

**A wealth of experience  
in precision engineering**



# Expertise and experience

At INA, we have been producing particularly space-saving machine elements for decades. The first INA product, the revolutionary needle roller and cage assembly, reduced the radial space requirement of a rolling bearing arrangement to that of a plain bearing. The products which we have developed since then have nearly all been smaller, with higher performance levels than previous designs.

This is primarily due to our pioneering manufacturing expertise. About 45

years ago, we started to use a drawn, sheet steel outer cup instead of a machined outer ring. In many applications, the INA drawn cup needle roller bearing with its low radial section height and high load carrying capacities, was superior to the components which were currently in use.

We are still making further developments on this technological breakthrough. Today, we are reaching higher levels of product quality through the constant improvements in our manufacturing processes. Increased cage and rib hardness as well as a marked improvement in roundness are only two examples of this. However, they do show quite clearly that we are at the head of the field when it comes to optimized quality in production of small section precision components.

Our engineers are particularly imaginative in finding a solution for tricky applications. For instance, we have solved lubrication problems in high vacuum environments by using soft silver.

We always supply our sealed bearing components for precision engineering lubricated for life. Where necessary, we obviously use greases which are safe for the food industry.

By using the Corrotect® corrosion protection coating, INA can also supply economical and extremely effective measures to prevent damage from corrosion.

As you can see, you can rely on our expertise and experience – as well as our service.



*Application example for INA components with low space requirements: high performance photocopiers*

## ... for drawn cup roller clutches with or without bearing assemblies

Our drawn cup roller clutches have always been small section, high performance components. A few years ago, we developed our smallest yet – for shafts with a diameter of only 3 mm and to date, no one else has achieved this. But we go even smaller: our new narrow section designs are only 6 mm wide. This is a gift to engineers who are constantly thinking up smaller and more compact equipment.

All INA drawn cup roller clutches have one thing in common: versatility. They are unbeatable as indexing, back-stopping and over-running clutches.

Our roller clutches have a thin-walled, drawn outer ring. Exact indexing is ensured by either plastic or steel springs which maintain contact between the clamping needle rollers and the shaft.

INA drawn cup roller clutches have a low moment of inertia due to their low section height. This in turn allows particularly high indexing frequencies.

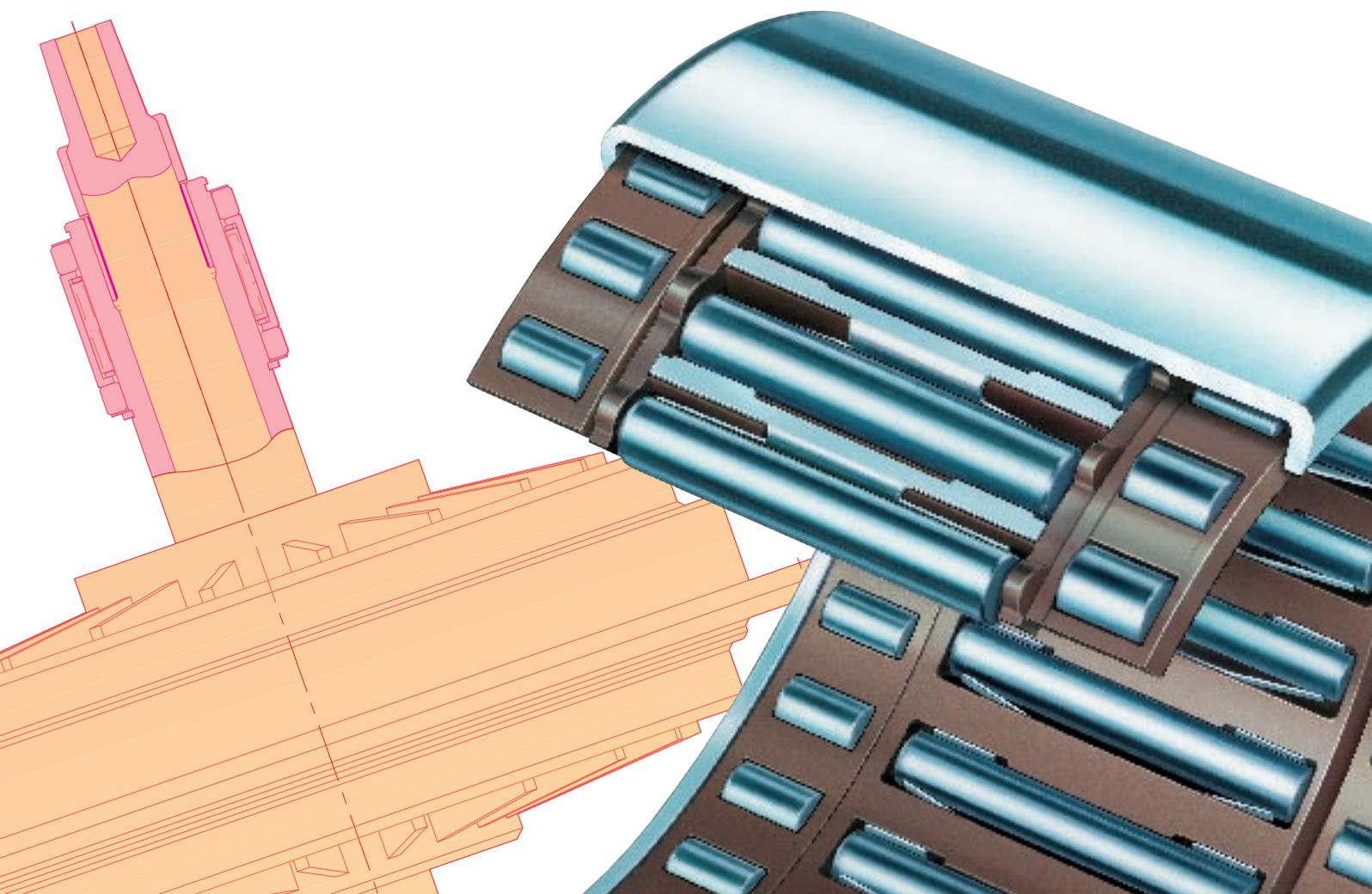
It is possible that you may also require radial support for your application. We can help you here too: up to shaft diameters of 6 mm we use integral plain bearings and from 8 mm, INA drawn cup roller clutches are available with integral rolling bearings.

Last but not least, our roller clutches can also be supplied with knurling to ensure positive location in plastic or light metal housings.

If you would like to know more about these versatile components, we will be pleased to send you more detailed information.



*Bearing bushes with narrow drawn cup roller clutches pressed in*



## ... for low section height rolling bearings

We have already told you about our drawn cup needle roller bearings. Small but not insignificant.

Our drawn cup needle roller bearings are by definition small, particularly in terms of radial space requirement. However, in order to save even more space, these bearings are now available in an even more compact design – only 6 mm wide. For extra-compact designs with particularly high performance density.

You can have even smaller bearings if you use a needle roller and cage assembly for the rolling bearing arrangement. For a shaft diameter of 2,5 mm, the width is only 4,8 mm. An unbeatable space requirement in terms of load carrying capacity and speed.

Our axial needle roller and cage assemblies are available for shaft diameters from 6 mm. With a radial section

height of 4 mm, the needle roller dimensions are only 1,5 x 2,2 mm. You can't get any smaller.

The combination of drawn cup needle roller bearings and axial cage assemblies is worth a particular mention. This provides, for the first time, a needle roller locating bearing arrangement as a single component – with a radial space requirement which at best only a plain bearing could match.

No less sophisticated are our RLF bearings. These are components which can be used for both radial and linear motion. To do this, we take a needle roller and cage assembly and fill it with balls. These RLF bearings are available from shaft diameters of 2,5 mm.

The root of all of this is our creativity – and 45 years of leading manufacturing expertise.



Power tools are typical applications for low section height INA components



INA axial cage assembly with 4 mm radial section height: with axial washer



INA components with low space requirement

## ... for complete component groups

We can also supply you with a plastic gear wheel with a pressed in clutch or rolling bearing or even a plain bearing. This forms a small component group. If you need a planetary gearbox made from polymer plastic, complete with clutch and ball bearings, you can get it from us. Ready-to-fit!

Incidentally, we have been involved with the production of components made from formed engineering plastic for over 35 years. We have established a manufacturing plant to specialize in this with its own machine tools and the most up-to-date single and double component injection moulding machines. Expertise on tap, for example, for metal/plastic bonded designs.

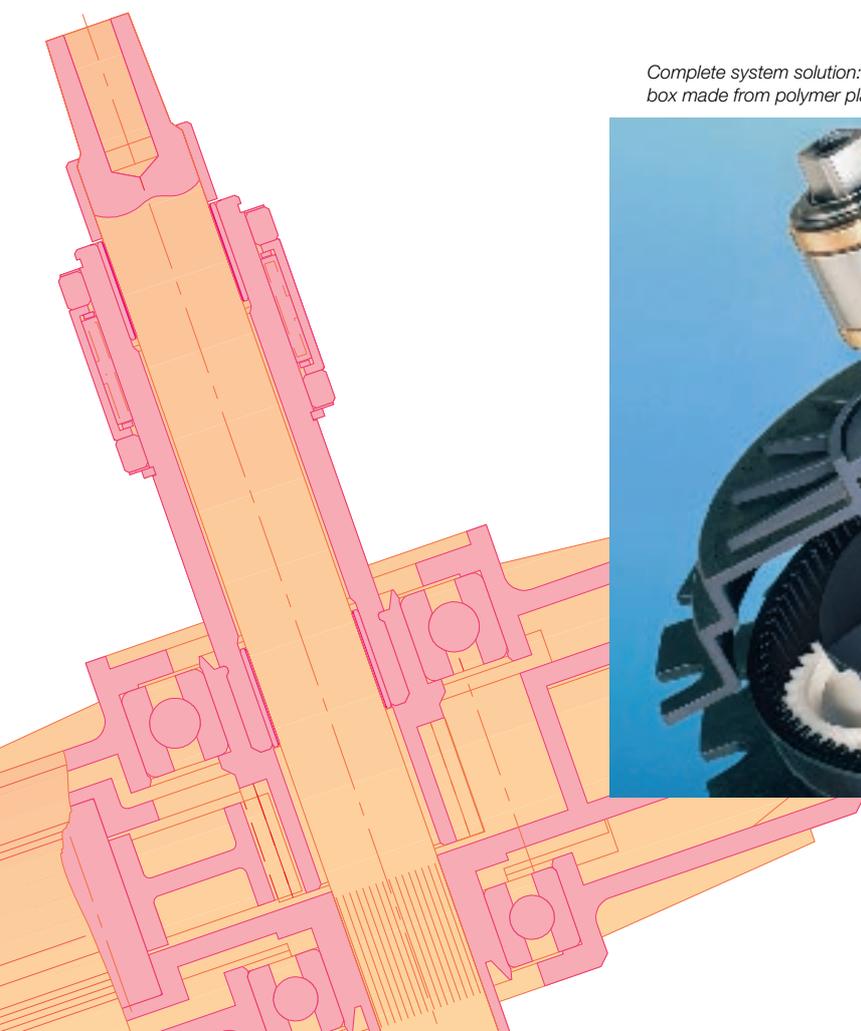
But, to get back to our component groups. It makes no difference to us whether they consist of two or three component parts or are complex

systems – we always produce the optimum technical and economical solution for each individual application. An intelligent combination of the smallest number of component parts in the smallest possible space for economical and cost-effective assembly.

One example is a turned component with a hardened needle roller as the shaft and a plastic pulley. This design saved our customer a great deal of money. Or using a formed part as a plain bearing with an injection moulded seal. Nice and simple.

We could easily tell you about a whole range of solutions to show you that, as a partner in development and system design, we understand our customers' requirements.

Good reasons for you to talk to us about your design solutions? We think so.



*Complete system solution: low noise INA planetary gearbox made from polymer plastic*





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