

FIDIA 
Giving shape to design

High-speed milling systems

Fidia is a firm believer in high speed milling and has dedicated years of continuous research to the development of machines that have successfully operated worldwide since the early 90s. Continuing market growth confirms the validity of the choices made by Fidia. Above all, high speed means high machine dynamics and fast spindle speeds. The resulting high feed rate can only be maintained by specifically designed machines in order to guarantee precision and surface quality at the same time.

A first result is a reduction in machining time and amount of bench work. But high speed also means being able to machine very hard materials and thus simplify production cycles with just one set up. The 5 axis version, available on all models, widens and highlights the advantages of high speed machining.

Fidia high-speed milling systems find application in many different sectors:

Aerospace

- structural parts
- landing gears
- turbine discs deburring
- turbine blades
- impellers
- layer tools
- composite routing

Automotive

- plastic injection moulds
- stamping dies
- forging dies
- die-casting dies
- tire moulds and models
- prototyping and styling models

Footwear mould and models

Electrodes

Household appliances moulds

Medical

General machining

Windpower

Naval

Military



Aerospace

5 axis machining is essential for operating on many types of aeronautical and aerospace components.

Solutions with bi-rotary heads and rotary-tilting tables represent the right solution to the most complex situations where productivity and accuracy are primary requirements.



Automatic turbine discs deburring

The accurate removal of burrs caused by the broaching operation of blade mounting slots is performed on 6 axis CNC dedicated machines that take advantage of a specific software, jointly developed with a world leading aero-engine manufacturer.





Automotive

Stamping dies

The automotive industry requires highly accurate machines to mill cast-iron and steel dies from the roughing operation to the final superfinishing of surfaces. Manual polishing can be mostly avoided and all operations can be done with a single set up of the work-piece on FIDIA fixed table solution.



Plastic injection and die-casting

The accuracy of details and the surface quality feature this type of moulds and dies. Bi-rotary heads with high accessibility and a consequent reduction of tool length make these targets possible.

Dust removal packages allow for the machining of graphite electrodes in complete safety and with respect for the environment.





Tires

Machining with an extremely compact 5 continuous axis high-precision head ensures optimum accessibility in steel and aluminium tread moulds as well as in resin models. Specific software packages together with very high-speed spindles make Fidia milling systems particularly suitable for "sidewall" lettering.



Prototyping and styling

The continuous reduction of time to market makes the construction of prototyping moulds and dies, and quality control gauges, more and more urgent, forcing to faster and faster prototyping tools.

The increased size of last generation machines, like the GTF series, allows for the machining of full-scale models even for the automotive field.





Forging

The extreme dynamic rigidity of machine tools allows for the direct machining of hardened dies. With the aid of suitable tooling, it is possible to restore dies having a nitride or a flood welded surface, thus avoiding edm.



Footwear

Rotary-tilting table for machining on five sides, automatic 16 station loader, copying software and enlargement/reduction using scale factors.

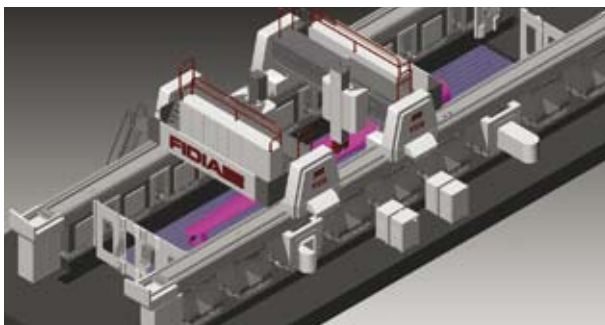
The wide range of accessories allows for the machining of sole, ski boot and boot moulds as well as complex resin models.





Wind power

With the development of new big machines, FIDIA makes its technology available for the machining of large components for the wind power, like the mold for rotor blade shaping, gearbox, and slew rings.



Honeycomb

Alveolar structures mainly used in Aircraft industry. They are featured by a multi-layer composition presenting maximum strength and minimum weight. The elaborate structure of the materials used for the production of honeycomb, requires special attention during tooling, clamping, dust and chip suction operations. For this reason, dedicated and interactive working cycles, already developed by Fidia, are often required.





The FIDIA Integrated System

The Fidia numerical controls takes full advantage of the potential offered by combining the performance of the Pentium 4 and the RISC Power PC processors. It is conceived to manage the most sophisticated high speed applications running at 5 axes with RTCP. It is equipped with Windows XP Professional operating system in multitasking mode.

Simple and reliable machining

C20 and C20 Vision are equipped with a 19" TFT video while nC15, which is the most compact version, is equipped with 15" TFT Touch screen. Thanks to HI-MILL 3D CAM and ISOGRAPH 2½D CAD/CAM they directly import CAD mathematical models in IGES, VDA-FS, DXF, DWG formats, enhancing but at the same time simplifying tool path management.

Mechanical machining such as slots, threads and pullers are programmed directly on board of the machine in total safety thanks to its soft keys and to the possibility to simulate in real time any kind of tool path.



High speed milling

The parameters, adapted to the specific dynamic characteristics of the machine tool, are optimized by the following path control software functions:

- dynamic Look-Ahead with advanced feed control for curves;
- Active Tuning and Active Damping to optimize performance in terms of accuracy, surface quality and execution times;
- set of customized parameters for different machining conditions (roughing, semi-finishing, finishing and rest-machining) recalled by G functions;
- Jerk Control (control of variations in acceleration).

C20 Vision and ViMill™

The C20 Vision numerical control with the integrated ViMill system allows the machine operator to visually check any possible collision or unexpected movements between tool, head and machine with the actual workpiece just before pressing the start push button or during the real milling process.

The ViMill function proves to be also very useful during machine operation and in case of program stop and re-start.

In fact, even if the part program has been duly verified with off-line simulation solutions, many CNC parameter settings can produce machine movements that are not possible to check using conventional off-line methods.

Using ViMill function, the operator can visually check all axes and movements at the most critical time, just before pressing start.

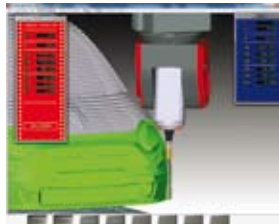
Besides, "like in a moviola video", using the CNC hand-wheel or the jog push buttons, the operator can virtually move the machine, back and forward, according to the selected part program with the actual set of CNC parameters and tools value defined.

It's very easy to verify the milling, to avoid rough mistakes and even check small undesired movements by using ViMill zooms and graphic functions.

Patent Panding



Look Ahead Virtual Milling display



Collision detection error display



GTF/P - GTF/R

The new GTF Gantry machine Line, identified by a wide operative volume modularity, combines High Speed performances with great structural stiffness.

GTF meets the ultimate needs of industrial sector as:

- automotive
- aerospace
- energy

The /P and /R versions feature modular structure, based upon mighty epoxy concrete columns.

Confirmed by the wide selection of rams and dedicated 5 axes milling heads, the GTF versatility ranges from aluminum to titanium, steel and cast iron.

Linear axis travel	X	Y	Z	
(mm)	starting from 2000 (79")	Within the range 2000 (79") 4000 (157")	Within the range 1000 (39") 2500 (98")	
Axis speed				
(m/min)	from 30 to 60 (1181 - 2362 ipm)			
Tool magazine				
Positions	from 24 to >120			
Milling head bi-rotary continuous/indexed	M5A	M5E	M5H	
A axis stroke	-110°/+95°		±110°	
C axis stroke	±200°/±220° (optional ±360°)			
Max power (kW)	55	62	34	40
Torque (Nm)	88	296	51	960
max speed (1/min)	24000 14000	15000	24000	3000
Toolholder	HSK100A - HSK63A		ISO 50	





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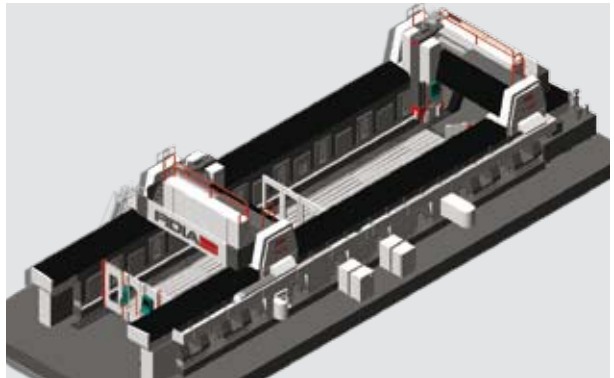
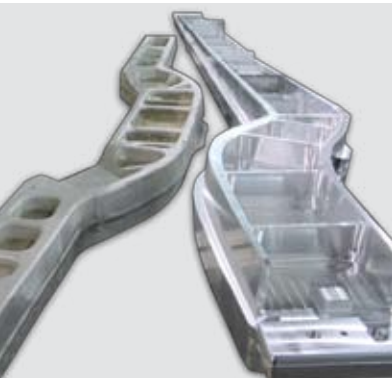
A double traverse further enhances the modular concept of the GTF machine.

Two independent heads can work either sharing the same piece or two different pieces using the bulkhead.

The X axis stroke can be adapted to all requirements.

Linear axis travel	X*	Y*	Z
(mm)	from 10000 (394")	2200 (87") 2800 (110") 3500 (138") 4000 (157")	from 1000 (39") to 2500 (98")
Linear axis feed			
(m/min)		up to 60	
Tool magazine			
positions	from 2x24 to 2x120		
Milling head			
bi-rotary continuous/indexed			
A axis stroke	-110°/+95°		
C axis stroke	±200° (optional ±360°)		
max power (kW)	55		
max speed (1/min)	24000	14000	
toolholder	HSK63A	HSK100A	

* +150 mm (6") rotating the C axis with vertical spindle





GTF/M

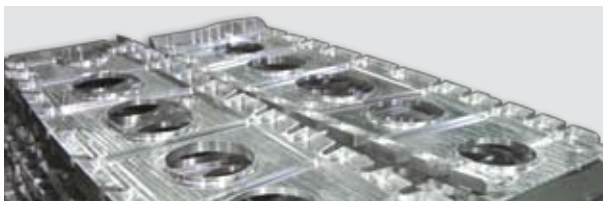
The most compact version in GTF family relies on a monolithic structure of steel and cast iron. Perfect size for plastic injection moulds and prototyping.

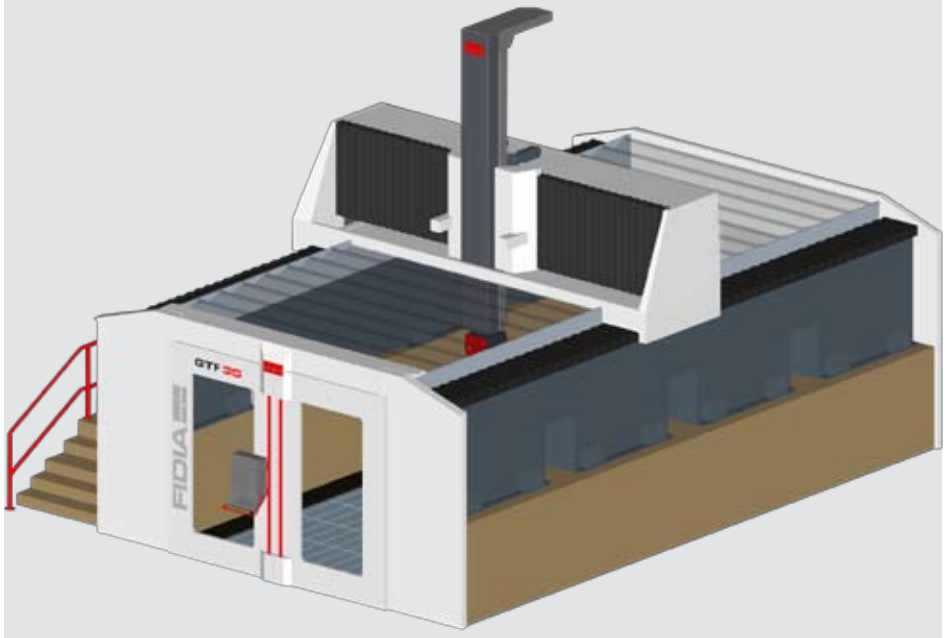
Linear axis travel	X	Y	Z
(mm)	2000 (79") 3500 (138")	1500 (59") 2200 (86")	1000 (39") 1250 (49") 1400 (55")
Axis speed			
(m/min)	30 (1181 ipm)		
Tool magazine			
positions	24 - 84		
Milling head			
M5A bi-rotary continuous/indexed			
55 kW - 24000 1/min - HSK63A			

GTF/Q

Compact epoxy concrete columns allow for modular sizing and bring the GTF into the wide market of aeronautical frames and composites.

Linear axis travel	X	Y	Z
(mm)	from 4200 (165") 12000 (472") more...	2200 (86") 2700 (106") 3500 (138")	1000 (39") 1250 (49") 1400 (55")
Axis speed			
(m/min)	30 (1181 ipm)		
Tool magazine			
positions	from 24 to >120		
Milling head			
M5A bi-rotary continuous/indexed			
55 kW - 24000 1/min - HSK63A			

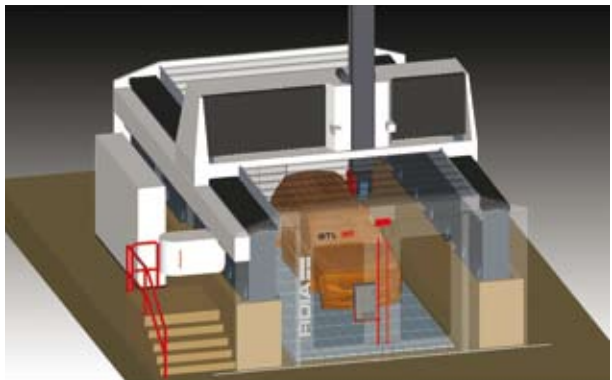
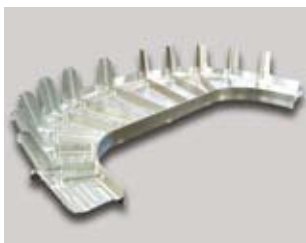




GTF/L

The lightest version of GTF family matches with composites 5 axes fast machining as well as styling model applications. Structures are made of welded steel and strokes can be widely configured.

Linear axis travel	X	Y	Z
(mm)	from 4000 (157")	2200 (86") to 4000 (157")	1000 (39") to 2500 (98")
Axis speed			
(m/min)	up to 60		
Tool magazine			
positions	24 - 84		
Milling head			
M5C			
22 kW - 24000 rpm - HSK63F			





K199

Being the most compact machine of the K series, it represents the ideal solution for all small and medium size molds and prototypes. The machine morphology with fixed bench provides evident advantages in workpiece loading and machining precision.

Linear axis travel	X*	Y*	Z
(mm)	1650 (64.9")	750 (29.5")	850 (33.4")
Linear axis feed			
(m/min)	30 (1181 ipm)		
Tool magazine			
positions	24 - 42		
Milling heads		bi-rotary continuous/indexed	
A axis stroke	-110°/+95°		
C axis stroke	±200° (opzional ±360°)		
max power (kW)	55		
max speed (1/min)	24000		
toolholder	HSK63A		
Fixed worktable			
dimensions (mm)	2000 x 1250 (78.7"x49.2")		
max load (kg)	10000 (26455 lbs)		

* +150 mm (6") rotating the C axis with vertical spindle





KR199

The implementation of medium size rotary tables significantly increases the working envelope, still guaranteeing the operator the maximum accessibility and ease of use.

The Direct Drive table solution with through hole is specifically designed for milling and turning of turbine engine hubs and outer casings.

Linear axis travel	X*	Y*	Z
(mm)	1650 (64.9")	750 (29.5")	850 (33.4")

Linear axis feed	
(m/min)	30 (1181 ipm)

Tool magazine	
positions	24 - 42

Milling head	bi-rotary continuous/indexed
A axis stroke	-110°/+95°
C axis stroke	±200° (optional ±360°)
max power (kW)	55
max speed (1/min)	24000
toolholder	HSK63A

Rotary Tables	1300	1600	800 DD
Table surface (mm)	1300 x 1300 (51" x 51")	1600 x 1600 (63" x 63")	Ø 800 (31.5")
Table (dia x trough hole) Direct Drive	-	-	Ø 800 x 500 (31.5"x19.7")
Maximum load (kg)	7000 (15432.3 lbs)	10000 (22046.2 lbs)	1000 (2204.6 lbs)
Rotation speed (1/min)	4	3	60
Position accuracy	± 5"	± 5"	± 3"

* +150 mm (6") rotating the C axis with vertical spindle





K211/411

Ideal solution specifically designed for large plastic injection moulds and for aeronautical components, are able to perform all machining processes in one single set up, from roughing out to super-finishing.

Linear axis travel		X*	Y*	Z
K211/K214	(mm)	2700 (106")	1100	1000/1400
K411/K414		4200 (165")	(43")	(39"/55")
Linear axis feed		X	Y	Z
(m/min)		30 (1181 ipm)	24 (945 ipm)	
Tool magazine				
positions		42 - 60 - 84 - 120		
Milling head		bi-rotary continuous/indexed		
A axis travel		-110°/+95°		
C axis travel		±200° (optional ±360°)		
max power (kW)		55		
max speed (1/min)		24000		
toolholder		HSK63A		
Fixed worktable				
K211/K214	dimensions	3500x1500 (138"x59")		
K411/K414	(mm)	5000x1500 (197"x59")		
max load (kg/m²)		9000 (1843 lbs/sqft)		

* +150 mm (6") rotating the C axis with vertical spindle





K611/811/911

This machine line represents the Fidia answer to Aerospace industry demanding for high speed 5-axes capabilities and requiring very long X axis travel and relatively small cross travel.

Thanks to the rack-and-pinion design, the K Range can be supplied with X axis travels tailored to Customer needs, without penalizing its dynamic performances.

Linear axis travel		X*	Y*	Z
K611/614	(mm)	6000 (236")	1100 (43.4")	1000 (39")/ 1400 (55")
K811/814		8000 (315")		
K911/914		9000 (354")		
Linear axis feed				
(m/min)		24 (945 ipm)		
Tool magazine				
positions		42 - 60 - 84 - 120		
Milling head		bi-rotary continuous/indexed		
A axis stroke		-110°/+95°		
C axis stroke		±200°(opzional ±360°)		
max power (kW)		55		
max speed(1/min)		24000		
toolholder		HSK63A		
Worktables				
K611/614	dimensions (mm)	8000x1500 (315" x 59")		
K811/814		10000x1500 (394"x59")		
K911/914		11000x1500 (433" x 59")		
max load (kg/m ²)		4000 (819 lbs/sqft)		



* +150 mm (6") rotating the C axis with vertical spindle



KR211/214

KR versions, thanks to the embodied large rotary table, allow for the every single side machining of pieces having a swing diameter of 2500 mm (98.5").

Linear axis travel		X*	Y*	Z
KR211/ KR214	(mm)	2700 (106")	1100 (43")	1000/1400 (39/55")
Linear axis feed				
(m/min)		30 (1181 ipm)		
Tool magazine				
positions		42 - 60 - 84 - 120		
Milling head		bi-rotary continuous/indexed		
A axis travel		-110°/+95°		
C axis travel		±200° (optional ±360°)		
max power (kW)		55		
max speed (1/min)		24000		
toolholder		HSK63A		
Rotary table				
dimensions (mm)		2200x2000 (87"x79")		
max load (kg)		15000 (33069 lbs)		

* +150 mm (6") rotating the C axis with vertical spindle





G996

G996 basic configuration is an upper gantry, with high rigidity monolithic basement that incorporates a fixed table.

Milling equipment on vertical ram includes 3, 3+2 axis and 5 continuous axis solutions

Linear axis travel	X	Y	Z
(mm)	850 (33")	950 (37")	600 (24")
Linear axis feed			
(m/min)	45 (1772 ipm)		
Tool magazine			
positions	24 - 42 - 84		
Milling head	3 axis (V)	Indexed bi-rotary (BSH)	Continuous bi-rotary (5A)
C axis stroke		-177°/+180°	±360°
B axis stroke		-102°/+24°	±110°
max. power (kW)	30	55	7,5
max. speed (1/min)	24000	24000	32000
toolholder	HSK63A	HSK63A	HSK40E
Fixed worktable			
dimensions (mm)	1200 x 830 (47" x 33")		
max load (kg)	2000 (4409 lbs)		
Main options			
Dust suction system			
High pressure coolant through tool centre			



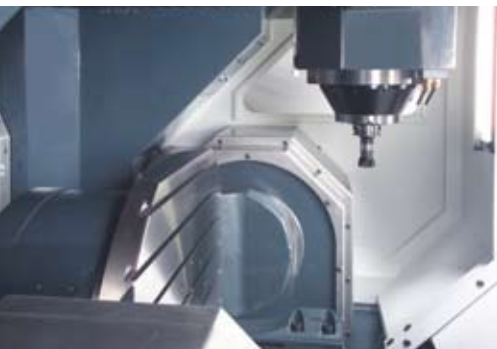


G996RT

The standard worktable can be replaced by rotary-tilting tables (trunnion type), each being particularly well dimensioned for the machining of complex geometrical shapes.

- L-900 with torque motors load capacity: 850 kg (1873 lbs)
- L-1000 with torque motors load capacity: 1200 kg (2645 lbs)

Milling spindle			
max power (kW)	30		
max speed (1/min)	24000		
toolholder	HSK63A		
Integrated rototilting table		L-900	L-1000
dimensions (mm)	600 x 600 (24" x 24")		Ø 800 (Ø 31")
max rotation diameter (mm)	800 (31")		1000 (39")
A axis	stroke	±120°	
	speed (1/min)	50	
	acceleration (°/s ²)	2000	
C axis	stroke	rollover	
	speed (1/min)	100	
	acceleration (°/s ²)	2000	
max load (kg)	850 (1873 lbs)	1200 (2646 lbs)	
Main options			
High pressure coolant through tool centre			
6-8 position automatic pallet changer			





FMS: Flexible Manufacturing System

The platform integrates a pallet system shared by two or more machines. A powerful dedicated software, automatically manages and optimizes the flow of production without intervention of the machine operator. Such a way of functioning pursues the following goals:

- reduction of waiting times;
- simplification of programming;
- optimization of tool wear-out;
- full monitoring of production flow;
- reduction of human error risks;
- never-ending 7/7 & 24/24 production.

Each machine can be also used in a standalone way, nonetheless granting the normal functioning of the FMS system with the other machines.





D218/318/418

Specialized milling systems for the finishing of moulds and dies as well as for the machining of light alloys. A wide range of possible configurations makes this machine extremely versatile.



Linea axis travel		X	Y	Z
D218	(mm)	2000 (79")	1000 (39")	800 (31")
D318		3000 (118")		
D418		4000 (157")		
Linear axis feed				
(m/min)		20 (787 ipm)		
Tool magazine				
positions		20 - 42		
Milling heads		bi-rotary indexed (BSH)	bi-rotary continuous (5A)	
C axis stroke		-177°/+180°	±360°	
B axis stroke		-102°/+24°	±110°	
max power (kW)		22	7.5	
max speed (1/min)		30000	32000	
toolholder		HSK50E	HSK40E	
Worktable				
D218	dimensions (mm)	2500 x 1500 (98"x59")		
	max load (kg)	18000 (39683 lbs)		
D318	dimensions (mm)	3500 x 1500 (138"x59")		
	max load (kg)	22000 (48502 lbs)		
D418	dimensions (mm)	4500 x 1500 (177"x59")		
	max load (kg)	28000 (61729 lbs)		
Main options				
Digitizing				
Dust suction system				
Chip conveyor				
6th axis rotary table				



HS664RT

Milling systems for the machining of small and medium parts.

The comprehensive range of optional accessories make these systems suitable for all applications where a fast and accurate machining of complex shapes is required.

Their high versatility is ideal for operations such as modelling, machining on electrodes, forging dies and plastic injection moulds and even for small production batches.

Linear axis travel	X	Y	Z
(mm)	600 (23.6")	560 (22")	400 (15.7")
Linear axis feed			
(m/min)	30 (1181 ipm)		
Tool Magazine			
positions	20 - 30 - 42		
Milling Spindles			
speed (1/min)	24000	36000	
max power (kW)	25.8	19	
toolholder	HSK63A/E	HSK50E	
Integrated rototilting table (RT)			
faceplate diameter (mm)	400 (15.7")		
max rotation diameter (mm)	570 (22.4")		
A axis stroke	-100° / + 105°		
C axis stroke	rollover		
Main options			
Automatic pallet changer for 8 or 16 workpieces			
Graphite dust suction unit			
Indexed rototilting table			
Digitizing			



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