

Performance not price

Earlier this year at the German METAV exhibition, LMT presented a new model for comparing tool performance. Andrew Allcock explains

Cutting tool selection should follow performance rather than price, says LMT, and explains why.

In recent years, efficient tool deployment has been influenced by Total Cost of Ownership (TCO). Although the TCO approach continues to be meaningful and useful as the basis for calculating the viability of capital investments, it does not go far enough when tools are involved, suggests the tooling group.

In simple terms, if the price of a specific tool is significantly reduced – a positive development from the TCO point of view – it can still cost users more than a tool offering higher performance. That becomes obvious when you consider not only the cost, but also the value of a tool to the overall production process – the Total Benefit of Ownership (TBO). After all, a tool's value does not only depend on its price or service life, but also on a number of technical and operational aspects. And that's why LMT has developed a new approach – in the shape of the Tool Performance Indicator (TPI) – for determining a tool's overall value. TPI is an index that clearly shows whether a new tool is better or worse than the previous one.

$TPI = TBO (\text{new/previous})/TCO$

Comparison of solid carbide cutter and HSS tools

	HSS	Carbide	Ratio
Lifetime costs	€98	€238	1:2.43
Lifetime benefit	10,260 cm ³	103,050 cm ³	1:10
Lifetime – standing time x material removal rate			
Carbide cutter TPI	10/2.43 =	4.1	

(new/previous), and if TPI is >1, then the new tool is better, if the TPI is <1, then the new tool is worse than the previous tool.

What is special is the fact that the TPI is not only arrived at on the basis of cost criteria, but also takes into account factors such as technical and operational benefit, market changes, the complexity of the application and the tool's life cycle.

An example given is for a comparison of solid carbide versus a high speed steel cutter.

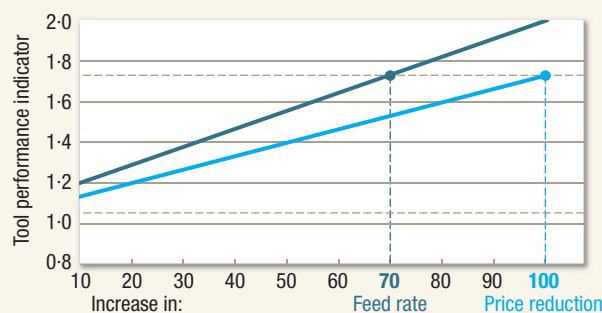
The solid carbide tool has a price tag two-and-a-half times higher than a high speed steel alternative. In terms of cost, the HSS tool is clearly much more favourably priced. However, when you take into account the performance of the carbide cutter over its entire service life, it beats the HSS cutter hands down with a TPI of 4.1 (see table below) – and this does not even allow for the other benefits accruing from shorter set-up and auxiliary process times. Nevertheless, these could also easily be taken into account using the TPI.

In the example, however, a simple calculation provides a clear answer to the decision at hand. Because the break-even point is already reached at a cutting performance of

13,700 cm³, the HSS cutter would only be more economic for users with lower cutting requirements.

TPI also provides the answer to the question: "How much more can be

The TPI shows that tool performance is more important than price



justifiably paid for higher value tools?"

In a comparison of two otherwise identical tools, the technologically enhanced tool offering a 70 per cent higher feedrate has the same TPI as a significantly cheaper tool (above).

Large performance increases of this kind are far from theoretical in view of the possibilities offered by modern high performance cutting. On the contrary, says LMT, state-of-the-art production systems involving integrated networks of numerous partial processes make indicators like the TPI an essential instrument for planning and calculating investment costs with a high degree of practical relevance.

LMT says it intends to use TPI in future – whenever it is meaningful and possible – because it offers clear evaluation of a tool's value for the entire production process. □