

Belgian medical devices supplier Orfit Industries opted for non-nuclear Hammer-IMS thickness measurement system

Orfit Industries executes extrusion quality control of engineered thermoplastic sheets with inline Hammer-IMS measuring system

The innovative thickness measuring system of Hammer-IMS is exactly what Orfit Industries in Antwerp needs for its high-temperature thermoplastic extrusion line. Medical specialists worldwide use Orfit's thermoplastic sheets for orthotic and prosthetic purposes. Bram Moons-Baitel, Orfit plant manager: "The non-nuclear M-Ray technology of Hammer-IMS perfectly deals with any sheet color, transparency level or thickness value, unlike the laser-based solution used previously. The inline multi-sensor system delivered by Hammer-IMS scans across the entire sheet width for maximum coverage of the thermoplastic material, which is still around 100 degrees Celsius or more. It is important to robustly measure directly on the hot, freshly extruded material without touching it. Hammer-IMS enables Orfit to respond and adjust the process much faster to keep material thickness steady and avoid wasting tons of high-grade thermoplastic material."



Qualitative orthotic and prosthetic extrusion plates

Innovative technologies are at the heart of Orfit Industries in Wijnegem in the Antwerp region of Belgium. The company develops and produces the most precise and reliable thermoplastic materials for medical devices that improve patient treatments around the world. Recently, Orfit installed a Hammer-IMS thickness measuring solution for its high-temperature thermoplastic extrusion line. Bram Moons-Baitel: "By keeping a closer eye on extrusion thickness, Orfit minimizes material waste and maximizes the quality of its orthotic and prosthetic product lines. Our orthotic fabrication materials are used for patients in physical rehabilitation and prosthetic socket materials for amputee patients."

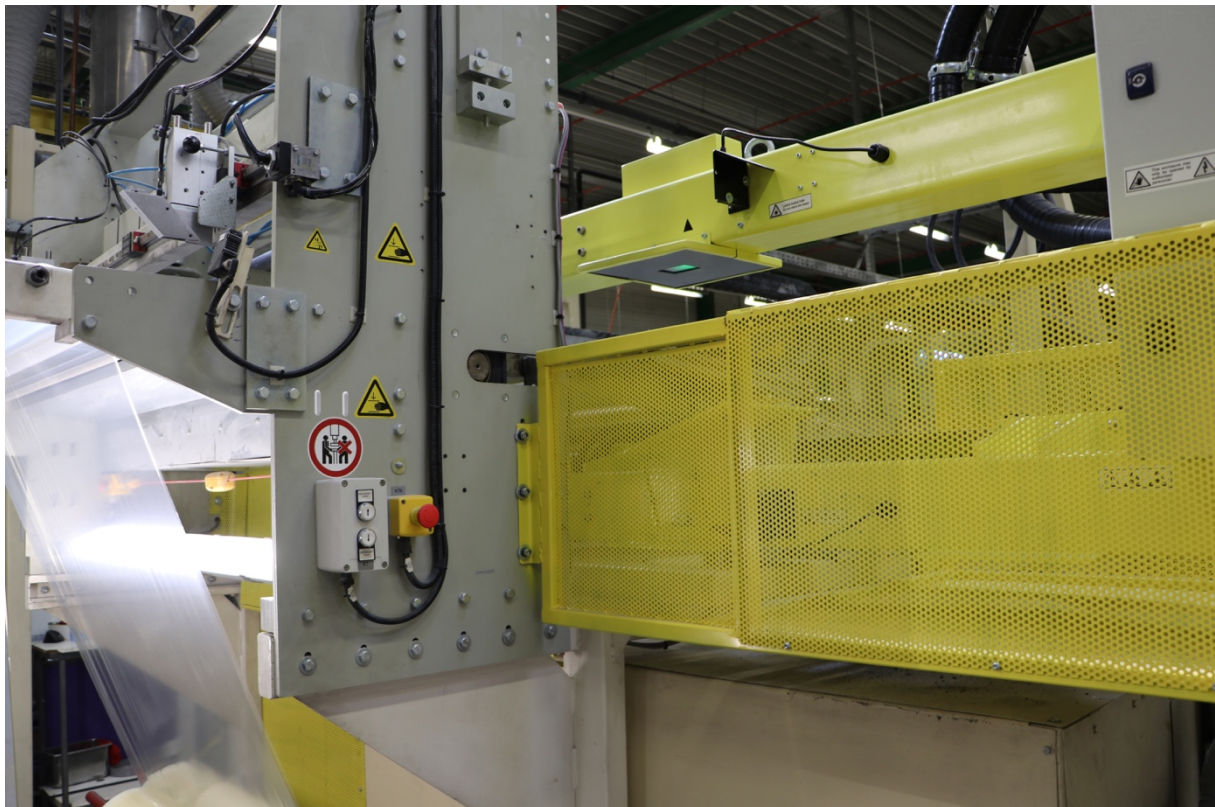
The thermoplastic extrusion process is very sensitive. Changing environmental conditions (temperature variations, air circulation, air humidity, etc.) influence the thickness of the extruded sheets. Previously, Orfit tried a fixed laser-based measuring system. Unfortunately, the use of the laser sensor faced problems when measuring certain material colors and transparency levels. Also the sensor was unable to adequately withstand the heat in the early extrusion process stages. Orfit was committed to extensive manual thickness measurements to keep the extruded material variants within specifications.

From laser to M-Ray based thickness measurement

Bram Moons-Baitel said that he was glad to hear about the emerging M-Ray measuring technology of Hammer-IMS. “After installing our new Hammer-IMS system in our thermoplastic extrusion process, things really changed. First of all, the measuring system can be positioned right after the chilling rolls to measure the hot, freshly extruded sheets. The Hammer-IMS system verifies material thickness variations caused by variations in the extrusion bank which may slightly shift under varying pressures.”

“Thanks to two scanning M-Ray sensors operating with high standoff distance, there is sufficient transversal material coverage without risking overheated sensors. By measuring 9 meter more upstream in the process, we can promptly adjust extrusion parameters locally to maintain correct thickness and avoid significant amounts of material waste.”

Bram Iliens, Hammer-IMS Product and Development Engineer: “The contactless M-Ray technology – based on electromagnetic millimeter waves – supports fast and accurate measurements. The M-Ray wave travels from the transmitter to the thermoplastic material, penetrates it and continues its path to the receiver. The time delay of the M-Ray wave caused by the material results in the thickness measurement of the material.”



For Orfit, the use of its M-Ray based measuring system of Hammer-IMS is advantageous in every aspect. According to Bram Moons-Baitel, “the Hammer-IMS solution is the only system available that is contactless, heat resistant and non-radioactive and able to measure transparent material.” Although Orfit already operated non-radioactive measurements in the past, the M-Ray technology is transforming other plastics, fabrics and nonwovens industries which are currently standardized on nuclear or radioactive measurements.

Intuitive sheet thickness adjustment saves material

“Organizing and executing thickness measurements at Orfit is fairly straightforward,” says Bram Iliens. “The manager of the extrusion division sets up the measurement ‘recipes’, which takes into account the gain factors that characterize thermoplastic shrinkage. Machine operators simply select the appropriate recipe and start measuring. During production, they keep an eye on computer screens with extrusion-related information and the Hammer-IMS display showing transversal sheet thickness in real time.”



Automated measurements and graphic result displays replace manual and cumbersome measurements executed in the past. “Now, the operators take pride in tuning thermoplastic thickness to much sharper accuracy levels than specified,” says Bram Moons-Baitel. “Typically Orfit produces sheets with thicknesses between 1.2 and 15 millimeters. The digital measurement results and calibration reports are also extremely helpful for us to insert into audit documents, to comply with tight regulation of the medical devices sector.”

When preparing a material switch in production, the setup of the extrusion line is rebuilt. Bram Moons-Baitel indicates that when starting up the line, Orfit operators are now able to promptly adjust the material thickness to avoid wasting hundreds of kilos of material. All wasted material is recovered by using in lower-grade products or ecologically recycled.

Short payback time thanks to ROI below two years

As part of the evaluation process of the Hammer-IMS system purchase, Orfit has taken into account a number of economic parameters. Bram Moons-Baitel clarifies that he anticipates a return on

investment (ROI) of less than two years, which is mainly financed through material savings. “Every saved kilogram of costly thermoplastic material through better thickness measurements has real impact. We use high-grade material to ensure that our clients benefit from steady resistance to stretch (RTS) performance when heating up our thermoplastic sheets. Executing intuitive and reliable thickness measurement forms an integral part of maintaining the high material quality that our customers rely on.”

“We see Hammer-IMS as a long-term partner,” concludes Bram Moons-Baitel. “Its robust and contactless M-Ray technology is exactly what we need for our thermoplastic extrusion line. The Hammer-IMS thickness measurement solution is contactless, non-radioactive and able to measure transparent sheets. It is also heat resistant because it operates with a standoff distance of up to 40 centimeters. The orthotic and prosthetic materials rolling off our production line are shipped to more than hundred countries across the world. Orfit intends to keep its production in Belgium, as its located near the port of Antwerp for flexible inbound of high-quality plastic materials.”



Bram Moons-Baitel

Four years ago, Bram Moons-Baitel was appointed Plant Manager of Orfit Industries. Before that, he successively held various technical and supervisory roles within the company. His natural interest in technology and eye for innovation enable Bram Moons-Baitel to establish and maintain qualitative and efficient production operations. According to him, the location for Orfit’s plastic extrusion manufacturing near Antwerp offers strategic advantages. The port of Antwerp ensures flexible inbound of high-quality plastic extrusion materials. Orfit’s location is also beneficial for attracting highly qualified plastic extrusion specialists.

