



STEEL  
CONSTRUCTION

ANGLES & FLATS  
BEAMS & PIPES  
PLATES  
SURFACE TREATMENT  
ROBOTIC WELDING  
SOFTWARE & AUTOMATION



**FLEX**

Automatic CNC thermal coping robot for sections



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Montfort International Itée

# H FLEX

## Automatic CNC thermal coping robot for sections

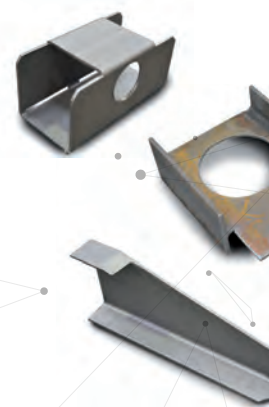
Structural steel buildings are constructed of steel sections of all shapes and sizes in combination to form the final project. These fabricated sections frequently require copes, blocks, mechanical openings, weld prep, miter cuts and more per the design. Part of the fabrication process includes the welding of detail items to the main member which requires that the layout locations must be identified and specific welding instructions indicated.

The FICEP FLEX coping robot not only generates all the thermal processes, but it also generates layout marks with welding instructions to facilitate the fitting operations and avoids human errors.

The FICEP robot permits the torch to be positioned to generate operations on both flanges and the web of typical structural steel sections including the underside of structural tubes. An

automatic tool changer for the plasma and oxy-fuel torch can implement the required torch in seconds. This permits the selection of the most efficient and effective thermal cutting process to be utilized.

The robot is controlled by FICEP's proprietary software which optimizes the torch movements to achieve the most effective cutting sequences. As the section enters the system, laser probing is utilized in seconds to determine the actual location of the sections surfaces to be processed relative to the profiles prescribed geometry. Any actual deviations in the prescribed physical geometry is recognized and the torch path is automatically corrected to compensate for these mill tolerance deviations. This ensures proper torch position, reliable ignition and total completion of the desired cut path per the sections design.



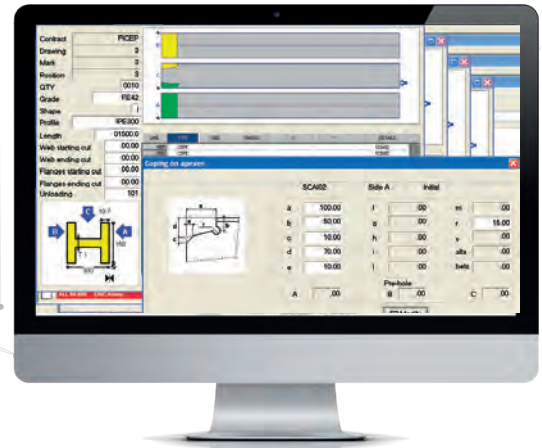
Pegaso is the latest generation CNC for FICEP lines where the PC, CNC and PLC are all integrated into a single circuit board for maximum reliability. Pegaso is based upon a field bus technology using CanBus and EtherCAT for controlling up to 32 separate CNC axes.





A graphical 3D simulation of the cutting process by the robot confirms the torch path and cutting sequences:

- Point-to-point LEAD CUT manual programming can be accomplished directly on the CNC control.
- Programming can be achieved with graphical macros that are stored and registered in the relevant library.
- Programming by downloading from an offline computer.
- Automatic precise torch positioning is achieved with laser technology.



The advantages of these systems are straight forward:

- All the manual operations to measure, lay out and cut are eliminated.
- Eliminate human error.
- Coping operations can be done in tandem with a FICEP drilling line to save space, material handling and time.
- The processing cycle is optimized.
- The manufacturing times are drastically reduced.
- Processing is done in a complete automatic cycle.
- The required floor space is reduced when compared to manual operations.
- Production costs are predictable and greatly reduced.
- The labor required for complicated operations are reduced to the minimum.

#### Main technical features

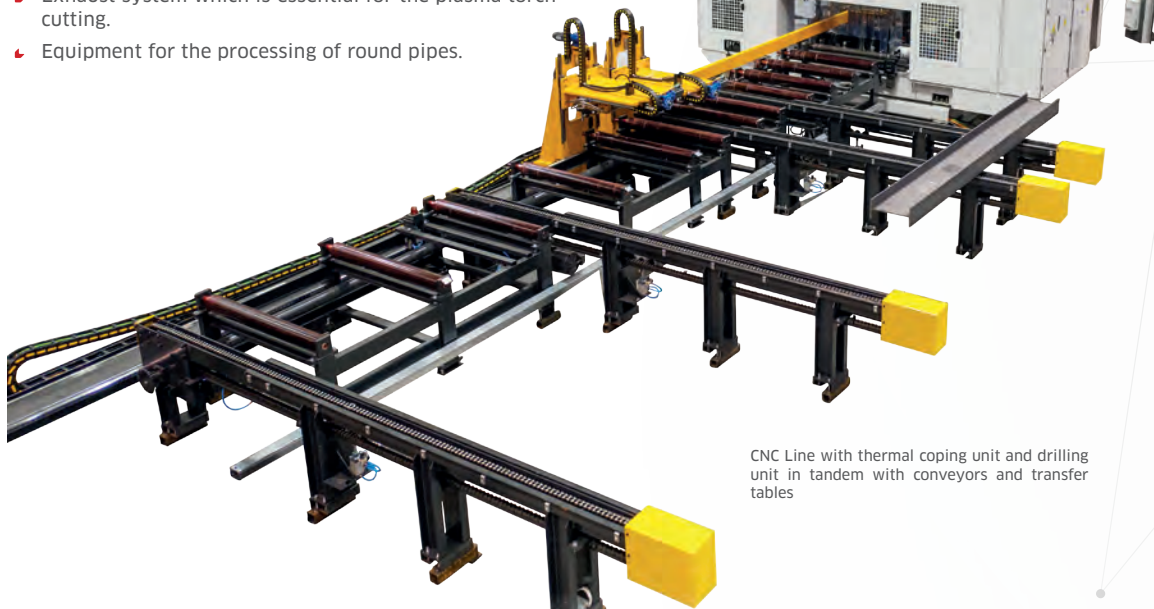
- The material positioning carriage adjusts to accommodate different section profiles. The standard powered infeed conveyor is 40' but can be extended as an option.
- The material positioning carriage is guided by a freestanding support structure and positions the stock section along the infeed conveyor.
- The machine frame is a box type structure constructed of tubes to provide an overhead support for the robot.
- A semi-spherical Cartesian robot incorporates 6 controlled axes that position the two cutting torches as required.
- Hypertherm True Hole technology.
- Laser technology is employed to manage material probing and compensate for section mill tolerance deviations.
- Automatic vises provide material clamping even during cuts where the material is required to move longitudinally for such operations as beam splitting.
- A hydraulic alignment device is integrated into the infeed conveyor assembly to orientate the incoming section to the cutting chamber.
- Detection and automatic adjustment accommodates normal mill tolerance deviations.
- The latest generation FICEP PEGASO control unit controlling 6 axes (7th axis optional).



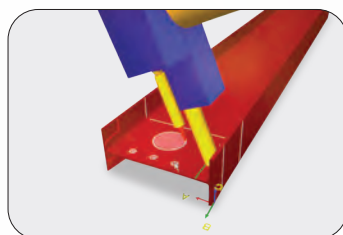
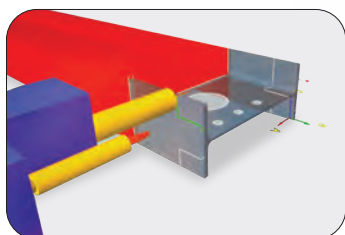
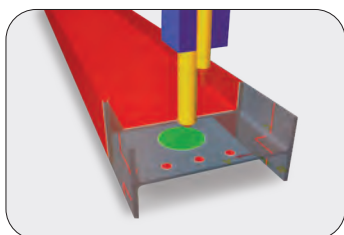
**Hypertherm**  
Cut with confidence™  
**True Hole™**

### Main options

- Plasma cutting system with Hypertherm power source and an oxy-fuel torch are selected as required automatically in seconds.
- Exhaust system which is essential for the plasma torch cutting.
- Equipment for the processing of round pipes.



CNC Line with thermal coping unit and drilling unit in tandem with conveyors and transfer tables



<b>FLEX</b> Automatic CNC thermal coping robot	<b>1201FRC</b>
Section size [min. inch]	3-1/4" x 3/8"
Section size [max. inch]	48" x 24"
Oxy-fuel torch [no.]	1
Plasma torch [no.]	1

TECH SPECS