



FAG



added
competence

Bearing Supports for Textile Machinery



added
competence

“Added competence” for Your Success

We have been an expert partner to textile machine manufacturers for several decades. With our strong brands, INA and FAG, we are among the leading manufacturers of complete bearing supports in this sector.

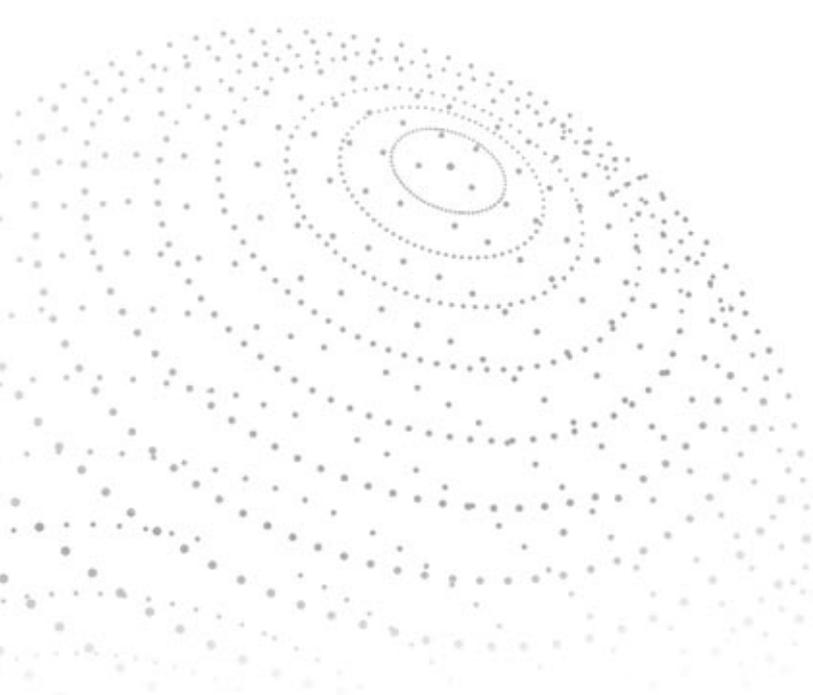
As a Schaeffler Group customer, you can expect a comprehensive range of catalog products with around 40,000 volume-produced products to choose from. In addition, we can offer you system solutions that are customized to your specific application and a series of advanced products that are extremely resistant to corrosion and wear, for example. In short – reliability and operating life to the highest standard.

The potential for optimization in machine building no longer lies only in the continuous improvement of individual components. The only way to increase the performance and cost-efficiency of machines on a long-term basis is to analyze and understand the entire system. This approach sums up our “added competence” concept,

since we attach central importance to system solutions thinking for bearing supports. As a customer, you therefore have access to a range of products that are perfectly matched to each other and that cover all bearing applications in your machines.

The Schaeffler Group considers itself as a development partner for your sector. This results in customized and optimized technical solutions for customers with durable ready-to-fit products. Expert application support and comprehensive design know-how are just as much a part of our strengths as rolling bearing calculation, testing and tribology. We have a worldwide network of engineers, and service and sales technicians working for you who ensure that we maintain close contact with you in your own location.

We always have the right product for your application. Just talk to us.



INA and FAG Products for Textile Machinery. Over 100 Years' of Experience in Your Sector

Regardless whether it is spinning or weaving, finishing or processing, cotton or synthetic fibers ... Modern textile machines are highly automated and must operate around the clock – with high material throughput. Using the right bearing components ensures a significant competitive advantage in this sector. “Right” in this case means components that are suitable for very high speeds and high loads during long operating times and reliability despite contamination from fibers and the influence of aggressive media. And for these requirements, you are at the right place with us! More than 100 years' of experience in the textile machine industry make INA and FAG leading development partners for the sector.

We offer a range of precision rolling bearings and linear guidance systems that is unique worldwide in terms of scope and variety. And we offer you genuine added value with system components –



Weaving machine (photo courtesy of Sultex)

ready-to-mount complete systems that are perfectly matched to the specific application. For example, solutions that are developed in conjunction with INA Drives & Mechatronics GmbH & Co. oHG (IDAM) for direct drive technology, a sector which continues to gain significance.

Various bearing solutions are required from the beginning right up to the end

of the “textile chain”. Products from INA and FAG make their quiet but leading contribution in all these processes. They are robust, low-wear, high-precision, clearance-free, easy to fit, do not require maintenance and durable.

Place your trust in quality and variety from one source. We look forward to working with you.



Texturing machine (photo courtesy of Barmag)



Embroidery machine (photo courtesy of ZSK)

Our Ideas – Your Added Value. From the Energy-Saving Solution ...



Classic INA products for texturing machines: Pressure rollers with high static load carrying capacity and exact line contact, smooth running thread guide rollers, ready-to-mount friction unit bearings

INA friction unit bearings for texturing machines are truly economical (see illustration above). These spindle units are complete and ready to mount – and no adjustments have to be made. The special feature here is their quiet operation. Since the special two row ball bearing on the top has an integrated elastic

suspension, spindle operation is precise and resonance-free – even in a broad work range of 8,000 to 25,000 rpm, which is above the critical speed.

Reducing operation noise is an important part of our product development efforts. For example, for a **tape tension pulley** for twisting machines (see illustration

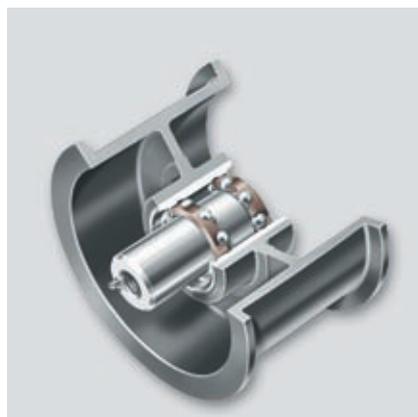
below center), we have reduced out-of-balance by 50%. But smooth running is not all – the time factor is also optimized since the ready-to-mount pulleys do not have to be balanced separately, and they have long maintenance intervals.

INA tape tension pulleys are known for their long operating life. An example are our special pulleys for the gripper drive in a weaving machine (see illustration below right). The pulley is easy to relubricate and has an extremely low moment of inertia. This allows the operating speed to be reached faster and up to 600 alternating rotary movements per minute can be performed with little energy consumption. This enables the user to increase productivity and, of course, maintain the same fabric quality.

We have developed a series of ready-to-mount systems that only need to be bolted on without first having to take the time to adjust separate parts to each other.



21,000 rpm: Tape tension pulley for OE spinboxes



Smooth running: Tape tension pulley for twisting machines



Lightweight: This tape tension pulley uses extremely little energy for alternating rotary motion

... to Easier Mounting all the Way Down to the Reduction of Noise

With the **eccentric unit for embroidery heads** (see illustration below left), you can obtain a clever system solution from us that is suitable for single or multiple embroidery heads. This INA subassembly comprises a lever, eccentric, connecting rod and the corresponding bearing units and simplifies the overall design of the machine. The gearing becomes unnecessary since the eccentric converts the rotary motion of the drive shaft to the up-and-down motion of the embroidering process. More than 1,000 strokes a minute are possible with our smooth-running precision rolling bearings. The effective seal enables you to save maintenance costs during the entire, long operating life.

Yoke type track rollers are another INA and FAG specialty. In weaving machines, for instance, they are used in the slay drive or in the gripper drive. Yoke type track rollers convert the rotating motion of the cam disk and eccentric disk to a

precisely defined and calculated back-and-forth motion. In the process, forces occur that can vary greatly in one cycle. These forces can increase very quickly, which can produce a strong impact on the bearing. That's why our pulleys have especially thick walled outer rings made from special rolling bearing steels. The optimized design of the tires means that slanted positions can be compensated and the contact pressure between the raceways can be considerably reduced. This means longer life for the bearings and the adjacent construction.

Cylindrical roller bearings allow the construction of locating and non-locating bearing solutions with high load carrying capacity in the gearboxes of weaving machines. FAG cylindrical roller bearings are especially suitable for this application since they run reliably even with marginal lubrication or high vibrations. The materials and geometry of the bearing cages are as varied as the operating conditions.



Schaeffler Group Industrial has a considerable amount of expertise in yoke type and stud type track rollers

A geometrically-stable sheet steel cage for high temperatures, a rib-guided solid brass cage for strong vibrations or high speeds or a completely new design for a special application? Just ask us – we are your development partner!



A smart system solution: The eccentric unit for embroidery head drives makes a gearbox unnecessary



FAG cylindrical roller bearings with solid brass cages enable locating and non-locating bearing solutions that have high load carrying capacity



High static load carrying capacity and low space requirements: INA needle roller bearing with cage, also available with full complement needle roller set

High Performance, Straight Down the Line: INA Linear Guidance Systems



High load carrying capacity and rigidity and speeds of up to 10 m/s:
Four row high speed linear recirculating ball bearing and guideway assembly

For many years now, important European textile machine manufacturers have relied on close cooperation with INA Linear Technology. This is due to the expert advice we provide for applications and designs and not least also due to our product range, which is unique in terms of scope worldwide. We offer a complete

modular system for the bearing supports of all linear movements in textile machines – from customized shafts with linear ball bearings to actuators with drives and control systems.

Linear guidance systems in large embroidery machines are a good example of

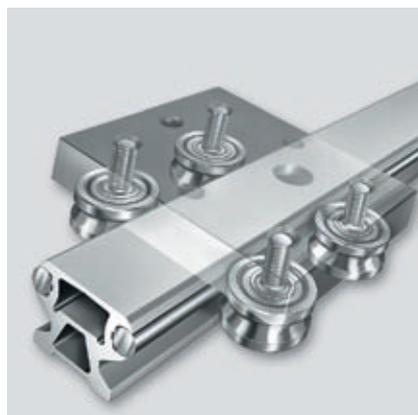
this variety. Here, innovative INA solutions are used for many of the elementary functions – simply because they are true cost-effective solutions for the manufacturer.

For example, for shuttle drives. Four row linear recirculating ball bearing and guideway assembly KUVÉ can withstand extreme accelerations up to 20 g without any problems. Or also for frame positioning during threading. KUVÉ enables reliable compensation of the micro-vibrations that occur during this process. The new accessory system KUVÉ-KIT offers significant added value to the user. This perfectly matched sealing and lubrication concept means that the specific environmental conditions during operation can be taken into consideration.

Another recommendation for embroidery machines are track roller guidance systems for moving the embroidery frame in the x and y directions. They enable high dynamics and precision for motion and functional processes.



Speeds up to 10 m/s: Linear actuator MLFI, also available with anti-corrosion protection



Track roller linear guide in lightweight design:
Reliable, fast, compact



Linear ball bearings of light range KN..-B now have 50% longer life compared with previous versions with the same dimensions

Comprehensive Service – In-depth Understanding of Textile Machinery Systems

Even the best product is useless if it hasn't been properly designed. Benefit from our engineers' experience and in-depth understanding of systems when selecting the right bearing and for all calculations.

Design. Customer-specific bearing supports and components are typical of the INA and FAG brands. The use of state of the art tools such as CAE goes without saying and is beneficial for both the customer and for us.

Selection/Calculation. With BEARINX®, we have created one of the leading programs for rolling bearing calculation. The program enables us to analyze all INA/FAG rolling bearing supports in detail. For example, the rotor dynamic tool from BEARINX® was used in the development of a chuck shaft to calculate the vibration behavior of the chuck. The measurable customer benefit is fewer tests and therefore a reduction in development costs.

Testing. The new product is tested only after this optimization has taken place. If requested, customer samples are tested in all situations and for all functions in one of our R&D Centers – from wear behavior to emissions and noise. Volume production only commences after a series of strict practical tests.

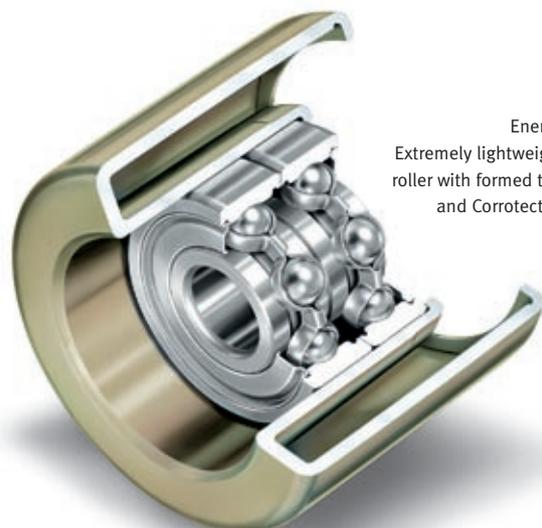
Surface Coating. Our products must also function safely and for long periods of time under extreme operating conditions.



High operating safety – shorter development times: By using BEARINX® for bearing design, we can model actual operating conditions

Advanced surface coatings developed and tested by us make their contribution here. They influence run-in behavior and emergency running characteristics and optimize corrosion protection as well as wear and friction behavior.

Corrotect® for corrosion protection and Triondur® for extreme resistance to wear are only two examples of the comprehensive range of coatings we can offer.



Energy saver:
Extremely lightweight apron roller with formed tire pulley and Corrotect® coating



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