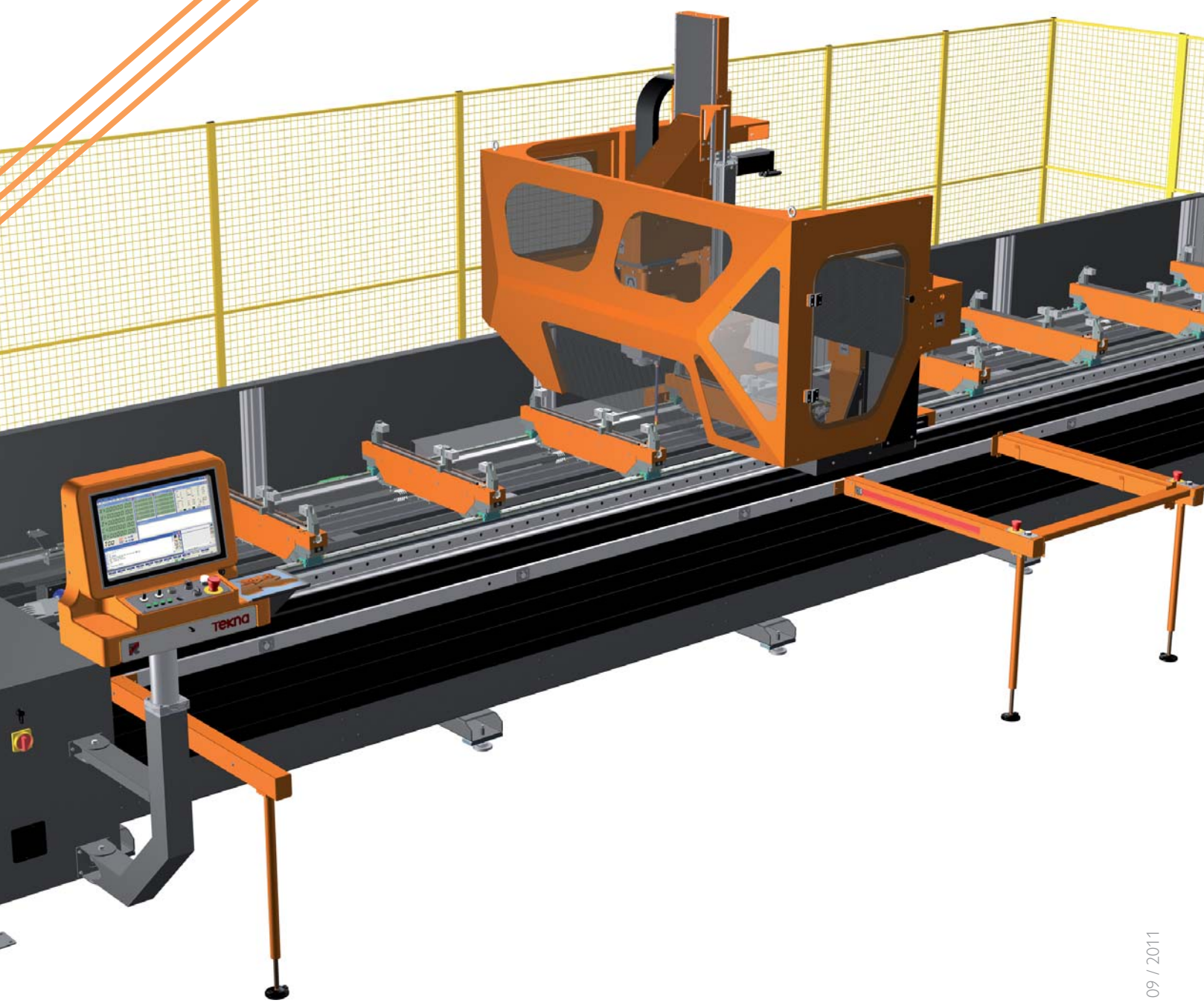
TK 442/3

5 Axis machining centres

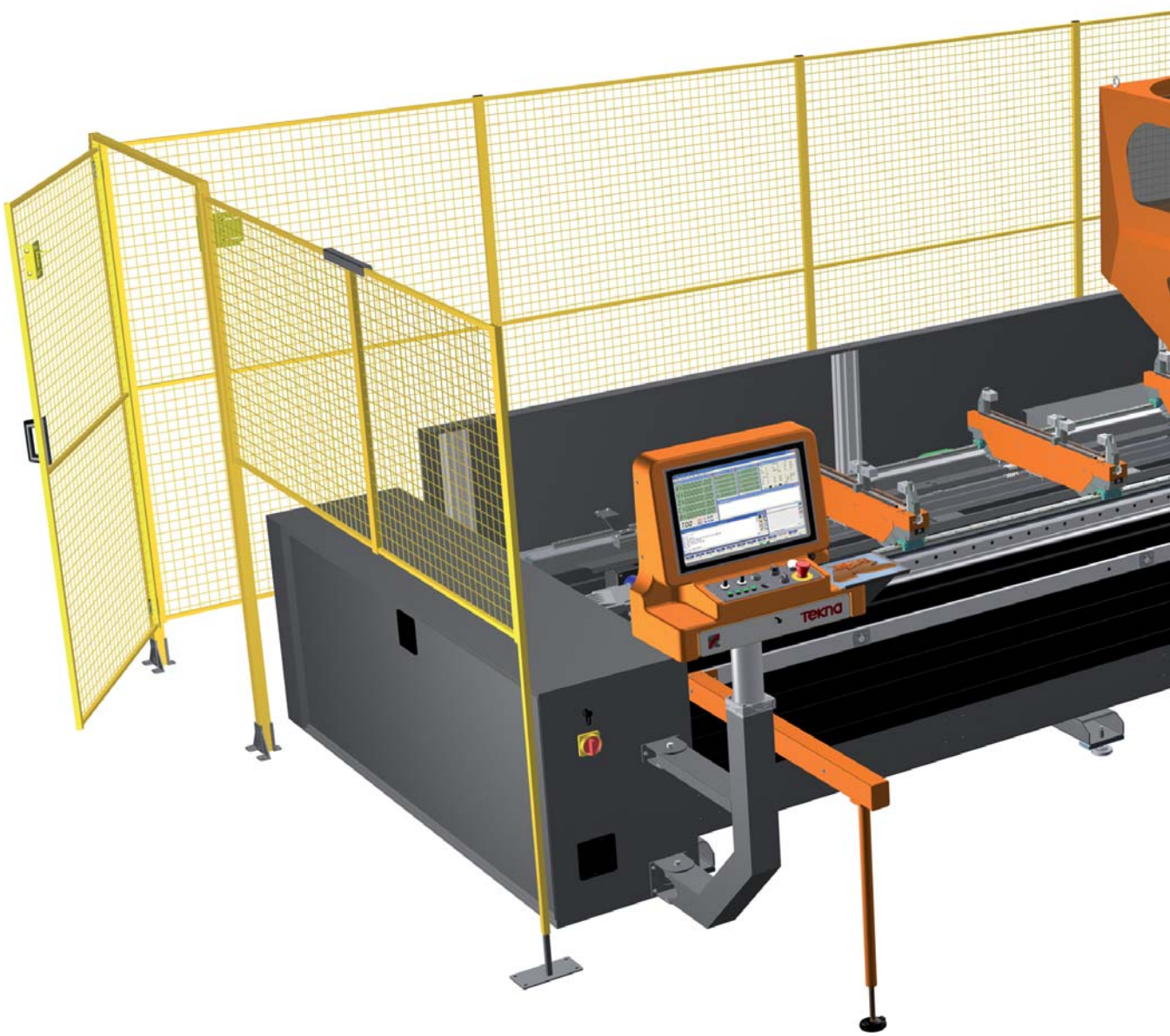


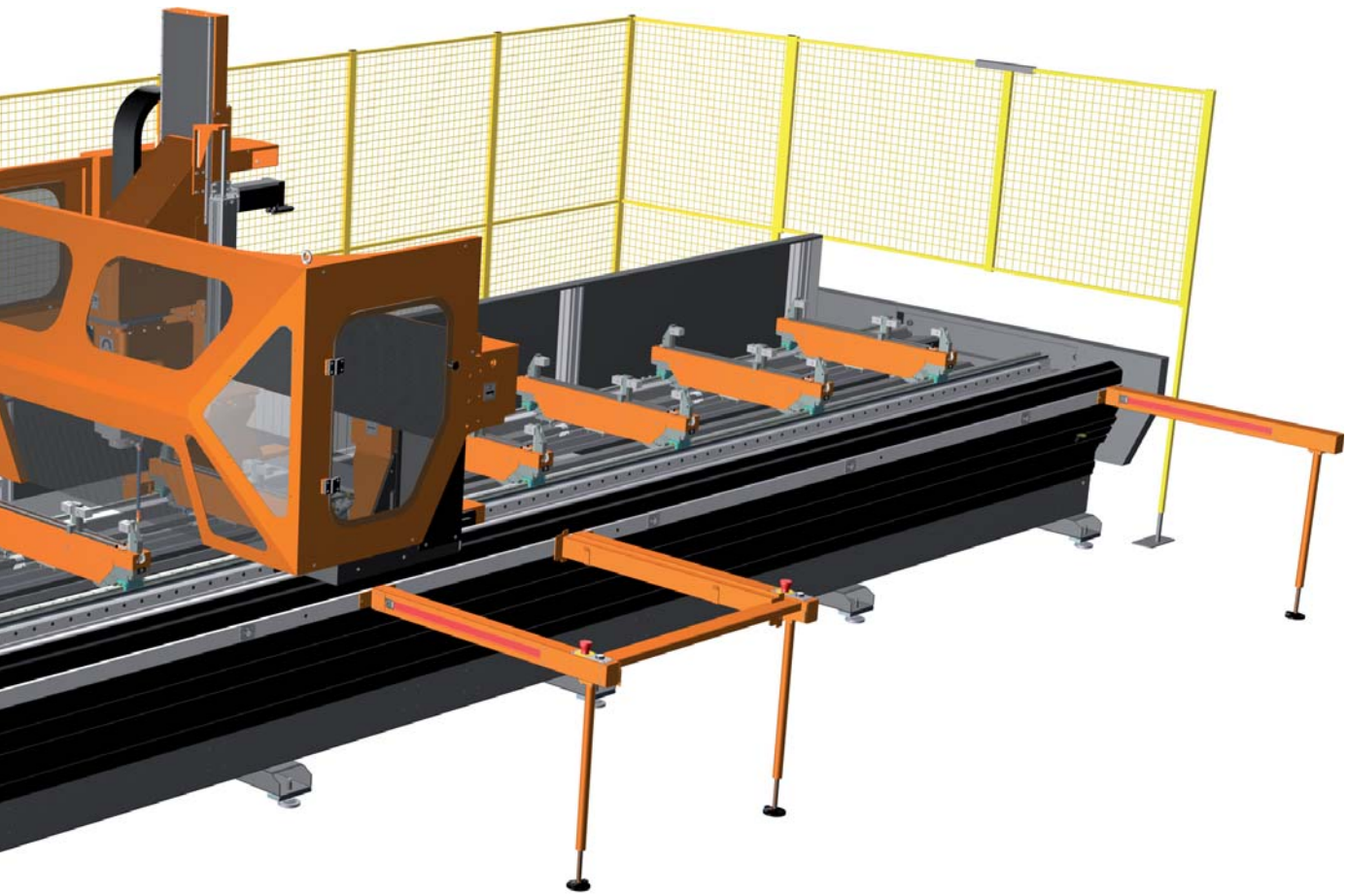
Tekna

English | 09 / 2011

TK 442/3

5-axis CNC vertical machining center equipped with an electric spindle that can rotate around the B and C axis, this allows for machining on five sides of the profiles with just one clamping operation and with no aggregate heads.
This machining center is designed for drilling and conventional milling processes and also for copy-milling operations on aluminum extruded profiles and other materials, including steel profiles up to 5 mm thick, steel reinforced PVC, composite materials and various other plastics or wood. When the machine is provided with a special circular blade it is also possible to perform butting, trimming and composite cutting operation.
The TK 442/3 model can be implemented in every industry and its flexibility and robustness allow to efficiently machine components that require high performances, such as aluminum profiles produced by the largest extrusion press all over the world.
Standard versions are available in 3 machining lengths: 3500, 6600 and 8200 mm. Upon request the machining center can be manufactured in different lengths in order to meet the special needs of each customer.





Features

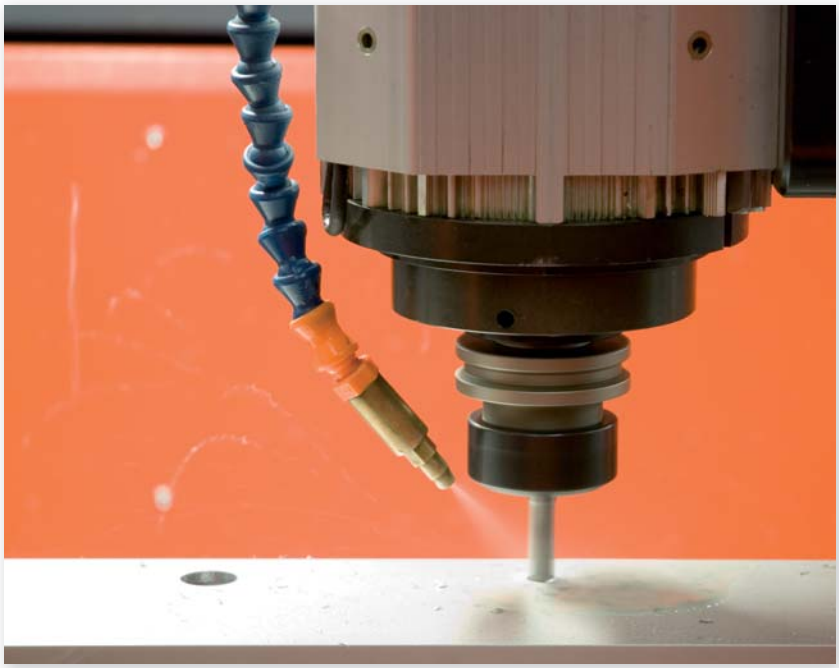
- Electrically welded steel bed frame with linear recirculating ball slideways and precision racks for X axis.
- Overhead crane in aluminum casting that is composed of two lateral supporting elements and a top crosspiece. On this crosspiece linear slideways with recirculating balls are mounted as well as precision racks for Y and Z axis.
- Machines 6600 or 8200 mm long are devided into two work areas. While the unit is machining on one side, the operator can safely load/unload the second work area.
- System which allows for the automatic positioning of each clamp according to the profile length and the machining process to be performed. The positioning is performed using the carriage and it is driven by the CNC control system.
- Electric-spindle with automatic tool change and liquid cooling system.

■ **Linear slideways with recirculating balls**

Thanks to these slide-ways, machine's components can smoothly slide along the machining axis. The ability to withstand mechanical stress while simultaneously maintaining a low coefficient of friction and a high sliding capacity enables these linear slide-ways to improve the performance of the machining center.

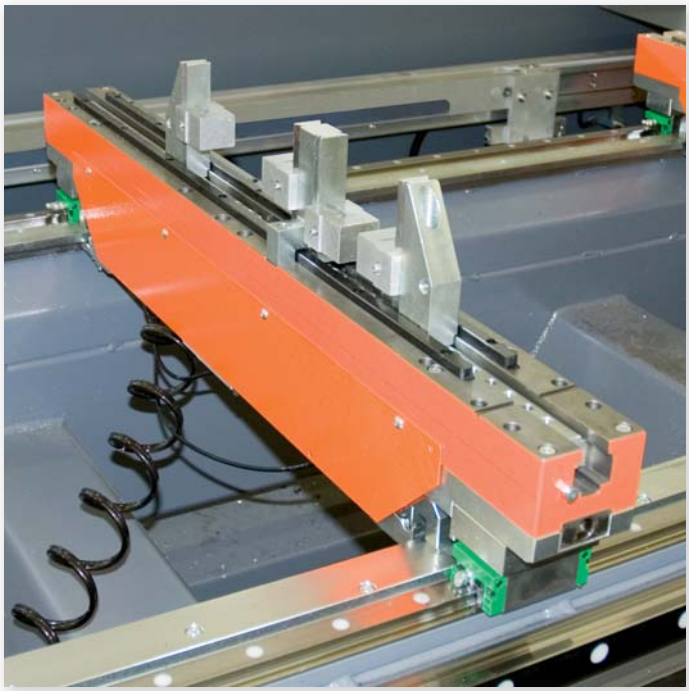
■ Tilting electric-spindle

The rotation is powered by a brushless engine. The precision reducer that is provided allows both for a rotation from 0° to 360° along the vertical axis, with increments of 0.01°, and for angle adjustments between +90° and -90° along an axis on the horizontal plane.



■ **Micro dropped minimal lubrication**

It optimizes the cooling liquid consumption during the machining; this system allows to minimize the quantity of the used product and meanwhile it guarantees a suitable cooling of the tool.



■ Pneumatic one/two-way clamps

They are mounted on linear slide-ways and the milling head automatically positions them on the machining table; the clamp arrangement is controlled by the CNC system.
Using the two-way system you can simultaneously machine 2 profiles with different dimensions and machining processes.

■ Motor-driven tool magazine

It is installed in the central area of the machine and it electrically moves on both sides of the TWIN area, reducing the tool change interval.
A removable enclosure protects tools from chips and dusts produced during the machining process.

Optional

- Full automatic protection.
- Circular blade.
- Translator carriage for the clamping system.
- Motor-driven conveyor belt.
- Auxiliary container for cooling liquid (30 liter).
- Laser detection kit.
- 3D Probe.
- Barcode reader.
- Remote controlled electronic wheel.
- Uninterruptible power supply (UPS).

Full automatic protection

Complete machine enclosure made up of sound-absorbing panels mounted on the back, lateral and top sides and of a shield with an automatic lowering function in the front side. In the TWIN mode, it is possible to independently open and close each half of the front enclosure, by controlling them from the CNC system.

■ Circular blade

Carbide tipped circular blade that can be used to precisely perform common cutting processes in the 5-axis machining center.

Technical features

Machinability	
Axis X	3500 mm 6600 mm (Twin 2400 ÷ 2900 mm) 8200 mm (Twin 3200 ÷ 3700 mm)
Axis Y	725 mm
Axis Z	300 mm
On three faces	300 mm x 700 mm
Max displacement speed	
Axis X	80 m/1'
Axis Y	55 m/1'
Axis Z	30 m/1'
Axis B	5000 deg/1'
Axis C	5000 deg/1'
Movements of the electric spindle axes	
Asse B	360 deg in 0,01 deg increments
Axis C	+90 deg to -90 deg in 0,01 deg increments
Electric-spindle	
Cone attachment	HSK F63
Max power (S1 service)	10 kW
Max torque (S1 service)	12,7 Nm
Max rotation speed	22.000 rpm
Cooling system	Liquid
Tool magazine	
Fixed	1 x 14 tools (L=3500 mm) 2 x 14 tools (L=6600 - L=8200 mm)
Motor-driven	1 x 14 tools (L=6600 - L=8200 mm)
Accuracy	
Repetition on linear positioning	+/- 0,1 mm

Software

Over the years Tekna has specialized in developing software solutions and now offers a broad range of products.
To create programs that control the machines, Tekna provides user-friendly software tools that can be used both by professional CNC programmers, who can implement the most complex solutions, and by completely inexperienced users; after a few training hours the customer will be able to operate the machining centre using a graphical programming.
Software solutions offered by Tekna result from an accurate design and from the actual customer needs analysis. The simplicity of usage of these solutions reduces the management time and costs.
All machines come with **antivirus software** preinstalled.

■ CN6 Numerical Control

The Numerical Control basic software controls all functionalities of the machining center through an interface based on windows that includes:

- The user graphic interface (HMI, Human Machine Interface) displays all variables of the centre, both about programming and user configuration.
- Project file: simple, intuitive and extraordinary useful function of CN6 which can be used as interface between any management program/ software and the machine. In a company it ensures a communication (i.e. a unique language) between the management function and the machine operators.
- 3D machining process: it is possible to import directly the .dxf file of the profile to be machined thus displaying a 3D image of the workpiece completed with the configured machining processes.
- Clamp positioning: automatic counting managed directly by the program; it can be run in different ways (static or dynamic) depending on the features of the desired machining cycle.
- The Scheduler function runs in several modes oriented both to a mass production and to a more flexible production in small quantity.
- Integrated **Formulas Software**: you can use it to define formulas based on the default variables (for example, the profile length) and then use them as macro parameters or within the "If" function.

■ ISO language editor

For numeric-control machines the international programming language ISO is used. With this language you can create programs to perform every kind of machining, with linear or interpolated paths, variable speeds, tapping, parameter use etc. and for managing all functionalities of the machining centre.

■ SLW Self-learning

With the Self-Learning SLW software the customer can easily create machining programs, selecting from a graphic menu a default number of functions (macros). The macro library generated by Tekna includes a large number of machining processes and it is possible to develop functions that increasingly simplify the man-machine interaction so that even an inexperienced user can very easily create several machining programs.

■ NC Tool

The NC Tool is a 2D CAD/CAM software tool that, starting from a CAD drawing, allows the operator to create CN6-compatible machining programs in ISO language by inserting information on the desired machining process.
Any changes to geometrical scales and to the dimensions of an existing drawing are automatically converted in a new updated ISO program.
NC Tool can import/export .dxf and .dwg files, moreover it allows text editing and the subsequent generation of ISO codes.

■ TK Cam

Software package that allows the creation of ISO programs using a 3D graphic programming.
With TK Cam it is possible to assign machining operation regardless of machine models and tool series and view a simulation of the running program in a 3D representation. In TK Cam it is possible to optimize tools and clamps, it provides an anti-collision function and the automatic generation of ISO codes for the program. In the TK Cam it is possible to import specific .dxf/.dwg drawings and to assign the corresponding machining operations. In addition allows the interaction with the management programs commonly used in the window and door frame manufacturing industry.

■ TK CadX

TK CadX is a software allowing to import 3D models and to identify the workings that can be carried out by a numeric control machine. By importing files in STEP, TK CadX formats, it independently scans any surface, it analyses them and processes the necessary data for the workings of the pieces; these data are exported in a NCX file (format read by TK Cam) for the automatic generation of ISO working programs of any single machine.

TK 442/3

5 Axis machining centres

Branches

Teknacentro
Tekna Nordest
TK Maquinaria
TK Portuguesa
Tekna Deutschland
Tekna USA
South America
China

Via Monte Bisbino, 56
20021 Baranzate (Milan) • Italy

Tel. +39 02356961
Fax +39 023562293

tekna@tekna.it
www.tekna.it

English | 09 / 2011