

BARMAG

IDY spinning

Sustainable solutions and technologies

From Melt to Yarn

Your benefits

From Melt to Yarn – Solutions along the textile value chain	4
What is IDY production ?	6
Key benefits	
■ High yarn quality	8
■ Savings in Opex	10
■ High efficiency	12
■ Customized solutions	14
■ Flexible processes	16
Plant Operation Center (POC)	
Industrie 4.0 optimizes processes	18
Partnering for Performance	20
Our promises	22





From Melt to Yarn

Solutions along the textile value chain

Place your business ideas in professional hands! Consulting, engineering, plant construction, high-tech machinery and lifecycle management – the whole package from a single source. Many years of experience in textile machine construction and our strong global network form a solid basis and the perfect prerequisites for us as your solutions provider.

Define your yarn properties from the very outset

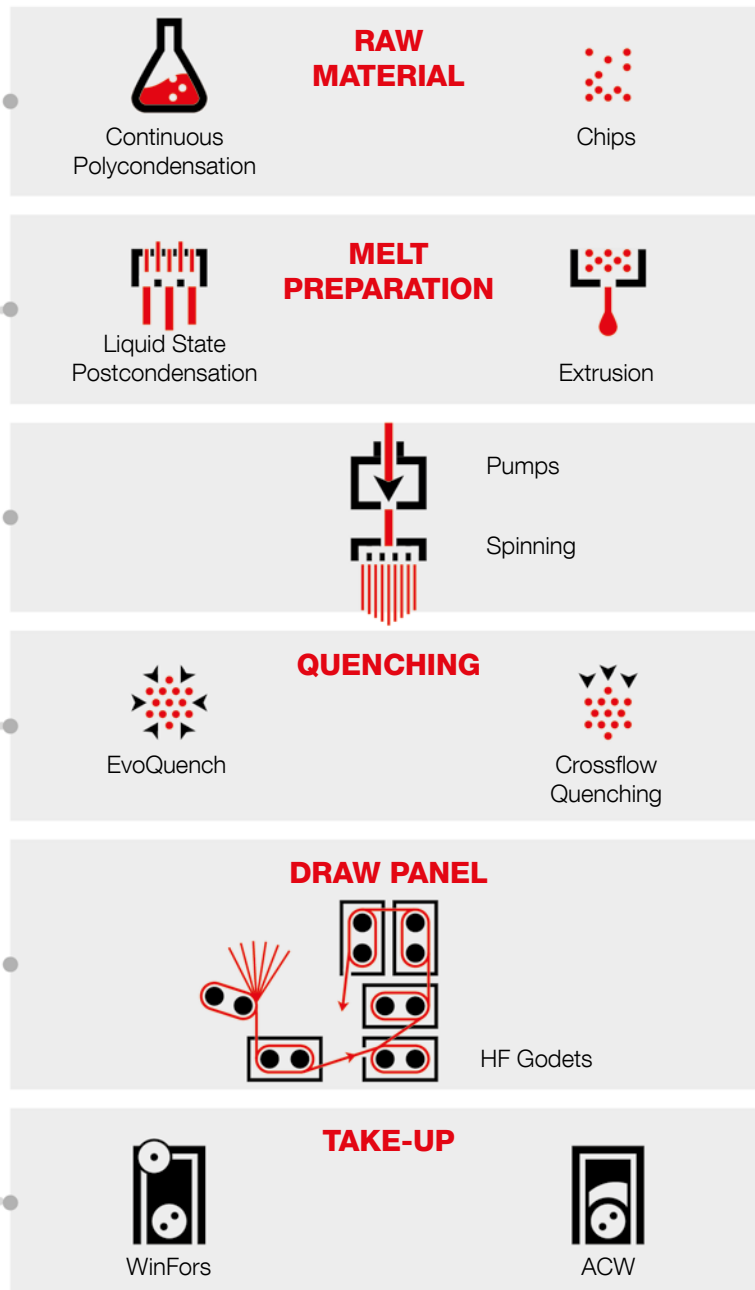
From chemicals or chips to manmade fibers, from melt to yarn, from polycondensation or extrusion to the industrial yarn package – we have your value-added chain under control. And you increase your profits. Because an optimized manufacturing process encompassing all production steps provides you with the greatest-possible influence on the quality of your end product. And your production costs. Add to this the

fact that our brand strength will make financing your project a profitable investment.

Extensive experience in engineering and management competencies help us deliver even complex projects and processes. You can rely on that!



INDUSTRIE 4.0



CUSTOMER SERVICES

Consulting, Lifecycle Management, Technical Support

What is IDY production?

Tires, safety belts, airbags, coated tarpaulins, conveyor belts – there are countless applications for industrial yarns manufactured on Barmag machines. Correspondingly specific are the demands made on the yarns used.

Decades of research and a constant dialog with customers ensure that our systems produce the perfect yarn for each and every application. From extra-super-low-shrinkage (XSLs) yarns for coated tarpaulins to high-modulus low-shrinkage (HMLS) yarns for high-end tire cords.

The idea

With our highly-developed components, know-how and proven technology, our industrial yarn machines manufacture extremely fine yarns all the way through to top-quality coarse yarns. Depending on the yarn fineness, up to 16 ends per winding position are possible.

Various concepts for various yarn types – this is the real challenge in industrial yarn spinning. The large variety of end products demands tailor-made process technologies. For your individual needs.

The benefits

Your success is very important to us. For this reason, we always maintain a focus on the benefits to you when developing our products. Profit from

- High yarn quality
- Savings in Opex
- High efficiency
- Customized solutions
- Flexible processes

e-save

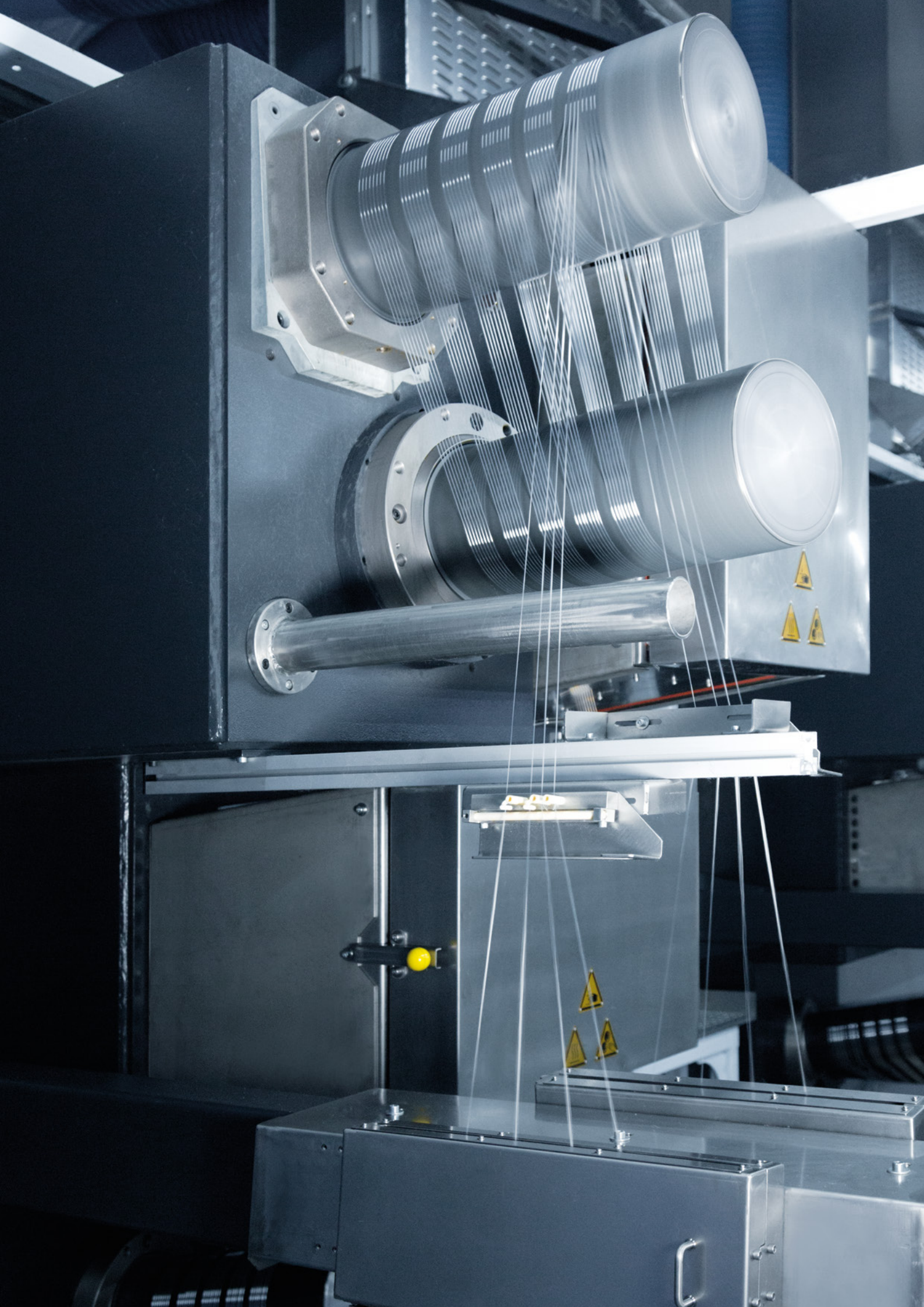
comprehensive efficiency

e-save provides you with a competitive edge

With e-save, Barmag introduced a label for particularly energy-efficient systems, machines and components back in 2004. Over the past years, e-save has established itself as the trademark of a comprehensive efficiency program. This underlines the preeminent role of Barmag when it comes to commercial success and sustainability.

Compared to other industrial yarn concepts available on the market, this solution convinces in terms of

- **Energy;** for HMLS processes for example, our 4 x 1500 den process requires more than 25% less energy per kg produced yarn compared to other machine concepts in the market.
- **Economics;** its special yarn path has a positive impact on yarn quality, which in return permits higher yarn prices.
- **Environment;** lower raw materials consumption, and a better carbon footprint due to energy efficiency.



No compromises in terms of quality – better safe than sorry

Yarn quality is the decisive criterion, particularly in industrial applications. After all, our lives frequently depend on it. Here, we are by your side – with our high-performance spinning system components: from the extruder and the spinning pump, the spin beam and the spin packs all the way through to the quenching system and the winder.

To this end, the reverse yarn path in the draw unit ensures even heat input and thus an especially gentle treatment. And this particularly benefits your seatbelt yarn.

EvoQuench for HMLS

Within the complex spinning process, the quenching unit ensures even cooling of the liquid filaments at the outlet of the spin pack. And therefore guarantees excellent yarn evenness. Our EvoQuench radial quenching unit is the perfect option for HMLS processes with a high number of filaments. However, for other industrial yarn processes you can rely on our cross-flow quenching system.

HF godets for gentle yarn treatment

Good yarn is the result of good yarn treatment. Our HF godets guarantee this: their even heating ensures highly-accurate and constant yarn temperature. 4 to 8 heating zones optimize the heating profile over the complete godet length. Your benefit: the godet heats the yarn exactly where it is needed.

ACW produces excellent quality yarn packages

Packages wound using the ACW are of excellent quality. The full package protection feature ensures fluff-free packages. A high quality take-off in downstream processing is guaranteed as a result of the possibility of varying the contact pressure along the entire running time of the package as well as the perfect package build-up by the Helicont system and step precision winding programs tailored to the specific denier ranges. The shape of the packages can be influenced as a result of the electrically-driven bailer rolls, hence enabling a high quality level in downstream processing. All yarn guiding elements are designed with the latest low-friction surfaces – ensuring the highest yarn quality level. A sensor-controlled transfer tail device guarantees 100% uniformity of the transfer and the end locator bunch.



Cost-efficient manufacturing – in all spinning processes

Competition within the yarn markets is becoming increasingly intense. The consequence: constantly-rising pressure on costs. The solution: optimized production processes, efficient systems, sustainable technologies. All these are provided by our IDY technology concepts.

Reduced heat loss: SP8x

Heat is a very considerable factor in polymer spinning systems. Generally, the polyester melt is conveyed to the spinning system at temperatures of up to 300 degrees Celsius. This harbors potential for energy optimization: in our SP8x spinning head series, we have considerably reduced the heat-radiating surface. Simultaneously, we have substantially improved the insulation compared to the predecessor models. The result: up to 75% less heat loss producing high-tenacity yarn using our 8 x 1500 den concept.

Reduced production costs: double-in-one as DIO or 6LA

The DIO spin pack reduces your production costs. How that works? Simply by increasing productivity. Because the DIO unites two independent spin packs in a single housing, hence providing the same performance as two single-end spin packs. A beneficial side effect of the DIO is reduced energy consumption due to the lower heat loss. DIO is available for low-denier industrial yarn systems.

Spinning lines producing high-denier yarns with a high number of ends rely on the 6LA spin pack: major advantages are the reusability of the filter as well as the longer lifespan. The latter results in fewer machine downtimes, reduces operating costs and thus makes your investment even more profitable.

Reduced energy consumption: HF godets

Compared to other godet heating concepts, our well-proven HF godets have 20% lower power consumption than alternative systems. This is the result of the skin effect, which directly takes the energy to the location that has to be heated. Furthermore, the HF technology allows a significantly more compact godet design. To achieve the same power output, the godet shell diameter can be reduced by 40 mm. Thus, the HF godet achieves energy savings of between 20 and 30%, even with high numbers of yarn ends per position.

Lower energy consumption also reduces the investment in the air conditioning system, power distribution units, etc. This is further supported by the power management, which ensures a uniform distribution of the maximum startup energy load for a take-up position. With the lower heat loss of the godets plus the water-cooled electrical control system, the A/C system power consumption can also be significantly reduced.



On the winning side

Efficiency is the most important characteristic of Barmag's industrial yarn spinning lines. Its core components convince with regards to economic maintenance, efficient operation and production speed.

HF godets score highly with their fast availability

As a result of their fast heating-up, our HF godets are swiftly back at production temperature following an interruption – for instance, due to cleaning. So that you can immediately start manufacturing excellent yarn quality again. And if the process conditions change, HF godets support you with short reaction times. For greater efficiency in your production.

Efficient operating with ACW

An extended parking time makes our ACW winder the perfect choice when it comes to auto-doffing systems. And, moreover, ACW is best-in-class for high speed processes and high-denier products. Its robust design catering to the demanding industrial yarn process results in

- High reliability;
- Low maintenance requirements;
- Long lifetime;
- High utilization rate.

Smooth surfaces and the carefully considered layout of its components ensure that the ACW is a maintenance-friendly, easy-to-clean unit.

HMLS speed record

When it comes to the challenging HMLS process, the ACW sets the benchmark high with regards to efficiency: it clearly beats the competition with production speeds that are up to 10% higher. Hence ensuring particularly low conversion costs.



Customized consultation, tailor-made concepts

No other filament yarn process is quite as special as the industrial yarn process. Numerous potential applications require diverse yarns, each with different properties. This is where we are your partner: you determine the end applications for your yarn. We ensure that your investment caters to these. With customized process consultation and tailor-made systems concepts.

We intuitively know what your production requirements are!

The automotive market is booming. Growth rates for car sales are currently at more than 7% per annum. Today, every car has approximately 30 to 35kg of textiles. Do you want to be part of this promising business? Then we have the perfect solutions for you: with our tailored machine concept – optimized for yarn path and winders – you will quickly be one of the top players in the sector.

Consultation and implementation

Needless to say, we also supply systems for airbag yarn, low-denier polyester yarn, HMLS, geotextiles, low-shrinkage yarn... Talk to us: our strength lies in process consultation in conjunction with our in-house R&D Center, where ideas are transformed into tangible products, and optimized. Together with you, our process specialists develop your specific solution, your tailor-made systems concept, the optimum investment in your future.



Unlimited possibilities – product diversity for your premium yarns

Our IDY technology offers you a comprehensive process window – without compromises in terms of the yarn quality. Our flexible spinning concepts allow for a variety of possible yarn products for numerous applications.

Diverse processes for all applications

Heavy or low denier? High-tenacity, low-shrinkage or even super-low-shrinkage? HMLS or safety yarns? Polyester or polyamide? We have the right systems configuration for all your requirements.

Reacting flexibly to trends

And whenever you change your production range? We can help you here, too. In addition to SLS yarns, you can also manufacture HT and HT-LE yarns with our flex concept. So, what does this mean? You can manufacture yarns for truck tarpaulins, geotextiles and airbags with one and the same system. Allowing you to quickly react to trends. Such as the rise in substituting polyamide for polyester in the production of airbag yarns.



atmos.io

Digitalisation optimizes processes

Within the context of the comprehensive digitization of our environment, production processes are increasingly interlinked with modern information and communication technologies.

Today, people, machines, systems, logistics and products are communicating and cooperate with each other, simplifying many processes as a result. Digital transformation is creating whole new dimensions. With a unique combination of experience and knowledge, we are at your side in conquering precisely these new dimensions.

atmos.io

atmos.io is the connectivity platform which provides the hardware infrastructure, software architecture and data models for all digital solutions for Barmag machines. Providing seamless data connectivity between shopfloor and the IT and ERP landscape at each customer, atmos.io ensures a secure and scalable integration. The platform functionalities can be tailored according to the requirements via the Barmag online solutions.

Reports and Analysis

The Plant Operation Center (POC) has for many years been an established process and production management system for the Barmag machines and systems deployed to manufacture textile yarns. Today, this functionality is included in the modules of the scalable atmos.io platform.

This is made possible by the modular character and the scalability of the system. And retrofitting additional modules is very simple. But atmos.io is capable of far more: the entire installed process chain can be connected ensuring also post doff data visibility. With this, the platform networks the entire production solution and the corresponding workflow.

Quality guarantee

What are the benefits of such a process and production management system? All process values relevant to the quality of your product are continually recorded and form the basis of online quality monitoring. The criteria and rules

of quality assessment and warning are defined by you. This applies both to online quality assessment (pre-doffing) and offline quality assessment (post-doffing).

Clear overview

Your manufacturing orders are set up in atmos.io and continually updated and displayed. The MES (Manufacturing Execution System) always provides you with a clear overview of each order and each product. This is valid both for currently running and already completed manufacturing orders. This is including full and centralized transparency for all connected manufacturing sites.

However, not only data integration, but also distributed workflows are possible, such as approval workflows and other tasks. This also includes tasks resulting from continuous condition monitoring, where atmos.io provides real-time notifications and dashboards when something happens or is predicted to happen.

Agile production

atmos.io not only enables the plant management to react fast and target oriented to indicated deviations from expected process settings. Modules such as AIM4DTY also provide clear problem-solving guidelines based on expert know how to automatically detected deviations or lower efficiency. This supports the industry in solving reaction problems, increases profit margins and reduces waste.

**Further information on atmos.io
can be found here**





Metric	Value
Machine Efficiency	88.5%
Production Efficiency	88.2%
Fuel System Flow	87.5%
Water Flow	87.1%
Lean Quality Break Point	87.0%

Max Sample
415 214 123 246
max.sample@company.com

Partnering for Performance

Our Customer Services department has one all-embracing mission: we want to make your production increasingly efficient and productive, and your business increasingly competitive and profitable. To do this, we offer you a close working relationship – Partnering for Performance.

Our services for your success

Textile technologies are becoming ever more efficient and flexible, opening up great opportunities to enhance your competitiveness. At the same time, this progress accelerates the race in the market. To be able to keep up and react swiftly to a changing market situation, it is important to maintain and expand your technical capabilities and to utilize them properly.

To achieve these, we place emphasis on a close, trusting service partnership with you to ensure reliable production and gain a technological edge, to secure your investment and to guarantee success in the future. Together, let us exploit the strengths of our technologies for your business.

Further information on our comprehensive Customer Services can be found here



Or contact us:
service.barmag@barmag.com

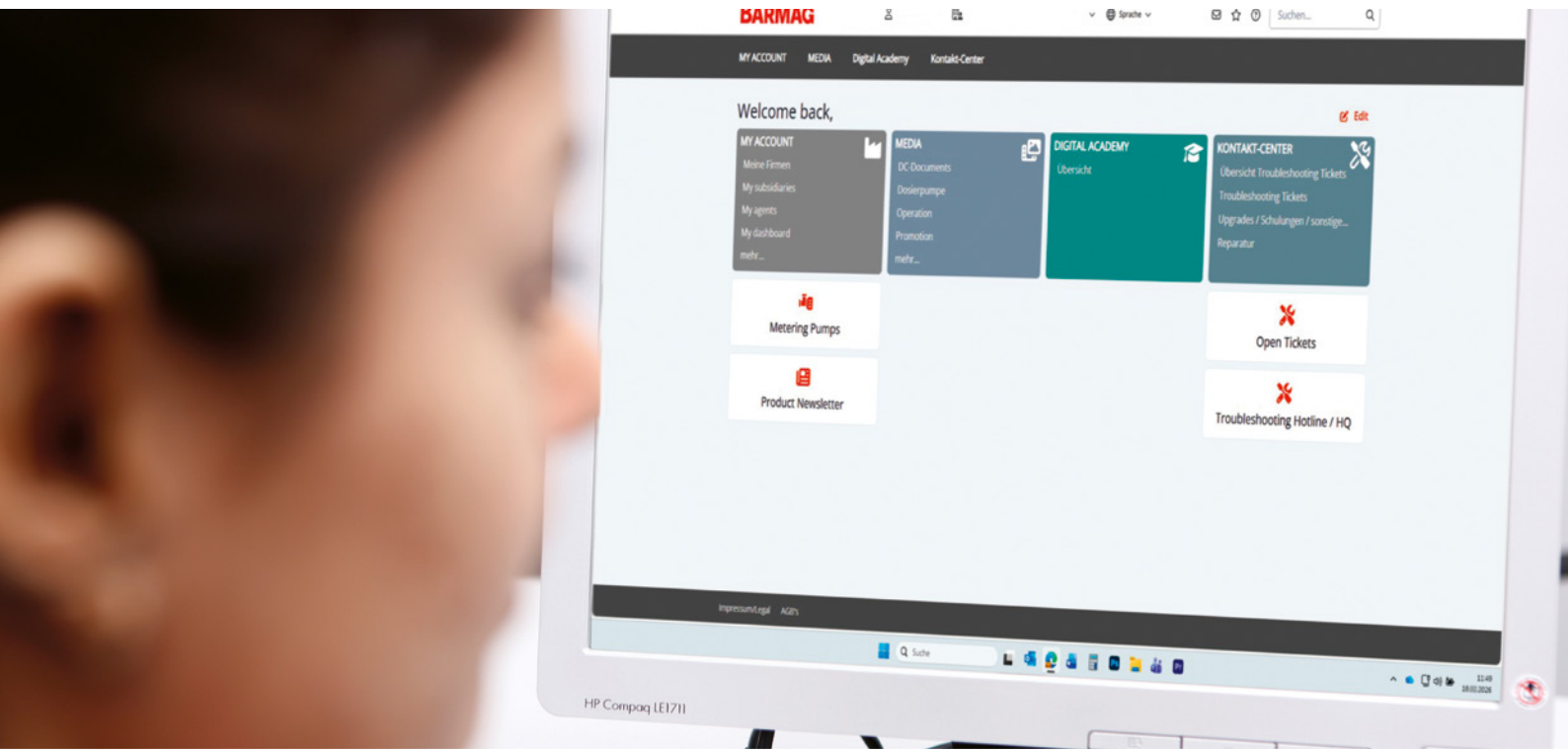
Our goal: your operational efficiency

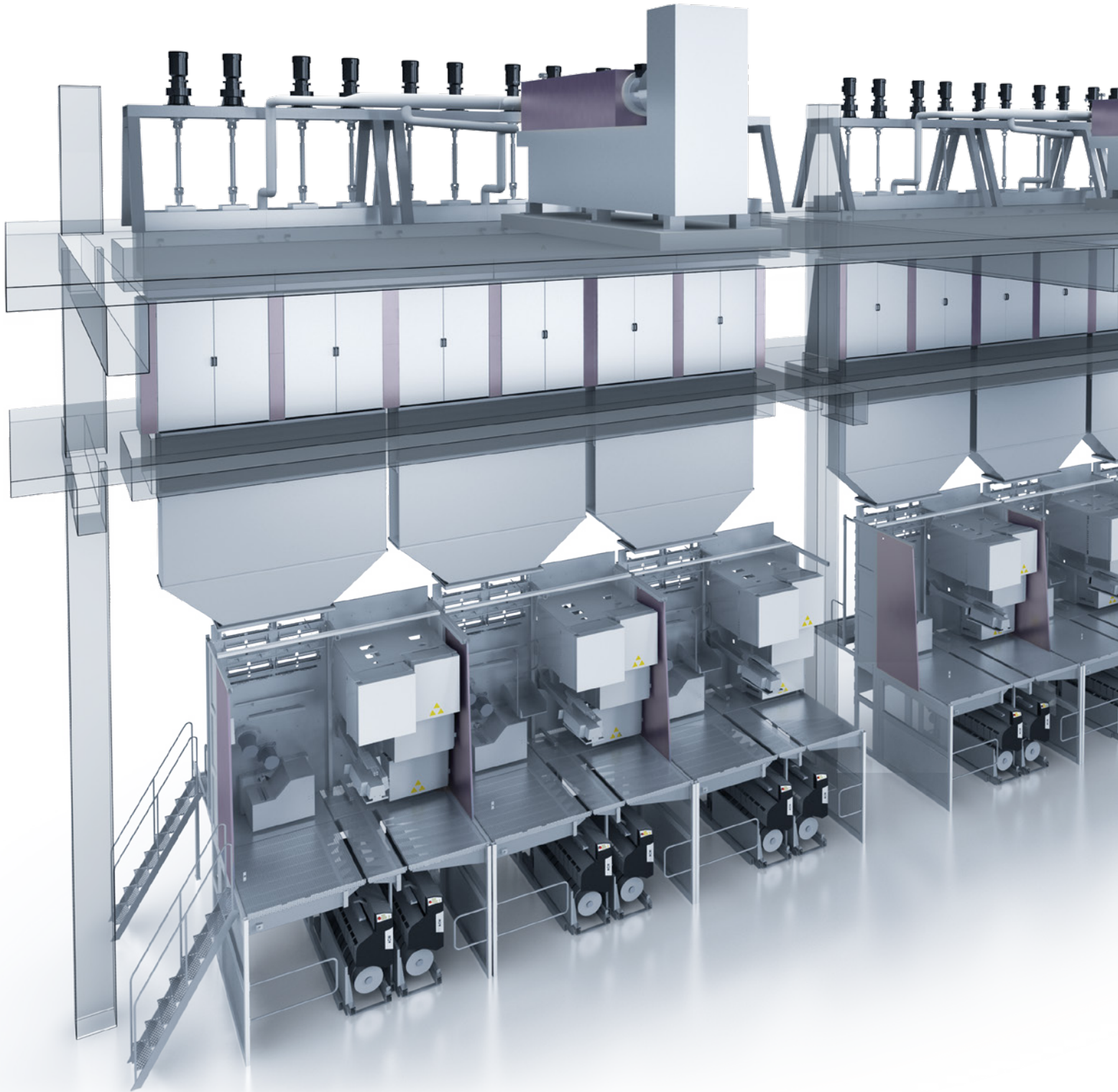
Through our partnership, we want to increase your operational efficiency to the best effect. With this in mind, we focus on optimizing your operating and manufacturing processes, your system and logistics management and the acquisition of further skills by your staff. Your success grows with the interplay of all the factors involved.

For this, we offer you the performance of a technology leader with a unique global service network, along with highly-qualified service and engineering experts. We will advise and support you in all phases of your business along the entire value creation chain of fiber production:

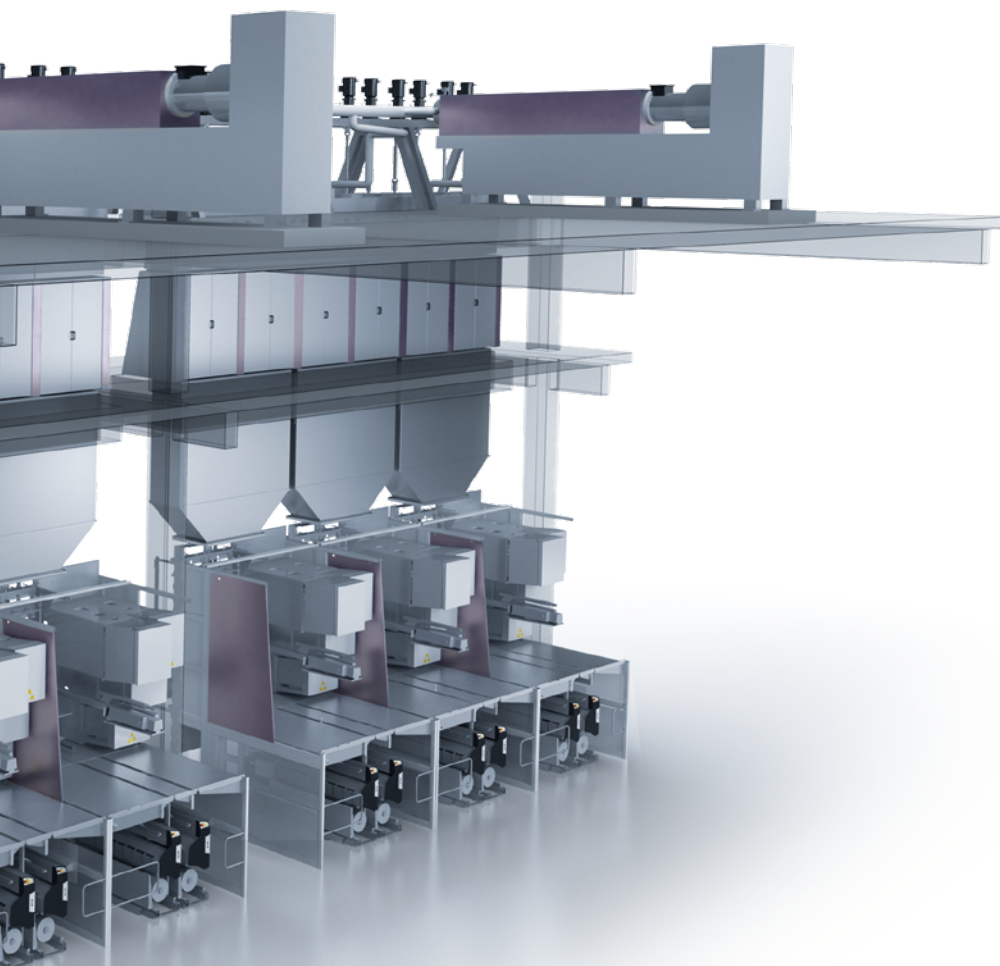
- With start-up services for the installation or relocation of your systems,
- With technical support around the clock,
- With modern services for maintenance and repair, performance enhancement and staff training,
- With longterm maintenance contracts for a continuously troublefree systems performance,
- With individual performance checks for an optimized plant operation, and
- With modernization and upgrades from the manmade fiber specialist.

Whatever you need, you can select services tailored to those requirements from a service portfolio that is unique in the industry.





XLS machines produce super low shrinkage yarns for mechanical rubber goods, e.g. tarpaulins.



Our promises

With our Barmag and Neumag competence brands, we are the world market leader for manmade fiber filament spinning systems, texturing machines, BCF systems and staple fiber systems. As a service provider for engineering and after-sales services, we offer total solutions for the entire textile value added chain. We attach great importance to energy efficiency and sustainable technologies in all our developments.

To what extent do you profit from this? Our market position guarantees you the benefits and quality of leading technologies, our sustainable products save you money and our comprehensive services save you time and hence increase your profit.

**More on Barmag
IDY spinning**



**Or contact us:
sales.barmag@barmag.com**

