TNT Motion

CNC TOOLING CATALOGUE

Precision Tooling.

Collets · Pull Studs · Clamping Nuts · Toolholders · Tapping Collets · Bussole

European Standards

DIN 6499 · ISO 15488 · JIS B6339 · MAS 403 · DIN 69872 · DIN 69893

HP Precision Grade

Runout ≤ 0.005 mm at 4×D — every batch with inspection report

Complete Range

ER8–ER50 · BT/CAT/HSK/ISO · GT12 · Bussole & Floating Holders

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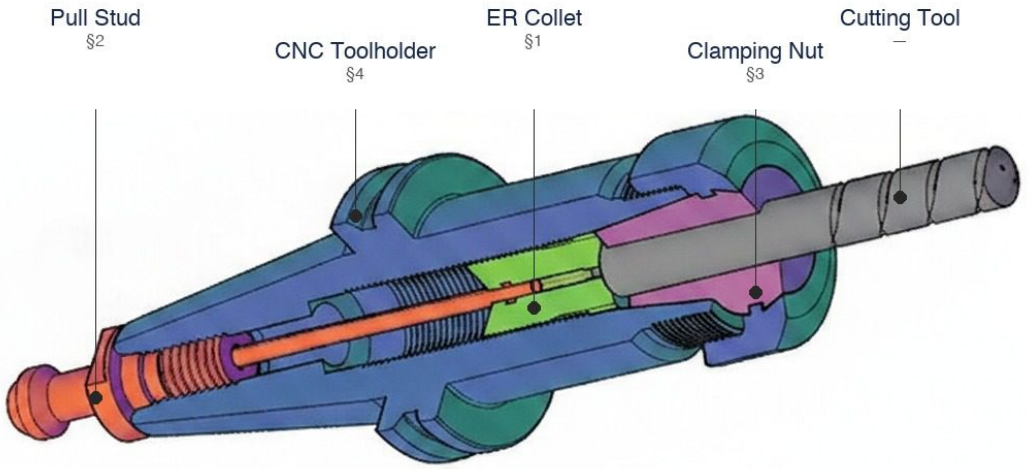
How the Tool Assembly Fits Together

Six precision components connect the machine spindle to the cutting edge. The four highlighted — pull stud, collet chuck, ER collet, and clamping nut — are supplied by TNT Motion.



MACHINE SPINDLE

Machine Spindle
BT / CAT / HSK / ISO taper. Supplied with your machine.

Pull Stud
Anchors the toolholder inside the spindle drawbar.

CNC Toolholder
Precision-ground taper seats flush in the spindle bore.

ER Collet
Spring collet grips the tool shank. 1 mm clamping range.

Clamping Nut
Pulls the collet into the taper and sets the clamping force.

CUTTING TOOL

Cutting Tool
End mill, drill, or tap. Supplied by you.

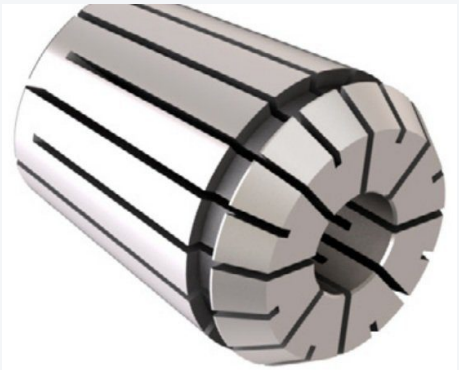
TNT Motion supplies all four interface components · §2 · §3 · §4 · §5

2 Precision Collets

ER8 – ER50 · Standard and HP grades · DIN 6499 / ISO 15488

Full ER range (ER8–ER50) in standard and high-precision (HP) grades. Spring steel construction with precision-ground clamping surfaces.

The ER system is the world's most widely adopted collet standard — large clamping range per series, reliable repeatability, and interchangeability across all toolholder brands.



- Runout ≤ 0.008 mm standard · ≤ 0.005 mm HP grade at 4×D
- Spring steel — consistent clamping force over millions of cycles
- 1 mm clamping range per collet — full diameter coverage per series
- Sealed and coolant-through (liquid-tight) versions available
- HP grade available ER8–ER40 · Inspection report with each batch
- MOQ: 10 pcs/size — mixed sizes accepted

DIN 6499 / ISO 15488 · 100% interchangeable between toolholder brands

ER Series — Dimensional Reference

Series	Clamping Range	Max Tool Ø	Outer Ø (mm)	L (mm)	Runout Std	Runout HP	MOQ
ER8	0.5–5.0 mm	5 mm	13.0	22	0.008 mm	0.005 mm	10 pc
ER11	0.5–7.0 mm	7 mm	18.0	27	0.008 mm	0.005 mm	10 pc
ER16	0.5–10 mm	10 mm	22.0	32	0.008 mm	0.005 mm	10 pc
ER20	1–13 mm	13 mm	26.0	38	0.008 mm	0.005 mm	10 pc
ER25	1–16 mm	16 mm	33.0	42	0.008 mm	0.005 mm	10 pc
ER32	2–20 mm	20 mm	40.0	47	0.008 mm	0.005 mm	10 pc
ER40	3–26 mm	26 mm	48.0	52	0.008 mm	0.005 mm	10 pc
ER50	4–34 mm	34 mm	60.0	60	0.008 mm	—	10 pc

Other collet types available on request

5C collets (0–1.25" range, lathes and indexing fixtures) · R8 collets (Bridgeport-style knee mills, 7/16" bore shank) · OZ collets (compact ER alternative for smaller machines and engravers)

3 Pull Studs & Retention Knobs

BT · CAT · ISO · HSK · DIN 69872 · MAS 403 · JIS B6339 · ANSI B5.50

Pull studs (retention knobs) are the critical safety link between the toolholder and the machine spindle drawbar. The wrong thread standard or head form = uncontrolled tool release at cutting speed.

TNT Motion supplies all major pull stud standards. NiCrMo steel (SCM435/S45C), case-hardened to HRC 58±2, precision-ground threads, thread runout ≤ 0.005 mm. Solid and through-coolant variants.

- BT30, BT40, BT50 — MAS 403 / JIS B6339 (MAS-I 45° and MAS-II 60° head forms)
- CAT40, CAT50 — ANSI B5.50 (V-flange, North American spindles)
- ISO40, ISO50 — ISO 7388-2B / DIN 69872 (European VMCs)
- HSK-A63, HSK-A100 — DIN 69893 (no pull stud — integral clamping)
- Through-coolant bore + O-ring sealed variants available
- MOQ: 50 pcs (single) or 10-pc sets (SET suffix)

Material & Quality Specifications

Property	Specification
Material	NiCrMo steel — SCM435 / S45C (Chrome-Moly)
Case hardening	0.4–0.5 mm depth (induction hardened), HRC 58 ± 2
Tensile strength	800–1,000 N/mm²
Thread runout	≤ 0.005 mm (ISO 7388-3)
Surface finish	Black oxidised, precision ground

DIN 69872 / ISO 7388-3 Configuration Types — Coolant & O-ring

Form	Coolant Bore	O-Ring Groove	Typical Application
Standard	No	No	Dry or external coolant — most common general purpose
Form A	Yes	No	Through-spindle coolant (TSC) — coolant bore through stud axis
Form F	No	Yes	Coolant-sealed spindle — O-ring prevents coolant entry into drawbar
Form A+F	Yes	Yes	TSC + sealed spindle — highest spec, used in HSC machining centres

Thread Size & Pull Force Reference (Generic)

Taper	Standard	Thread	Pull Force (ATC)	Typical Machines
BT30	MAS 403 / JIS B6339	M12 × 1.75	~1,200 N	Compact VMC, CNC lathes
BT40	MAS 403 / JIS B6339	M16 × 2.0	~3,000 N	Standard VMC/HMC (most common)
BT50	MAS 403 / JIS B6339	M24 × 3.0	~8,000 N	Heavy-duty VMC/HMC
CAT40	ANSI B5.50	5/8-11 UNC	~3,000 N	North American machining centres
ISO40	DIN 69872 / ISO 7388-2	M16 × 2.0	~3,000 N	European VMC, Heckert, Deckel-Maho
ISO50	DIN 69872 / ISO 7388-2	M24 × 3.0	~8,000 N	Large European VMC/HMC

Critical: always confirm head form against your spindle drawbar

BT40 pull studs come in MAS-I (45°) and MAS-II (60°) variants — same M16 thread, different head geometry. Send us your machine model and we confirm the exact form required.

4 Clamping Nuts

ER8–ER50 · Balanced to 30,000 RPM · Standard · Mini-Nut · Bearing · Coolant-Sealed

The clamping nut threads onto the toolholder nose and pulls the collet into its tapered seat — generating the clamping force that holds the cutting tool. The nut directly controls runout and repeatability.

A worn or mismatched nut causes uneven collet seating, increased runout, and premature tool wear. TNT Motion clamping nuts are precision-ground to match ER collet thread tolerances.

- Dynamically balanced — certified for spindle speeds up to 30,000 RPM
- Heat-treated steel with black oxide or bright finish
- Precision-ground threads — no measurable play against ER collet
- Standard nut: general purpose, all ER sizes
- Mini-nut (MN): reduced outer diameter for tight tool clearance
- Coolant-sealed nut: lip seal for through-tool coolant delivery
- Bearing nut (BN): integral thrust bearing, low-torque tightening

ER Clamping Nut Specifications

ER Size	Thread (internal)	D outer (mm)	L (mm)	Max RPM	Variants
ER16	M22 × 1.5	27	14	30,000	Standard · MN · Sealed · BN
ER20	M27 × 1.5	34	15	30,000	Standard · MN · Sealed · BN
ER25	M33 × 1.5	42	17	30,000	Standard · MN · Sealed · BN
ER32	M40 × 1.5	50	18	30,000	Standard · MN · Sealed · BN
ER40	M50 × 1.5	62	21	25,000	Standard · MN · Sealed · BN
ER50	M62 × 1.5	75	24	20,000	Standard

Torque matters — always use a collet chuck wrench

ER32: tighten to ~100 N·m. Under-torque = tool pull-out risk. Over-torque = collet damage and reduced clamping range. Bearing nuts (BN) allow low-effort tightening to full torque — recommended above 15,000 RPM where even torque distribution is critical.

5 CNC Toolholders

BT · CAT · HSK · ISO · Balanced G2.5 at 25,000 RPM · Runout ≤ 0.003 mm

The toolholder is the mechanical backbone of every machining operation. It interfaces the machine spindle with the cutting tool and must deliver rigidity, balance, and low runout simultaneously.

TNT Motion supplies a complete range for all major CNC spindle standards. All toolholders are balanced to G2.5 at 25,000 RPM as standard. MOQ: 5 pcs per type.

- BT (JIS B6339) — dual-contact and standard; BT30, BT40, BT50
- CAT (ANSI B5.50) — V-flange design; CAT40, CAT50
- HSK (ISO 12164) — hollow taper, simultaneous flange contact; HSK-A32 to A100
- ISO (7388-1) — steep taper; ISO30, ISO40, ISO50 (also called SK / DIN 2080)
- Precision-ground taper · Radial runout ≤ 0.003 mm at gauge length

Clamping Method Selection Guide

Clamping Method	Runout	Torque Capacity	Best Application
ER Collet Chuck	0.008 mm	Medium–High	General milling, drilling, reaming
Weldon End Mill Holder	0.010 mm	Very High	Heavy interrupted milling, side-lock
Hydraulic Chuck	0.003 mm	High	Finishing, boring, precision reaming
Shrink Fit	0.003 mm	Very High	High-speed machining, 5-axis, HSM
Shell Mill Arbor	N/A	Very High	Face milling, shell mill bodies
Morse Taper Adapter	0.015 mm	Medium	Drills, reamers, older machines

Standard Configurations by Taper

Taper	Type	Gauge L (mm)	Runout	Balance	Standard
BT40	ER Collet Chuck	63–100	≤ 0.003 mm	G2.5 / 25k	JIS B6339
BT40	End Mill Holder	63–150	≤ 0.005 mm	G2.5 / 25k	JIS B6339
BT50	ER Collet Chuck	80–125	≤ 0.003 mm	G2.5 / 20k	JIS B6339
CAT40	ER Collet Chuck	63–100	≤ 0.003 mm	G2.5 / 25k	ANSI B5.50
HSK-A63	ER Collet Chuck	50–100	≤ 0.003 mm	G2.5 / 30k	DIN 69893
HSK-A63	Hydraulic Chuck	50–100	≤ 0.002 mm	G2.5 / 30k	DIN 69893
ISO40	ER Collet Chuck	63–100	≤ 0.003 mm	G2.5 / 25k	ISO 7388

HSK Toolholder Technology

The HSK (Hohlschaftkegel — hollow shank taper) system, standardised as ISO 12164, represents the most advanced toolholder interface for high-speed and high-precision CNC machining. Unlike steep-taper systems (BT/CAT/ISO) which contact only the taper surface, HSK achieves simultaneous taper and face contact, eliminating the axial float that degrades positional accuracy at high spindle speeds.

HSK-A32 to HSK-A100

Advantages over steep-taper systems

- Simultaneous 2-point contact (taper + face) → zero axial runout under load
- Centrifugal force increases — not decreases — clamping as speed rises
- Repeatable positioning to ±0.001 mm axially and radially
- Suitable for spindle speeds up to 60,000 RPM
- Shorter projection, higher stiffness → better surface finish at depth

HSK Types Available

HSK Type	Drive	Keyway	Best For
HSK-A (most common)	Internal keyway	Yes	General purpose — turning, milling, drilling
HSK-E	Internal keyway	No	High-speed, rotationally symmetric tools
HSK-F	Face keys	No	Face-contact tools — shell mills, face mills

HSK vs BT/CAT — which is right for your application?

BT/CAT: excellent for general VMC work below 15,000 RPM. HSK: choose when spindle speed exceeds 15,000 RPM, when axial positioning accuracy matters (e.g. 5-axis), or when tool change repeatability must be ±0.001 mm. HSK also eliminates the need for pull studs.

6 Hydraulic Chucks

Hydraulic clamping · Run-out ≤ 0.003 mm · No heating or special tooling required

Hydraulic chucks grip the tool shank by pressurising oil in an annular chamber, creating uniform 360° contact over the full clamping length. Simply insert the shank and tighten one Allen screw — no collets, no heating, no balancing fixtures.

Radial run-out ≤ 0.003 mm at 3× diameter. Outstanding vibration damping extends tool life and improves surface finish. Ideal for finish milling, hard materials, and close-tolerance work on any BT, ISO, HSK-A, or CAT spindle.

Bore Ø (mm)	Clamping length	Run-out	Taper compatibility
6	Short / medium	≤ 0.003 mm	BT · ISO · HSK-A · CAT
8	Short / medium	≤ 0.003 mm	BT · ISO · HSK-A · CAT
10	Short / medium	≤ 0.003 mm	BT · ISO · HSK-A · CAT
12	Short / medium	≤ 0.003 mm	BT · ISO · HSK-A · CAT
16	Short / medium / long	≤ 0.003 mm	BT · ISO · HSK-A · CAT
20	Short / medium / long	≤ 0.003 mm	BT · ISO · HSK-A · CAT
25	Short / medium	≤ 0.003 mm	BT · ISO · HSK-A · CAT
32	Short / medium	≤ 0.003 mm	BT · ISO · HSK-A · CAT

Shank tolerance must be h6. Reducer sleeves available for shanks down to Ø 3 mm.

Shrink Fit Holders — Calettatura a Caldo

Thermal interference fit · Run-out ≤ 0.003 mm · Induction heating 250–300 °C

Heating to 250–300 °C with an induction unit expands the bore to accept the shank; cooling creates a solid interference fit — no moving parts, maximum rigidity, and clamping forces exceeding 900 Nm for Ø 32 shanks. Minimal holder diameter allows access to deep pockets and fine-featured workpieces.

Bore Ø (mm)	Shank tolerance	Min. clamping force	Run-out
6	h6	> 50 Nm	≤ 0.003 mm
8	h6	> 100 Nm	≤ 0.003 mm
10	h6	> 160 Nm	≤ 0.003 mm
12	h6	> 230 Nm	≤ 0.003 mm
16	h6	> 280 Nm	≤ 0.003 mm
20	h6	> 400 Nm	≤ 0.003 mm
25	h6	> 600 Nm	≤ 0.003 mm
32	h6	> 900 Nm	≤ 0.003 mm

Induction shrink-fit units available separately. Contact us for recommended heating cycles.

7 Capto — ISO 26623-1 Modular Toolholding

Sandvik Capto · Polygon taper ISO 26623-1 · Sizes C3–C10 · Repeatability ≤ 0.002 mm

Capto uses a three-lobe polygon taper to transmit torque without a separate drive key, achieving face + taper contact simultaneously. The result is ≤ 0.002 mm repeatability in both radial and axial directions, making it the preferred interface for multi-task turning centres, modular boring bars, and automatic tool-change systems.

TNT Motion supplies Capto-shanked toolholders, adaptors (Capto → ER, Capto → Weldon, Capto → boring), and extension modules for all standard sizes C3 through C10.

Size	Coupling Ø (mm)	Max. torque	Typical application
C3	31.75	70 Nm	Small turning centres, live tools
C4	40.00	140 Nm	Medium machining centres
C5	50.00	275 Nm	Medium–large machining centres
C6	63.00	550 Nm	Large machining centres, boring
C8	80.00	1 100 Nm	Heavy-duty boring & milling
C10	100.00	2 100 Nm	Very large machine tools

All Capto couplings comply with ISO 26623-1 and are fully interchangeable with OEM Sandvik Capto tooling.

ISO 50 Toolholders

DIN 2080 / ISO 7388-1 · Large-end Ø 69.85 mm · M24 × 3.0 pull stud · High torque spindles

ISO 50 is the large-capacity 7:24 taper used on heavy milling and boring machines, machining centres with spindle power > 15 kW, and portal mills. The larger taper diameter and M24 pull stud handle the high clamping forces required for face mills, large end mills, and heavy-duty boring operations.

	ISO 50	ISO 40 (for comparison)
Standard	DIN 2080 / ISO 7388-1	DIN 69871 / ISO 7388-1
Taper ratio	7:24	7:24
Large-end Ø	69.85 mm	44.45 mm
Pull stud thread	M24 × 3.0	M16 × 2.0
Drive key	Yes	Yes
Coolant-through	Available	Available
Typical spindle	> 15 kW · portal / boring	5–15 kW · general machining

ISO 50 holders available in: ER chuck, face mill arbour, shell mill arbour, boring bar adaptors.

8 Tapping Collets

GT12 · GT24 · GT42 · Rigid & torque-limiting clutch · JIS B4302 · 65Mn spring steel

Rigid (without clutch)

Direct-drive for CNC rigid tapping where the machine controller synchronises spindle speed and Z-axis feed precisely. Zero axial float — maximum thread positional accuracy.

- Best for: machining centres with rigid tapping G-code
- Zero backlash — thread pitch is controlled by the CNC
- Simpler, lower-cost, longer life than clutch versions

With torque-limiting clutch

The clutch mechanism slips at a preset torque threshold, preventing tap breakage when the tap bottoms out in a blind hole or encounters hard material.

- Best for: pneumatic tapping arms, older CNC without rigid tapping
- Protects taps in blind holes and interrupted cuts
- Adjustable slip torque on selected models

With torque-limiting clutch

Rigid (without clutch)

Common specifications

- Size classes: GT12 (tap shank Ø 6–12 mm) · GT24 (Ø 12–22) · GT42 (Ø 16–36)
- Material: 65Mn spring steel body, hardened & precision-ground
- Standards: JIS B4302 (GT12 / GR15 / GR20) — fits corresponding tapping chucks
- MOQ: 10 pcs per size

GT12 Size Chart — JIS B4302 (representative; GT24/GT42 on request)

Thread	Tap Ø (mm)	Pitch (mm)	Shank Ø GT12 (mm)	Square Drive (mm)	Length (mm)
M3	2.5	0.5	4.5	2.24	60
M4	3.3	0.7	5.5	2.80	62
M5	4.2	0.8	7.0	3.55	64
M6	5.0	1.0	8.0	4.50	66
M8	6.8	1.25	10.0	5.50	70
M10	8.5	1.5	12.0	6.30	74
M12	10.2	1.75	14.0	8.00	78
M14	12.0	2.0	16.0	9.00	80
M16	14.0	2.0	18.0	11.20	84

9 Collet Chuck Adapters — Bussole

Straight Shank · Morse Taper · ER16–ER40 · TIR < 0.01 mm

Straight shank and Morse taper collet chuck adapters allow ER collets to be mounted directly in drill presses, conventional milling machines, lathes, and any equipment with a straight bore or Morse taper spindle.

This is the most cost-effective route to adding precision ER clamping capability to conventional machinery — no dedicated CNC toolholder required. The adapter sits in the machine spindle; the ER collet and nut clamp the cutting tool in the normal way.

- Hardened and ground — TIR < 0.01 mm (DIN 6499 compatible)
- Compatible with all standard ER clamping nuts and collets
- Available: ER16, ER20, ER25, ER32, ER40
- Straight shank diameters: 8, 10, 12, 12.5, 16, 20, 25, 32 mm
- Morse taper versions: MT1, MT2, MT3, MT4
- MOQ: 10 pcs per type

Straight Shank Adapters — Clamped by set screw (Weldon flat) or friction fit

Shank Ø (mm)	ER Size	Collet Range (mm)	Typical L (mm)	Notes
8	ER16	0.5–10	60	Compact, drill press
10	ER16	0.5–10	60	Standard shank
12	ER20	1–13	65	Common milling
12.5	ER20	1–13	65	Metric/imperial crossover
16	ER25	1–16	70	Medium machining
20	ER32	2–20	75	Heavy-duty milling
25	ER32	2–20	80	Large bore machines
32	ER40	3–26	90	Maximum clamping range

Morse Taper Adapters — Seated in spindle taper, drift or drawbar removal

Taper	ER Size	Collet Range (mm)	L (mm)	Notes
MT1	ER16	0.5–10	80	Small lathe/drill press
MT2	ER16	0.5–10	85	Standard drill press
MT2	ER20	1–13	90	Most common combination
MT3	ER25	1–16	95	Heavy-duty drill press
MT3	ER32	2–20	100	Maximum capacity MT3
MT4	ER32	2–20	110	Large machine spindle
MT4	ER40	3–26	115	Full-capacity MT4

10 Floating Tap Holders

Bussole con Compensazione · Axial float ± 2–3.5 mm · GT12 Compatible · M1–M20

Floating tap holders (bussole con compensazione / AM series) provide axial tension-compression float so the tap follows its own thread pitch rather than being forced by the spindle feed rate.

A floating body holds the tap via ER collet; the body can travel axially ± 2–3.5 mm inside the housing. When spindle feed and tap pitch are slightly mismatched, the compensation prevents broken taps and damaged workpieces.

Compatible with ISO metric threads M1–M20, UNC, UNF, BSW, and BSP threads.

- Axial float ± 2 mm standard (ER16/20) · ± 3.5 mm on larger sizes
- Spring-loaded tension and compression — entry and retract both compensated
- Accepts GT12 tapping collets (M3–M16) or ER collets (M1–M20)
- Available for BT40, CAT40, HSK-A63, ISO40 spindle tapers
- Recommended for: pneumatic tappers, older CNCs, deep-hole tapping

ER AM Series — Dimensions & Compensation

Model	D (mm)	L (mm)	Compensation	Clamp Range	Standard
ER16 AM	17.0	27.0	± 3.5 mm	2.0–6.0 mm	DIN 6499 / ER
ER20 AM	21.0	31.0	± 3.5 mm	2.5–7.0 mm	DIN 6499 / ER
ER25 AM	26.0	35.0	± 3.5 mm	2.0–14.0 mm	DIN 6499 / ER
ER32 AM	33.0	40.0	± 4.0 mm	2.0–20.0 mm	DIN 6499 / ER

Floating Holder Specifications by Spindle Taper

Spindle Taper	Thread Range	Axial Float	GT12 Compatible	Max Spindle RPM
BT40	M3–M16	± 2 mm	All GT12 sizes	8,000 RPM
CAT40	M3–M16	± 2 mm	All GT12 sizes	8,000 RPM
HSK-A63	M3–M16	± 2 mm	All GT12 sizes	12,000 RPM
ISO40	M3–M16	± 2 mm	All GT12 sizes	8,000 RPM

Rigid tapping vs floating holder — quick selection rule

Use RIGID tapping collets (GT12) on CNC machines with rigid tapping G-code (spindle and feed electronically synchronised). Use FLOATING holders on pneumatic tappers, manual machines, or any machine where you cannot perfectly match spindle RPM to feed rate. The floating holder works safely on both machine types — when in doubt, choose floating.

11 Tap Holder Sleeves

For ER collet tap holders · Rigid & Slip-clutch versions

Tap holder sleeves fit inside ER collet holders to grip taps by their square drive. Series B is rigid (no clutch) for blind holes; Series B-GR includes an adjustable slip clutch to protect taps from breakage when breaking through.

Grub-screw variants (B/B-GR-G) add radial locking for Weldon-flat tap shanks. Compatible with all ER-series toolholders. Complete assorted kits available in storage case.

Series	Tap thread	Ø D (mm)	Ø d (mm)	Type
B	M 1 – M 5	8 – 16	4 – 7	Rigid (no clutch)
B	M 5 – M 10	12 – 20	6 – 12	Rigid (no clutch)
B	M 10 – M 20	16 – 25	10 – 20	Rigid (no clutch)
B	M 20 – M 33	25 – 40	18 – 32	Rigid (no clutch)
B-GR	M 1 – M 5	8 – 16	4 – 7	Slip clutch
B-GR	M 5 – M 10	12 – 20	6 – 12	Slip clutch
B-GR	M 10 – M 20	16 – 25	10 – 20	Slip clutch
B-GR	M 20 – M 33	25 – 40	18 – 32	Slip clutch
B/B-GR	Complete kit	—	—	Assorted set in case

Also available: grub-screw variants (for Weldon-flat tap shanks) and sleeves with integrated ER collet.

12 ER Clamping Nuts & Wrenches

All ER series · Mini / Hex / Standard / Precision / High-speed

Clamping nuts (ghiere) secure the ER collet inside the toolholder. Choosing the correct nut type affects clamping force, run-out, tool pull-out resistance, and suitability for high-speed spindles.

Torque wrenches ensure consistent, repeatable clamping to specification and prevent over-tightening which can reduce collet life.

Type	ER Range	Notes
Mini nut	ER 8–25	Low-profile, for compact toolholders
Hex nut	ER 11–40	Most common; fixed-key tightening
Standard nut	ER 16–50	Right-hand & left-hand thread
High-precision nut	ER 11–32	Run-out ≤ 3 µm
Ball-bearing nut (GA)	ER 16–40	Reduces tool pull-out effect
GA-E high-speed nut	ER 11–40	Balanced for high-speed spindles
Mini wrench (CH Mini)	ER 8–25	Open-end, for mini nuts — 5 sizes
Hex-nut wrench (CE)	ER 11–20	Open-end, for hex-type nuts
Standard wrench (ST)	ER 16–50	Hook-end, for standard nuts
Side-grip wrench (GOC)	ER 11–40	Hook with lateral grip
Precision ring wrench	ER 16–32	Ring-type, for high-precision nuts
Mini torque wrench	ER 8–25	8 – 40 Nm, click-type
Torque wrench (CE)	ER 11–20	20 – 70 Nm, for hex nuts

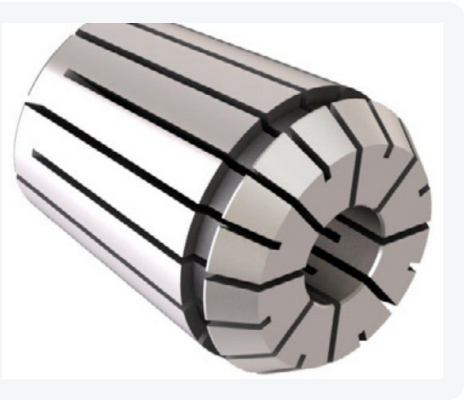
Nut sets available. Torque wrenches recommended for repeatable clamping accuracy.

13 EOC Collets

DIN 6388 / ISO 10897 · EOC 6 to EOC 40 · Cone angle 2.52°

EOC collets (DIN 6388 / ISO 10897) feature a shallower 2.52° cone angle compared to 8° for ER collets, delivering superior concentricity and rigidity under high axial loads. The 30° outer taper ensures precise seating in EOC-type toolholders.

Available in nine sizes from EOC 6 to EOC 40, covering shank diameters from 1 mm to 40 mm (step 0.5 mm; 1.0 mm for EOC 40). EOC collets are NOT interchangeable with ER collets — verify holder compatibility before ordering.



Series	Art.	Range (mm)	Step	D (mm)	L (mm)	Code
EOC 6	0578	1 ÷ 6	0.5	11.50	21.0	400E
EOC 8	0624	1 ÷ 8	0.5	14.50	26.0	401E
EOC 10	0633	1 ÷ 10	0.5	17.20	30.0	404E
EOC 12	0645	1 ÷ 12	0.5	19.80	34.0	407E
EOC 16	0768	2 ÷ 16	0.5	25.50	40.0	415E
EOC 20	—	2 ÷ 20	0.5	29.80	45.0	4541E
EOC 25	0769	2 ÷ 25	0.5	35.05	52.0	462E
EOC 32	0770	3 ÷ 32	0.5	43.70	60.0	467E
EOC 40	0802	8 ÷ 40	1.0	52.20	68.0	468E

D = body outer diameter · L = overall length · Art. = article reference number

14 Collet Types — A Buyer's Guide

ER · ER HP · ERC · ER Square · EOC · GT12 — which to choose and why

Spring collets are the precision interface between toolholder and cutting tool. The type determines run-out, clamping range, rigidity under axial load, and compatibility with through-coolant delivery. Choosing the wrong type costs precision, tool life, and — in tapping applications — broken taps.

Type	Standard	Cone angle	Range / collet	Run-out	Primary application
ER Standard	DIN 6499/B	8°	1 mm	≤ 8 µm	General milling, drilling, reaming
ER High-Prec.	DIN 6499/B	8°	1 mm	≤ 3 µm	Finish milling, small-diameter tools
ERC Coolant	DIN 6499/B	8°	1 mm	≤ 8 µm	Through-coolant direct to cutting edge
ER Square Bore	DIN 6499/B	8°	Fixed sq.	—	Tap holders — grips square tap shank
EOC	DIN 6388	2.52°	Full series	< ER std	High-rigidity milling, heavy axial loads
GT12	JIS B4302	—	Fixed	—	Floating tap holders, tap breakage protection

When to choose EOC over ER:

→ Heavy axial loads: face milling, deep slot milling
→ Long overhang — shallower taper reduces deflection
→ One collet covers the full diameter range of the series

When to choose ER HP over ER Standard:

→ Tool diameter < 6 mm where run-out breaks the tool
→ Surface finish requirement finer than Ra 0.4 µm
→ High-speed spindle operation above 15 000 rpm

ER standard collets (DIN 6499/B) · 1 mm clamping range per collet

GT12 tapping collet · for floating tap holders

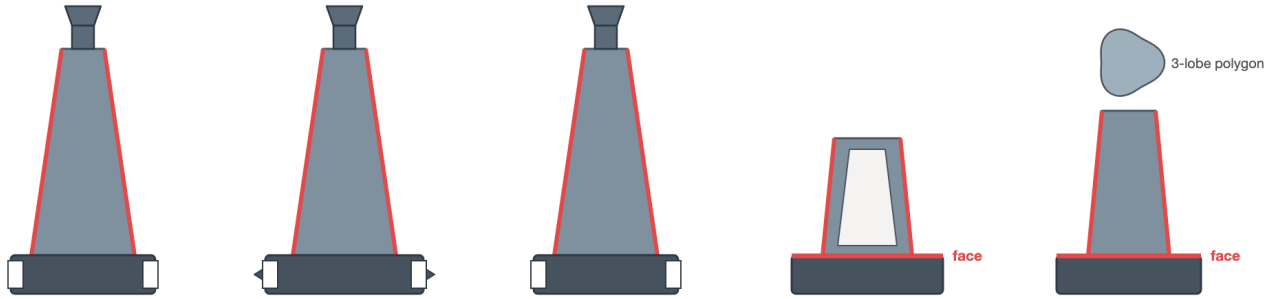
15 Toolholding — A Buyer's Guide

BT · CAT · ISO · HSK · Capto — what actually differs between spindle interfaces

The spindle interface is fixed by your machine — but understanding what each system does explains which toolholders, pull studs, and accessories you need, and why high-speed machines specify HSK. Red marks the contact surfaces: steep tapers touch on the cone only; HSK and Capto add face contact for axial rigidity at speed.

Spindle Interfaces — Where the Toolholder Meets the Machine

Red = contact surfaces. Steep tapers (7:24) contact on the cone only; HSK and Capto add face contact for axial rigidity at speed.



BT (JIS B6339 / MAS 403)
7:24 steep taper · symmetric
Japanese/Asian machines
BT30 · BT40 · BT50
dual-contact (taper+face)
available as BT "Big Plus"

CAT (ANSI B5.50)
7:24 steep taper · V-flange
North American machines
CAT40 · CAT50
imperial pull stud thread
5/8″-11 UNC (CAT40)

ISO / SK (ISO 7388, DIN 2080)
7:24 steep taper
European machines
ISO30 · ISO40 · ISO50
M16 (ISO40) · M24 (ISO50)
pull stud DIN 69872

HSK (ISO 12164 / DIN 69893)
1:10 HOLLOW taper — short & light
taper + face contact together
axial repeatability ±0.001 mm
clamps from inside — no pull stud
up to 60,000 RPM (HSK-E)

Capto (ISO 26623-1)
tapered 3-lobe POLYGON
torque without drive keys
face + taper contact
repeatability ≤ 0.002 mm
turning + milling + modular

Steep taper (BT/CAT/ISO): taper-only contact — proven, economical; above ~15,000 RPM centrifugal force makes the spindle bore grow faster than the solid shank, reducing grip. HSK's hollow shank expands WITH the bore and its face contact fixes the axial position — this is why high-speed and 5-axis machines specify HSK. Capto's polygon transmits torque without keys and repeats to 2 µm, making it the standard for multi-task turning centres and modular boring systems.

Which taper does my machine use?

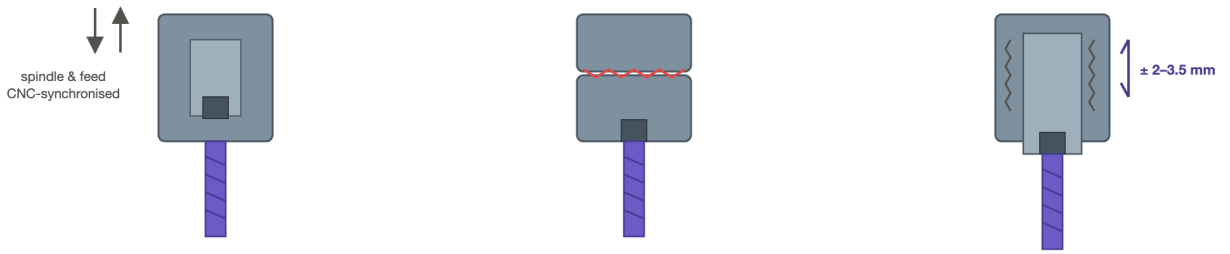
If your machine is…	Your interface is most likely…
Japanese or Asian machining centre (Fanuc, Mazak, Okuma, Doosan)	BT30 / BT40 / BT50
North American machining centre (Haas, Cincinnati, Fadal)	CAT40 / CAT50
European machining centre (DMG, Hermle, Mikron)	ISO40 / ISO50 or HSK-A63
High-speed spindle > 20,000 RPM or 5-axis machining	HSK-A (any size)
Multi-task turning centre / modular boring system	Capto C4–C8
Heavy portal mill or boring machine > 15 kW	ISO 50 / BT50

Tapping — A Buyer's Guide

Rigid GT12 · torque-limiting clutch · floating compensation — matched to your machine

Tapping breaks more tools than any other operation, because a tap must screw itself into the hole at exactly its own pitch. The tap holder — not the tap — decides whether a feed/pitch mismatch snaps the tool. Match the system to the machine:

Tapping Systems — Rigid, Torque-Clutch, Floating



RIGID (GT12, no clutch)

Machine has rigid-tapping G-code: spindle angle and Z-feed locked to thread pitch. Zero float = best thread position accuracy. Simplest and longest-lived.

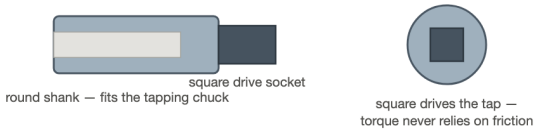
TORQUE-LIMITING CLUTCH

Clutch slips at a preset torque: tap bottoms in a blind hole or hits hard material → holder keeps turning, tap doesn't snap. For pneumatic arms and older CNCs.

FLOATING (compensazione)

Spring-loaded float, tension AND compression: the tap follows its own pitch when RPM and feed don't match. Manual machines, tappers, deep holes.

GT12 tapping collet anatomy



Taps transmit torque through their SQUARE — a round collet alone will slip and break the tap. GT12 (JIS B4302) collets hold the tap by both the round shank and the square drive end. Series: GT12 (M3–M16) · GR15 (M3–M20) · GR20 (M6–M30) — 65Mn spring steel, hardened. Tap-holder SLEEVES do the same job inside a standard ER square-bore system (Series B rigid, B-GR with built-in slip clutch).

The blind-hole rule

A tap that bottoms out in a blind hole stops dead — something must give. On a rigid holder that something is the tap. Use a torque-limiting clutch (GT12 clutch version or B-GR sleeve) for blind holes on any machine without perfectly calibrated depth control, and always program a dwell/reverse before the tap reaches the bottom.

16 Tooling Selection Guide

Step 1 — Identify your machine spindle taper

If your machine has…	Choose this taper
Japanese or Asian machining centre (Fanuc, Mazak, Okuma, Doosan)	BT30, BT40, or BT50
North American machining centre (Haas, Cincinnati, Fadal)	CAT40 or CAT50
European machining centre (DMG, Hermle, Mikron)	ISO40/50 or HSK-A63
High-speed spindle > 20,000 RPM or 5-axis machining	HSK-A
Conventional knee mill (Bridgeport type)	R8 collet or R8 adapter
Drill press or lathe tailstock	Morse taper adapter (MT2–MT4)

Step 2 — Choose the right collet and clamping nut

Requirement	Recommended product
General milling, drilling, reaming (runout < 0.01 mm)	ER Standard + standard nut
Precision finishing (runout < 0.005 mm)	ER HP + bearing nut
High-speed > 15,000 RPM (balance critical)	ER HP + dynamically balanced nut
Through-spindle coolant delivery	ER Sealed + coolant nut
Tight bore / low clearance setup	ER Standard + Mini-Nut (MN)
Tapping on CNC with rigid tapping G-code	GT12 rigid tapping collet
Tapping on pneumatic arm or non-rigid CNC	GT12 + torque clutch
Tapping with axial float compensation needed	Floating holder (bussola con compensazione)

Step 3 — Select your toolholder type

Operation	Toolholder type	Reason
General milling / drilling	ER Collet Chuck	Universal — accepts full round-shank range
Heavy interrupted milling	Weldon End Mill Holder	Set-screw side-lock for high torque
Precision boring, fine finishing	Hydraulic Chuck	Runout ≤ 0.003 mm, vibration-damped
High-speed / 5-axis	Shrink Fit Holder	Highest rigidity, 0.003 mm runout
Face milling, shell milling	Shell Mill Arbor	Direct face-mill body mounting

Need help selecting the right tooling?

Send us your machine model (brand + spindle type) and the operations you perform. Our engineering team will confirm the correct taper, pull stud head form, collet grade, and clamping nut type. We reply within 24 hours on business days.

17 Standards & Specifications Reference

Standards Referenced in This Catalogue

Standard	Scope	Applies to
DIN 6499 / ISO 15488	ER collet dimensions and tolerances	ER8–ER50
JIS B6339	BT toolholder tapers and pull stud threads	BT30, BT40, BT50
MAS 403	Pull stud geometry for BT spindles	BT (MAS-I · MAS-II)
ANSI B5.50 / MAS 404	CAT V-flange toolholders and pull studs	CAT40, CAT50
ISO 7388-1	ISO steep-taper toolholders (SK / DIN 2080)	ISO30, ISO40, ISO50
ISO 7388-2B	Pull stud geometry for ISO spindles	ISO pull studs
DIN 69872	Pull stud / retention knob dimensions	BT / ISO pull studs
ISO 12164 (HSK)	Hollow shank taper interface dimensions	HSK-A, E, F
ISO 1947 / ISO 1940	Toolholder balance grading (G6.3, G2.5)	Balanced toolholders
JIS B4302	Tapping collet shank geometry and sizing	GT12 tapping collets

Runout & Precision Grades — Quick Reference

Grade	Runout at 4×D	Typical Application
Standard ER collet	≤ 0.008 mm	General machining, drilling, rough milling
High Precision (HP) ER	≤ 0.005 mm	Finishing, reaming, precision boring
Hydraulic chuck	≤ 0.003 mm	Fine boring, carbide reaming, mirror finish
Shrink fit holder	≤ 0.003 mm	High-speed machining, 5-axis, HSM
Weldon end mill holder	≤ 0.010 mm	Heavy milling, high-torque roughing

Balance Grade Reference — ISO 1940 / ISO 1947

Balance Grade	Max Residual Imbalance	Typical Spindle Speed	Application
G6.3	6.3 mm/s	< 10,000 RPM	General-purpose toolholders
G2.5	2.5 mm/s	10,000–20,000 RPM	Standard high-speed toolholders (TNT default)
G1.0	1.0 mm/s	20,000–40,000 RPM	Precision high-speed toolholders

Concentricity reference — collet chuck adapters (DIN 6499)

TIR measured at 3× collet clamping diameter from nut face: 0.5–3 mm bore: max TIR 0.015–0.020 mm · 3–10 mm bore: max TIR 0.020 mm · 10–20 mm bore: max TIR 0.030 mm · 20–30 mm bore: max TIR 0.030 mm

18 Contact Information

TNT Motion

Engineering & Sales
info@tntbearings.com
+39 347 619 0296

Website
tntbearings.com/cnc-clamping-tools

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