OUR VALUES, OUR HISTORY

Almost 100 years of history told through our milestone and values

Innovation
1st Machining Center
1960

Clever thinking
Plasma control
1980

Pioneering
Titanium machining
2005 - 2010

Bravery
Spark 3500
2015 - 2018

Tirelessness
HS50
2023

Ingeniousness
Mandelli workshop set up
1932

Revolutionary
Spark
2000 - 2005

The big one
Spark 4000
2024

Customer orientation
FMS
1970

Evolution
Storm, Rock, Thunder
1990

Forerunners
iPuma and Rumble
2010 - 2015

Responsiveness
Allied Group worldwide network
2021

4 & 5 axes Mill/Turn Horizontal Machining Centers

The Spark model, the HS50 (High Speed) and the Rumble (Profiler) are the three pearls that place the Mandelli range firmly in the crown of world-class machine tool builders.
All our models are equipped with Siemens or Fanuc control systems, with systems from other NC builders also considered.
The Rumble is an innovative profiling machine with a wide range of applications in the sectors of aerospace, water treatment, precise carpentries - in other words, wherever flat parts require high-precision machining along three axes. The Rumble, in fact, boasts high productivity thanks also to our loading system.
Our "purest" HMC lines, Spark and HS50, guarantee excellent static and dynamic performances under the most demanding working conditions thanks to their design using the Finite Elements Method (FEM). Characterised by a thermo-symmetrical structure made of welded steel or castings. Our HMCs are built using components and structures from top-quality brands: linear axes that move by means of roller bearings and linear guideways and a fixed rotary table to provide the best vibration damping. This moving system ensures rapid feeds of up to 50/75 m/min and accelerations of up to 4/7 m/s2.
The direct measuring system uses high-resolution pressurized optical scales on the linear axes and encoders on the rotary table to guarantee the utmost precision in positioning and repetition.
The multitasking version of our HMCs combines turning and milling operations in a single machine, thus bringing a huge advantage to the end user.
The result of an optimization process encompassing both innovation and distinctive traits, our production lines are characterised by a multitasking technology that combines the unique qualities of a vertical boring machine (up to 600mm) and the traits of a milling center.
Our machining centers are designed for machining a wide range of metals and alloys; different spindles are chosen according to torque, rpm, and power, including a special focus aimed at all industries where materials such as titanium and superalloys are widely used.
For example, our "Ti" type machine brings a real solution for high stock removal and finishing to outstanding degrees. Powerful torque on the rotating tables, direct drive motors, a cooling system up to 350 bars, the Smartcut system to damp chattering; all this allows the semi-finishing operations to be by-passed and time saved.
Positioning accuracy of 4 arcsec on linear axes, rigid structures thanks to a ribbed but light design, and reliability; these provide the answer for whoever is aiming for errorless high productivity.
That is why our main mission is to provide machining solutions, not just machines.
The meaning of providing solutions is deeply rooted in the accurate study of the structures, first-class components, stringent selection of materials followed by equally stringent quality checks. This approach, combined with the work of highly-specialized mechanical, electronic and application engineers, has led us into the exclusive world of turnkey solution providers.

SPARK Beyond the limits

Tirelessly striving for perfection

The Spark model has a wide range of pallet sizes and relevant axes strokes. The range covers square tables from 630 x 800 mm up to 1600 x 2000mm and can bear loads up to 20 tons in milling mode. 5-axis machining is the main purpose of this model, which combines the 3 linear axes to the rotating pallet and the universal head.
The mix of table size and spindle speed/torque/power characteristics allow any possible application to be covered, in any machining field. Equipment such as ATC, probes, coolant, CNC (Siemens or Fanuc) and accessories complete the configuration of the HMC.

SPARK MILLTURN (T) is the multitasking machining center for milling and turning operations (up to 600 mm height) contained in a single machine. Direct drive motors on a linear axes and a rotary table guarantee the perfect balancing of the work forces combined with excellent dynamic reaction. A special clamping device based on high-precision ring couplings in the spindle allows it to be used for milling/turning mode without any stress or injury to the high-precision spindle bar.

SPARK (Ti)
Designed for industries where materials such as superalloys and titanium are widely used for their mechanical rigidity.

Fitted with a dual-drive anti-backlash system for the universal head rotation, it can provide a 12000 Nm continuous torque on the "A" axis, and is combined with damping devices that reduce vibrations by 75% and 100 bar coolant pressure for milling operations and 350 bar for turning.

The Sparking HS Smart & fast

MODEL	SPARK 2								
	HS-50 multitasking	HS-63 multitasking	SP 1200 milling multitasking	SP 1300 milling Titanium	SP 1600 milling multitasking	SP 2100 milling multitasking/ Titanium	SP 2600 milling	SP 3500 milling	SP 4000 milling
X, Y, Z Axes mm (inch)	800-800 800 (31-31-31)	1100-1000 1100 (43-39-43)	1200-1200-1450 (47-47-57)	1300-1100 1050 (51-43-41)	1600-1400/1700-1250 1550 (63-55/67-49/61)	2000-1700/2000T Ti-1800 (79-67/79T/Ti-71)	2500 -2000 1800 (98-79-71)	3500-2000 1800 (138-79-71)	4000/2500 3000/2800 (157/98-118/110)
Pallet size mm (inch)	500 X 500 (20 x 20)	630 x 630 (25 x 25)	800 x 800 (31 x 31)	630 x 800 (25 x 31) 800 x 800 (31 x 31)	800 x 1000 (31 x 39)	1000 x 1250 (39 x 49)	1000 x 1250 (39 x 49) 1250 x 1600 (49 x 63)	1250 x 1600 (49 x 63) 1600 x 2000 (63 x 79)	1250 x 1600 (49x63) 1600 x 2000 (63x79)
	-	-	1000 T (39) T	-	800 x 800 - ø 1000 T (31 x 31 - ø 39) T	1000x1000 - Ø1250 T (39 x 39 - Ø 49) T	-	-	-
						1000 x 1250 Ti (39 x 49) Ti			
B Axis Payload Kg (lb)	1000 (2205) 4 axes 800 (1764) 5 axes	1500 (3307) 4 axes 1000 (2205) 5 axes	2000 (4409)	1500 (3307)	2500 (5512) 2500/4000 T(5512/8818)	5000/ 8500 (11023/18739) 5000 (11023) T 5000 (11023) Ti	5000/8500 (11023/18739)	8000 (17637)	up to 20000 (44092)
Nr of interpol. Axes	4 /5	4 /5	4 /5	4 /5	4 /5	4 /5	4 /5	4 /5	4 /5
Rapids m/min (inch/min)	75 (2953)	75 (2953)	60 (2362)	50 (1968)	50 (1968)	50 (1968) 50 (1968) T 30 (1181) Ti	50 (1968)	35 (1378)	40 (1575)
Acceleration m/sec² (inch/ sec²)	7 (276)	7 (276)	5 (197)	4 (157)	4 (157)	4 (157) 4 (157) T 2.5 (98) Ti	4 (157)	2.5 (98)	3 (118)
Thrust N (lbf)	10000 (2248)	12000 (2698)	20000 (4496)	12000 (2698)	16000 (3597)	16000 (3597) 16000 (3597) T 24000 (5395) Ti	16000 (3597)	16000 (3597)	30000 (6744)
Milling spindle speed rpm	10000/ 20000	10000/ 20000	Wide range of electrospindles or mechanical spindles, from 5000rpm up to 24000rpm						
Spindle torque (S1) Nm (lbf/inch)	198 (1752)	300 (2655)	Wide range of electrospindles or mechanical spindles, from 100 up to 1500 Nm						
Taper	HSK-63	HSK-63/100	HSK-100 / ISO-50 / CAPTO-C6/8						
Tool Technical data at full/alternate pockets Ø mm / L mm weight kg (Ø inch / L inch weight lb)	100-200 (4-8) 400 (16) 15 (33)	100-325 (4-13) 600 (24) 35 (77)	100-325 (4-13) 600 (24) 35 (77)	100-325 (4-13) 600 (24) 35 (77)	100-325 (4-13) 600 (24) 35 (77)	100-325 (4-13) 600 (24) 35 (77)	100-325 (4-13) 600 (24) 35 (77)	00-325 (4-13) 600 (24) 35 (77)	Up to 600 (24) Up to 900 (35) Up to 60 (110)
Tool changer capacity	108/216/324 tools		110/200/290/342/492 tools						
Tool-to-tool change time	2,5" to 4" (>5Kg)	3" to 5"(>5Kg)	15"					20"	
Automatic Pallet Changer	single pallet, 2 pallets, 6/8 pallets arena type, 5 to 100 pallets in line or multilevel, loading/unloaading and centreing stations								
Pallet-to-pallet change time	10" to 15" (>600 Kg)	12" to 20" (>600 Kg)	20"	20"	40"	50"	50"	60"	60"
Tool room and smart tool	tool room >500 tools, smart tool by means of anthropomorphic robot hanging on aerial rail								
Machine Weight (Kg/ lb)	25000 (55115)	30000 (66138)	35000 (77161)	38000 (83775)	45000 (99207)	54000 (119048) 58000 (127867) Ti	70000 (154322)	74000 (163140)	96000 (211643)
Numerical Control	Siemens ONE / Fanuc								
HMI	22" iPuma control (portrait frame)								
Positioning accuracy according to ISO 230/2									
Accur. (A) µm (1/1000 inch)	4 (0,16)	4 (0,16)	4 (0,16)	4 (0,16)	5 (0,20)	5 (0,20)	5 (0,20)	5 (0,20)	5 (0,20)
Repeat. (R) µm (1/1000 inch)	3 (0,12)	3 (0,12)	3 (0,12)	3 (0,12)	4 (0,16)	4 (0,16)	4 (0,16)	4 (0,16)	4 (0,16)
B Axis Accur. (A) (arcsec)	4	4	4	4	4	4	4	4	4
B Axis Repeat. (R) (arcsec)	3	3	3	3	3	3	3	3	3

The cutting edge among the "small"

HS models were conceived to serve all those industrial sectors needing high precision and reactive axes. The 500 x 500 mm pallet size provides a wide range of applications: mobility, general mechanics, power generation, oil and gas, brakes...

The HS is a compact multitasking machining center inspired by the Spark model, whose structural approach it has kept without losing its natural light weight and reactivity.

Its performance guarantees high productivity. It is modular design to minimize environmental impact and to make transportation and installation installation easier. It is versatile to meet the needs of any industry; compact, to guarantee optimal handling of spaces and operations; technological in offering a 4- or 5-axis machining solution by means of a roto-tilting table.

Equipped with three thermal circuits, it can assess and manage changes in the thermal condition, thereby maintaining accuracy and precision even in borderline conditions.

RUMBLE
The sharp profiler

Power, speed, precision for 5 axes high-complex point machinings

This model was designed to machine hard materials and complex profiles. It boasts dual-drive technology for Y axis movement as well as X and Z axes in order to avoid any backlash on the linear axes.
Each linear slide-way is equipped with a double ball screw and direct drive, high-resolution pressurised optical scales, and high-precision encoders on the rotary axes. The B and C axes (spindle and table) work by means of a double pinion and crown for backlash recovery.
The machine's basic configuration includes the HSK 125 taper for a 2688 Nm continuous max torque on the mechanical spindle; this guarantees optimal swarf removal.
Rumble is equipped with a pallet-handling system that allows workpieces to be loaded/unloaded in masked time: horizontal loading for easy handling and vertical position machining for easy swarf self-fall.

TECHNICAL DATA	RUMBLE 4000	RUMBLE 6000
X Axis mm (inch)	4000 (157)	6000 (236)
Y Axis mm (inch)	2000/3000 (79/118)	2000/3000 (79/118)
Z Axis mm (inch)	1250 (49)	1250 (49)
Rapid Speed rpm	40	40
Acceleration m/sec2 (inch/sec2)	3 (118)	3 (118)
Thrust N (lbf)	30000 (6744)	30000 (6744)
Max Payload Kg (lb)	5500 (12125)	8000 (17637)
Taper	HSK – ISO	
Tool Number	100 – 200 – 300	
POSITIONING ACCURACY ACCORDING TO ISO 230/2		
Accuracy (A) µm (1/1000 inch)	5 (0,20)	5 (0,20)
Systematic Positioning Error on full stroke (E) µm (1/1000 inch)	8 (0,32)	8 (0,32)
Repeatability (R) µm (1/1000 inch)	4 (0,16)	4 (0,16)

HEADS

4 or 5 axes and a wide range of choices of torque and power speed

A wide range of heads to satisfy the most diverse needs.
Made of electro-welded steel or spheroidal cast iron, both thermally stabilized, the spindles equipping the SPARK and HS line heads provide maximum radial axial rigidity in any working condition thanks to a pneumatic system which varies the preload according to rotation speed and zero backlash kinematics combined with ultra precise dynamically-balanced ceramic bearings.
A recently patented solution controls the spindle operating temperature through a cooling system whereby the refrigerant flows inside the head to guarantee excellent geometric stability and best tool performances. A network of sensors monitor spindle operation, adjusting or stopping it according to pre-set thresholds in the event that any faulty operating conditions are detected.

Real-time monitoring to prevent potentially critical conditions both for the spindle and the workpiece being machined.

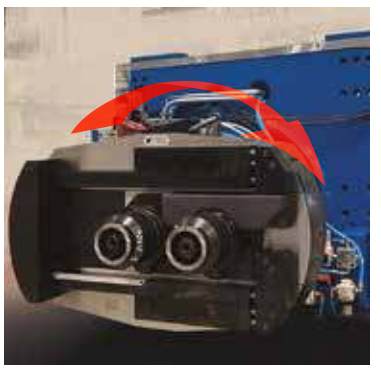
Rumble Head

TECHNICAL DATA	RUMBLE HEAD B + C axes	H HEADS	U HEADS	A HEADS
Speed rpm	20-5000	5000 ÷ 24000	6000 ÷ 9000	5000 ÷ 24000
Power in S1 kW (HP)	55-80 (64 ÷ 118)	30 ÷ 78 55-80	48 ÷ 50 (64 ÷ 67)	37 ÷ 75 (50 ÷ 101)
Torque in S1 Nm (lbf/inch)	2000-2688 (3585 ÷ 13426)	71 ÷ 2666 2000-2688	405 ÷ 707 (3585 ÷6257)	78 ÷ 1259 (690 ÷11143)
A Axis rpm	(B) 16 (C) 16	-	-	7,5 ÷ 15
A Axis machining torque in S1 Nm (lbf/inch)	(B) 8500 (C) 12000 (B) (6270) (C) (8850)	-	-	3000 ÷ 12000 (26552 ÷106208)
Angular Range	(B) ±180° (C) ±180	-	0° / -90° each 2,5°or continuous	-100 °/ 90° (continuous)
Accuracy (A) arcsec	5	-	5	4
Repeatability (R) arcsec	4	-	4	3
Taper	CAT 60	ISO - HSK - CAPTO		

H-Head

U-Head

A-Head



Facing Head

APC/FMS

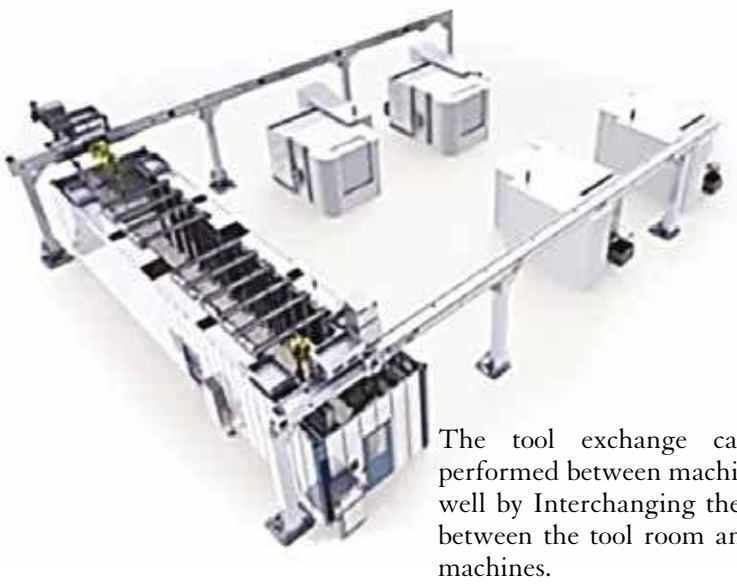
Wide range of solutions for piece-handling

The SPARK and HS lines can be equipped with any HS model of pallet-automation systems with APC: the twin automatic pallet changer that optimises floor space, the trans-pallet system housing up to a maximum of 8 buffer stations for any pallet size, single- or double-level expandable shuttles and integrations with complex multilevel systems.
All the pallet-handling solutions can be integrated into the company ERP and are designed to guarantee the highest levels of autonomy in operative automation in line with production output needs.
Equipped with the most advanced safety systems and designed according to main ergonomic principles, Mandelli's automation solutions facilitate maintenance and daily operations.

Smart Tool & Tool room

The Tool room is shared in common between 2 or more machines allowing centralized tool management and maintenance at a single point.

It can host more than 500 cutting tools according to user needs. The concept of the tool room and of the "Smart tool", aims to Optimize the tool set in each ATC of the machines to be ready for the specific operation required on the workpiece.



The tool exchange can be performed between machines as well by Interchanging the tools between the tool room and the machines.

Beyond the optimization performed with iScada (our native software for pallets and smart tool management), again a single operator can handle up to 5 machines tools-set, by picking up and release the serviced tools.

The shifting of the tools (batches of 5 tools/each) is carried out by means of an anthropomorphic robot on aerial rail that perform the pick-up and deposit of the tools inside the ATC of the machines. There, the storage of the tools is made by the usual CNC management system.

RETROFITTING

As well as standard structural interventions to restore initial levels of operating conditions, Mandelli offers an up-grading of machinery including electronics, to allow integration of retrofitted machines into new FMS lines. Mandelli studies retrofitting solutions together with the customer to find the ONE solution that will best meet new productivity requirements.

iPUMA package

Making the approach to the machine easier and more intuitive

It is a Mandelli original software package designed to manage the Smart Factory of today allowing for accurate real time control of the machining center thanks to its five modules.

iPum@Control, the user interface to control the machine into 3 *screen sections* for a overview of the operational status;
iPum@Scada, the *Supervising & Control Software* developed to ensure the best machining processes;

iPum@Predict, to detect potentially *failure* conditions and *prevent* them 48 hours in advance;

iPum@Smartcut, the system that monitors the cutting process for *vibrations damping*.

MANDELLI SERVICE

Mandelli also offers a selection of maintenance courses with different specialisations for end-user maintenance squads responsible for minor quick repairs

10,000

Mandelli SERVICE is a structure interconnected in real time with all the company functions, both on site and online. With more than 10,000 original spare parts in stock, in synergy with Allied warehouses all over the world.

Remote diagnostic control within 8 h of the request

80%
OF CASES

Local squad intervention on site within 24 h

12%
OF CASES

Mandelli technicians intervention on site within 72 h

8%
OF CASES

MANDELLI in the world

- **Headquarters**, Piacenza - Italy
- **North Europe Branch**, Brussels - Belgium
- **North America Branch**, Los Angeles - USA
- **Allied Group Warehouses**

05/2024 - Gessetto Comunicazione
Allied Group Communication Unit
Ph. MANDELLI SRL archive

Mandelli SRL

Via Caorsana, 35
29122 Piacenza - ITALY
Tel. +39 0523 548548
www.mandelli.com
mandelli.info@mandelli.com

To visit our website, scan the QR code with yuor smartphone