

From conventional to high speed grinding, in one solution

by Claudio Tacchella

The Italian company Rettificatrici Ghiringhelli - headquarters in Luino (VA) - presents at the GrindTec exhibition - Stand 1038 – Hall 1, a special machine configuration of the famous APG range which was designed for the ideal use of the centerless grinding process at high cutting speed up to 120 m/s with CBN wheels for companies and industries with requirements for medium or large production volumes.

“Our centerless grinding machines, - says Mrs. Patrizia Ghiringhelli, Joint Managing Director of the Rettificatrici Ghiringhelli -, are customized according to the customer’s “technical requirements”, with a wide and varied range of components and production problems to solve. In this context the grinding process at high cutting speed finds countless areas of application where the investment into suitable machines can turn out to be extremely profitable. Until recently the market was showing a certain skepticism towards the high-speed grinding. Today the approach to this technology is quite

different, as it is a tried and tested process. Following these analyses, we felt the time had come for us as well to make it available. This new machine configuration was created to complete the actual APG series, by expanding the range of modern and technologically advanced centerless grinding solutions.”

On the new machine the grinding wheel head is equipped with electrospindle on super precision bearings, developed in partnership with the Italian company Capellini srl based in Podenzano (PC). Drive by integrated coaxial asynchronous motor with 55 kW power and torque of 240 Nm and liquid cooling in autonomous circuit. Wheels up to 500 mm Ø x 250 mm width with a peripheral speed of 120 m/s can be mounted. The wheel balancing is automatic and integrated into the spindle through a balancing unit accomplished by the Italian company Balance System in Pessano con Bornago (MI). In particular the balancing head has integrated rotation sensors, AE acoustic emission for wheel-piece contact

and wheel-diamond and allows a wheel pre-balancing through a guided procedure. The engineers in Ghiringhelli have designed the lubrication cooling system with particular attention to the feeding nozzles of the liquid in the area wheel-piece. The control wheel head with spindle on super precision bearings accommodates wheels of Ø 305 mm x L 250 mm for a torque of 11 Nm. The control wheel head can be inclined by +/- 5°. The grinding wheel dressing is through CNC with a dressing orthogonal group (axes X/Y), as well as for the control wheel (axes X1/Y1). The machine dynamics develops with 6 basic axes CNC controlled and the whole architecture is based on a solid mineral casting frame, 100% recyclable, designed with CAD 3D and FEM engineered. In this configuration the machine can grind pieces from Ø 1,5 to 70 mm. The CNC is equipped with Siemens 840D SL and, as an option, the brand new digital native Sinumerik-ONE which allows the creation of a Siemens digital twin (Digital Twin).



The new Ghiringhelli APG is designed for the optimal use of the centerless grinding process at high cutting speed up to 120 m/s

“The new CNC Sinumerik-ONE, digital-native – continues Patrizia Ghiringhelli -, allows to plan identical solutions to those to be physically accomplished and to simulate their functioning. The users of the grinding machine can this way optimize the set-up and improve the performances during production, maintenance, piece programming, automation and all technological cycles by becoming more flexible and by reducing the time-to-market”.

The new APG adopts the innovative communication protocol Siemens IO-Link and all the software functions, automation included, are joined to those of the machine through the exclusive CNC interface which belongs to Ghiringhelli.

“The high speed wheel structure, - concludes Patrizia Ghiringhelli -, is not only available for new supplies, but also for those who already have a conventional APG centerless grinding machine at their disposal and wish to evaluate its possible transformation with us. This big opportunity is feasible thanks to the careful planning developed according to our principles of modularity and standardisation that we adopt on all our creations.”

A potential which offers the user the transition to a technological segment of higher level. The new APG allows high customization for very precise “turnkey” grinding solutions. It can find application in various fields such as automotive, bicycles/motorcycle, aerospace, power tools/tooling, bearings, electrical motors, textile and precision mechanics.

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The Ghiringhelli centerless grinding machines can be equipped with automatic piece feeding systems and with post-process measuring systems used for machine correction

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GrindTec 2020
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Hall 5, Booth 5061