Up to 300% longer tool life

1945 – 2015
70 Years

Superior Clamping and Gripping

SCHUNK®

TENDO® E compact

The Universal Hydraulic Expansion Toolholder

Superior Clamping and Gripping

Jens Lehmann stands for precise gripping, and safe holding. As a brand ambassador of the SCHUNK team, the No. 1 goalkeeper represents our global competence leadership for clamping technology and gripping systems. The top performance of SCHUNK and Jens Lehmann are characterized by dynamics, precision, and reliability.

For more information visit our website:
www.gb.schunk.com/Lehmann

Jens Lehmann

Henrik A. Schunk, Kristina I. Schunk, brand ambassador Jens Lehmann, and Heinz-Dieter Schunk

Top Performance in the Team

SCHUNK is the world's No. 1 for clamping technology and gripping systems – from the smallest parallel gripper to the largest chuck jaw program.

In order to boost efficiency, SCHUNK customers have bought more than 2,000,000 precision toolholders, 1,000,000 gripping modules, and 100,000 lathe chucks and stationary workholding systems so far.

This makes us proud and motivates us to attain new top performances.

As a competence leader, we recognize and develop standards with a large potential for the future, which will drive the rapid progress in many industries.

Our customers profit from the expert knowledge, the experience, and the team spirit of more than 2,300 employees in our innovative family-owned company.

The Schunk family wishes you improved end results with our quality products

Heinz-Dieter Schunk Henrik A. Schunk Kristina I. Schunk

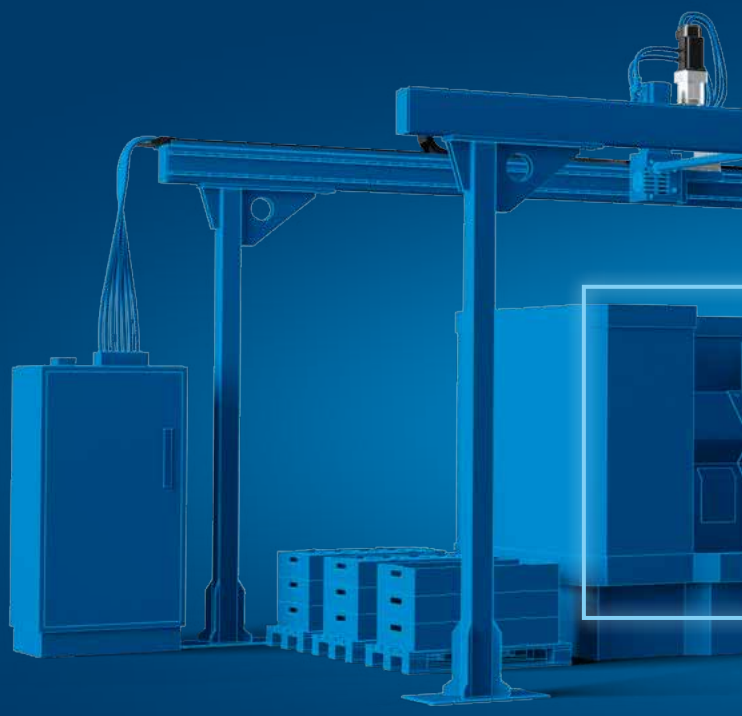
Superior Clamping and Gripping

It’s time to use your machine’s full potential!

With superior components, we find potentials where you would never expect to find them. In your machine.

Make use of your machine’s full potential with the extensive product portfolio from SCHUNK.
SCHUNK, the competence leader for clamping technology and gripping systems, can now open up the full potential of your processing machines and production processes. Reduce costs by combining accurate, flexible workpiece machining with dynamic production automation.

SCHUNK Synergy – when everything fits together.
With SCHUNK Synergy, you benefit from superior components from our innovative family-owned company and the result of a perfectly harmonized interplay of clamping technology and gripping systems. The more you use of SCHUNK, the more efficient your machine is.



Lathe Chucks

The whole world of lathe chucks. Precise hold with full dynamics.

Magnetic Technology

5-sided machining in one set-up. Free of deformation and ready in seconds.

Toolholders

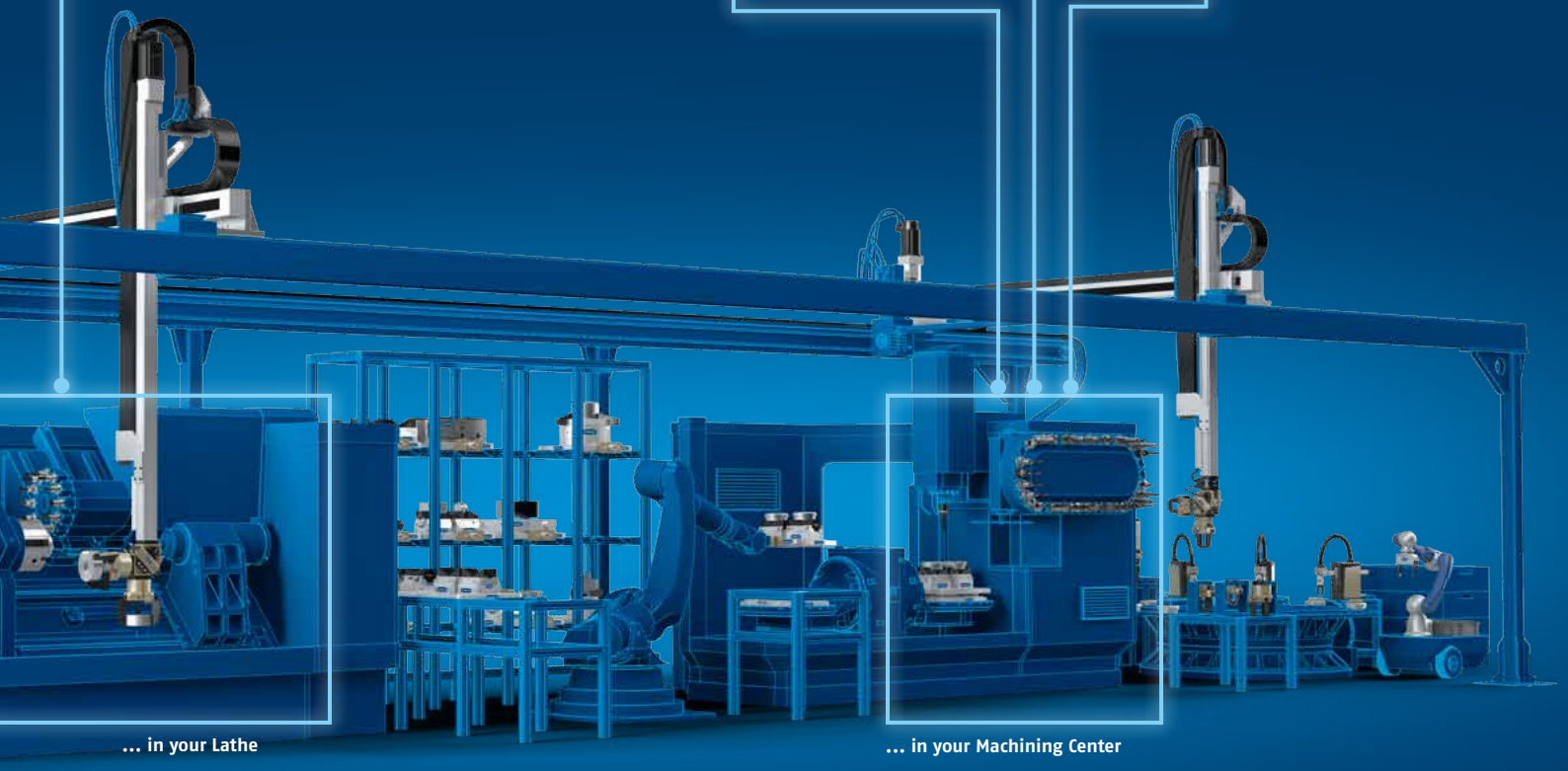
The perfect system for tool clamping.

Chuck Jaws

Unique diversity. The world's largest standard chuck jaw program from one source.

Stationary Workholding

The largest modular system for individualists. Whether it's pneumatic, hydraulic, or mechanical.



... in your Lathe

... in your Machining Center

T|E|N|D|O® E compact

The universal hydraulic expansion Toolholder

Up to 300% longer tool life*

2,000 Nm torque with Ø 32 mm

The ultimate solution

- **for all cutting tools**
- **for all applications: milling (roughing, finishing), drilling, tapping, reaming**

*Verified in a study by the wbk Institute of Production Technology at the Karlsruhe Institute of Technology (KIT).

www.schunk.com/tendo/wbk


TENDO E compact

T|E|N|D|O® E compact

The universal hydro expansion toolholder

Narrower tolerances, enormous cost pressure, better quality – TENDO E compact is the answer to growing demands in high-volume machining, which is no longer economically feasible with ER collets, heat-shrinking toolholders, Weldon mounts and lower-quality hydro expansion toolholders.

With the TENDO E compact hydro expansion toolholder, SCHUNK combines all high-performance parameters into a contemporary toolholder which satisfies and even exceeds all requirements.

TENDO E compact has an impressive price, which makes the switch from mechanical and thermal toolholders to significantly more precise TENDO quality an easy decision.

- Up to 300% longer tool life*
- Highest torques, now up to 2,000 Nm with dia. 32 mm in dry clamping conditions, 900 Nm with an oil tool shank
- Best surface finishes – no chatter marks
- Minimized noise emission
- Reduced tool costs
- Extremely fast tool change without peripheral equipment
- Long-lasting run-out and repeat accuracy < 0.003 mm

* Verified in a study by the wbk Institute of Production Technology at the Karlsruhe Institute of Technology (KIT).

Sensational!
Milling at full speed!
TENDO® E compact

① Milling

TENDO E compact is the first hydro expansion toolholder that is suitable for difficult high-volume machining with up to 2,000 Nm torque with dia. 32 mm (in dry clamping conditions).

② Reaming

The outstanding vibration damping for best workpiece surfaces and long-lasting run-out for high dimensional accuracy.

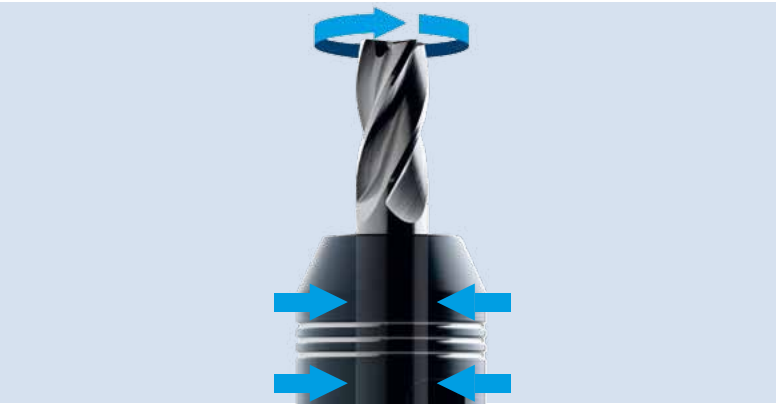
③ Drilling

Drilling – one of the traditional strengths of the TENDO family. Vibration damping and run-out accuracy < 0.003 mm are also the top features of TENDO E compact.

④ Tapping

TENDO E compact is virtually predestined for tapping with its high torques and outstanding vibration damping.

Your Benefits



High torque of up to 900 Nm (Ø 20) and 2,000 Nm (Ø 32) for highest volume machining

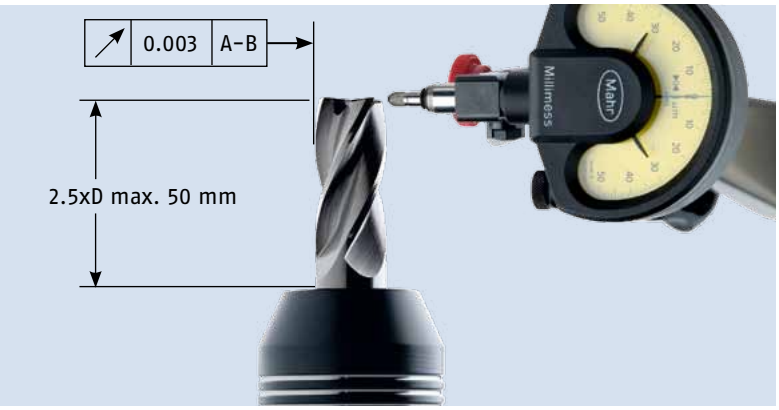
Due to the compact design, holding forces and a high torque transmission are guaranteed.

Your benefit:
Highest material removal rate.

High radial rigidity for a better part geometry accuracy

The optimal radial rigidity resulting from a robust toolholder body, avoids lateral deflection during metal cutting.

Your advantage:
High part accuracy geometry at the workpiece and the highest material removal rates e.g. 400 cm³/min (25 in³/min) with 42CrM04 (4140)*.
* depending on the machine tool and the tool



Permanent run-out accuracy of less than 0.003 mm – without any fluctuations

This assures best surface results due to a uniform cutting action and highest reproducibility.

Your advantage:
Safe and precise machining.

Excellent vibration damping

The hydraulic system absorbs vibrations, assures smooth running, and the best workpiece surfaces.

Your benefit:
High surface quality, the machine spindle is protected from damage, and service life is increased.

Tool change within seconds, micron-precise without peripheral equipment. Just screw to the dead stop

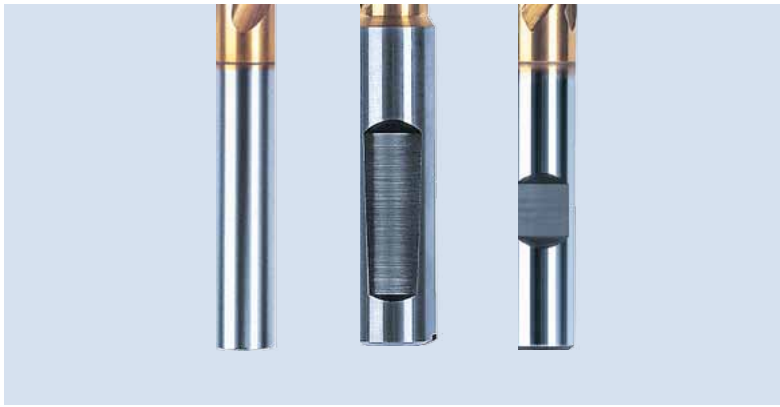
Easy handling. Turn in the actuation screw with an Allen key to the dead stop. The clamping results in a run-out accuracy of less than 0.003 mm without the need for additional peripheral equipment.

Your advantage:
Time savings due to reduced set-up times and no investment costs for additional clamping devices.

All shaft types can be clamped

With TENDO E compact all customary tools (Ø 3 to 32 mm) with a smooth cylinder shank as well as recesses according to DIN 1835 Form B, E and DIN 6535 Form HB, HE can be clamped directly with or without intermediate sleeves.

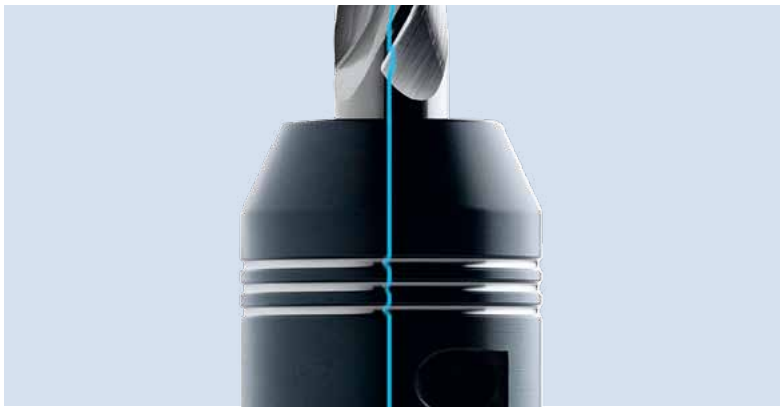
Your advantage:
No additional costs for new tools.



Suitable for HSC / HPC machining – precision-balanced as standard

With a balancing grade G2.5 at 25,000 rpm, the HSK-A 63 version for high speeds is perfectly suitable for HPC / HSC machining centers.

Your advantage:
Perfect for HSK high speed spindles.



Maintenance-free

The sealed system of the TENDO E compact blocks the penetration of dirt, coolant, lubricants or chips. The clamping area will not be damaged and proper function is guaranteed.

Your advantage:
Maintenance-free and a long service life.

TENDO® E compact in Details

Innovative Hydraulic Expansion Technology

1 The actuation screw
The actuation piston is moved with the actuation screw and can be tightened to a dead stop without a torque wrench.

2 The actuation piston
The actuation piston compresses the hydraulic fluid into the chamber system.

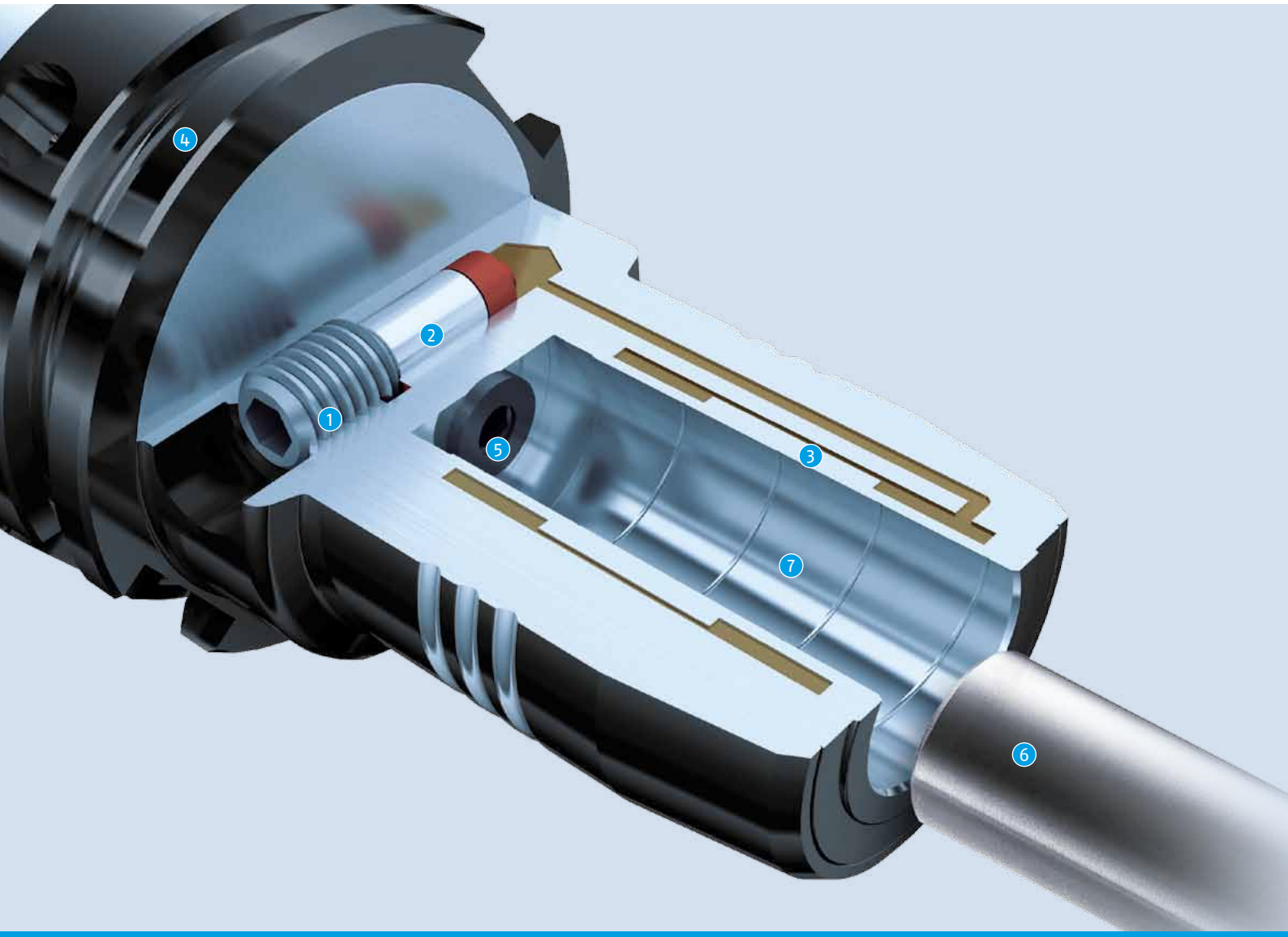
3 The expansion sleeve and chamber system
The expansion sleeve expands against the tool shank. This clamping process first centers the tool shank before fully clamping it over the whole surface. The chamber system fills with hydraulic fluid, exerting a damping effect on the clamped tool. Wear on the cutting edge of the tool is minimized, service life is increased by up to 40 %.

4 The toolholder body
The toolholder body includes the machine interface, e.g. HSK, SK, JIS-BT, CAT, etc.

5 The length adjustment screw
For fast and easy presetting.

6 The tool
The tool is clamped centrically to the center axis – highest run-out and repeat accuracy of less than 0.003 mm

7 The groove
The enormous clamping pressure of the TENDO hydraulic expansion toolholder creates a displacement of oil, grease, or lubricant residues into the groove causing surfaces to remain dry.



TENDO® E compact in Comparison

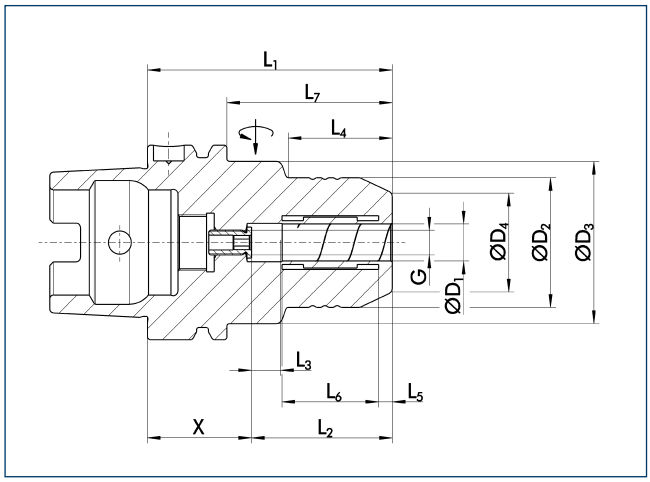
Characteristics	TENDO E compact	ER collet chucks	Weldon	Heat shrinking toolholders
Run-out accuracy – Even cutting action – Influences damping and balance grade – Cost reduction	++ 0.003 mm (measured at 2.5 x D permanent)	– 0.01 – 0.02 mm	– 0.01 – 0.02 mm	+ 0.003 mm (measured inside the bore hole)
Process reliabilty – Permanent run-out accuracy	++	–	–	–
Torque at Ø 20 mm – Highest volume machining – Process reliability	++ up to 900 Nm	○ 220 Nm	++ Form-fit clamping	+ 420 Nm
Radial rigidity – Higher part geometry accuracy at the work-piece at rough machining – Lower cost for remachining	++	–	++	–
Damping – Increased tool service life – Prevents the machine spindle from damage – Lower costs – for remachining – Avoiding chatter marks	++	○	–	–
Flexible by using intermediate sleeves – Enlarged field of applications – Cost reduction – Higher clamping force at given shafts – Peripheral cooling	++	++ (Collet chucks)	–	–
Clamping of all shafts (Weldon, Whistle Notch, ...)	++	++	–	–
Handling and Operability – No operator training necessary – Avoids clamping errors – Low set-up costs	++	+	+	–
Resistant to dirt – No maintenance – Lower costs	++	–	+	–
Exact length pre-adjustment	++	–	–	–
Necessary peripheral equipments (regarding costs)	++ Allen key	○ Hook wrench + assembly device	○ Allen key + assembly device	– Induction unit

++ very good + good ○ neutral – bad

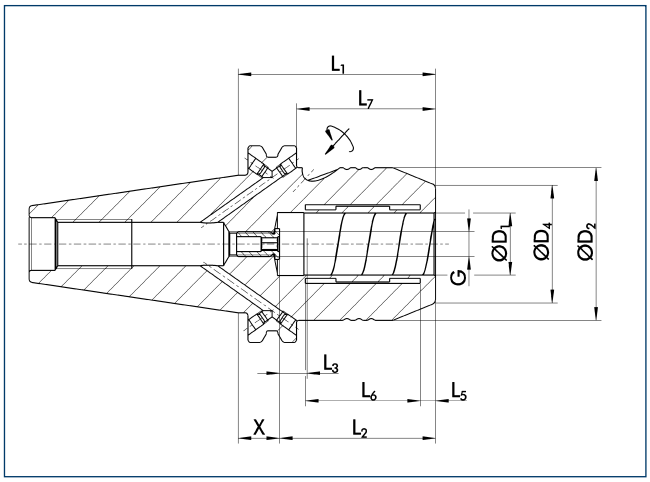
Summary: TENDO E compact combines all the performance parameters.

Technical Data

HSK-A 63 / HSK-A 100



SK 40 / BT 30 / BT 40 / SK 50 / BT 50



Mounting	ID	D1	D2	D3	D4	L1	L2	L3	L4	L5	L6	L7	X	G
HSK-A 63	0206404	12.0	42.00	52.50	32.00	80.00	46.00	10.00	34.00	4.50	31.00	54.00	34.00	M8x1
SK 40	0206414	12.0	42.00	–	32.00	50.00	46.00	10.00	–	4.50	31.00	31.00	4.00	M8x1
BT 30	0206554	12.0	42.00	–	32.00	69.00	46.00	10.00	–	4.50	31.00	47.00	23.00	M8x1
BT 40	0206434	12.0	42.00	–	32.00	58.00	46.00	10.00	–	4.50	31.00	31.00	12.00	M8x1
HSK-A 63	0206405	16.0	53.00	–	38.00	80.00	51.00	10.00	–	5.00	37.00	54.05	29.0	M8x1
SK 40	0206415	16.0	49.25	–	38.00	64.50	51.00	10.00	–	5.00	37.00	45.45	13.5	M8x1
BT 40	0206435	16.0	49.25	–	38.00	72.50	51.00	10.00	–	5.00	37.00	45.50	21.50	M8x1
HSK-A 63	0206406	20.0	52.50	–	38.00	80.00	51.00	10.00	–	5.00	37.00	54.00	29.00	M8x1
HSK-A 100	0206566	20.0	52.50	–	38.00	90.0	51.00	10.00	–	5.00	37.00	61.05	39.00	M8x1
SK 40	0206416	20.0	49.25	–	38.00	64.50	51.00	10.00	–	5.00	37.00	45.50	13.50	M8x1
SK 50	0206426	20.0	49.25	–	38.00	64.50	51.00	10.00	–	5.00	37.00	45.50	13.50	M8x1
BT 30	0206556	20.0	42.00	–	38.00	90.00	51.00	10.00	–	5.00	37.00	47.00	39.00	M8x1
BT 40	0206436	20.0	49.25	–	38.00	72.50	51.00	10.00	–	5.00	37.00	45.50	21.50	M8x1
BT 50	0206446	20.0	49.25	–	38.00	83.50	51.00	10.00	–	5.00	37.00	45.50	32.50	M8x1
HSK-A 100	0206568	32.0	72.00	–	58.50	100.0	61.00	10.00	–	6.00	44.00	71.05	39.00	M8x1
SK 50	0206428	32.0	72.00	–	58.50	81.00	61.00	10.00	–	6.00	44.00	62.00	20.00	M8x1
BT50	0206448	32.0	72.00	–	58.50	90.00	61.00	10.00	–	6.00	44.00	52.00	29.00	M8x1

Cleaning Unit RGG

A sparkling clean Machine Table – all by itself

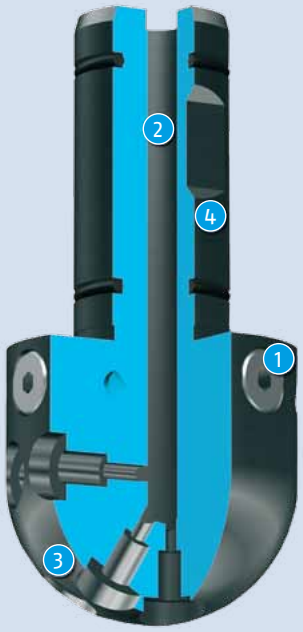
The easiest way to clean. The RGG cleaning unit from SCHUNK is designed for cleaning workpieces and the interior of the machine with air or coolant. It fits in any sealed toolholder with a clamping diameter of 20 mm, and reduced auxiliary process times in every machine tool.

A total of six nozzles on the ball head blow out a powerful jet of air or coolant, which is forced from the toolholder mounting via a bore hole in the shank of the cleaning unit. The head can also rotate with the tool spindle when it moves, and can reach all corners of the working area.

Advantages:

- Low price unit for flexible automation of your machine
- Fast, automatic cleaning for a maximum utilization of your machine
- Auxiliary process times are reduced to a minimum
- Increased safety for the machine operator
- Suitable for any SCHUNK toolholder mount (except heat shrink)

Sectional functional diagram



1. Locking screws and restrictor inserts to change out the cleaning jet
2. Center bore for introduction of cleaning medium
3. Outlet openings for producing cleaning jets
4. Clamping diameter for mounting in any toolholding system

Technical Data

Description	ID	Clamping range	Dead weight
RGG	0308590	20 mm	0.1 kg

Intermediate Sleeves GZB-S

Flexible clamping areas covered by intermediate sleeves

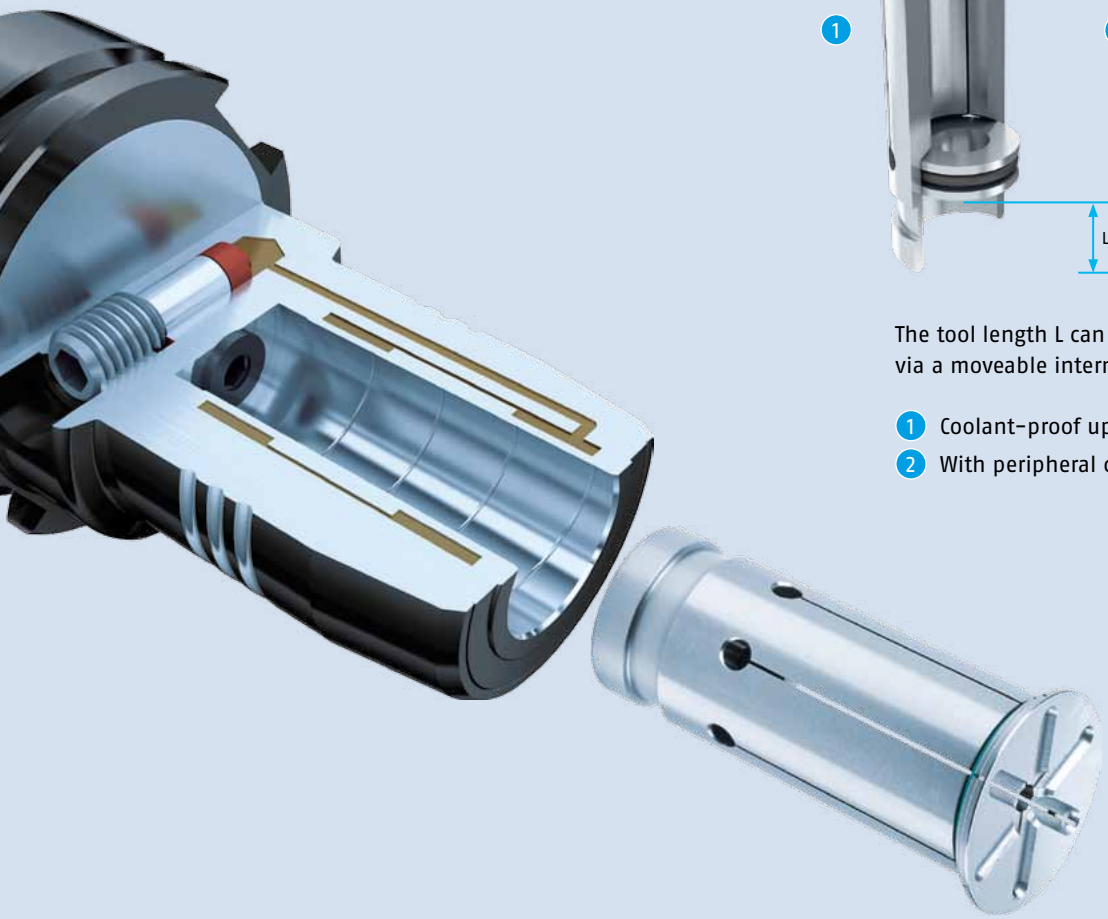
SCHUNK intermediate sleeves allow clamping of several, different shank diameters with just one toolholder. The universal intermediate sleeves GZB-S are available in two versions: sealed coolant-proof, and with innovative peripheral coolant channels. Both offer the unbeatable advantages of SCHUNK intermediate sleeves. And both can be used in the SCHUNK toolholding systems **TENDO, TRIBOS, SINO-R,** and all standard hydraulic expansion toolholding systems.

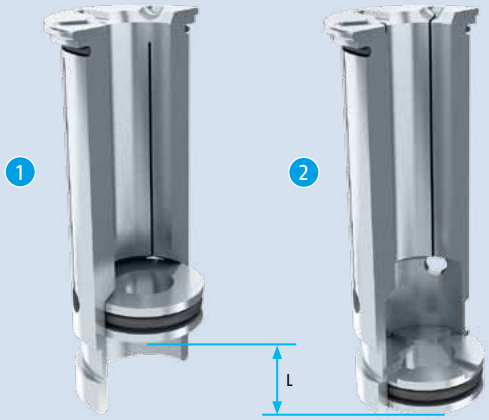
Your advantage:

- Highest flexibility for optimal cost control
  One toolholder for several clamping diameters
- Versatile length pre-adjustment due to moveable intermediate piece
- Increasing metal removal than in case of direct clamping, due to a higher torque

Product features:

- Two versions: Coolant-proof up to 80 bar or with peripheral coolant
- Run-out accuracy of less than 3 microns
- Intermediate sleeves with peripheral coolant
  6 coolant slots with special nozzle geometry
- Intermediate sleeves are coolant-proof
- Additional sizes and special designs are available on request





The tool length L can be adjusted flexibly via a moveable intermediate piece.

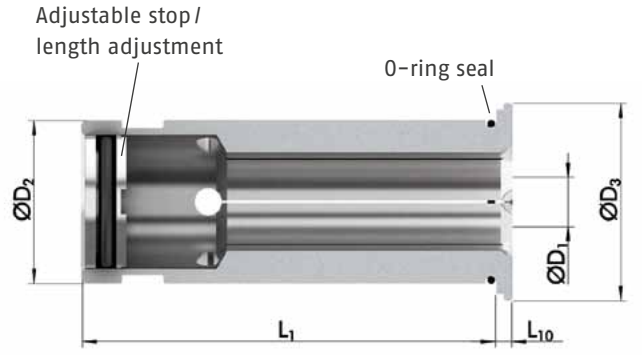
1 Coolant-proof up to 80 bar
2 With peripheral coolant

Systematic cooling with peripheral coolant channels

Six coolant slots now make a difference with peripheral coolant. With their special nozzle geometry, they ensure optimal and directed supply of coolant to the blade.

Your advantages with peripheral coolant channels:

- Optimized collant emission
- Increase of the tool service life
- Optimal chip removal by systematic coolant rinsing
- Significantly improved machining results



Optimized coolant emission:
GZB-S 20/16 for peripheral cooling
in a TENDO E compact.

Toolholders from SCHUNK.
A system for perfect tool clamping.

Toolholders from SCHUNK

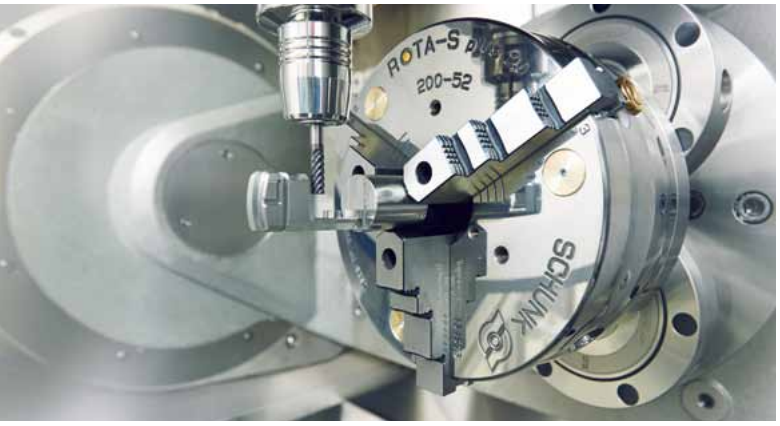
Every specific application has other demands to the toolholder. Particularly, when it comes to precision, compromises cannot be accepted. Here, SCHUNK uses its technologies.
The innovative and high-precision toolholders cover a unique range of customer requirements. From micro to finest processing, up to heavy-duty and volume machining.

Discover the program diversity of SCHUNK.

We focus on special applications, and find the optimal toolholder for your machining task.

Request our catalog for Toolholders now.

SCHUNK Toolholders



TENDO Hydraulic Expansion Toolholders

"The original" **TENDO** is the technological leader of hydraulic expansion toolholders from SCHUNK – universal in use, efficient and absolutely precise. Profit from the unique features of the **TENDO** family: **TENDO** with consistent run-out and repeat accuracy of <0.003 mm for roughing, drilling, reaming and finishing.

TRIBOS Polygonal Clamping

With the **TRIBOS** polygonal technology, SCHUNK offers a tooling system with a flexible and comprehensive spectrum of applications – from heavy-duty cutting to micro cutting. Excellent features of centric run-out of 0.003 mm result in longer lifetime and better surface quality. **TRIBOS** polygonal clamping technology is suitable for HSC and tested up to 205,000 rpm.

SINO-R Expansion Toolholders

With **SINO-R,** SCHUNK offers an expansion toolholder based on expansion toolholding technology. Three features make the **SINO-R** series unbeatable for thread milling in terms of quality and productivity: The high radial rigidity, which prevents the deflection of the tool, the higher torque transfer for full utilisation of the tool capability, and the top vibration damping for the best thread surfaces without chatter marks. This is assured by an unbeatable combination of a monoblock design, a multi-layer system structure and thicker walls.