

GNUTTI

连续自动工作机床

灵活的解决方案

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为了将连续自动加工技术与加工中心相结合，Gnutti Transfer 开发了一款高灵活性连续自动工作机床（Flexible Transfer Machines）。由于使用了 GT2 和 GT4 装置，该机床适用于要求苛刻的汽车及转包生产等市场。

近几年来，世界制造业对产品的生产要求日趋严格：无论何种应用领域，都需要有灵活、高产、精密且快速的生产系统。这些趋势特点彼此之间显然存在矛盾：尽管如此，机床制造商并未气馁。为了达到各项要求，他们开发了多种不同的解决方案。比如，Gnutti Transfer 已经开发出一系列高技术解决方案。

一个完善的解决方案

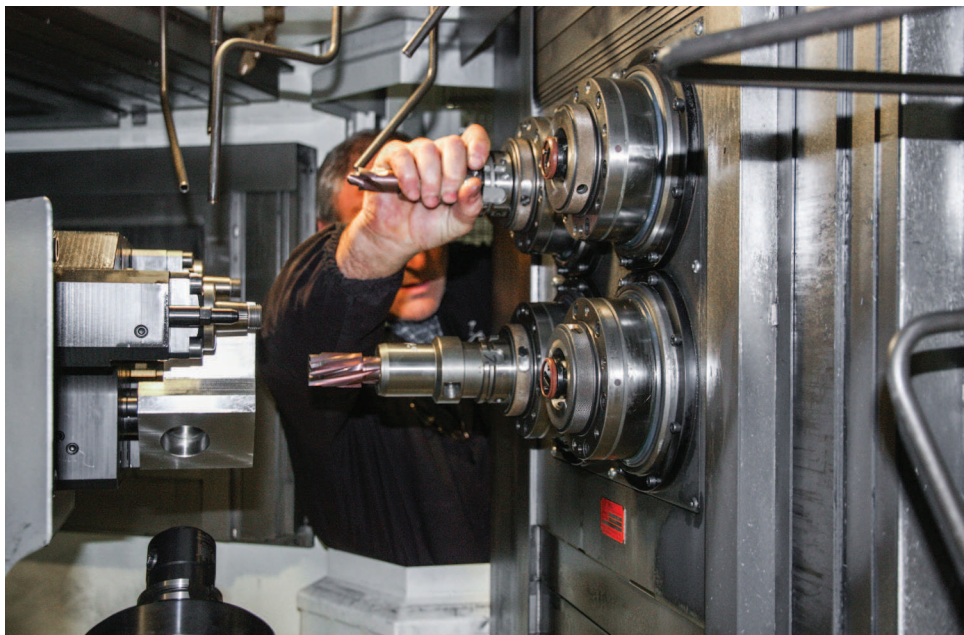
从多个角度来看，在连续自动工作机床所涉及的数个市场中，汽车制造业就是一个非常典型的标杆：在与主要的汽车制造商合作的过程中，包括生产率、尺寸精度、重复性及可重复配置能力等机床特点都是重要的竞争优势。

实际上，一方面它们计划不断提高汽车的可重复性和安全性能；另一方面，这些标准会对相关零部件产生连锁反应，对机床制造商也会带来明显影响。

与几年前相比，汽车制造业中车型的升级换代周期已从 5 至 7 年缩短至目前的 3 年：这种趋势对制造厂的影响很大。为了通过快速高效的重新配置来应对汽车车型的升级换代，制造厂必须具有足够的灵活性。

对于大中批量订单，产品必需满足越来越严格的公差要求，且确保所有批次的产品具有可测量及历经检验的可重复性和再现性。

为了满足此需求，Gnutti Transfer 开始打造新一代机床——配备 GT2 和 GT4 装置



的高灵活性连续自动工作机床。GT2 和 GT4 装置分别有 2 根和 4 根主轴，使得在不作任何妥协的情况下提供用户所需的精度。所要打造的连续自动工作机床必须是比标准加工中心更出色的机床，将连续自动工作机床的典型特点——较高的生产率与极佳的灵活性和可重新配置性相结合。

尖端技术

该高灵活性连续自动工作机床是一款在十字拖板上装有组装式操作装置 GT2 和 GT4 的多工位机床。

相较于其他解决方案，带 4 根主轴的 GT4 装置可以少安装至少 3 个刀库，加工速度节省 8 至 16 秒；该优势缩短了加工过程，提高了机床的生产能力，各组件的灵活性也带来了高可重复配置性。

THE FLEXIBLE SOLUTION

Over the last few years, the world manufacturing industry has notably increased its requirements: irrespective of the application sectors, flexible, productive, precise and fast manufacturing systems are requested. Several of these single features are apparently incompatible one another: obviously, this has not discouraged machine tool manufacturers, which have developed various solutions to give a positive answer to each requirement. Like Gnutti Transfer, which managed to make a virtue of necessity offering a broad array of high-tech solutions.

A COMPLETE SOLUTION

Among the reference markets for the transfer machine world, automotive represents a benchmark from many points of view: production rates, dimensional precision, repeatability and re-configurability are essential qualities to work with the major car manufacturers.

If on one hand, in fact, they propose constantly upgraded vehicles, with high repeatability and safety performances, on the other hand these standards impact in cascade on the relative components and, definitely, on machine tool producers.

In comparison with few years ago, in fact, in the automotive world the model restyling has decreased from 5-7 years to the current 3: this has strongly concerned productive plants, which must be

Combining the transfer technology to machining centres', Gnutti Transfer has developed Flexible Transfer Machines: plants that, thanks to the use of GT2 and GT4 units, are suitable for demanding markets like automotive and subcontracting in general.

flexible enough to manage the modifications through a fast and efficient re-configuration.

We are then referring to big-medium batches, with the need of complying with stricter and stricter piece tolerances and of granting measurable and demonstrable repeatability and reproducibility on the entire batch volume.

To meet this need, Gnutti Transfer has therefore implemented a new generation of machines, the Flexible Transfer Machines,

equipped with GT2 and GT4 units respectively with two and four spindles: the target is offering precisely what users want, without coming to a compromise. The goal is to assure a better alternative than standard machining centres, summing the higher production rates that are typical of transfer machines to excellent flexibility and re-configurability.

TOP TECHNOLOGY

The Flexible Transfer Machine is a multi-station model equipped with modular operating units GT2 and GT4 mounted on a cross saddle.

Compared to other solutions, the GT4 module with 4 spindles allows avoiding at least 3 tool changers, with a saving included between 8 and 16 seconds: the advantage is not only connected with the shorter cycle time but also with the operational ➔



如果机床各刀具均装有独立轴和一根专用主轴以增强加工过程的可靠性，从而使机床达到非常高的可用度。

连续自动加工技术

生产率高和单价低仍然是使基于连续自动加工技术的机床备受客户青睐的主要特点。但是，由于使用了GT2和GT4装置，Gnutti Transfer 对高灵活性连续自动工作机床进行了改良，对其生产过程进行了简化及优化。

分别带2根及4根主轴的GT2和GT4装置使该机床可以根据加工工件来采用适合的装置，实现最佳配置。

加工灵活性来自工件夹具的使用：除了常用的自定心台钳之外，实际上还可以安装半个自定心夹紧机构以及持续旋转的台钳和钳口以及专用快速更换夹紧机构；它们应根据

➔ capability of the machine and with the re-configurability granted by the flexibility of each single module.

A system based on the fact that each tool is equipped with independent axes and a dedicated spindle enhancing the process reliability and, definitely, sharing in reaching a very high machine availability.

THE FLEXIBLE TRANSFER

Productivity and low piece/cost remain the main features driving the choice of a machine based on transfer technology, but with the Flexible Transfer Machine Gnutti Transfer has taken a further step forward that allows simplifying and optimizing the productive process thanks to the use of the GT2 and GT4 units.

The modules with two and four spindles allow in fact configuring the machine in optimal way, according to the workpiece to be implemented, exploiting the necessary units.

The machine flexibility derives then from the use of piece clamping equipment: besides the usual self-centring vices, in fact, it is possible to mount semi-self-centring systems, vices and jaws rotating in continuous and special quick-change clamping systems studied according to the design of the part to be produced. Shifting from one equipment to the other is as simple, with clear advantages in the machine re-configuration phase for even very different pieces one another, obviously maintaining the same quality requisites on the finished product.

Besides, the Transfer Machine can use any type of useful addi-

tional device for the productive process, such as deep drilling and roll-threading units, milling heads, CNC heads for the recess machining, shaping machines, turning solutions and in process measuring devices

Irrespective of the characteristics of the parts to be implemented today, the Flexible Transfer Machine is a winning choice also for tomorrow's workpieces: noteworthy added value for users, who will avail themselves of a high-tech solution able to keep pace with times many years later, too.

Flexible Transfer Machine

	SIZE 125		SIZE 150	
	GT2	GT4	GT2	GT4
Spindle Number	2	4	2	4
Tool Change Time	0 Seconds			
Unit Stroke	150 Mm		175 Mm	
Machining Area	X=±260 Mm	X=±260 Mm	X=±230 Mm	X=±230 Mm
	Y=±85 Mm	Y=±260 Mm	Y=±85 Mm	Y=±230 Mm
Spindle Power	5.5+7,5 Kw		11 Kw	
Speed	6,000 Rpm		4,500 Rpm	
Refrigeration	Up To 100 Bars			
Number Of Stations	4, 6, 8			
Turret Rotation Axis	Vertical/Horizontal			
Clamping Systems	Self-Centring Vice Special Reconfigurable Equipment Vices/Jaws Rotating In Continuous			
Numerical Control	Fanuc 30I / Siemens 840D			

加工工件来设计的。从一种机床转变为另一种机床的过程简易，对因加工工件之间存在非常大的差异而需要重新配置的机床来说具有明显的优势，而且可以确保成品工件达到同一质量标准。

此外，Transfer Machine 机床可为生产过程加装任何类型的其他的实用装置，例如深孔钻削和螺纹滚轧装置、铣头、凹槽加工数控机床的刀架、成型机、车削解决方案以及过程测量装置

无论现在已安装的装置具有什么特点，对于日后的加工工件来说，高灵活性连续自动工作机床都是一个明智的选择：尤其是为用户增加附加值，有助于用户在多年后仍能获得使其能紧跟行业发展趋势的高技术解决方案。

高灵活性连续自动工作机床

	尺寸 125		尺寸 150	
	GT2	GT4	GT2	GT4
主轴数量	2	4	2	4
换刀时间	0 秒			
装置行程	150 mm		175 mm	
加工范围	X=±260 mm	X=±260 mm	X=±230 mm	X=±230 mm
	Y=±85 mm	Y=±260 mm	Y=±85 mm	Y=±230 mm
主轴功率	5.5 ÷ 7.5 kW		11 kW	
转速	6,000 rpm		4,500 rpm	
冷却	100 bars 以下			
工位数目	4、6、8			
转塔刀架旋转轴	立式/卧式			
夹紧机构	自定心台钳			
	专业的可重新配置设备			
	持续旋转的台钳/钳口			
数控	Fanuc 30i/Siemens 840D			

