

Milling-grinding center combined

VERSA® 645 *linear*

NEW





High-precision milling and coordinate grinding on the same machine

The FEHLMANN VERSA 645 linear boasts solid construction and impressive mechanical accuracy. High temperature stability with extremely low thermal growth is another one of the amazing features of this versatile machining center in portal design – making it the ideal machine to use for coordinate grinding.

Which fine finishing method is the best for our application? Deciding between hard milling and coordinate/contour grinding requires weighing the balance between costs, processing time and precision. FEHLMANN solves this problem with the new VERSA 645 linear with coordinate grinding function. The two methods are combined perfectly into a single machine. You have the flexibility to determine the most economical way to achieve your desired finish on a case-by-case basis.

Advantages of combining hard milling and grinding:

- Versatile and economical – one machine for two processes.
- Save time by only clamping the workpiece once for both milling and grinding. No need to re-clip.
- Shorter cycle times with two processes running on the same machine.
- Multi-use precision: Make one investment in high precision, and gain double the benefits thanks to the combination of milling and grinding
- Increased efficiency due to high process reliability. Parts can be precisely pre-milled before grinding, ensuring a perfectly pre-finished part. Varying offsets caused, for example, by warpage during hardening, are eliminated.
- Consistent excellent surface quality and contour accuracy: due to the choice of most suitable machining strategy and automatic dressing of grinding tool.
- Simple programming: grinding functions such as pendulum stroke and dressing can be easily integrated into the program after milling.



Areas of application

The VERSA 645 linear is the perfect choice for all applications that require high levels of precision and efficiency. The workpiece is pre-milled with a 0.02 mm allowance and then ground to a finish. Minor adjustments and excellent surface qualities are possible during grinding.

Typical applications include bore holes, contours and guides that require the highest degree of precision and the best surface quality. The combination of milling, hard milling and coordinate/contour grinding on the same machine guarantees complete, reliable machining in one clamping. Additional finishing processes, due to materials, can also be performed precisely and economically without having to re-clamp the workpiece. The VERSA 645 linear is able to machine a wide variety of materials such as steel, ceramic and carbide metals. You get the most flexibility in a wide range of applications.



Technical highlights:

- Excellent surface finish due to integration of controlled dressing spindle into the machine.
- Structure-borne sound sensor in the dressing spindle detects contact with the grinding pin for the highest quality during dressing.
- The dressing spindle is integrated into the machine's cooling circuit.
- Best access to the workpiece, even with 5-axis milling — made possible by the symmetrical swiveling range. The dressing spindle moves underneath the swiveling bridge during swiveling.
- Pendulum stroke and automatic dressing operations can be started quickly and easily using cycles with pre-configured parameters.

Automatic dressing:

To achieve the highest degree of precision and the finest surface quality, grinding tools are dressed before the workpiece is machined. The VERSA 645 linear uses a sophisticated method with a dressing spindle integrated into the machine to do this. Grinding pins that have been newly loaded are first measured with the laser and then brought to a defined diameter with the rotating dressing wheel at a speed of 3000-20000 rpm. The structure-borne sound sensor in the dressing spindle detects contact with the grinding pin, guaranteeing uniform and consistent dressing. Once the cutting parameters and corrections have been set by the operator, further dressing will be done automatically between machinings, using a cycle. The appropriate radius corrections are automatically adjusted after each dressing. This method of dressing guarantees consistent cutting conditions and, thus, maximum dimensional accuracy, best surface finish and excellent process reliability.



Visualisation of dressing process with evaluation electronics



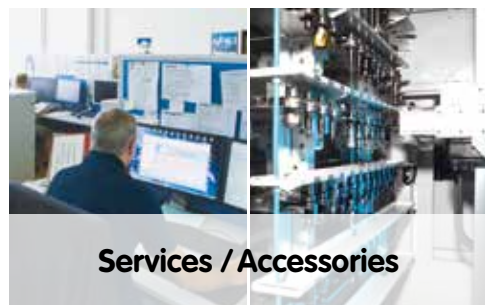
Machining centers in portal design



Machining centers



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