

Titus Group
Product brochure

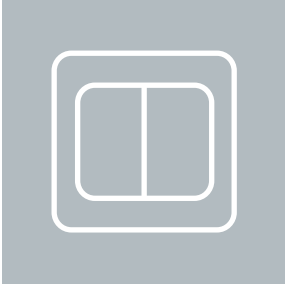
Titus Technologies



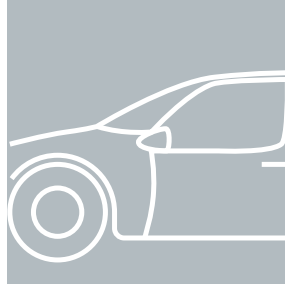
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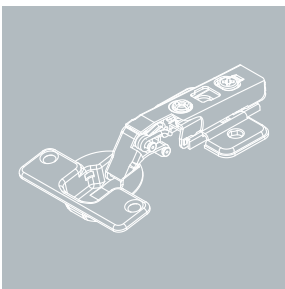
Unique automated process solutions for a wide range of industries



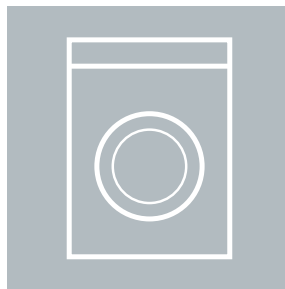
Electrical industry



Automotive industry



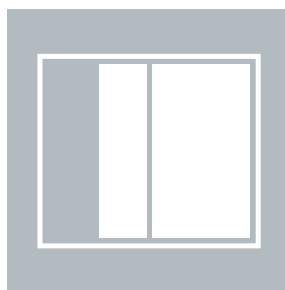
Metal processing



House-hold appliances



Medical devices



Furniture industry



Small and precision components' engineering excellence

- Capable of solving the most demanding requirements
- Constant development of competences to keep pace with the latest technology advancements

Design support

- Engineering support to adapt the product design for the most efficient assembly, maximized productivity, lower production costs and shorter time to market

Automation Systems



Proven Technology

- Our solutions have been used in own manufacturing of high-volume hardware and components for few decades
- The most demanding machine solutions are commissioned by our long-term partners

Quality

- Integrated quality checks for consistent components quality
- Robust construction assures a life-long reliable functioning
- On-line monitoring system

Fully Integrated Manufacturing

- Titus Group has the competence, experience and resources to offer support in all phases of the product life cycle: from product design to efficient high volume manufacture of small precision components

Automation Systems

Technical Guide

Markets served	Automotive	Pedal box, turbo compressor, heating spark plug, handbrake, licence plate lamp, oil filter
	Household appliances components	Heater, washing machine door block, switch circuit plate, hydrostat
	Electro components	Electric motor, current electromagnet, switches, sockets, connectors, printed circuit board
	Medical and pharmaceutical products with cleanroom requirements	Medical test tube, transducer
	Metal processing industry	Concealed hinges, soft closing systems, window fittings
	Furniture industry	Cam and dowels drilling and insertion
	Other components	Dampers
Machine building principles	Modifiability	The assembly system can be modified, rebuilt or upgraded with additional workstations during its lifecycle to suit the product redesign needs.
	Integrability	The assembly system can be integrated into an existing manufacturing or warehousing automated system.
	Versatility with self-adjustment	The machine can be programmed to allow the assembly of multiple product versions. The system will reset automatically according to the item number entered by the machine operator.
	High productivity	All assembly system components, from construction frame through transport system, workstations and programming, are tailored to follow the productivity requirements of high-volume precision parts manufacturing.




Energy efficiency	Each working station on the machine operates through sensors' control to achieve optimal energy and compressed air supply.
Robust and rigid construction	<p>Devised to suit high-speed and high-volume process, the sturdy steel construction of Titus automated assembly systems ensure a life-long high reliability of even the most precise operations, like measuring. Fewer downtimes contribute to lower maintenance costs.</p> <p>It enables comfortable transport and short set-up times at customer premises.</p>
Design support	Our team of engineers can provide support during the product development stage in order to ensure that products are engineered to maximize productivity, improve automation system, lower the manufacturing costs, and shorten time to market.


Automation Systems

Workstations

In many years of providing assembly solutions, we have solved a wide variety of technical challenges which has

provided us with a broad base of knowledge that we use to solve the most demanding tasks in automated assembly.

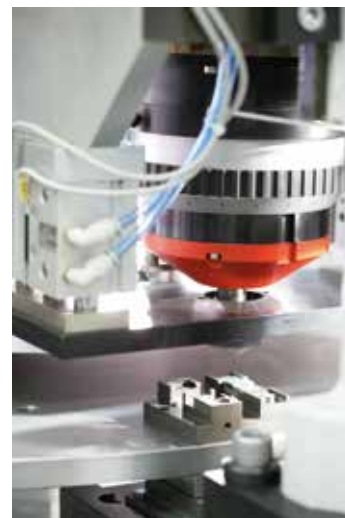
Component handling	<p>Pick and place units, robots</p> <p>Rotation units, grips</p> <p>Vacuum, electromagnetic, pneumatic and mechanical</p>	 <p>Hydrostat transfer from blister to transport line</p>
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Feeders	<p>Vibrators, rotators, bowl and linear feeders</p> <p>Special solutions</p>	 <p>Unit that divides and doses miniature screw springs</p>
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Mechanical operations

Screw driving, orbital riveting, thread cutting, winding

To appropriate height or depth, moment or angle



Riveting unit

Dosing

Liquids, silicone, paint, grease, oil, gels, powder, additives, sand

Precise filling of small quantities of various liquids or powders

Special solutions



Paint dosing

Thermal processing

Heating, drying, cooling

Air and water cooling, silicon drying, ultraviolet, induction heating



Cooling

Automation Systems

Workstations

Welding and Connecting

Welding (TIG, ultrasonic), orbital riveting, gluing, soldering



Ultrasonic welding



Soldering

Control and Testing stations

Finished part control or intermediate inspections

- Dimensions, temperature measurement
- Product shape
- Liquid, air sealing
- Strength
- Hardness
- Temperature
- Electrical resistance

Custom test stations for assembled part's functionality checks, built upon customer requirements.

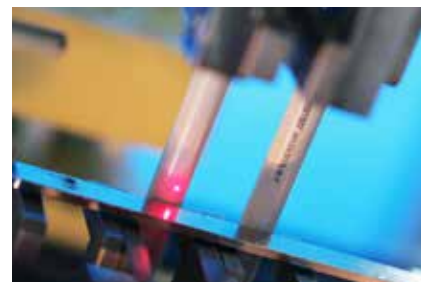
Video inspection
Robot guided controls
Sensor control: inductive, optical and pressure sensors, flow and force meters, colour and contrast, temperature and laser sensors, acoustical/noise check



Pedal box robot video inspection

Marking, labelling

Mechanical stamping, ink-jet printers, laser printers



Laser labelling



Ink-jet printing

Packing

In boxes, smaller containers, blisters

- With packing track
- Mechanical, with robots,
- With or without counting of parts

Process programming

Our proprietary software “Monitoring” collects, elaborates and transfers the data to a PC. It enables events’ recording and statistical processing that are displayed in graphs, chart pies,...

It can be integrated with existing ERP and upgraded to allow for advanced functions.

All the equipment built in the line is freely programmable assuring line upgrade to specific needs.

ONLINE Service enables remote maintenance, diagnostics and program errors’ solving.

- Highly intuitive and user-friendly graphic interface
- Error history
- Display of alarm messages
- Interface language can be adapted to customer's request



Our partners

Festo, SMC, FDS, Bodmer, Links, Baltec, Trumpf, Baluf, Turck, Bosch, Miachi, Stöger, Deprag, Weiss, ABB, Epson

Assembly Lines with Asynchronous Transport System

- When over 12 workstations are required
- When more parts will be assembled on a single line
- Free access to all workstations
- Easy feeding and delivery of components



Work stations are located consecutively in a line.

It can be built as a combined system with inclusion of indexing table assembly machines.

Asynchronous transport system	One-lane or two-lane	Smooth, impact free motion sequence
	Vertical or horizontal	Additional working stations can be added easily without having to disassemble the transport system.
	Circle flow possible (KARE)	
	Precise and quick positioning at the workstation with precise pallet blocking system	
Pallets	The product is being assembled on a pallet transported between workstations.	
Coding	Mechanical	Electronic
	A two-position system identifying parts with defect	Enables complex information storage. A plurality of signals are recorded allowing for identification of type of defect on the workpiece.
		Signal read-out and encoding device emit control signal and direct the process. The piece can be excluded from the process or redirected according to type of mistake.

Samples of products



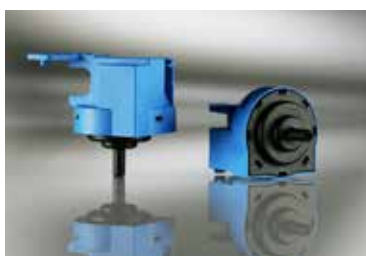
Electric motor



Washing machine door lock



Heating spark plug



Hydrostat



Medical test tube



Pedal box

Rotary Indexing Table Assembly Machines

- Appropriate when up to 12 workstations are required
- Floor space saving
- High productivity
- Short delivery times



Work stations are located around a rotary indexing table.

Automated quality check can be positioned on all workstation.

Composition of two or more rotary indexing tables allows for compact design and more sub assembly stations when space is limited.

NC rotary indexing table

Numerical controlled rotary indexing table that allows application of more than 12 workstations.

Samples of products

Window fittings



Soft closing system



Heater



Connectors

Standard Modules

- Standard preassembled parts
- Faster construction and assembly of rotary indexing tables and assembly lines
- The possibility of subsequent installation in the line

<div data-bbox="172 549 467 577" data-label="Caption"><p>Rotary vibration feeder</p></div> <div data-bbox="608 551 1009 999" data-label="Image"></div>	<div data-bbox="1115 549 1521 633" data-label="Text"><p>Rotary vibration feeders ensure correct and fluent product flow and feeding of workstation.</p></div> <div data-bbox="1115 667 1499 840" data-label="List-Group"><p>Vibrators differ according to:</p><ul style="list-style-type: none">- dimensions of primary bases of vibrators and the dosing direction,- types and sizes of bowls,- types and sizes of noise insulation,- types and height of bearers.</div>
<div data-bbox="172 1023 546 1052" data-label="Caption"><p>Linear vibration feeder VP-13</p></div> <div data-bbox="608 1025 1009 1533" data-label="Image"></div>	<div data-bbox="1115 1023 1533 1078" data-label="Text"><p>For automatic filling of rotary vibration feeders.</p></div> <div data-bbox="1115 1112 1533 1196" data-label="Text"><p>The level of the filling in the rotary vibration feeder is controlled by the level probe.</p></div> <div data-bbox="1115 1230 1506 1285" data-label="Text"><p>Linear vibration feeder VP-13 is used for the line transport of different parts.</p></div> <div data-bbox="1115 1319 1219 1372" data-label="Text"><p>Capacity 20 l</p></div>
<div data-bbox="172 1557 519 1586" data-label="Caption"><p>Line vibration feeder VP-06</p></div> <div data-bbox="608 1560 1009 2008" data-label="Image"></div>	<div data-bbox="1115 1557 1503 1671" data-label="Text"><p>Line vibration feeder VP-06 is used as an extension for adding elements from the rotary vibration feeder to the workstation.</p></div>

Motorised stores and elevators



For automatic filling of rotary vibration feeder.

The level of the filling in the bowl is controlled by the level probe.

The level probe switches on or switches off the electric motor of motorised store.

Capacity motorised stores

150 l

Capacity elevators

200 l

400 l

Dosing modules



Description

For automatic dosing of screws from rotary vibration bowls to a screwdriver unit.

The dosing module depends on the type and the size of dosing and on the size of rotary vibration feeder.

Packing routes



For handling of empty and full boxes.

Possibility of installing one or several packing units using a wide band transporter that supplies empty boxes onto the packing route.

Complete multi-slide die casting solutions



Total in-house engineering expertise

- Die cast machine design development and construction
- Tool design, tool making and sampling
- Integration of automation and robotics into the die cast process
- Component re-engineering capabilities available

Highly effective die casting machines

- Fast cycling
- Very efficient tool/machine combinations
- Easy to operate
- Fast tool changes

Die Cast Technologies



Multi-slide die cast tooling

- In-house multi-slide tooling expertise
- In-house tooling facility
- High precision
- Complex form castings

Multi-slide die cast processes

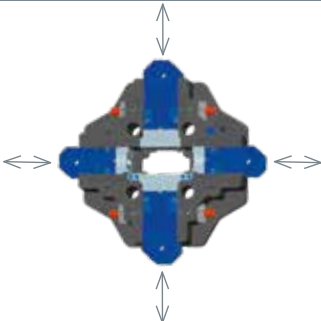


- Over-moulding machines
- Wheel weight machines
- Multi-slide machines
- Automatic ingot feeders
- In-process automation

Custom die casting

- High quality components
- Zinc components from 1g to 1000g
- Dimensional consistency over high volume production runs
- Service tailored to individual customer requirements

Die Cast Technologies

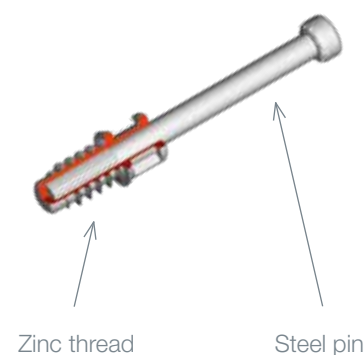
Product Overview and Process Benefits

Machines	Manufacturing systems for the die casting industry: <ul style="list-style-type: none">• Pneumatic multi-slide machines: 2 tonne locking force• Hydraulic multi-slide machines: 20 tonne locking force• Wheel balance weights machines• Over-moulding machines	We believe our range of machines covers all user needs for the production of precision zinc die castings and can be used for component manufacture for a broad spectrum of industries.
Multi-Slide Die Casting Technology	<p>Our machines have up to 6 independently programmable tool movements; ideal for the production of small zinc die castings with complex forms.</p> <p>The multi-slide approach enables castings of complex forms to be produced and can eliminate the need for secondary operations.</p>	
Split Line Injection	Optimise raw material and process energy inputs <p>Injecting zinc at the tool split-line optimises process inputs. Less zinc is needed to manufacture components when compared with conventional machines and importantly less energy is required to re-process sprues.</p> <p>Casting yields are considerably better than conventional die casting systems. Casting yields of up to 90% of raw material are possible.</p>	 <p>Casting yield 60%</p> <p>Casting yield 90%</p>
Machine Controls	<p>All machines are equipped with control systems that continually monitor machine performance in order to optimise production outputs:</p> <ul style="list-style-type: none">• PC based touch screen operator interface• PLC based machine control <p>The control system incorporates:</p> <ul style="list-style-type: none">• 'Live' process feedback about machine performance• Machine set up and programming• Full fault analysis with error messaging system• Machine controllers can be networked and machine performance can be remotely monitored• Remote network support	

CombiCasting Zinc Over-Moulding

Combi over-moulding uses zinc and steel raw materials to produce components made from a combination of both materials. In the over-moulding process a pre-formed steel insert is placed into a mould, then zinc is injected into the mould, covering all or part of the insert.

The resultant 'combi-style' products can have significantly improved performance and features. Also, raw material costs are reduced by the means of substitution, zinc is replaced with steel.



Wheel Balance Weight Technology

We can provide a complete range of production equipment for the manufacture of all types of balance weights:

- cast clip-on weights
- all steel clip-on weights
- steel adhesive weights
- zinc adhesive weights

The machines are fast cycling and have high output rates compared to traditional balance weight machinery.



Custom Precision Die Castings

Titus die casting machines have excellent performance characteristics which allow us to produce and deliver parts to the most demanding of quality standards. We can offer a custom die casting service from several locations around the world.

Key features and advantages

- high dimensional accuracy
- complex form castings
- complete range of post casting operations
- components from 1g to 1000g in zinc or aluminium

- zinc over-moulding technology
- custom die casting service tailored to individual customer requirements



Build Quality


All components used in the manufacture of our machines are specified and manufactured to the highest standards.

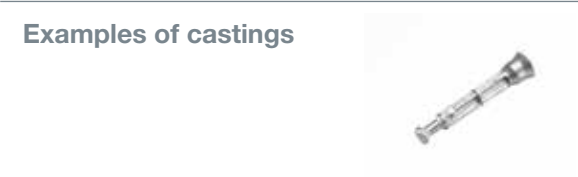
All bought in components used are branded products and are widely available.

Customisation of machine specification to suit customer needs.

Our equipment is built by qualified and experienced engineers within our ISO 9001:2008 certified manufacturing system. All machines are 'wet' run and fully trialled before they are shipped as are all of the multi-slide tools we produce ensuring trouble free start-ups.

Hydraulic Multi-Slide Die Casting Machines

<p>Hydraulic multi-slides</p> 	<ul style="list-style-type: none">• Powerful and accurate multi-slide die casting machine• High productivity zinc die casting• Split-line injection• Castings with minimal porosity and excellent surface finish• Quality consistency over high volume production runs
<p>LamaCaster H65</p>	<p>Ideal for the production of complex small zinc components that require the highest levels of surface finish with minimum porosity.</p> <ul style="list-style-type: none">• Locking force: 8 tonnes• Tool size: 100mm x 65mm• Shot weight: up to 60g• Dry cycle speed: 55 cycles per minute
<p>LamaCaster H100</p>	<p>Suited to four-slide production requiring minimal porosity and good surface finish.</p> <ul style="list-style-type: none">• Locking force: 20 tonnes• Tool size: 100mm x 100mm• Shot weight: up to 225g• Dry cycle speed: 55 cycles per minute



Technical details

..... see page 2.10

Accessories and spare parts

..... see page 2.9

Pneumatic Multi-Slide Die Casting Machines

Pneumatic multi-slides



- Fast cycling
- Low operating costs
- Split line injection
- Compact and flexible design
- High quality parts with complex forms
- Low capital investment costs and fast start up times

LamaCaster 65

Delivers speed and repeatability in the production of small zinc components.

- Locking force: 2 tonnes
- Tool size: 65mm x 65mm
- Shot weight: up to 60g
- Dry cycle speed: 100 cycles per minute

Examples of castings




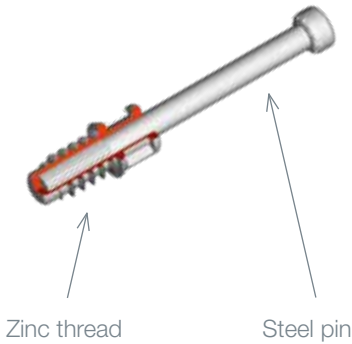

Technical details

→ see page 2.10

Accessories and spare parts

→ see page 2.9

Zinc Over-Moulding CombiCast Machines

<p>CombiCast machines</p> 	<ul style="list-style-type: none">· Assembly of two parts in a single operation, usually steel inserts and zinc· Fast feeding· Assembly accuracy and strength· Significant component's cost reduction· 'Combi' casting technology can be used in conjunction with all LamaCaster hydraulic and pneumatic machines
<p>Lama CombiCaster</p>	<p>For the production of complex two-material components - zinc casting onto inserts made from another material.</p> <ul style="list-style-type: none">· Locking force: dependant on machine· Tool size: determined by product· Shot weight: up to 60g· Dry cycle speed: up to 100 cycles per minute
<p>Zinc over-moulding</p>  <p>Zinc thread</p> <p>Steel pin</p>	<p>Over-moulding combines zinc and steel materials to form a completed part. The over-moulding process uses pre-formed steel inserts that are placed into a mould. The zinc material is then injected into the mould around the insert thereby forming the finished part.</p> <p>Re-engineering an existing one-material product into a 'combi' product can improve the product features. The product performance can also be improved by using the most appropriate material for each product feature. An added benefit of 'Combi' cast technology is that it reduces dependence on a single raw material.</p>
<p>Examples of castings</p> 	<p>Combi dowel</p>



Technical details

..... see page 2.10

Accessories and spare parts

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Wheel Balance Weights Machines

<p>Wheel balance weights machines</p> 	<ul style="list-style-type: none"> • Speed and repeatability in casting of zinc wheel balance weights • Compact and flexible design • Customized to individual customer product requirements • Fast production rates • High speed clip transport and feeding system with robotic option • Consistent part quality
<p>LamaCaster BW60</p>	<p>For the production of 'clip-on' weights from 5g to 60g.</p> <ul style="list-style-type: none"> • Production rate: Up to 1200 parts p/hr. • Tool size: 65 x 65mm • Dry cycle speed: 50 cycles per minute
<p>LamaCaster BW30-2</p>	<p>For the production of 'clip-on' weights from 5g to 30g. Two cavity system that delivers higher production rates.</p> <ul style="list-style-type: none"> • Production rate: Up to 2500 parts per hour • Tool size: 65mm x 65mm • Dry cycle speed: 50 cycles per minute
<p>LamaCaster BW250</p>	<p>For the production of truck 'clip-on' weights up to 250g.</p> <ul style="list-style-type: none"> • Production rate: 1000 pcs per hour • Tool size: 80mm x 60mm • Dry cycle speed: 40 cycles per minute
<p>Wheel balance weights technology</p> 	<p>We can provide a complete range of wheel balance weights solutions for customer specific designs, including the assembly of adhesive blanks onto tape.</p> <p>LamaCaster technology provides lead free wheel weights solutions:</p> <ul style="list-style-type: none"> • Zinc cast clip-on weights • Zinc adhesive weights • Steel clip-on weights • Steel adhesive weights



Technical details

..... see page 2.10

Accessories and spare parts

..... see page 2.9

Precision Die Casting

<div data-bbox="172 549 520 577" data-label="Section-Header"><h2>Custom die casting service</h2></div> <div data-bbox="152 597 864 1134" data-label="Image"></div>	<p>Titus die casting machines have excellent performance characteristics which allow us to produce and deliver to our customers parts to the most demanding of quality standards. We can offer a custom die casting service from several locations around the world.</p>
<div data-bbox="172 1170 546 1199" data-label="Section-Header"><h2>Key features and advantages</h2></div>	<ul style="list-style-type: none">• High dimensional accuracy• Complex form castings• Complete range of post casting operations• Zinc components up to 1000 g• Zinc over-moulding technology• Value engineering and custom die casting service tailored to individual customer requirements
<div data-bbox="172 1468 447 1497" data-label="Section-Header"><h2>Examples of castings</h2></div> <div data-bbox="633 1449 1306 2234" data-label="Image"></div>	

Technical details
see page 2.10

Accessories and Spare Parts

<p>Automatic ingot feeder Integrated</p> <p>For the controlled feeding of zinc ingots. Available on all LamaCaster die casting machines.</p>		<p>Capacity up to 15 ingots (approx. 90kg)</p> <p>Feed rate Maximum 6kg/min</p>
<p>Automatic ingot feeder Stand-alone</p> <p>For use with most conventional die casting machines.</p>		<p>Capacity up to 15 ingots (approx. 90kg)</p> <p>Feed rate Maximum 6kg/min</p>
<p>Melt pot</p> <p>For use on all Titus die casting machines.</p>		<p>Power rating 18 Kw</p>
<p>Gooseneck – injection unit</p> <p>For use on all Titus die casting machines.</p>		<p>Gooseneck re-conditioning service also available</p>
<p>Multi-slide die casting tools</p>		<p>See page 3.5</p>

LamaCaster Machine Specification

	Hydraulic die casting machines		Pneumatic die casting machines	Die casting machines for wheel balance weights			Zinc over moulding machines
	LamaCaster H65	LamaCaster H100	LamaCaster 65	LamaCaster BW60	LamaCaster BW30-2	LamaCaster BW250	Lama CombiCaster
Slide Movemet/ Tool							
No. of slides	4	4	4	4	4	3	2
Max. stroke (theoretical)	50 mm	50 mm	40 mm	38 mm	38 mm	40 / 900 mm	40 mm
Locking force	8 t	20 t	2 t	2 t	2 t	2 t	2 t
Nominal die size	100 x 65 mm	100 x 100 mm	65 x 65 mm	65 x 65 mm	65 x 65 mm	60 x 60 mm 80 x 60 mm	65 x 65 mm
No. of cavities				1	2	1	
Melt pot							
Heat power	18 kW	24 kW	18 kW	18 kW	18 kW	24 kW	18 kW
Melt rate	80 kg/hr	105 kg/hr	80 kg/hr	80 kg/hr	80 kg/hr	80 kg/hr	80 kg/hr
Melt pot capacity	160 kg	160 kg	160 kg	160 kg	160 kg	160 kg	160 kg
Pneumatics / hydraulics							
Line pressure (max.)	120 bar	8 bar / 120 bar	8 bar	8 bar	8 bar	8 bar	8 bar
Air consumption	25 m3/hr	50 m3/hr	100 m3/hr	54 m3/hr	54 m3/hr	30 m3/hr	100 m3/hr
Capacity of air reservoirs	12 l	12 l	18 l	18 l	18 l	18 l	18 l
Dry cycle speed (cycles per/min.)	55	55	100	50	50	40	100
Injection							
Injection piston diameter	25.4 mm	25.4 / 40 mm	25.4 mm	25.4 mm	25.4 mm	50 mm	25.4 mm
Injection cylinder diameter	63 mm	63 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Max. injection cylinder stroke	30 mm	45 mm	30 mm	30 mm	30 mm	30 mm	30 mm
Max. shot weight (theoretical)	100 g	360 g	100 g	108 g	108 g	360 g	100 g
Max. recommended shot weight	60 g	225 g	60 g	60 g	60 g	250 g	60 g
Nozzle							
Heat power	500 W	500 W	500 W	500 W	500 W	500 W	500 W
Power supply							
Three phase	50 amps 400 V	50 amps 400 V	32 amps 400 V	32 amps 400 V	32 amps 400 V	50 amps 400 V	32 amps 400 V

Engineering and production of tooling for various industries



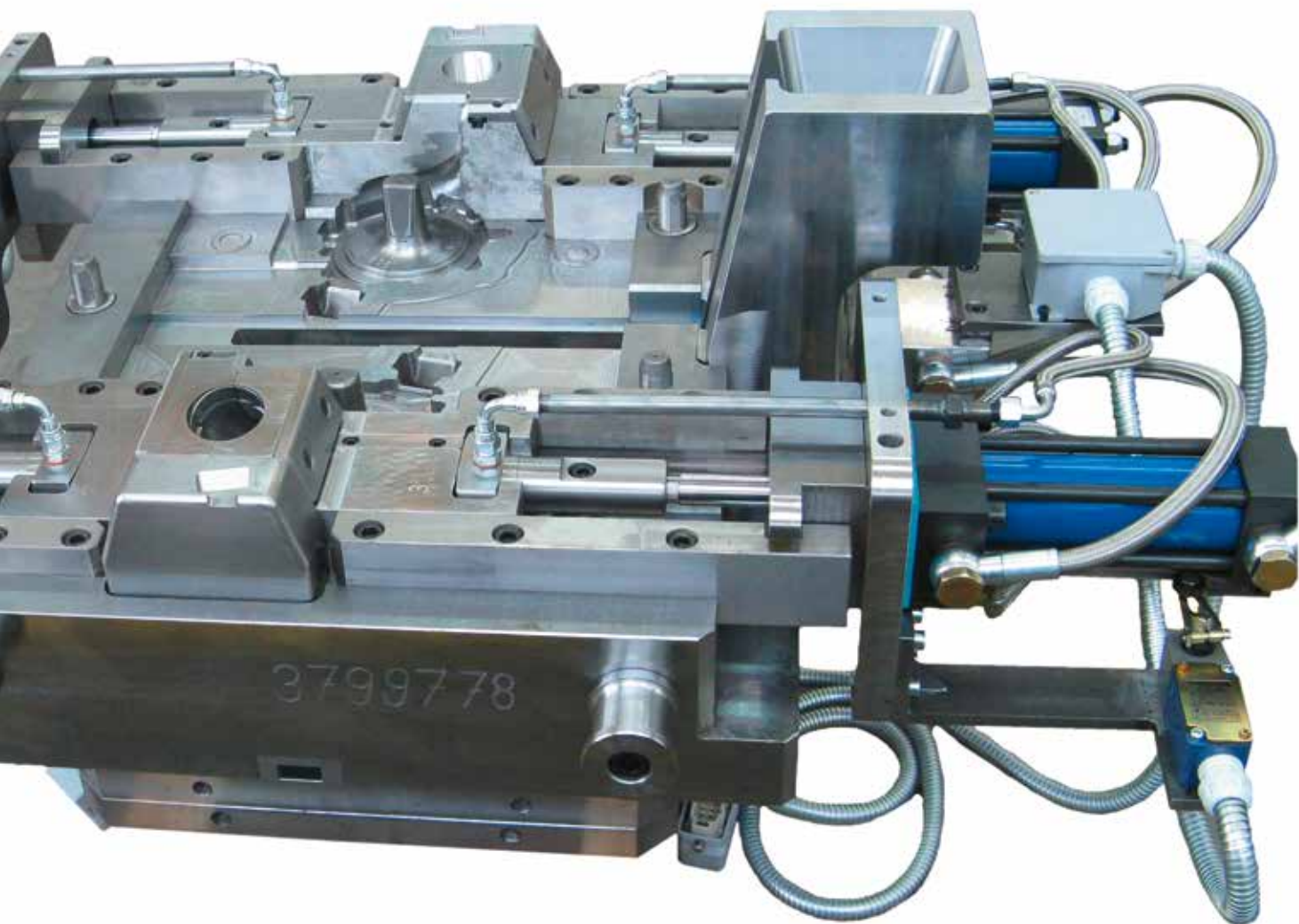
Gravity tools for turbochargers

- High productivity
- Excellent mechanical properties of the product

High precision construction

- Optimal tool design
- High productivity
- Reliable tool performance

Tooling



Innovative turnkey solutions

- Tailored to unique customer needs
- High quality of products made by our tools

Full support to our customers

- In the planning process
- During the implementation phases
- After the tool is in production

Tool service

- Assistance to improve tools' performance
- Assistance in development of new products' tools
- Regular maintenance and service

Technical Guide

Markets served

Automotive industry

Tools for:

- turbochargers: housings, cores and volutes
- engine mounts
- headlight supports
- hinges for automobile hood
- wheel balance weights (wheel equipment)
- motorcycle front forks: housings and cores
- motorcycle engine cover

Electric

- axels
- housings
- contacts
- supports and housings for lights

Household appliances

- washing machine door hinge

Metal working

- furniture connectors
- concealed hinges
- dampers
- wire joiners

Toy industry

- manual typewriter

Die casting industry

- tools, melt pots, goose necks

Automation systems

- standard modules and transport
- pallets for assembly lines

Design and building of tools

We conform to following principles and methods:

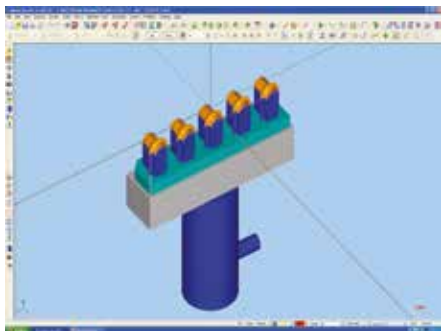
APQP (advanced product quality planning) and **PPAP** (production part approval process) – method of approving production process that is capable of consistently producing a conforming product.

FMEA (failure mode and effect analysis) of products and processes

SMED (single minute exchange of die)

Software equipment

At tool construction and design we use the most advanced software solutions and 3D CAD/CAM design software. The CAD software used is Pro/Engineer and the CAM system is Mastercam. This allows us to offer the highest level of design quality and building of customized tools. Optimal tool design and construction provide high productivity and long life of a tool.



Manufacturing equipment

Tools are manufactured using advanced CNC machines: MahoDeckel, Charmilles, Agie, Hauser and Jung.

We are equipped with a 3D DEA coordinate measuring machine for inspection and Mytutoyo optical measuring machine.

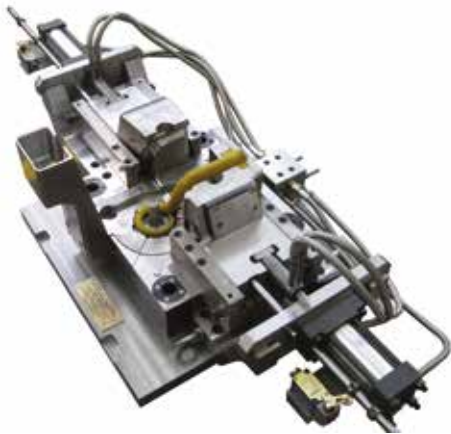
operation	model	manufacturer	workpiece weight (max)	X max (mm)	Y max (mm)	Z max (mm)	4. os max (mm)	5. os max (mm)	N max	Control
CNC milling	VCP710 DMU80P	Micron Deckel-Maho	1600 800	710 800	650 700	450 600	table rotation		20.000 18.000	TNC 430 TNC 426
Coordinate grinding	S3	Hauser	/	400	250	100	/	/	/	CNC314
Die Sinking	Roboform 200	Charmilles	500	320	220	320	/	/	/	Roboform
Wire erosion	Classic Challenge	Agie Agie	450 400	350 500	250 350	250 250	70 70	90 90		Agie Vision Agie Vision
Profile grinding	JF520 MS	Jung	50	450	175	250	/	/	/	/
Measuring machine	Gama 1202	DEA	/	1050	950	650	/	/	/	/
Die sinking	Roboform 550S	Agie	1600	600	400	450	/	/	/	FAWC180 IWB






Operations

standard processing methods		X max (mm)	Ymax (mm)	piece
Grinding	Surface grinding	750	250	1
	Surface grinding	800	500	1
	Surface grinding	250	500	1
	Surface grinding			1
Milling	Milling machine	900	350	5
	Milling machine	2000	700	1
	Copying Milling	360	200	1
Turning	Lathe			2
Sawing	Sawing machines			1
Drilling	Precise drilling	600	400	1
	Drilling machines			3
	Auxiliary drilling machines			1
Sandblasting	Sandblasting machine			1

Gravity Die Casting Tools



- Precise tooling with tight tolerances
- Ability to cast complex product shapes
- Dimensional accuracy and repeatability of castings
- The highest level of flexibility in tool construction

Gravity die casting tools	We specialize in design and construction of turbo charger housings, coring and volutes.	Max. tool size Depends on customer request
		Weight of castings Up to 15kg

Aluminium castings from our tools		turbo charger cores and housing
		
		motorcycle back fork housings and cores
		motorcycle engine cover
		engine mount




High Pressure Die Casting Tools

- High precision
- High productivity
- Dimensional consistency over high volume production runs
- For the manufacturing of components from 1 to 1000g

Conventional tools	<p>Nr. of slides depends on product specifics.</p> <p>For machines with locking force up to 120 tonnes and max line pressure 300 bar.</p> <p>To be used with zinc alloys.</p>	<p>Max. tool size 800 x 600 x 600mm</p> <p>Weight of castings Up to 1000g</p>
<div>Multi-slide tools</div> <div></div>	<p>Up to 5 slides.</p> <p>For machines with locking force up to 2 tonnes and line pressure up to 8 bar.</p> <p>To be used with zinc, lead or tin based alloys.</p>	<p>Max. tool size 300 x 300mm</p> <p>Weight of castings From 60 to 225g</p>
Castings made by our tools	<div></div>	<p>wheel weights for automobiles and trucks</p> <p>furniture fittings</p> <p>parts for electric appliances</p> <p>components for automotive</p>

Stamping Tools

- High precision
- Long life expectancy
- High productivity levels
- Wide range of applicability

Progression tools 	<p>The most suitable method of designing new tools is chosen on the basis of customer's sketch or 3D model.</p>	<p>Max. tool size 2500 x 1000 x 700mm</p> <p>Strip thickness up to 6mm</p>
Transfer tools 	<p>Design and construction includes tooling and a transfer system.</p> <p>Protective hard coatings To improve tool life expectancy and productivity</p> <ul style="list-style-type: none">· In highly demanding applications· On high volume tools	<p>Max. tool size 3000 x 1500mm</p> <p>Strip thickness up to 2mm</p>
Deep drawing stamping tools 	<p>We advise the most suitable number of tool steps to ensure:</p> <ul style="list-style-type: none">· Good performance· Long life expectancy· High product quality	<p>Max. tool size 2500 x 1000 x 700mm</p> <p>Strip thickness up to 2mm</p> <p>Design and manufacture of tools for cold bending of sheet metal.</p>

Castings made by our tools		<p>Tools for furniture fittings, automotive industry and other industries</p>
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Plastic Injection Mould Tools

- High production rates
- Repeatable high tolerances



Tools for production of parts from thermoplastics.

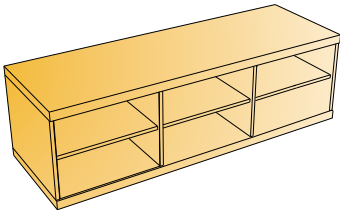
Max. tool size
1000 x 1000mm

Thermoplastic products made by our tools

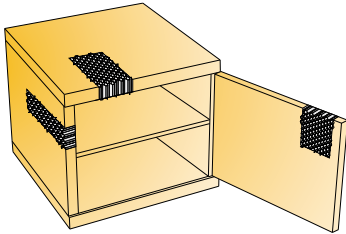


Plastic parts for house-hold appliances, automotive products, furniture hardware, electroindustry

Clean and fast assembly of furniture cabinets



Rigid cabinet assembly



Frameless Hollow Core Board assembly



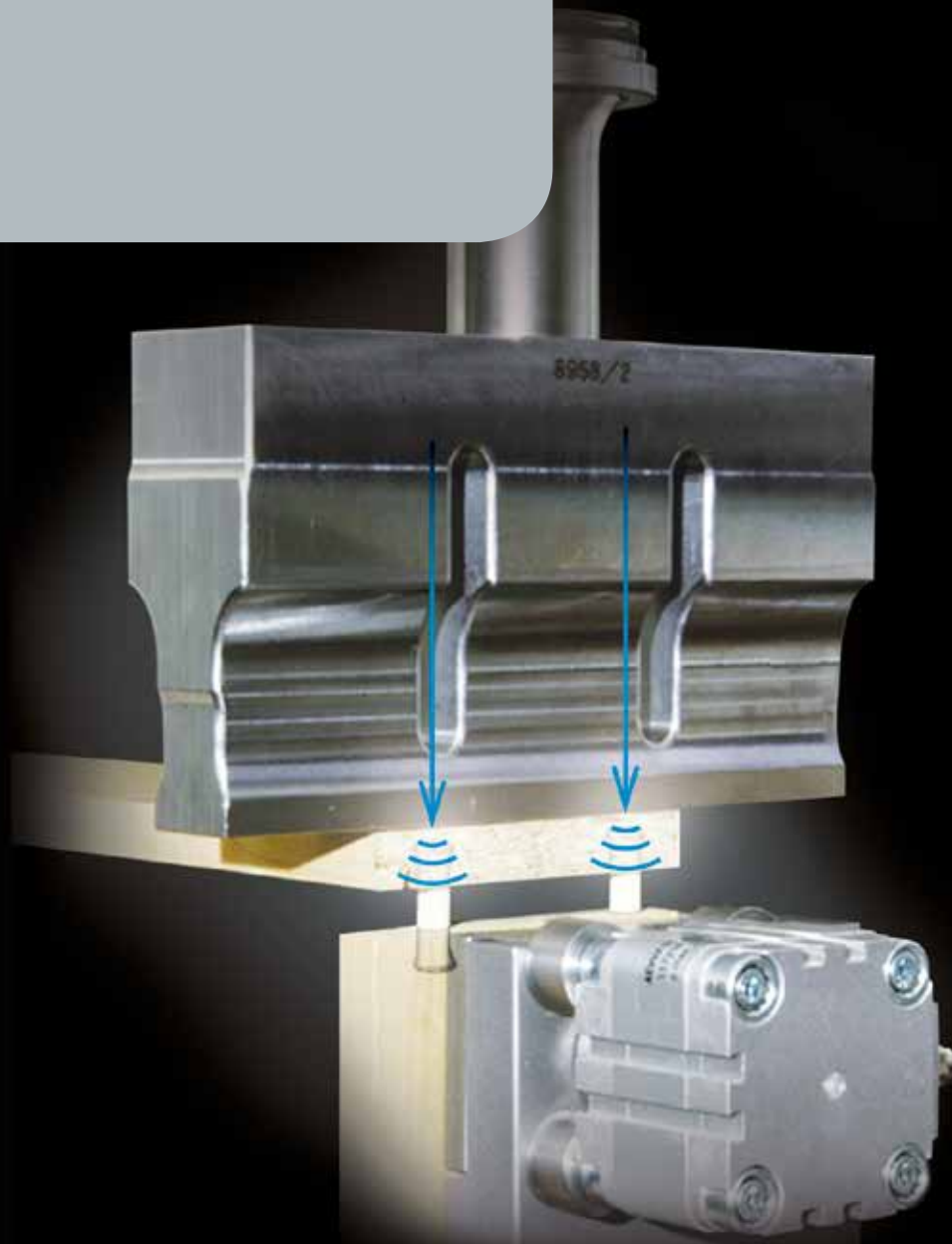
Revolutionary ultrasonic fastening

- Faster
- Cleaner
- Stronger

Advantages over traditionally glued dowels

- Bonds in three to four seconds
- Exceptional strength

Titusonic Technology



Quality assured

- The Titusonic process utilizes a Statistical Process Control (SPC) to monitor performance
- Each pressing is recorded and can be checked for quality reasons at any time

Can be applied to most wood based materials

- MDF, HDF
- Chipboard
- Most solid woods
- Plywood
- Frameless HCB

HCB fastening with Ultrasonics

- Doesn't require inner frame for fastening strenght
- Can be applied in random positions
- Can be tailored to anchor most conventional fittings

The Fastening Revolution

Technology		
Titusonic®	Is a part of the Titus Group which has been involved in design and manufacture of connectors for the furniture market for over 30 years. Titusonic® products are based on the revolutionary WoodWelding® fastening process for ultrasonically bonding wood materials without the use of adhesives, providing	The advanced process can be adapted into many product categories with the first two industrial applications in wood technology being Titusonic® cabinet fastening (Sonic Rivet) and Titusonic® Hollow Core Board (HCB) fastening, jointly developed with and licensed from WoodWelding SA, Switzerland.
	Exceptional strength Speed of fastening	
Ultrasonic process	When using the WoodWelding® process ultrasonic energy of approximately 20.000 cycles per second is applied. Adding pressure to the process, the liquified plastic connector element is forced into the wood utilising the natural porosity of most wood based materials such as chipboard, MDF, HDF and plywood. Most solid woods can also be used with this process, which takes only seconds to complete.	Traditionally wood products are joined together using mechanical fasteners such as wooden dowels and glue, screws or other connecting fittings. However these methods produce their own problems, which are largely resolved by the use of WoodWelding® technology. It takes fastening of wood products into the 21 st century with a process which can be likened to welding of steel in car manufacture and shipbuilding.

Titusonic® Cabinet Assembly

Ultrasonic fastening

Titusonic® Sonic Rivet

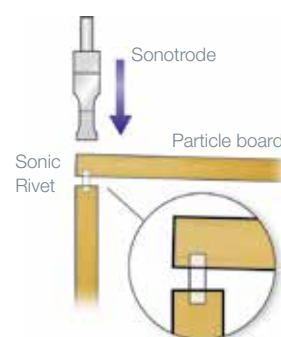


The Titusonic® Sonic Rivet replaces the commonly used wooden dowel and glue in the construction of cabinets and other furniture products.

Fastening process

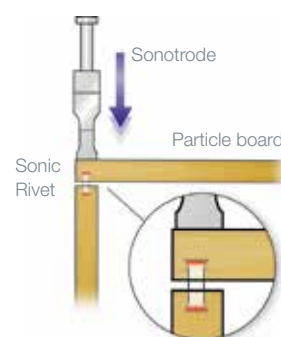
The WoodWelding® process uses a plastic dowel – Titusonic® Sonic Rivet, which is simply inserted in one side (no glue) and the panels pre-assembled and then placed in the press.

Pre-assemble the cabinet and place it into the press



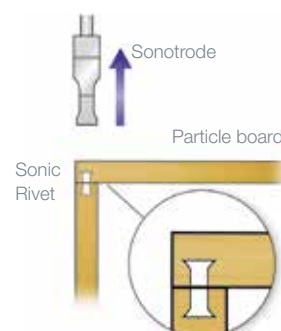
Pressure is applied to the joint whilst the ultrasonic energy is activated. The process time is about 1-2 seconds during which time the plastic dowel melts only at the ends and the plastic integrates with the chips in the particle board so that it bonds the boards together.

Ultrasonic energy bonds the boards together

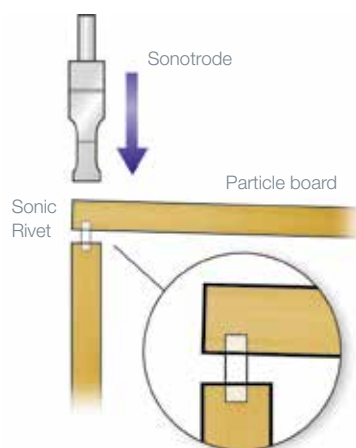
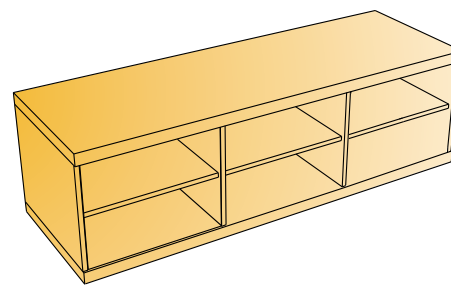


There is then a very short dwell time of about 2 seconds when the dowel shrinks in length so as to provide an additional clamping force (pulling together of the joint). The cabinet can then exit the press and is at full strength so it can be handled in a normal way and indeed instantly packed and despatched to the customer.

After 2 seconds of dwell time the cabinet can exit the press



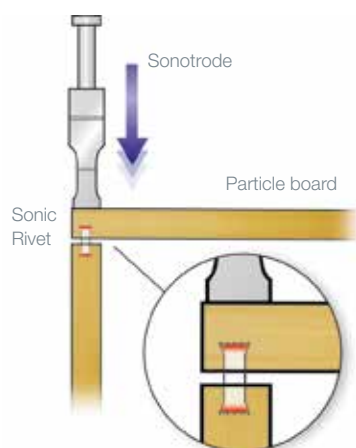
Titusonic® Sonic Rivet



The Titusonic® Sonic Rivet or “Hidden Dowel” has four key advantages over traditional methods of cabinet assembly. It is:

Quicker

The complete cycle time through a production press can be improved by between 3 and 6 times. The dwell time in a traditional press can be between 20 and 60 seconds waiting for the glue to go off sufficiently. The dwell time for the new Titusonic® dowel is about 2 seconds. The difference is made up of delivery and exit times from the press which are not altered by this process.

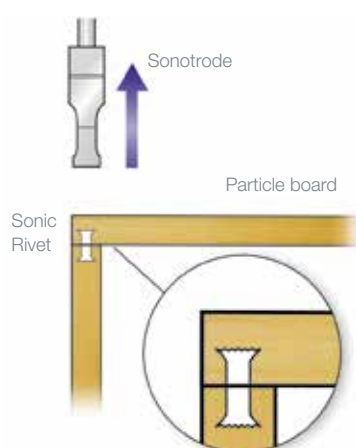


Stronger

The product is approximately 30% stronger than its traditional wooden dowel rival.

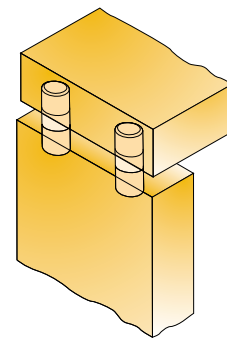
Cleaner

No more glue! This simplifies machinery and eliminates clean down at end of shift. Much furniture needs cleaning of glue which has spread.



Repeatable / Measurable

The new product is an engineered process. The old product is wood and glue which varies according to a number of factors. The new product is more reliable, repeatable, with performance that is more recordable, measurable and traceable for quality purposes.



Titusonic® Sonic Rivet



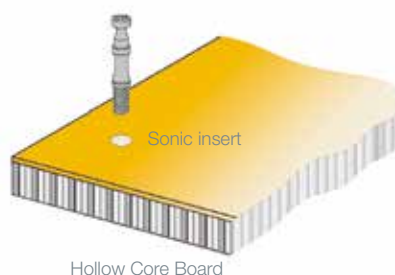
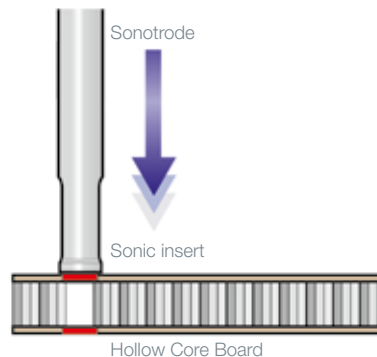
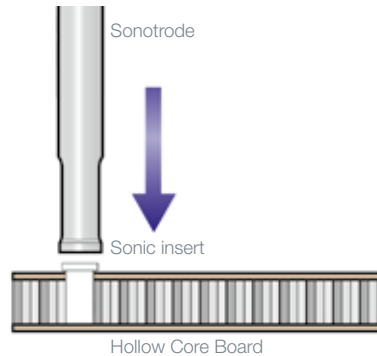
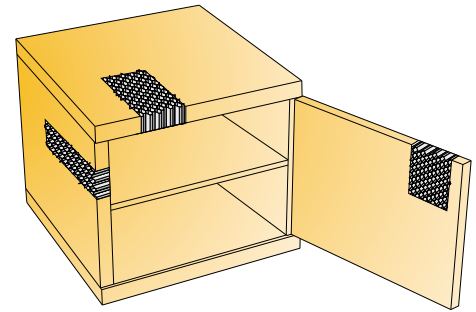
Made of plastic

Dimensions (mm)	Item number
Ø6 x 30	SR 0716
Ø6 x 40	SR 0726
Ø8 x 30	SR 0712
Ø8 x 40	SR 0725

Ligmatech MDE120 cabinet
press with ultrasonics



Titusonic® Sonic Insert



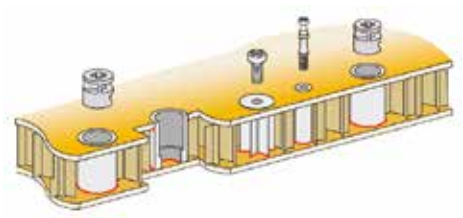
Hollow core boards (HCB) have slowly been introduced into furniture over the last 15 years and a few leading manufacturers have invested heavily in the production and use of this new type of light weight panel. These first HCB production lines demand the use of a frame to support and separate the thin panel surfaces and to enable edgebanding to be applied with conventional machines. These frames also enable the use of conventional hardware such as assembly fittings, hinges and drawer runners which can be attached to them. However the frames are expensive to fabricate and heavy, so defeat the prime benefit of HCB which is to provide a panel which is as light as possible.

Frameless HCB

The two main problems in the use of frameless HCB are:

- **How to apply an edge**
- **How to assemble the boards and fasten fittings into them**

Titusonic® is offering a revolutionary fastening solution – WoodWelding® Technology. The process focuses the ultrasonic energy onto specific locations on a plastic insert or fitting so that with applied pressure it melts into the porous surfaces of the HCB, at both the top and bottom of a blind hole (see illustration) in about 1 second and then solidifies in 1-2 seconds more. The process is fast, consistently gives strong results and eliminates the need for glue. This provides the ultimate solution as Titusonic® inserts can be placed in random positions on a HCB panel providing the flexibility that furniture designers require.



		Dimensions (mm)	Item number
Sonic Insert Dowel mount  Made of plastic		Ø10 x 38	SI 0607
Sonic Insert Cam house  Made of plastic		Ø18 x 38	SI 0608
Sonic Insert Round  Made of plastic		Ø25 x 19 x M5	SI 0616
		Ø25 x 22 x M5	SI 0611
		Ø25 x 30 x M5	SI 0610
		Ø25 x 50 x M6	SI 0602
		Ø40 x 50 x M6	SI 0618
		Ø40 x 50 x M8	SI 0621
Sonic Insert Spoked  Made of plastic		Ø25 x 30 x M5	SI 0609
		Ø25 x 50 x M6	SI 0603
		Ø40 x 50 x M6	SI 0619
		Ø40 x 50 x M8	SI 0622

Gateway 1000/2000
Titusonic® table press
for small volume application



Weeke ABL210 stop-go line
for drilling and insertion of
Titusonic® HCB inserts

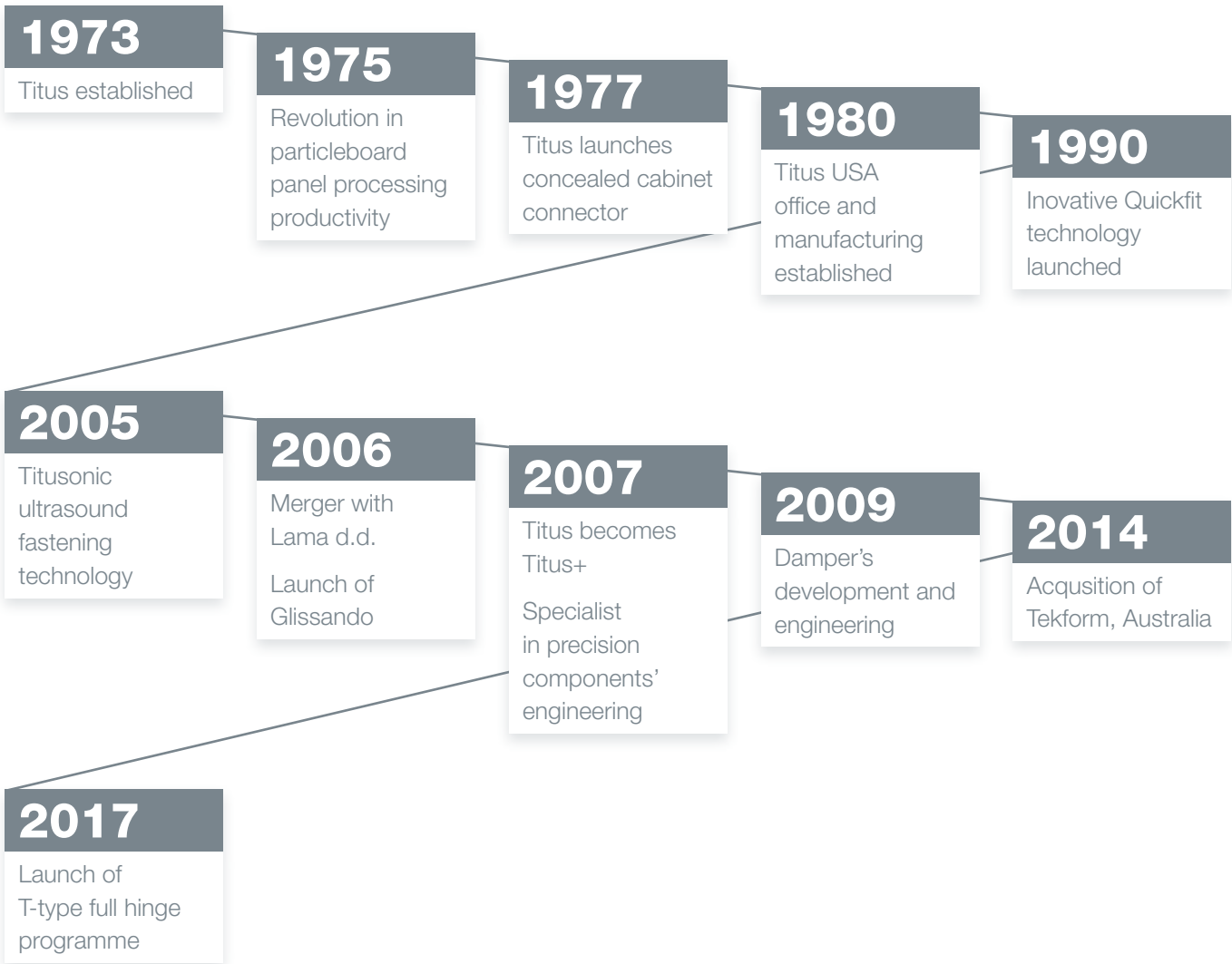


The Titus Group Profile

Titus focuses on the design, manufacture and distribution of connectors, concealed hinges drawers and soft closing mechanisms in furniture and household appliances.

Titus Group is owned and managed from its headquarters in United Kingdom. We are able to provide products and services to every customer around the world based on manufacturing facilities in Europe, North America, China, SE Asia, Australia and New Zealand.

Quickfit technology makes Titus the World leader in connectors for RTA furniture



Vision

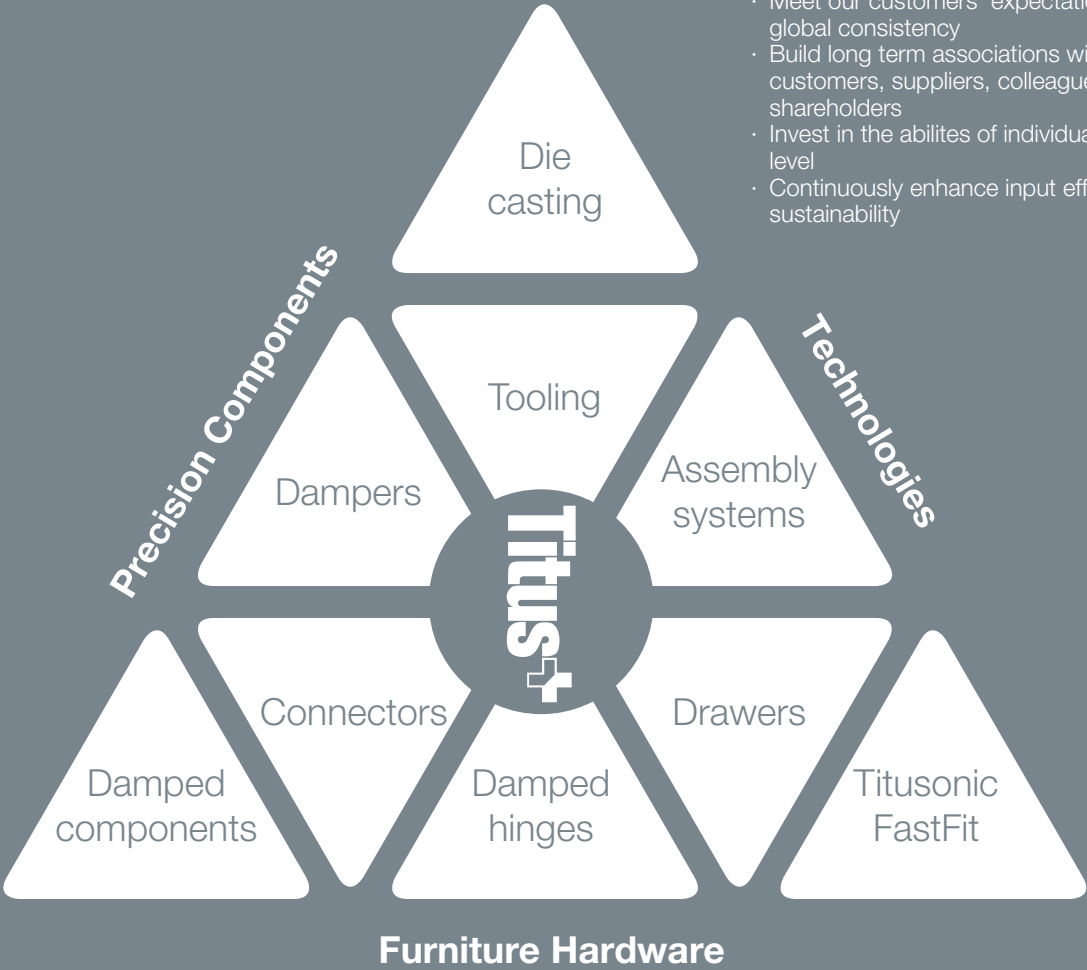
The world's best engineering for precision components

Mission

To provide manufacturers with components' solutions that improve competitiveness

Titus Business Philosophies and Principles

- Gain total knowledge of our customers and their markets
- Focus on identifying and creating high volume component niches
- Meet our customers' expectations with global consistency
- Build long term associations with customers, suppliers, colleagues and shareholders
- Invest in the abilities of individuals at every level
- Continuously enhance input efficiency and sustainability



Furniture Hardware

- Cabinet connectors
- Concealed hinges
- Soft closing systems
- Drawers and drawer systems
- Kitchen accessories
- Furniture locks
- Decorative

Components

- Dampers
- Precision components

Technologies

- Automation systems
- Precision castings
- Die cast technologies
- Tooling
- Ultrasound fastening technology
- FastFit technology

‘Totally Integrated Engineering’

Product Design

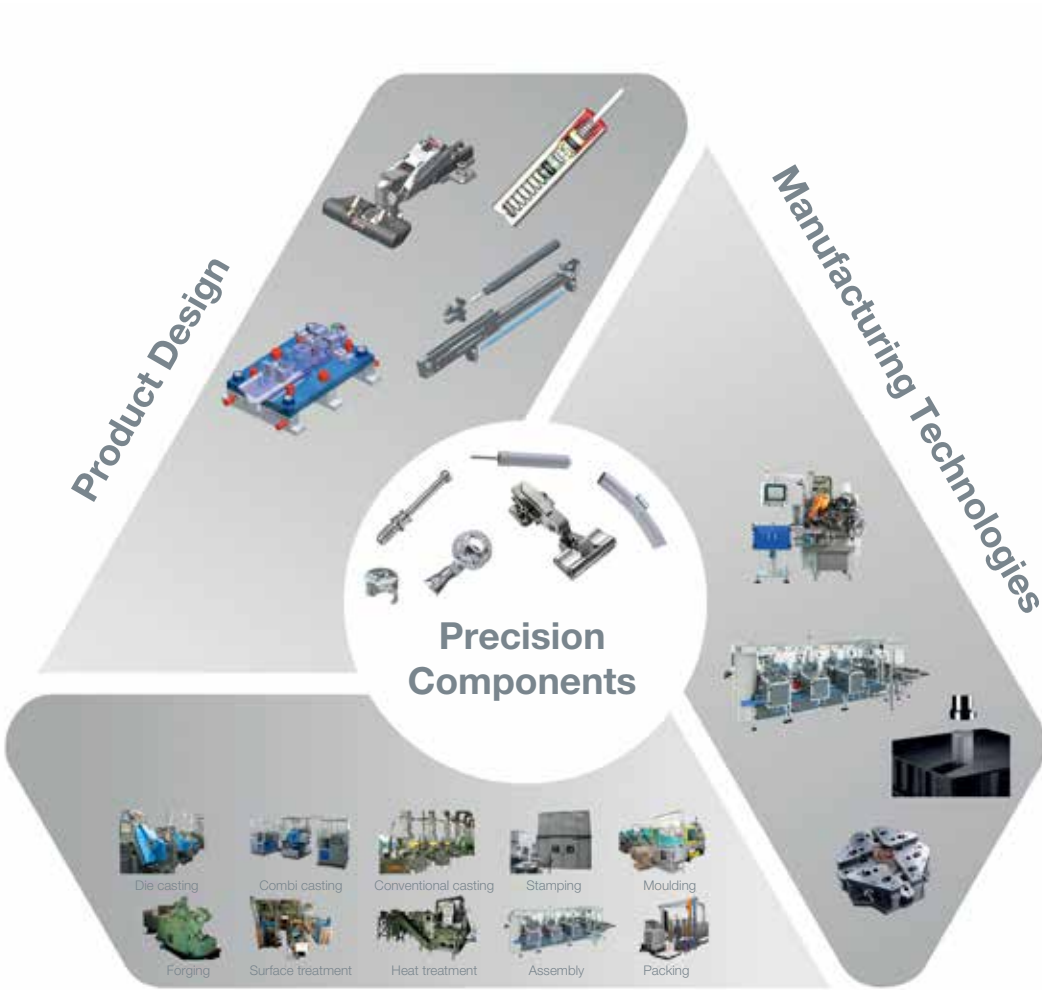
Design and engineering of unique components
Consistent and repeatable product quality

Manufacturing Technologies

to improve productivity and product quality

Manufacturing Operations

A wide array of technologies and services required for high volume production of precision components available in-house



Manufacturing Operations

Fittings for purpose

Unique product advantages for better value for money and lower ‘total installed cost’

Innovations that improve

with less parts, less different parts, less preparation actions, faster assembly

Fast time-to-market

Continuous Improvement

The Titus Group Mission, to improve the competitiveness of our customers, encourages us to continuously improve our products, services, processes and competencies of our employees.

Quality

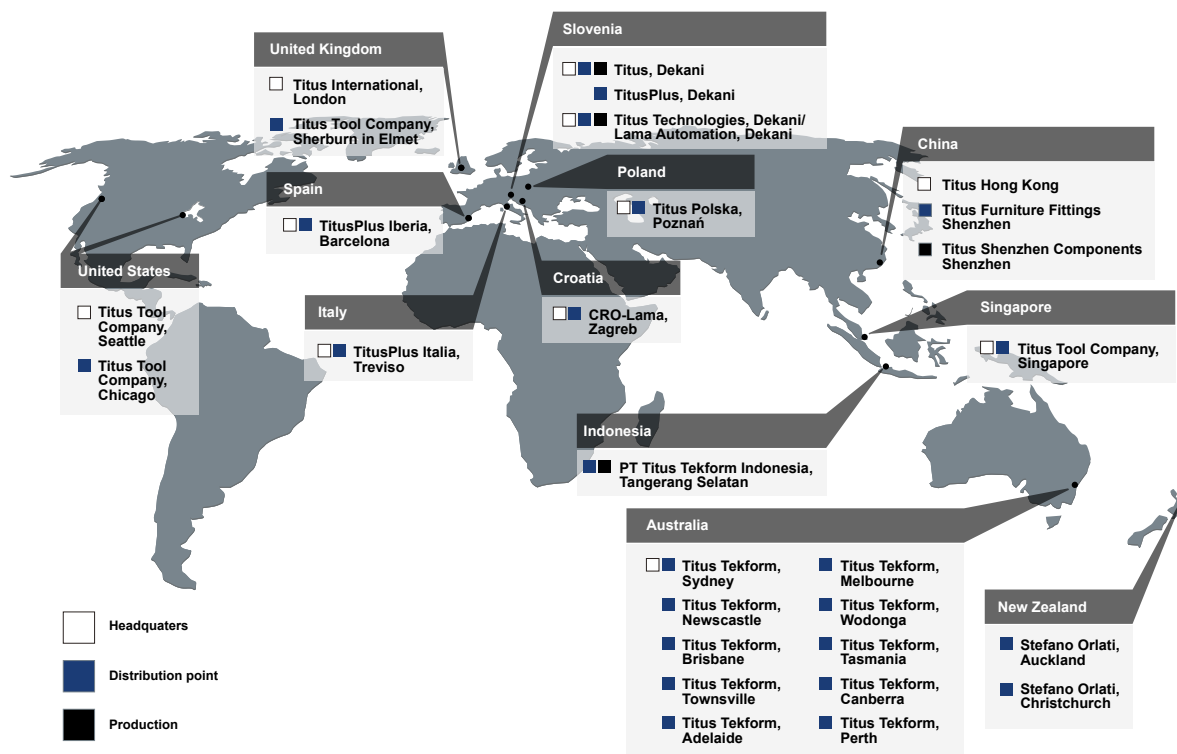
We believe that the Titus Mission is achieved most effectively through the management of our design, manufacturing and service activities in conformance with the ISO 9001 standard for quality management. Quality has a broad meaning for us: it is our guide to the selection of materials, work, processes, internal relations and cooperation with partners.

Products

Our integrated quality system produces technically optimized products of high quality. They are assessed regularly in our own test labs as well as by internationally renowned institutions, such as LGA from Germany, CTBA from Frawnce, FIRA from United Kingdom, CATAS from Italy, AIDIMA from Spain, and others.



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Notes

Notes

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