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A recipe for greater productivity

Symrise, the fragrance and flavor additive manufacturer, continues to develop new potential to increase productivity. The Manufacturing Execution System and TERMEX, an interactive operator terminal by Pepperl+Fuchs make important contributions.

History

The origins of Symrise, based in Holzminden in Lower Saxony, Germany, stretch back as far as 1875 when chemists Wilhelm Haarmann and Karl Ludwig Reimer built a factory to manufacture synthetic vanillin. In 1919, barber Carl Wilhelm Gerberding who was a regular customer of Haarmann & Reimer, founded another company in Holzminden. Dragoco Gerberding & Co initially produced perfumes for personal use. After Haarmann & Reimer and Dragoco had been operating successfully as independent businesses and became increasingly active on the global stage, the two companies merged in 2003 to form Symrise. Today, the company employs a staff of approximately 5000 people in more than 30 countries. In the last fiscal year, Symrise generated sales of approximately 1.3 billion euros, making it the fourth largest supplier of fragrances and flavor additives in the world.

Product range

Continuous product innovation and improvements in the manufacturing process were decisive factors in the success of the company. Research and development provide added quality and functional benefits for the end customer, and aromas can significantly reduce the salt, fat or sugar content in foodstuffs. Symrise registers about 40 patents each year. Their product range currently comprises approximately 6000 items manufactured from 3000 different raw materials. The production managers regularly encounter new challenges because of the diversity of the product range and high quality standards. Incoming orders can increase sharply: Whether an advertising campaign for a customer's product was particularly successful or favorable weather conditions increase the demand for ice-cream –

Symrise customers expect prompt, reliable deliveries of all the flavoring agents they require. Symrise guarantees short delivery times and a delivery reliability rate of more than 98%.

Technical boundary conditions

Symrise has adopted the same philosophy as its founders by investing continuously in production facilities and process controlling systems to guarantee maximum flexibility, quality and productivity. The ERP (Enterprise Resource Planning) system used throughout the company is SAP R/3. Symrise technicians have installed a so-called Manufacturing Execution System (MES) on the plant management level, which is one echelon lower in the IT hierarchy. Unlike the ERP system, this process-based system is linked directly to the automation level and therefore enables the control of production in realtime. The MES controls the segmenting of an order. It divides a production order into suborders and specifies processing sequences and required equipment and materials – this can be quite a demanding task considering there are typically 20 to 50 ingredients in each product and order volumes can amount to anything between 10 kilograms and 15 tons. The smallest possible weighing unit is just a few milligrams. Extensive quality controls and the documentation of batch production are also required due to the complexity of the overall manufacturing process. All processing steps have to be cleared by the relevant operator. The MES manages the recipes dynamically while taking into account the various qualities of natural raw materials listed in the quantity specifications.

Hardware in the safe area

More than 80% of the manufacturing process is automated at Symrise by using automatic metering units. The remaining 20% of the manufacturing process is performed manually. The weighing stations in the safe area are fitted with scales and connected to PCs in order to provide visual assistance throughout the weighing and mixing process. Dr. Ludwig Tumbrink, Production Manager at Symrise, justifies the use of PCs instead of numerical displays: "The weighing process is much more accurate and finishes more quickly if the metering cycle is displayed in the form of a graphic progress bar, for example, rather than numbers." "For us, an increase in productivity is the most important criterion for defining processes and designing workspaces."

Hardware in the hazardous area

When the MES was introduced, process visualization in hazardous areas became even more complex. "It must be possible to install a suitable terminal in main zone 1 and the terminal must also be insensitive to many different chemicals and fluctuations in temperature prevalent under harsh ambient conditions. Interfaces to the remaining IT infrastructural elements and a function that illustrates all the process steps in the MES are also required."

explains Karsten Woitas, responsible for technical production equipment at Symrise. Two options for displaying the MES in hazardous areas were considered: First of all, Symrise technicians tested weighing terminals supplied by a leading scale manufacturer. Then commercially available operator terminals for hazardous areas were assessed to determine the extent to which Symrise MES processes could be displayed.

Choosing TERMEX

A decision was made in favor of the TERMEX operator terminal by Pepperl+Fuchs. This intrinsically safe device with a 5.7" display is suitable for use in hazardous areas that correspond to ATEX Zone 1, 2 and 22, but is also approved for the North American market (Class I, Div 1). With enclosure degree of protection IP65, a TERMEX terminal can operate at ambient temperatures between -20 °C and +50 °C. Even the most complex processes can be displayed using the TERMEX Pro device software. Unlike weighing terminals, the operator terminal is interactive and can even process input variables.

A convincing argument in favor of the TERMEX operator terminal is the size of the display and the possibility of displaying graphics. The decisive factor for Symrise was ultimately the option of connecting the device to scales. The TERMEX allows the connection of intrinsically safe scales, in particular those manufactured by Sartorius or Mettler-Toledo. The device also has an interface for barcode readers, which are used at Symrise for connecting SCANEX handheld barcode reader that are also manufactured by Pepperl+Fuchs.

Summary and future outlook

The robust TERMEX has excelled at Symrise. The operator terminal has also been used for tasks other than weighing, e.g., as a machine terminal, for quite some time. Support for manufacturing processes controlled by the MES remains the most important application area of the TERMEX terminal. Dr. Ludwig Tumbrink: "The TERMEX is capable of displaying our processes in line with requirements, which is not the case with similar terminals offered by other suppliers".

Key words: Symrise, Haarmann, Reimer, Holzminden, fragrance, aroma, scent, care, flavor, nutrition, TERMEX, SCANEX, barcode reader, operator terminal

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Fig. 1: Symrise in Holzminden is the fourth largest aroma and flavor additive manufacturer in the world.



Fig. 2: Scale interfaces are indispensable in recipe management



Fig. 3: TERMEK operator terminals can also be used in aggressive atmospheres.



Fig. 4: Text or graphic display: The 200 TERMEX series terminals



Fig. 5: The 300 TERMEX series is ideal for complex projects