AUTODESK. UNIVERSITY

Dual Spindle Lathes: the Cheapest Form of Automation

John Saunders

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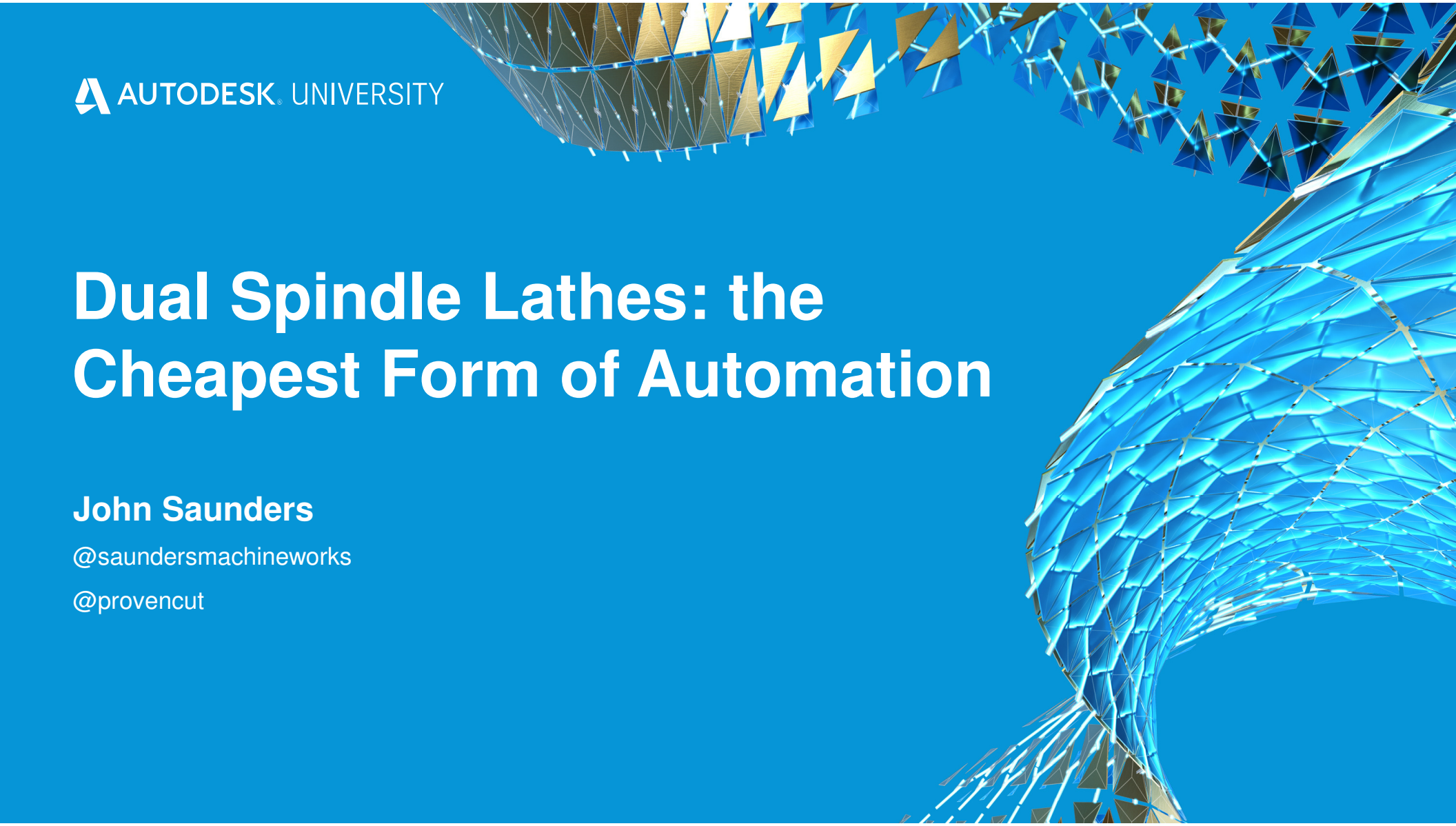
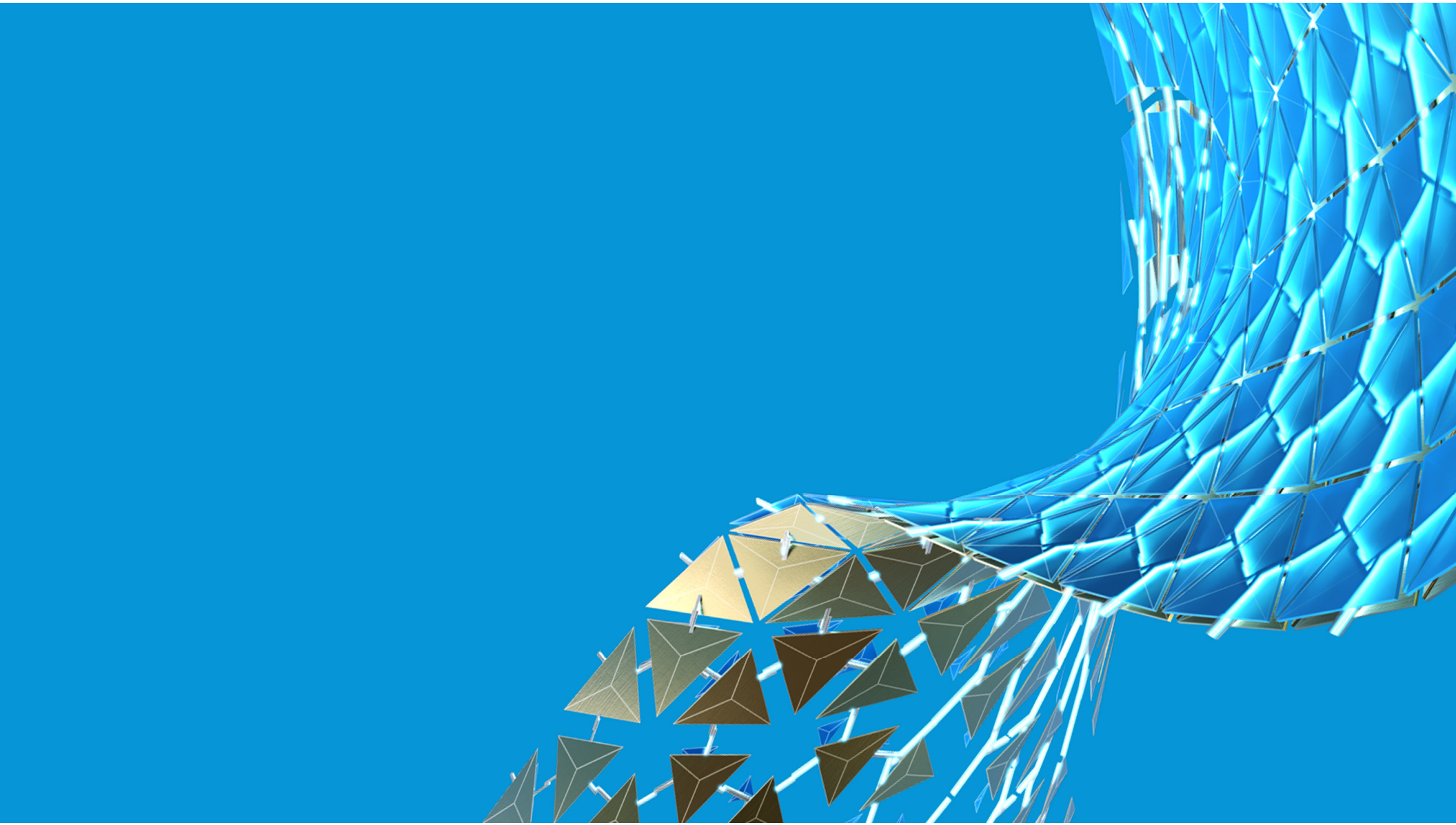
@provencut





About the speaker

John Saunders owns and operates Saunders Machine Works and is the founder of ProvenCut, a video speeds and feeds library website. John has documented his machining endeavors through the YouTube channel NYC CNC and has enjoyed becoming a member of the manufacturing industry. When he isn't modeling in Fusion 360 or at a machine, he enjoys Arduino, tennis, and his vizsla Judd.

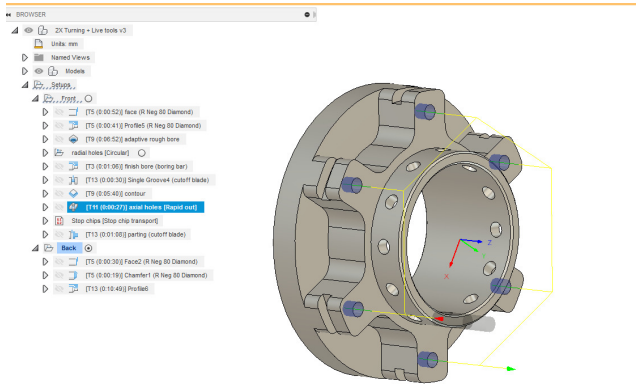
SAUNDERS MACHINE WORKS SMW

PROVENCUT

Dual Spindle Lathes: the Cheapest Form of Automation

- **Dual Spindle**
- **Lathe (mill!)**
- **“Cheap”**
- **Automation**
- **Y-Axis**
- **Live Tooling**

Y Axis



MILL IN Y!

Axial bolt hole patters, non-cylindrical shapes

DIAL IN TOOLING

Adjust Y (and X) to be perfectly “on center” with the Lathe spindle. Increase part quality, part accuracy, and tool life.

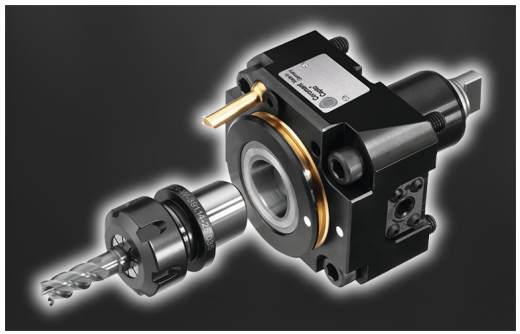
DON’T HAVE A Y AXIS? TRY POLAR INTERPOLATION

Can be used in the event you don’t have a Y axis to mimic

Sandvik Coromant Capto

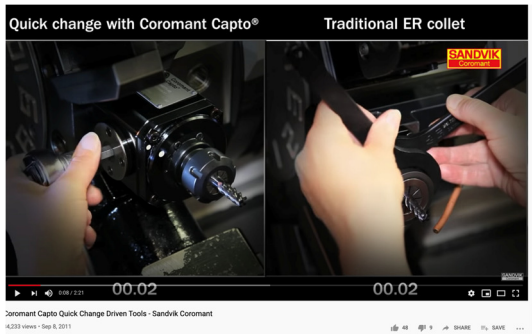
STATIC TOOL

DRIVEN TOOL



DRILL

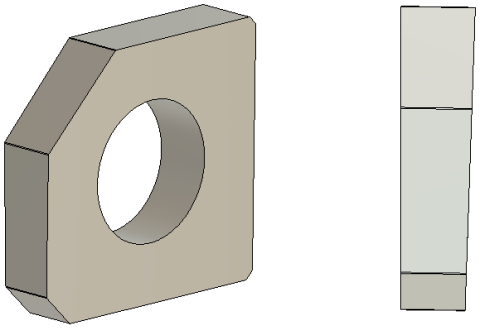
CHANGE TIME



2 MICRON REPEATABILITY

Sample Parts

MOD VISE WASHER



DIAMOND PIN

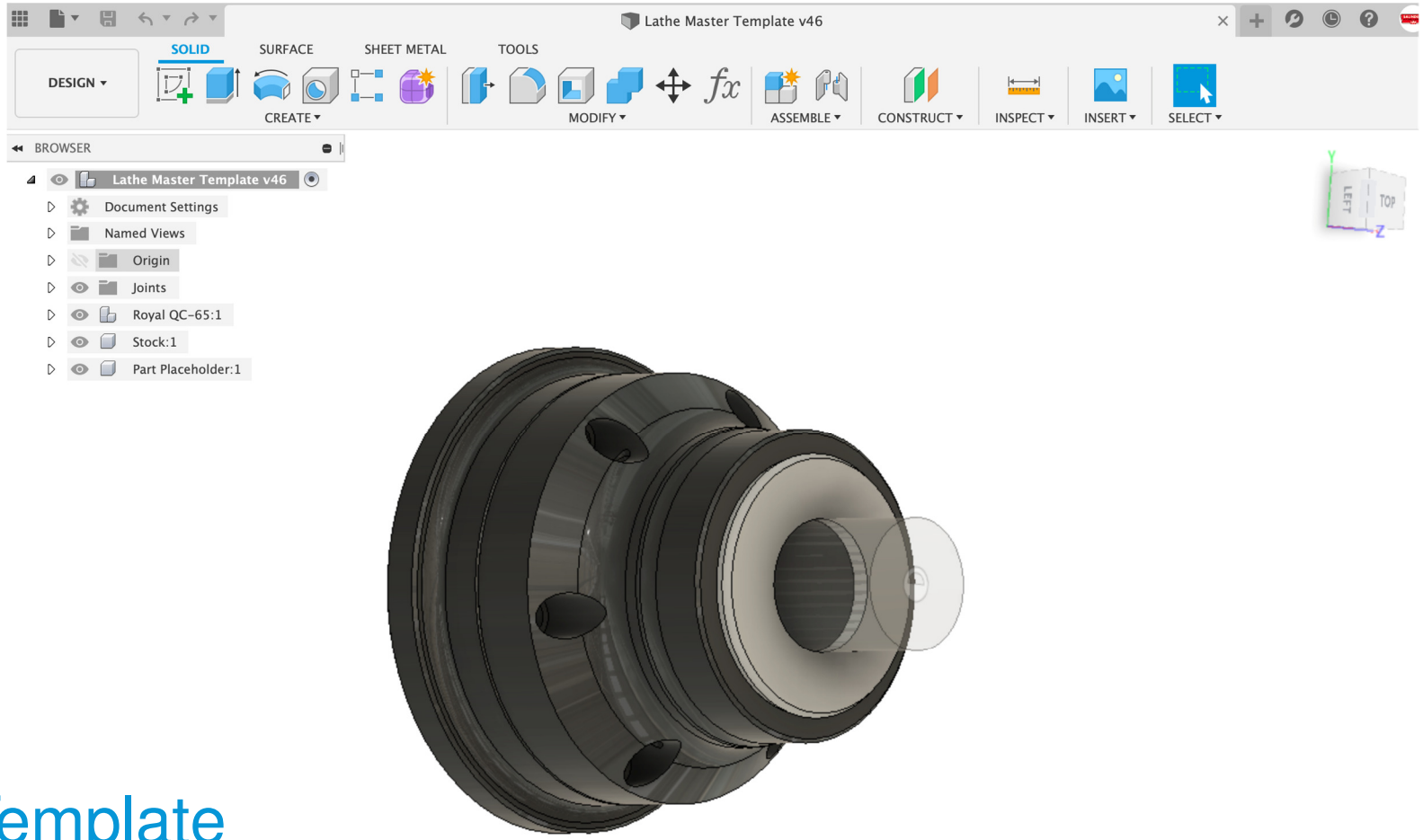
PLATE SPACERS

OTHERS

Bar Feeders

Offer ability to feed in material and store additional bars for longer part runs

- **Price** (<$20k)
- **Simplicity**
- **Considerations**
  - Tool Life
    - Tool Break Detect
    - Turret Probe
    - Capto or other quick change
  - Chip evacuation
  - Coolant levels



Container Template

Use Fusion 360 pre-build “Container” model to include defined tooling, speeds/feeds, CAM operations, fixturing, stock definitions

Workholding

ROYAL QUICK-GRIP™ CNC COLLET CHUCKS

The Most Advanced Collet Chucks Available for Today's CNC Lathes

- ✓ Ten-Second Collet Changes Slash Setup Times.
- ✓ Industry-Leading Gripping Range – 0.062".
- ✓ Ultra-Precision Accuracy – 0.0002" TIR Guaranteed.
- ✓ Extreme Grip Force = Most Aggressive Chip Removal Rates and Fastest Cycle Times.
- ✓ Maximum Rigidity Produces Superior Part Finishes.
- ✓ Best Tool Clearance – Critical For Live Tooling.
- ✓ Exclusive Royal Risk-Free Performance Guarantee.
- ✓ In-Stock for Same-Day Shipping.

Proudly Made in U.S.A.

Three Unique Models For All Applications

Accu-Length™

- Our best-selling model.
- Fixed-position collet maintains precise z-axis part positioning – critical for secondary operations.
- Usually the best choice for main spindles, and always required for sub-spindles to ensure proper part transfer.

Pull-to-a-Stop

- Pullback design, however z-axis part positioning can be controlled with an included internal stop.
- Stop is easily removed for bar work.
- Often used in robot-load applications where workpiece confirmation is required.

Pullback

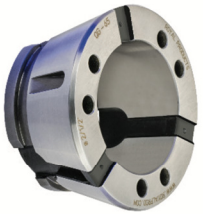
- Most economical choice, but limited primarily to first operation, main-spindle applications.
- No ability to control z-axis part position.

NOTE – In order to provide our customers with the best possible service, Royal maintains a huge inventory of Quick-Grip™ CNC Collet Chucks, plus more than 375 unique drawtube connector models – enabling same-day shipping on virtually all collet chuck orders.

ROYAL QUICK-GRIP™ CNC COLLET CHUCKS

Big Benefit #1 Ten-Second Collet Changes

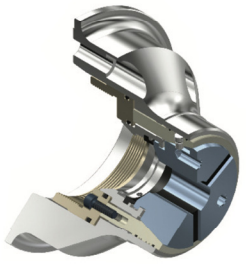
With the Royal Quick-Grip™ CNC Collet Chuck, collet changes take just seconds. Here's how it works:



1. The unique collets are constructed of hardened steel segments securely joined together by vulcanized rubber. Each collet contains an annular hook and groove configuration on the rear section of its outer diameter.

2. The installation tool incorporates steel pins that align with reamed holes on the collet face. When these pins engage the face holes and the trigger on the tool is actuated, the collet becomes temporarily compressed.

3. In its compressed state, the collet can then be inserted into the collet chuck, where the hooks on the rear of the collet segments become axially aligned with a retaining groove in the chuck.



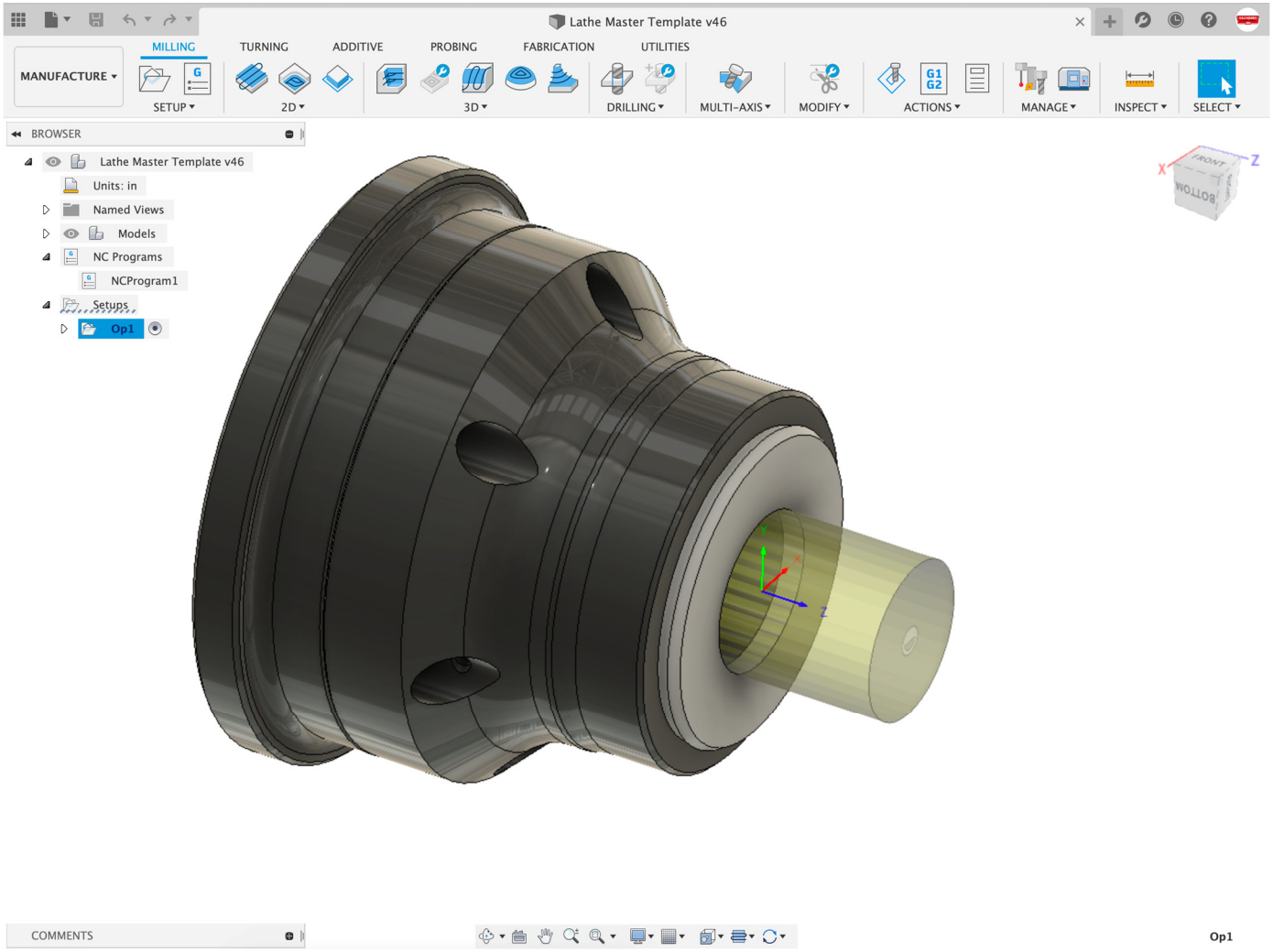
4. Releasing the installation tool allows the collet to spring open, seating the hooks in the groove and drawing the matching ID/OD tapers into full, positive contact. The collet is now installed.

REDUCED SETUP TIME = GREATER THROUGHPUT AND HIGHER PROFITS!

WCS (origin)

Program on Chuck face!

- **Minimize crash risk**
- **Common across programs**
- **Reduced setup time**



“Cheap”?

PRICE (APPROXIMATE)

- **Haas: open pricing on website**
- **Machine Tool with Subspindle & Y: ~$120k**
- **Bar Feeder: $17k**
- **Royal Chucks: $8k**
- **Capto Budget: $10 - $20k**

COMPARISION

Erowa Compact 80 (unit cost , pallet cost)

Robot (Safety, programming, accuracy, weight limits)

SIMPLICITY

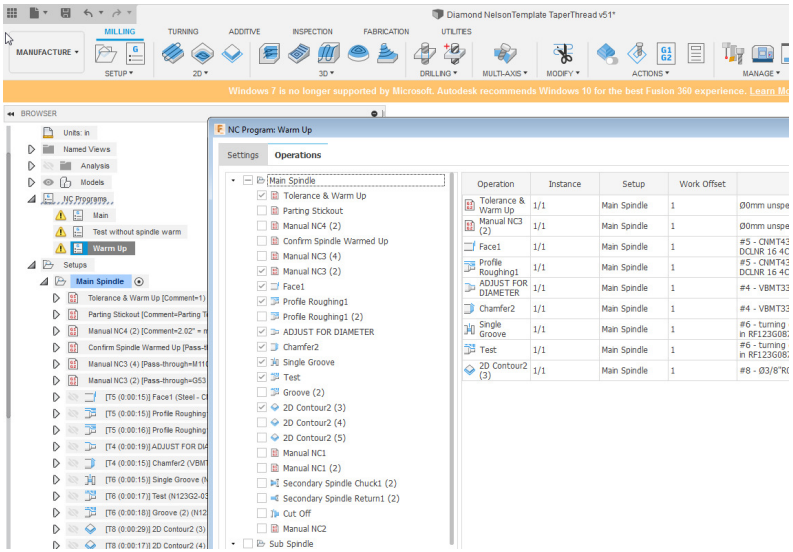
- **Easy to use as a 2 axis lathe**
- **Automate when needed**
- **Minimal Setup with Royal, Capto, WCS**
- **Quick Change Collets, M130 Media Display**

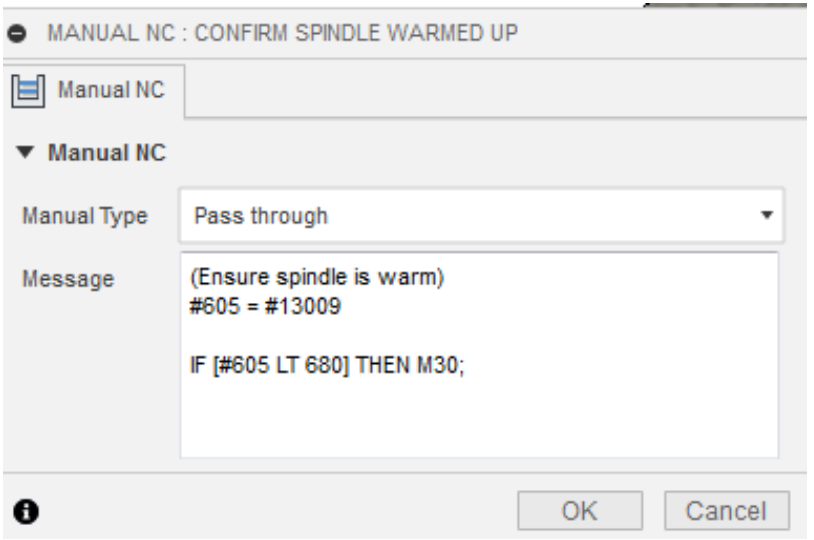
RESALE

- **Common or coveted by many manufacturers and job shops**
- **Avoids niche automation equipment and machine tools**

Temperature matters

-Any Precision Machinist





Warm Up

Run a machine warm up cycle that includes turret indexes, driven tooling, spindle and sub spindle, coolant cycling. Match warm up to the part profile

Poka Yoke

Measures spindle temperature; program will not run unless spindle is sufficiently warmed up

Tool Life Management

Time
IN CUT

#
OF HOLES

#
OF PARTS

Load
MAX LOAD

Summary

- **Still functions as a basic 2-axis lathe**
- **Strong re-sale value in any economy**
- **Fusion 360 templates, quick change tooling + workholding make for fast, safe programming**
- **Change parts & program in minutes**
- **Scalable to run unattended, lights out**