QUICK ASSEMBLY GUIDE

CNC Tooling at a glance.

Six parts. One job each. Use this guide to understand how the spindle, pull stud, tool holder, collet, nut, and cutting tool work together — then pick the right specification for your machine.

How it all fits together

A CNC cutting tool is built from six pieces that stack from the machine spindle down to the cutting edge. The four in the middle — pull stud, tool holder, collet, and clamping nut — are what TNT Motion supplies.

YOUR MACHINE SPINDLE

1 Spindle

ROTATES THE TOOL — MACHINE SIDE

The tapered bore (BT, CAT, HSK or ISO) accepts the toolholder. An internal drawbar grips the pull-stud head with thousands of pounds of force.

2 Pull Stud (Retention Knob)

ANCHORS HOLDER IN SPINDLE

Threads into the back of the toolholder. The spindle's drawbar grips its head — this is what holds the toolholder in place under cutting load. Wrong thread standard = no clamping.

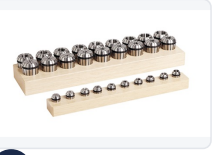
DIN 69872 · MAS 403 · JIS B6339 · ISO 7388-2B

3 Tool Holder

CARRIES THE TOOL — SPINDLE INTERFACE

Bridge between spindle and cutting tool. Tapered shank seats precisely in the spindle bore; cylindrical nose holds the collet. V-flange in the middle is what an Automatic Tool Changer grips.

BT40 · CAT40 · HSK63 · ISO40



4 Collet (ER series)

GRIPS THE TOOL SHANK

Slotted spring-steel sleeve. Slides into the toolholder's tapered nose; as the nut tightens, the collet collapses uniformly around the tool shank. One collet covers a 1 mm clamping range.

DIN 6499 · ISO 15488 · ER8 → ER50

5 Clamping Nut

SQUEEZES COLLET ONTO TOOL

Threads onto the toolholder's nose and pulls the collet into its tapered seat — this is what generates the clamping force. Must be dynamically balanced above 12,000 RPM. Torque matters: ~100 N·m on ER32.

balanced to 30,000 RPM · all ER sizes

YOUR CUTTING TOOL

6 Cutting Tool

END MILL, DRILL, OR TAP

The plain cylindrical shank sits inside the collet, which transfers torque from the spindle to the cutting edge. Total runout at the tip depends on every part above it — this is why high-precision (HP) collets matter.

Quick specification reference

Common sizes and standards for fast cross-checking against your machine spec sheet.

ER Collet Series · DIN 6499 / ISO 15488

Series	Clamping Range	Max Tool Ø	Runout (Std / HP)	Nut Thread
ER8	0.5 – 5 mm	5 mm	0.008 / 0.005 mm	M10 × 0.75
ER11	0.5 – 7 mm	7 mm	0.008 / 0.005 mm	M13 × 0.75
ER16	1 – 10 mm	10 mm	0.008 / 0.005 mm	M19 × 1.0
ER20	1 – 13 mm	13 mm	0.008 / 0.005 mm	M24 × 1.0
ER25	1 – 16 mm	16 mm	0.008 / 0.005 mm	M30 × 1.5
ER32	2 – 20 mm	20 mm	0.008 / 0.005 mm	M38 × 1.5
ER40	3 – 26 mm	26 mm	0.008 / 0.005 mm	M45 × 1.5
ER50	4 – 34 mm	34 mm	0.010 mm	M55 × 1.5

Tool Holder Tapers · Common Standards

Taper	Standard	Typical Use	Pull Stud Standard
BT30 · BT40 · BT50	JIS B6339 / MAS 403	Asian and many European VMCs	MAS 403 P30T-1 / P40T-1
CAT40 · CAT50	ANSI B5.50	North-American machining centres	ANSI B5.50 / DIN 69872
HSK63 · HSK100 (A/E/F)	DIN 69893	High-speed spindles above 12 k RPM	Integral — no pull stud
ISO30 · ISO40 · ISO50	ISO 7388-1	Older European mills	ISO 7388-2 / DIN 69872

Tapping Collets · JIS GT12

Body Size	Tap Range	Square × Round (mm)	Variant
GT12	M3 – M16	Per JIS B 4302 size chart	Rigid · or with torque-limiting clutch

Next step

This Quick Assembly Guide is the on-ramp. Pair it with the full **CNC Tooling Catalogue v1.0** for complete dimensional data, codes, and ordering tables — both available from tntbearings.com.

Request a quote

tntbearings.com/quotation

Submit a list of part codes, sizes and quantities. We reply with prices and lead times within one business day.

Technical consultation

info@tntbearings.com

Not sure which taper, collet or pull-stud standard you need? Send your machine model — we'll confirm the right spec.

Sample order

From 10 pcs

ER collets from 10 pcs/size. Pull studs from 50 pcs. Toolholders from 5 pcs. Tapping collets from 10 pcs/size.

Quality assurance

Inspection on request

Every production batch ships with dimensional inspection documentation when requested. ISO & DIN compliance certified.

The single most common mistake: mismatched pull-stud thread. BT40 holders come in MAS-I (M16) and MAS-II (M16 with different head form) variants. Always confirm thread and head profile against your spindle drawbar — we keep both standards in stock and will match what your spindle expects.