

Success Story

"It's not a tube you're investing in – it's safety"

For many years, APT has been relying on inline X-ray measuring systems from SIKORA

Founded in 2011, the German company APT is specialized in the production and processing of fluoropolymers. At their location in Neuss, over 30 employees ensure daily that fluoropolymers become high-quality tubing, shrink tubes and profiles. Since the start of 2017, APT now belongs to the publicly listed Masterflex Group based in Gelsenkirchen, Germany.

What customers can expect from APT is already visible in the company name. "APT stands for 'Advanced Polymer Tubing' and describes high-quality tubes with characteristics that are well above the standard market portfolio", says Erich Kipping, who, together with Holger Heuser, is Managing Director of the company since its foundation.

There are only a small number of manufacturers worldwide, who specialize in fluoropolymer tubing with a similar portfolio. The reason is that fluoropolymers are very specialized. Not only are they extremely temperature resistant, but they are also resistant to almost all types of chemicals, such as fuels, solvents or lye and are even long-time weather-resistant. "Fluoropolymers are becoming essential when high temperatures, aggressive chemicals or both are involved", says Kipping. Additionally, fluoropolymers are ultra-clean and biocompatible and, therefore, suitable for especially demanding applications, which would not be achievable with common polymers.

Applications for fluoropolymer tubing

Due to their chemical resistance, the polymers are used in process and plant engineering, amongst others, for heat exchangers for power plants or the transport of aggressive media. In the paint industry, entire painting lines are equipped with hoses from APT for the paint supply. Fluoropolymer tubing can also be found in the sector for consumer goods. The low surface energy allows an easy cleaning of the products and prevents, for example, fried egg sticking to the familiar Teflon® frying pan. In automatic coffee machines, tubes are applied for the supply of hot water. Here, the special demands are: They must withstand constantly high temperatures while simultaneously being pure – meaning without any kind of additives and plasticizers - so that they are physiologically safe. "Purity is not just essential for food and nutritional products", says Kipping. In the semiconductor industry, so-called silicon wafers for the manufacturing of computer chips are exposed during the production process, developed and corroded. "The used chemicals pass through ultra-pure, resistant fluoropolymer tubing", explains Kipping. A further exciting field of application for these hoses is the laboratory, analytics and biotechnology. "During criminal investigations, a DNA analysis is commonly done with automatic equipment. Our tubes are also built into these devices. Thereby, each centimeter of tubing must meet the highest quality standards. After all, no one should be sent to prison if innocent", says Kipping.

Due to the fact that tubes from APT are being used in various operating and security related areas, their production is subject to numerous standards. In the USA, for instance, drinking water and food compatibility is certified by the FDA (Food & Drug Administration). Furthermore, for medical technology, there are standards or regulations,

such as ATEX, which regulate constructions in potentially explosive areas. For such application, tubes must be electrically conductive in order to avoid electrostatic charges. In addition, there are fire protection regulations, as well as fire protection classes, for example, for the use of tubes in airplanes. This ensures that in case a tube ignites through fire, it will melt eventually, but it will not burn because it is self-extinguishing due to its structure.

Professional Quality Management

For APT it is crucial to comply with standards to fulfil customer demands. Here the Quality Management plays a significant role. "Naturally, we are certified according to ISO 9001. All of our products are manufactured according to this standard and documented", explains Kipping. To ensure the quality of the tubing and optimization of production processes, APT applies online measuring and control technology from SIKORA in their extrusion lines. In the past, the classical testing technology was a mere sampling inspection. Tubing sections were measured randomly regarding their inner diameter, outer diameter, wall thickness and ovality of the tube. The tube was run on the machine and after a certain time a sample was taken, which was then measured with the aid of a caliper rule and test pin. If the tube met the specifications, it was manufactured for the customer in the requested length. At the end of production, another sample was taken and measured. The quality of the complete tubing length was evaluated by the two samples.

Inline X-ray measuring systems from SIKORA

Over the years, the used measuring equipment was further developed and optimized. The sampling inspection was gradually replaced by the continuous inline quality control. "There are a number of methods for dimensional control", says Kipping. "Since our foundation, we have chosen to use X-ray measuring technology from SIKORA. The decision was made on grounds of experience we gained by using other technologies and which showed us its limitation for the kind of measurements we needed. This was mainly regarding reproducibility of the data and their accuracy."

The X-ray measuring devices of the X-RAY 6000 PRO series from SIKORA reliably and precisely measure the wall thickness, eccentricity, the inner and outer diameter and the ovality of up to three different material layers of a tube. With the inline measurement, the measuring values are visualized on a big display of the corresponding processor system both numerically and graphically. The operator at the line can see at a glance if the values are within the defined tolerances. "The application of our X-ray measuring devices is very flexible. As with APT, it can be installed directly after the extruder - thus, before the cooling trough - or alternatively between two cooling troughs", explains Peter Hügen, Area Sales Manager at SIKORA AG and first contact for APT.

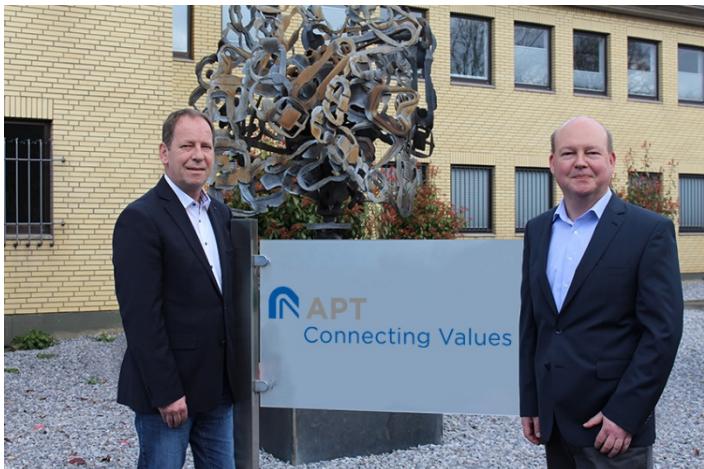
Right from the start, APT wanted to take a leading role regarding the quality of their products. We define ourselves mainly by the characteristic quality and this is a crucial aspect, as meanwhile, there are various suppliers of tubing from other countries. For this, a continuous quality control is necessary. With an inline-measurement of the products, quality can be quicker assessed, controlled and reproduced", explains Kipping. Measuring devices do not just serve for quality control, but also assist the machine operator to operate his equipment efficiently. An eccentricity of the wall thickness, for example, is displayed on the monitor as an eccentric ring, whereas the position of the thinnest wall thickness is highlighted in color. With this information, the operator can intervene and control the process much sooner and prevent the production process exceeding the tolerance limit. Therefore, with the automatic control of the line speed or the extruder rpm in consideration of the minimum values, the devices from SIKORA ensure an optimal process control.

Recording is also a crucial element of Quality Management, as customers usually require a measurement report. Each centimeter of tubing that APT delivers to customers can be assigned to a corresponding recorded measuring value. "This is an essential element of our Quality Assurance", emphasizes Kipping. "Naturally, we are not the only manufacturer who is using X-ray devices from SIKORA, but hardly any businesses are on the same quality level as we are. Furthermore, we have a very low customer complaint rate, which is constantly below one percent. Sometimes it is just wiser to invest in a higher-quality product right from the start. I always tell our customers: It is not a tube you're investing in – you're investing in safety. These are not gardening hoses with which you water the lawn, but tubes where a breakage can be very costly and can have severe consequences", explains Kipping. In addition to the continuous inline-dimension measurement, material saving is an important topic for APT. "Ultimately, we have a relatively low material waste – effectively, we have little to dispose of", says Kipping. "This is always desirable considering the comparatively high costs of raw material for fluoropolymer." SIKORA's X-ray measuring devices help to reduce waste, as measuring values are available immediately after the start-up of the line. Therefore, the start-up process is relatively short and is carried out without significant material loss.

Erich Kipping is especially pleased with the cooperation with SIKORA; not only regarding the measuring technology and the accompanying benefits, but also with the customer support. "In SIKORA, we have found a reliable and competent partner who is available at any time and offers perfectly customized solutions. Therefore, we will continue to use measuring devices from SIKORA in our lines in the future."



Picture 1: SIKORA's X-ray measuring system X-RAY 6000 measures all hose parameters. At the monitor of the processor system ECOCONTROL 6000, the product data are being visualized.



Picture 2: Close cooperation between APT and SIKORA: Peter Huegen, SIKORA Area Sales Manager (l.) and Erich Kipping, APT Managing Director (r.)

Masterflex Group

The Masterflex Group is the specialist in the development and manufacturing of sophisticated connection and hose systems made of high performance plastics and fabrics. United under the umbrella brand Masterflex Group there are six specialists as product brands for various connection requirements: besides Masterflex these are Matzen & Timm, Novoplast Schlauchtechnik, Fleima-Plastic, Masterduct and APT. With further operational units in Europe, America and Asia, the Masterflex Group is represented almost everywhere in the world.

SIKORA AG

SIKORA is a leading global manufacturer and supplier of measuring and control technology for the hose and tube, wire and cable as well as optical fiber and plastic industries. With more than 200 employees worldwide, 13 offices and more than 30 regional representatives all over the world, the medium-sized company provides customers with innovative product solutions and individual service. The measuring and control systems are exclusively made at the headquarters in Bremen/Germany. Innovation, product quality and customer satisfaction define the daily activities at SIKORA.

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