



CASE STUDY

It's all about the cut-out

Cut-out-compatible cooling solutions from Pfannenberg reduce maintenance requirements and improve machine availability for the Swiss Krono Group, producers of engineered wood products based in Heiligengrabe, Germany

"The people from Pfannenberg first presented their thermal management concept and then over the following weeks pointed out many areas in our production facility where there was room for improvement. We are now satisfied users."

*Oliver Marten,
Swiss Krono Group*

Large amounts of dust in the air are a particular challenge for electronic components and cooling systems for electrical enclosures used in the wood engineering industry. In the search for a solution which would prevent machine failure caused by heavy soiling and would also guarantee rapid retrofitting, the Swiss Krono Group chose the cut-out-compatible thermal management concept from Pfannenberg. Since then, the woodworking company has installed and refitted a number of different systems from the Hamburg-based expert in thermal management solutions at the production site in Heiligengrabe including cooling units, air/water heat exchangers and filter fans.

Production reliability 24/7

The Swiss Krono Group is one of the world's leading producers of engineered wood products and its facility in Heiligengrabe is one of the most successful manufacturers of OSB – oriented strand boards – in Europe. Other core competences at the site are the production of high-quality laminate flooring, medium and high-density fibre (MDF/HDF) boards and high-quality insulation material made of wood fibre.

To fulfil their customers' demand for excellent quality and to meet their tight deadlines, the Swiss Krono Group is compelled to run the production systems 24 hours a day on almost every day of the year. Reliable cooling of electrical enclosures therefore plays a crucial role, as Frank Schmidt and Oliver Marten, Heads of electrical engineering in Flooring Manufacture and OSB Departments respectively at the site in Heiligengrabe, explain:

“The maintenance staff have a lot of responsibility for ensuring that production runs smoothly at our site – day and night, on workdays and at weekends and on public holidays. The cost of production losses caused by machine downtime rapidly amounts to six-figure sums if we do not use the right technology, such as reliable cooling for our switching and machine control systems, of which we have many.”



Discussion about a new electrical system: Frank Schmidt (centre) talking to his colleagues Rico Koßmann (left) and Werner Hille (right).

Challenges of the wood processing industry

Since the site in Heiligengrabe started up in the 1990s, many switching systems have been put into operation on

the shop floor. They have been cooled up to now with filter fans and cooling units. The systems have frequently malfunctioned and production has even ground to a complete halt on occasion. Production downtime costs have resulted.

None of this is surprising, given the extreme conditions to which the switching systems in the wood processing industry are exposed. First of all, the air is contaminated with large amounts of dust. In some production areas, this is exacerbated by soot from the diesel engines in HGVs and forklift trucks.

Furthermore, heat and cold can also have a detrimental effect on technical systems under some circumstances. Last, but not least, there is a latent fire hazard: in wood processing, a short-circuit in the electronics can rapidly develop into a fire and therefore a serious risk in terms of safety and insurance.

No maintenance and no dust

The switching systems for a short-cycle press system at the Heiligengrabe site for producing flooring was fitted with twelve cooling units for electrical enclosures. Particularly in the summer, the extreme environmental conditions caused the plant to break down frequently: the control components overheated because the temperatures in the electrical enclosures were too high.

As there was water available for cooling in this workshop, Pfannenber recommended the implementation of a thermal management concept with air/water heat exchangers with closed cooling circuits which would render them impervious to environmental conditions such as the dusty atmosphere or changing temperatures.

As a result, the existing cooling units for the electrical enclosures were replaced by air/water heat exchangers of Pfannenber's PWS/PWI series. These offer maximum reliability even at ambient temperatures of over 55°C and in particularly polluted environments.

The air/water heat exchangers put a stop to the dust problem and the maintenance required was reduced almost to zero as, unlike in cooling systems, there were no condensers nor filter fans to require servicing. What's more, the cooling system used 60% to 70% less energy after the change to different technology.



A very dirty electrical cabinet (above), and in contrast, a cabinet for the packaging line that has been cleaned on the outside (below).

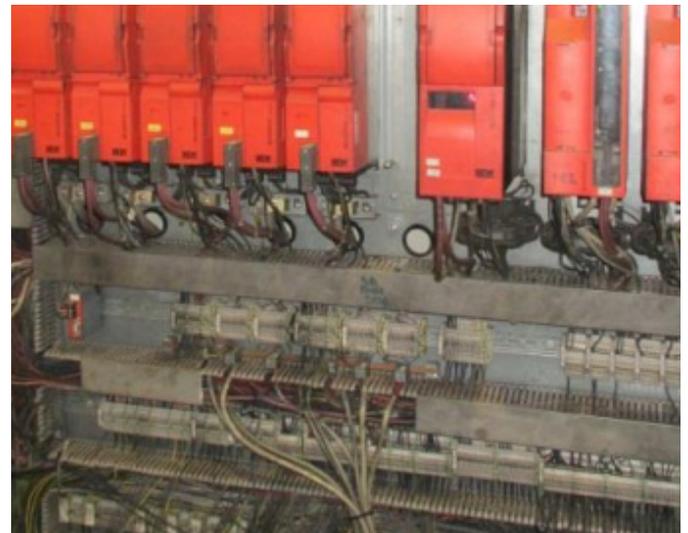
Clean and clever: deluxe retrofitting

Pfannenberg also modified a packaging line in the dispatch area of the production facility in Heiligengrabe where the finished goods are collected by HGVs. This area had also been plagued by breakdowns in the past due to the high levels of dust in the air. Previously, this switching system was cooled with ceiling fans and filters built into the enclosure doors to clean incoming air. First, Pfannenberg provided a deep-cleaning service for the whole switchgear cabinet, inside and out, including the PCBs on the inverters.

To prevent the cabinet from becoming dirty again and generating more costs as a result in the future, the ceiling fan combination was replaced by partially recessed, ener-

gy-efficient ϵ COOL DTI 6301 cooling units in combination with filter fans manufactured by Pfannenberg. These units are particularly suitable for use in higher ambient temperatures and in contaminated environments. For example, compressors with widely spaced fans prevent the deposit of dust and dirt and thus ensure that operation is reliable and maintenance at a minimum. The filter fans with their patented fluted filter mats have remarkably long maintenance intervals.

As part of the ϵ COOL range, the cooling units in the 6000 series also require up to 43% less energy than traditional cooling systems and are equipped to be particularly service-friendly. Worn parts and other components can be replaced very quickly. A single technician can install or remove one of these units in about 10 minutes.



Very dirty frequency converters before cleaning (above). The cleaned switchgear (below) was put back into reliable operation for the packaging line.



The electrical enclosures for the packaging line after being refitted with DTI cooling units.



The filter fans from Pfannenber are fully sealed so that no air can enter them.

Cost benefits and maximum flexibility

Cut-out compatibility was the crucial reason why the Swiss Krono Group chose thermal management solutions from Pfannenber. This means that the air/air and air/water heat exchangers and the cooling units from Pfannenber have identical housing cut-outs and fixing points.

Even the most recent devices in the energy-efficient εCOOL series are backwards compatible thanks to the standardised housing, so that older devices from the manufacturer can be replaced easily. It is now possible for one cut-out to be used for 11 different thermal management solutions.

Plant operators such as the Swiss Krono Group benefit from this in several respects. Identical housing cut-outs for almost every electrical enclosure bring standardisation to the service requirements and the stocking of spare and replacement parts. Another plus is the option to adapt the cooling technology quickly to changes in the environmental conditions, temperature and technology, which was the case in Heiligengrabe when the cooling units were quickly replaced by air/water heat exchangers.

“This versatile thermal management concept allows us to shift considerable service capacity towards other tasks. We can respond to any requirement for maintenance and service with just a few replacement parts quickly and flexibly. That’s why we integrated Pfannenber in our list of approved materials,” explains Schmidt.

Consistent package solution

The project in Heiligengrabe demonstrates the enormous importance of taking advice on thermal management for electrical enclosures. Without accurate analysis and extensive consultation on site with experienced experts, it is unlikely that these projects would ever have been implemented in the way they were and the considerable potential for optimisation would probably have remained unused.

It was the whole package of advice, service and technology that persuaded Frank Schmidt: “Our company is benefiting from the manufacturer’s know-how and care-free package. Obtaining advice, servicing and maintenance from a single source saves time and money.”



New switchgear cabinet for a short-cycle press for flooring manufacture, equipped with air/water heat exchangers from Pfannenber.

Facts at a glance

<p>Task</p>	<ul style="list-style-type: none"> • Ensure the availability of machines and systems for wood processing at the Heiligengrabe site • Design a thermal management solution which would be impervious to dust-heavy atmosphere and reduce maintenance requirement • Develop a flexible thermal management solution which would guarantee rapid response times to breakdowns and allow easy adaptation to changes in the ambient conditions
<p>Challenges</p>	<ul style="list-style-type: none"> • Protect sensitive switchgear from dust pollution • Stop switching systems from overheating and generally protect them from temperature fluctuations • Contain the latent risk of fire associated with wood processing
<p>Products used</p>	<ul style="list-style-type: none"> • εCOOL cooling units (DTI/DTS series) • Air/water heat exchangers (PWI/PWS series) • Filter fans
<p>Success factors</p>	<ul style="list-style-type: none"> • Compatible cut-outs guarantee rapid set-up times and facilitate warehousing • Easy retrofitting and upgrading thanks to cut-out compatibility and easily installed devices • Significantly lower maintenance requirement by replacing cooling units with air/water heat exchangers • Significantly lower energy consumption with energy-efficient εCOOL technology • Comprehensive consultation and thorough service

Summary

By implementing the Pfannenberg thermal management concept with its unique cut-out compatibility, the Swiss Krono Group at Heiligengrabe was able to reduce stocking and maintenance costs significantly. Furthermore the wood engineering company is benefiting from better machine and system availability thanks to greatly improved protection from dust. Using the energy-efficient εCOOL technology has also resulted in lower energy costs.