THERMOFORMING

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METAL SHEET



CNC MILLING



PRESSES



LASER CUT







AUTOMATION











DRIVE YOUR

TECHNOLOGY

COMI Worldwide



The Group

COMI is established in 1973 with the aim of designing and producing thermoforming industry.

After more of 50 years of activity, today COMI is a solid industrial reality, with more than 3.500 systems installed in over 50 countries all around the world, a top-level reference list and a brand among the most prestigious in its market. Today the Group presents itself as a reference player in the industrial sector with 6 production sites in Italy and 4 foreign sales offices.

The companies that are part of the Group are: **COMI**, specialized in the production of thermoforming machines, presses, cutters and waterjets; **AMUT COMI**, today **COMI Packaging**, specialized in packaging thermoforming machines; **COMI TÈAS**, today **COMI Automation**, specialized in automation and laser cutting systems; **COMI Aerospace**, a company that recently joined the Group, specializing in the design and production of aircraft seats; **ACS World**, partner company specialized in the sale of spare parts in the aviation sector.

Facts & Figures







Manufacturing facilities in Italy



Subsidiaries abroad



Milion euro revenues



of Sales from international markets

5%

Invested constantly in R&S





Machines installed globally

Key Sector

Automotive



Technologies & range



Guarantee the manufacturing solution with the highest performance in every working condition has been the COMI driver since it was born.

Through the development of important projects with the range today available and the acquisition of complementary technologies/ partnership, COMI will pursue its growth towards a 360° offer to its customers.



SELECTION CRITERIA

| Basic/SuperLine Vacuum | Forming | HIPS - ABS | PMMA - PP | PVC | REFRIGERATORS | APPLIANCES | AUTOMOTIVE | SANITARY | INDUSTRIAL |
|---|---|------------|-----------|----------|---------------|------------|------------|----------|------------|
| In line Thermoforming BasicLine / SuperLine | 1÷8 mm 0,03÷0,31 inch Vacuum in the mould | 0 | ~ | | S | ~ | ~ | ~ | |
| In line Thermoforming BasicLine / SuperLine Basic/SuperLinePressure | 1÷8 mm 0,03÷0,31 inch Vacuum + "in bell" ballooning Forming | 0 | ~ | | 0 | ~ | ~ | ~ | |
| In line Thermoforming BasicLine / SuperLine HEDL Pressure Forming | 1÷8 mm 0,03÷0,31 inch Vacuum + "in bell" ballooning | S | ~ | | 0 | ~ | ~ | ~ | |
| In line Thermoforming BasicLine / SuperLine | 0,5÷3 mm 0,02÷0,11 inch Vacuum + ballooning + pressure | 0 | ~ | | S | ~ | ~ | | |
| Single-station Thermoforming BasicLine Thermoforming Moulds | 1÷12 mm 0,03÷0,47 inch Vacuum in the mould | ~ | S | • | ⊘ | 0 | ② | S | S |
| Single or Double side Side by Side Cutting & Punching system | Refrigerators Frigorifero Positive or Negative Forming ns | S | ⊘ | • | 0 | 0 | 0 | 0 | ⊘ |
| Double/ single blade guillotins | CNC centres Punching Presses & Molds | 0 | ⊘ | O | S | 0 | 0 | 0 | 0 |

BASICLINE/SUPERLINE VACUUM FORMING

LOADING Sheet

HEATING One station in BasicLine, two for SuperLine IR ceramic or quartz heating elements **FORMING** Vacuum in the mould Positive moulds

CUTTING Perimetral cut by guillotine or presses



BASICLINE/SUPERLINE NEW GENERATION

LOADING Sheet

HEATING

One station in BasicLine, two for SuperLine IR ceramic or quartz heating elements

FORMING

Forming by vacuum in the mould and ballooning through a bell located in the upper part of the heating station Bell capable to work with positive molds with 2 similar or different shapes (Side-by-Side) Cooling system to quickly cool down the thermoformed part Positive or negative moulds



BASICLINE/SUPERLINE PRESSURE FORMING

LOADING Sheet

HEATING

One station in BasicLine, two for SuperLine IR ceramic, quartz, or flash black heating elements

FORMING

Forming by vacuum in the mould and ballooning through a bell located in the upper part of the heating station Bell capable to work with positive molds with 2 similar or different shapes (Side-by-Side) Compressed air at 2/4 bar inside the bell, to support vacuum Cooling system to quickly cool down the thermoformed part Positive or negative moulds

CUTTING

Perimetral cut by guillotine or presse



HEDL PRESSURE FORMING

LOADING

from reel to reach a very high productivity, or sheet

HEATING

single top panel at 3 steps (reel) or 2 sandwich panels (Sheet) IR ceramic, quartz, or flash black heating elements

FORMING

Forming by vacuum in the mould, with ballooning through a bell integrated in the mold Compressed air at 2/5 bar inside the bell, to support vacuum Positive or negative moulds

CUTTING

Perimetral cut by guillotine or punching presse Chip cutting system at exit station



GUILLOTINES

Single or double blade cutting stations specifically designed to be integrated in the thermoforming plant for the execution of the liners and doors contouring.

Different configurations make possible to meet the plant and productivity requirements.

THERMOFORMING MOULDS

Thanks to a long-standing experience gained in 50 years of activity, COMI designs and manufactures specific thermoforming moulds for the appliances industry, among which:

- Double cavity inner liner moulds
- Side by side inner liner moulds
- Negative inner liner moulds





PUNCHING PRESSES

Presses for the drilling or cutting of the thermoformed innercells and doors have been realized to be put in line with thethermoforming machines.

Presses with different closing planes force have been studied to embrace various solutions: 30, 60, 100, 150 and 200 tons.

PUNCHING MOULDS

To complete the production cycle, COMI provides punching moulds for the piece finishing. The strong experience in the refrigerator sector enabled to develop the best technical solution according to the different production needs, among which:

- Inner liners with corner cutting moulds
- Separated inner liners punching moulds
- Inner doors cutting moulds

LABORFORMA - SINGLE STATION

All LaborForma industrial thermoforming machines are manufactured according to CE rules and provided with:

Manual sheet loading, Sheet clamping system, Forming station with plug assist system, Bilateral sheet heating system with ceramic heaters, Cooling system with fans, Vacuum system, PC with color display screen and control software. It may be equipped with the following optional • Automatic sheet clamping adjustment with motors (Patent)

• Automatically adjustable window frame with motors (Patent)

- Automatic mold plate clamping
- Mold drawing carriage
- Automatic sheet loader
- Unwinder
- Pre-heating unit
- Quartz or halogen heating elements
- Remote diagnostics





HEATING SYSTEMS

Each eating panel may be equipped with different type of heaters, chosen according to the end user's requirements among ceramic heaters, either standard or high-efficiency, quartz heaters, flash heaters (halogen). Dimension of heating elements are selected according to the product type to be thermoformed. The optional configuration of the machine includes also the installation of an IR pyrometer, which assures a correct

thermoforming of each sheet, in particular when different temperature values are involved.

SHEET LOADER

When the production cycle requires high output rates, or the sheet shape generates handling problems, the machine may be combined with an automatic sheet loading/unloading system. The sheet transfer is obtained by a set of suckers with no need for adjustment, while the loading carriage is driven by a motor system assuring a vibration-free feeding and a perfect centering of the workpiece on the window frame.

REEL UNWINDER

When "soft" materials provided in coil are required, the singlestation machine may be equipped with:

• Feeding out from a reel, unwinder powered and controlled

• Special unloading automatic system, with grippers mounted on a motor carriage capable to take the thermoformed part out from the forming zone, to cut the material in the wide direction, and to unload it.





LOADER & PRE-HEATING

The loader and pre-heating system allows an additional increase in the output rate, even with large sized tools.

• Sheet conveyor system by guides and toothed chains

• Integrated pre-heating station equipped with sheet loader allows a further reduction in the cycle times

• Automatic unloader takes the thermoformed part out from the forming station and makes unloading easier, in particular when the part has sizes that makes difficult to move it.

SYSTEM & SERVOMOTORS

The core of the thermoforming system is the powered handling controls of mold plate, plug assist and material clamping tools. The use of servomotors, allows to improve:

- handling accuracy
- output rate, with increase in cycles/hour number

• machine noise level decrease, plus no environmental contamination because the oil-dynamic power unit is not used anymore.



Comi Packaging

Joining experiences in the field of thermoforming

COMI Packaging has been created by merging AMUT Thermoforming Division and COMI division for packaging thermoforming machines. AMUT S.p.A. is a historical Italian company specialised in plastics processing plants and foil thermoforming machines. COMI S.p.A. has been active since the 1970s as a leading company in the production of thermoforming machines for the white goods industry and for the packaging industry following the acquisition of the Italian CBM Moretti. COMI Packaging is the union of technological and innovation know-how for the thermoforming of items for packaging.











IN-MOULD FORMING AND PUNCHING

These machines are suitable for products in PP, GPPS, HIPS, PET, PLA, PVC, barriered and thermoplastic materials in general, which require the highest quality and accuracy, even in case of materials subject to a remarkable shrinkable: such as cups for beverages and foods packaging, containers with low geometric tolerances and / or for automatic filling lines, etc.

PRESSURE / VACUUM FORMING AND STEEL RULE DIE CUTTING

Efficient solution for the thermoforming of trays, plates, lids, plant pots, technical and food containers with every thermoplastic material (PET, PS, OPS, PP, PVC, barrier materials, etc.). Highest flexibility: high performances for large productions but quick tooling and moulds low cost allowing production of small batches economically.





SPECIAL MACHINES

COMI Packaging designs and manufactures special solutions for specific products. It is a continuosly evolving range of machines developed according to customers' requirements and market trends.



INDUSTRY 4.0

COMI has implemented new innovative technologies and patents, as well as a particular attention to industry 4.0 through the use of the latest generation Siemens HMI software that allows you to detect anomalies in production and fix them without stopping the cycle. The software is user friendly but with advanced integrations to external systems (MES / ERP) and equipped with digitized systems such as cloud computing, edge computing and augmented reality.

In detail, the WINCC UNFIED SYSTEM technology also allows non-IT staff to customize the user interface according to their specific needs without the need for external support and simplify its operation. The digitization of our machines offers a smarter, more innovative and easier to use product. Among the features implemented there is automatic parameterization based on the characteristics of the product, automatic diagnosis and identification of the causes of failure.

Advantages:

- downtime reduction
- better machines usability
- enhanced asset visibility
- waste reduction









ANOMALY DETECTION

INDUSTRIA I CLOUD

ADVANCED HMI

PROCESS AUTOTUNING



SHEET METAL FORMING SOLUTIONS

APPLICATIONS FOR THE REFRIGERATION INDUSTRY

DOOR PANEL



CABINET PANEL



TUBE WRAPPING

CHEST FREEZER



TUBE SERPENTINE



FOAMING FIXTURES





GLUYING



TUBE BENDER



LASER PIERCING



REFRIGERATORS DOOR PRODUCTION LINE

Automatic systems designed to produce refrigerators external doors, flanged or curved, with wide drawing both central and lateral, folded square, with integrated handles, with dedicated profiles.

Black, pre-painted or stainless steel sheet can be used, either in coils or pre-cut squares of different thicknesses. The production line configuration generally includes blanking stations, customizing presses, bending machines (interpolated electric, linear or universal), door separation unit, short side flanging unit and possible reinforcement application.

The single-shot flanging process represents the point of excellence of these plants: fast cycle times and maximum quality are in fact guaranteed, avoiding the presence of multiple mold movements.



REFRIGERATORS CABINET PRODUCTION LINE

Automatic lines designed to make for refrigerators cabinet or U-shaped washing machines, side panels, panels with Joder profiles, panels with clinched reinforcements, riveted or welded, top panels.

Black, pre-painted or stainless steel sheet can be used, either in coils or pre-cut squares of different thicknesses.

The production line configuration generally includes shearing units, profiling or longitudinal bending units, bending units for short sides, tilters, U-bending machines. The COMI Automation lines are supplied with high quality molds completely made in Italy, and can be integrated with:

- automatic stations for the production and the application of the condenser inside the sides by fixing with conductive adhesives or simple taping
- masking tape and reinforcement application unit.



CONDENSER PRODUCTION LINE

Automatic lines designed to produce condenser serpentines for sides or U-shaped refrigerator cabinets.

In addition to the production of the condenser, COMI Automation is also able to realize stations for the automatic application of the condenser on the side by taping or gluing.

Starting from coils, the production line includes straightening, cutting and storage hopper for cut pipes in order to be able to process many at the same time during the bending phase and reduce cycle times (up to 10-12 seconds depending on the number of folds). The application cycle foresee taking the coil from a template for placing it in shape by pick-up and transfer at the point of application along the refrigerator side/cabinet, fixing and pressing. The fixing phase can be done by single taping, taping with a cover or by gluing.



EVAPORATOR PRODUCTION LINE

In case of thermoformed cells, based on the required heat exchange efficiency target, the COMI Automation solutions can include the cell pre-coating with aluminum tape, the creation of a butyl conductive paste saddle between the tube and the cell wall and the external protective cover of the tube with plastic or aluminum tape. Automatic lines designed to produce evaporators wound for refrigerators cabinets or for the application of evaporators produced offline by gluing or other fixing technology. The application process of the evaporator tube is carried out starting from coils and includes straightening, cutting and wrapping, while the shaping of the tube can be "D" rather than "O". The aluminum cells line includes aluminum cell forming stations, evaporator winding on the cell, and taping.



OVEN CAVITY PRODUCTION LINE

Automatic production lines designed to roduce C,O-shaped cavities welded to spot or continuous electrodes, clinched, laser-welded, cavities for electric or gas ovens with assembly of the related components, expanded cavities. These production lines can start either from coils with mechanical presses for the molding of the strip or from precut and stamped squares, they are supplied with high quality presses and molds made in Italy, and can be integrated with:

- auxiliary lines such as the processing of the top and bottom panels, of the side support brackets and of the resistance support
- process control systems with laser sensors or probes.



WASHING DRUMS PRODUCTION LINE

Automatic lines designed to produce washing machine baskets with front loading mechanical seaming, top loading with plastic flange, welded with laser technology.

The production line for washing machine baskets is made both from coils with mechanical presses for the band molding and from pre-cut and stamped squares. The COMI Automation lines are supplied with high quality molds completely made in Italy, and can be completed with:

- auxiliary lines such as cruise processing, shaft bushing, laser marking and final basket palletization
- process control systems with laser sensors or probes



PRESSES



SELECTION CRITERIA

| | COMPOSITES | RUBBER | RESIN | AEROSPACE | AUTOMOTIVE | RAILWAY | MILITARY | MEDICAL | APPLIANCES | INDUSTRIAL | |
|------------|------------|--------|----------|-----------|------------|---------|----------|----------|------------|------------|--|
| Composite | S | | ~ | 0 | 0 | 0 | 0 | S | 0 | S | |
| Carbontech | 0 | | ~ | S | ~ | 0 | 0 | | ~ | S | |
| Labortech | 0 | ~ | ~ | S | 0 | 0 | 0 | ~ | ~ | S | |
| Ermione | | 0 | S | ⊘ | ~ | ~ | 0 | | 0 | ~ | |
| Titanium | | 0 | I | | 0 | 0 | | 0 | 0 | ~ | |
| Chrome | | 0 | S | ~ | S | 0 | | ~ | ~ | S | |
| Develope | | 0 | | ~ | 0 | 0 | ~ | 0 | 0 | ~ | |
| Special | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | |



COMPOSITE SERIES

The COMPOSITE series presses are available both in the column version and in the frame version with prismatic guides. In this last case the guides rails can be hydraulic in order to free the moving platen during the inlet of the mold. All the models can be equipped with APS – Active Parallelism System. **DESIGN** Column or frame

CLAMPING FORCE from 2.500 to 40.000 kN - from 276 to 4409 US tons

MOULD OPENING OR APS FORCE from 250 to 4.000 kN - from 28 to 441 US tons

PLATEN DIMENSION AND MAX DISTANCE customized

STROKE from 500 to 3.500 mm - from 19,6 to 137,8 inch

SPEED fast clamping, up to 900 mm/sec compression, up to 80 mm/sec opening, up to 900 mm/sec



NRT - NEW RUBBER TECHNOLOGY

Presses designed for compression molding of rubber items such as gaskets - heat exchanger gasket - sheets.

DESIGN frame

PLATE MOVEMENT downward

CLAMPING FORCE from 1.500 to 10.000 kN / from 165 to 1102 US tons

DIMENSION OF HOT PLATEN from 400 x 400 mm to 1.100 x 2.200 mm

STROKE & LIGHT from 400 to 1.200 mm - from 15,7 to 47,2 inch

MAX TEMPERATURE standard 240 °C

PRECISION standard \pm 5 °C, with 3 zone \pm 3 °C



TITANIUM

The TITANIUM series machines are presses with column or frame structure. In the column version they are designed for the compression molding of technical rubber articles, and can be equipped also with an integral vacuum bell. In the frame version they are designed for the

production of automotive articles, even of large size, and can be equipped with integral suction systems.

DESIGN column

PLATE MOVEMENT downward **CLAMPING FORCE**

from 1.000 to 10.000 kN / from 110 to 1102 US tons

DIMENSION OF HOT PLATEN from 400 x 400 mm to 1.100 x 1.100 mm

STROKE & LIGHT from 400 to 1.200 mm - from 15,7 to 47,2 inch

PRECISION standard ± 5 °C, with 3 zone ± 3 °C



CHROME

Compression presses designed for rubber items moulding, also with vacuum bell, as well as thermosetting resin items. In this case the press can be equipped with automatic systems for part loading/unloading.

DESIGN column

PLATE MOVEMENT upward

CLAMPING FORCE

from 1.500 to 6.000 kN / from 165 to 661 US tons

DIMENSION OF HOT PLATEN from 400 x 400 mm to 900 x 900 mm

STROKE & LIGHT from 300 to 700 mm stroke – from 400 to 800 mm daylight

MAX TEMPERATURE standard 240 °C

PRECISION standard \pm 5 °C , with 3 zone \pm 3 °C



DEVELOPE

Small dimension presse designed to perform high quality laboratory test.

DESIGN column

PLATE MOVEMENT upward

CLAMPING FORCE from 200 to 800 kN / from 22 to 88 US tons

DIMENSION OF HOT PLATEN from 400 x 400 mm to 700 x 700 mm **STROKE & LIGHT** 400 mm - 15,7 inch

MAX TEMPERATURE standard 240 °C

PRECISION standard ± 5 °C, with 3 zone ± 3 °C



SPECIAL

COMI manufactures special presses and systems, specifically designed upon customer requirements, among which presses with circular platens for the production of large gaskets, presses with platens up to 12.000 mm (472,4 inch) for the heat shields forming, thermoplastic co-injection systems in compression presses, automotive/truck interiors manufacturing plants, presses for the production of zootechnical articles and much more.



REVAMPING INJECTION MOULDING MACHINES

Our revamping allows to reconstruct injection moulding machines technologically advanced based on solid original structural elements. The revamping activities can involve:

- Grinding of the platens
- Hydraulic system with feedback control
- Redesign of the electric system and control electronics

• Application of new accessories and possibilities, such as inverters, additional injection groups, shifting platforms

- Customized painting
- CE certification and 24 months new warranty
- Custom-made solutions.

Revamping activities might be completed by the transformation of the machine, for instance through the substitution or the addition of injection groups capable to obtain presses for bimaterial components moulding.



ENGINEERING



WORKING AREAS

COMI manufactures highly automated working units for composite materials (GMT-SMC-LFT) parts production.



AUTOMATIC LINES

Carbon fiber LFT-D LWRT Composites

Working unit designed for the co-molding of automotive arts, made by:

• Warehouses for composite thermosetting materials

• Centering Unit

• Electric oven with multiple temperature areas and double metallic belts

- COMPOSITE press
- Rotating table for the inserts
- Anthropomorphic robot
- Conveyor belt for material unloading
- LFT extruder

• Complementary ovens (Transfer and maintenance)

• Automatic cutting machines for SMC Thanks to the development of a specific software capable of managing the different forces needed for the two operations and the design of special molds for forming and cutting, this working unit allows to produce with a single press the under-body panel already cut, ready for its assembly on the car.

Following the Industry 4.0 logic, all the equipment that make up the production unit - oven, press, rotary table and three robots - are interconnected and managed by the central software that manages the entire plant.

CNC MILLING



SELECTION CRITERIA

| LaborMix | | COMPOSITES | PLASTICS | RESIN | MOOD | ALUMINIUM | LIGHT ALLOYS | AEROSPACE | AUTOMOTIVE | MARINE | RAILWAY | DNIM | MOLD | INDUSTRIAL |
|---|--|------------|----------|-------|------|-----------|--------------|-----------|------------|----------|---------|------|------|------------|
| X: 2.500 - 6.100 mm Y: 1.500 - 3.100 mm Z: 900 - 1.200 mm | 2,2 / 12 kW 18.000 - 32.000 rpm | ~ | 0 | ~ | ~ | | | | 0 | | ~ | | | ~ |
| LaborMax | | | | | | | | | | | | | | |
| X: 3.200 - 6.200 mm Y: 2.000 - 2.600 mm Z: 900 - 1.200 mm | 10 / 12 / 15 kW 24.000 rpm | S | ~ | ~ | ~ | ~ | | | ~ | | ~ | | ~ | 0 |
| LaborMac | | | | | | | | | | | | | | |
| X: 2.600 mm Y: 1.500 - 1.700 mm Z: 1.000 - 1.200 mm | 15 / 22 kW 24.000 rpm | S | ~ | ~ | | ⊘ | ⊘ | 0 | 0 | | | | ~ | ~ |
| LaborMidi | | | | | | | | | | | | | | |
| X: 3.000 - 12.000 mm Y: 1.500 - 2.000 mm Z: 250 - 600 mm | 22 kW 20.000 rpm | | ~ | | ~ | 0 | | | | | | | ~ | 0 |
| LaborShape | | | | | | | | | | | | | | |
| X: 2.000 - 6.000 mm Y: 2.000 - 3.000 mm Z: 900 - 1.500 mm | 22 / 30 / 42 kW 18.000 - 24.000 rpm | ~ | | ~ | | 0 | S | ~ | | | | | 0 | 0 |
| LaborWind | | | | | | | | | | | | | | |
| X: 6.000 - 50.000 mm Y: 4.000 - 8.500 mm Z: 1.200 - 4.500 mm | 15 / 22 kW 20.000 - 24.000 rpm | ⊘ | | ~ | ~ | ~ | | ~ | | ~ | | 0 | | |
| LaborMarine | | | | | | | | | | | | | | |
| X: 4.000 - 50.000 mm Y: 2.600 - 8.000 mm Z: 1.200 - 3.000 mm | 10 / 15 / 22 kW 20.000 - 24.000 rpm | 0 | | ~ | ~ | ~ | | | ~ | ⊘ | | | | |
| LaborSpace | | | | | | | | | | | | | | |
| X: 10.000 - 20.000 mm Y: 4.000 - 8.000 mm Z: 3.000 - 6.000 mm | 10 / 15 / 22 kW 20.000 - 24.000 rpm | v | | ~ | | | ~ | S | | | | | | |

LABORMIX

LaborMix is a 5 interpolated axis milling center specifically designed for the machining of plastic and composite materials.

Equipped with working head with spindle at two opposite exits or four independent spindle head, it is the best solution for three-dimensional trimming of thermoformed parts. With working head with spindle and automatic toolchanger, it is instead widely used for the machining of small resin and wood models. LaborMix allows to achieve very high productivity results and quality in trimming operations, with modeling capability.



| AXIS | STROKES | SPEED |
|-------|---------------------------|----------|
| | | 80 m/min |
| Х | 2.500-6.100 mm / 98-240" | 80 m/min |
| Υ | 1.500-3.100 mm / 59-122" | 40 m/min |
| Z | 900-1.200 mm / 35.4-47.2" | 30 rpm |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | |



LABORMAX

LaborMax is an extremely versatile working center capable to satisfy the milling requirements on a wide variety of materials, with characteristics which made it the best solution for composite materials working operations.

Available in several standard dimensions and versions, with fixed, rotary (pallet changer) or extractable tables, with different power working head, with linear or rotary tool magazines. LaborMax is distinguishing for the great versatility, the wide possibility to furthermore complete the machine with auxiliary devices, the stiffness of the structure, for whole technical characteristics which position it at the top of its category.

| AXIS | STROKES | SPEED |
|-------|---------------------------|----------|
| х | 3.200-6.200 mm / 126-244" | 80 m/min |
| Υ | 2.000-2.600 mm / 78-102" | 80 m/min |
| Z | 900-1.200 mm / 35.4-47.2" | 40 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |







LABORMIDI

LaborMidi has been specifically designed to machine aluminum, policarbonate and technical polymers.

Its "open" configuration with mobile bridge allows a wide access from the 2 sides of the machine, but also allows to be used in totally automated production systems which require automatic loading/unloading by robotized devices. Available in the 3 and 5 axes version, it can be equipped with a wide range of accessories according to customer needs. LaborMidi is an effective solution for panel machining with a very good quality/price ratio, extremely easy to install and introduce in the production process.

| AXIS | STROKESÙ | SPEED |
|-------|----------------------------|----------|
| Х | 3.000-12.000 mm / 118-472" | 80 m/min |
| Υ | 1.500-2.000 mm / 59-78" | 80 m/min |
| Z | 250-600 mm / 9.8-23.6" | 40 m/min |
| A (*) | +/- 120° | 40 rpm |
| C (*) | +/- 365° | 30 rpm |





LABORMAC

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LaborMac is a 5-axis machining center specifically developed to optimize the machining of molds and parts in aluminum and composite. The extreme rigidity provided by the monolithic structure with Gantry type mobile portal on the Y axis, significantly limits the vibrations helping to achieve very good quality even at high speeds. LaborMac version "C" offers instead high performance in modeling and trimming of composite materials and resins, can be equipped with Oil Mist and suction hood for dust extraction.

The version "A", dedicated to aluminum machining, is equipped with a working head of higher robustness, tool's cooling system by chemical water, steel table with T-slots and two chips conveyors.

| AXIS | STROKES | SPEED |
|-------|-----------------------------|----------|
| х | 2.600 mm / 102.4" | 80 m/min |
| Υ | 1.500-1.700 mm / 59.1-67" | 80 m/min |
| Z | 1.000-1.200 mm / 39.4-57.2" | 60 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |



LABORSHAPE

LaborShape is a 5 axis machining center specifically designed for high speed machining on aluminum and light alloys.

Compact dimensions and extremely rigid monolithic structure, axis displacement with recirculating ball screws and magnetic linear guides to ensure the best accuracy, working head with torque motors are the main technical features which makes this model the best solution for high chip removal. LaborShape is the best answer to the working requirements for mould in aluminum or light alloys, whereas accuracy and quality of finishing are requested.

| AXIS | STROKES | SPEED |
|-------|--------------------------|----------|
| х | 2.000-6.000 mm / 78-236' | 80 m/min |
| Υ | 2.000-3.000 mm / 78-118" | 80 m/min |
| Z | 1.250 mm / 49.2" | 80 m/min |
| A (*) | +/- 120° | 40 rpm |
| C (*) | +/- 365° | 40 rpm |









LABORWIND

LaborWind is the family of machining centers designed for those applications requiring the biggest working area, especially for the vertical "Z" axis.

The mobile crossbeam, "suspended" on lateral steel or reinforced concrete structures, allows to cover very large working areas without overload the basic structure of the machine.

Available with various spindle power and tool magazine configurations, with longer longitudinal axis strokes versions the machine can also be supplied with double mobile crossbeam and independent working unit, thus to double the production capacity. LaborWind is the solution for the machining of parts and models of wind turbines and yachts.

| AXIS | STROKES | SPEED |
|-------|----------------------------|----------|
| х | 6.000-50.000 mm / 157-334" | 80 m/min |
| Y | 4.000-8.500 mm / 315-1968" | 80 m/min |
| Z | 1.200-4.500 mm / 47.2-177" | 40 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |









LABORMARINE

Thanks to its mobile portal configuration, the machine can also be laterally loaded/unloaded, with clear advantages for the manufacturing space organization.

With Labor Marine the working area is exactly configurable according to the specific need, making the best use of the available space in the factory. LaborMarine allows to have an appropriate working area for large dimension parts milling, ensuring at the same time the maximum machine accessibility for loading/unloading operations. Although these are typical requirements of the marine sector model manufacturers, today this machine is particularly appreciated also from the foundry model makers.

| AXIS | STROKES | SPEED |
|-------|----------------------------|----------|
| х | 4.000-50.000 mm / 102-315" | 80 m/min |
| Y | 2.600-8.000 mm / 157-1970" | 80 m/min |
| Z | 1.200-3.000 mm / 47.2-118" | 40 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |





LABORSPACE

LaborSpace is a special CNC machining center which integrates the functions of a mobile portal milling machine with a rotating unit typical of a horizontal lathe, designed to perform machining of high dimension aerospace propulsion systems. It is capable to machine aerospace solid motor cases up to 20 meters length by 5 meters diameter, made by advanced composites materials (carbon fiber and epoxy resin) protected by a rubber layer and equipped with aluminum flanges, which may reach 120 tons weight. Laborspace capable to perform precisely on very wide, long and high strokes the three critical operations for that parts manufacturing process: the composite multilayer cutting, the light alloy flanges drilling and the external rubber machining.

| AXIS | STROKES | SPEED |
|-------|-----------------------------|----------|
| х | 10.000-20.000 mm / 157-315" | 30 m/min |
| Y | 4.000-8.000 mm / 394-788" | 30 m/min |
| Z | 3.000-6.000 mm / 118-236" | 20 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |







SELECTION CRITERIA

| VentorFast | | ALUMINIUM | LIGHT ALLOYS | STEEL | CASTIRON | TITANIUM | AEROSPACE | AUTOMOTIVE | MOULDING | MOLD MAKER | INDUSTRIAL |
|---|---|-----------|--------------|-------|----------|----------|-----------|------------|----------|------------|------------|
| X: 2.000 - 6.000 mm Y: 1.500 - 3.000 mm Z: 1000 - 2.000 mm | 18 - 50 kW 45 - 160 Nm 15.000 - 45.000 rpm | S | ~ | ~ | ~ | ~ | S | ~ | | ~ | |
| VentorMaster | | | | | | | | | | | |
| X: 2.500 - 10.000 mm Y: 2.000 - 4.000 mm Z: 1.000 - 2.000 mm | 11 - 105 kW 210 - 1.000 Nm 8.000 - 12.000 rpm | S | ~ | ~ | ~ | ~ | | ~ | ⊘ | 0 | |
| VentorPower | | | | | | | | | | | |
| X : 6.000 - 40.000 mm Y: 3.800 - 5.000 mm Z : 1.000 - 2.000 mm | 11 - 105 kW 210 - 1000 Nm 8.000 - 12.000 rpm | ~ | ~ | ~ | ~ | 0 | | ~ | ~ | ~ | ⊘ |
| LaborMidi | | | | | | | | | | | |
| X : 2.000 - 6.000 mm Y : 2.000 mm Z : 1.000 mm A : +/- 110° C: +/- 190° | 90 kW 32 Nm 32.500 rpm Taper : HSK - F 80 | | ~ | ~ | ~ | | S | | ~ | ~ | |

Sest application

VENTORFAST

VentorFast is a 5-axis machining center "portal" type with mobile bridge and fix working table, designed to obtain the maximum rigidity and the best resistance even under the most severe working conditions.

The vertical axis rigidity is guaranteed by movement performed along 4 guides within the "RAM" "box-in-box" structure.

The X/Y/Z axis displacement is obtained by dual drive gantry system, while the axes positioning accuracy is detected by optical lines.

| AXIS STROKES | | SPEED |
|--------------|--------------------------|----------|
| х | 2.000-6.000 mm / 78-236" | 60 m/min |
| Υ | 1.500-3.000 mm / 59-118" | 60 m/min |
| Z | 1.200-2.000 mm / 47-78" | 40 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |

The machine can be equipped with 5 axes continuous interpolation as well as with "Index" type heads.

VentorFast performs high speed machining and high accuracy processing of aluminum and steel, with proved successfull applications in the aerospace sector.





VENTORMASTER

VentorMaster is a 5-axis machining center designed to obtain high torque needed to work on hard metals such as steel and titanium. This machines have a fixed table and mobile transversal bar which runs along the X axis guides which are placed in the upper part. The axes movements are on roller guides and screw rectified to double preloaded scroll, while the axes positioning accuracy is detected by optical lines. The movement of the vertical axis "RAM" occurs within a "box-in-box" structure. Available 5 axis heads versions either with continuous interpolation or «Index» type. VentorMaster develops high torque and has an extremely robust structure, features which makes it particularly suitable for metal machining performed by molding companies and mold makers.

| AXIS STROKES | | SPEED |
|--------------|---------------------------|----------|
| х | 2.500-10.000 mm / 98-394" | 40 m/min |
| Υ | 2.000-4.000 mm / 78-156" | 40 m/min |
| Z | 1.200-2.000 mm / 47-78" | 40 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |





VENTORPOWER

VentorPower is a 5-axis machining center, portal type with mobile bridge and fixed table, equipped with advanced technological solutions capable to reach outstanding performances. The axes movements are on roller guides and screws rectified to double spiral preloaded, the positioning accuracy of the axes is detected by optical lines, the RAM is "box in box" type. Available also a "cross mobile" version with Z 1 Racing (RAM) up to 1800 mm and Z2 (bar) up to 4000 mm. Can be mounted both heads with 5 axes with continuous interpolation or "Index" type, additional option the «automatic head change» system.

VentorPower is a machining center for steel, cast iron, titanium and aluminum, suitable for industrial sectors such as Mechanical Fabrication.

| AXIS STROKES | | SPEED |
|--------------|-----------------------------|----------|
| х | 6.000-40.000 mm / 236-1575" | 40 m/min |
| Υ | 3.800-5.000 mm / 150-197" | 40 m/min |
| Z | 1.000-2.000 mm / 39-78" | 40 m/min |
| A (*) | +/- 120° | 30 rpm |
| C (*) | +/- 365° | 30 rpm |





MONNALISA

Monnalisa is the innovative 5 axes horizontal working center specifically developed for the machining of monolithic aluminum structural parts of large dimensions, particularly suitable for applications in the aeronautical sector. The extremely robust structure is made entirely of cast iron and properly reinforced to obtain maximum rigidity and dynamicity with minimal thermal drift. The tables are two large worktops, symmetrical to each other (pallet changer) in order to allow the operator to replace the pieces during the processing phases, in a comfortable position and in full safety.

| AXIS STROKES | | SPEED |
|--------------|--------------------------|----------|
| Х | 2.000-6.000 mm / 78-236" | 50 m/min |
| Υ | 2.000 mm / 78' | 50 m/min |
| Z | 1.000-2.000 mm / 39-47" | 50 m/min |
| A (*) | +/- 110° | 210%sec |
| C (*) | +/- 200° | 210°/sec |



The aluminum work tables are designed to use both the vacuum suction that any fixing system for the piece, with a flow rate of 2,000 kg for each floor.

The piece loading is made simple by the rotation of the table of 90 ° obtained with two mechanical arms hydraulically actuated, while for gripping the table four hydraulic pistons are used. The large capacity tool's magazine allows to have

more than 100 tools, it is positioned laterally and is properly protected from chips and dust when not used.



Thanks to the large size tape evacuator positioned below the work surface, a volume of 1 cubic meter of chips per hour is evacuated. The X carriage is made by a rigid structure to double upright in cast iron and is moved by 4 gear-boxes with integrated pinion and 4 brushless motors. The scheme is a gantry of two Dual Drive systems for the recovery of the games via electronic preload.

WATERJET CUT



WJA JET is the series of cutting machines with movable bridge "gantry" type, ideal for cutting of large pieces as well as high production volume thanks to the possibility to have the multiple cutting heads configuration. Several versions are available, in dimensions, with 3 or 5 axis head, even with twin mobile bridge.



FB JET

FB JET is our "entry level" waterjet cutting machine, recognized by customers for its excellent quality/price ratio.

The machine structure is cantilever type, with accessibility on three sides, while the stainless steel water tank is separated by the basement to avoid any cutting vibration transmission. FBJET is a very compact machine made by very high quality components to guarantee the maximum reliability over the years.



LC JET

LCJET is an extremely compact waterjet cutting machine which combines all the state of the art techniques and top quality components: latest generation numeric control FANUC, high pressure water feed supplied by a KMT Waterjet Systems pump, Windows user interface, system designed to work in complete autonomy, SGA abrasive feed system (calibration of +/- 5 %). The compact dimensions, the high quality precision cutting, the completely closed protection cabin make LCJET ideal for small production batches and/or where limited space is available.





CUTTING BOX

Cutting Box is the most advanced solution in our waterjet cutting systems: conceived as an independent station, it is usually integrated in highly automated manufacturing lines with stressful working cycles.

Designed as a closed cell, where the working units are cutting heads set on ABB anthropomorphic robot managed by last generation IRC5 control unit. The table on which the pieces are clamped is pallet changer type, allowing loading/unloading in pendular cycle and ensuring at the same time maximum safety to the operator. Cutting Box finds its best application in the automotive sector, to perform trimming of internal parts of the car (carpets, dashboards, noise insulation panels, etc).

LASER CUT



SENIOR (2D)

The bidimensional laser cutting machine mod. SENIOR is a fixed table system equipped with laser sources from 200W to 2000W. The machine is planned to seat Fanuc or Rofin Sinar laser sources at customer discretion. The high quality and cutting accuracy: outcome of an advanced technology of the laser sources and of an extreme precision of the applied mechanics, as well as the innovative technical solutions duly studied for dieboards sector. Reliability, efficiency and robustness; COMI SpA has always paid particular attention to these factors, consequently giving a high production performance, limiting maintenance to a minimum.



SIMO (3D)

SIMO is addressed to the three-dimensional laser cutting details thermoformed for the automotive industry. The translation of the axes is by linear motors, with a rigidly "gantry" and two distinct motors for moving the portal. It has been used two torque motors and an electrical manifold for the rotary axes of the cutting head avoiding the two axes mechanical limitations but ensuring more full turns. This feature grants a large and easy planning of works paths in order to perform complex and challenging tracks in less time and avoid dowelling the axes by unnecessary movements for the job process.

LASER T*/SLIM T* CUTTING UNIT FOR PLASTIC & COMPOSITE

LASER T * and the SLIM T * compact systems are complete robotic units for cutting plastic and composite materials and for welding / cutting metal components.

They are widely used for applications in the automotive sector (carpets, planks, plastic components), for processing thermoformed materials (ABS, polystyrene, plexiglas and plastic in general) and for composite materials (glass and carbon fibers, kevlar, etc.).

Laser T^{*} is a system that ensures the highest standards of safety, work area cleanliness and environmental respect.

It includes a CO2 laser source, whose radius is led by an articulated arm up to a cutting head moved by a robot. To complete the system, a special waste collection and evacuation device is provided, as well as a protection cabin with relative aspiration and particulate filtering system.

Laser T * is a fully versatile system, through which the customer is able to autonomously produce any new model or add a design variant simply by modifying the machine's work cycle at software level.

The Slim T * compact system has been designed to work small components, guaranteeing the same results in terms of flexibility, quality and performance of the largest Laser T * at a reasonable price. Occupying an area of 2 x 3 meters is also ideal where the installation space represents a limit.





AUTOMATION



AUTOMATED WORKING UNITS

COMI designs and manufactures highly automated working units where an anthropomorphic robot, mounted on a fixed platform or on a longitudinally moving carriage, completed by control unit and software for its programming, perform operations such as:

• Spraying reinforcing / insulation foams on specially designed templates

• Leveling milling of the cured and hardened foam layer

• The perimeter cut of the machined part. Loading, positioning and blocking of the workpieces is customized to optimize accessibility and flexibility, with systems like Twin Shuttle with translating or slide-through tables mounted on trolleys, fixed tables and optional transversal translation inside the unit, vacuum pumps for piece clamping.



THE ROBOT MILLING & CUTTING UNIT

The Robot Milling & Cutting unit is made by: • **4 antropomorphus robot**, 6 axes, mounted on the unit basement

- 2 Robot's control cabinet
- Portable control console
- 4 Electro-spindles by 12 kW(S1) / 15 kW(S6) @ 24.000 Rpm with automatic tool changer HSK F63
- Spindles cooled by liquid with separate

refrigerating unit, tool connection cleaning by air

- 2 Tool's magazines at 8 positions, "rack" type
- 2 contact probing **Tool setter**



FIBERS PRODUCTION LINE

Textile fibers and glass fibers are the historical sector of COMI TEAS and we have created automatic systems operating all over the world allowing the production and handling of over 4 million reels every year.

The manufacturing processes that can be automated with our systems are handling of the winding and doffering area, technological handling, transfer shuttle, palletizing, packaging, labelling, weighing, quality checks.

The traceability of the product throughout the process is essential. The experience and the software knowledge of COMI TÈAS allow to always identify the best and most reliable solution (bar code, RFID, vision systems for solutions that require form recognition). In the field of fibers applications COMI TÈAS is able to realize highly customized solutions for specific processes and with limited spaces, as well as turnkey automation of the entire factory supply chain (direct and indirect roving production, glass wool or mineral wool as for the configuration illustrated below which starts from the stacking of mineral wool panels up to their final packaging on pallets).



PACKAGING

HOUSEHOLD APPLIANCES thermoforming machines punching presses punching molds

INDUSTRIAL sheet single station coil unwinder automatic loader

THERMOFORMING MOLDS

LASER CUTTING

FIBER PRODUCTION LINE

TRUCK PANEL ASSEMBLY

FROM COLD TO CABINET

CUSTOMIZED AUTOMATION SYSTEM

WORKING AREAS SPRAYING

ENGINEERING

AUTOMATION

WATERJET 3 - 5 axis

UNITS

TURNKEY PLANTS

AIRCRAFT SEAT DESIGN spare parts for aircraft

ROBOT cutting box

CNC MILLING & TRIMMING 3 - 5 axis

ROBOT cutting & milling

3D C02 ROBOT LASER CUTTING

2D LASER CUTTING

RECONDITIONING

PRESSES

METALSHEET

HOUSEHOLD APPLIANCES

washing refrigeration cooking boiler

INDUSTRIAL tube bending marriage condenser & evaporator



CNC MILLING

LASER CUT



PRODUCTION SITES



COMI AUTOMATION Via dell'Artigianato 37, Teglio Veneto (VE), Italy

FOREIGN SUBSIDIARIES



COMI AMERICAS

46850 Magellan Dr. Suite 160 Novi, MI 48377, United States



O COMI MIDDLE EAST

The Ibn Battuta Gate Offices, office no: GF08, PO Box 385219, Dubai, UAE

Via Liegi, 2 | 24040 Ciserano - Zingonia (BG), Italy Tel +39 035 882567 | Fax +39 035 885051 commerciale@comispa.it | www.comispa.it



ACS WORLD





COMI DEUTSCHLAND

Cecil-Taylor-Ring 12-18, 68309 Mannheim, Germany

Via San Sossio 38, 80049 Somma Vesuviana (NA), Italy



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