



It's all about Making the Right Choice

Today, Indian machine shops can no longer compete with the machine shop next door; the competition is with the best in class. If the competition is not already here, it will be here soon and will leave no room for underperformance. It is time for Indian machine shops to be well prepared to not only defend their home turf but also enter the global playing field. Although some prominent Indian machine shops have done it right and are already challenging the best global players, most have not and the time is running out.

Where To Start

The first step is to define the business requirement of today and the strategy for the future. Some questions that you can ask include: What is the cost per part and is it being used optimally? What are the current components and what will be machined in the future?

Based on the type of parts produced and the amount of capital invested or planned, the challenges may be different and sometimes, unique. In effect, there will be a combination of challenges and expectations for the manufacturing system. In most cases, one will find the following levers that can majorly impact the cost per part:

- Type and capacity of the machine
- Type of tooling
- Workholding solutions

Here, we will focus on workholding solutions:

Selecting The Right Workholding Solution

- **Get the experts involved:** It is important that the workholding solution is selected based on expert opinion. Companies like Airtech and Chuckmatic have teams of experts with extensive experience of helping various companies in selecting or designing the optimal

As the Indian component manufacturing industry opens up to the global market, it is highly essential for this industry to become globally competitive in terms of cost and quality to succeed in the new and evolving market dynamics. The key contributors to a machine shop's cost and quality efficiency are machines, tooling and workholding. Industry experts closely analyse the workholding scenario and suggest how to lock on the right workholding option.

workholding solution.

- **Ensure objective communication:** The objectives should be clearly shared with the experts, for example, your existing process & cost and the best way to utilise it. It is also essential to share your unique challenges and know-how of existing manufacturing systems. This is regardless of whether you wish to improve single component efficiency or want a range to be accommodated in a single machine.
- **Evaluate:** When working with experts to evaluate and document the existing process and challenges, get the right team (the users) to interact with the experts. It is also a good idea to translate the objectives into workholding requirements such as component reference points, accuracy requirements, set-up time requirements, changeover requirements, etc.
- **Work along:** While the experts work out the solution, it is essential to stay engaged through the process and go through the solution process iterations. Today, the iterations

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do not call for extensive travel to workholding manufacturers' works or vice versa; this can easily be done using remote collaboration tools over the Internet in a secure way. Companies like Airtech and Chuckmatic extensively use such remote collaboration tools to help control the project costs and keep the end-user team engaged through the process.

- **Ensure expert manufacturing:** Not anyone can manufacture a workholding solution; it calls for intricate dimension controls, heat treatment, balancing and control of each part at various stages. Thus, it is best to let experts manufacture the solution.
- **Prove out:** A thorough testing is a must; do not waste energy on unnecessary details. It is optimal to stay focused on the elements that contribute to the results and measure the performance against the earlier documented requirements.
- **Follow a timeline:** A strict discipline of project management should be employed or else, factors such as cost-effectiveness and benefit will not be achieved.

Some Examples

A truck manufacturing company was facing the problem of low production of brake drums due to a higher rate of rejection. Despite many efforts by the machine supplier and the tooling team, the results were not coming through in that when the accuracy went up, the cycle time also increased. Finally, the workholding company identified the problem—the component was deforming at the time of declamping. The solution that the experts came up with was to use a special dual pressure chuck with floating jaws instead of a standard power chuck. In a dual pressure chuck, the clamping forces can be adjusted in the running condition without stopping the spindle. The pressure at the time of rough cut can be higher and can be automatically

reduced at the time of finish cut. The end result was that the production throughput increased by more than 30% with the same machine and the same tools.

Here is an example from the valve industry. The component was a valve seat and the manufacturing process involved first machining the component and then using hydraulic press to remove the ovality, which was introduced during the machining process as the wall thickness was less. Here is how sometimes knowledge moves between industries; the new works manager, who had previously worked in the automobile sector with extensive experience of working with workholding specialists, called in experts with a clear requirement to remove the hydraulic press process. This was easily achieved by employing a compensating type self-centering 2+2+2 chuck.

Another example is of an Indian company that had to start a new mass-produced component at a highly optimal cost to overcome the global competition. The new works manager knew that he needed an optimal manufacturing system to get the results. He got three experts—the machine builder, the tooling supplier and the workholding expert—to work together and build the most effective solution. The result surpassed all expectations and today, the company enjoys a major share in the supply of components globally.

Not always is the solution complex; here is an example where a small change in the workholding solution helped the customer immensely. A machine shop, which was a mass manufacturer of very short cycle time components, worked with the workholding solution that came in as standard equipment with the machine. The works manager, as a casual remark, advised the workholding expert to change the chuck every three months as the chuck wears out very soon due to frequent clamp/declamp cycles. The workholding expert studied the system for a few hours and advised



■ Special dual pressure chuck with floating jaws

the manager to replace the existing cylinder with a lower actuating force cylinder. This resulted in the life of the chuck increasing by more than 50%.

Key Takeaways

- Give importance to the workholding solution. It can greatly reduce the cost per part
- Engage an expert workholding company
- Follow project management discipline

Finally, workholding may look like a small element in the entire manufacturing system; however, it can make a big difference to the effectiveness and efficiency of the system. Global competition is increasing by the day. It is time to change your outlook towards workholding. ◀



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