PROCESS HANDLING DESIGN











4.500m² of productive site

1.800+ successful projects

patented systems

15 new devices and novelties

65 Countries served

45 years of experience Nicomac is one of the leading companies in the international clean room and equipment for oral solid departments. Founded in 1977 in Milan, Italy, in over half a century successfully realized over 1800 projects in 65 Countries in the world, supplying clean rooms, coating systems and granulators that can also be under isolator.

The excellence in quality and products, along with the support of an expert and qualified team, are the foundation of the results obtained by Nicomac and the satisfaction of our worldwide customers, many of them FDA/EMA approved.

PROCESS HANDLING DESIGN

INTEGRATED GRANULATION **PROCESSS**

Nicomac can supply a fully integrated line for an OSF dosage department..

A single qualified supplier for:

- Weighing room
- · High Shear Mixer Standard o heated
- Fluid bed Dryer
- Comill
- BIN and BIN Blender
- Pneumatic conveying
- Tablet presses (with certified partner)
- · Capsule filling machines (with certified partner)
- PSC Perforated Super Coater or SWC Solid Wall Coater coating systems
- · WIP CIP



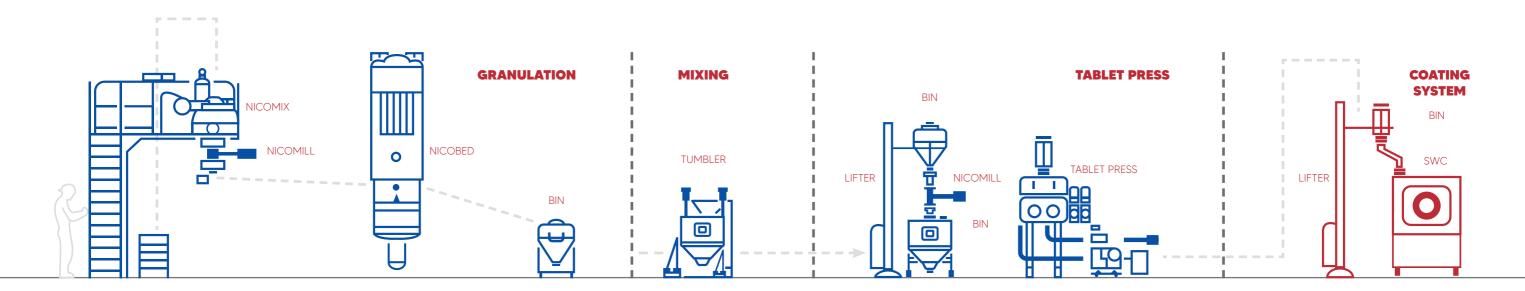




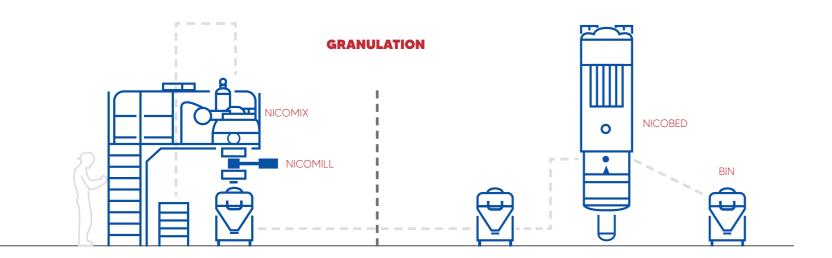
COMPLETE SUPPLY

Nicomac can supply single equipment or complete systems with horizontal or vertical flux philosophy.

Pneumatic Transfer



BIN Transfer











DISPENSING

Nicomac designs and builds custommade stainless steel or laminated laminar flow extractors, integrated in the dispensing room.





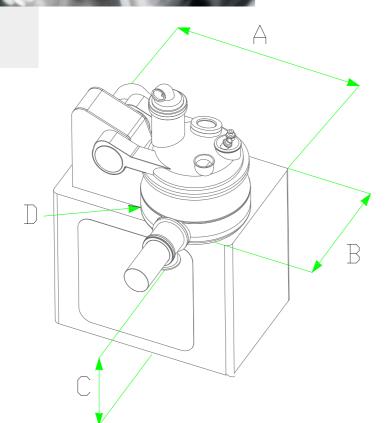
PHD - PROCESS HANDLING DESIGN





HIGH SHEAR MIXER

Nicomac's High Shear Mixers are built in a tulip shape that allows a perfect mixing, absence of mechanical friction and dead zones. Thanks to an exclusively designed chopper and impeller, with inverter regulation, great powder fluxing properties can be reached, with perfect mixing and granulometry uniformity. The binding agent is manually dosed or through a peristaltic pump. Thanks to the inclined bottom and the product exit valve, designed for perfect hold, the discharge happens totally and easily. impeller and chopper have a triple lip hold. A piston allows the impeller elevation to allow complete cleaning. the process ends according to the motor's couple value in order to obtain repeatability and reduced processing times. PLC-PC control system for automatic management of all the process phases, washing included. Automatic lifting of the martinetti lid. Platform for perfect handling and direct unload on the NICOMILL calibrator.



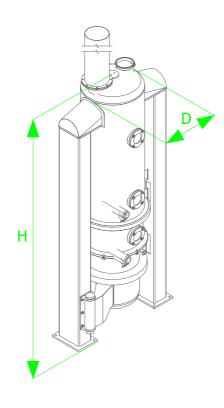






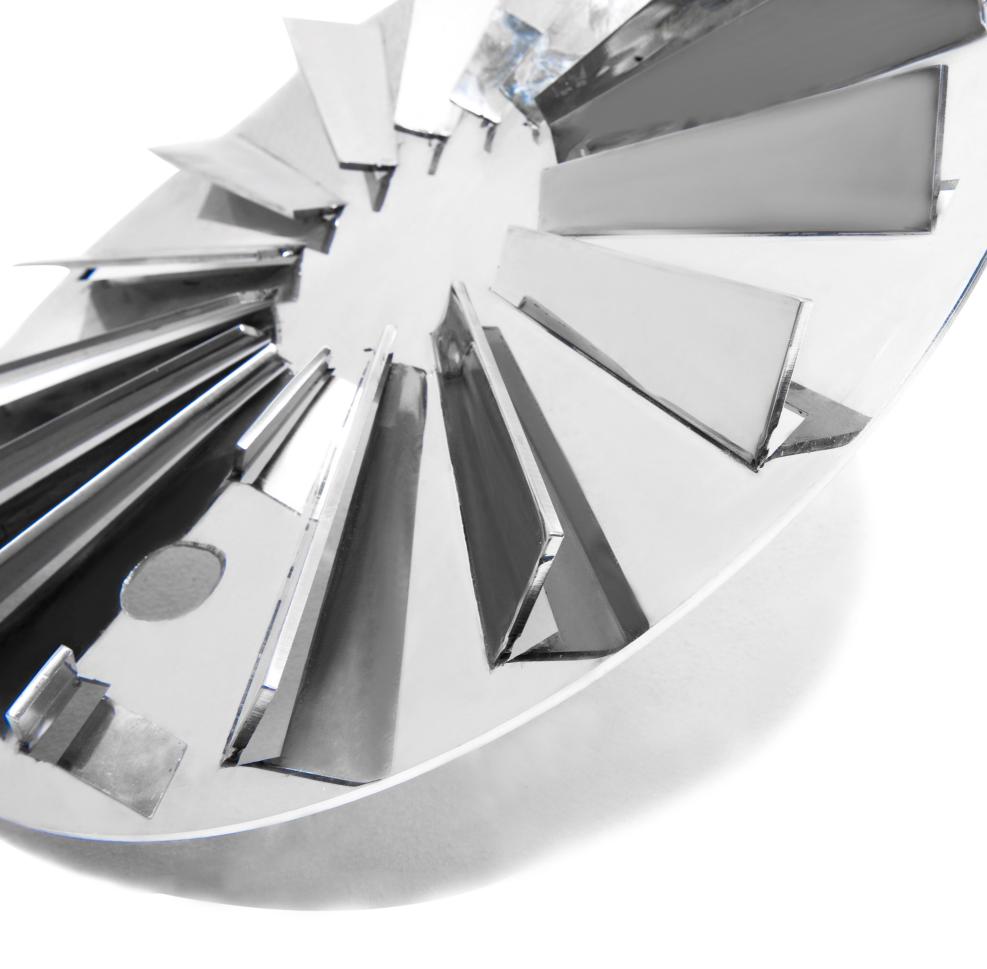
FBD

In the last 35 years, the fluid bed technology moved from a quick drying of the granules to a new technology: the fluid bed processor that allows the drying, granulation, coating of the particles and pellettization. Nicomac's fluid bed are built with all parts in contact with the product in AISI 316 L stainless steel, mirror polished even on the outside. They can be supplied certified at 2bar and 10bar. All the models have removable drum to allow an easy inspection, easy maintainance, product handling flexibility. They are supplied with automatic product load and unload systems with closed containment systems.



NICOMIX	5-15	12-35	20-60	40-100	65-200	120-300	205-550	310-800	400-1100	600-1600
Geometrical capacity	15 lt	35 lt	60 lt	100 lt	200 lt	300 lt	550 lt	800 It	1.100 lt	1.600 lt
Max working product density 0.5	5 kg	12 kg	20 kg	40 kg	65 kg	120 kg	205 kg	310 kg	400 kg	600 kg
Min working product density 0.5	2 kg	4 kg	8 kg	15 kg	20 kg	40 kg	70 kg	100 kg	150 kg	180 kg
impeller speed	30-590 rpm	23-450 rpm	18-360 rpm	15-280 rpm	12-240 rpm	11-210 rpm	9-175 rpm	8-150 rpm	7-145 rpm	6-135 rpm
Chopper speed	300 rpm	300-2.700 rpm	300-2.700 rpm	300-2.700 rpm	300-2.700 rpm	700-1.500 rpm	700-1.500 rpm	700-1.500 rpm	700-1.500 rpm	700-1.500 rpm
Bowl diameter	320 mm	410 mm	500 mm	600 mm	780 mm	900 mm	1.100 mm	1.200 mm	1.300 mm	1.430 mm
Bowl internal height	180 mm	240 mm	280 mm	340 mm	450 mm	520 mm	640 mm	700 mm	760 mm	820 mm
Total Depth (base machine without platform) "A"	1.850 mm	1.950 mm	1.950 mm	2.100 mm	2.450 mm	2.450 mm	2.800 mm	3.000 mm	3.000 mm	3.200 mm
Total Width (base machine without platform) "B"	850 mm	950 mm	1.200 mm	1.300 mm	1.300 mm	1.300 mm	1.650 mm	1.650 mm	1.900 mm	2.200 mm
Height with lid open	1.700 mm	1.900 mm	2.300 mm	2.650 mm	2.800 mm	3.150 mm	3.500 mm	4.000 mm	4.500 mm	4.700 mm
Height discharge valve "C"	900 mm	900 mm	900 mm	1.000 mm	1.000 mm	1.150 mm	1.150 mm	1.150 mm	1.300 mm	1.400 mm
Basic Machine weight	750 kg	1.000 kg	2.100 kg	2.600 kg	3.100 kg	3.900 kg	4.900 kg	5.700 kg	6.500 kg	8.000 kg
Base machine	11	15	18	22	30	37	55	75	90	115
installed power	kw	kw	kw	kw	kw	kw	kw	kw	kw	kw
installed power NICOBED	kw 5	kw 12	20			kw 120		310	kw 375	600
•				kw	kw		kw			
NICOBED	5	12	20	40	65	120	kw 205	310	375	600
NICOBED Container volume It. Max working product	5 23 lt	12 36 lt	20 63 lt	40 130 lt	65 230 lt	120 475 lt	205 520 lt	310 890 lt	375 1.100 lt	600 1.525 lt
NICOBED Container volume It. Max working product density 0.5 Min working product	5 23 lt 5 kg	12 36 lt 12 kg	20 63 lt 20 kg	40 130 lt 40 kg	65 230 lt 65 kg	120 475 lt 120 kg	205 520 lt 205 kg	310 890 lt 310 kg	375 1.100 lt 375 kg	600 1.525 lt 600 kg
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5	5 23 lt 5 kg 2 kg 450	12 36 lt 12 kg 4 kg 600	20 63 lt 20 kg 5 kg	40 130 lt 40 kg 1500	65 230 lt 65 kg 20 kg 2.000	120 475 lt 120 kg 40 kg 3.500	205 520 lt 205 kg 60 kg 4.500	310 890 lt 310 kg 100 kg 6,000	375 1.100 lt 375 kg 150 kg 6.000	600 1.525 lt 600 kg 200 kg 8.000
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5 Air Flow	5 23 lt 5 kg 2 kg 450 m ³ /h	12 36 lt 12 kg 4 kg 600 m ³ /h	20 63 lt 20 kg 5 kg 1.000 m ³ /h	40 40 kg 130 lt 40 kg 10 kg 1.500 m³/h	65 230 lt 65 kg 20 kg 2.000 m ³ /h	120 475 lt 120 kg 40 kg 3.500 m ³ /h	205 520 lt 205 kg 60 kg 4.500 m³/h	310 890 lt 310 kg 100 kg 6.000 m ³ /h	375 1.100 lt 375 kg 150 kg 6.000 m ³ /h	600 1.525 lt 600 kg 200 kg 8.000 m ³ /h
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5 Air Flow Bottom spray guns	5 23 lt 5 kg 2 kg 450 m ³ /h 2 370	12 36 lt 12 kg 4 kg 600 m ³ /h 3	20 63 lt 20 kg 5 kg 1.000 m ³ /h 2 550	40 kg 130 lt 40 kg 10 kg 1,500 m³/h 3 780	65 230 lt 65 kg 20 kg 2,000 m³/h 3 780	120 475 lt 120 kg 40 kg 3.500 m ³ /h 6 1.100	205 520 lt 205 kg 60 kg 4.500 m ³ /h 9	310 890 lt 310 kg 100 kg 6.000 m ³ /h 12 1.500	375 1.100 lt 375 kg 150 kg 6.000 m ³ /h 12 1.600	600 1.525 lt 600 kg 200 kg 8.000 m ³ /h 18 1.800
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5 Air Flow Bottom spray guns FBD Diameter "D"	5 23 lt 5 kg 2 kg 450 m ³ /h 2 370 mm 1.780	12 36 lt 12 kg 4 kg 600 m ³ /h 3 460 mm 2.200	20 63 lt 20 kg 5 kg 1.000 m ³ /h 2 550 mm 2.437	40 kg 130 lt 40 kg 10 kg 1.500 m³/h 3 780 mm 2.700	65 230 lt 65 kg 20 kg 2.000 m ³ /h 3 780 mm 3.200	120 475 lt 120 kg 40 kg 3.500 m ³ /h 6 1.100 mm 4.400	205 520 lt 205 kg 60 kg 4.500 m ³ /h 9 1.300 mm 4.900	310 890 lt 310 kg 100 kg 6.000 m ³ /h 12 1.500 mm 5.600	375 1.100 lt 375 kg 150 kg 6.000 m ³ /h 12 1.600 mm 5.800	1.525 lt 600 kg 200 kg 8.000 m³/h 18 1.800 mm 7.400
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5 Air Flow Bottom spray guns FBD Diameter "D" FBD Height "H"	5 23 lt 5 kg 2 kg 450 m ³ /h 2 370 mm 1.780 mm	36 lt 12 kg 4 kg 600 m³/h 3 460 mm 2,200 mm	20 63 lt 20 kg 5 kg 1.000 m ³ /h 2 550 mm 2.437 mm	130 lt 40 kg 10 kg 1,500 m³/h 3 780 mm 2,700 mm	65 kg 230 lt 65 kg 20 kg 2,000 m³/h 3 780 mm 3,200 mm	120 475 lt 120 kg 40 kg 3.500 m ³ /h 6 1.100 mm 4.400 mm	205 520 lt 205 kg 60 kg 4.500 m³/h 9 1.300 mm 4.900 mm	310 890 lt 310 kg 100 kg 6.000 m ³ /h 12 1.500 mm 5.600 mm	375 1.100 lt 375 kg 150 kg 6.000 m ³ /h 12 1.600 mm 5.800 mm	1.525 lt 600 kg 200 kg 8.000 m³/h 18 1.800 mm 7.400 mm
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5 Air Flow Bottom spray guns FBD Diameter "D" FBD Height "H" Inlet outlet air	23 lt 5 kg 2 kg 450 m³/h 2 370 mm 1.780 mm 100 DN. 650x600	36 lt 12 kg 4 kg 600 m³/h 3 460 mm 2.200 mm 150 DN. 650x600	5 kg 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.0	130 lt 40 kg 10 kg 1.500 m³/h 3 780 mm 2.700 mm 200 DN. 650x600	230 lt 65 kg 20 kg 2.000 m³/h 3 780 mm 3.200 mm 250 DN. 650x600	120 475 lt 120 kg 40 kg 3.500 m³/h 6 1.100 mm 4.400 mm 300 DN. 650x600	kw 205 520 lt 205 kg 60 kg 4.500 m³/h 9 1.300 mm 4.900 mm 400 DN. 650x600	310 890 lt 310 kg 100 kg 6.000 m ³ /h 12 1.500 mm 5.600 mm 400 DN.	375 1.100 lt 375 kg 150 kg 6.000 m ³ /h 12 1.600 mm 5.800 mm 450 DN.	1.525 lt 600 kg 200 kg 8.000 m³/h 18 1.800 mm 7.400 mm 600 DN. 650x600
NICOBED Container volume It. Max working product density 0.5 Min working product density 0.5 Air Flow Bottom spray guns FBD Diameter "D" FBD Height "H" Inlet outlet air HMI control board	23 lt 5 kg 2 kg 450 m³/h 2 370 mm 1.780 mm 100 DN. 650x6000 mm 320	36 lt 12 kg 4 kg 600 m³/h 3 460 mm 2.200 mm 150 DN. 650x600 mm 650	20 63 lt 20 kg 5 kg 1.000 m³/h 2 550 mm 2.437 mm 150 DN. 650x600 mm 1.000	130 lt 40 kg 10 kg 1.500 1.500 1.500 1.500 1.700 1.700 1.700	65 kg 230 lt 65 kg 20 kg 2.000 m³/h 3 780 mm 3.200 mm 250 DN. 650x600 mm 1.800	120 475 lt 120 kg 40 kg 3.500 m³/h 6 1.100 mm 4.400 mm 300 DN. 650x600 mm 2.100	kw 205 520 lt 205 kg 60 kg 4.500 m³/h 9 1.300 mm 4.900 mm 400 DN. 650x600 mm 2,900	310 890 lt 310 kg 100 kg 6.000 m ³ /h 12 1.500 mm 5.600 mm 400 DN. 650x600 mm 3.800	375 1.100 lt 375 kg 150 kg 6.000 m³/h 12 1.600 mm 4.50 DN. 650x600 mm 4.100	1.525 lt 600 kg 200 kg 8.000 m³/h 18 1.800 mm 7.400 mm 600 DN. 650x600 mm 5.300





TWISTER SYSTEM

The exclusive Twister® System patented by Nicomac is at the foundation of the success of the fluid bed dryer. The Twister allows a perfect air flow turbulence control which, combined with tangential and above spraying guns flow, allow for pressure drops minimization and ensuring a uniform and repeatable process that prevents product sedimentations and agglomerations, reducing processing times.



The uniform distribution of the binding solution is fundamental for a good granulation, in the Nicomac system is granted by Schlick spraying guns that follow the air flow allowing a perfect granule coating. Nicomac has a combined Bottom-Top spray system, a unique combination that allows great flexibility and great efficacy in function of the product to granulate. Bottom Spray with Schlick guns that allow an atomizing flow control and "AIRBUBBLE" spray for a spray of great efficiency and efficacy. The Top Spray with multihead Schlick guns to produce a wider spray pattern, investing in a uniform and total way the granule.

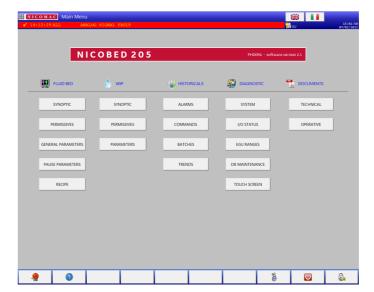




On the AISI 316L stainless steel plate with inflatable gasket are installed PTFE antistatic or synterized stainless steel AISI 316L cartridges with light bulb attachment. This allow an easy inspection and disassembly of the filter cartridges.



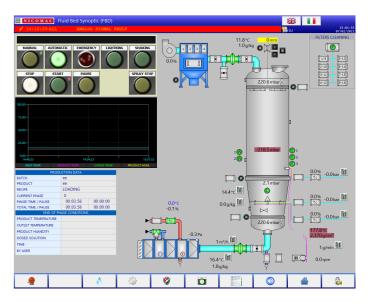




✓ 14:12:29 ALL		SIGNAL								76	SU		151 87/82
	ID	version		status description phase									1
tecipe loaded in PLC:	4	1	TN	eport test				0					
Displayed Recipe:	2	1	ТП	T TEST RECIPE									
Recipe Header			Ri	RGP - Recipe General Parameters				RPP - Recipe Phase Parameters					
			1	2	3	4	5	6	7	8	9	10	Л
Phase description													454
Phase type (PTY)		Loading	Heating / Drying	Spray c/Speed	Spray c/Speed	Heating / Drying	Cooling	Product Shaking	Cooling	Recipe End			
Inlet air temperature (°C)			50.0	60.0	60.0	70.0	60.0	0.0	0.0	0.0			-
Cooling battery (off/on)			0	0	0	0	0	0	0			- 5	
Inlet air flow (m3/h)			500	600	1000	1000	500	500	700	600			
Peristaltic pump speed (rpm)					25	20							•
Top atomization air pressure (ba	r)				0.0	0.0							
Bottom atomization air pressure (bar)				0.0	1.0	0.0	0.0	0.0		0.0			
Air Bubble pressure (bar)				0.0	1.0	0.0	0.0						
Product temperature (°C)													
Product humidity (g/kg)													
Solution flow (g/min)													
Filters cleaning frequency (s)		20	20	20	20	20	20		0				
End of phase for product temperature (°C)			0.0			0.0	0.0		0.0			V	
End of phase for outlet air temperature (°C)			0.0			0.0	0.0		0.0			ot	
End of phase for product humidit	ty (g/kg)			0.0			0.0	0.0		0.0			
End of phase for dosed solution	(g)				0	0							
End of phase by time (s)				0	300	0	300	0	0	300			re
End of phase by user (off/on)				1 1	1	1	1	1	1	0			

FACIM

The Flexible Automation Computer Integrated Management (FACIM) is a closed loop feedback system where the working phases are integrated, rationalized and coordinated, thus improving quality, flexibility and repeatability with reduced processing times. PLC-PC control system with IFIX 100 automatic recipes. Touch screen monitor with user friendly synoptic software CFR21 Part 11.







TABLET PRESSES Through the fruitful collaboration

with a long time experienced partner, Nicomac can supply high efficiency and productivity tablet presses aslo under Isolator, triple layer, with high mechanical resistance, and high quality punches. The models have the option of a removable turret and a touch screen control system which can be equipped with special software for analyzing compression data.

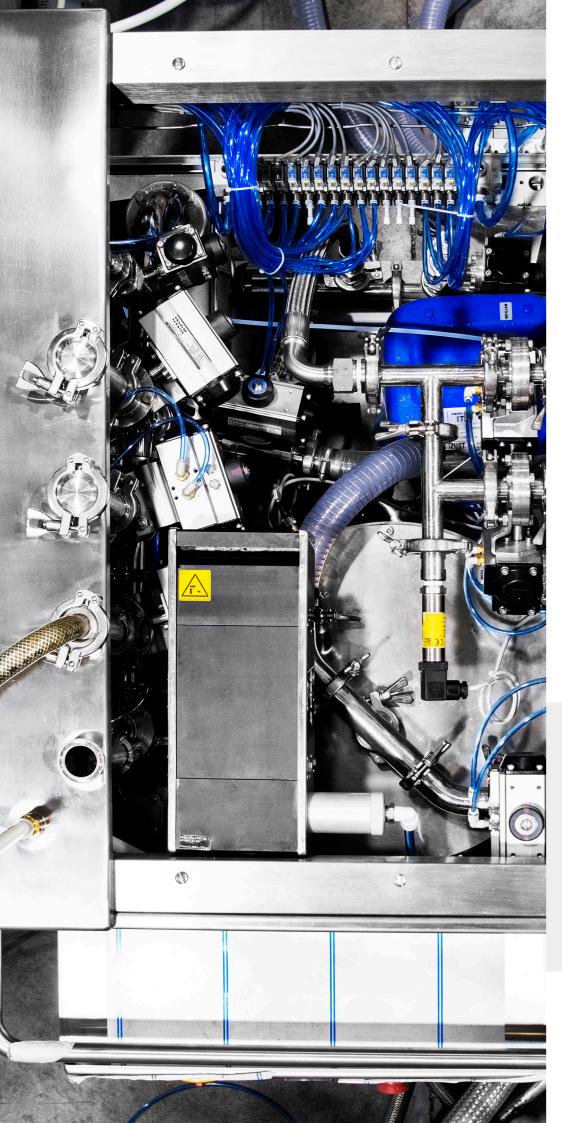






NICOMILL

The Nicomac cGMP line of calibrating mills offers great quality at a competitive price NICOMILL is the ideal application for obtaining a uniform particle size for substances withanunevenparticlesizedistribution for both wet and dry granules. Once the product has been fed into the grinding chamber, it is crushed by means of an impeller against the surface of a conical sieve with the size of the holes depending on the calibration result to be obtained. The residual product that remains in the grinding chamber is very small.





WIP-CIP

Years of experience in Washing and Cleaning In Place technology allowed Nicomac to create a cutting-edge and cGMP compliant system that can be used for all the cleaning processes that need validation, resulting the best possible solution for the cleansing of accurate washing in every corner. The control system involves the possibility to insert numerous recipes that allow to automatically manage all washing,

rinsing, fluid drain and drying phases, ensuring a perfect cleansing.

A wheeled skid contains a 10 bar washing Pump, detergent Pump and tank, membrane drying Pump, pipes, actuators, valves, membrane pump coating machines. On both models are to eliminate waste fluids, Control installed several sprayballs that allow an Panel with pneumatic and electronic components.





PHD - PROCESS HANDLING DESIGN



NICOBIN

NICOBIN is a mixer for BIN, designed for the mixing and homogenization of dry powders in all powder handling processes for which there is the need to mix the powders homogeneously directly in the BIN, eliminating the loading, unloading and cleaning operations of the mixer. The NICOBIN produces an efficient mixing effect thanks to a double inclination of 15° with respect to the rotation axis of the machine itself and rotates the BIN both clockwise and counterclockwise. The NICOBIN has an electromechanical locking system of the BIN in ordertoensuretheposition of the platformal ways horizontal during the BIN loading / unloading phase and at the end of each processing cycle.

NICOBIN is designed to be easy to inspected and cleaned. Lifting platform: consisting of an AISI 3104 arm connected to sliding guides whose movement is carried out by means of a screw system operated by an electric motor. NICOBIN is fully protected by an AISI 304 stainless steel casing. It is designed according to the cGMP and in compliance with current safety regulations, is equipped with a series of magnetic sensors and photoelectric barriers that guarantee both passive and active safety at the same time. The NICOBIN is managed by a PLC system which, connected to the safety sensors and to the arm closing block, activates the electric motor for the rotation of the BIN. This motor is able to rotate the BIN to be mixed both clockwise and anticlockwise at a variable speed. The range of models allows to reach a maximum capacity of 2000 kg.



LAVABIN

The LAVABIN allows the total internal and external washing of the BIN with an automatic system. Water inlets (industrial and demineralised) Water drain (valve washing, internal washing and external washing). Drainage of the pipeline with compressed air. Washing pressure 10 Bar. Pipes and components in AISI 316L steel. Washing cabin in AISI 304 satin finish RA ≤0.8 μm. Positioning of the washing and drying lid inside. Air handling unit for drying the bin. Automatic management of washing cycles with PLC + touch screen. Buffer tank made of AISI 316L with heating system; Automatic door opening.



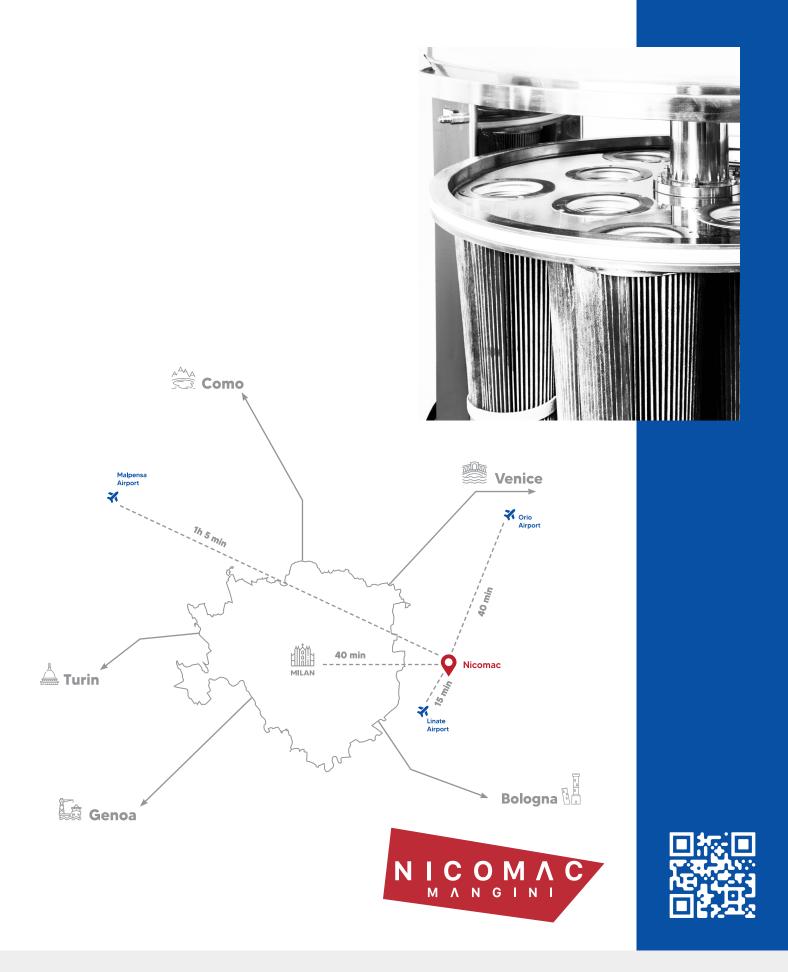


COLUMNS

Nicomac lifting columns are designed for handling drums, containers, IBCs, BINS. They are built with an elevator, capable of lifting, by means of an arm, a palletized container (BIN) and placing it with the discharge area in correspondence with the feeding mouth of the process machine. All the elevators in the series have been studied and designed to be fixed to the floor and constrained to the ceiling. Nicomac columns can also be used as a mixer with the rotation of the BINS. Lifting action through worm screw. Accurate finish for easy cleaning. Great reliability and safety.







GET IN TOUCH