GET BACK TO MAKING MONEY

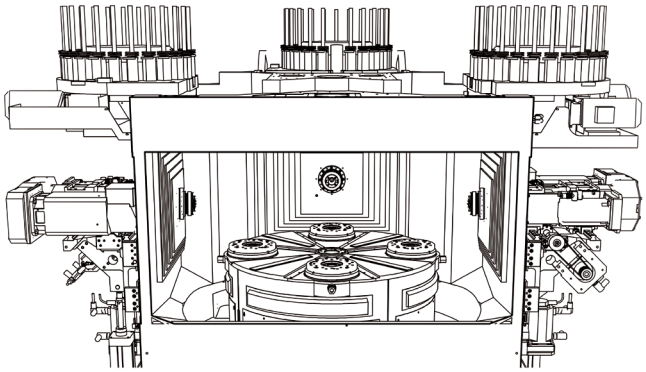
As Competitively As You Used To!

By Maurizio Porta

MACHINING CENTERS: WHY A BATTERY OF MACHINING CENTERS IS A MISTAKE!

- THE 5 WEAK POINTS OF THE MULTICENTER
- ROUND TABLE AT FANUC
- A CUSTOMER TESTIMONY

THE 5 WEAK POINTS OF THE MULTICENTER



Since it often happens that those who are evaluating the MULTICENTER make seemingly logical reasoning with respect to conventional machining centers and ask questions in their mind but immediately give themselves answers that are often incorrect, I decided that I will ask myself questions (after years I understood what is going on in the head of potential customers) and then I will give you the answers according to my experience.

You will see how often an external point of view can lead to totally different conclusions.

Why am I doing this? Because it happens that people who ask questions in their mind, instead of asking me directly for an open discussion, give answers (wrong answers) dictated by an incomplete knowledge of the product and draw conclusions leading them to dangerous and risky choices!

So, let's start to analyze what you might think or have already thought in your head ...

1. **ONE MACHINE, GOOD IDEA! ... BUT IF IT BREAKS DOWN I AM 100% STOPPED!**

So, ... this idea in your mind seems quite different to conventional machines, for example if I have single machining centers and one breaks down the others continue to produce and I am not stopped 100%.

The reality is different.

The MULTICENTER has been designed so that the module that is down can be excluded and simply by moving the tools to the other modules you can produce at a slower pace but without stopping all production. The same reduction in production as would occur with a down machining center.

In addition, as it is designed, access to the module is possible from the back in total safety while the machine is operating, because it is completely open and not inside the machine itself. This means even PM can be completed with the machine still running.

2. **BUT WHAT IF A PALLET BREAKS? BETTER HAVE MORE MACHINING CENTERS!**

Here too ... it is an apparently correct observation but, with the same logic, the MULTICENTER has been studied in such a way to exclude a pallet if necessary, even if the pallet is completely disassembled.

When the "off" pallet arrives in front of each working module, the part program is not started. In fact, this exclusion operation even was once carried out by teleservice from our software technicians on a customer's request.

Today we have 4 simple and clear buttons implemented in the interface. These buttons with an ON / OFF for each pallet makes this operation simple and intuitive.

3. **BUT THE WORKING FIELD IS SMALL ... ONLY A 250mm CUBE??? MACHINING CENTERS HAVE A MUCH LARGER ENVELOPE!**

Right observation! Ok the premise is that, of course, if your component is larger than 250mm this is NOT the right solution for you, but I have had several people who, even if the piece is smaller than 250mm, still make the same observation: "With a larger work envelope I can put more parts on the pallet and gain on the tool change time".

Let me explain: the purpose in having a smaller work envelope are the advantages that it automatically brings. It does not take a genius to lengthen the strokes ... but, in this case, it suits the expression "LESS IS MORE"!

And here is why:

LESS STROKE = MORE RIGIDITY

With more compact strokes, the working module is more rigid, it is precisely the structure itself that automatically makes this the case.

On the contrary, the more stroke you have, the more the machine structure is subject to elastic variations.

LESS STROKE = MORE ACCURACY

Why more precision? Even here, it is not that we have studied some devilry to get to this conclusion, but, simply, if my slides in XYZ are compact, all the materials such as recirculating screws, for example, are less subject to thermal variation.

For this reason, with our modules we can achieve a positioning accuracy of 0.0125mm and a repeatability of 0.005mm without the use of precision optical scales.

I can not say all because I have not verified, and it is impossible to do so considering the number of machining centers manufacturers, so I will say that ALMOST ALL machining centers need to adopt precision optical scales to make their performance acceptable.

However, optical scales are not bad, they do improve the accuracy.

In fact, even the MULTICENTER can be improved thanks to this technology, even if it has been applied only for 5% of the production of our machines. More for a matter of a customer's principle than for any real necessity.

Anyway, here are the precisions with optical scales: positioning equal to 0.0075mm and a repeatability of 0.005mm.

What do you think about it? Is that enough for you as an explanation of why less work stroke is a much, much more advantageous situation than a higher stroke?

..... No?

Ok, let's move on to the next LESS reason ...

LESS STROKE = OBLIGED TO WORK ONLY ONE PIECE

What is the advantage here?

In fact, what advantage is there to work only one piece because I have no more work envelope available?

Ah yes ... now I remember and here I will give the best of myself ...

By putting a single piece per pallet you get huge automatic benefits, so the MULTICENTER was designed in this way and for this reason it is enjoying unprecedented success!

A single piece allows you to place it very close to the base of the pallet, in this way the time of turning or tilting turns out to be very small because it is a matter of physical leverage. In addition, now I will tell you a secret that this pallet incorporates and has never been revealed before.

The pallet in question, the MULTICENTER pallet, is apparently a pallet very similar to those found on the market, indeed aesthetically it looks like a rotary table for sale. In reality, it is a PORTA SOLUTIONS project that has been patented for specific reason which makes it unique compared to other rotary pallets.

To explain this concept conceptually I have schematized under a "normal" table that you can buy from any rotary

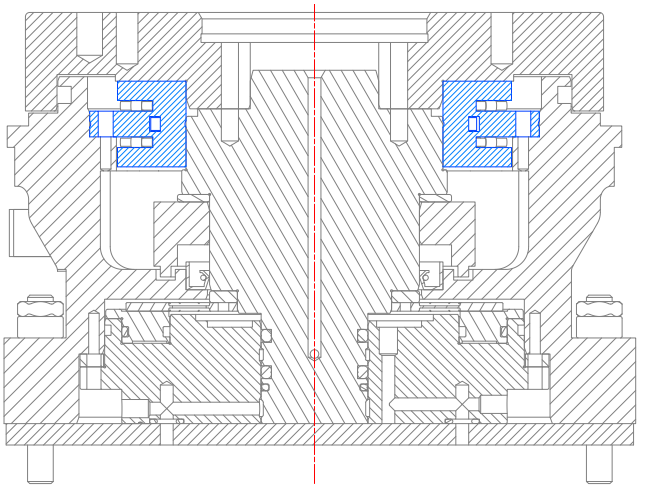
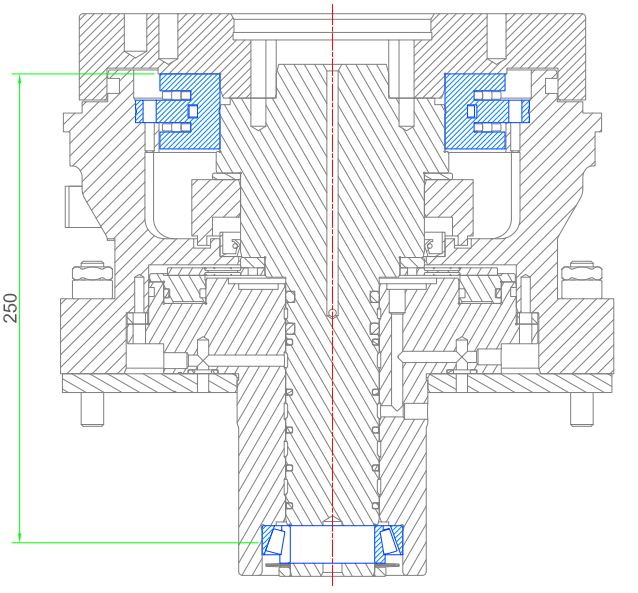


table builder and the "PORTA SOLUTIONS" version which we have patented.

Figure 1

As you can see, the STANDARD FIGURE 1 table has a single bearing (blue color) that, in addition to allowing the rotation of the plate, gives the rigidity in terms of tilting or tilting



moment to a force applied 90 degrees with respect to the rotation axis (tool cutting).

Figure 2

In the FIGURE 2 solution you can clearly see how, in

addition to the big blue bearing, there is another tapered roller bearing placed 250 mm away. Being a tapered roller bearing, this bearing has a very high axial load and, being 250 mm apart, creates, together with the main bearing, a very rigid construction able to make this pallet unique in terms of rigidity.

Now, this distance of 250 mm, if overturned by 180 degrees, automatically delineates the area within which you want to position your work piece to obtain the best rigidity of the system.

Here is the diagram of what is described below.

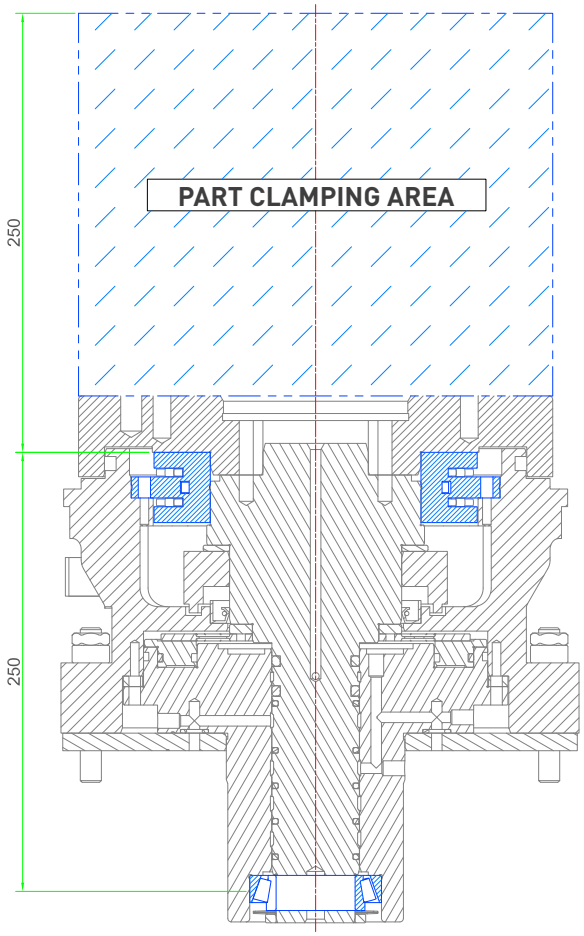


Figure 3

On the contrary, if you have a pallet with large work areas, here's what happens and what an unbalanced proportion you will end up with between bearing and piece position, this is going to unbalance the gear lever too much and in a dangerous way!

"In the economy, demand and offer is a mathematical model for determining the price within the mathematical system technically called with an intuitive term, MARKET".

Wikipedia

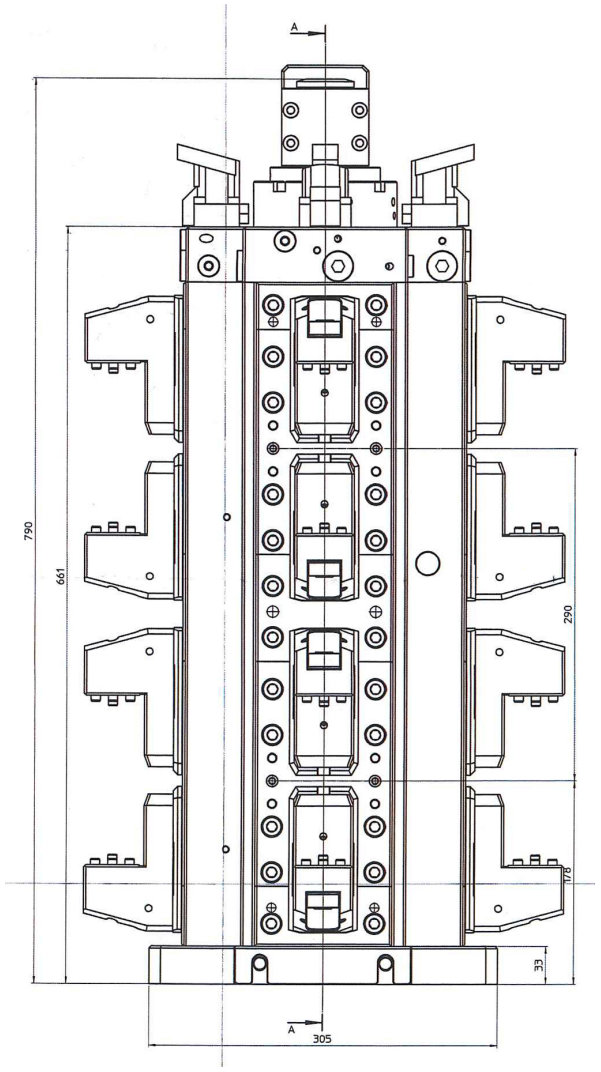


Figure 4

In fact, these things can translate into affecting the finished pieces coming out of the machine, that the pieces in the upper part of the work envelope have different final dimensions than those below.

Moreover, this situation makes you produce pieces of different quality because the cutting data you can use are different depending on the position of the piece caused by things like deflection or vibration and this changes part finish. A big problem for QA and final order quality. I am finding this more and more often with machining centers.

What do you think about it? Is this sufficient to explain why a piece per pallet is a much, much more advantageous situation than many pieces?

.... No?

So let's move on to the next LESS reason ...

With all this LESS, MORE will come!

On the other hand less for this LESS = MORE!

LESS STROKE = LESS PIECES FOR PALLET = MORE LIFE TOOL

Why more tool life? Having fewer pieces per pallet, or just one piece per pallet, I can have tools, or better, compact toolholders, because with multi-position pallets as in the last image, my tool holders need to be long so that when you rotate the pallet you can reach the furthest piece.

I am sure that you will immediately understand how a long tool holder can more easily vibrate and be less stable, thus shortening the life of the cutting edge as well as causing vibration and consequent problems.

Imagine now the situation of the first point, the machining center with the piece placed at the top of the pallet, combined with the long tool holder in order to work the piece ... a less than ideal scene!!!

You do not know how many situations like these I have seen and I continue to see outside. Then often the solution is a scandalous slowdown of the cutting parameters in order to get a decent machined piece.

That's why when I hear: "but the machining center has more stroke than the MULTICENTER", I would like to answer: "luckily for me yes!" But then calmly and patiently I have to slowly explain the above and make this point seemingly from LESS to MORE.

I did not know whether to tell you the secret I'm about to tell you, but I decided to do it ...

When I propose my solutions using the method of FLEXIBLE PRODUCTION, adopting the MULTICENTER as an alternative to common machining centers and changing from one technology to another, I can obtain incredibly positive performances with the same cutting tools that the customer already uses. This is only because of the fact that I put one piece per pallet, increasing the rigidity as explained above and drastically shortening the tool holders. The combination of these two things is an explosion of productivity and cost savings; it allows you to work the piece faster and extending tool life thanks to the reduction of vibrations.

If the same machining centers could work with these parameters but without vibration, the MULTICENTER would have no sense in existing!

Why did I decide to unveil this secret that I have never unveiled since 2005? Because after all these years, I realized that the machining centers will never get to this point because the laws of physics can never change!

What do you think about it? Are these sufficient as an explanation of why a piece per pallets is a much, much more advantageous situation that allows rigid and not long toolholders, improved tool life and reduced tooling cost, improved machine accuracy, and reduced downtime?

4. BUT IF I HAVE TO SELL MACHINING CENTERS IT IS EASIER, THEY ARE STANDARD!

Well, I understand ... . but let me tell you one, even two clarifications:

"In the economy, demand and offer is a mathematical model for determining the price within the mathematical system technically called with an intuitive term, MARKET".

Wikipedia

"The market demand or offer determines the price of the good that is exchanged. Demand and offer tend to adapt to one another: in this way a price of equilibrium is reached that is able to satisfy the purchase and sale needs of the good expressed by families, companies, the State and buyers. ".

Encyclopedia Treccani

I started with these two explanations to make you understand that on a theoretical level, yes the machining centers are standard machines and statistically have more applications than the MULTICENTER.

In practice if you have a machining center to sell, there are **too many offers** on the market of used machines, so your machining center in question is not very interesting because the chances of finding one equal or similar is huge.

All this brings a fall in the value of your machining center, with you hoping to be able to sell it at all.

On the contrary, for the MULTICENTER there is practically no used market, who owns it, holds it tight. The proof is that I am often asked to supply used MULTICENTER machines, but there are none in circulation!!

You can check these two data on the web, look for used machining centers and see how many possibilities are presented to you, then do the same for the MULTICENTER and you will see that there is no market.

PS: if you find one, call me immediately and report this opportunity because I will be the first interested and to repay the favor I offer you a dinner for two in the best restaurant in your area!

What do I want to tell you with these explanations? That a machining center theoretically has potentially many more customers interested in buying it, but the offer is so much that it is difficult to sell it, you have to sell it low and be happy if you find someone who is not a trader.

The MULTICENTER has a lot of people interested, because it can work pieces within the 250mm cube which covers a great number of parts but there are none so people unsuccessfully look for a machine to buy on the market.

Now you understand which of the situations is less risky if tomorrow you want to sell your machine tool, in fact the MULTICENTER turns out to be a less risky investment compared to common machining centers and I do not say so, the market says so!

5. BUT THE WORKING CENTERS ARE EASIER TO PROGRAM, THE MULTICENTER SCARES ME!

This is one of the things that potential customers often think and do not really understand because only a very small part of them ask. Maybe because you think the answer is obvious, "of course it's more complicated!" With 3 modules working at the same time, you need a great programmer! So with this in mind, you do not ask ...

Actually anyone who knows the ISO programming language and who knows how to program a simple 3-axis, can program the MULTICENTER after only 4 hours of study to become familiar with the interface.

This is thanks to the simple and intuitive interface with touch screen functions that drastically simplifies everything. The interface clearly divides the part program of each module. So, even the programmer who is for the first time to program, sees an environment, for example of module one, which is very simple because you will have to concentrate only graphically on module one and program 3 axes as a common machining center, then select module two or three and do the same thing.

Even in this case we do make life easy for those who use the MULTICENTER in order to achieve extraordinary results!

As you have seen, asking questions leads to very different conclusions. That's why I suggest you send me questions for which you may think you already have some answers, but in reality there could be different points of view that can guide you in different directions.

That said, if you have questions, and if you also think you already have answers, write me an email to:

maurizio@flexible-production.com

Worst case my answer will coincide with yours, or you will receive a different answer with a different point of view ...

At the end you will evaluate yourself which one will do the most for you.

"The market demand or offer determines the price of the good that is exchanged. Demand and offer tend to adapt to one another: in this way a price of equilibrium is reached that is able to satisfy the purchase and sale needs of the good expressed by families, companies, the State and buyers. ".

Encyclopedia Treccani

ROUND TABLE AT FANUC

FANUC

PROGRAM

ROUND TABLE DAY AND VISIT TO THE SHOW ROOM

09:00 - 10:00	Round Table Day and visit to the Show Room
10:00 - 12:30	Registration of participants and welcome coffee
	INDUSTRY 4.0: The main steps towards change and profitability
	Round table moderated by Enrico Pagliarini, Radio 24
	Welcome greetings
	Marco Ghirardello, FANUC ITALIA
	Industry 4.0: state of the art, opportunities and perspectives.
	Paolo Guazzotti, ASSOLOMBARDA
	Over 4.0: from Smart Factory to Smart Evolution.
	Gabriele Grassi, ELETTRIC80
	Energy efficiency: concrete benefits that generate profit.
	Maurizio Porta, PORTA SOLUTIONS
	FANUC Factory in Japan: total process integration
	Marco Ghirardello, FANUC ITALIA
	Questions and Answers session

Enrico Pagliarini
Radio 24

Maurizio Porta of Porta Solutions then underlined the importance of two aspects directly related to technological innovation: predictive maintenance and energy saving. The Department of Energy of the United States of America has quantified, through an in-depth analysis, the value of predictive maintenance: its execution involves a minimum savings of 30% in costs of reactive maintenance and 45% in downtime. Of course, not all companies have the means to invest in technologically advanced machine tools.

"One of the goals of Porta Solutions for 2020-2025 is to convert part of the business model from the sale of machine tools to the provision of the sales service of production hours, so that everyone can have access to the advantages of Industry 4.0. The rental of production hours will allow customers to take advantage of the most advanced technology without having to necessarily purchase the asset, a pay-per-use applied to machine tools. With a return also for loans granted by banks to companies: thanks to the analysis of the data collected by the machines on the network, credit institutions will be able to verify the effective productivity and therefore reliability of those who request a loan".

Testimony of a client who applied the method Flexible Production

KÜHR GmbH

KÜHR

HERE WHAT THE MULTICENTER SOLVED!

Below are the three questions that I asked one of my customers who uses the MULTICENTER.

Incidentally, let's give real names and surnames, because there are too many endorsements that praise certain products that are entirely made up. The funny thing is that it is never possible to verify them, and this aspect, which is the result of science-fiction marketing, upsets me a great deal!

Why? Well... Because there is no signature at the bottom of these endorsements; no one knows who this super satisfied customer is and, because of privacy laws, you are not allowed to know... This is a typical gimmick!

SO, WHAT DID I DO?

I simply asked my 3 questions and then asked for permission to publish the answers as an endorsement (in compliance with privacy laws) with all the necessary references so that anyone, even you, can contact the person/company in question and verify the truth of what is being reported!

Here are my three questions and the respective answers, verbatim:

1. What kind of problems were you experiencing before buying the multicenter?

Our company is specialized in outsourced jobs, and our expertise can be summed up as being efficient in the production of small and medium lots of high-precision components made of Aluminum, Copper, Brass and Titanium. Prior to the MULTICENTER, we had high processing costs and long delivery times.

2. How did you solve this problem thanks to the multicenter?

Ever since we installed the MULTICENTER, we have cut down on scrap, we are able to deliver much faster and we have reduced our production costs thanks to the quick re-tooling.

3. What positive results have you achieved by using the multicenter?

With the MULTICENTER, we have achieved positive results, improving the quality of our finished pieces and increasing productivity. Now, we can offer our customers faster deliveries at a more competitive price!

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