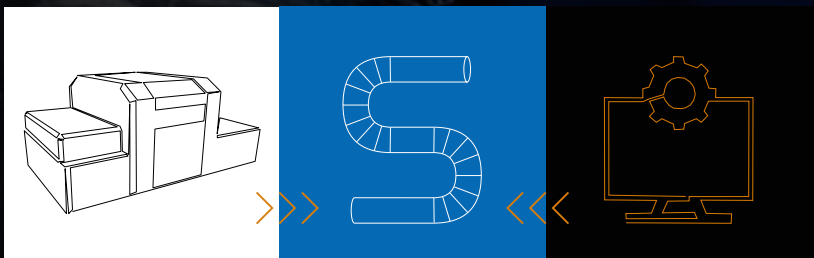


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INDUSTRY SOLUTION

IN TECHNICAL INSULATION



Dear Readers,

In recent years, technical insulation has evolved from a peripheral issue to a core strategic issue. Rising energy costs, more demanding climate targets and an increasing shortage of skilled labour are presenting the entire industry with challenges that can no longer be overcome using traditional methods alone.

As an authorised signatory at Schwartmanns for many years, I see on a daily basis how companies can significantly speed up their processes and reduce costs and errors through the targeted integration of digital technologies. I would therefore like to show you how our tried-and-tested industry solution comprising software, machines and comprehensive service can create real competitive advantages.

In this paper, you will find out which specific market trends currently exist, which regulatory innovations you should definitely be aware of and how we can help you to realise your potential. This paper was published in Q2 2025 and cites relevant sources where we refer to them.

Read how you can make your technical insulation more efficient, more precise and more profitable. I wish you inspiring insights!

Sincerely

Yours, Marcel Schwartmanns




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CHALLENGES IN OUR INDUSTRY

Technical insulation plays a decisive role when it comes to saving energy and reducing costs. In industrial plants in particular, insulation prevents heat loss and thus actively contributes to climate protection.

Studies put the potential savings from optimal insulation at 14 million tonnes of oil equivalent (≈ 160 TWh) of energy per year - this corresponds to around 40 million tonnes of CO₂ (eiif.org). For comparison: 160 TWh roughly covers the annual electricity consumption of over 11 million households. Hardly any other technology makes it so easy to make enormous contributions to climate targets.

However, despite this importance, the insulation industry has been struggling for years with a variety of challenges that are slowing down progress. Many companies still work with analogue, manual processes, there is a shortage of young professionals and digitalisation is still in its infancy.

The result: inefficient processes, avoidable errors and unrealised savings potential. A typical

scenario: an employee travels to the construction site and measures pipelines with a folding rule and sketchpad, after which sheet metal templates are produced by hand - a time-consuming process that is prone to errors. At the same time, the shortage of skilled labour means that personnel is scarce and expensive.

In Germany, staff shortages are now one of the biggest obstacles in construction; in September 2024, 60.4% of construction companies complained about a shortage of skilled labour as a barrier to construction activity (allgemeine-bauzeitung.de). For insulation companies, this means that productivity and efficiency must be ensured with fewer staff.



THE SOLUTION?

Technical insulation plays a decisive role when it comes to saving energy and reducing costs. In industrial plants in particular, insulation prevents heat loss and thus actively contributes to climate protection.

In the rest of this paper, we will first look at current market trends and regulatory changes. We then discuss the specific challenges facing the industry and present our industry solution - a combination of software, machines and service - in detail. Finally, practical examples and success stories show how integrated technical insulation solutions are already creating added value today.

TYPICAL CHALLENGES IN TECHNICAL INSULATION ARE:

- **Unnecessary loss of time due to manual measurements:** Traditional manual measurements take a lot of time and require duplicate work steps.
- **Missing interfaces between measuring, planning and cutting:** Data often has to be transferred manually, resulting in media disruptions and errors.
- **Limited specialist expertise & lack of familiarisation with machines:** Without sufficient training, modern machines are not fully utilised.
- **High material costs due to imprecise production:** Inaccurate cutting leads to waste and reworking

MARKET DEVELOPMENT & REGULATORY CHANGES

The market for technical insulation is on the upswing. Driven by rising energy prices, stricter climate regulations and the need for cost efficiency, demand for modern insulation and manufacturing solutions is growing.

The global volume for industrial insulation is estimated at around USD 9 billion in 2024 and is set to rise to over USD 14.8 billion by 2034 (+5.0 % per year) (precedenceresearch.com). In Europe, too, technical insulation is increasingly coming into focus as an „overlooked champion“ of decarbonisation (eiif.org).

Plant operators are increasingly realising that insulation measures pay for themselves quickly - most investments in insulation pay for themselves in less than 2 years through energy savings - little has been done in terms of regulation for a long time, but since 2024, EN 17956 has been the first Europe-wide standard to set clear efficiency standards for industrial insulation. This standard introduces an A-G energy label similar to household appliances: Insulation for pipes, fittings and tanks will be categorised into energy efficiency classes (pbctoday.co.uk).

System operators will be obliged to insulate new systems to at least class C - i.e. no more „inadequate“ insulation.

The following applies to existing systems: if an upgrade to class C pays for itself in less than 5 years, it must be retrofitted (eiif.org). This European standard was developed on the initiative of the EiiF and is intended to help achieve the climate targets that have been set.

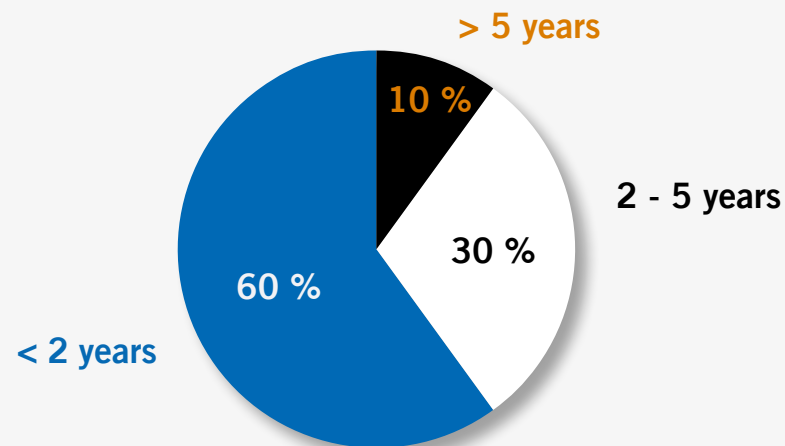


The British industry organisation TICA expressly welcomes the new standard, as it raises awareness of the „gaps in the Net Zero strategy caused by uninsulated pipes“ (pbctoday.co.uk).

At the same time, initiatives are being launched there to train specialists in thermography and to carry out more insulation checks (TIPCHECK). This development shows a trend that can be felt throughout Europe: technical insulation is changing from a niche topic to a mandatory programme. Companies that invest in modern technologies at an early stage can gain a competitive advantage.

The good news is that the willingness to invest is increasing. In an evaluation of over 3,000 energy audits in European industrial companies, 3 out of 4 companies decided to invest in additional insulation measures following the analysis (eiif.org). In total, 4 TWh of energy and 1 million tonnes of CO₂ can be saved, says the Eiif - enough to supply around 285,000 households with electricity for a year. This huge savings potential - combined with regulatory pressure - means that the technical insulation industry is on the verge of a technological leap.

AMORTISATION PERIOD FOR INSULATION MEASURES



MODERN MACHINES, SOFTWARE AND SERVICES ARE MORE IN DEMAND THAN EVER TO EFFICIENTLY IMPLEMENT THE NEW REQUIREMENTS.

SKILLS SHORTAGE, INCREASED EFFICIENCY, DIGITALISATION

CHALLENGES IN THE INDUSTRY

Despite a positive market outlook, insulation companies face considerable operational challenges on a day-to-day basis. A shortage of skilled labour and an ageing workforce make it difficult to find enough qualified employees for assembly and prefabrication.

At the same time, cost pressure is increasing, which can only be offset by higher productivity. This reveals a key problem: many processes are still carried out manually, which limits efficiency.

Prefabrication in particular - i.e. the workshop production of sheet metal cladding - has enormous potential for optimisation. However, some processes are still carried out manually, i.e. blanks are calculated, recorded and cut out by hand. In some workshops, there are even templates hanging on the wall so that frequently required parts can be outlined. Such methods are not up to date: they take a long time and the results are not always reproducible. Typical errors such as calculation inaccuracies or dimensional deviations in hand-cut sheet metal are the result. This leads to reworking, material waste and quality problems.

Another obstacle is the lack of digital consistency. There are often isolated solutions. Measurements are taken in analogue form, planning is perhaps done in Excel and cutting is done separately. Media disruptions cost time and harbour sources of error. Data is sent to the workshop via WhatsApp or on paper instead of being automatically fed into the production system. If just one part is forgotten, the person taking the measurements has to travel to the construction site again or there are waiting times until the missing part is produced. Such delays are critical in times of tight deadlines.

In addition, digitalisation skills are not yet sufficiently developed in many companies. Insulators are first and foremost craftsmen, not software engineers. Complicated CAD programmes or machine controls that are difficult to operate are a deterrent - especially when day-to-day business is stressful anyway. Without the right training and intuitive software, expensive machines fail to fulfil their potential. This is where the weaknesses of conventional offerings on the market become apparent: many software tools are not specifically tailored to insulation technology and overwhelm users instead of supporting them.

The shortage of skilled labour exacerbates all of these issues. Every inefficient work step weighs twice as heavily when staff are in short supply.

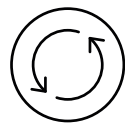
Technical insulation is therefore faced with the task of combining traditional craftsmanship with state-of-the-art technology. The aim is to digitalise knowledge, convert manual processes into automated ones and relieve the burden on existing employees with user-friendly tools. Companies that master this transformation will be able to produce more efficiently, attract young talent more easily and significantly reduce errors and costs.

Manual labour can hardly be replaced in assembly on the construction site - experienced insulators will still be needed there in the future. But in the workshop, a lot can be compensated for with technology: Modern machines can replace 5-10 workers when it comes to unwinding and cutting.

In view of the hundreds of vacancies in the industry, this is a decisive lever for processing orders on time despite staff shortages. Companies that invest in automation can take on orders for which they would otherwise lack the staff.



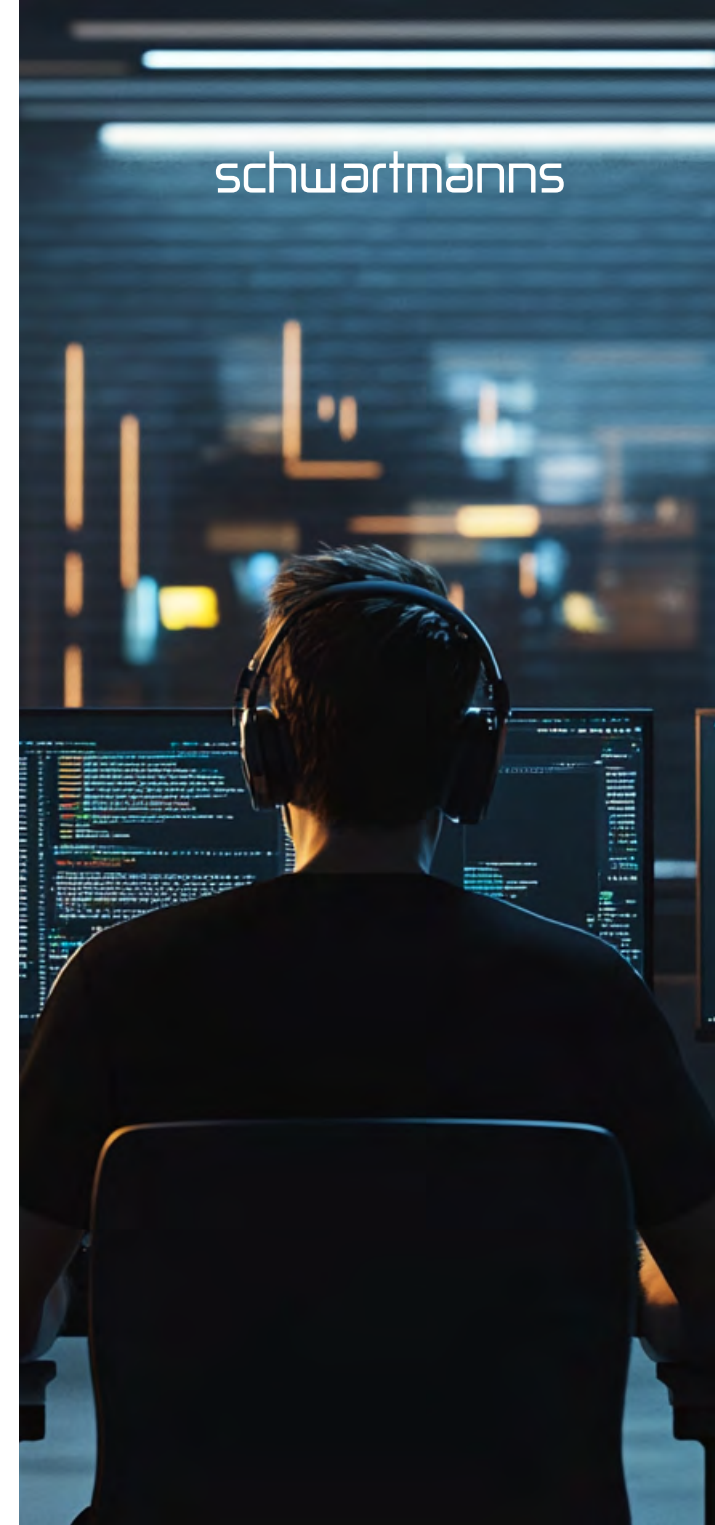
Digitisation



Automation

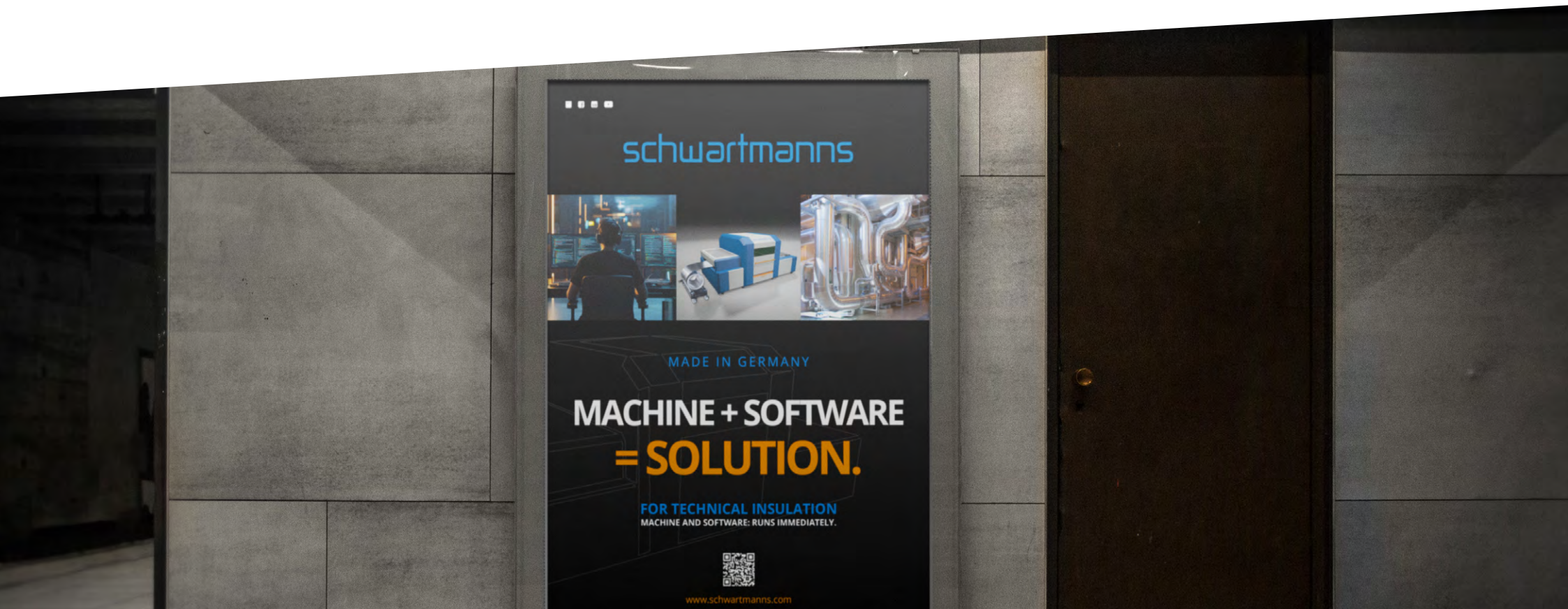


Efficiency



OUR INDUSTRY SOLUTION: COMBINATION OF SOFTWARE, MACHINE AND SERVICE

At Schwartmanns, we have taken these challenges and developed a holistic industry solution for insulation technology. Our approach: perfect interaction between man, machine and software. Instead of just selling individual machines, we see ourselves as a partner to insulation companies and supply a complete package that is precisely tailored to the needs of technical insulation.



OUR INDUSTRY SOLUTION CONSISTS OF CLOSELY INTERLINKED COMPONENTS

We develop integrated solutions that are precisely tailored to the requirements of insulation technology. We not only supply the machine, but also act as your sparring partner to ensure that the processes of man, machine and software interact smoothly.

PRECISE DIGITAL MEASUREMENT WITH ISODOT

No more incorrect hand notes! With our mobile 3D measurement system isodot, pipelines and fittings are digitally recorded with millimetre precision. Laser and photogrammetry replace folding rule and pencil. This gives you reliable measurement data instead of manual errors

SIMPLE PLANNING WITH ISOCONNECT

The recorded data flows seamlessly into our isoconnect planning software. This is intuitive to use and specially developed for insulation projects. The result is a continuous data flow from the measurement to the machine

PRECISE PRODUCTION WITH ULTRA-CUT

Our laser-based ULTRA-CUT cutting system brings the data to sheet metal in perfection. The machine cuts all the required blanks with laser precision and without reworking - directly from the coil overnight, if necessary. This means that all parts are ready for assembly the next morning. Reworking or manual cutting is completely eliminated

SERVICE THAT THINKS ALONG WITH YOU

We do not leave the customer alone after the purchase. From comprehensive pre-investment advice, machine demonstrations and workshop planning to training and support, we provide personalised support every step of the way.

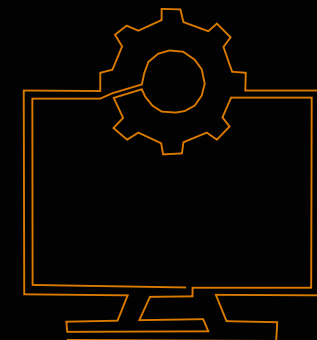
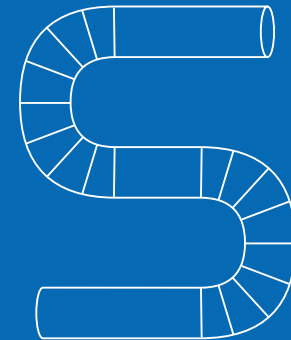
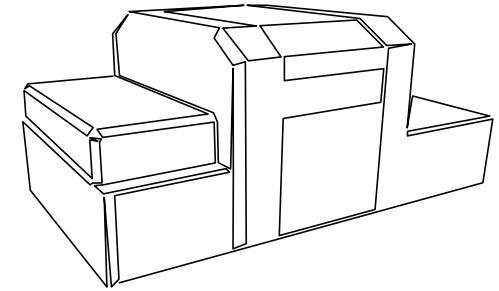
WHY SCHWARTMANN'S?

BECAUSE WE SUPPLY EXPERTISE, MACHINES,
SOFTWARE AND SERVICE FROM A SINGLE SOURCE

All of our components are perfectly harmonised so that everything fits together: Mechanics, electronics and digital tools. Integration into existing processes takes place directly and without production downtime, as we adapt our solution to the customer process and not the other way round.

The result is greater efficiency and fewer errors: our customers save time, costs and material from day one. We have developed the industry solution specifically for insulation technology - no compromises, no unnecessary functions, but a 100% focus on pipe insulation, sheet metal cladding and their special features. At the same time, our solution remains modular and scalable. A medium-sized company can start small, e.g. with a compact cutting machine or a used system, and gradually upgrade later. A large company with a high throughput, on the other hand, receives the most powerful system currently available on the market with the ULTRA-CUT and additional tools. Flexibility is important to us: If customers encounter a particular problem, we develop a solution in the shortest possible time - be it a software extension or an adaptation to the machine. This level of speed and industry focus is almost unthinkable with large generalists.

We are also unstoppable when it comes to user-friendliness! Our software was developed with insulators for insulators - it is clear and easy to learn. Complex geometries such as flattening on segment bends, twisted longitudinal seams or conical end pieces are already stored as automated functions. The user does not have to draw complicated designs, but simply enters the required parameters - the software does the rest and controls the machine accordingly. Man, machine and software work hand in hand, without any frictional losses.



BOTTOM LINE

... OUR CUSTOMERS AND PARTNERS DON'T JUST BUY A MACHINE ... THEY BUY **SCHWARTMANN**

This means: an all-round carefree package of technology and personal support. We have been successfully pursuing this concept for decades. Schwartmanns is a family business with over 60 years of experience in insulation technology. During this time, we have supplied more than 250 computer-controlled machines all over the world. Based on this experience, we know exactly what is important in the industry. We look forward to accompanying our partners in technical insulation into the future with this experience, our innovations and our commitment.

“
Technology, experience and
personalised support - that
has been our promise for over
60 years.

MARCEL SCHWARTMANN

Managing Director
Service & Marketing

MIKE ZARTMANN

Managing Director
Development & Production

PRACTICAL EXAMPLES & SUCCESS STORIES

schwartmanns

The advantages of an integrated industry solution are best demonstrated in practice. Numerous customers - from medium-sized insulation companies to large industrial service providers - have already successfully taken the step towards digitalisation with Schwartmanns. Their feedback speaks for itself.

„Thanks to Schwartmanns, our processes are finally running smoothly. No more unnecessary intermediate steps - simply measure, plan and produce.“

~Udo Dohlen, Managing Director Dohlen Isoliertechnik GmbH & Co. KG www.isoliermeister.de

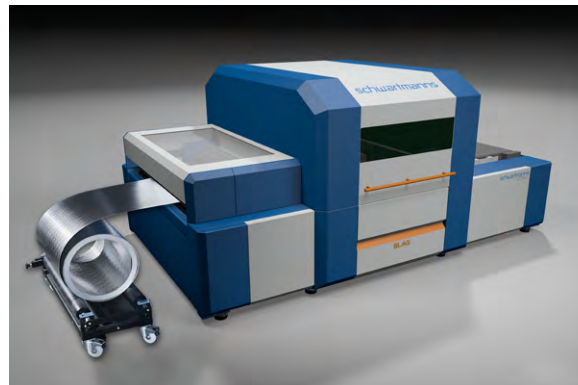
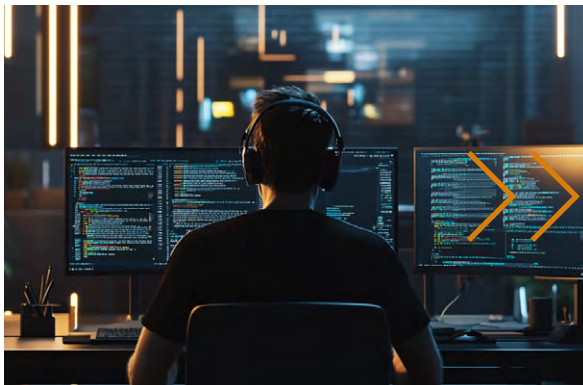
This quote succinctly describes what our solution achieves: Previously separate work steps

merge into a continuous workflow that is significantly faster and error-free. Where previously perhaps half a dozen work steps were necessary (sketching measurements, drawing, typing in measurements, creating a DXF file, transferring to the machine, manual readjustment, etc.), today a single data flow from digital measurement to laser cutting is sufficient. Media disruptions are a thing of the past. A workshop manager reports:

„We previously had a machine without a software connection. Since switching to Schwartmanns, we save valuable time every day.“

~Dietmar Orlowski, Managing Director of Isoliertechnik, Insulation materials www.orlowski-isoliertechnik.de

Production reliability also increases. Thanks to the automatic calculation and precise laser cutting, errors are virtually non-existent - complaints due to unsuitable sheet metal mouldings have been reduced to almost zero. One customer, who previously had to struggle with manual cutting, summarises the difference as follows: „We used to frequently measure ourselves or make mistakes. Today, every part fits right away - that saves us rework and hassle.“ The higher quality means that projects run more smoothly and end customers are more satisfied.



Another plus point from the customer's point of view is the newly gained flexibility. Thanks to digital measurement and networked production, even urgent orders can be processed much faster. Practical example: An insulation company had to equip a distant construction site with complex pipework. Previously, they would have had to return to the office after taking measurements on site, create drawings and cut the pipes by hand (or send them to a prefabricator). That would have taken days.

With our solution, things worked differently: the employee used isoconnect to measure all the lines digitally and the data was immediately sent to the workshop at home via the cloud, where the ULTRA-CUT produced all the sheet metal parts overnight. The very next morning, all segments were ready for assembly on the construction site. Missing parts? Thanks to 3D measurement, there could hardly be any - and if there were, they could be produced immediately.

This example is representative of many: The throughput times in insulation are dramatically reduced by an end-to-end digital process chain, often by 50% or more. At the same time, the added value remains in-house instead of being lost to external suppliers. Both small and large companies rely on Schwartmanns. Our referen-

ce list includes well-known companies in the petrochemical, plant engineering and utilities industries as well as medium-sized family businesses.

They all appreciate the fact that our solution has enabled them to establish internal company standards that work across all locations. Internationally active customers in particular benefit from the fact that we offer interfaces to common CAD and BIM systems, allowing insulation data to flow directly from planning to production. We also support the roll-out in various plants, provide on-site training in the respective national language (via partners) and are available via remote service. This holistic support clearly sets us apart in the market.

Today, we are one of the most innovative providers of technical insulation. This is shown not only by the figures - over 250 systems installed worldwide - but above all by the success of our customers. Many companies that once suffered from time pressure, staff shortages and quality problems have repositioned themselves thanks to our industry solution. They work more efficiently, can accept more orders and delight their customers with more precise workmanship. Anyone who has ever seen how a digital measurement leads seamlessly to a precisely fitting bent sheet metal part quickly realises where the journey is heading.



WHY AN INTEGRATED INDUSTRY SOLUTION IS THE KEY TO THE FUTURE

Technical insulation is on the threshold of a new era. Increasing requirements for energy efficiency and climate protection, tightened by standards such as EN 17956, are coming up against an industry that is traditionally characterised by craftsmanship.

There is no way around digitalisation and automation to meet these requirements and at the same time counter the shortage of skilled workers and cost pressure. An integrated industry solution is the key to success.

Why? Because only a holistic approach ensures that all the cogs mesh together - from the first measurement to the last screw cap of the insulating shell.

An isolated solution may optimise individual steps, but the full potential only unfolds in the interaction between software, machine and service. If each piece of information is only recorded once and then passed on digitally, the result is smooth processes without interruptions. Errors are eliminated at the root, throughput times are minimised and resources are conserved. At a time when deadlines are becoming ever tighter and materials ever more expensive, this is an invaluable advantage.

Schwartmanns recognised early on that the future of the insulation industry lies in integrated

solutions. That is why we have invested heavily in development - both in state-of-the-art machine technology (e.g. laser cutting, AI-supported measurement) and in industry-specific software. Machines and software are the core components of an industry solution, complemented by a partner-orientated service concept. This interplay is already enabling our customers to increase their efficiency many times over and set themselves apart from the competition.

With such a solution, companies are ideally equipped for the future. Further innovations are already on the horizon: Building Information Modelling (BIM) will become even more prevalent in the future - Schwartmanns is a pioneer here with an existing BIM interface in isoconnect.

A lot will also happen in the field of measurement technology, for example through even more automation and AI (keyword isodot). We will continue to drive the industry forward with innovations in the coming years - both in terms of machines and software. We integrate all of

this seamlessly into our solution concept so that our customers always have their finger on the pulse.

An integrated industry solution is the key to the future of technical insulation because it unlocks the full potential of digitalisation. It combines climate protection with cost-effectiveness, high-tech with craftsmanship and today with tomorrow. Companies that take this step are already benefiting from greater efficiency, quality and flexibility - and they are securing a head start that could make the difference between success and failure in the years to come.

Schwartmanns is ready to accompany you on this journey - innovatively, practically and in partnership. Because the insulation industry of the future is digital, networked and efficient - and that's exactly what our industry solution is made for.

Dear readers,

Thank you for taking the time to read our paper. I hope you were able to take away a lot of ideas for your company. Technical insulation is becoming more and more demanding, and yet I am convinced that this is precisely where we all have great opportunities.

Perhaps you have realised while reading that your company is also facing the challenges we have described. If so, I would like to invite you to come and talk to us. Let's look together at how we can make your processes faster, more efficient and more precise.

Because one thing is certain, the future of insulation is digital and integrated and we would be delighted to accompany you on this exciting journey.

Feel free to call me directly or send me an e-mail. I look forward to exchanging ideas with you!

Stay curious, innovative and above all healthy!

Yours



Thomas Pitsch

Authorised signatory | Sales manager

MAINE GERMANY
MACHINE + SOFTWARE
= SOLUTION.
FOR TECHNICAL INSULATION
 MACHINE AND SOFTWARE: RUNS IMMEDIATELY.



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2022
Short List
ULTRA-CUT Laser Cutting Machine

T|I Technische Isolierung
Product of the year
2020
Winner
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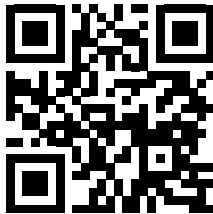
MACHINES FOR TECHNICAL INSULATION



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