

LMT 65

Working and cutting line with saw blade \varnothing 650 mm



CE

Thanks to the high number of controlled axes, the fully automated system produces components machined and cut to size using a multispindle work centre and a cutting machine with front blade exit, guaranteeing maximum flexibility for numerous applications. 16 different variants are available, which can be configured in terms of depth and length of material loading/unloading magazines and right or left feed direction.

Description of the individual line components

LOADING MAGAZINE

The system allows the profiles to be stored and then fed horizontally. It consists of 9 supports with bar traversing belts fitted with mobile inserts. The simultaneous forward feed and belt phasing are guaranteed by a splined shaft that transmits the movement to all the supports. A reference stop mounted on the support nearest the machining area allows an initial alignment of profiles as they are being loaded. (PUSH)

Optional device for machining profiles with very complex and variable geometries. The magazine can be supplied with an innovative controlled axis system for automatic overturning and for ensuring the correct stability and position in the work area.



Technical specifications:

- Profile presence detection with photocells
- Minimum transportable profile length: 1000 mm
- Maximum transportable profile length: 7100 mm (on request higher length)
- Useful loading capacity: 2000 mm in the 7020 version and 4000 mm in the 7040 version
- Maximum permitted weight: 600 Kg (7020 version) and 1200 Kg (7040 version)

The standard distance between the inserts of the loading belts is 300 mm; the load capacity is equal to 6 bars for the 7020 version and 12 bars for the 7040 version. Other possible configurations must be verified by the technical office.

Available optional:

- Intermediate support kit for light profiles that tend to deform under load

BAR FEEDER AND PROFILE PICK-UP SYSTEM



Structure

It consists of a beam in electro-welded steel that guarantees stability over time.

Longitudinal axis drive and movement (X)

Mounted on lateral guides with recirculating ball slides and rack with helical teeth of high quality, precision, strength and reliability. The independent X axis (longitudinal), along which the carriage with arm and rotating collet moves, is driven by a brushless servomotor. The servomotor used allows short high-speed positioning times and rapid return. The position of the axis is detected by an encoder.

Carriage

Constructed in die-cast aluminium. The carriage has two supplementary controlled axes (transversal Y and vertical Z) to allow profiles of different section to be picked up without any action by the operator.

Profile pick-up system

Consisting of horizontal rollers and vertical rollers in chrome-plated steel to prevent scratching, guaranteeing optimum movement of the profiles. The zero reference along the X-axis is a retractable pneumatic stop. The standard rotating clamp with automatic controlled positioning allows rapid and accurate adaptation of the variable and intermediate angle pick-up (+90/0°/-90°).



Technical specifications:

- Maximum allowable profile width: 250 mm
- Maximum allowable profile height: 200 mm
- Maximum allowable profile length: 7100 mm (longer on request)
- Maximum allowable profile weight: 25 Kg/m

MULTISPINDLE MACHINING UNIT

The multispindle machining unit has been designed to carry out various machining operations on all four sides of an aluminium profile.



Structure

The structure consists of three centre frames, one load-bearing and one intermediate in steel with a third in aluminium on which the electrospindles for the mechanical machining are installed. The solution adopted guarantees stability, speed and precision during machining. This construction solution offers considerable advantages in terms of maintenance.

Axes movement

The independent V (vertical) and C (transversal) axes are driven by brushless servomotors through high-precision ground recirculating ball screws and a preloaded lead nut. The digital servomotors used allow short high-speed positioning times and rapid return.

Electrospindles

Each of the electrospindles installed on the machine has a 3.3 kW output, an inverter controlled speed of up to 18,000 rpm and pure oil tool lubrication by means of a micro-drop concentrated high pressure spray (minimal lubrication). As standard, they use ring nuts and type ERG 25 collets. Electrospindles (6,5kW) for machining threads and with quick-release (HSK 40) are available as optional extras for rapid tool changes. The machine is set-up to receive up to a maximum of 20 electrospindles, to be verified in line with the required machining operations. Their arrangement on the centre frame will be designed according to the specific needs of the user.

Working area

Two sets of vices are provided for the correct alignment and pneumatic locking of the profiles entering and leaving the machine tool during the machining phases.

Technical data:

V axis travel (vertical)	400 mm
C axis travel (transversal)	700 mm
Maximum profile dimensions	See diagramm
Electrospindle power rating:	3.3 kW at 18,000 rpm (opt. 6,5 kW at 19.000 rpm)
Tool collet:	ER 25 (opt. HSK 40)
Max tool diameter:	13 mm

Available optionals on the multispindle machining unit:

- Quick-release electrospindles with HSK 40 shank
- 6,5 kW/19,000 rpm electrospindles for thread cutting
- Tilting electrospindles (for machining inclined faces)
- Sensor kit for tool integrity control
- Profile dimensions sensor kit for the correct positioning of the machining operations
- Profile support kit with controlled movements in Y and Z for unstable profiles

CUTTING UNIT WITH BLADE Ø 650 mm



Automated single front head line sawing machine with electronic blade tilt angle control. It consists of:

- Machine base in electro-welded stabilized steel, sized to guarantee stability and precision during machining.
- Blade mounting support head with special bearings designed to guarantee the absence of play and ensure precision and repeatability during rotation
- Oscillating support in cast aluminium supported at the back to achieve optimum removal of chips and swarf into the lower compartment of the base.
- Motor support and saw mounting shaft in cast aluminium. The solution employed allows motors with high nominal power to be used and a wide range of cutting schemes to be obtained.

The horizontal and vertical support surfaces for the profile are provided with:

- Loading side traversing idle roller table with chrome plated rollers
- Chrome plated and rubber lined rollers
- Horizontal vices unit (2) with controlled positioning (X and Y)
- Vertical vices unit (2) with controlled positioning (X and Y)

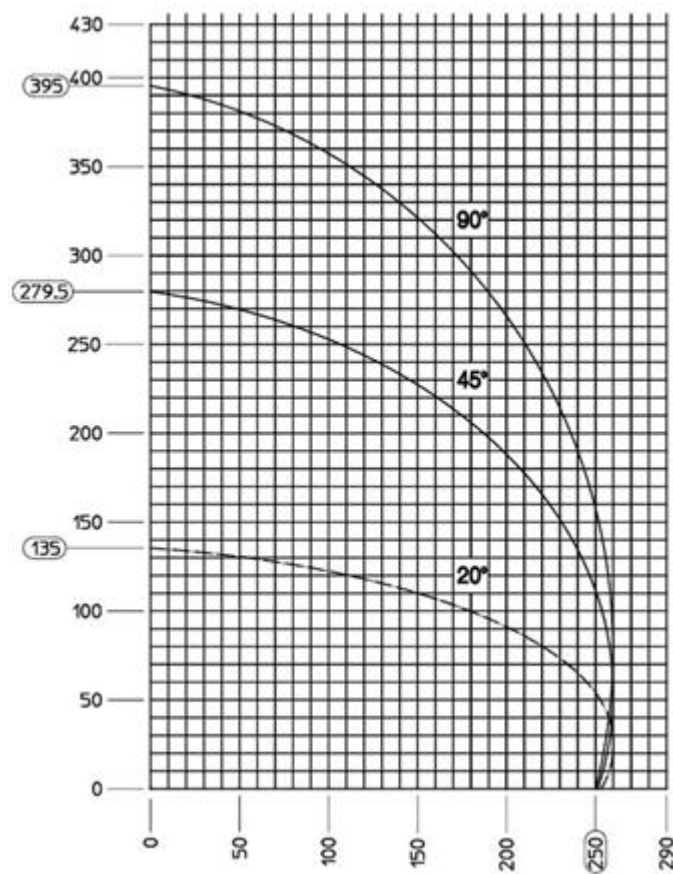
Available optional:

- Profile support kit with controlled movements in Y and Z for unstable profiles

Technical specifications:

- Tungsten carbide saw blade \varnothing 650, thickness 5 mm
- Pneumo-hydraulic blade feed
- Adjustable blade exit speed, rapid retraction
- Blade angle control with intermediate degrees $-20^{\circ}/+90^{\circ}/+20^{\circ}$ (from 20° to 160°)
- Set up for the forced extraction of chips
- Micro-drop and pure oil blade lubrication system
- Set up to take swarf removal belt
- Blade motor power: 7.5 kW (in continuous service S1)
- Motor/saw blade transmission via a Polyflex type multiple V-belt
- Weight: 1320 Kg (without templates)

Cutting diagram



UNLOADING MAGAZINE



The system is equipped with a motorised lowerable roller table that allows the finished pieces to be rapidly extracted and stored on motorised belts and then transported towards the operator. It consists of a minimum of 8 supports (the number varies according to the version) on which a belt runs with a shaped carrier that provides a firm base for the unloaded pieces. The number of supports can be increased and the distance between them varied in order to configure the bar unloader storage to the individual needs of the user. Simultaneous forward feed and belt phasing are guaranteed by a shaped motor shaft that transmits the motion to all the belts.

Technical specifications:

- Minimum unloadable bar length: 250 mm standard
- Minimum length from 40 to 140 mm (optional): with unloading trasversal belt in front of the sawing machine
- Minimum length from 141 to 250 mm (optional): with unloading trasversal belt external to the casing
- Optional minimum length: for lengths shorter than 40 mm subject to technical verification
- Maximum lenght: 5000 mm or 7000 mm, depending on the requested version
- Useful depth of storage: 2000 mm or 4000 mm, depending on the requested version
- Profile presence detection: by photocell
- Complete storage unit: by photocell
- Profile anti-drop safety device: by safety micro

CONTROL CONSOLLE

Compact control console mounted on wheels for executing programs.



Technical specifications:

- Resistive touchscreen display TFT 17" with LED backlight
- Standard mouse and keyboard housed in a retractable compartment

PC comprising of :

- Solid state hard disk
- 2 Net interfaces
- USB ports
- 3-year international "on site" warranty for commercial PC

With the following applications installed:

- FST MI for managing the working lists and blocks of manual control and service on line – assistance.
- FST graphic Software based on the Windows operating system for planning the machining operations and designing the finished piece. Automatic generation of the executable CNC program.

Software characteristics

- Cutting and machining lists entered via an operator interface
- Cut optimization with reversibility and symmetry management
- Inline re-optimisation with exclusion of ruined parts
- Re-use of offcuts
- Profile graphic archive
- Three-dimensional macro archive (or macro creation and management)
- Import and export of data from XML
- Display of the workpiece and machining operations in a CAD 3D environment
- Simulation of the machining operations
- Display of technical features of pieces and tools
- Graphic user interface
- Import of geometries in DXF format

LABEL PRINTER

Very fast graphic printer with automatic recognition of label presence. Different barcode formats can be handled. The printer must be positioned at the profile unloading end for manual application of the labels.

Available optionals:

- Ribbon kit which allows using thermographic or normal paper
- Different label formats and oriental languages can be managed

ELECTRIC CABINET

Equipped with filters for protection against emission and reception (EMQ) disturbances and with air conditioning system for the cooling of the electrical/electronic components. It has an IP 54 protection grade against dust and liquids.

Standard Configuration:

- Loading magazine
- Bar feeder and profile pick-up system
- Multispindle machining unit
- Cutting unit
- Unloading magazine
- Control console
- Soundproof casing and safety devices
- Installation and training (travel, board and lodging costs not included)

Optionals:

Swarf and chips removal belts

Available in different lengths and heights, they can be positioned at the rear of the cutting machine to remove the chips and swarf produced by the cutting. The addition of other belts allows chips and swarf to be removed away from the machine, including outside the safety fences.

TRANSVERSAL BELT 3200 x 1550 (H) mm ramp 40°

as an alternative:

LONGITUDINAL BELT 5500 x 2200 (H) mm ramp 40° + TRANSVERSAL BELT 1800 x 360 (H) mm ramp 20°

Unloading trasversal belt in front of the sawing machine

Positioned under the cutting machine, it allows cut pieces of length between 40 and 140 mm to be unloaded (shorter lengths to be technically assessed case by case). An automatic baffle allows the cut profiles to be separated from the waste material, which is transported towards the rear chip removal conveyor

Unloading trasversal belt external to the casing

Positioned downstream of the cutting machine and upstream of the unloading magazine, it allows cut pieces of length between 141 and 250 mm to be unloaded.

Dust extractor

The cutting machine can be connected at the rear to a chip suction unit that removes the chips generated during the cut by means of an 80 mm diameter tube. A kit is available for cleaning the workshop and the areas around the operating machines.

Fume extractor (50Hz)

Positioned above the operating machine's soundproof casing, it allows any fumes generated during the profile cutting and machining operations to be extracted.

SOUNDPROOF CASING AND SAFETY DEVICES

The plant is provided with CE marking in accordance with the requirements of Directive 2006/42/CE (Machinery Directive). Design and construction comply with the safety standards currently in force in the European Union and in the main industrialised countries (USA, Canada, etc.). In particular, for the European Union, the plant complies with the following legal requirements: Directive 2006/42/CE (Machinery Directive), Directive 2006/95/CE (LVD) and Directive 2004/108/CE (EMC). The plant is also equipped with safety devices in accordance with product standards and those governing health and safety at work:

- Soundproof casing with interlocked openings
- Barrier with interlocking gates protecting the rear and sides



The electrical system has been engineered in compliance with the provisions contained in European Union directives 2006/95/CE (LVD), 2004/108/CE (EMC) and conforming to the applicable standards governing the safety of electrical systems (EN 60204-1, EN 61000-6-2 and EN 61000-6-4). Special care has been given to the provision of emergency cables and to the system for activating and resetting them. If any faults occur, the operator is alerted by light signals and messages on the monitor. In the event of faults or breakdown, The protection devices inside the panel are designed to prevent injury to persons and/or damage to the machining centre itself.

In the case where the interaction between the plant and the environment in which it is installed adversely affects the above conditions, a global solution must be agreed with the buyer in order to render the location suitable and safe for the installation of the plant.

Electrical connection

Power supply voltage: 400 V three-phase + earth with neutral (50 Hz) in a TT type system for connecting to the electrical cabinet.

The three-phase power supply must have the star centre connected to earth (TT, TN-C, TN-S diagram). Otherwise, the customer must install a star/star isolation transformer with the star centre connected to earth upstream of the electric cabinet.

When installing the machine, make sure that the power supply line is of good quality and reliable, protected by an automatic line switch and connected to a good earthing system.

The 400 V power supply cable must be protected against overload and short circuit using a suitable thermomagnetic switch. Protection against indirect contacts must be by means of a differential switch with a differential current rating $I_d \geq 0.5 \text{ A}$.

The 230 V single-phase voltage for the connection to the PC is inside the electric cabinet, protected by a differential switch with differential current rating $I_d = 0.03 \text{ A}$. An external UPS can be connected to the main cabinet switch for use by the PC.

Operating conditions

- Lighting: min. 300 lux. Also check that the location in which the plant is to be installed does not have any zones in shadow and that there are no excessively bright lights or stroboscopic effects (reflections-reverb).
- Temperature: The machine can work at ambient temperatures between +10°C and +40°C.

Standard accessories

- Plant installation layout
- Pack containing service keys, floor anchors and a spiral hose for compressed air connection
- Use-maintenance manual for the plant, including list of recommended spare parts
- Use-maintenance manual for the main machines of the line (sawing machine, multispindle, extractor)
- Software instruction manual
- Software installation CD
- Compact flash (memory card) containing a backup of the numerical control, software and main electronic components
- User manual for the principal electronic devices (drives, inverters, printer)

Remote Assistance

The plant is fully set-up for the remote assistance service. The customer must possess Internet access from the PC on the control console.