TIP TALK

Delivering Profitability

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Could you be in the 100?

Top scientist Sir Paul Callaghan says New Zealand is a poor nation because we work at low-wage activities. "We have the capacity to be prosperous, but we choose not to be," the New Zealander of the Year said in a speech to the Labour Party congress.

The last budget has been criticised for its lack of a coherent plan for economic growth, when Callaghan said New Zealanders were looking for a vision "about where we can go as a country".

There was a disparity between rich and poor compared with other developed countries, productivity was near the bottom of the OECD despite Kiwis working longer than those in other developed countries, and we were failing to capitalise on a school system that performed highly in international comparisons.

Callaghan challenged Prime Minister John Key's emphasis on tourism as a means of boosting wealth, saying to meet National's goal of catching Australia, businesses would have to produce an extra $40 billion in exports. "Instead of 1000 people visiting Milford Sound every week, we'd need 60,000," he said, "and even then New Zealand would remain behind because tourism created only $80,000 in revenue per job annually."

He compared that with Fonterra, which created $350,000 per job annually, or US-based Apple computers, which produced $1m-plus per job.

"The more tourism, the poorer we get. Tourism is a great industry, but it cannot be a route to prosperity." There were innovative companies that collectively earned New Zealand around $4 billion a year in exports.

To create an extra $40b in revenue, New Zealand only needed to foster another 100 of those.

That requires entrepreneurial genius.

But the most important thing was creating an environment they wanted to live in, because creative genius was mobile. "Creative people don't want to live in gated communities with poverty on their doorstep."

View full article at stuff.co.nz

ITA Member IMC Group

Turn your operators into programmers

We constantly hear how difficult it is to find skilled operators in New Zealand and the resources for training new machine operators are limited.

Now you can turn your operators into programmers.

ITA - Iscar Tool Advisor is a computer software that take all the pain out of deciding what tool to use, how to use it and what cutting speeds.

The software is constructed to provide an effective process of narrowing down all possible alternatives. Consequently, the result is the end-user is guided towards specific recommendations indicating the most suitable cutting tools, cutting conditions and machining strategies.

It also takes into consideration restrictions like clamping stability, long overhang, type of cut, machine power limitation, and all settings that could influence cutting data.

The output data provided by the software comprises inserts and tool designations, carbide grades, recommended machining conditions, required machine power, net operation time and material removal rate. This information can be sorted according to user preference.

The user ability to define preferences is one of the features that the ITA software provides. Details such as tool diameter, solid carbide vs. indexable tooling, product family, grade and tool designations, can be defined. Since release in early 2010, tens of thousands of mechanical engineers, technologists and foremen are using this software on a daily basis in more than 100 countries around the globe.

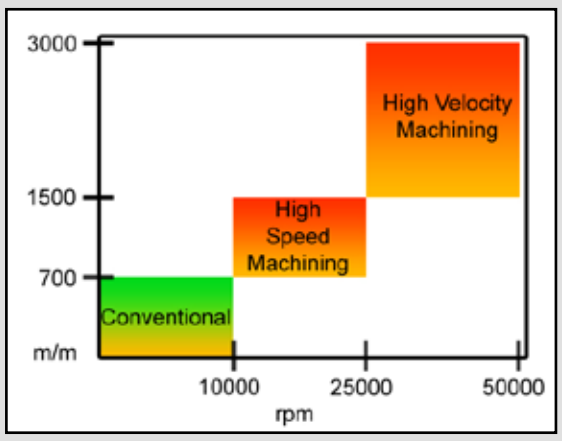
Available free of charge 24/7.

As an added bonus, it improves the efficiency of your skilled staff as they no longer need to look up the cutting parameters in catalogues; it's all on line and speeds their programming abilities.

Go to **http://www.iscar.com/ita/ or search youtube ITA Iscar Tool Advisor.**

What is High Speed Machining? (HSM)

A better way to define high speed machining is to say that it covers a number of metal removal processes. In the Mould and Die world, high speed machining allows the trade-off between time on the machine and time on the polishing bench to shift dramatically - a little more time on the machine means a whole lot less time on the bench. The point where this shift begins to occur marks one of the boundaries of high speed machining. (This shift often yields a double bonus - high speed machining often reduces total machining time as well as reduces or eliminates bench time.)

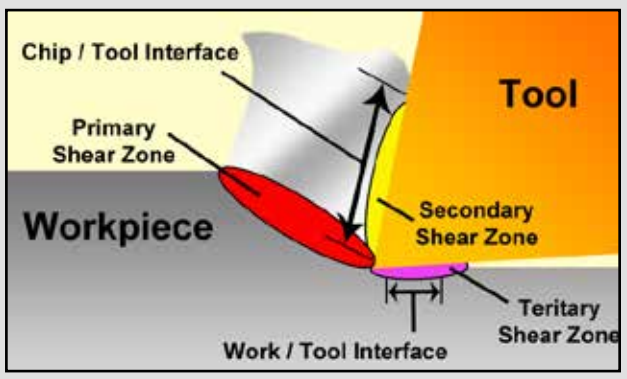


Why does high speed machining work?

The fundamentals of what happens when a cutter meets metal, at conventional speeds and feeds, has been understood for many years. Chips are formed by deformation of the parent material. As a cutting edge moves into steel, cast iron, aluminium, or other materials, it generates high temperatures and stress in the material at the point of intersection and slightly ahead of the cutting tool edge.

These stresses and temperatures are sufficient that plastic deformation of the work piece material takes place. The metal deforms easily within an area called the primary shear zone. As the material reaches its yield point, a chip breaks away from the parent material and slides along the primary shear plane, pushing material ahead of the cutting tool.

A secondary shear zone occurs along the face of the cutting tool. As the chip slides up the face of the cutter, friction raises temperatures in this zone. Studies reveal that the secondary zone temperature is as high as 1200 degrees Celsius when machining tool steel. As the cutting edge moves through the material, deforming the material to shear a chip, a third shear zone occurs under and behind the leading edge. This zone is a result of material spring back.



This illustration shows the action that occurs in the cutting zone. Plastic deformation allows the chip to shear from the parent material in the primary zone.

But what happens at High Speed?

Much of the chip formation mechanics at high speed involve heat. At high speed, which is relative to the material being cut, higher heat is generated. More energy is going into the work piece and that energy becomes heat.

Higher temperature at the primary shear zone helps speed up the plastic deformation process that results in a chip being formed. Because of the increased rate of plastic flow, high speed cutting experiences a decrease in the cutting force needed to remove a chip.

Researchers estimate the heat-input distribution this way:

About 80 % of heat is generated by the mechanical deformation that creates the chip,
18 % is created at the chip/tool interface or secondary shear zone, and
2 % is created on the tool tip.

What goes in must come out. In the case of high speed machining, **heat generated in the cut is dissipated three ways:**

About 75 % is taken by the chip,
5 % by the work piece, and
20 %percent is conducted through the tool.

At conventional machining speeds, there is time for heat to move from chip to uncut metal and create a work-hardening condition. This increases the force needed to create a chip, which creates more heat, and on it goes. Coolant mitigates the cycle by reducing the temperature in the cut zone and flushing away the chips. But at very high rpm, the tool rotation throws coolant away from the cut zone so without very high pressure or through-the-tool coolant, it never reaches the cutting zone.

A big advantage of high speed machining is that at elevated rates of speed and feed, the chip is cut and evacuated so fast it tends to transfer little or no heat to the green work piece.

Send your "last photo" or "man with a lot of money" to admin@iscar.co.nz Every photo published wins a prize!

New JET HP LINE High Pressure Coolant Tooling from ISCAR *now fully Standard.*

ISCAR introduces a complete family of totally standard tooling to cover virtually the entire range of turning, grooving and parting. Under the family name JHP (for Jet High Pressure), the new tools handle like standard tools during setup, edge change and insert replacement. The new ISCAR JHP tools go hand in hand with standard high pressure plumbing options that have been available on most popular CNC turning machines for years. You can quickly move up to faster, more secure processing of problematic long-chipping metals -- even have unattended operation.

What does HPC turning provide that conventional flood-coolant turning does not?

Delivering a "hydraulic wedge" of coolant with enough accuracy, force and cooling effect to reach the cutting zone as a liquid, not a vapor. In the liquid phase, it not only lubricates the cutting process and flushes the chips away, it also quenches, which causes the chip to become brittle, so it spontaneously shatters into smaller, more manageable pieces. All the coolant goes directly to the secondary shear zone.

Due to the coolant's internal flow path, HPC systems provide another benefit. They keep the entire spindle, tool, insert and work-piece cooler, leading to much longer tool and equipment life. In a sense, it works like the cooling system in an automobile engine.

Proven Benefits

Typical results have been 20-50% shorter cycle time, with reduced work hardening and built-up edge, superior chip control and longer tool life. In stainless steel, the technique also eliminates the all-too-familiar built-up edge and resultant overheating, tool failures, and poor surface quality on the work-piece.