

When is a Collet Chuck a Better Choice than a Three-Jaw Chuck?

Bar Feeding

A collet chuck is almost always the best workholding choice for machines equipped with bar feeders. Collet chucks help minimize vibration, open and close faster than three-jaw chucks, and, most importantly, provide full 360° contact to ensure that the **bar stock remains on centerline for accurate re-gripping** after being advanced.

Small Diameter Work

Collet chucks are best suited for parts ranging in size from 1/16" to 3" in diameter because they offer much better tool clearance, can be run at higher speeds than jaw chucks, and provide superior grip force.

Short / Thin Parts

A collet chuck's low-profile design provides better tool clearance and allows machining to take place very close to the chuck face. This ability to work closer to the chuck can also help prevent thin parts from sagging or bending.

High Speed Operation

Collet chucks are much less vulnerable to the negative effects of centrifugal force, enabling them to **run at higher speeds while maintaining consistent grip force**.

Reduced Setup Times

Changing a collet is much faster than changing chuck jaws, and there is no boring required. Collet chucks keep your machines making chips – and profits!

Pipe and Tube Work

The 360° contact provided by a collet **distributes the gripping force evenly** around the entire part circumference, reducing the risk of crushing or distorting thin-walled parts.

Odd Shaped Parts

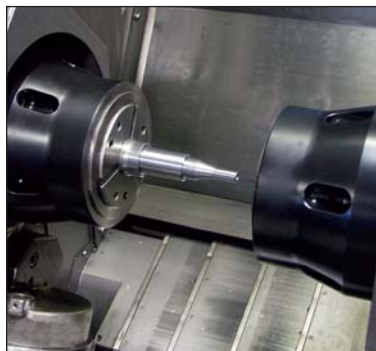
Collets can be easily customized to hold odd-shaped or off-center parts. A wide selection of standard collets is readily available to handle round, square, and hex stock.

Better Tool Life

The paddlewheel-like shape of a 3-jaw chuck can deflect coolant before it reaches the cutting tool tip, shortening tool life, whereas the streamlined shape of a collet chuck enables precise coolant delivery.

Increase Productivity and Profits with a Royal CNC Collet Chuck!

What is the Difference Between a Pullback Chuck and an Accu-Length™ Chuck?



With a pullback collet chuck, closing the collet is accomplished by pulling it back into the chuck body, whereas with an Accu-Length™ chuck, the collet is rigidly fixed to the chuck body and a tapered sleeve pushes forward over the collet to compress it.

Using a pullback chuck will result in a slight variation in z-axis positioning of the workpiece. This happens due to the fact that as the collet draws back and closes down, it begins to grip the workpiece and pull it back too. Typically the movement is just a few thousandths of an inch, and remains consistent as long as the part diameter doesn't vary.

This slight z-axis movement is often acceptable for first operation work and can be easily remedied with a facing cut. However, there are several situations where Z-axis movement is not desirable. In these cases, using a Royal Accu-Length™ collet chuck with **dead length operation will protect against workpiece movement.**

Important – For machines with two spindles, it is always necessary for the secondary spindle (right-hand) to be equipped with an Accu-Length™ collet chuck, and it is strongly recommended that the main spindle (left-hand) use an Accu-Length™ chuck as well.

Which Chuck Model is Right for You?

- Step 1** Determine the correct spindle mount, (A2-6, 140 mm, etc.). The collet chuck you choose must have the same spindle mount as your machine.
- Step 2** Determine the required capacity. It is usually common practice for the collet chuck capacity to either match, or slightly exceed, the machine's bar capacity.
- Step 3** Choose between Accu-Length™ and Pullback models

	Accu-Length	Pullback
Simple first-op turning*	✓*	✓*
Bar feeding*	✓*	✓*
Jobs where the workpiece OD or stock size is not consistent	✓	
Secondary operations, especially when an accurate length feature must be maintained in relation to first-op features	✓	
All secondary spindles (and main spindles of two-spindle machines)	✓	
Multiple pulls on the same part	✓	

*While both pullback and Accu-Length™ chucks may be used in these applications, Accu-Length™ is often a better choice and must be chosen if any of the other parameters are met.

- Step 4** Choose between Quick-Grip™ and Low-Profile models

	Quick-Grip™	Low-Profile
Fast collet changeover time	✓	✓
Short length	✓	
Small nose diameter		✓
High grip force	✓	✓
High Accuracy	✓	✓
Wide clamping range	✓	

For additional help in determining which collet chuck model is best suited to your specific needs, please contact a Royal Products applications engineer at 1-800-645-4174.