



LMX 650

Machining and cutting line with down-feed blade 650mm diameter and bar passage 300 x 300mm

Available versions

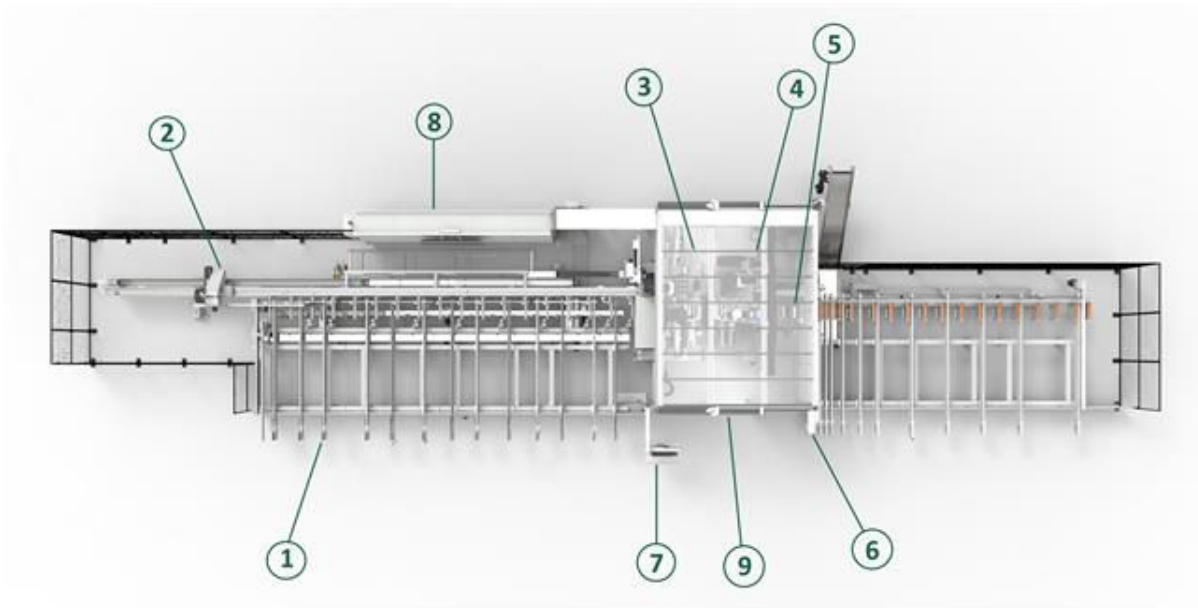
- LMX 650 (7530/2030 - RH)
- LMX 650 (7530/4030 - RH)
- LMX 650 (7530/6030 - RH)
- LMX 650 (7530/2030 - LH)
- LMX 650 (7530/4030 - LH)
- LMX 650 (7530/6030 - LH)

Please note – Electro-spindles and angled chip removal belt 40° are not included on any of the above.

Standard Configuration

- Loading magazine (1)
- Bar feeder with profile pick-up system (2)
- Multi-spindle machining unit with motorized clamps (3)
- X-Module for cutting and end-milling operations (4)
- Longitudinal belt under the multi-spindle and cutting unit (5)
- Unloading magazine with transversal belt external to the casing (6)
- FST Line 4.0 cutting and machining version, installed on the control console (7)
- Electric cabinet cooling plant (8)
- Soundproof cabin and anti-intrusion safety devices with electric locks (9)

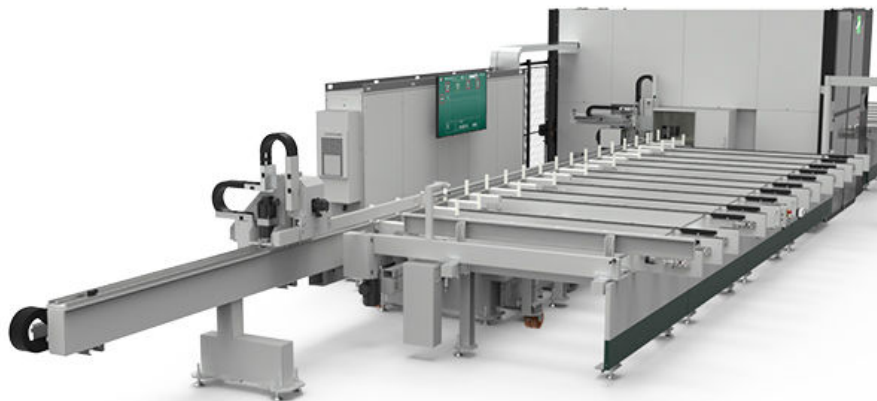
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Description of the Individual Components

LOADING MAGAZINE

Allows the profiles to be stored and then fed horizontally. The magazine consists of 13 loading modules on which belts run fitted with pins, the positions of which can be varied according to the dimensions of the profiles to load. The profile is moved onto the rollers of the bar feeder by a controlled device. The bar is aligned on the left (gripper side). The length of the loaded bar is always measured automatically prior to machining.



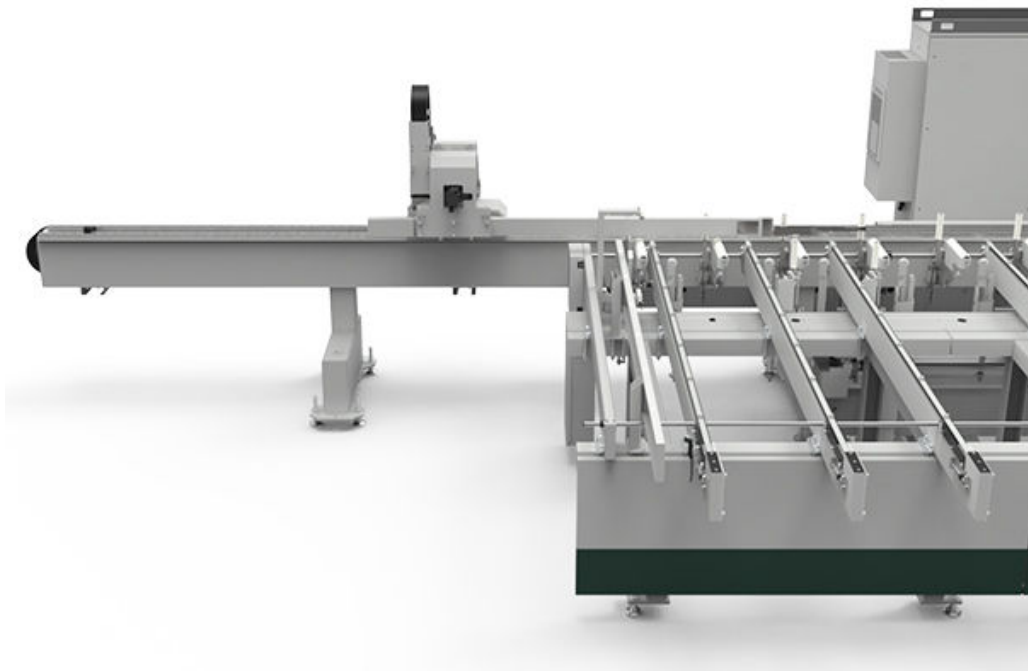


Technical Specifications

Profile presence detection with photocells
Minimum transportable profile length: 1000 mm
Maximum transportable profile length: 7500 mm
Useful loading width: 3000 mm
Intermediate supports for loading magazine 7530
Capacity: 700 Kg

Loading capacity					
Standard distance between pin centres	400 mm	Loading capacity	6 bars	Maximum profile width	300 mm
Min distance between pin centres (opt.)	300 mm	Loading capacity	9 bars	Maximum profile width	220 mm

BAR FEEDER AND PROFILE PICK UP SYSTEM



Structure

Consisting of an electro-welded steel beam designed to guarantee rigidity and stability over time

Carriage

Fabricated in stabilised and machined structural steel. The carriage has two supplementary controlled axes (transversal Y and vertical Z) to allow profiles of different sections to be picked up without any action by the operator.

Longitudinal axis drive and movement (X)

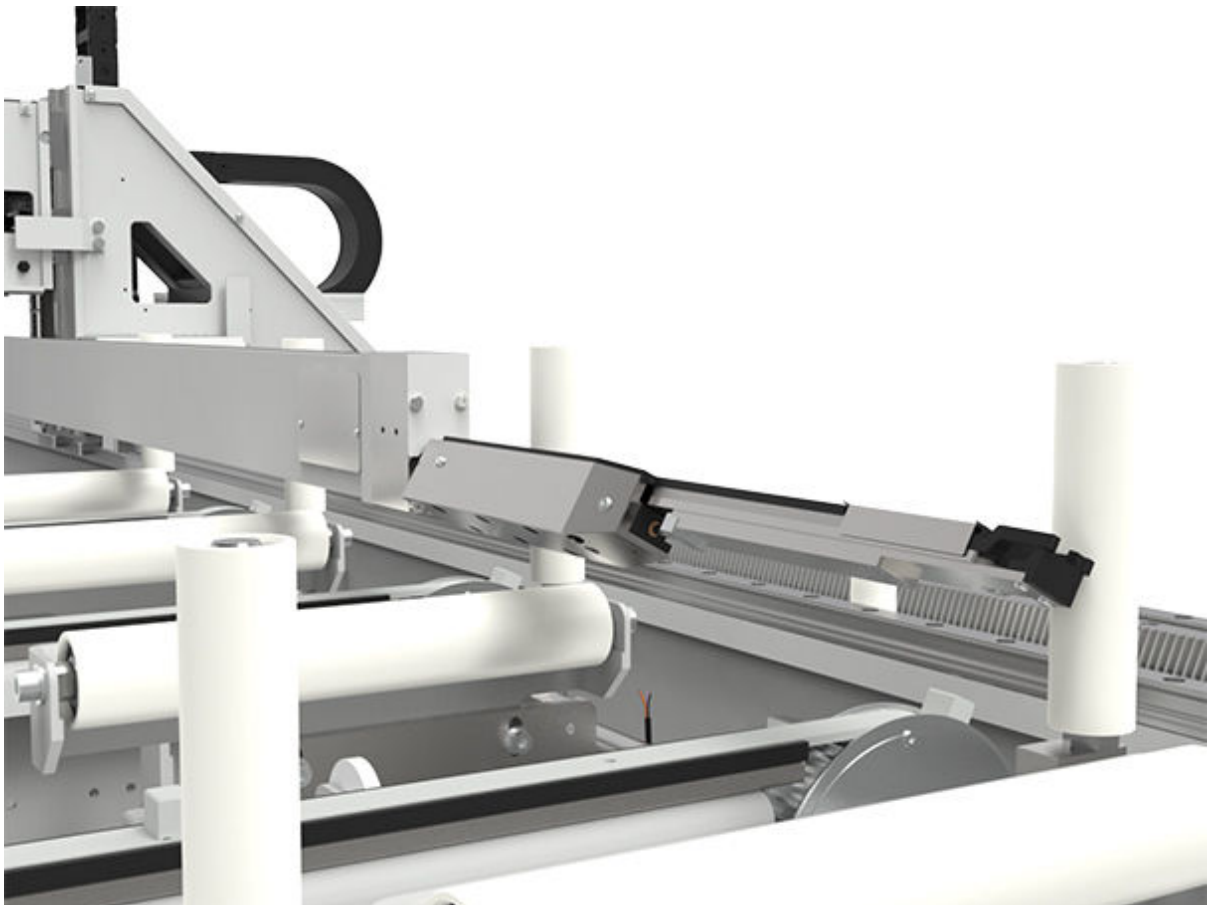
Of high quality, precision, strength and reliability, on linear guide-ways with recirculating ball slides and a rack with helical teeth. A brushless servomotor drives the independent X axis (longitudinal), along which the carriage with arm and rotating gripper moves. The



servomotor used allows short high-speed positioning times and rapid return. An encoder is used to detect the position of the axis.

Profile pick-up system

Consisting of horizontal and vertical rollers in scratch-proof plastic material, guaranteeing optimum profile movement. The zero referencing along the X-axis is carried out by a photocell. The standard rotating gripper with automatic controlled positioning allows rapid and accurate adaptation of the variable and intermediate angle pick-up ($\pm 90^\circ$).



Technical specifications:

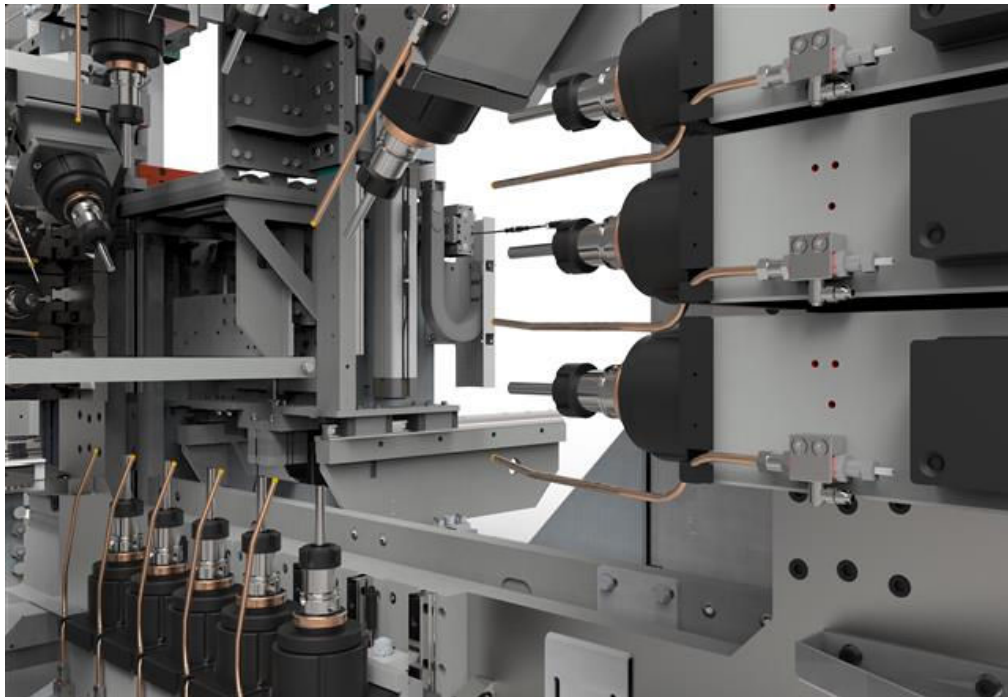
Maximum allowable profile width: 300mm
Maximum allowable profile height: 300mm
Maximum length of profile handled: 7500mm
Maximum allowable profile weight: 15kg/m
Weight of the structure approx. 3,300kg

Available options:

XPUSH Pack gripper (for shutter machining)
Independent lowerable rollers



MULTISPINDLE MACHINING UNIT



Structure

Consists of a base in electro-welded steel and a centre frame housing the electro-spindles. The solution adopted guarantees stability, speed and precision during machining and as well as considerable maintenance advantages.

Axes movement

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

Electro-spindles

These have a 3.3kW output, an inverter controlled speed of up to 18,000rpm and pure oil tool lubrication by means of a micro-drop concentrated high pressure spray (minimum quantity lubrication). An HSK-C40 rapid change tool coupling is fitted as standard. The following options are available:

- Synchronous electro-spindles for mechanical machining and tapping (4kW)
- Tilting electro-spindles for oblique machining operations, with pneumatically driven rotation or controlled rotation with positioning between 0 and 50°.

The machine can house 18 electro-spindles, to be selected based on the machining operations required.

Their arrangement on the centre frame will be designed based on the needs of the user.

Working area



Two sets of vices are provided upstream and downstream of the electro-spindles, both motor driven and controlled, for the correct positioning and pneumatic locking of the profiles during the machining phases. The vice surfaces are equipped with blowers to remove any chips.

Technical specifications:

V axis travel (vertical)	430mm
C axis travel (transversal)	800mm
Electrospindle power rating:	3.3kW at 18,000rpm
Tool coupling:	HSK-C40
Max tool diameter:	13mm
Multispindle weight (without spindles):	3300kg
Maximum working capacity	300mm x 300mm

Available options:

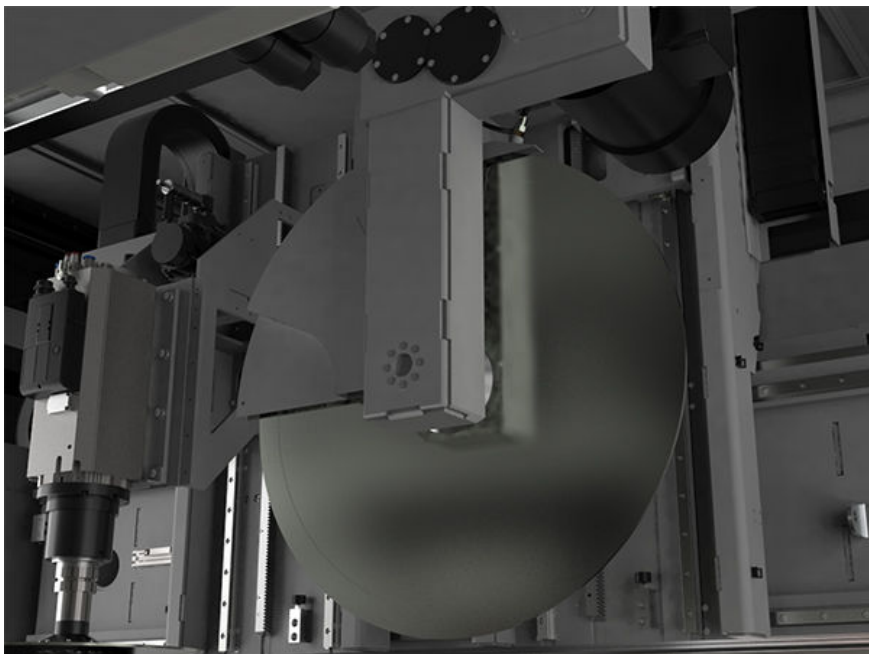
HSK-C40 4kW/17,000rpm synchronous electro-spindle for mechanical machining and tapping

HSK-C40 3.3kW tilting electro-spindles

Sensor for tool integrity control

Unstable profile supports with controlled movements in Y and Z

X-MODULE: CUTTING UNIT WITH 650MM DIAMETER BLADE



Downward cut with 4 axis controlled movement (x,y,z and rotation A) and 650mm Ø blade. The unit is made up as follows:

- Machine base in electro-welded stabilized steel, sized to guarantee stability and precision during machining.



- Movement gantry equipped with controlled dual axis. X axis driven by brushless motor with epicycloid reduction gear and precision rack. Axes Y and Z driven by brushless motors with epicycloid reduction gear.
- Cutting head with infinite 360° blade rotation
- Blade motor power 7.5 kW, with blade speed control by an inverter, drive transmitted to the blade by a toothed belt
- Work surfaces in scratch-proof plastic material with blower system for removing chips

The horizontal and vertical work surfaces are provided with:

- In-feed vice unit, out-feed vice unit.
Each vice unit has horizontal and vertical tightening devices.
Both horizontal vices are fitted with controlled positioning along axis Z.
The out-feed vice unit is fitted with controlled positioning along axis X.

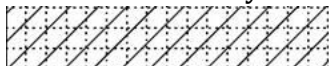
The out-feed has a motorised and controlled gripper for extracting the piece.

Technical specifications:

- Tungsten carbide saw blade Ø 650mm, thickness 5mm
- 7.5 kW blade motor, blade speed controlled by an inverter
- Set up for the forced extraction of chips
- Minimum quantity lubrication (MQL) with pure oil
- Transversal belt for the evacuation of chips and swarf
- Motor/blade driven by toothed belt
- Weight: 3700kg

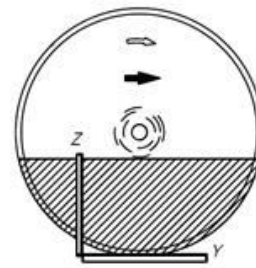
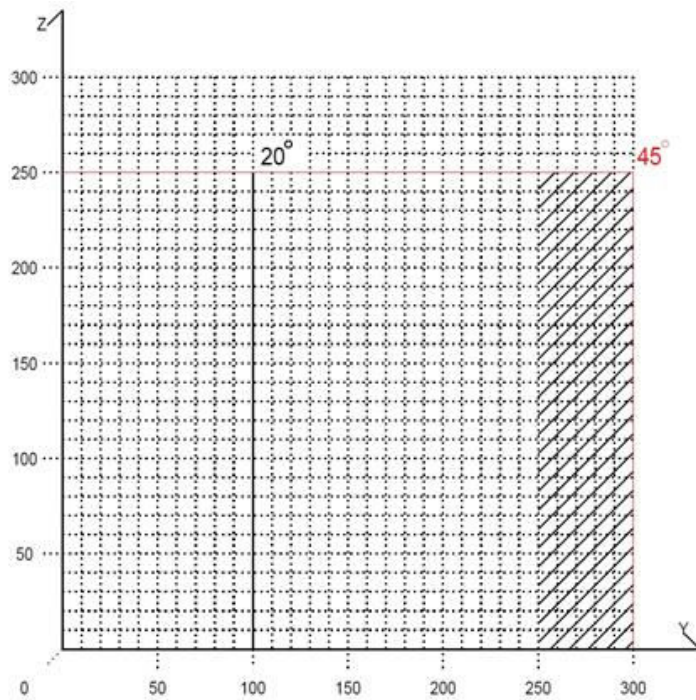
CUTTING DIAGRAM

Area that can be machined only with vice pads replacing (standard)

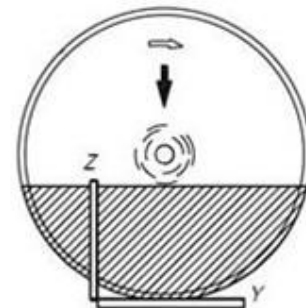
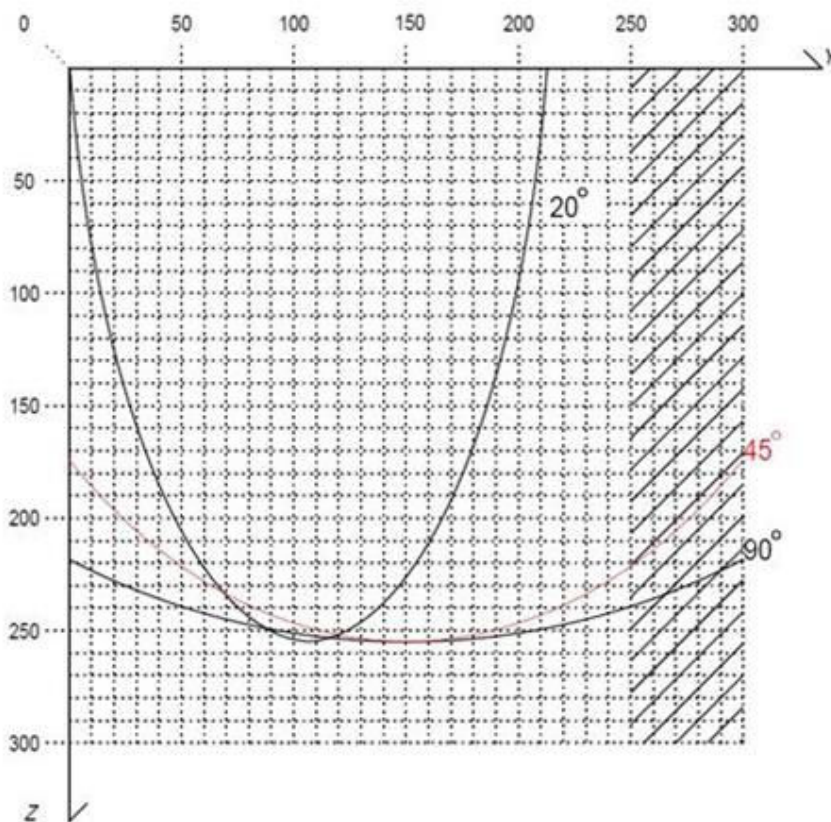


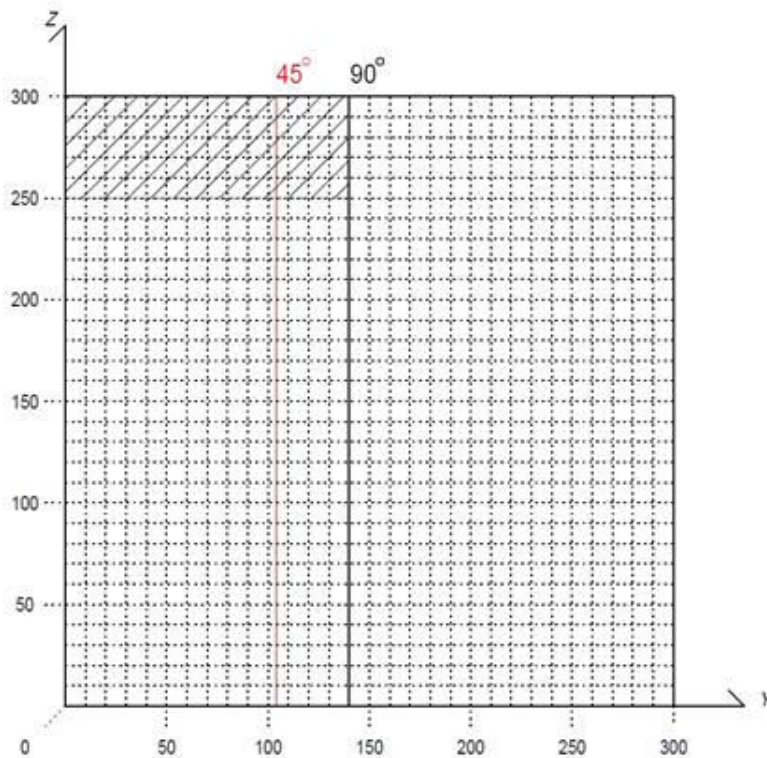
Cutting with X and Y axes interpolation

Blade advancement

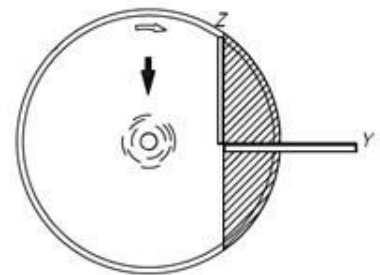


Descending cutting without interpolation

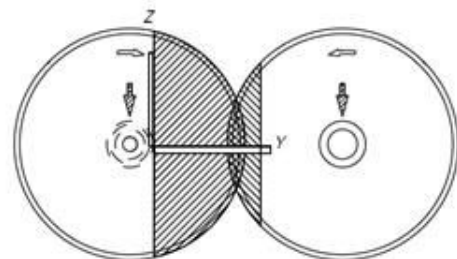
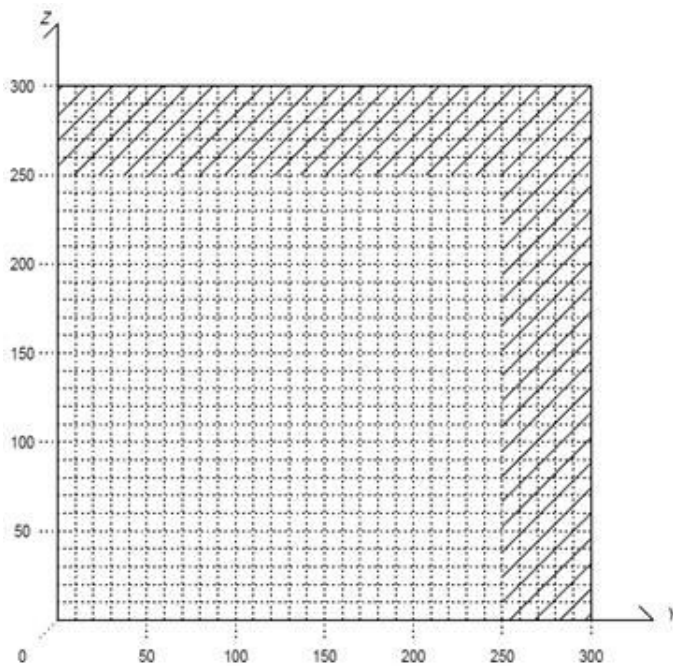




Descending cutting in two phases



Blade advancement



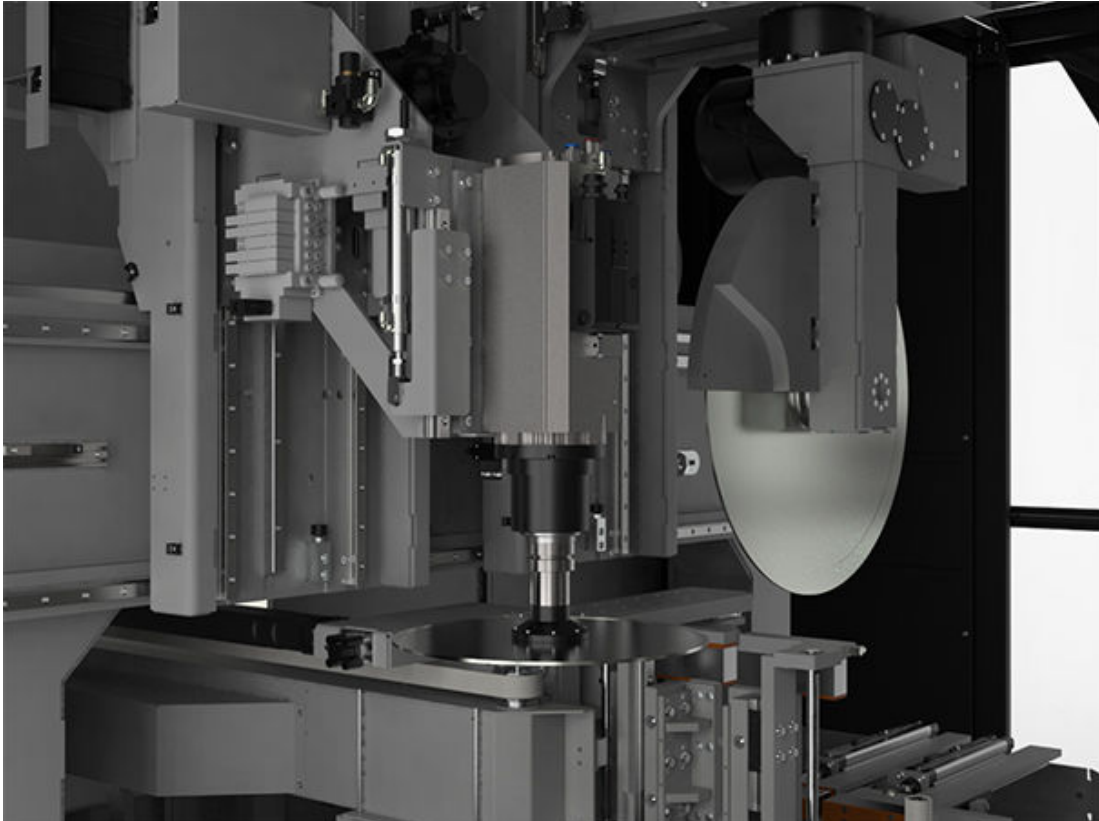
Available options:

For milling and facing operations it is possible to add:



XMU

X Milling Unit with 16kW HSK63E electrospindle



XMU optional:

3 location tool magazine (recommended)

C axis for XMU electro-spindle unit

90° angular head

45° angular head (Ø 300mm blade excluded)

HSK63E coupling for 90° mill blade (Ø 400mm blade excluded)

End-milling cutter set (to drawing)

UNLOADING MAGAZINE

Consists of a roller table with lowerable rollers to allow the finished pieces to be rapidly extracted and stored on motorised belts and then transported towards to the operator. Unloading modules are also present (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 personalise the unloading magazine. Simultaneous forward feed and belt phasing are guaranteed by a shaped motor shaft that transmits the motion simultaneously to all the belts. The magazine has 3 configurations (2030, 4030, 6030) for unloading bars of lengths up to 3000, 5000 and 7000 respectively.

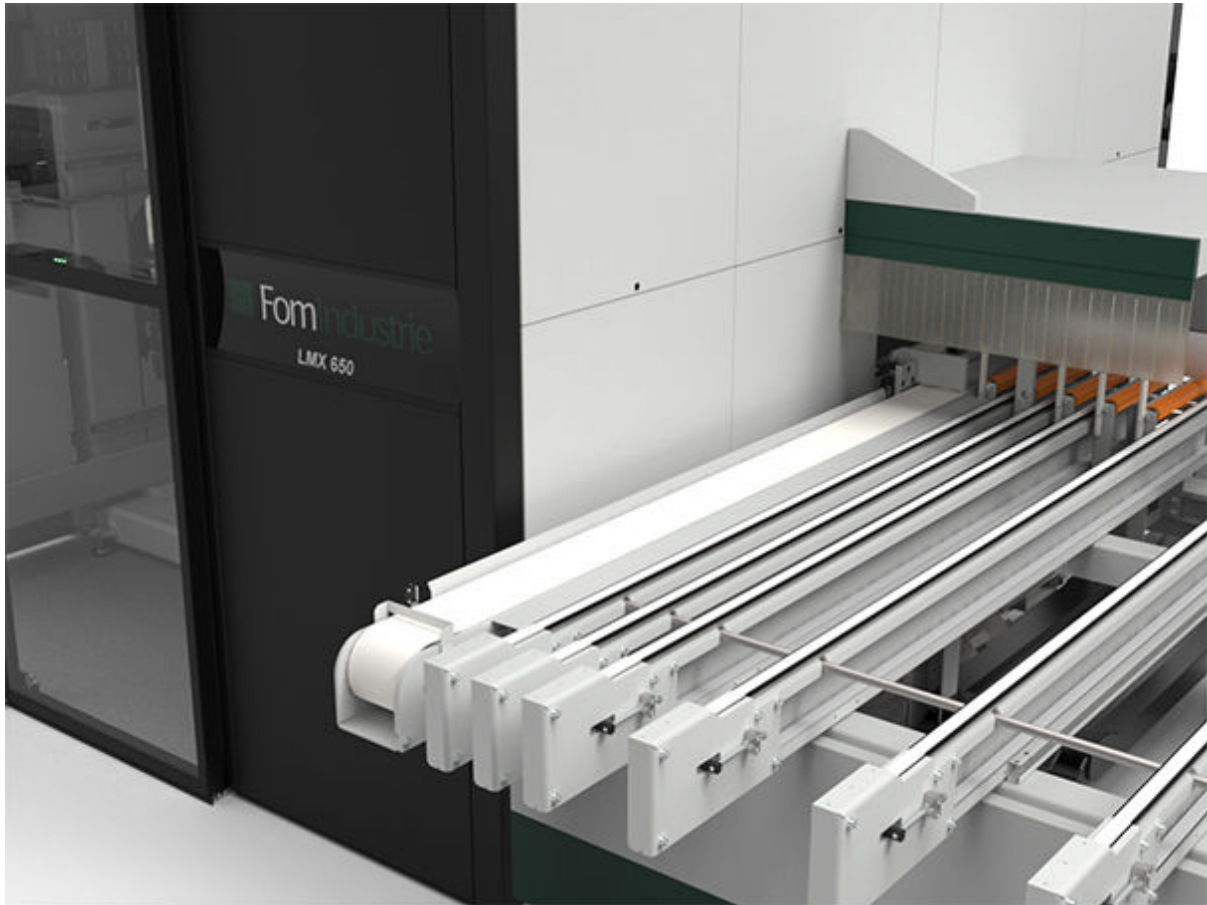


Technical specifications:

- Minimum unloadable bar length: 40mm
- Optional minimum length: for lengths shorter than 40mm subject to technical verification
- Maximum unloadable bar length: 2500mm, 4500mm or 7000mm, according to the version
- Useful storage depth: 2500
- Profile presence detection: by photocell
- Complete storage unit: by photocell
- Profile anti-drop safety device: by safety micro

Unloading transversal belt external to the casing

Positioned downstream of the cutting machine and upstream of the unloading magazine, it allows cut pieces of length between 40mm and 250mm to be unloaded.



MOVABLE CONTROL CONSOLE

Attached to the protection cabin and used to execute commands and run programs.
Display clearly visible from the different machining positions.



Technical specifications:

22" backlit led display

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 LINE 4.0 cutting and machining version

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 txt, MS™ Excel, ODBC, XML files
- 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

LINE OPTIONS:

Transversal belt for the evacuation of chips and swarf

Necessary to dispose of chips and waste generated during cutting. Two versions are available:

- 3700 x 1600 (H) mm inclined 40°. For unloading to a bin max height 1500mm
- 5500 x 2200 (H) mm inclined 40°. For unloading to a bin max height 2100mm



SUPPORTS FOR UNSTABLE PROFILES AND OVERTURNING UNITS

For machining profiles with very complex and variable geometries, the bar feeder can be equipped with a controlled axis system for automatic profile overturning and support.



55" LCD DISPLAY

It is located in the loading zone for displaying programs and bars to be loaded



MANUAL LABEL PRINTER

Extremely fast, manages various barcode formats. The printer must be positioned at the profile unloading end for manual application of the labels.

Available options:

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

XLAB AUTOMATIC LABEL PRINTER

Very fast with automatic control of the label presence on the print head. Different barcode formats can be handled. The printer, which must be positioned at the entrance to the machining zone, automatically applies the label to the profile, with the option to select two sides of the profile according to the most suitable plane.

OIL MIST FILTER UNIT

DUST EXTRACTOR

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

FUME EXTRACTOR (50 Hz)

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:

- Perimeter guard with electric locks to allow access to the machining areas
- Fencing with electrically locked gates protecting the rear and sides of the cabin
- High visibility of the machining area



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.



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.



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 $I_d \geq 0.5$ 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 $I_d = 0.03$ 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).

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, multi-spindle, extractor) |
| • Software instruction manual |
| • Software installation CD |
| • Compact flash (memory card) containing a backup of the numerical control, software and main electronic components |
| • Manual with exploded view of spare parts for easy identification of the parts necessary |
| • 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.