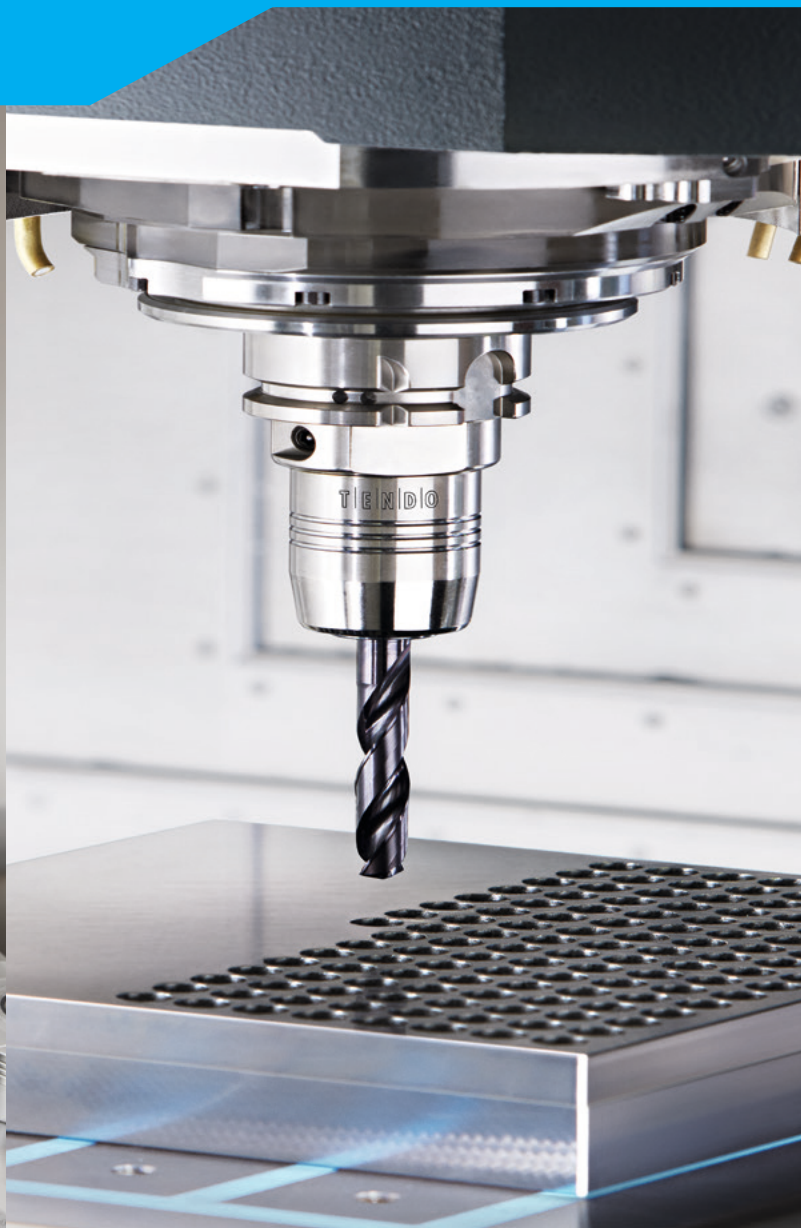


T|E|N|D|O®

Hydraulic expansion toolholders

Versatile toolholding system for
all application areas

Hand in hand for tomorrow



Hydraulic expansion toolholders

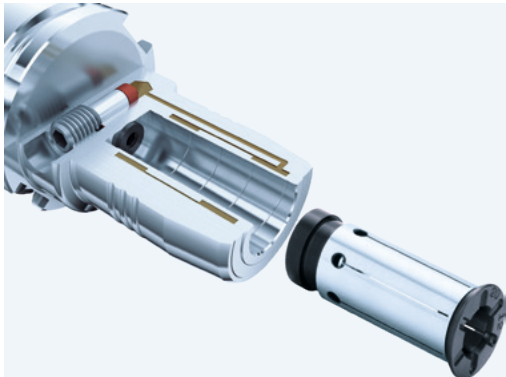
For decades, TENDO has been synonymous with high-precision clamping of shank tools. Through continuous development, this pioneering clamping technology meets the ever-increasing demands of challenging, versatile precision machining. TENDO enables the clamping of all standard shank types, and the extensive product range offers the right solution for almost every application.

Master the following challenges with TENDO:

- Highest run-out and repeat accuracy < 0.003 mm
- Excellent vibration damping
- Precise length preadjustment, axially or radially
- Quick changeover in seconds
- Fine-balanced by default (G2.5 / 25,000 RPM)



Vibration damping



Variable thanks to intermediate sleeves



Dirt grooves for reliable torque transmission



Resistant against dirt and coolant

Interfaces

For all common machine spindles

Reliable clamping process

By actuating the clamping piston, the hydraulic fluid is pressed into the chamber system, completely leak-free thanks to the special seal

Easy manual clamping

Fast and process-reliable tool change with just one Allen key

Vibration damping

The chamber system filled with hydraulic fluid has a damping effect on the clamped tool and reduces tool wear.

All standard shank types can be clamped

Form A: with smooth cylindrical shank form A according to DIN 1835 and DIN 6535 HA
Form AB: with flat end face and cylindrical shank with drive area, shank form B according to DIN 1835 and DIN 6535 HB
Form B: with lateral drive areas, shank form B according to DIN 1835
Form E: with inclined surface, shank form E according to DIN 1835 and DIN 6535 HE

Available for every application

100% clamping, 100% reliable, 100% versatile in use – this is what the extensive TENDO product range stands for. Whether milling, reaming, drilling, countersinking, thread milling or drilling, HSC-precision is ensured.

All standard shank types can be clamped for process-reliable clamping. TENDO hydraulic expansion toolholders allow the clamping of tools with smooth cylindrical shanks according to DIN 6535 Form HA up to Ø 32 mm as well as those with recesses according to

- DIN 1835 Form B, E
- DIN 6535 Form HA, HB, HE,

directly and flexible with intermediate sleeves.



Learn more
schunk.com/tendo

TENDO Silver – The all-rounder for drilling applications

TENDO Silver offers an easy entry into the hydraulic expansion technology, providing the best cost-performance ratio in direct clamping. Nine interfaces make TENDO Silver a process-reliable and precise toolholder that clamps all standard shank types.



Balance grade
G2.5 at 25,000
RPM



High
flexibility



All shank types
can be clamped



Excellent
vibration
damping

NEW

Micron-precise tool change in seconds



- All commercially available shank types can be clamped**
 - Form A:** with smooth cylinder shank, shank form A according to DIN 1835 and DIN 6535 HA
 - Form AB:** with flat face and cylinder shank with pulling face, shank form B according to DIN 1835 and DIN 6535 HB
 - Form B:** with lateral pulling faces, shank form B according to DIN 1835
 - Form E:** with inclined clamping face, shank form E according to DIN 1835 and DIN 6535 HE

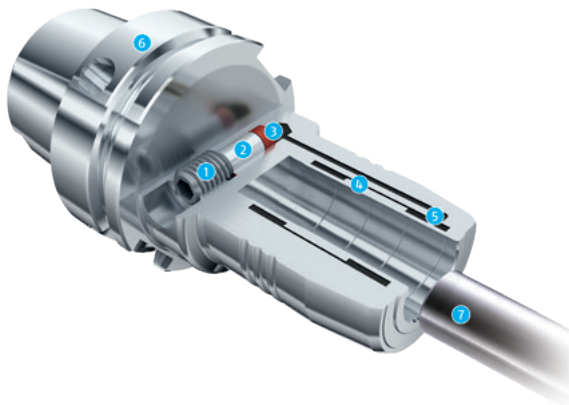
- Fine-balanced by default**

With a balancing grade of G2.5 at 25,000 RPM for high rotational speeds

- Seconds-fast, micron-precise tool change without peripheral devices**

Time savings through set-up time reduction and no investment or energy costs for additional clamping devices

- Clamping screw**
The clamping screw activates the clamping piston
- Clamping piston**
The clamping piston compresses the hydraulic fluid into the chamber system
- Sealing element**
Special seal for leak-free clamping
- Expansion sleeve**
The expansion sleeve evenly expands against the tool shank
- Chamber system**
With a dampening effect on the clamped tool
- Base body**
With machine-sided interface
- Tool**
Highest run-out and repeat accuracy < 0,003 mm



Interfaces
HSK-A 63
HSK-A 100
SK 40
SK 50
JIS-BT 30
JIS-BT 40
JIS-BT 50
CAT 40
CAT 50



Run-out accuracy
≤ 3 μ



Min. torque
16 .. 650 Nm



Max. speed of rotation
25000 .. 50000 RPM



Diameters
6 .. 32 mm



schunk.com/tendosilver

Permanent run-out and repeat accuracy of < 0.003 mm

No compromises. The TENDO Silver combines the advantages of hydraulic expansion technology with an attractive pricing structure. This way, you benefit from seconds-fast tool changes, excellent vibration-damping properties, and micron-precise run-out and repeat accuracies.

The TENDO Silver was developed for a wide range of applications and seamlessly adapts to various machining requirements. The robust design of the TENDO Silver not only enhances rigidity for demanding machining tasks, but also ensures additional flexibility and full compatibility with SCHUNK intermediate sleeves and extensions.

- + Excellent vibration damping
- + Precise length preadjustment
- + High flexibility
- + Dirt grooves for reliable torque transmission

Increase of the tool service life of up to 40%

Tight tolerances, enormous cost pressure, and higher precision – TENDO E compact is the answer to the increasing demands in volume machining that can no longer be economically met by ER collets, heat shrinking toolholders, Weldon mountings, and technically inferior hydraulic expansion toolholders.

The TENDO E compact impresses with a price that makes switching from mechanical and thermal toolholders to the significantly more precise TENDO quality easy.

- + Excellent vibration damping
- + Highest torques
- + Versatile in use
- + Seconds-fast, micron-precise tool change without peripheral devices

Learn more!

For more information or should you have any questions, we are happy to assist you. Please feel free to contact our expert in tool clamping technology.

Phone +49-7133-103-2500

The universal hydraulic expansion toolholder for volume cutting, reaming, and thread-cutting!

The TENDO E compact sets entirely new standards. With strong performance in torque transmission, damping properties, rigidity, and run-out accuracy, the TENDO-E compact is ideally suited for precise and fast machining – especially in heavy-duty applications.



Highest
torques



Permanent
run-out
accuracy



High radial
rigidity



High
flexibility

TENDO E compact – The toolholder for universal use



+ High torque for volume cutting

Due to the compact design, high holding forces and therefore high torque transmission are permanently ensured

+ High radial rigidity

No lateral deflection during the machining process and high shape accuracy on the workpiece while achieving the highest material removal rates

+ High flexibility

Clamping of different diameters through the use of slotted or coolant-tight intermediate sleeves

+ Excellent vibration damping

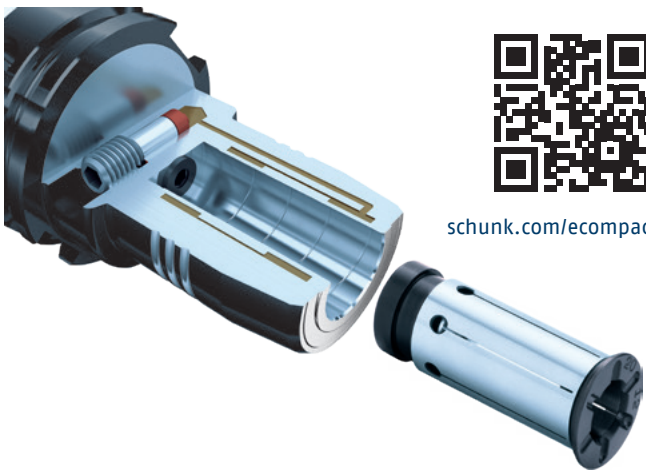
Prevention of micro-breakage, best workpiece surface qualities, protection of the machine spindle, increased tool service life, and consequently, reduced costs

Increase efficiency through the use of intermediate sleeves

SCHUNK intermediate sleeves allow clamping of multiple different shank diameters with just one toolholder. The universal GZB-S intermediate sleeves are available in two versions: the proven coolant-proof version and the innovative peripheral cooling version. Both are compatible with the SCHUNK toolholding systems TENDO, TRIBOS, and SINO-R as well as with other standard hydraulic expansion toolholders and power toolholders.

Your added value:

- Highest flexibility with optimal cost control:**
One toolholder, several clamping diameters
- Comprehensive compatibility**
The universal GZB-S intermediate sleeves are compatible with the SCHUNK toolholding systems TENDO, TRIBOS, and SINO-R as well as with other standard hydraulic expansion toolholders and power toolholders
- Individual**
Further sizes and customized designs are available on request



Interfaces

HSK-A 63
HSK-A 100
SK 40
SK 50
JIS-BT 30
JIS-BT 40
JIS-BT 50
CAT 40
CAT 50
BT-DC 30
BT-DC 40
BT-DC 50
CAT-DC 40
CAPTO C5
CAPTO C6



Run-out
accuracy
≤ 3 µ



Min.
torque
110 .. 850 Nm



Max.
speed
25000 .. 50000
1/min



Diameters
6 .. 32 mm



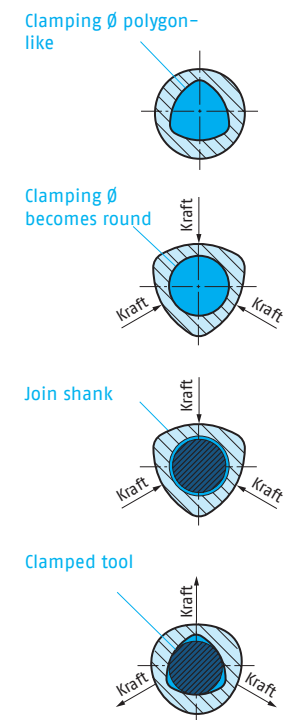
[schunk.com/ecomact](https://www.schunk.com/ecomact)

The best of both worlds combined!

Precise micro-machining as well as the processing of the tightest and hardest-to-reach workpieces are the strengths of TRIBOS. The patented TRIBOS polygonal clamping technology is available for all common machine interfaces. It is used in the automotive, aerospace, and watchmaking industries as well as in tool and mold making, medical technology, and machine and plant engineering. The one-piece mountings are mechanically resistant and ensure virtually maintenance- and wear-free clamping in the long term.

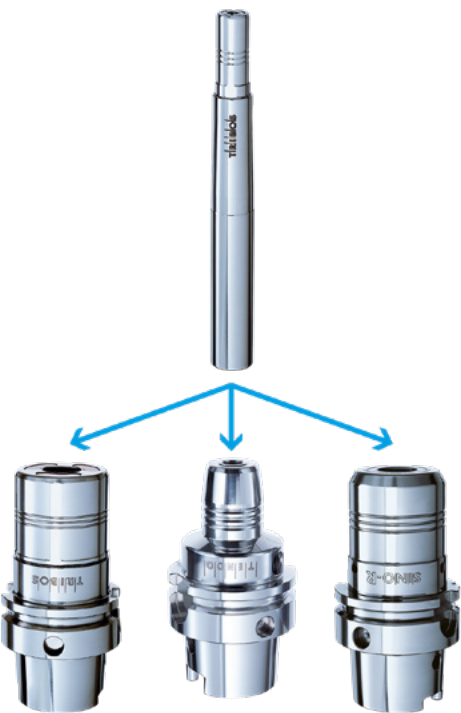
From micro to macro – TRIBOS at a glance:

- + Best run-out behavior < 0.003 mm for longer tool service lives and best surface qualities
- + No moving parts, making it completely maintenance-free
- + Wide range of clamping diameters from 0.3 to 32 mm
- + Rotationally symmetrical design for machining at the highest speeds



This is how the polygonal technology functions

Under pressure, the polygonal clamping diameter of the toolholder becomes round, allowing the tool shank to be easily inserted. When the pressure is released, it returns to its polygonal shape and securely clamps the tool for reliable processing.



TRIBOS SVL extensions

By using TRIBOS SVL extensions, standard cutting tools can be used instead of expensive special tools. The extension, with a run-out accuracy of < 0.003 mm and a slim interfering contour, can be combined with all SCHUNK toolholders.

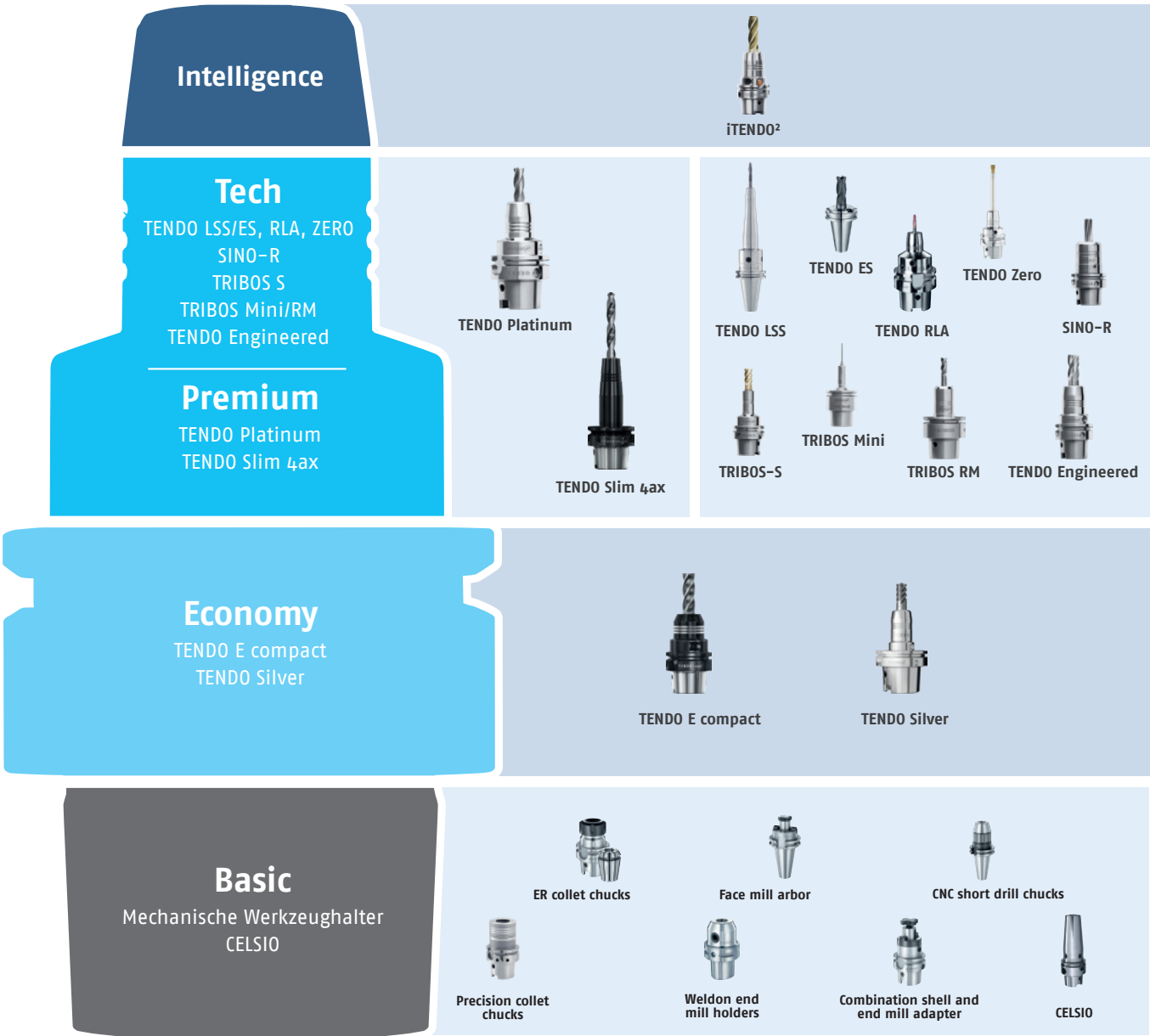
SCHUNK toolholders

The complete program for all applications

Each specific application has different demands. Expecially when it comes to precision, no compromises can be made. This is where SCHUNK, as a technology leader, sets standards with its Total Tooling complete program.

The innovative and high-precision toolholding systems cover a unique range in proven SCHUNK quality.

We focus on the application and find the optimal toolholding system for your task. Discover SCHUNK's wide range of technologies, from mechanical and heat shrinking toolholders to vibration-damping precision toolholders in SCHUNK polygonal technology and SCHUNK hydraulic expansion technology, all the way to the ultimate solution for Industry 4.0 applications – the first intelligent toolholder, iTENDO².





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