



Some of the huge air ducts run at dizzying heights and can only be reached with a manlift



Armacell's pre-covered elastomeric insulation material, was specified for insulating all pipes and ducts of the air-handling system

## Arma-Chek Silver in the world's largest lyocell plant

### Austrian Vöcklabruck district is the site of Europe's biggest ever Arma-Chek project

The extensive pipe- and ductwork of the air-handling systems in the Lenzing Group's new lyocell fibre plant had to be insulated on a very tight schedule. Together with the project management the insulation company Knieringer found in Arma-Chek Silver the optimal solution for the complex requirements.

The Lenzing Group's new lyocell fibre plant is record-breaking: in just 24 months the most modern fibre production facilities in the world were constructed at the company headquarters in Lenzing (Austria). The production line with a capacity of 67,000 tonnes per year is around four times as big as previous lines. This is where lyocell fibres are manufactured – man-made regenerated fibres made from cellulose, which Lenzing AG sells under the brand name TENCEL®. Lyocell fibres made by Lenzing are used in the textile industry and also for nonwoven fabrics and technical applications. With the new plant the Lenzing Group is consolidating its position as global market leader for lyocell fibres. The new line has enabled the annual capacity to be increased from 155,000 to 222,000 tonnes. The company invested around 150 million euros in this project which marks a technological milestone for the Lenzing Group. With the new facilities Lenzing is further strengthening the position of TENCEL® as a universally usable textile and nonwoven fibre on the international market.

Construction of the jumbo line went according to plan, both

financially and in terms of time. Apart from one day of bad weather, work was carried out day and night to stay on schedule.

The manufacturing of lyocell fibres is revolutionary. The production process is based on a solvent spinning procedure and is the greatest achievement of cellulose fibre technology. Due to the closed production loop, lyocell under the TENCEL® brand is the fibre of the future: environment-friendly and economical. The lyocell fibre is a functional fibre made from a natural raw material. It is of botanical origin as it is extracted from wood pulp. Lyocell's environmental performance is very good – up to 100 times less water is used in its production than in that of conventional cotton.

#### **Air-handling system is a key component of the patented production line**

The wet-spinning process results in very high temperatures and high humidity in the production areas. Part of the new patented TENCEL® line is an innovative air-handling concept. The ventilation pipes and ducts are made of stainless steel and aluminium.

#### **Highest requirements for the technical insulation**

The temperatures and high humidity in the spinning hall are very different from the outdoor conditions where temperatures range from -16 °C in winter to +35 °C in summer. So it is essential that the air-handling equipment is

insulated efficiently. For the project manager of Lenzing AG, closed-cell insulation material was the only option in these ambient conditions. At the same time, the product had to be UV resistant and easy to clean. Arma-Chek Silver, the pre-covered elastomeric insulation material made by Armacell, was specified for insulating the entire pipe- and ductwork of the air-handling system.

### **UV-resistant, easy-to-clean 2-in-1 system**

Arma-Chek Silver is an Armaflex insulation material with a flexible covering consisting of a tough polymer layer, a double-layer laminate of aluminium and a UV-resistant polyester foil. Due to its attractive silver-coloured surface this is a reliable insulation system which can also be used in applications with high aesthetic requirements. The smooth surface also makes Arma-Chek Silver very easy to clean. Furthermore, the system is highly resistant to various acids, alkali and salt solutions, hydrocarbons, alcohols etc. This not only provides installations with tough protection against aggressive ambient conditions, but also means that disinfectants can be used for cleaning. The UV resistance of the multi-layered covering materials is continuously subjected to weathering tests in accordance with DIN EN ISO 4892 (Weather-Ometer).

Especially on production lines where the insulation is subject to mechanical stress during maintenance work, Arma-Chek Silver has benefits compared to metal claddings. The material has high mechanical stability whilst at the same time maintaining a certain degree of flexibility. The covering materials provide the insulation with effective protection against mechanical impact, yet are flexible enough to recover from blows, usually leaving no dents in the surface.

### **Time-saving installation thanks to pre-covered insulation systems**

Unlike traditional insulation materials and coverings, Arma-Chek Silver can be installed in one work step. This allows considerable time-savings – a great advantage in this project with a very tight schedule. Arma-Chek products can be installed easily, directly on site without the need for special tools. The material is easy to cut and highly resistant to tearing and impact.

Furthermore, there is no need to provide supporting and load-bearing structures, which are often needed for metal jackets. Because these systems have a higher coefficient of heat transfer than metals and no Parker screws penetrate the insulation during installation, Arma-Chek Silver generally allows the use of thinner insulation thicknesses than metal jackets. Armacell's technical customer service team helped the insulation company to determine the correct insulation thickness.

### **Reliable protection against moisture ensures long service life**

Arma-Chek Silver is very well protected against moisture. Because the covering is attached directly to the insulation, any risk of water ingress at these points is ruled out. If metal cladding systems are not completely tight – and it is never completely possible to ensure that they are – water can penetrate the insulation. Moisture not only leads to a drastic reduction in the thermal properties of the insulation material, significant corrosion damage can occur under the insulation. In the case of the Arma-Chek products the flexible covering

is firmly attached to the insulation and seams are sealed with the Arma-Chek Silver self-adhesive tape. This is a PSA system which develops adhesive forces when pressure is applied. As there are no seams or crimps in the Arma-Chek systems, neither moisture nor germs can penetrate the insulation. An application comparison test has shown that pipework insulated with Arma-Chek is much better protected against corrosion than metal-clad installations.

If traditional open-cell insulation materials with a metal jacket are used in environments with high humidity, there is a risk of water penetrating the insulation through gaps in the covering. In combination with dust and dirt particles, the damp mineral fibre insulation can then provide an ideal breeding ground for microbial growth. Arma-Chek Silver is manufactured based on AF/Armaflex. The elastomeric insulation material has a closed microcell structure, very low thermal conductivity and high resistance to water-vapour transmission. These properties ensure that installations insulated with Arma-Chek have long-term protection against condensation. Because they are dust- and fibre-free materials, Armaflex products offer passive protection against micro-organisms. In addition, AF/Armaflex is equipped with antimicrobial Microban® technology and has even greater resistance to bacteria and mould.

### **Everything went according to plan**

To coordinate material usage and labour, the project manager drew up a workflow plan. The Arma-Chek Silver products were produced and delivered on call with a lead-time of 10 working days. All in all the employees of the company Knierzinger installed 10,455 m<sup>2</sup> of Arma-Chek Silver continuous sheets in insulation thicknesses of 19, 25 and 32 mm and secured the seams with some 81,000 m of Arma-Chek Silver self-adhesive tape. Before the start of the largest Arma-Chek Silver project in Europe so far, the insulators were trained in the correct installation by an Armacell applications specialist.

In July last year, the Lenzing Group started up the world's largest lyocell fibre line and reported very positive experiences at the end of the year. Even in the first months after commissioning the jumbo line was already running at full capacity and without any breakdowns



The ventilation installations were insulated with around 10,500 m<sup>2</sup> of Arma-Chek Silver sheet material



The central air-handling station is located on a separate floor under the roof of the new building



The seams were secured with the Arma-Chek Silver self-adhesive tape



The air-ducts in the production hall are exposed to very high temperatures and 70 % humidity