



ROTA-RACK®

**SIMPLE, OFF-THE-SHELF CNC LATHE AUTOMATION
INCREASES THROUGHPUT AND PROFITS**



ROYAL
PRODUCTS
Optimize everything.



WHAT IS A ROTA-RACK®?



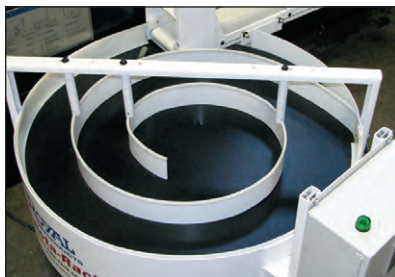
US Patent #7,757,837

The patented Royal Rota-Rack® is an automatic accumulator that can be used with any bar-fed CNC lathe to safely collect finished parts, providing **hours of highly profitable, unmanned production.**

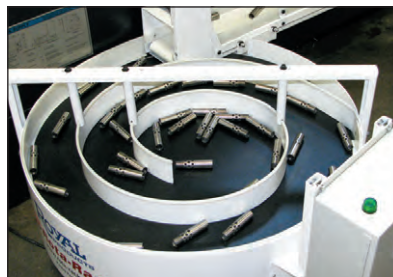
Do you know....

- There are 168 production hours in a week.
- You are probably only using 40 of them.
- Your machines are worth \$100 per hour.
- You could be **making an extra \$12,800 per week** on each machine with a Rota-Rack®.
- You already invested in the bar feeder – how can you not complete the automation package?
- **Pays for itself in less than two weeks – Incredible!**
- What are you waiting for?

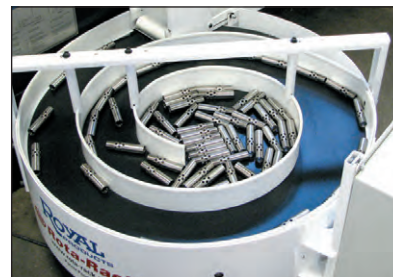
Overnight Production = Pure Profit



5 PM – Tuesday



11 PM – Tuesday



6 AM – Wednesday

WHAT WILL THE ROYAL ROTA-RACK® DO FOR YOU?



Big Benefit #1 Increases Capacity, Throughput, and Profits

Adding a Royal Rota-Rack® to a bar-fed CNC lathe greatly increases machine utilization and throughput.

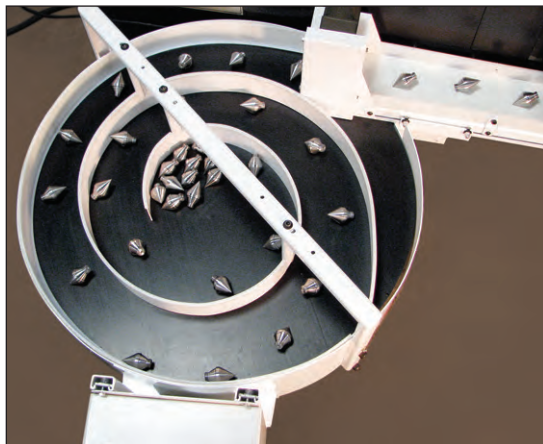
- ❑ Run existing machines extra hours: nights, weekends, lunch breaks, etc.
- ❑ Faster cycle times – no waiting for an operator to unload parts / empty collection boxes.
- ❑ Higher efficiency – **produce more parts per shift.**
- ❑ Better employee utilization – why have a person do a job that can be handled with simple automation?
- ❑ Increased profitability.



Note: Collection box removed for clarity.

Big Benefit #2 Eliminates Part Damage

The Royal Rota-Rack® has been designed to provide maximum part protection, a feature that is important for all parts but one that is especially useful for parts with delicate external features like threads, edges, and corners.



- ❑ Each time the Rota-Rack® collects a finished part, the turntable smoothly rotates to the next position to ensure that the following part will not forcefully collide with any of the previously-collected parts.
- ❑ All contact surfaces of the Royal Rota-Rack® and conveyor are covered with a high-lubricity UHMW plastic material to minimize friction and protect surface finishes.
- ❑ **Reducing scrap and rework costs directly improves profitability.**
- ❑ The Rota-Rack's® unique spiral helps keep finished parts in sequential order, aiding in quality control/inspection.

Big Benefit #3 Provides Complete Reliability

The Royal Rota-Rack® won't show up late, doesn't get sick, and **keeps working long after your last employee leaves for the night or weekend.**

First day of hunting season? Big snow storm? Cousin's wedding? The Rota-Rack® doesn't care. How many of your competitors will be turning out parts on Super Bowl Sunday?



**Check out the Royal Rota-Rack®
Video at www.rotarack.com**



THE PROFIT MAKER

Case Study – Royal Rota-Rack® Increased Profits at a Small Job Shop by Over \$60,000!

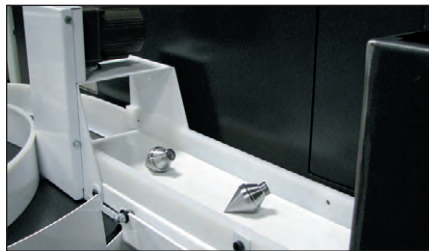
- ❑ The owner of a small job shop installed a Royal Rota-Rack® with the intention of running one of his CNC lathes for a few extra hours in the evenings after his employees left for the day.
- ❑ For costing purposes, he continued to base all of his overheads on the first shift, figuring that any extra production hours achieved with the Rota-Rack® would be virtually all profit.
- ❑ The shop rate on his CNC Lathe = \$80 per hour.
- ❑ The owner started out conservatively, using Rota-Rack® to deliver just three hours of extra production per night.
- ❑ 3 hours x 5 days = 15 hours per week of extra production.
- ❑ 15 x \$80 = \$1,200 in extra profits per week.
- ❑ \$1200 x 52 weeks = \$62,400!

In this real-life example, the lathe only ran an average of three extra hours per night, and still **generated more than \$60,000 in extra profit in the first year** alone. In reality, many shops use the Royal Rota-Rack® to run an extra six to eight hours per night, plus weekends.

How Does The Royal Rota-Rack® Work?



1. User enters the part cycle time and degree of turntable rotation via a simple PLC controller. A counter can also be set to shut the Rota-Rack® down after a specified number of parts have been collected.



2. As a finished part comes out of the lathe, it drops onto the conveyor and is moved towards the Rota-Rack's® rotating turntable.

The Royal Rota-Rack® is very simple to set up and operate. Most users are up and running within an hour or two of removing it from its shipping crate.



3. Each time a part comes out of the machine, the Rota-Rack® indexes to the next position. The degree of turntable rotation is easily adjusted according to part size.



4. As the turntable indexes, the parts are gently guided towards the center via the spiral.



5. After several hours of unmanned production, finished parts are manually removed from the center of the Rota-Rack®.

COMMON CONCERNS ABOUT LIGHTS-OUT PRODUCTION



Crossing over from manned production to unmanned production is a big step for any shop. It isn't easy – but for those who commit to it, the benefits are enormous. Here are few of the most common objections that we hear, and some input on how we addressed some of the same issues in our own shop:

“My machine might crash.”

That's true - it might. However, today's CNC's are equipped with all kinds of sensors that immediately shut everything down upon any sign that something has gone wrong. If your machine crashes, you might have to deal with an expensive repair. But what you also must accept is that no operator is a psychic – when was the last time one of your people shut a machine down just before it crashed?

“I might come in the next day to find out that we made a full run of bad parts.”

Again, that may happen, but it won't happen every time. In fact, you'll soon realize that this hardly ever happens, and when it does, the value of the scrapped material is so low in relation to the value of the finished parts that it doesn't matter. One of our customers said it best – “\$300 worth of aluminum is nothing compared to \$3,500 worth of finished parts!”

“I want to keep my people employed - machines are taking over the world...”

Like it or not, automation is here to stay. Look at the agricultural industry – it is estimated that 100 years ago 30-40% of the American population made its living from agriculture. Today that number is about 3%, yet we produce much more food, and of much higher quality, than ever before. That would never have been possible without automation advancements such as the combine.

Automation can actually improve life for your employees by freeing them from repetitive, mundane tasks so they can tackle more complex jobs within your company, and potentially earn more money because they are doing jobs with a higher value. For example, as we became more automated here at Royal, many machine loaders/unloaders advanced into the assembly department. This was a higher-paying position, and we had a need for increased personnel because we were making more parts each week.

Sure, over time your need to increase headcount will be reduced and **you will become a much leaner company**. However, our experience is that this almost always occurs through natural attrition, and rarely does simple automation result in an immediate need to cut staffing levels.



Utilized to its fullest extent, it is entirely possible to generate an **additional profit of \$150,000 – \$200,000 per lathe, per year, with the Royal Rota-Rack®.**



FIVE TIPS FOR SUCCESSFUL LIGHTS-OUT PRODUCTION



1. Reduce the Risk of Tool Breakage

For roughing tools and large drills, use load detection (standard on many machines) to sense tool breakage. If you don't have load detection, utilize tool management.

Example – if you know a certain tool typically lasts for at least 50 parts, switch it out after 40. If you don't have load detection or tool management capabilities, figure out your weak link and adjust your run-size according to what that tool can safely handle. **Whatever you do, don't decrease speeds and feeds in the hopes of extending the life of a \$9 insert!**

2. Control the Chip

Produce chips - not stringers. Leverage the expertise of your cutting tooling suppliers – they can offer you suggestions for optimizing speeds and feeds, let you test various cutting tool geometries, etc. In our own shop, we had an application where we had to try several different approaches for a troublesome grooving operation until we found the optimal one.

Another important aspect of chip control, especially on sub-spindles, is cleaning your workholding between parts with an air blast to ensure that the next part is correctly seated. If you don't have air blast on your machine, use a large diameter thru-coolant drill and blast the chuck with coolant while it is spinning.

3. Coolant Management

Coolant quality and consistency must be regularly monitored – poor coolant shortens tool life, damages machine seals, and hurts part finishes. In addition to regular coolant maintenance, all coolant sumps should be equipped with a tramp oil skimmer.

It is also important to **keep the coolant inside the machine instead of dumping it out with each finished workpiece**. Techniques include air-blasting the part before unloading, adding drain holes to the part collection basket, refraining from positioning the part collection basket under the part until just before the cut-off tool breaks thru, reducing or shutting off coolant flow during part-off, etc.

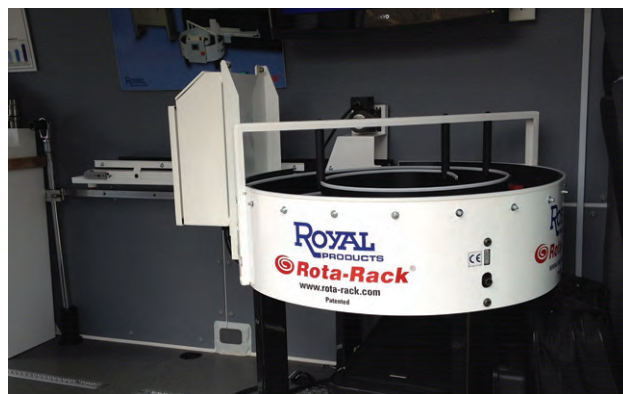
4. Thermal Stability/Scheduling

Learn how each of your machines is affected by heat. One of our large Rota-Rack® customers discovered that not all of his machines are stable enough to handle certain high-tolerance jobs over the course of an unmanned shift, so he simply schedules his jobs accordingly.

5. Make it Part of Your Company Culture

Your employees must embrace lights-out manufacturing, and realize that it doesn't make their jobs less secure – it makes them more secure because it better positions your company against domestic and foreign competition. They need to change their thinking from “Can this job run lights-out?” to “How long can I run this job lights-out?”

Ask yourself **“How many shops that thought CNC was a passing fad are still around today?”** If you don't invest in the latest available technology to make your shop as competitive as possible, how can you expect to remain competitive against those who do? The Royal Rota-Rack® is one of the simplest, least-expensive automation devices you can employ, and the payback is both immediate and ongoing.



Want to see a Rota-Rack in person? Give us a call and we'll arrange for one of our fully-equipped demo vans to visit your company. You can even drop some of your parts onto it so see how they are handled.



**Check out the Royal Rota-Rack®
Video at www.rotarack.com**

HEAVY-DUTY DESIGN – BUILT TO LAST



Large Capacity

With over 850 square inches of surface area, the Royal Rota-Rack® can hold **hundreds of parts*** and provide hours of unmanned operation.

Unique Rotary Spiral

Gently guides finished parts to the center as the turntable rotates.

Coolant Management

Integral drip tray with drain collects excess coolant.

Totally Self-Contained – No Machine Tool Contact

The Royal Rota-Rack® is a complete stand-alone unit – there are no electrical or physical connections of any type with the machine tool. This provides hassle-free installation and ensures that all machine warranties remain intact.



Very Heavy-Duty Construction

Weighing in at 450 lbs., the Royal Rota-Rack® is a serious piece of equipment that is **built to withstand years of abuse** in the harshest production environments. A heavy gage welded steel frame provides outstanding rigidity, enabling the Rota-Rack® to easily support up to 700 lbs. of finished parts.

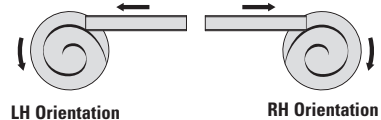
Excellent Part Protection

Low-friction UHMW coating on all contact surfaces protects finished parts from scuffs and dents. This durable plastic is the same material used in the manufacture of motorcycle chain guides.

Universal Design

The Royal Rota-Rack® **adapts to any CNC lathe** that is equipped with a part catcher:

- Turntable can rotate either clockwise or counter-clockwise, and can be positioned to either the left side or right side of the lathe.



- Height range 10.5 – 53 inches. Other height requirements can be accommodated upon special request.
- Rota-Rack® is completely free standing – no bolting to the machine or floor is required.
- Control box can be positioned anywhere on circumference for optimal clearance.
- Easily adapts to machines with existing conveyors.

The Royal Rota-Rack® is reliable, doesn't take sick days, and **pays for itself within a few months of use. Order yours today and get a jump on your competition!**

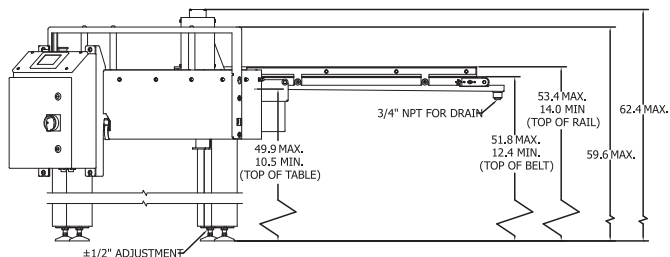
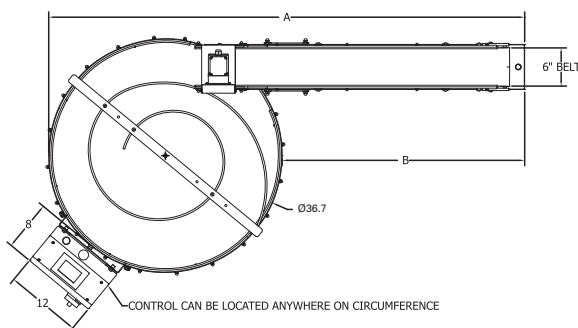
*Actual number of parts depends upon individual part size.



ROYAL ROTA-RACK® SPECIFICATIONS

Large Enough to Hold Lots of Parts, Small Enough to Fit Almost Anywhere

The diameter of the Rota-Rack's turntable is 36", making it large enough to hold a significant number of parts, yet small enough to fit into tight spaces. When considering space utilization, it is very important to note that the Rota-Rack® can **double or triple capacity**, yet its footprint is only about 10% that of a new lathe and bar feeder.



General Specifications

Usable Surface Area	850 in² / 5480 cm²
Max. Part Length*	10" / 25 cm
Min. Part Diameter	0.25" / 0.6 cm
Max. Part Diameter*	3" / 8 cm
Payload Capacity	700 lbs. / 318 kg
Height Range	See drawing
Power Supply	110V, 50/60Hz
Unit Weight	450 lbs. / 205kg (including conveyor)

*It is sometimes possible to exceed these parameters. Contact Royal for info.

Conveyor Dimensions

DESCRIPTION	A	B
Short	53"	16"
Standard	75"	38"
Long	94"	57"

Note – unit shown is configured for left-hand positioning. Changing to right-hand configuration simply requires flipping the spiral and conveyor bracket.

Easy Installation

We often refer to the Rota-Rack® as "Off the Shelf Automation" because it is such a breeze to install. In fact, most users report having it up and running within an hour of unpacking it from its shipping crate.

Each Rota-Rack® normally ships with its height and orientation preconfigured according to customer specifications. And because **the unit does not need to connect to the lathe either physically or electrically**, installation is simply a matter of attaching the legs, sliding it into place in front of the machine, and plugging it into a standard 110v outlet.

The one additional step that may be required for some installations is the modification of the lathe's part collection box, usually located on the door of the machine. In order for parts to reach the Rota-Rack® or its conveyor, the bottom and/or side of the box may have to be opened up as shown in the photo.



Note – see page 62 for important information regarding coolant management.

HOW TO ORDER THE ROYAL ROTA-RACK®



The Heavy-Duty Royal Rota-Rack® is Available with Two Control Options and Three Conveyor Options:

Deluxe Control

- The deluxe control enables the Rota-Rack's® operation to be matched to the machining cycle time.
- Three inputs are entered by the user: part cycle time, amount of rotation, and auto-shutoff quantity.
- With this control, each time a part drops out of the machine, the Rota-Rack® will energize and index.
- The deluxe control is useful for applications where accurate spacing is required to **prevent delicate parts from coming into contact with each other.**

Basic Control

- The basic control eliminates operator input of the timing/rotation functions.
- With the basic control, the conveyor and turntable maintain a continuous low-rpm motion.
- No auto shut-off feature is available with the basic control.

Conveyors

- There are three conveyor options to handle all clearance needs.
- The conveyor bolts to the Rota-Rack and plugs directly into the control.
- Long conveyor includes a support leg.



In-Stock For Immediate Shipping

Royal Heavy-Duty Rota-Rack®

DESCRIPTION	PART NUMBER	PRICE
Heavy-Duty Rota-Rack® with Deluxe Control	51002*	\$14,515
Heavy-Duty Rota-Rack® with Basic Control	51003*	12,645

*Order conveyor separately.

Conveyor Options

DESCRIPTION*	PART NUMBER	PRICE
Short	51021	\$4,140
Standard	51022	4,140
Long	51023	5,665

*See dimensions on previous page.

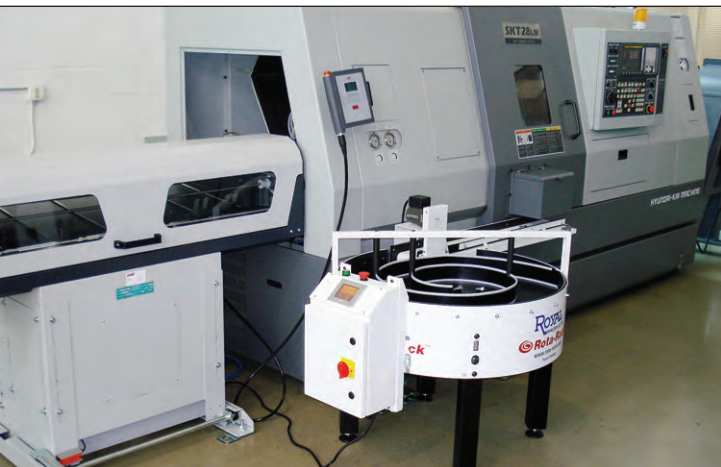
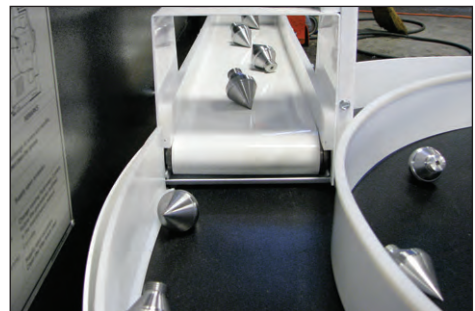


**Check out the Royal Rota-Rack®
Video at www.rotarack.com**



ROYAL ROTA-RACK® INSTALLATIONS

Works With Any CNC Lathe



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Video at www.rotarack.com



ROYAL BRINGS INCREASED PRODUCTIVITY DIRECTLY TO YOUR COMPANY PARKING LOT



Not Able to Visit a Tradeshow?

No problem – with Royal's nationwide fleet of fully-equipped mobile showrooms, **we can bring the show right to your company parking lot.**

Each of our demo vans is outfitted with dozens of productivity-enhancing CNC metalworking accessories that you and your team can see/touch/try firsthand, and then determine for yourselves how they might bring value to your company.

Schedule your visit today at royalproducts.com



UNSURE? ROYAL HAS YOU COVERED!

With Royal's exclusive Risk-Free Performance Guarantee, **you can try many of our products on the toughest jobs in your shop for 45-days**, and if you aren't 100% satisfied with the performance, we'll take it back and arrange for a full refund.

How can we offer such a guarantee? It's simple – our products are all designed and built to outperform expectations, and very few customers are ever disappointed.

We understand that implementing new technology can be scary, and we are happy to alleviate your concerns by removing the risk.

Call us today at 1-800-645-4174 to find out more.