

# Wagner Systems – More than 50 years of fine mechanics components and assemblies' production

**W**agner Systems is a Cape Town-based ISO 9001:2015-certified contract manufacturer in the precision engineering field, specialising in the production of fine mechanics components and assemblies.

Founded in 1965, the company provides specialist precision engineering services to customers in various industries worldwide. These include, amongst others, enterprises producing medical devices (dental implant systems, audiology/hearing aids, cardiovascular, ophthalmology and endoscopy) and laboratory equipment, aerospace, radioastronomy, the mechanical industry, and industry in general – even music instruments and model car builders! Its main business in recent years has been in the dental implant industry.

## Market position

The company is internationally positioned in the mainstream production environment, and has the flexibility to support both established businesses and newcomers to industry. It is particularly geared to offer the following:

- Series and batch production of fine mechanics components and assemblies
- Production of components for prototype development
- Guidance and advice on component design for manufacturability

## Capabilities

With more than 50 years' experience in the production of fine mechanics components and assemblies, Wagner Systems' capabilities cover a wide spectrum of requirements, including:

- Machining of fine mechanical components to fine

tolerances

- Fine mechanics assemblies
- Fine spur gear machining for modules  $\leq 0.8$  mm
- Passivation of stainless steel
- Laser marking
- Manual and automatic polishing
- Colour coding of metal, including titanium anodizing, and colour bands by UV-cured ceramic-based paint

## Processes and materials

The company's processes include machining, mostly CNC mill-turning, surface finishing and treatment, as well as assembly and acceptance testing. It, furthermore, produces fine mechanics components and assemblies in a range of raw materials, including:

- Titanium, stainless steel (mostly martensitic and austenitic), cobalt alloys, aluminium, brass, beryllium copper, oxygen-free copper, precious metal alloys, and tool steel
- Engineering plastics – PEEK, POM, PPSU, Teflon and others

## Technology and production equipment

Wagner Systems traditionally used mostly Schaublin machines and lathes from Switzerland, a leading brand in the fine mechanics and watch-making industry some years ago. These machines are renowned for their sturdiness, accuracy and longevity.

However, as part of a project to improve productivity and increase capacity, Wagner Systems commissioned an EMCO Emcoturn 25 CNC lathe in January 2020. The relatively small 12-post turret of this machine with its six driven tools has proved to be an excellent solution for the size of components, as well as the quantities and batch sizes, regularly produced ▶



*A selection of assemblies produced by Wagner Systems*



*A selection of components produced by Wagner Systems*

by Wagner Systems. Cycle times for the production of identical components are significantly shorter on the Emcoturn 25 CNC lathe than on the company's other machines.

The lathe's SINUMERIK CNC control system also offers productivity-enhancing benefits compared to the older systems used before, amongst others the standard ShopTurn machining step programming capability.

### Sphinx Tools' solid carbide micro drill technology

The production of fine mechanics components frequently requires drilling of small diameter holes  $\leq 2\text{mm}$ , often with a high length-to-diameter ratio. As such, Wagner Systems regularly drill holes of  $\leq 0.5\text{mm}$  diameter. The introduction of Swiss-based Sphinx Tools' solid carbide micro drill technology to the company for this purpose, brought enhanced productivity and a host of other benefits to Wagner Systems. With Sphinx Tools' micro drills, Wagner Systems have found amazing drilling consistency, long wear life, quality and precision or – stated differently – “the size is the size”.

Sphinx Tools' standard range of micro drills, in essence, are micro deep hole drills starting from  $\varnothing 0.20\text{mm}$  up to  $\varnothing 2.00\text{mm}$  in 20xd and from  $\varnothing 0.40\text{mm}$  up to  $\varnothing 1.50\text{mm}$  for 40/60 and 80xd drilling depth. This performance of Sphinx Tools' micro drill range offers benefits – amongst others to the injection moulding industry – in starting holes for matrixes/extrusions in plastic and aluminium, thereby simplifying the mould production process.

Wagner Systems entered into a distributor agreement with Sphinx Tools for the South African market for their precision drilling, reaming and milling product ranges. This partnership offers peace of mind, knowing that Sphinx Tools products are manufactured and tested according to strict quality assurance processes, and that the company complies with both quality management standards EN ISO 13485:2016 and ISO 9001:2015, and that its products are FDA approved.

### A player in a specialised industry

“Being a specialised component supplier and usually an unseen contributor, Wagner Systems' successes are mostly enveloped in its customers' achievements within their specialised fields of operation,” says Lasni Millar, Wagner Systems' managing director. “The company's ability to turn exacting customer requirements into workable solutions, often provides the breakthrough for those who require fine



**Wagner Systems recently commissioned its second EMCO Emcoturn 25 CNC lathe. The machine is seen on the left. The EMCO Emcoturn 25 on the right was commissioned in January 2020 and except for two brief periods when Wagner Systems had to close their doors due to Covid-19 in 2020, it has been working two 8-hour shifts per day five days per week since then**

mechanics input during their product development programmes.”

For Millar, the company's ability to produce to tight specifications within short turnaround times is illustrated in the fact that Wagner Systems was contracted to produce components for South Africa's National Ventilator Project during the early stages of the Level 5 Covid-19 lockdown in 2020. Initial involvement in the project entailed producing several pre-production sampling components for CPAP ventilators, followed

by an order in mid-July 2020 to deliver production quantities of seven types of CPAP ventilator components by end August 2020. The order consisted of production, assembly and cleaning of new components, and the cleaning of certain components produced by other suppliers.

According to Millar it is not often that a local manufacturer has the opportunity to become involved in projects of this nature – and in this case, crucial for human life support during medical treatment of Covid-19 patients – that directly affect the lives of fellow South Africans.

“Although our contribution may have been small in proportion to the rest of the project, this is what Wagner Systems are geared for and are good at – to produce exactly according to specification and within short time frames. We take pride in the fact that we could do so for this important national project.”

### The future of the business

A key driving factor for Wagner Systems is that of ongoing improvement. As such the company's continued focus remains on further enhancing its capability to respond with flexibility to customer requirements and orders. This is achieved via sustained productivity refinement to advance its competitiveness and, ultimately, sustainability. This ongoing programme extends across all segments of the business and aims to improve manufacturing processes and the reduction of variables to increase production output. Its success in this regard is illustrated in Wagner Systems having been

awarded Productivity SA's prestigious National Productivity Award 2019 in the Emerging Business Sector category.

The company, furthermore, is systematically replacing outdated production equipment with modern technology and machinery to further improve production capability and turnaround time. In this regard the advantages of the technology of the company's new



**Small hole drilling – Specialised T-piece fuel restrictor with 0.1mm diameter hole, drilled with a Sphinx Tools micro drill**

Emcoturn 25 CNC lathe made such a positive difference in the company's operations, that a second machine was commissioned in December 2021. Further investment in machining and tooling technology are planned for the next few years, while continued attention is given to upskilling the company's workforce.

"I have no doubt that the success we're achieving and the future outcome of the road we've embarked upon, have placed Wagner Systems in a favourable position when it comes to proficiency and output," says Millar. "This, especially, makes a difference where it matters most – with our customers. With improved operational efficiency and increased production capacity, we're now able to respond to customer orders and requirements with enhanced flexibility and deliver within shorter lead times – competitive benefits that favour the end-user."

**Conclusion**

The fine mechanics industry is positioned in a demanding environment with exacting customer requirements, complicated production procedures, and diverse challenges that come with each new production order.

Wagner Systems, as a contract manufacturer in this field, have built a reputation over more than 50 years of being able to produce and deliver what, at first, may have seemed impossible to achieve. A number of factors contribute to this, amongst other, their programme of ongoing improvement, a focus on

productivity, and a scheduled plan of action to remain current as far as production technology and equipment go.

Above all, the company has proficient technical and production teams that consist of experienced individuals with practical know-how gained over decades, a keenness to take on new challenges and a solutions-driven attitude to make things work. For Wagner Systems, this certainly is what matters most!

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