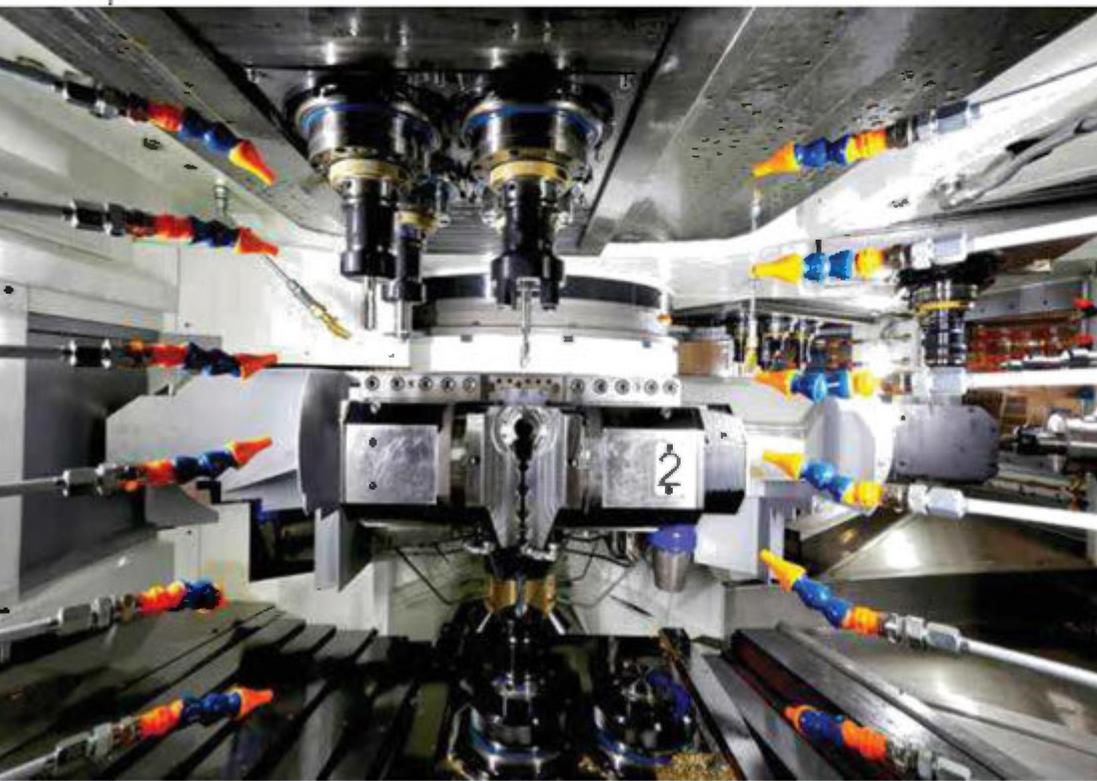


组合机床？灵活高效！

Andrea Pagani, Flavio Della Muzia



Gnutti 可以提供全套组合机床解决方案，满足各种制造要求。这要归功于他们的设计制造方法，这种方法旨在实现设备的高水平定制，从而满足同期制造行业的需要。

Gnutti Transfer 将其出众的能力、专业知识和激情投注到每一台机床之中，因此，他们才能在当前复杂且竞争激烈的市场中脱颖而出。

Gnutti 自 1955 年成立以来迅速发展，在生产组合机床方面实现了卓越成就。在七十年代，机床机型从采用气动技术转变为配备液压系统，再加上市场需求的不断增长，这些都使得 Gnutti 显著提高了专业知识和人力资源的素质。八十年代初期，Gnutti 是最早采用先进技术解决方案的公司之一，使用相关电子产品，以满足苛刻行业（如汽车行业）的要求，创新始终是其获得成功的秘诀之一。

在 Gnutti 的所有特点中，最突出的是其高定制水平的解决方案，得益于技术部门拥有高技术水平的团队以及几乎全部组件均内部生产的战略，公司针对每个具体的实际生产问题都进行了研究，从而确保管控每个细节。

满足所有要求的丰富产品

我们研发并推出了大量设备以满足复杂工艺的需求，这样客户可以从其中确定最适合他们生产要求的设备。

例如，针对小型工件系列并且循环时间非常快的特点，我们可以提供年产数百万件零件但其中只出现几种变型的传统双向或三向组合机床，如具有不同灵活度的棒材机（多轴组合机床），其灵活性由轴运动或集成旋转



工位的可用性决定。
Gnutti 系列产品中最先进的解决方案包括灵活组合数控机床，最多可在 6 个方向进行加工，配备水平/垂直轴转塔和 GT2-GT4 设备（双主轴和四主轴模块），一个加工中心中配备 2 到 4 个主轴，提供类似于换刀系统的顺序加工，但并没有配置这种装置，因此没有磨损且无需进行特定维护。灵活组合机床，正如其名称所示，除了由夹紧系统的旋转提供的第 4 轴之外，所有主轴都配有 3 个轴，因此具有很好的灵活性。此外，还可以安装多个动力头，用于凹槽加工或利用电动机容量进行与众不同的加工操作。这些机型引起了市场的浓厚兴趣，有时会对模块化中心概念和加工中心的选择产生不利影

TRANSFERS? FLEXIBLE AND PRODUCTIVE!

Competence, knowledge and a lot of passion: they are the ingredients Gnutti Transfer puts in each of its machines, so that they can make the difference in a complex and competitive market like the current one.

Established in 1955, Gnutti has grown rapidly and has identified its excellence field in the production of transfer machines. In the Seventies, the shift from machines with pneumatic technology to models equipped with hydraulic systems, combined with the constant rise of the market demand, has allowed Gnutti to enhance know how and human resources significantly. In the early Eighties, it ranks among the first companies that adopt advanced technological solutions, with a relevant use of electronics to supply demanding sectors (such as automotive), where innovation has always represented one of the key elements for success.

Among the peculiarities that characterize Gnutti, stands out the high customization level of the proposed solutions, studied for each single productive reality thanks to a highly skilled team composing the technical division and to the strategic choice of manufacturing in-house the almost totality of components, to keep every slightest detail under control.

A BROAD OFFER FOR ALL REQUIREMENTS

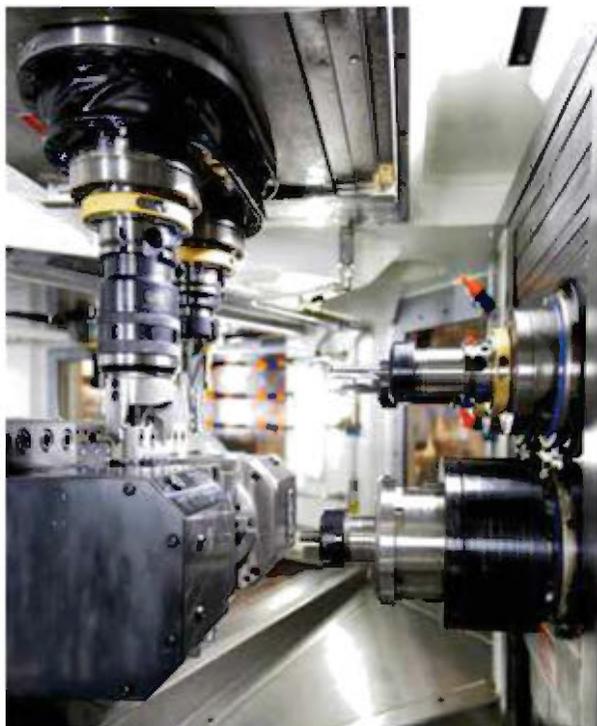
This complex process leads to the creation of a broad range of plants, among which customers can identify the most suitable for

Gnutti can satisfy every manufacturing requirement with its complete proposal of transfer solutions. The credit goes to a design and manufacturing approach that aims at a high customization level of plants, to meet the requisites of the contemporaneous manufacturing industry.

their production requirements. Specifically dedicated to a small family of workpieces and with very fast cycle times, we can find for instance the traditional 2-or 3-way transfer for the manufacturing of millions of pieces yearly while several variants then spring from it, like for instance bar machines (multispindle transfer machines) with different flexibility levels dictated by the axis motion or by the availability of an integrated turning station.

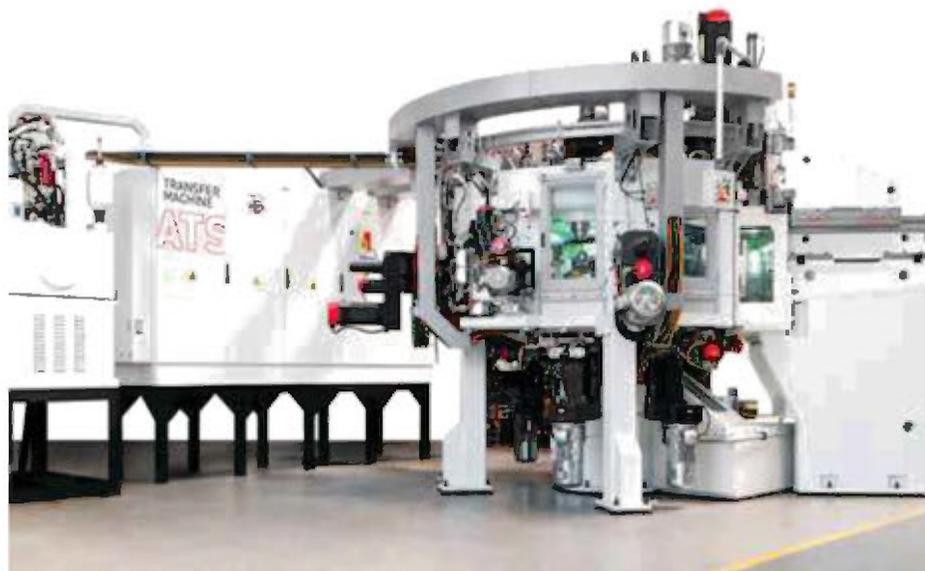
The most advanced solutions of Gnutti range include NC Flexible Transfer Machines, with 6 ways maximum, horizontal/vertical axis turret and GT2-GT4 equipment (two-spindle and four-spindle modules) with 2-to- 4 spindles in a single machining centre, provided with sequential machining resembling those of tool-changer systems but without this device and therefore wear-and specific maintenance-free. Flexible Transfer Machines, as their name specifies, allow a good flexibility level due to the fact that all spindles are equipped with 3 axes, besides a 4th axis given by the rotation of the clamping system. Moreover, it is possible to mount multiple heads, for recesses or to carry out very different machining operations exploiting the motor capacity. These models are arousing lively interest on the market, sometimes to the detriment of the modular centre concept and opting for machining centres, notably developed in performance terms and getting closer to modular centres themselves.

Among top products, Piccola is a NC transfer machine with ➡



响，特别是在性能开发以及更接近模块化中心方面。在顶级产品中，Piccola 是一

款配备水平工作台和垂直轴的数控组合机床，有 24 个工位，可以加工微小工件，加工期间工件旋转，就像静态部件和旋转部



➔ horizontal table and vertical axis, 24 positions, which allows the machining of tiny workpieces, with the part in rotation, behaving like a sort of "hybrid" between operations with static components and the ones with rotating components, with the use of rotating gripping groups. This allows much higher precision levels of the product and lower thermal drifts, with cycle times that range from less than one second to about 20÷30 seconds, depending on the machining complexity. Unlike other solutions proposed on the market, Piccola is fully based on CNC, with each spindle freely moving on three axes, in addition to the component rotation.

Finally, Gnutti proposes transfer machines and modular centres, the latter with bigger work cubes and devised for medium-entity volume (from 200 to 500 thousand pieces yearly).

They are solutions with revolver head or tool-change technology, which allow having rotary tables and up to 5 NC axes, thus permitting the management of operations in sequence with about one minute cycle times.

BEYOND MACHINES

Gnutti's constant propensity for innovation, then, has led the company towards the development of numerous new products that allow dealing with workpieces with even very complex geometry.

A suitable pre- and after sale service is as important in the Brescia company's strategy, with teams able to intervene (both from remote with the tele-assistance and directly on the spot) to satisfy whatever need.

Concerning this, they have established a dedicated internal Service Unit, composed by specialized technicians, and three units headquartered in North America, Germany and China, where highly specialized professionals can intervene at customers' factories within 24 hours to solve any type of problem and so drastically reduce eventual downtimes.

Moreover, Gnutti's management strongly believes in the value of training: they regularly organize training sessions dedicated to customer companies' operators to provide them with the best conditions to manage all production phases through deep knowledge of machines' operation.

This is useful also for Gnutti technicians, who receive very precise and detailed feedbacks from users and, in case of intervention, can solve problems faster.

Among the about 210 employees who work at Gnutti Transfer, finally, many are young graduates who share in enriching the company with new resources and, in collaboration with more experienced technicians, assure the ideal combination to offer always forefront reliable solutions.



不仅提供机床产品

Gnutti 不断追求创新，使公司开发出许多新产品，这些新产品能够处理具有非常复杂几何形状的工件。

适当的售前和售后服务在 Brescia 公司的战略中同样重要，这样公司团队能够进行干预（借助远程协助远程干预或现场直接干预），以满足各种需求。

考虑到这一点，他们建立了专门的内部服务部门，该部门由专业技术人员组成，三个内部服务部门的总



件操作的“混合体”并使用旋转夹持组。这使得产品精度更高，热漂移更低，循环时间从不到一秒变为 $20 \div 30$ 秒，这取决于加工的复杂度。跟市场上提出的其他解决方案不同，Piccola 完全基于 CNC，除部件旋转外，每个主轴都可以在三个轴上自由移动。最后，Gnutti 提出了组合机床和模块化中心，后者具有更大的工作体积并设计用于中等实体体积（年产量达 20 万到 50 万件）。这些解决方案采用回转式动力头或换刀技术，允许使用旋转工作台和最多 5 个数控轴，因此可以按约一分钟的循环时间顺序管理操作。



部分别设立在北美、德国和中国，高专业水平的专家可以在 24 小时内到达客户的工厂，解决各种类型的问题，从而显著减少可能的停机时间。

此外，Gnutti 的管理层坚信培训的价值：他们定期组织培训课程，为客户公司的操作人员进行培训，使他们通过深入了解机床操作，为他们提供管理所有生产阶段的最佳条件。

这对 Gnutti 的技术人员也很有用，他们从用户那里获得非常精确和详细的反馈，在进行干预时，他们就可以更快地解决问题。最后，在 Gnutti Transfer 工作的约 210 名员工中，许多人都是年轻的毕业生，他们成为公司的“新鲜血液”并与经验丰富的技术人员协作，确保完美结合，从而始终能够提供最前沿、可靠的解决方案。