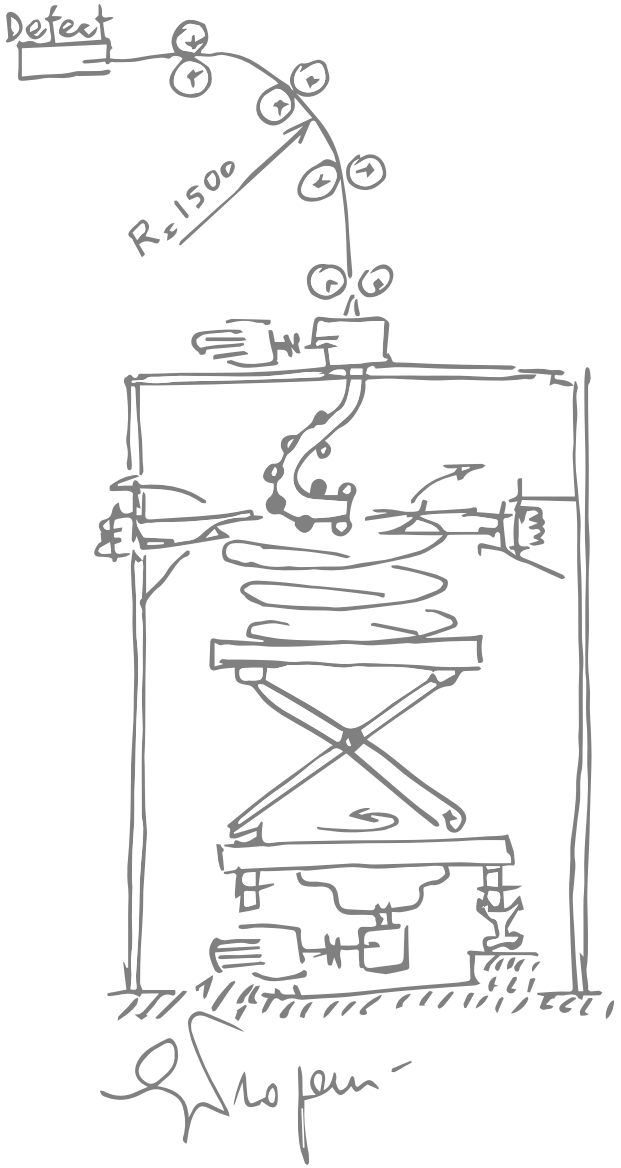



Continuus Properzi

# Zinc Wire Breakdown Operation by (Continuous Casting & Rolling) CCR Line for pure Zn and ZnAl alloys

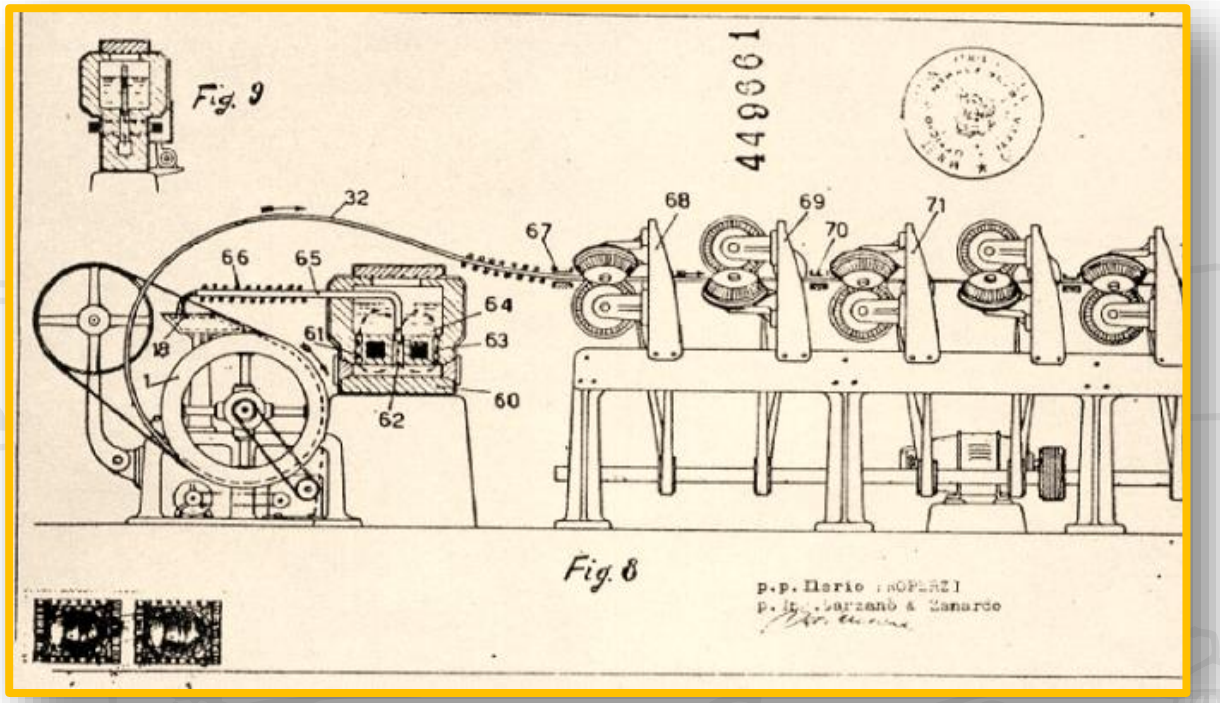
Presentation by Eng. Michelangelo Nidasio

# 1947 FOUNDATION OF THE COMPANY

Continuus Properzi

Almost seventy years ago, near after the war, when market globalization was not even dreamt of by the most enlightened futurologist economists, Continuus-Properzi, under the leadership of Mr. Ilario Properzi (1897-1976), was already selling around the world his patented casting and rolling lines for the production of rod which brought about a revolution in the strategic industry of electrical conductors.

# 1947 FOUNDATION OF THE COMPANY

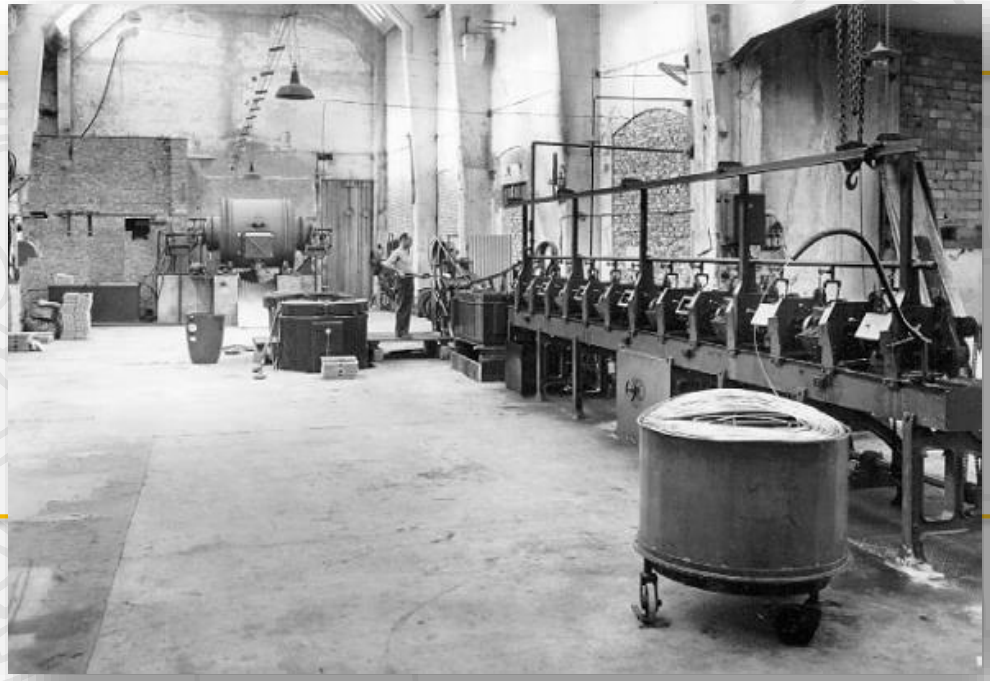



*First Properzi Patent*

The Properzi continuous casting and rolling system has probably been the first in-line continuous casting and rolling system to find an industrial application and opened a road to those who later studied other procedures for different metals and different products.

# 1947… INDUSTRIAL PRODUCTION OF AL ROD

Continuus Properzi



One of the first successful trial on aluminium in 1948 despite the hard condition of Italian post-war period.
Note the manual transfer of the metal from furnace to caster.

# VIEW OF THE MODERN 15 TPH ALUMINIUM ROD LINE

Continuus Properzi

# 1963… INDUSTRIAL PRODUCTION OF CU ROD

Continuus Properzi

First ever production of continuous copper rod from copper scrap – in Carrolton – GA – United States.

# VIEW OF ONE MODERN 25 TPH COPPER ROD LINE, USING CATHODES AS RAW METAL

Continuus Properzi

# 1979 ROLLING MILL MODEL MICRO – COLD OR HOT PROCESS

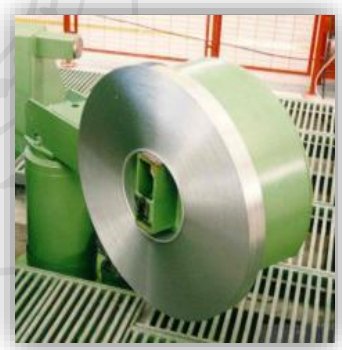
Continuus Properzi

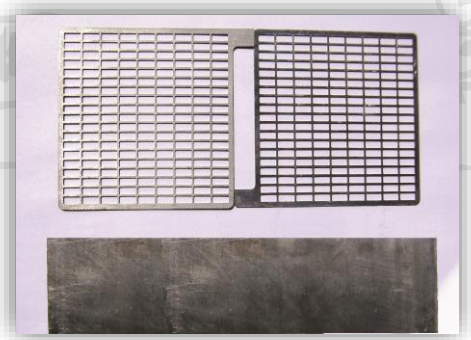
Micromill® stands for a rolling mill able to produce wires below 2.0 mm with very precise tolerances – from 8-10 mm rod – It was born after a very deep scientific study of the theory an practice of 3-roll reduction sequences in a mono-bloc actioned by one only motor: an unsurpassed technique. In several niches it showed superior performances than standard drawing machine.

# 1980 LEAD STRIP LINES – MORE THAN 30 LINES COMMISSIONED UP TO DATE

Continuus Properzi

The strip is expanded to form grids for Lead-Acid batteries.





# 2014 TAKING OVER THE KNOW-HOW OF THREESIXTY EXTRUSION TECHNOLOGY LTD. CONTINUOUS FORMING

Continuus Properzi

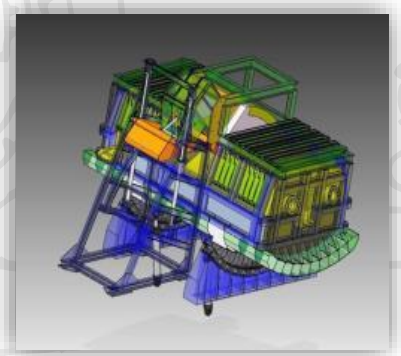
This technology, machinery and equipment is available for the clients under the brand Pro-Form (Properzi Continuous Rotary Extrusion).

bsi. ISO 9001 Quality Management FM 33637 OHSAS 18001 Occupational Health & Safety Management OHS 586148

# PROPERZI ENGINEERING BESIDES AL & CU ROD TECHNOLOGY




Numerous international patents have been granted in several different metal working applications.



# ZINC APPLICATION

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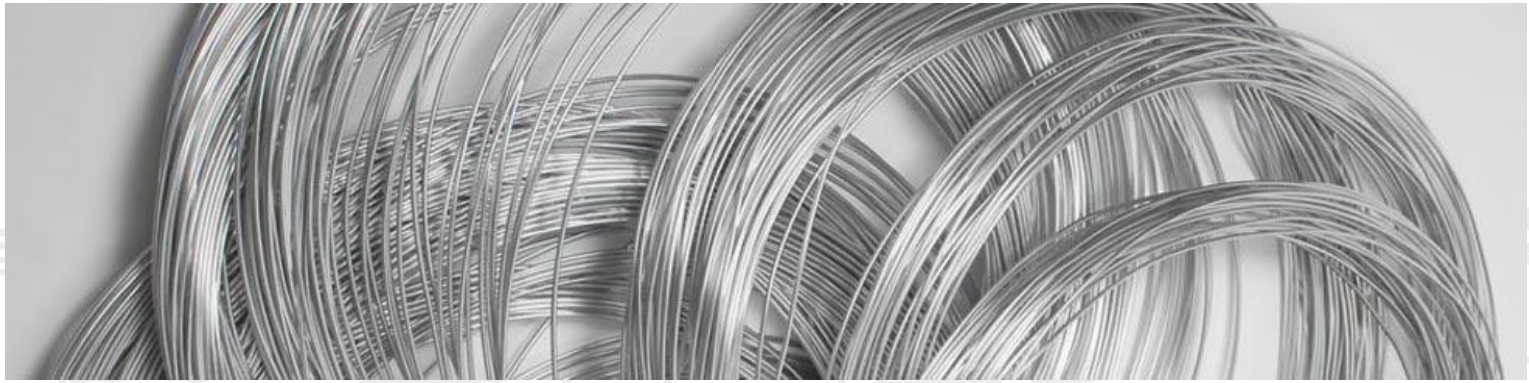
## Zinc and zinc alloy wire



**Zinc wire and Zinc Alluminium alloy wire** is used to apply zinc coatings by metal spraying process on steel products in order to protect them against corrosion. Zinc and zinc alloy wire sprayed coatings are integral steps in the manufacture of various electronic, capacitor, automotive, heat exchanger and tube & pipe products. Thermally Sprayed Zinc based alloy wire coatings are also used in the Corrosion protection of bridges, locks & dams, above ground storage tanks, light poles, and other critical infrastructure.

# WHAT IS CORROSION?

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The ISO 8044 standard defines corrosion as a physical-chemical interaction between a metal and its environment, leading to modifications of the properties of the metal and often to a functional deterioration of the metal itself, of its environment or of the technical system formed by the two factors…
Corrosion is an entirely natural process, and its cost is extremely high since the annual loss is estimated to be 2.5% of the GNP.

# HOW TO PREVENT CORROSION?

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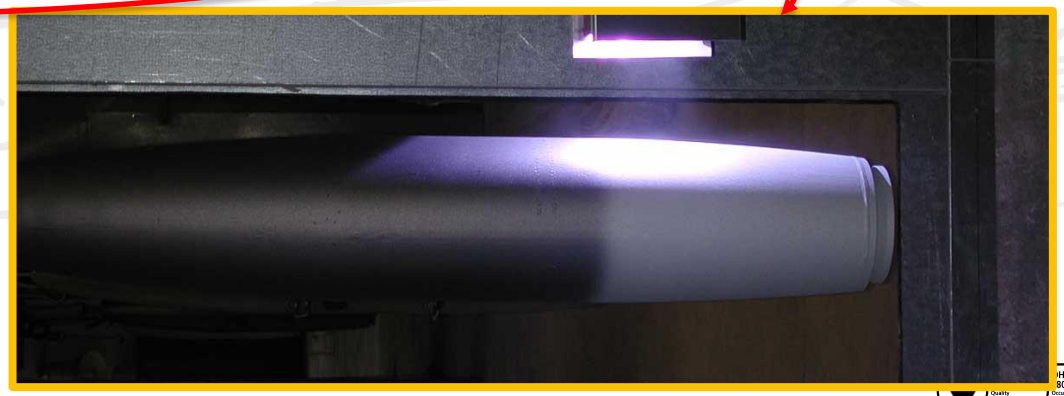
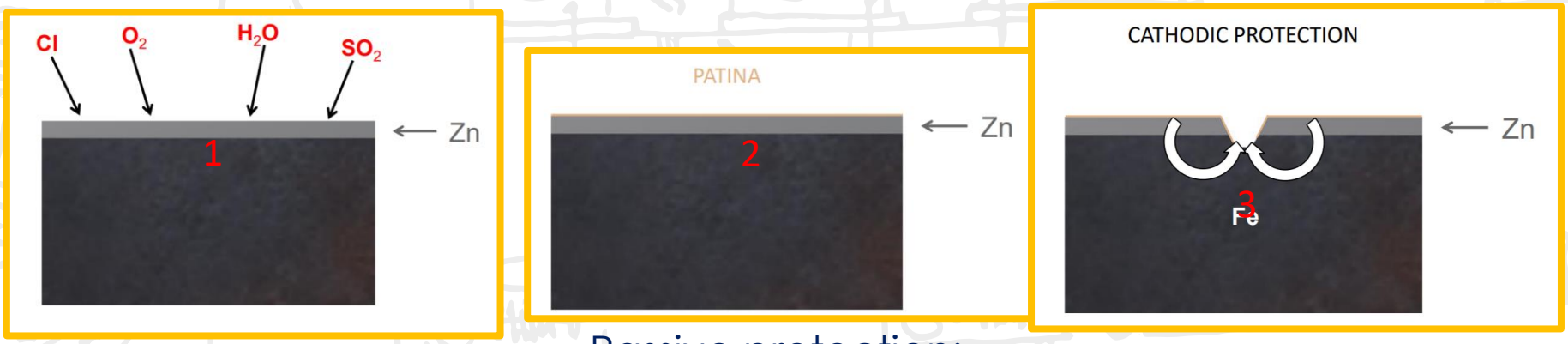
For corrosion to set in, an electrolyte (generally, water) must transfer electrons.
To prevent this phenomenon from occurring, the process needs to be interrupted by a barrier applied between steel and water.
This can be achieved by different means:

- paint;
- hot galvanizing;
- thermally sprayed zinc (TSZ);
- thermally sprayed zinc-aluminum (TSZA);
- duplex system.



# WHY THE USE OF ZINC?

Zinc will protect in more than one way:
like paint and galvanizing, zinc will form a barrier layer;
zinc will then oxidize and form a patina layer providing additional protection;
zinc and zinc-aluminum have an additional advantage: zinc will provide cathodic protection, which means that in case of coating damage down to the steel, zinc will be sacrificed and thus prevent the steel from corroding.



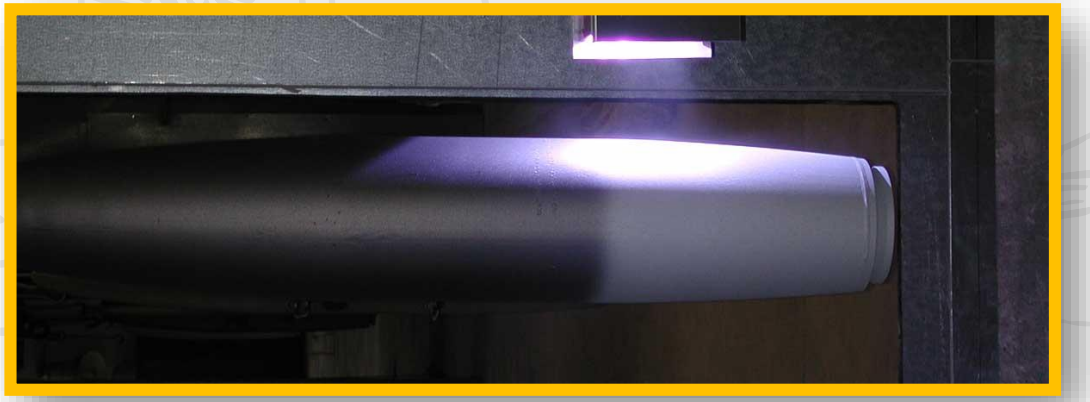

Passive protection:

1) Barrier protection of the metal against aggressive elements
2) Zinc reacts with aggressive agents in the atmosphere to form a protective layer, PATINA
3) Active sacrificial function of Zinc

# WHY METALIZATION?

Continuus Properzi

- No size limitation which can ultimately reduce the number of field splices needed when compared to galvanized members (offshore wind platform)
- No drying or curing time, which greatly increases manufacturer productivity
- Zinc is a recyclable material and the metallizing process produces zero volatile organic compound emissions.
- Low temperature process in which the metallized surface never exceeds 120-150°C. Thus, there is virtually no risk of weld damage or distortion of the steel due to high temperature or overheating.



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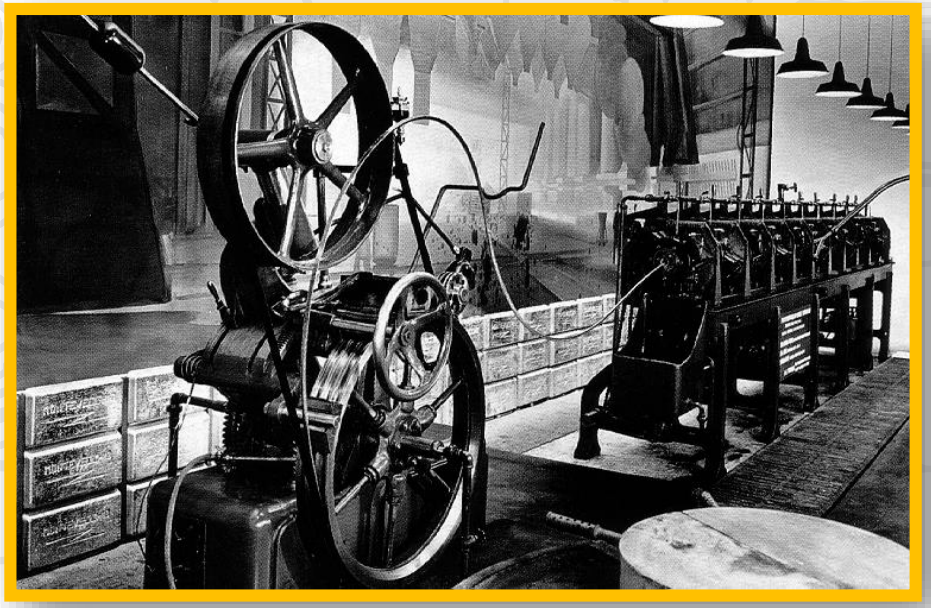
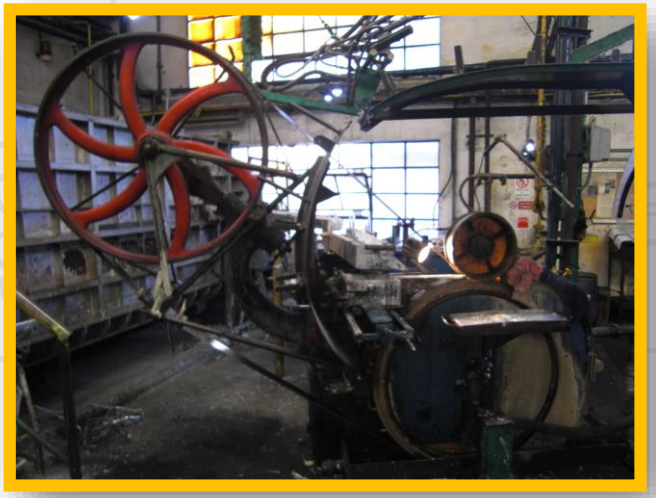
# WORLDWIDE MARKET DEFINED PROPERZI TECHNOLOGY THE BEST ONE FOR PRODUCING PURE ZN AND ZN-AL ALLOYS ROD & WIRE

## EVERYTHING STARTED FROM A VERY SIMPLE LINE



From INGOT to WIRE ROD for producing pure Zinc wire WHAT WE DONE……



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# TYPICAL CCR ZINC LINE IN OPERATION

Continuus Properzi


## THANKS KHOSLA ENGINEERING LTD - INDIA

# VERY EFFICIENT FURNACE SET

Continuus Properzi


## GAS FIRED FURNACES

## ELECTRICAL FURNACE


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# CASTING MACHINE

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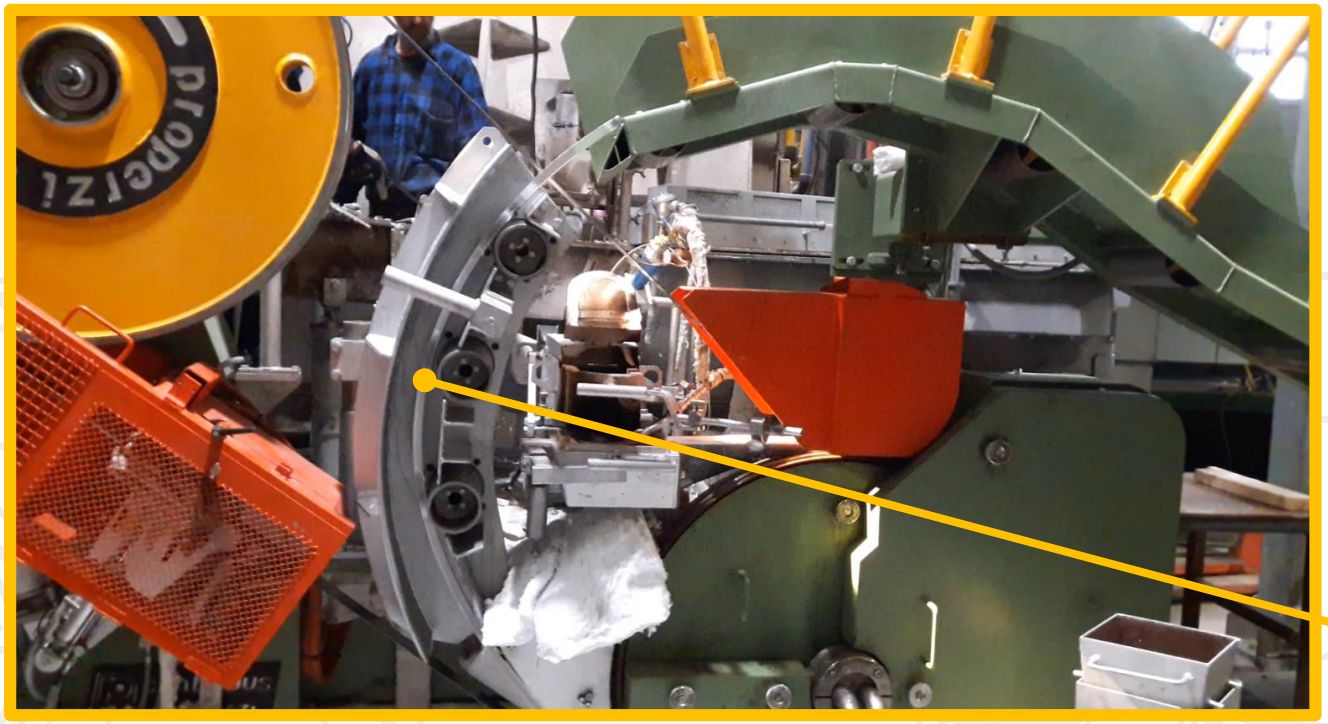

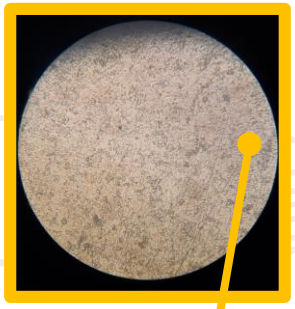

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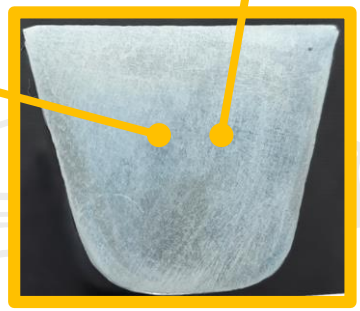
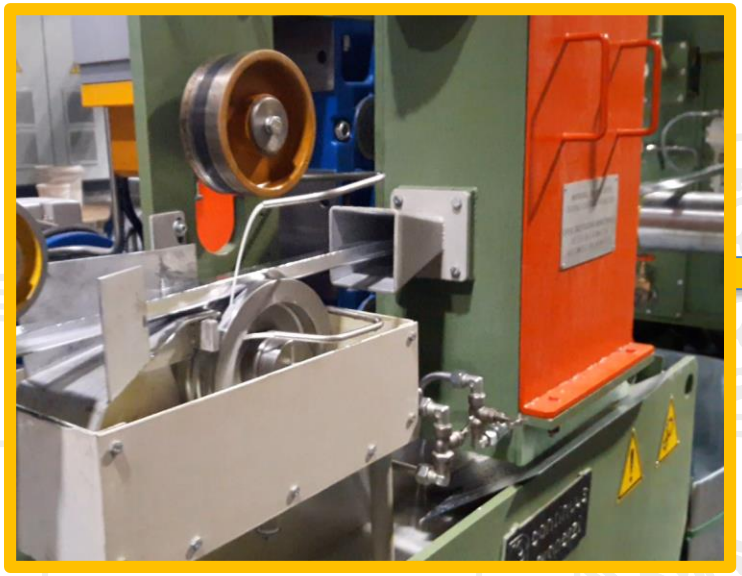


**The Casting Machine is the heart of the line: sophisticated alloys require the most detailed and precise design in all individual parts. Cooling is the diamond of the machine. Cooling parameters can be stored in the PLC as recipes.**

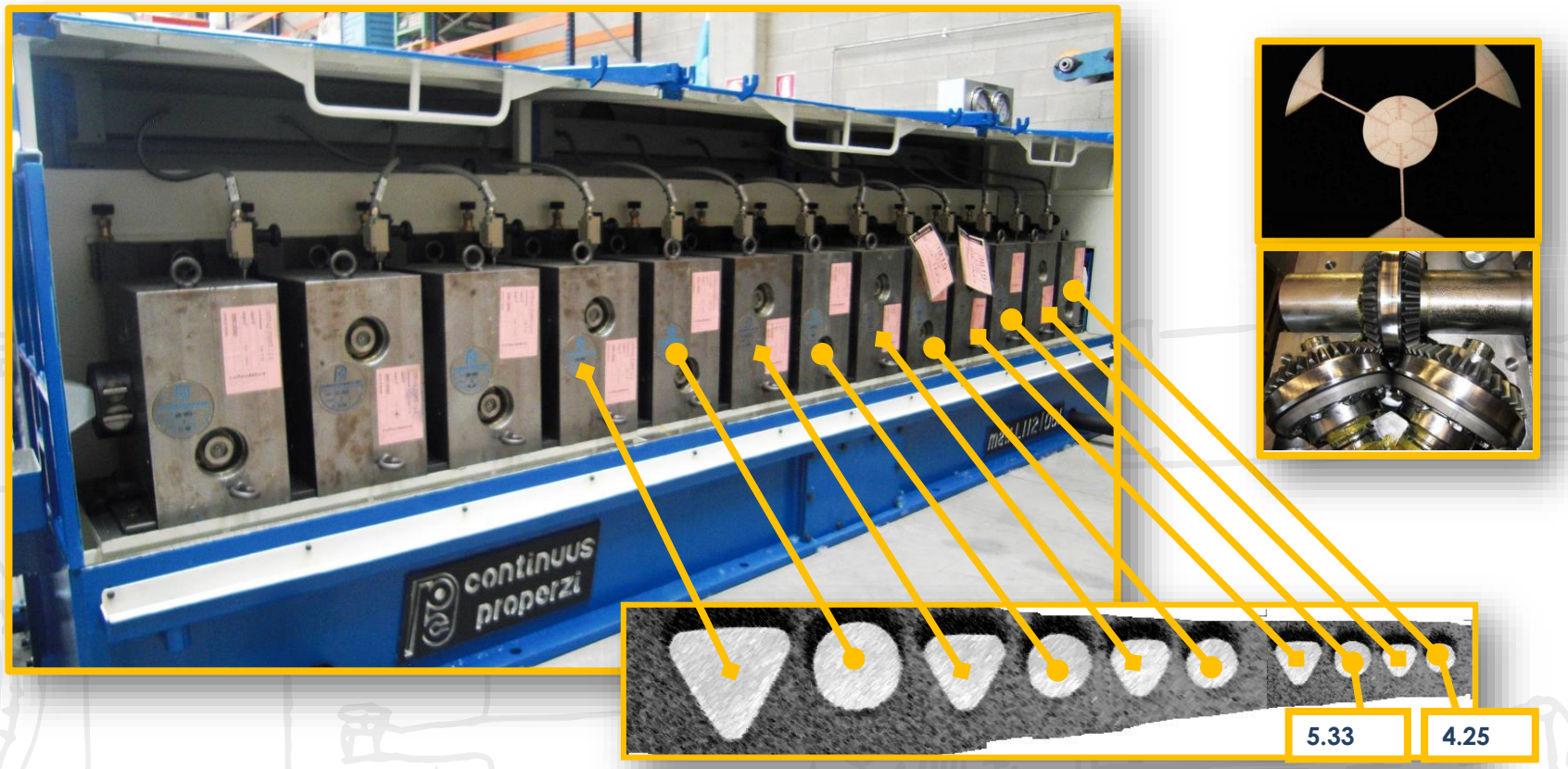
# BAR AUTOMATIC SHEAR



Before approaching the rolling mill the bar must be pass through the following machines:

- AUTOMATIC SHEAR provided to cut the cast bar at the startup of the Line and in the unlucky event of emergency. The cutting system is composed by two drums rotating on horizontal axis; each drum contain at least two blades which cut the cast bar during the rotation of the drums

# ROLLING MILL




**The Rolling Train is the Swiss watch of the line: This technology facilitates a nearly perfect balance of lateral spread and longitudinal displacement of the metal during each reduction step - the 3-roll rolling system allows excellent control of the rod geometry avoiding the temperature loose.**

# CONCENTRIC BASKET COILER

Continuus Properzi

**The coiler is designed to coil the wire coming from the rolling mill into concentric coils for internal transportation. We can make coils of 5.33mm and 4.25mm depending on the final products.**

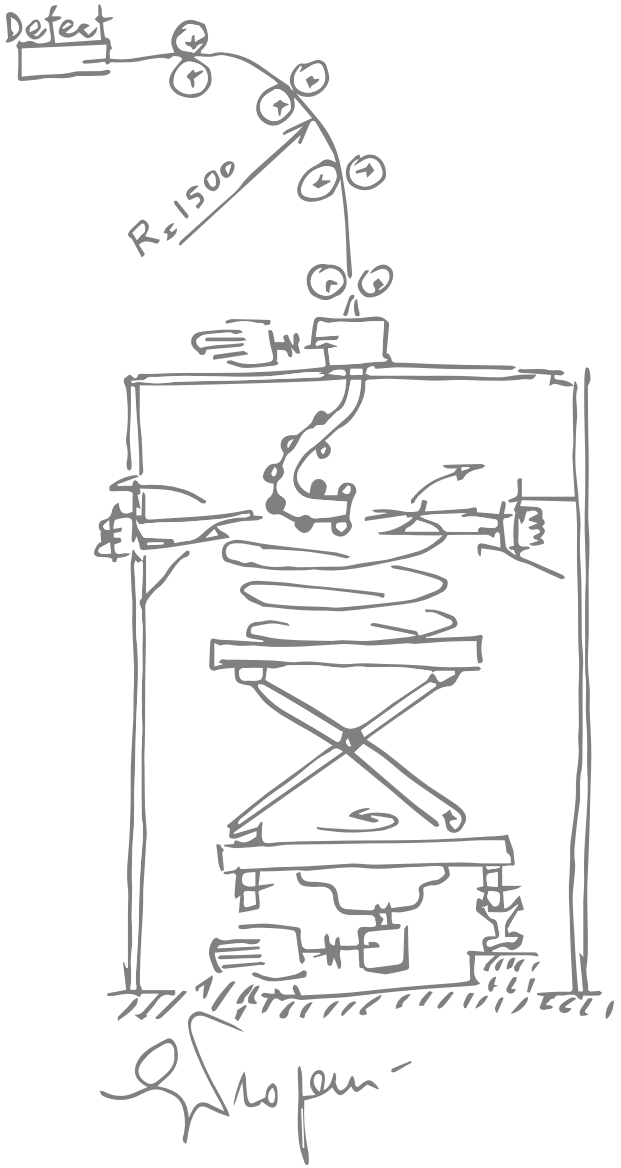
# ADVANTAGES

Continuus Properzi

**The Continuous CCR (Continuus Casting & Rolling) Lines by PROPERZI is considered the worldwide best and simple system for producing rod and the most economical way for producing wire. The advantages of PROPERZI technologies are:**

- No problem in maintaining constant the rod parameters
- High productivity and precision in automation
- Reliable and convenient packaging
- Technical support always available (consultancy@properzi.it)
- Unparalleled customer satisfaction

**Customers who use PROPERZI CCR rod and wire always experience an increase in their profits**




# Continuus Properzi

*Headquaters:*
*Continuus-Properzi S.p.A.*
*Via Emilia km. 310*
*26858 Sordio (Lodi) - Italy*
*Phone: +39.02.98.84.92.1*
*sales@properzi.it*

*USA Division:*
*Properzi International Inc.*
*909, Ridgebrook Rd. Suite 102*
*Sparks, MD 21152, USA*
*Phone: +1.443.212.4320*
*info@properzi.us*

Presentation by Eng. Michelangelo Nidasio