

The SMC Technology Center in Eindhoven.

COMPLEX ISSUES

Working with Japan on complex issues for the semiconductor industry, among others, is an optimal approach for the Dutch site. Silvester Engelen: 'It is a real challenge when you are asked by large, important parties to help think of solutions to a specific problem (see box). But it is also a godsend. Of course, you can try to figure out for yourself where the latent need of the market lies, but it is much more efficient if the market itself comes up with it. Then you know you are working on exactly the right issues. And it keeps you on your toes to keep up and that really appeals to us. After all, today's specials are tomorrow's standards. And you'd better control those then.' ●

● **www.smc.eu**