

Innovate

How to Deliver Manufacturing Productivity Through New Equipment and Technology

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There is a flood of new products, software, and sensor-equipped tools on the market and a wave of promises from suppliers about “Industry 4.0” solutions. It sounds like a perfect storm of productivity increases and cost reductions, right?

The reality is far from a tsunami of success. Today, many workshops are adopting new business models with a higher mix of workpieces and lower volumes of batches (HMLV). This creates new challenges. The overall equipment efficiency (OEE) in machining HMLV operations is commonly below 50%, even in workshops running on full capacity.

What leads to manufacturing inefficiency?

In HMLV operations, it's a constant balancing act between machines, equipment and team skills. Each area must be prepared to act fast on incoming orders, without the predictability of knowing what arrives when. But short reaction times between batches and the inability to test and discover better machining leaves businesses without the insight needed to improve utilization.

This leads to issues like machine downtime, rejected workpieces, high consumption of tools despite high inventory, broken delivery promises or ultimately negative profit margins.

Predicting and preparing for HMLV is difficult, and it's easy to underestimate the efforts and experience required. But, if you start by identifying the reason and the financial impact of a problem, you are better equipped to evaluate the investment needed to solve the problem.

Seco Consultancy's evaluation method

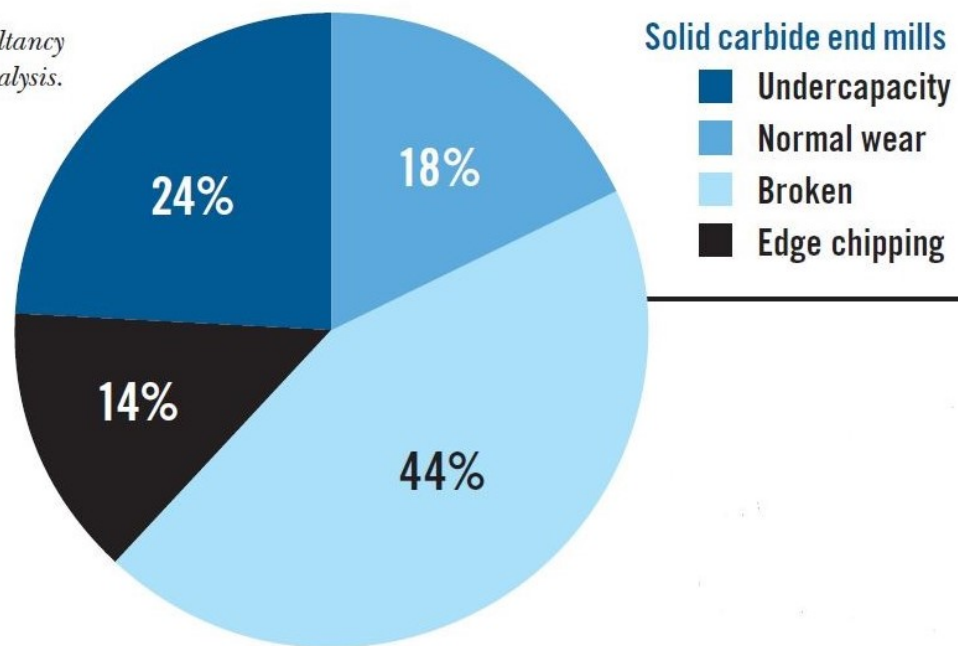
Seco Consultancy approaches manufacturing efficiency and improvement programs through three specific lenses — machining processes, manufacturing systems, and people. Each lens has several unique applications that, when combined, create a completely new picture of manufacturing efficiency.

Tool wear analysis - A microscopic view of tools

Tool wear analysis is a great way to start investigating workshops. By analyzing used cutting edges, the consultant can help identify how good the machining process is. The illustration below shows the results from a Seco Consultancy Tool Wear Analysis. It indicates bad process control, which is a waste of tools and time, and can result in bad quality of the workpiece. Changing a broken tool, which includes correctly identifying the tool, finding a replacement, unclamping and re-clamping, takes at least 30 minutes. Sometimes it's even necessary to measure and put new presetting values into the machines. A workshop consuming 10,000 edges per year with 40% breakages spends at least 2,000 hours per year doing this, which equals one full-time job, during which time the machines are just standing still. The reasons behind this inefficiency are not always easy to find and are usually not

caused by bad tools. This is why it is necessary to continue to map the complete workshop to find out the root causes.

*Results from a Seco Consultancy
Tool Wear Analysis.*



Mapping efficiency before investing in improvements

To identify the complete improvement potential of a workshop, Seco Consultancy must also look at the tools in context of other measurements like quality inspection, SMED-analysis for workpiece change and key people interacting in the manufacturing system, which include subcontractor coordination and claims handling.

The final analysis links all the findings in one report, which includes:

- Machining to delivery performance
- Work in progress and lead time
- Planning and rescheduling
- Overall efficiency

Once the inefficiency map is visualized and accepted, it is possible to target and prioritize improvement projects. Awareness and visualization are the most important drivers for commitment to sustainable improvement. The Seco Consultancy evaluation, combined with monitoring solutions, training and education, is the foundation of a successful improvement program.

The workshop process model

It's important to consider the entire flow of working processes that makes delivery of parts possible. Seco Consultancy divides it into four principal functions following the flow of an order from quotation to delivery: capability promising, engineering, preparing and machining.

Normally, the bottleneck function or process is easy to identify, but the problem behind the bottleneck needs the methods described above. Since each function has a "handover," inefficiencies travel across all functions. The problem gets worse with each step and finally accumulates in the machining function where tools are breaking, and machines stand still.

Once the bottlenecks and inefficiencies are removed, increased overall equipment efficiency can follow.

The global illusion of average

Every workshop is different, especially when it comes to culture and craft. Each organization involves a unique mix of assets, skills, workpieces, management styles and customer demands.

Expensive countries can therefore produce parts faster and cheaper than lower cost countries. It is good engineering, preparation and cooperation in the workshop that makes a real difference in machining. Seco Consultancy can offer both evaluation methods and different “connected” consultancy solutions that support improvement of the efficiency in the entire workshop. Examples are Programming Support, Inventory Management Systems (Secopoint and Smart Supply technology), Real Time Machine Monitoring Systems (Machine Metrics Technology) and Tool Monitoring with the Red Dot award-winning Idem technology, developed by Seco.

With the new Consultancy Solutions added to the high-end cutting tool range, Seco can better fulfill its explanation of why they are here: “We offer machine shops the next level of productivity and reduced waste of resources by delivering solutions based on innovative, high-performance products and supporting services.”