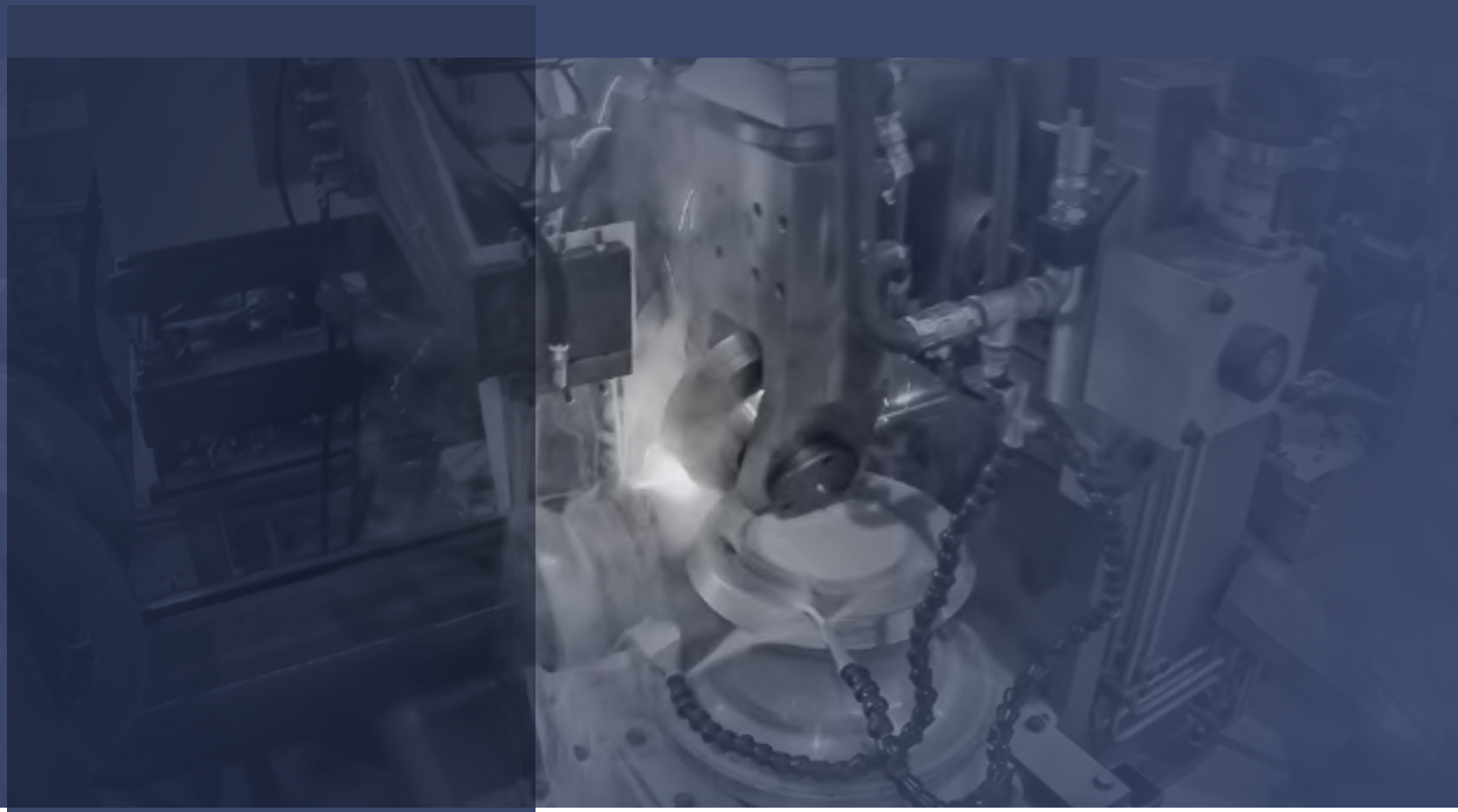
FIMI MACHINERY
Coil Processing Solutions



FIMIGROUP

tube & pipe solutions

FIMI tube mill philosophy.

To design and manufacture machines without compromises in order to guarantee maximum reliability to the Customer, continuity of production, consistently high quality of pipes, short time and low cost of toolings and maintenance.

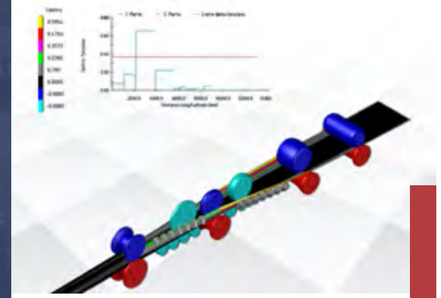
FIMI's pipe mills have to guarantee the best quality of the products giving also the best performances during the production (in terms of speed reached) and in maintenance/ set-up phase (in terms of easiness in maintenability and quick change solution for the set up operations).

The experience reached is also giving FIMI the possibility to offer the optimal solution needed by the customer, guiding and letting him also grow in pipe mill world. The possibility to offer all the machines required for a complete factory is one of the most important characteristics of FIMI.
The market is asking more and more attention to the time necessary for the set up.
For this reason, FIMI has developed different proposals to give the best solution combining the quickness and the automatization that the customer is looking for.

To reach the best performances, the line also needs the best cutting technology. That is why a lot of research has been dedicated to flying cut-off systems. The control in speed and the precision in cutting guarantee the best performances in terms of cycle time and blade life.

For high quality pipe mills, FIMI proposes also single motorization on each shaft of the roll forming section. This allows an extreme control of the speed and the torque on each shaft and the possibility to adjust the ratio between upper and lower speed in order to avoid slidings on the surfaces of the metal strip, also after the grinding usually done on the rollers that changes their nominal diameters changing consequently the quality of the product.

Our Know How



FIMI engineers are facing every day challenges in order to keep their machines to the top level in technology, maintainability and reliability. Each project is verified in every detail in order to give the Customer the best result. The flexibility, the experience of the engineers and the wide know how reached in all the areas related to industrial machineries, allow FIMI to offer a complete portfolio of production lines and accessories machines for the complete process of pipe mills.

The technology in profiling has been increased including cage forming for the linear profiling of the pipe substituting some of the standard passages giving more flexibility and productivity to our lines.

Depending on the production range, FIMI Pipe Mills can be composed in different ways in order better adapt to the requests of the customer and the quality obtained.

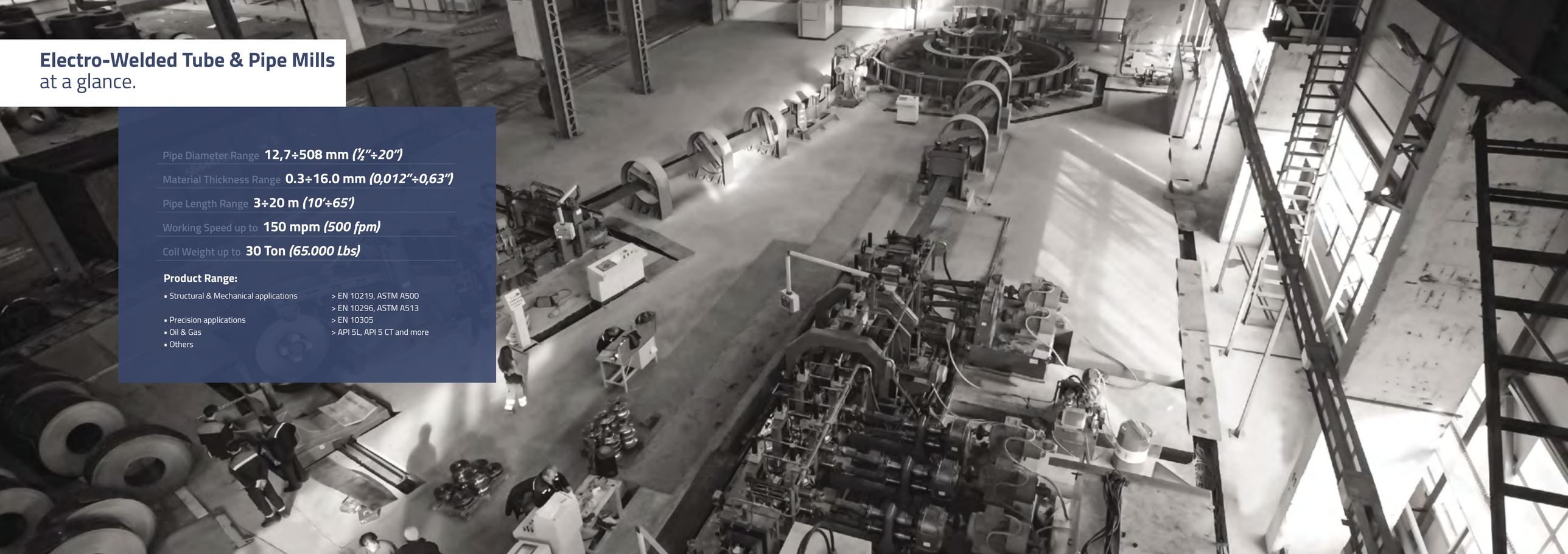
- The maintaining of the tension between one passage to the next one on the forming section is one of the key aspects for a good pipe quality. This is obtained optimizing the motorization on each shaft depending from the range of outer diameter and wall thickness requested to the line.

- Highly advanced electronics continuously keep under control the motor torque in order to uniform the stress on the material. The high flexibility of the system allows the operators to adjust all the parameters in the way they prefer in order to increase the quality.

Time by time, the experience in pipe mills has grown passing from small sizes and thicknesses up to the top range of pipes production. The quality of the pipes produced has also increased from structural to oil and gas including also machinery for the profiling, finishing and testing of the pipes.

This brought the know how also in machinery types like end-facing, hydrostatic-test, NDT island (online and offline) and automatic packing.

Electro-Welded Tube & Pipe Mills at a glance.



Pipe Diameter Range **12,7÷508 mm *(½"÷20")***

Material Thickness Range **0.3÷16.0 mm *(0,012"÷0,63")***

Pipe Length Range **3÷20 m *(10'÷65')***

Working Speed up to **150 mpm *(500 fpm)***

Coil Weight up to **30 Ton *(65.000 Lbs)***

Product Range:

- Structural & Mechanical applications
  - > EN 10219, ASTM A500
  - > EN 10296, ASTM A513
- Precision applications
  - > EN 10305
- Oil & Gas
  - > API 5L, API 5 CT and more
- Others

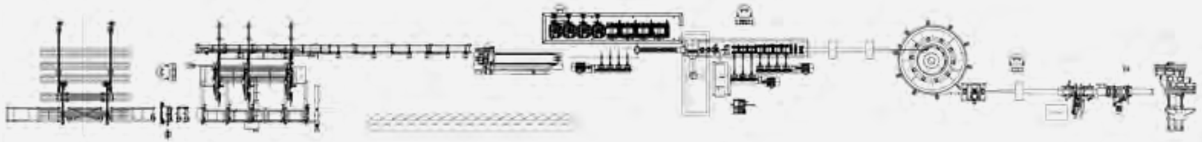
Electro-Welded Tube & Pipe Mills
applications

> STRUCTURAL & MECHANICAL
EN10219, ASTM A500
EN10296, ASTM A513

Custom and standard solutions, carefully realised to maximize productivity.
Traditional forming, Cage Forming and direct forming are possible.

> PRECISION
EN10305

Tubes for precision applications, high productivity, low and custom optmized space occupation, high energy efficiency, for one of the most demanding markets.
Traditional forming available.



Electro-Welded Tube & Pipe Mills
applications

> OCTG & LINE PIPE
API 5CT - API 5L

Fimi's API/OCTG mills and finishing floor solutions are carefully designed, built and tuned for customer's specific requirements.
Fimi solutions in this field are based on the knowledge of all processes involved, from strip preparation, to pipe forming and welding, down to finishing: a unique and single supplier for the whole production machinery.

Fimi portfolio for API/OCTG includes, among others: slitting lines, coil storage, strip entry and preparation, accumulators, pipe mills, cooling sections, flying-saws, handling equipments, flushing devices, chamfering systems, hydrotesters, various kind of NDT integration, advanced bundling systems and all that's necessary for complete turn-key projects.

Electro-Welded Tube&Pipe Mills

FIMI is able to design, build and install plants for the production of pipes in the range from 12,7 up to 508 mm *(½" - 20")* diameter, manufacturing them according to API 5CT-5L, ASTM A53-A53M production standards.
Speed and thickness are also matching specific customer specifications.

Besides complete lines, FIMI provides individual parts for the replacement or integration into existing production lines: uncoilers, coil opening units, automatic strip joint benches, horizontal spiral accumulators, straighteners.
ERW Tube & Pipe Mill able to produce from 127 up to 273 mm *(5"-10")* with optimal performances and quality.

Composed of both standard cages and linear cages; the cutting system is the FIMI standard Double Blade flying Cut-Off. This provides high flexibility and high speed up to 60 mpm *(200 fpm)*.

> Tube & pipe mills with Cage Forming

TUBE MILL TM8 - installed in Vietnam

- Pipe Diameter » **90÷219 mm *(32"÷8")***
- Wall Thickness » **3,0÷8,0 mm *(⅛"÷0,31")***
- Pipe Length » **6,0÷12,0 m *(20'÷42')***
- Working Speed » **60 mpm *(200 fpm)***

> Traditional forming tube & pipe lines with and without quick change

TUBE MILL TM10 API - installed in Russia

- Pipe Diameter » **127÷273 mm *(5"÷10")***
- Wall Thickness » **3,0÷8,0 mm *(⅛"÷0,31")***
- Pipe Length » **6,0÷12,0 m *(20'÷42')***
- Working Speed » **60 mpm *(200 fpm)***

- Linear Cage Forming.
- Quick Change Tooling System.
- Internal Scarfing System.
- Eddy Current System.

> Direct forming tube mills

TUBE MILL TM80 TWIN - installed in India

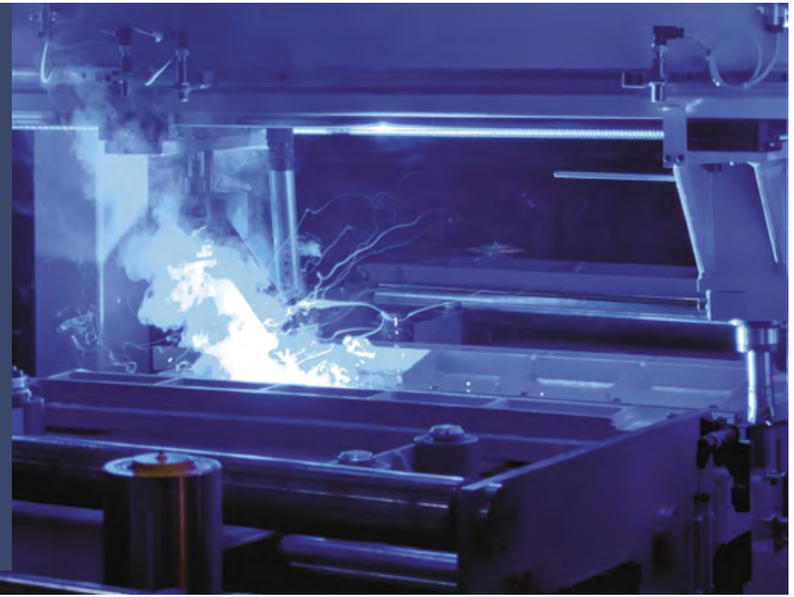
- Square » **25÷80 mm *(1"÷3¼")***
- Rectangular » **40x30 mm *(1½"÷1¼")***
  100x60 mm *(4"÷2½")*
- Wall Thickness » **1,0÷3,0 mm *(0¾₄""÷0¼")***
- Pipe Length » **4,0÷12,0 m *(13'÷39')***
- Working Speed » **120 mpm *(400 fpm)***
  140 mpm *(460 fpm)*

Automatic Strip Joint Benches

Together with the accumulator, they allow to change coil and joint it with the already working strip maintaining constant the speed of the pipe mill.

In order to grant a no-stop function of the mill and avoid the introduction of material head for every coil, the strip preparation joint bench is able to joint the head and the tail of 2 coils after having crop them in order to have a clear welding edge. The entire cycle can be performed in fully automatic mode.

The unit is composed by:
- Entry Guiding Adjustable System.
- Pinch System for the head of the strip.
- Welding Torch.
- Milling System for welding seam.
- Pinch System for the tail of the strip.
- Exit Guiding Adjustable System.



Strip Accumulators

To avoid stopping the production during the joint of coil to coil, a spiral accumulator is present to give the correct buffer for this operation.
The entry section run faster than the profiling unit giving the margin to weld head and tail.

The system can work with the following methods:
- Synchronized functioning: the entry speed and the outlet speed are the same of the mill.
- Stop of the line for the welding of the tail/head. In this phase the mill takes the material stocked in the accumulator.
- When the welding process has finished, the entry speed is higher than the outlet in order to accumulate quickly the quantity of strip used during the welding phase.
- When the defined strip quantity is reached, the machine is automatically synchronized with the speed of the pipe line.

Cut-Off Units

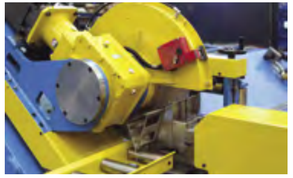
FIMI's cut-offs are machines completely designed, manufactured, assembled and commissioned as a result of the perfect understanding of the technological cycle, customer's needs and feedback constantly received from our experience on the field.

FIMI develops, manufactures and installs milling cut-off units able to cut pipes in the range from 12,7 up to 610 mm *(½"-24").*
API outside diameter, according to customer's specifications
based on production speed and wall thickness.

- Four Blades shear - Orbital Flying Cut-Off.
- Double Blade Shear - Flying Cut-Off.
- Single Blade Shear - Flying Cut-Off.

- Use of reduced diameter TCT blades with a high rigidity and low vibrations.
- Very strong construction for a precise and vibration-free cut.
- Possibility to continue the production even in case of blade breakdowns, using two coaxial blades.
- Great simplification, reduction and unification of the components which minimize the needs for technical assistance and stock of spare parts.
- System of universal clamps used to cover all the profiles to be cut and their correspondent dimensions, with minimal setup time and number of clamps.

- Extreme flexibility - the wide range of sizes and sections that can be cut always with the best parameters requested by the blades (also) for this machine either HSS or TCT.
- High-quality of cut and a long blade life.
- Unique cutting line in the world can follow unequal pathways.



- Possibility to adjust feed per tooth, cutting speed and milling speed in a wide range in order to optimize the working conditions for both HSS and TCT blades.
- Reduced time for clamp/blade replacement.
- Minimal necessity of maintenance and easy chips evacuation and cleaning.
- Low operating costs.

a complete offer provided by **FIMI**.

To complete the electro-welded tube/pipe mills or also supplied individually as implementation of existing lines, FIMI provides machines for the finishing of steel tubes, with a range from 19 to 608 mm *(0,75"-24")* in diameter, for thicknesses from 0.5 to 20 mm *(0,02"-0,8")* and lengths from 3 to 20 m *(10'-65')*, both in-line and off-line, depending on the Customer's needs.

The management of the working phases is completely automated and can be easily integrated both to the tube lines and to the other components of the line.

The range of tube finishing machines supplied by FIMI is among the most complete:

- Hydraulic tube pressure test units up to 500 bar *(50 MPa)*.
- Single or multi-headed tube end facing units.
- Tube threading units.
- Non-destructive control systems.
- Packing systems.
- Tube handling units.

Handling Systems

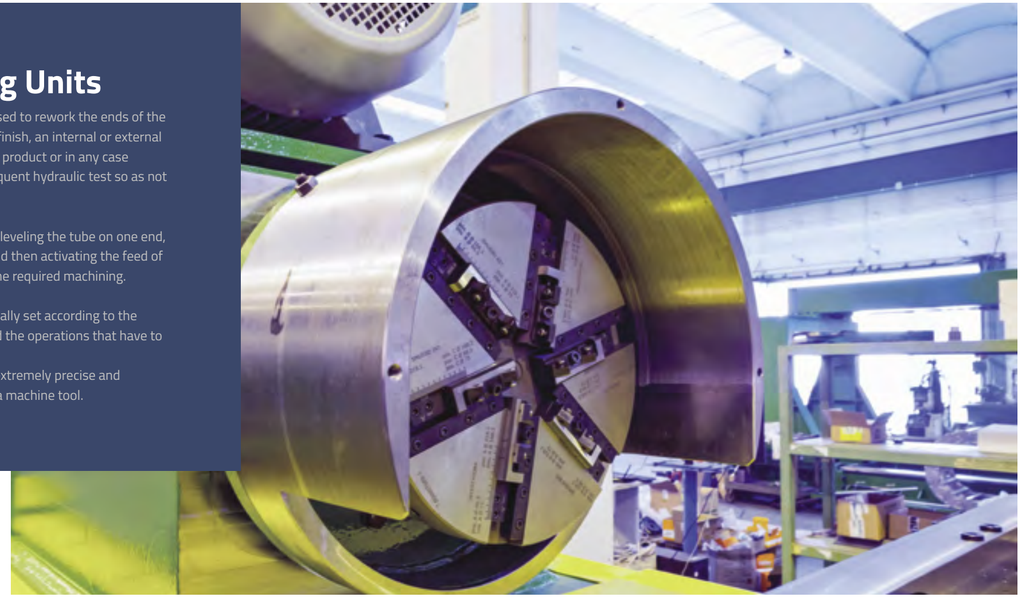
Handling systems for tubes designed to connect the various stations of the plant.

End Facing Units

The End Facing Unit is used to rework the ends of the tube to create a perfect finish, an internal or external bevel defined by specific product or in any case necessary for the subsequent hydraulic test so as not to damage the seals.

The cycle takes place by leveling the tube on one end, locking it with clamps and then activating the feed of the tool that performs the required machining.

The system is automatically set according to the diameter of the tube and the operations that have to be made.
The movements are all extremely precise and comparable to those of a machine tool.



Threading Units

The threading unit is used to rework the ends of the tube to create an internal or external thread defined by a specific product.
The cycle takes place by leveling the tube on one end, locking it with clamps and then activating the feed of the tool that performs the required production.

The system is automatically set according to the diameter of the tube and the operations that have to be made.
The movements are all extremely precise and comparable to those of a machine tool.

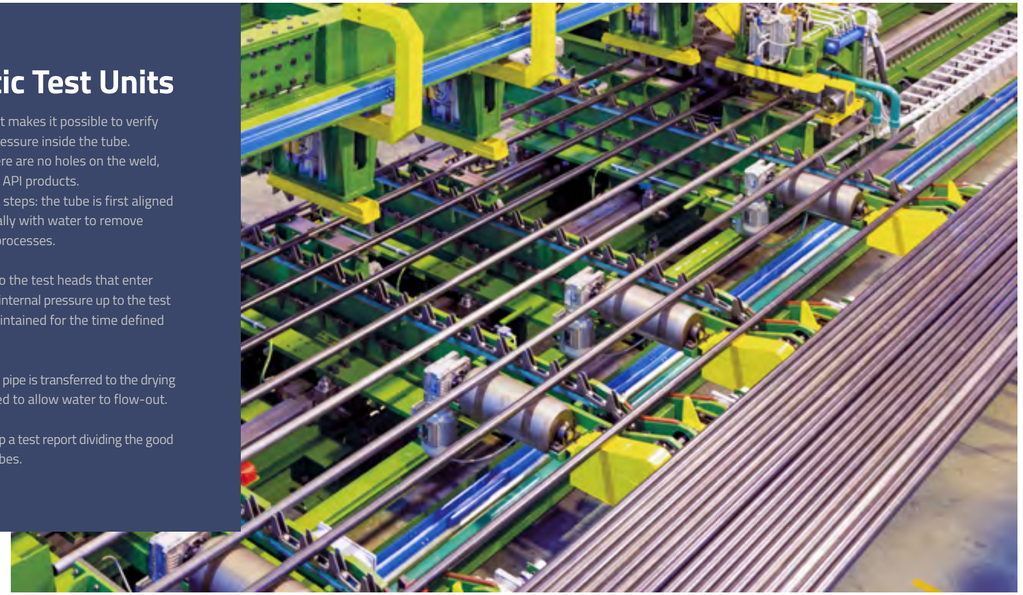
Hydrostatic Test Units

The Hydrostatic Test Unit makes it possible to verify the correct seal of the pressure inside the tube.
The test verifies that there are no holes on the weld, which is a prerogative of API products.
The test is performed by steps: the tube is first aligned and then washed internally with water to remove residues from previous processes.

The tube is transferred to the test heads that enter water and then raise the internal pressure up to the test pressure that is then maintained for the time defined by the API specification.

At the end of the test, the pipe is transferred to the drying station where it is inclined to allow water to flow-out.

The system then draws up a test report dividing the good tubes from the waste tubes.



Painting Units

Colored epoxy powder or water based paints, transparent varnishes, external protective coatings for line pipe and OCTG applications, can be applied with our optimized systems.

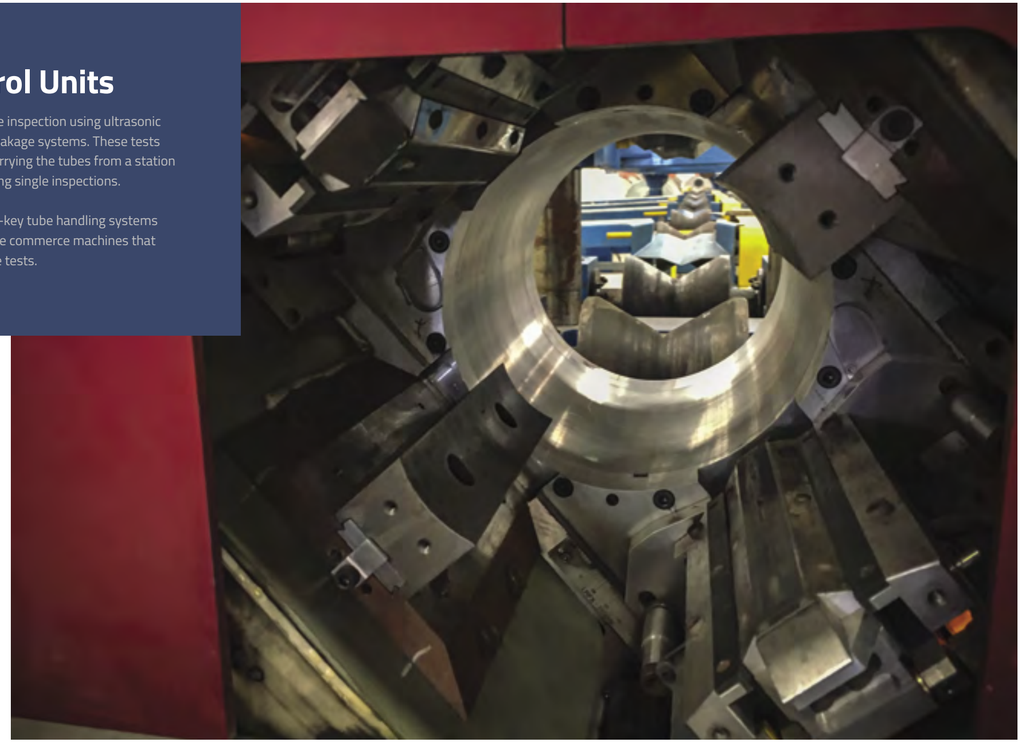
Proper knowledge of tube factory demands and needs, drive us to realize custom optimized and higly profitable solutions.

From 1/2" to 20", with different heating and paint curing systems.

NDT Control Units

API products require pipe inspection using ultrasonic systems (UST) or Flux Leakage systems. These tests have to be performed carrying the tubes from a station to another and performing single inspections.

FIMI is able to offer turn-key tube handling systems and the integration of the commerce machines that perform non-destructive tests.



Tube Packing Systems

FIMI tube packers are completely smart systems which allow the preparation of square, rectangular and hexagonal bundles.

Thanks to an accurate construction, they are able to stack square, rectangular, beveled round and hydro-tested tubes directly in line with the Tube Mill, avoiding intermediate stoppages.

Automatic stackers, magnetic or traditional system, starting from 12,7 up to 508 mm *(½"-¾"-20")* length from 3 up to 20 m *(10'-65')*. Stackers automatically form, weight and drain the bundles of pipes ready to be packed using manual or automated strapping systems.

LAGO DI COMO
ITALIA
A WORLD WITHIN A WORLD

FIMIGroup sustains and promotes the environment

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