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BOSSARD
Proven Productivity

No. 737 I MARCH

Bossard News

EDITORIAL

Dear Customers,

2022 was a turbulent year that was dominated by numerous challenges and unforeseeable events. Following hot on the heels of the difficult pandemic period, these circumstances have turned the supplier situation into an almost "perfect storm" – with sharp price increases, delivery times that are in some cases currently twice to three times longer than they were before, and a lack of production capacities. The war in Ukraine has added to the uncertainty, too.

But we have achieved remarkable results as a company in spite of all these challenges. For the first time ever in Bossard's history, we generated record sales exceeding CHF 1 billion and record profits, too! We successfully served our customers with the products they required throughout a tough 2022, and our long-standing multi-sourcing strategy proved to provide real added value, especially during this time.

But it would appear that 2023 is another year that will be characterized by uncertainty, as war is still raging in Ukraine and – for the first time in generations – we are having to contend with inflation in many markets. The initial easing seen on the buying markets in recent months is again giving way to a strained situation and rising prices.

However, we are convinced that our Smart Factory solutions and our product and application expertise will enable us to provide our customers with extra added value again this year – be it through more efficient processes or better fasteners for demanding applications. We are proud that we can improve our customers' competitiveness and celebrate further successes together in the future.

We would like to take this opportunity to sincerely thank both our customers and our partners. It is a real privilege to work with you.

PETER KAMMÜLLER
General Manager, Bossard Schweiz

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CONTENTS

Online

You can find the PDF edition of Bossard News online at:
www.bossard.com

BOSSARD GROUP

A new record in a challenging environment

The Bossard Group has broken the "billion barrier" for the first time in its company history – and reported record sales in all regions in the 2022 financial year.

Many people struggle to comprehend huge numbers. A normal human brain is hardly even able to understand 1 million – a number that roughly describes the extent of Bossard's product range – never mind 1 billion (one thousand million). That's a 1 followed by nine zeros. If you didn't need examples before to help you grasp how big that number is, you will now.

Let's take seconds, for example.
1 billion seconds is equal to 31 years and 259 days. Or, if you'd prefer a more visual example: if you stacked 1 billion sheets of paper one on top of the other, you would build a tower 297,000 kilometers tall – and just 87,000 kilometers short of the moon. And, as a final example: a CHF 1 coin weighs 4.40 grams. One billion CHF 1 coins added together give an impressive weight of 4,400 metric tons, which is almost half the weight of the Eiffel Tower in Paris.

Granted
We'll admit, we did actually round down in this calculation, because the number we're actually talking about is 1 billion, 153 million and 800 thousand Swiss francs, or CHF 1,153,800,000 in numerical terms. That first-class figure represents the sales that the Bossard Group generated in the 2022 financial year. Not only is this a brand-new record in Bossard's 192-year history; it also marks the first time ever that it has broken the "billion barrier". In 2021, our sales figures sat just below the billion mark at CHF 995.1 million. But the twelve months that followed saw impressive growth of 18.4% in local currency terms.

And that's despite even optimistic market observers describing the general conditions as "definitely challenging, if not difficult". What with geopolitical tension and crises, inflation and skills shortages, the ongoing burden of COVID-19, supply chain disruptions, the burden of the strong Swiss franc and more besides, each of the three market regions had to contend with specific challenges – and sales growth was achieved in each one.

Particularly pleasing

The Bossard Group's excellent earnings and broad-based growth since the end of 2020 includes a continuing positive trend that is reflected in the sales generated during the fourth quarter of 2022. During that time, sales across all regions saw a 13.3% rise in local currency terms from CHF 250.8 million in Q4 of 2021 to CHF 276.2 million 12 months later.

Turning our attention to Europe

With 0.8% growth in sales to CHF 141.2 million (a rise of 6.1% in local currency terms) during Q4, demand remained high. Bossard's Smart Factory services became even more of a priority for customers during this time.

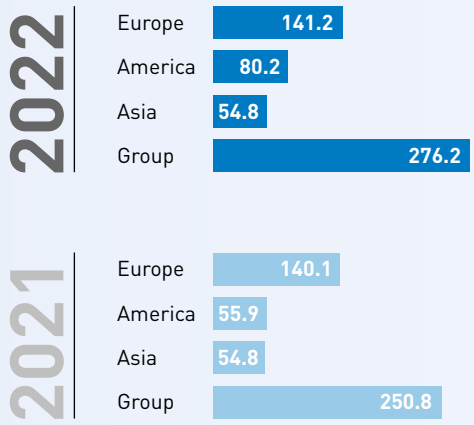
Turning our attention to America

Dynamic economic growth and exciting projects in the electric mobility sector, to name but one example, led to double-digit growth rates. In the last quarter of 2022 alone, sales jumped by 43.5% to CHF 80.2 million (a rise of 37.3% in local currency terms), with Canadian firm PENN Engineered Fasteners Corporation – consolidated as at December 1, 2022 – making a major contribution. The aim was and is to further expand performance in America.

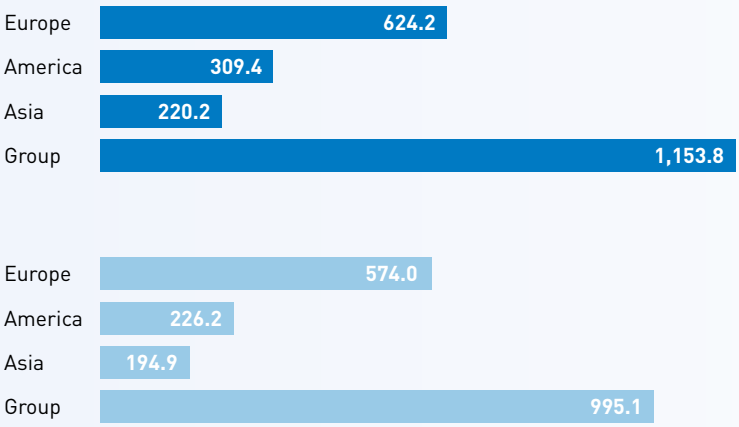
Turning our attention to Asia

At CHF 54.8 million, sales in Q4 remained at the previous year's level (a rise of 5.4% in local currency terms). We consider this a success given the tough environment, with high base effects in 2021 and China lifting its COVID-19 restrictions, leading to a significant increase in infection rates and production losses.

Net sales in Q4 (in CHF m)



Net sales from January to December (in CHF m)



Change	In CHF	In local currency
Europe	0.8%	6.1%
America	43.5%	37.3%
Asia	0.0%	5.4%
Group	10.1%	13.3%

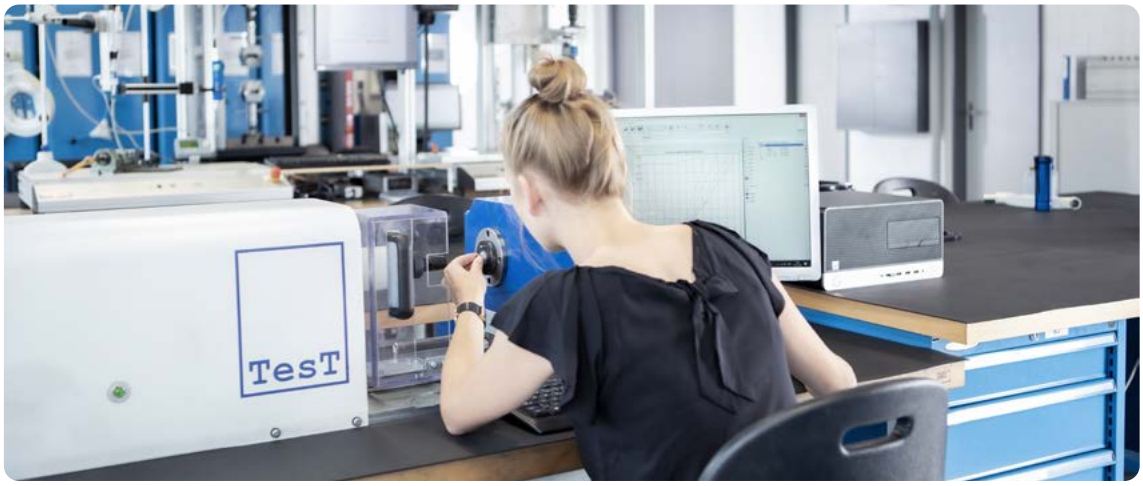
Change	In CHF	In local currency
Europe	8.7%	14.4%
America	36.8%	31.0%
Asia	13.0%	14.3%
Group	15.9%	18.4%

ENGINEERING

Assembly Technology Expert

EXPERT TEST SERVICES

Friction values of screws and their pitfalls



The information provided on your screws' product packaging also includes details on the friction values. In practice, they are often important for working out the screw connection's torque. But what do these values mean, and why are they not automatically applicable for your application?

The effect of friction

If a screw connection is to work, it must generate a preload force. The preload force ultimately presses the parts to be connected together. When it comes to product safety, component life span and component performance, friction plays an important role in screw connections.

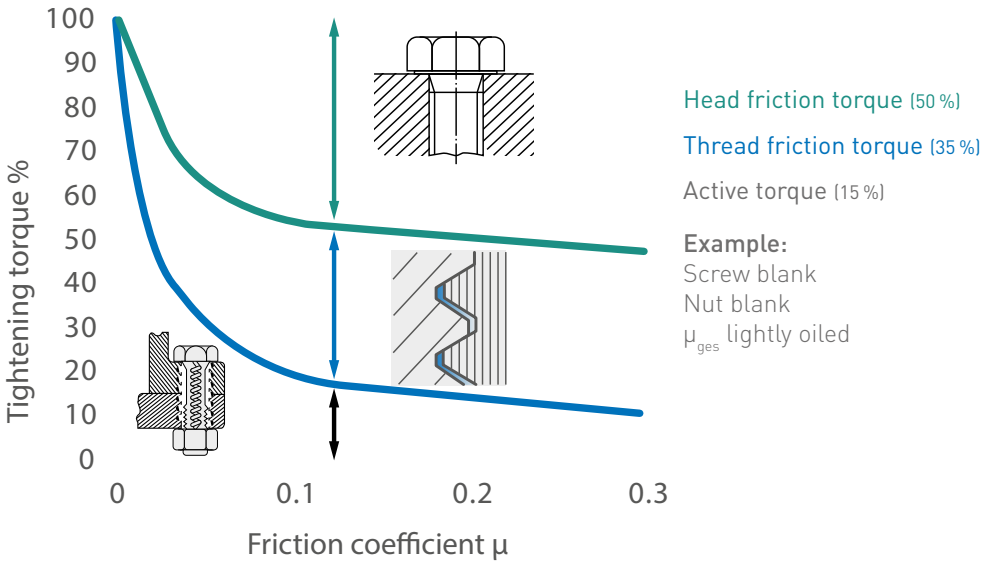
When you use a tool to tighten a screw, the torque (force x lever arm) should produce the desired preload force. However, a lot of the torque energy is lost due to friction. If we take a standard metric screw, around 35% of the energy is lost through the thread and approximately 50% through the screw head and nut contact surface as thermal energy. This leaves roughly 15% of the energy for building up the preload force.

> *We'll show you how to interpret the values.*

Testing friction value ranges according to the ISO standard

Knowing the friction values for the screw connection is crucial to achieving the correct preload force for a secure fastening. Manufacturers define what are known as "friction value ranges" for their screws that are determined according to the ISO 16047 standard ("Fasteners – Torque/clamp force testing"). This involves testing with defined surfaces such as "bare" (uncoated), "cleaned" or "zinc plated/passivated". This results in comparable friction values for different screws, which is hugely advantageous in production monitoring and coating comparisons.

Example 1



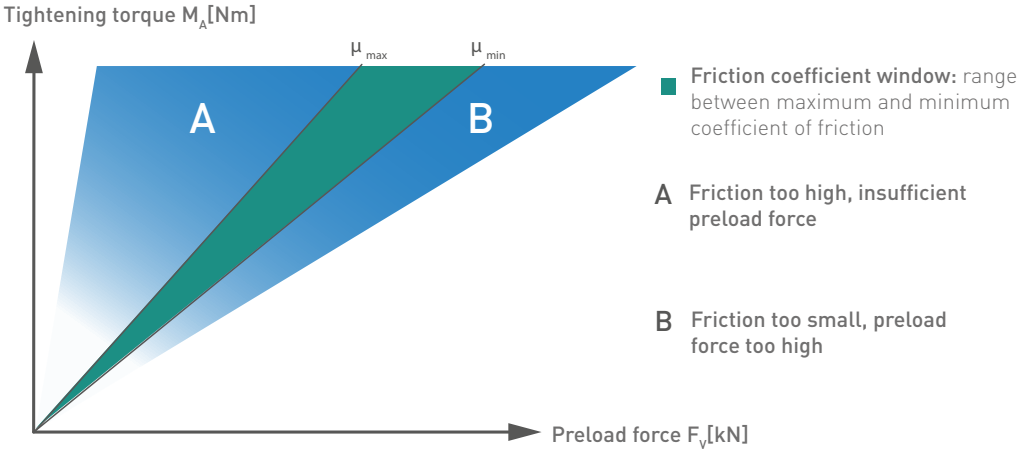
Overview of the influences of friction when tightening screws. Only about 15% of the force in the tightening torque remains here for the preload force (Fv).

The limits of friction value ranges

Unfortunately, you cannot use the friction values that the manufacturer provides for each of your applications without further consideration. Why, you might ask? Often, your screws, washers and nuts have the same corrosion protection. Then there are other surfaces that are not included in the ISO test setup in play. This gives rise to different friction values, which in turn leads to deviations during assembly.

If the product with the corresponding friction value range is not selected and used for the application in accordance with the same, this will have consequences for the preload force (see graphic 2). The result is that either excess preload force (B) is generated (which may elongate or destroy the screw even during assembly), or the preload force (A) is too low, causing the fastener to fail in the component used – as a result of the screw suffering a fatigue fracture, for example.

Example 2



Example A: The friction is higher than intended. Result: Lack of preload force, which can cause the connection to loosen over time. Example B: Friction is lower than defined and intended, preload force is higher, higher than permissible in some cases, assembly problems under certain circumstances.

Testing friction values in the test lab
We recommend testing your products in your application to achieve the desired parameters, not to mention the surfaces that will actually be used. In our laboratories, we test friction values according to ISO 16047, and also in relation to the applications involved, by precisely measuring the torque and the preload force. This process involves friction value tests between 0.1 Nm and 4,000 Nm and thread sizes between M3 and M36, enabling preload forces of up to 700 kN or 70 t to be achieved. We also check special screw connection situations as needed. Our engineers will be happy to advise you. Contact us at www.bossard.com.

What is friction?

Friction is a force that occurs when two bodies or particles come into contact with one another. It makes it more difficult for the bodies to move against one another. Alternative terms are “rubbing” and “frictional resistance”. Scientific friction theory (tribology) makes a distinction between the different forms. One is solid-state friction between the contact surfaces of solids that are in contact with one another – in classic screw connections with a screw, washer, component and nut, for example. Then, there is static friction and sliding friction, which occur both simultaneously and alternately (what is known as the “stick-slip phenomenon”).

SCAN ME

Smart Factory Logistics

LAST MILE MANAGEMENT

Enhanced efficiency and time savings on the last mile

Bossard has been a strategic partner to ABB for more than 15 years. As a leading tech firm operating in the electrification and automation segments, ABB's assemblies consume half a million fastening parts every year. That is why it manages over 4,400 items in various quantities. For this reason, efficient production and an end-to-end information chain are particularly important to ABB.

Enhanced efficiency in materials handling
ABB was keen to make the entire materials handling process up to the assembly workstation direct and as fast as possible. What made meeting this requirement especially challenging was the fact that ABB has many product models. Bossard assisted ABB with Last Mile Management. Last Mile Management is a solution for efficient setup and replenishment instructions for internal logistics. It provides the milk runner with a digital, smart and paperless route map so that they can go about their picking operations in a targeted manner and refill assembly workstations. The fully automated intralogistics system makes handling the "last mile" efficient and helps to save time, too.

Savings thanks to Smart Factory Logistics
Since this solution was implemented with Bossard, ABB has saved over 23% in process costs. And the walking distance for assembly personnel has demonstrably decreased by at least 13%. These are figures that make everyone happy. The result – 13,300 SmartLabel Cloud systems and around 3,800 SmartBin Cloud solutions distributed throughout five production halls – is a proud achievement and testament to a successful project! Especially since there was no production downtime during the installation process – thanks in part to the excellent cooperative relationship and preparations.

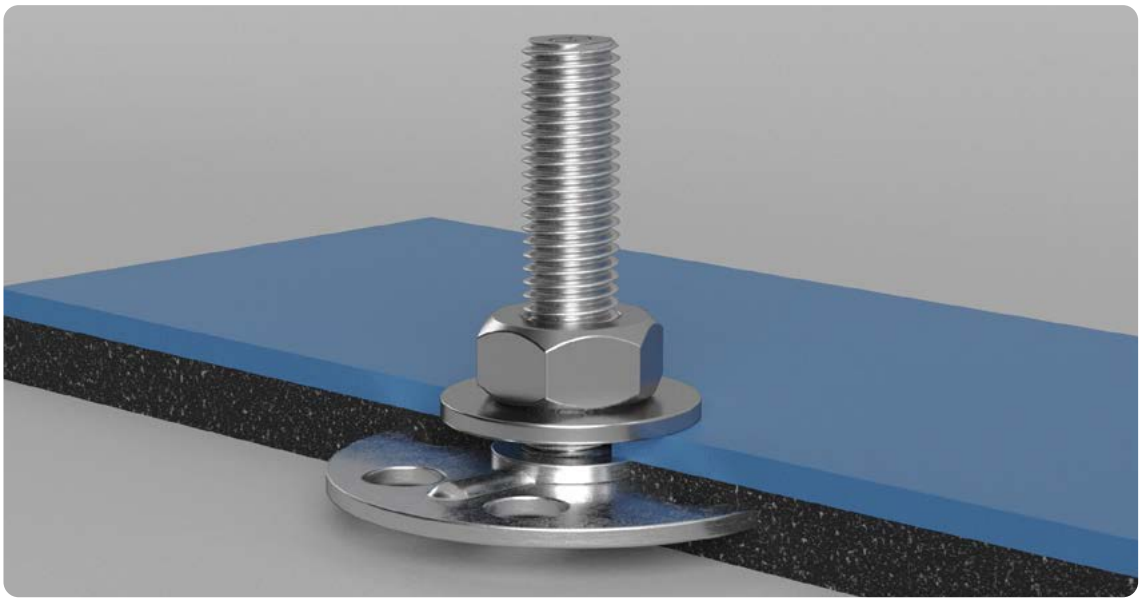
The colleagues in Logistics are in seventh heaven! Fewer steps in Internal Logistics and optimized material flows mean the system has been very well received by everyone involved.

PRODUCTS

Product Solutions

IDEAL RESULTS IN LIGHTWEIGHT MATERIALS

Fasteners for composite materials and plastics

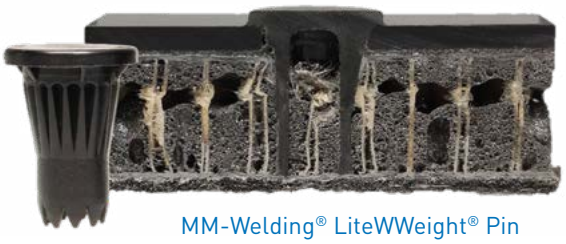


Lightweight and multi-material designs are tremendously important in a number of industrial segments – and this covers an extensive range of applications that is continuously growing.

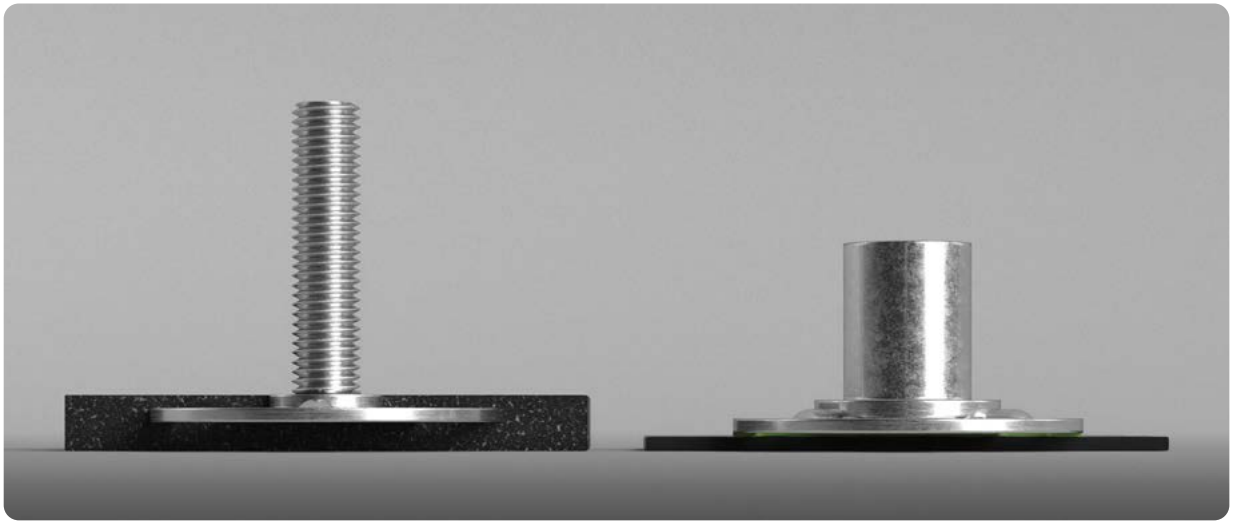
As the industry is using a growing number of material combinations such as carbon fiber composites, folds in the material, crystal-like structures, sandwich materials, sinusoidal honeycombs, ring elements or foamed areas, the demands being placed on fastening solutions are increasing. So it is important to go about operations in an actionable, reliable, durable and sustainable way, taking into account the total costs and weight reduction. What options are available for creating ideal connections in this application area?

Connecting lightweight materials is challenging

Connecting lightweight materials and multi-material components requires interdisciplinary expertise that, unfortunately, is often lacking in practice. Materials are becoming increasingly sophisticated, manufacturing is constantly evolving and the range of material properties is becoming ever more diverse. In parallel to these developments, there is growing demand for multi-material assemblies and global diversification between OEMs, suppliers, subcontractors and design offices. In short, it has never been more important to use and design smart and state-of-the-art lightweight materials. But, at the same time, implementation has never been as complex. Fasteners and technologies that combine the individual high-tech components to form an optimized end product are fundamental here.



MM-Welding® LiteWWeight® Pin in porous sandwich material



bigHead® fastener in co-process (left) and glued on, post-process (right)

As the issue is so complex, sophisticated designs and effective configurations can only be created if practitioners consider and understand fastening, connection and assembly from a holistic standpoint.

Whether you are dealing with high-strength and thin-walled fiber composites, heavy-duty honeycomb panels or other lightweight materials, specific considerations are a must if the best possible fastening solution is to be created. What is more important: an optimized cycle time or lower costs? Or are there tightness, strength and workability specifications to adhere to? Every requirement needs its own specific solution. Using optimized fastening or connection technologies and solutions helps to give competitive advantages a boost thanks to cost optimization, functionalization, design optimization and, of course, weight reduction.

MM-Welding® LiteWWeight® DoublePin in porous sandwich material

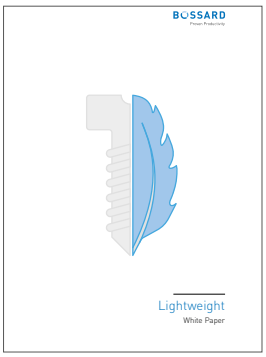
We provide you with more than just innovative fastening technologies, processes and the appropriate processing technology. We also offer you a highly qualified team that will be by your side, every step of the way, until you find the ideal solution.

Talk to your Bossard representative, or meet our experts at JEC World 2023 in Paris from April 25 to 27! You will find us at booth S57 in Hall 5. Why not arrange an appointment with us right now?

SCAN ME

You will also find more information on suitable "Fastening solutions for composite and plastic materials" in our free, English-language white papers:

SCAN ME



SCAN ME

JEC WORLD 2023 The Leading International Composites Show
April 25-27, 2023 | PARIS-NORD VILLEPINTE

Hall 5
Booth S57

VERWO AG

The advantages of Bossard's screw connection training courses being tailored to customer needs are obvious

VERWO develops, manufactures and assembles technologically complex industrial products for discerning customers. Safe production and assembly operations and highly trained staff are fundamentally important to VERWO.

During a customer visit, we welcomed Roger Kühne, VERWO's Head of Development, to Bossard AG's headquarters in Zug. We showed him what Proven Productivity means for us and – more importantly – for him.

In addition to the product solutions we provide in sheet metal processing, we also offer VERWO support in logistics with several applications. Assembly workstations equipped with intelligent SmartBins take over B- and C-parts management. Bossard's supplier management solution also cuts process costs and administration work, since all the suppliers are integrated and seamlessly supplied.

For VERWO, one thing is clear: it can only win over its customers by offering quality. This also includes putting staff through further training to keep them up to date with the latest technology. It quickly became clear that the Bossard Academy could offer exactly that.

> *"In our opinion, the Bossard Academy is the ideal partner for tailored training programs".*
>
> *Roger Kühne, Head of Development at VERWO AG*

The Bossard Academy stands for quality

The Bossard Academy's specialist seminars cover fastening technology from both a theoretical and a practical standpoint. We cover all aspects of modern screw connections in a holistic and application-related manner – from the physical principles and the materials used, to their use in development, design and production operations in a wide range of industries.

"The Bossard Academy's training courses and specialist seminars are always geared to our customers' specific needs."

Jürgen Eixler, Head of Engineering at Bossard AG

In this way, Bossard is providing its customers with support in the exact areas they find problematic. We helped VERWO to clarify its needs and to develop, plan and hold specialist seminars and training courses – on the basics of screw connections, fasteners for joining sheet metal, screws and fuses, and corrosion and corrosion protection.

We were delighted to work together with the 12 attendees from Assembly and Design to make the day a profitable one.

As is standard practice at the Bossard Academy, a good 50% of the theoretical part was supplemented with practical exercises and workshops, enabling the attendees to find out for themselves how using a torque tool incorrectly affects the preload force. Or which tool type ensures which level of tightening safety and preload force scatter. There were also moments when the penny dropped for attendees when they were using new, functional screws for sheet metal applications. And that's just one part of the exciting practical component.

The proven combination of theory and practice helps attendees to try out and test the lessons they have learned straight away. Workbenches and the necessary materials and tools are available at the Bossard Academy for this very purpose.

VERWO AG

VERWO is an innovative system provider for discerning customers' technologically complex industrial products. Its range is rounded off by specialized services in engineering, procurement management and quality management. Around 300 employees at the VERWO sites in Switzerland and Czechia do their very best to implement customer orders perfectly.

The content was perfectly adapted to our needs and the issues we face in sheet metal processing beforehand. Dominik and Daniel, the two instructors, impressed us with their professional expertise – which they always combined with a hint of humor!

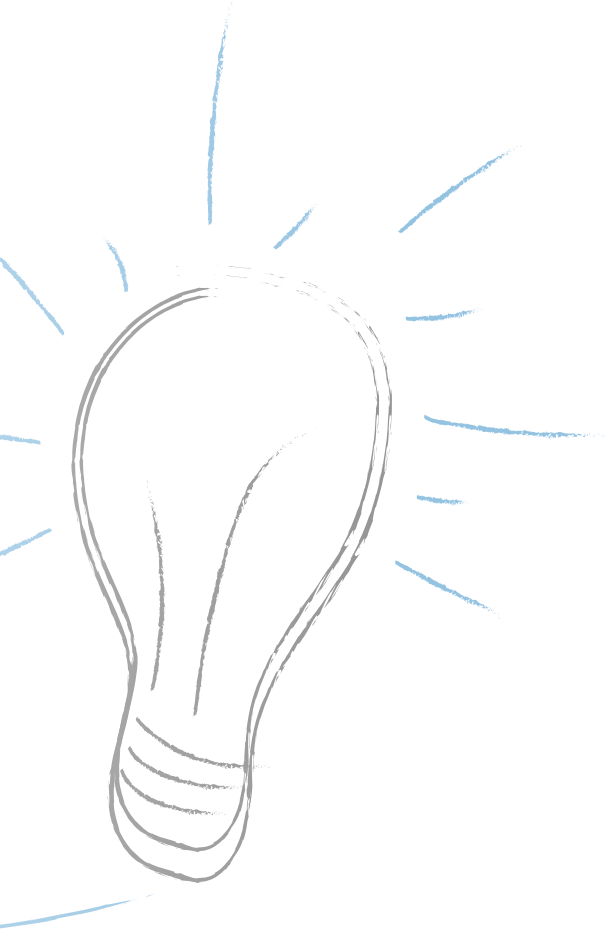
Roger Kühne, Head of Development at VERWO AG

"The training rooms are excellent for diverse, hands-on training. We'd be delighted to come back!"

Roger Kühne, Head of Development at VERWO AG

SCAN ME

Contact and advice
Would you like to learn more about our training courses and seminars? Feel free to contact us!



QUALITY HAS A NAME – THE BOSSARD ACADEMY

The Bossard Academy's specialist seminars combine theory and practice in fastening technology. By taking a holistic approach that is always application-related, we cover all aspects of modern screw connections – from the physical principles and the materials used, to their use in development, design and production operations in a wide range of industries.

Attendees put the lessons they have learned in the seminar room to the test straight away in the practice room using state-of-the-art tools and contemporary infrastructure.

Bossard – the fastening technology experts

190 years of experience
We have been supplying customers with fasteners since 1831. Keeping our knowledge of assembly and fastening technology up to date and acquiring experience as a partner to our customers are fundamental to our successful company history. We are happy to share this wealth of experience with our customers.

Sound knowledge
All of the Bossard Academy's instructors have many years of experience in assembly and fastening technology and are qualified as screwdriving engineers or screwdriving technicians by the German Fasteners Association (DSV®).

Steep learning curve
Thanks to the experience we gained from our very own operational practice and holding over 150 seminars and training courses, we know what issues our customers are faced with. Attendees appreciate the Bossard Academy's highly practical approach and efficient way of conveying knowledge.

GLOBAL – LOCAL: BOSSARD SWITZERLAND

With the Product Roadshow, we bring our wide range of products to your company

Switzerland

BOSSARD PRODUCT ROADSHOW

Learn what makes our range special

Bossard's product portfolio offers solutions for the manufacturing industry. In addition to standard parts and direct fastenings, our wide range also includes locking elements, riveting, electrical, press-fit and welding technology, all kinds of latches, threaded inserts and much more besides.

Casual and down-to-earth: Bossard's Product Roadshow is a flexible product presentation that combines both theory and practice. Bossard works with you beforehand to assess which product categories or branded items you would be interested in. Our experts present the Bossard range using samples and installation examples.

You can ask questions at any time, discuss challenges that you are currently facing and forge valuable contacts with our specialists.

Sound exciting? Contact us to arrange a Product Roadshow on your premises.

Tribological dry coatings

As part of a strategic realignment, Bossard has decided to stop offering coatings under the brand name “ecosyn®-lubric”. Marketing of the coatings is entirely dependent on the expertise of the chemicals manufacturers and their licensees or local coating service providers.

Bossard ecosyn®-lubric Black/Silver as tribological coatings will now be marketed under the CresaCoat® brand by CREDIMEX.

Neither this confirmation of equivalence nor the information on the data sheets may be used as a substitute for customer testing to ensure that the coated product is reliable, effective and fully satisfactory for the intended end use. In particular, Credimex AG accepts no liability for specified friction value ranges.

We are happy to support you with our experience to find the ideal solution for your specific application requirements and also to validate your solution.

Bossard Academy – the screw connection experts

When bolted connections fail, it is risky to dangerous for life, limb and the environment. This is why optimum training in bolting technology is becoming increasingly important.

The Bossard Academy takes account of the increased requirements with its specialist seminars and offers the following options for design engineers, assembly and maintenance personnel in May:

- Tuesday, May 9th, 2023: Secure screw connections
- Wednesday, May 10th, 2023: Multifunctional and thread forming connection technology
- Thursday, May 11th, 2023: Corrosion and corrosion protection

Find more information on our website - you can also register there:

www.bossard.com

Klimaneutral
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