

# CLAMPING & CENTRIFUGAL FORCES



[www.rindex.com](http://www.rindex.com)

MADE IN SWEDEN

**mpc** AUTOMATION  
SYSTEMS

## GLOBAL DISTRIBUTION LOCATIONS TO THIS DATE



## MPC AUTOMATION SYSTEMS PRODUCTS

### GRIPPEX BAR PULLER

- \* COOLANT DRIVEN
- \* INSTANT SET-UP
- \* COVER 2-105 MM



### RINDEX MULTI JAWS

- \* SIX JAWS IN ONE
- \* QUICK CHANGE
- \* 100 % CLAMPING SURFACE



### RINDEX C-WEIGHTS

- \* CENTRIFUGAL COMP.
- \* DETACHABLE WEIGHTS
- \* EXTRA WEIGHTS OPTIONAL



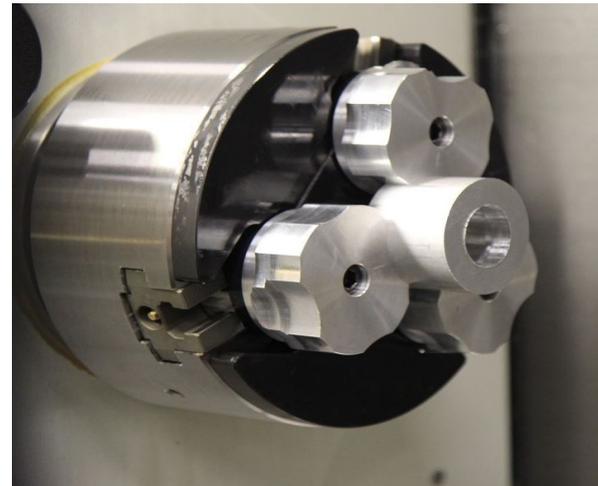


# ABOUT CLAMPING FORCES

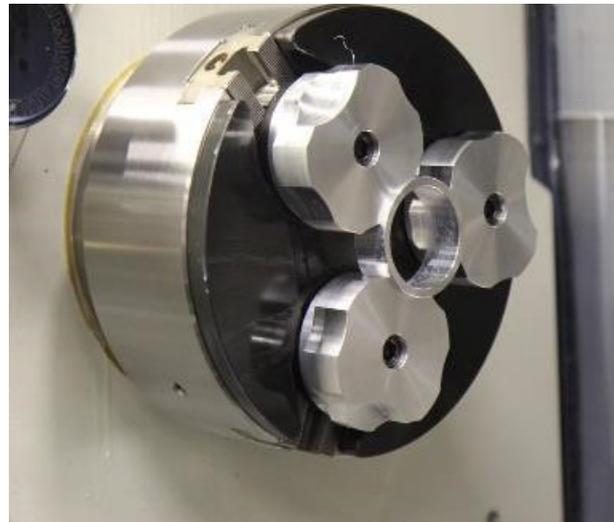
## Summary

When manufacturing thin walled and/ or delicate parts you will have problems with choosing clamping forces and correct RPM. The reason is the trade off between the two, kN Vs. RPM.

You should use 100 % enclosing jaws. however, they are heavy, effecting maximal RPM and therefor surface structure and parts / minute.



- \* Make informed clamping decisions based on data
- \* Use 100% enclosing jaws
- \* Clamp half as hard
- \* Use counterweights, Turn at double speed
- \* Choose the right jaw material for best friction
- \* Wash parts first before machining





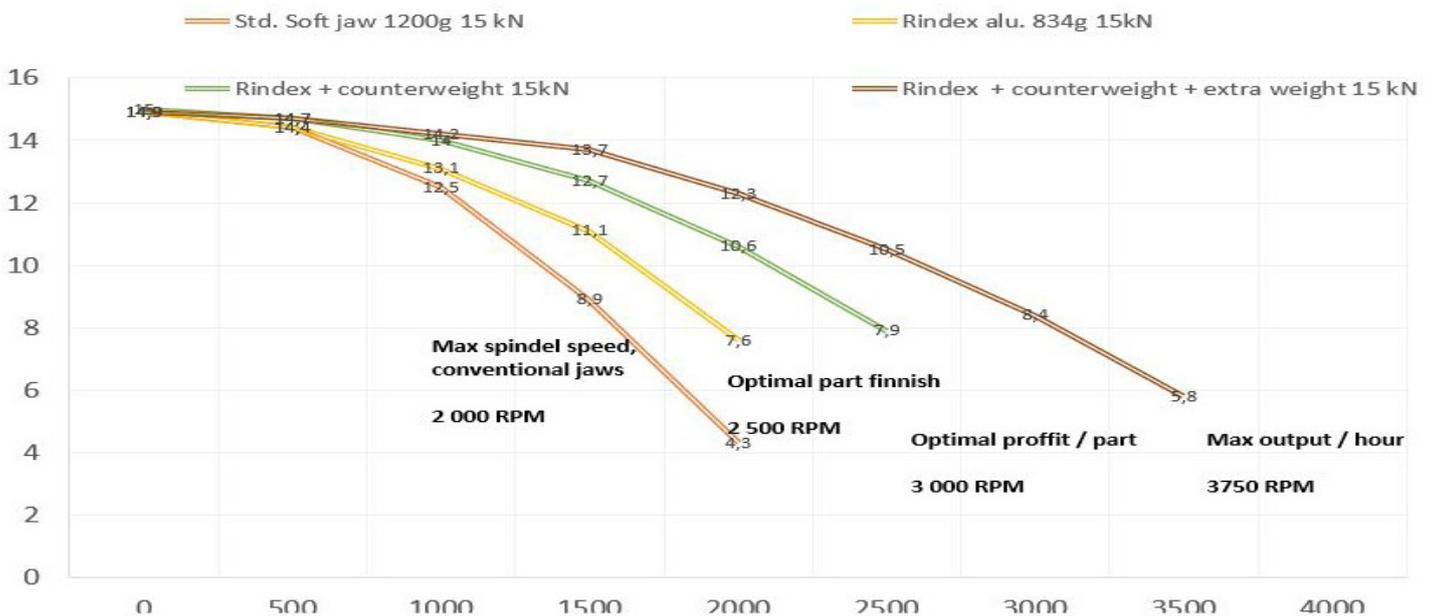
## CLAMP HALF AS HARD, TURN TWO TIMES AS FAST

Choosing the right tools and cutting data is key to efficient high-quality manufacturing. However, most companies let the operator choose RPM without any supporting data, limiting machining capability and tool capacity.

A standardized way of choosing cutting data values will result in less mistake as well as less “trial and error” machine down time. As a result, you will end up with consistent production, less rework and inspection time.

Here are some insights that we have experienced when trying out our latest product line, the Rindex System.

**JAWS AND COUNTERWEIGHTS AT DIFFERENT CLAMPING FORCE (kN) AND SPINDEL SPEED (RPM)**



# HOW MUCH CLAMPING FORCE SHOULD I USE?

The latest cutting tool technology allows you to use less clamping force than before. With or without counterweights, you should lower the initial clamping force. Use Higher RPM. It is economically sane.

## **#1 You need less clamping force than you think.**

try to use half the clamping force and double the RPM. Not possible? Add counterweights. You can produce more parts with better quality without having make any calculations.

## **#2 Don't let the operator make cutting data decisions,**

Make operators use a software provided by a tool manufacturer, such as Sandvik Coromant. You will end up with measurable results.

## **#3 Surface structure is as important as always**

As cutting tool technology advances, so does customer expectations. Rindex makes sure that there are zero clamping marks or deformations.

## **#4 Use 100% enclosing jaws**

Our jaws are 100 % enclosing up to 120 mm. This means less clamping marks and less initial clamping force needed. If you have special requirements, please let us know.

## **#5 Choose the right jaw material**

When using aluminum to aluminum, you will have a friction equal to 2 times that of steel to steel. Choose jaw material after part requirements rather than jaw cost and life expectancy.

**“CLAMPING FORCE HAS NOT BEEN UTILIZED AS A PRODUCTIVITY FACTOR TO THIS DAY”.**

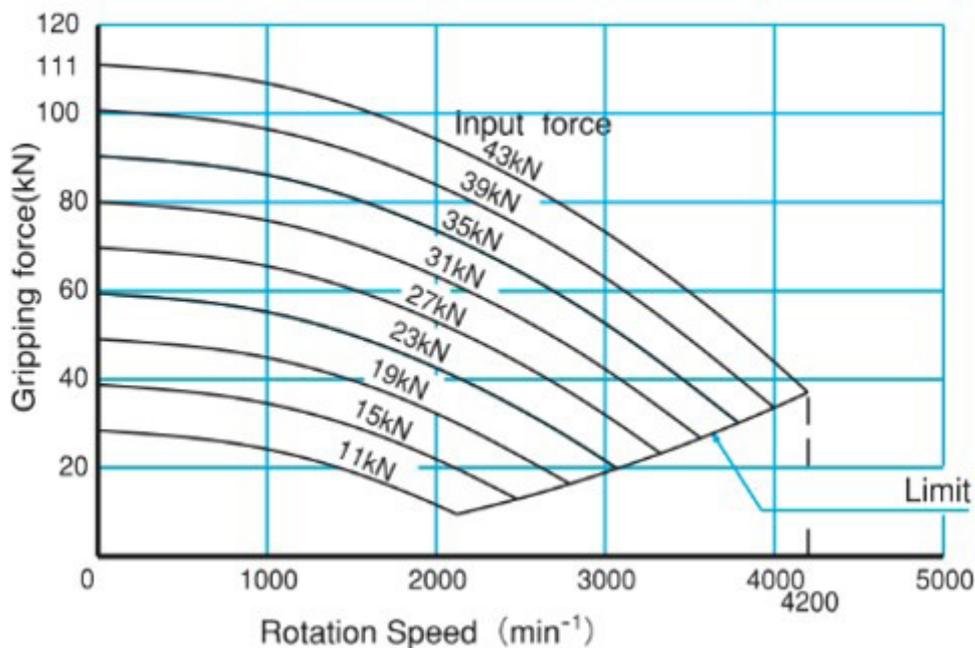
**- KENT MOLINDER, TPA ENGINEERING.**

# FREE CHOICE OF RPM IS CENTRAL TO EFFICIENCY GAINS

Conventional steel jaws mounted in standard chucks have not allowed for high speed turning (see clamping force diagrams). When put to the test, we were able to decrease the initial clamping pressure by half and, at the same time, increase spindle speed (RPM) by 2-3 times. Increased spindle speed effects chip removal rate as well as surface structure. Modern cutting tool technology allows for higher RPM and lower clamping force than before.

## Standard jaws mounted on a standard Kitagawa chuck

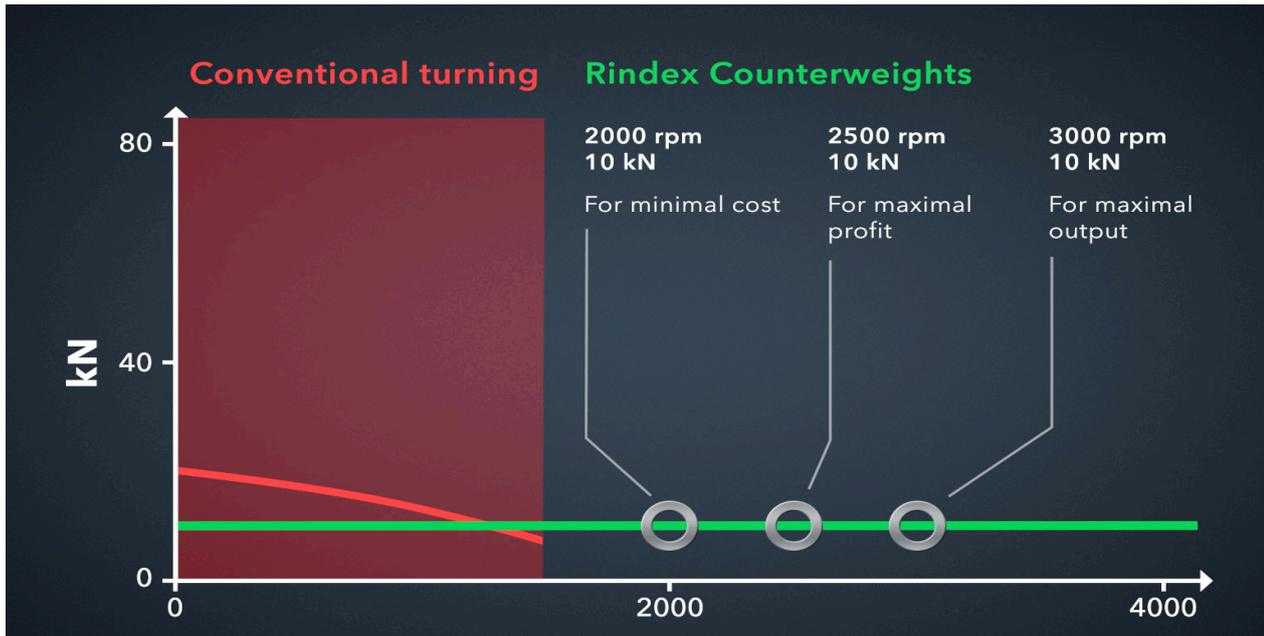
### B-210



Lean production is about maximizing customer value and minimizing waste of resources. Post-processing and scrapping do not only affect the profitability of the current project. Upcoming jobs will also suffer due to delays. A cost-effective way to ensure quality is to spend more time in the preparation phase, measure often and optimize the process during the project.

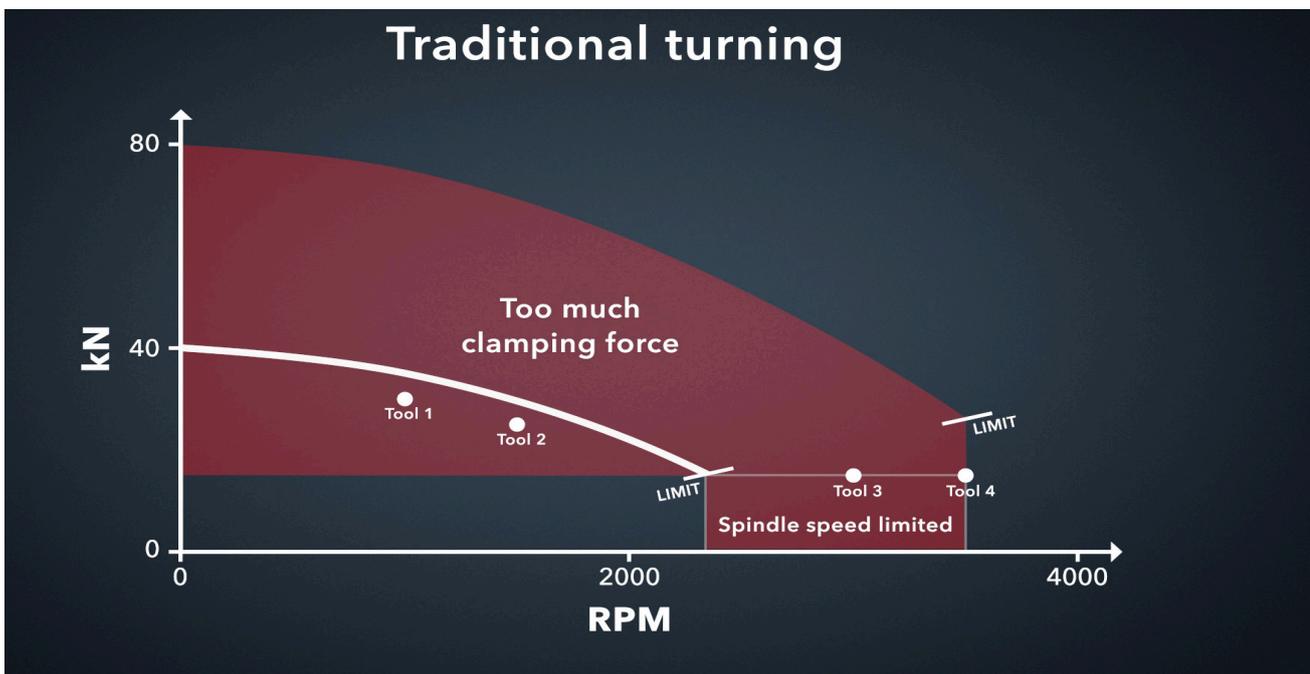
According to Sandvik's calculations, the correct cutting data can generate 15 times more productivity compared to (sub) optimizing tool life or choosing cheaper inserts.

# LEAN PRODUCTION



Optimal speed for all tools / tempos cannot be achieved without centrifugal force reduction. Without counterweights, there is a limit to how fast the chuck can turn. Compromizes must be made. With counterweights, the machinist can follow the instructions for cutting data given from e.g. Sandviks CoroPlus. This improves quality and output.

It is often desirable to lose some clamping force as spindle speed increases, as all operations require different clamping forces and different RPM. Since the counterweights have been equipped with extra weights it is easy to decide how much the clamping force should decrease to fit all operations.





## MPC AUTOMATION SYSTEMS

MPC Automation Systems AB was founded in 1986. Since then, we have marketed CNC-machines, developed accessories and software for automation of CNC machines. One of our best selling products, the Grippex Barpuller, has been a world wide success and represents our strive to make great things better. Our latest product line, flexible quick jaws with counter weights for takes our legacy into the 21st century.

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