

CANADIAN MACHINERY AND

# metal WORKING

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Teknion's engineering  
manager Albert Li.

## Bent on design

Furniture maker's business booms  
thanks to well-designed solutions

## CNC CENSUS REPORT

How many CNC machine tools were installed last year?  
The answer might surprise you.

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# Virtual reality comes to grinding

Thun, Switzerland is a small village and home to a software behemoth that can simulate the most complicated manufacturing processes and make them look real. A local universal grinder manufacturer, in this suburb of Bern, recently hosted an eye-opening grinding conference. They premiered Virtual Grinding (VG); software that simulated the grinding process so closely that abrasive testing might not be necessary in the near future.

Historically the sourcing, implementation, training and optimization of grinders had been a tedious process. With VG, all of these stages are reduced to simulation.

## SOURCING

While evaluating one grinder versus another, even specific models or features, extensive travel is required. Today, VG can fully simulate a machine, including adding and stripping off any options that a particular application may require. In production grinding, the wheelhead, dressing, gauging and infeed sensing systems often interfere with one another spatially; VG eliminates this concern by allowing the simulator to import both work pieces and work holding systems. Potential collisions are avoided by altering the location of these items or the overall machine work envelope.

## IMPLEMENTATION

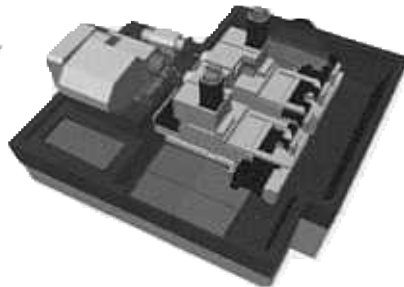
Frequently, the fine points of grinding, such as arbor deflection in production ID grinding, are only reviewed once the machine is delivered to site. The challenge that the supervising engineer faces is lead-time to order the correct production tooling. With VG, even finer points like arbor deflection can be calculated and accounted for in the model.

## TRAINING

Unfortunately, the end user often sacrifices training in order to meet their customer's untimely runoffs. With VG this will no longer be an issue as the primary training can be simulated offline. The axes actually simulate any chosen program with full motion in



Machine exterior



Machine interior and wheelhead slide


3-D models. It was quite scary to see how close to reality this was with full shadowing of moving components. It was much like watching *Toy Story* the first time. Handwheels, positioned forward or backward, see corresponding movements generated by

the simulation. Even opening or closing of the main door, electrical cabinets or service doors is easily simulated. During the conference, they took us right down to the individual hydraulic lines in full 3-D view for service discussions. Operators will no longer need to travel for training. At the conference conclusion, one maintenance manager asked if this data would be available online. The answer? Absolutely. This data will form the basis of the online database, including explosion drawings, usable for service and electronic parts ordering.

## OPTIMIZATION

As the simulation system develops, the goal is to have customers develop technology databases of materials with their associated speeds and feeds, allowing companies to optimize their production. Taken a step further, users will offer fully virtual cost estimating, rather than costly machine trials.

Drawing a parallel to milling, virtual grinding, integrated both in house and on the web, will revolutionize grinding like CAD/CAM did chip making. Is your grinding department doing business as usual or going virtual?

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