GFI

COMBINED GRINDING FLUTING MACHINE

- Ergonomy, safety, fast and accurate working cycles.
- Reduced cleaning and maintenance.
- Reliability.
- Easy to learn the use of the machine.

These main concepts are the bases of this newly designed tool machine.

Ocrim GFI is a numerical control combined grinding and fluting machine of last generation.

Ease of use

The numerical control, equipped with liquid crystal (LCD) color monitor, ensures an easier use and more accurate performance.

All functions are programmable through dedicated menus. Programs are self-driven and easy to read (Italian, English, French and Spanish). Mathematical calculations for required indexing gears are no longer necessary. It is possible to obtain from 10 to 2500 indexings with a unit increment.

It has been eliminated the guide for the helix inclination, and so it is disappeared an imprecise and complex operation. Spiral inclination from 0% to 20% with increments of 0,01% either lefthand or righthand. An electronic handwheel allows machine axes to be easily moved during machine set up.

Fluting speed

Two main factors exert direct influence on substantial time saving: one is the rapidity in setting up the tools and roll; the other is the working speed that can be considered tripled when compared to conventional machine types. It is sufficient to position the tool and the roll on the machine to proceed with the fluting. Formerly, it was necessary to position the tool, to change the indexing gears and incline the spiral guide. Also change of operation is very simple and may be sequential. In fact, after the rectification, the fluting operation can be started.

Cambered and cylindrical grinding

This machine can work as a very grinding machine. The grinding wheel type, the precision of bearings and machine sturdiness allow for surface without defects and optimum dimensional precision. It is possible to carry out the cambered grinding on smooth rolls (reduction) in one phase only, while on traditional machines it is carried out in three different phases.

Dependability

Fully reliable, this newly developed machine is the result of Ocrim's expertise combined with the state-of-the-art technology in machine tools manufacturing.

Software

Complete yet simple software for the best fluting of any type of roll. Functions are provided for the finest control of all operations. For example: possibility of setting the tool to any previous corrugation, manual movement along any axis, variation of any functional parameters, shown on the display. A video-camera indicates work progress during fluting or grinding operations.

Architecture of the machine

The acrhitecture of the machine is extremely innovative with technical solutions that drastically reduce the installation times, maintenance, cleaning and preparation to working cycles. The grinding wheels and corrugating tools allow high cut speeds, that together with high acceleration and speed of the return run, result on limited working times.

Increased also the acceleration and speed in empty runs. Reduced the longitudinal dimensions.

Basament

The configuration forsees a monolithic basement, in stabilized electro-welded steel, designed with the most modern technologies (solid modelling in 3D and verification with computerized analysis of finished elements FEM) to guarentee the maximum stability and stiffness during time.

The basement supports driving head and integral faceplate composed by a frame cross member with a dovetail section where are mounted the supports of the working cylinder.

The machine lies on the floor on antivibrating graders, special for tool machines, that guarantee an ideal stiff and antiskid anchorage, in order to avoid any other operation during the installation (holes for screw, threaded tie rod, buildings, etc.)

Accident prevention protections and electric panel are fixed to the basement, in order to reduce to the minimum the time for installation and the start-up of the machine.

Wheelhead - Toolholder

Two orthogonal wheelheads, one longitudinal (axis Z) and one transverse (axis X) are mobbed along the machine axes, controlled by large-diameter boll screws with preloaded lead nut. Wheelheads/slide by linear recirculating ball guides which are driven by servo-motors. All these components guarentee stiffness, speed and absent wearing. All the guides and screws are protected by bellows and telescopic guards and are automatically lubricated with oil by a centralized plant.

Toolhead

On the wheelhead of axis X is mounted the toolhead.

The rotation of the toolhead is driven by a direct coupled motor with variable speed by means of inverter, to get always the best working conditions.

The toolhead is fitted with three couples of ball bearings, with precision oblique contact.

The wheel progress is automatic and allows both the cylindric and convex rectification (reduction)

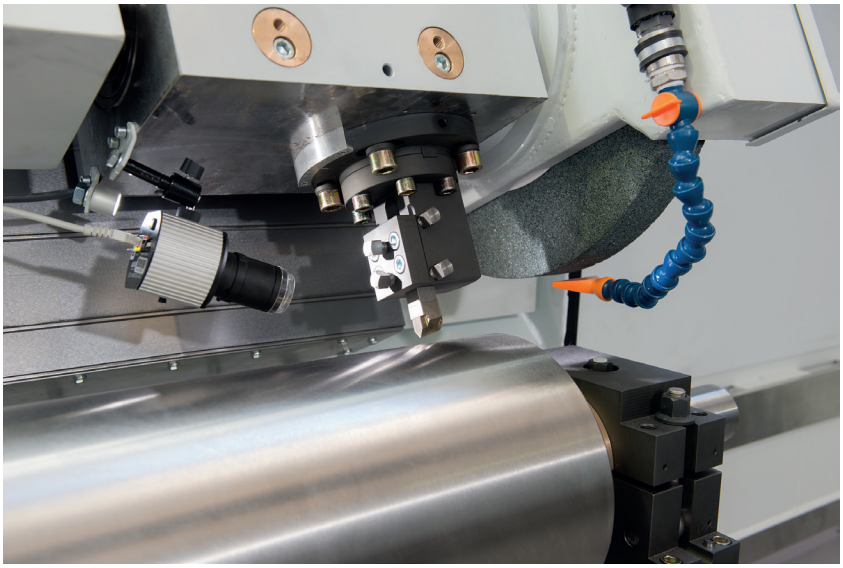
Toolholder

On the wheelhead of axis X is also mounted the toolholder. The toolholder can rotate on its axis to allow the tool to follow exactly the grinding screw.

It can be mounted both the traditional tools with welded plate, and the new tools with mechanical fixing insert, the tools with mechanical fixing insert guarantee high precision, specially during the fluting of smooth rolls.

By installing a dedicated tool is also possible to realize the turning of the rolls edge, executing the ray or the bevel; this allows to get a roll as a new one; avoiding cracks which can be noted on grinding rolls after having carried out various fluting operations. The position of the tool is shows on the screen and the operator can regulate it directly with the electronic handwheel from the driving console table, without opening the sliding guard.

It is possible to assembly multiple tools (optionals).



Sliding head

The sliding head is a structure in cast iron, fixed to the basement. A servomotor coupled to a precision reducer guarantees the requested couple and precision during the rectification and fluting of grinding rolls. A precision mechanical coupling compensates high torsion rigidity, characterized by misalignments between the axis of the sliding head and the axis of the roll.

Roll support

The roll supports are in cast iron and are fixed to the dovetail guide of the basement. They allow the alignment of the roll and the working concentrity that shall be carried out. The stainless steel pins of the roll under working leant on bronze surfaces.

Metal shaving recovery tank - Tank for lubro-refrigerating liquid

The above tank is integrated in the machine but it easily extractable to allow a rapid maintenance. This tank is positioned under the roll under working so that all the metal shavings fall inside keeping the machine perfectly cleaned. A lot of time is wasted on traditional machines for removal operations of metal shavings and af refused of rectification.

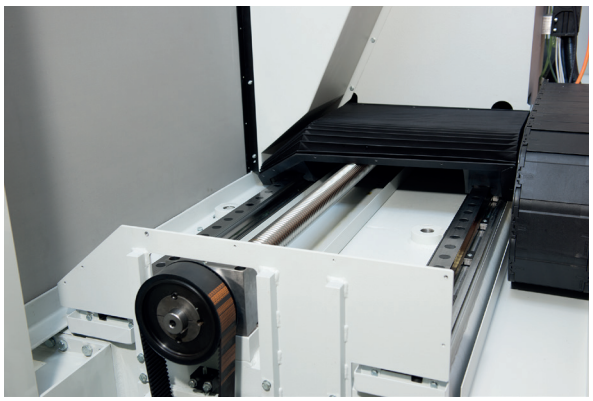
Accident prevention guards

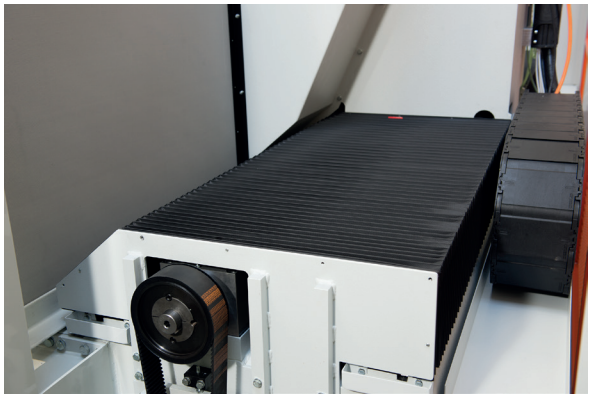
The machine, during the automatic workings, is completely closed. Two sliding doors, interblocked, allow to enter inside for the substitution of the roll, only when the machine is in manual modality.

Maintenance

Maintenance operations and wear are substantially reduced. Integral guides, whiche require constant and careful lubrication and subject to wear, have been eliminated.

The using of permanent magnet brushless servomotors, belt drives and Poly V, life-lubricated epicyclical reducers and toolhead, allow long intervals between one maintenance and another. Level sensor on the lubrication gearcase advise the operator when it is necessary to do the topping up.

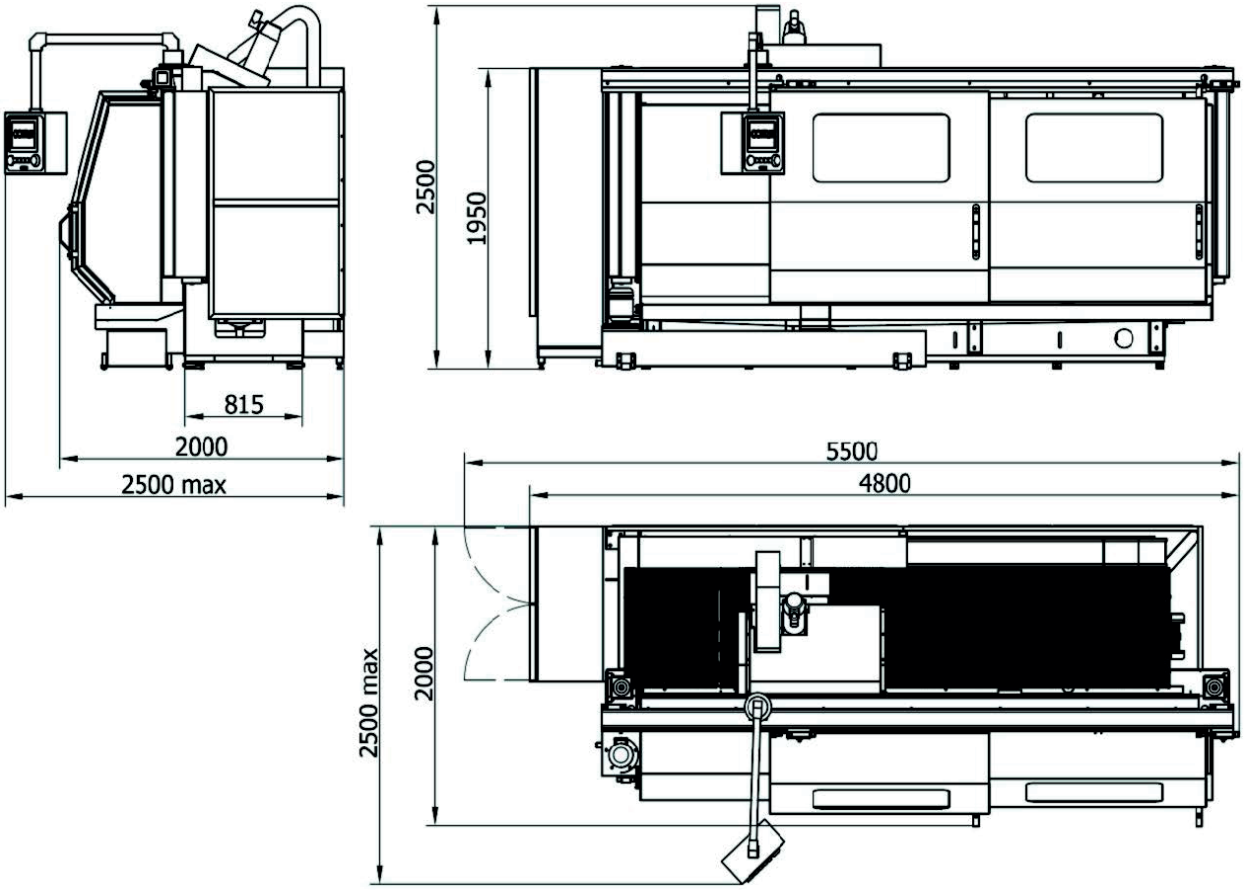




Technical information

Model	Roll dimensions (mm)		Main characteristics					Total installed power (kW)	Net weight (kg)	Shipping volume (m^3)
			Fluting		Grinding		Motor (kW)			
					Grinding wheel					
	Diameter	Lenght	Cutting speed (m/min)	Flutes (n°)	Ø [mm]	r.p.m.				
GFI	200 ÷ 500	0 ÷ 1800	30	10 ÷ 2500	500	1700 ÷ 2500	7,5	35	7000	28

Technical features of the equipemnt can be modified without any obligation of notice. Data may be not fully in accordance with the market versions.



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