Mastering Wire and Cable Quality with Innovative Measurement Solutions



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NF Wire Forum

October 28th 2025

Ahead together

CERSA MCI

MEASUREMENT AND CONTROL INSTRUMENTS

SUMMARY:

- Company presentation
- Measurement solutions to meet industry needs, applied to:
  1. metallic wire producers
  2. Dies shop and dies producers
  3. Cable producers



COMPANY PRESENTATION

ID CARD

Creation date: 1981

Localization: Marseille-Aix en Provence / France

Our expertise: Developing and manufacturing measurement instruments for wire, cables, tubes and fiber optics industries.

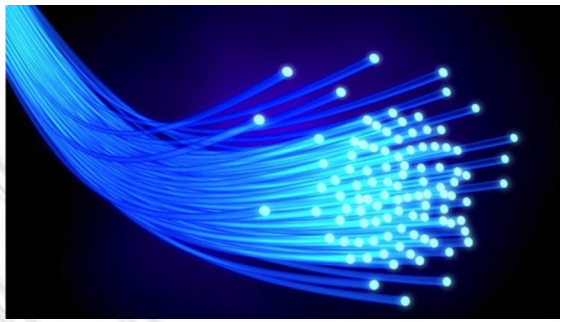
Specificities: Use of cutting-edge and innovative technologies, continuous investments in R&D



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MEASUREMENT AND CONTROL INSTRUMENTS

INDUSTRIES





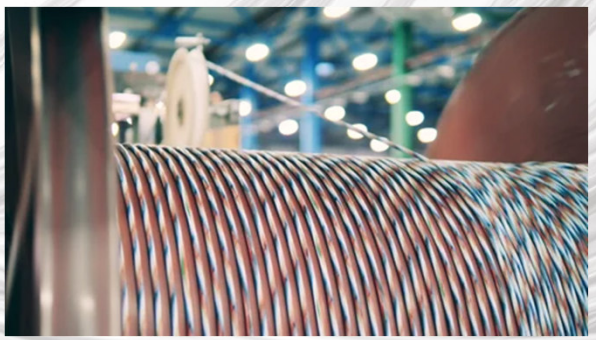
OPTIC FIBER



FINE WIRES



TUBE

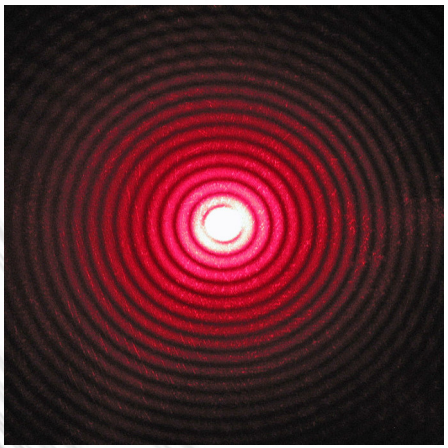


CABLES

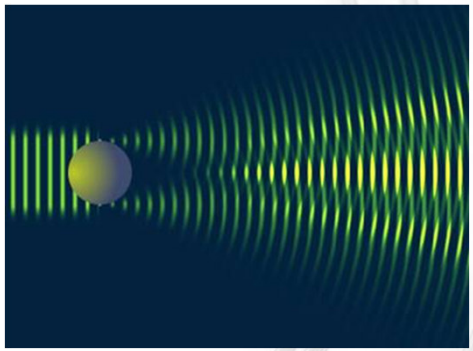
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OUR VISION:
YOU CAN UNDERSTAND AND IMPROVE
ONLY WHAT YOU CAN REVEAL AND MEASURE

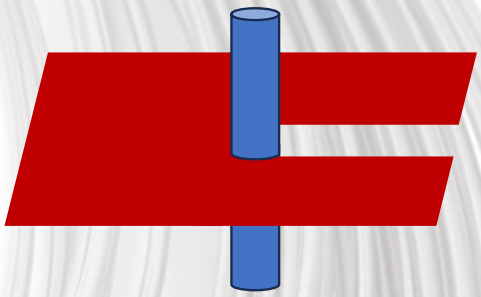
MASTERING OPTICAL TECHNOLOGIES



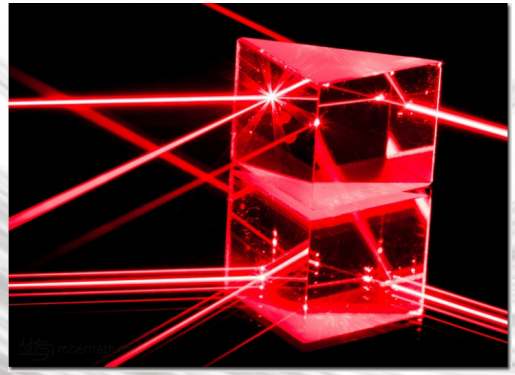
DIFFRACTION



INTERFERENCES



SHADOW



LIGHT POLARIZATION



LIGHT REFLECTION

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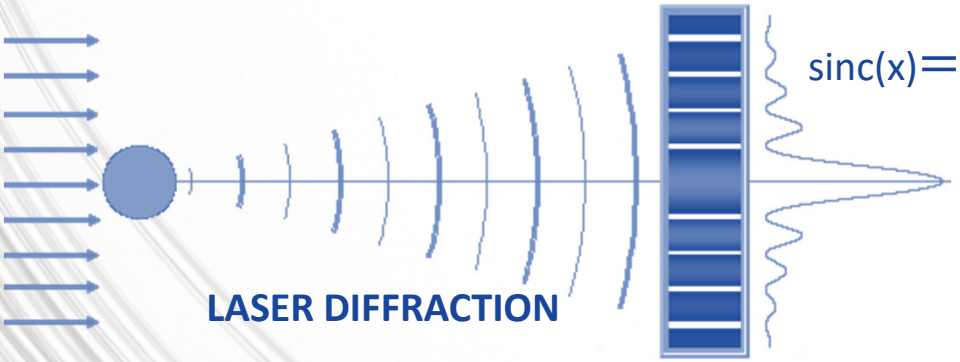
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TECHNOLOGIES APPLIED TO TO METALIC WIRE

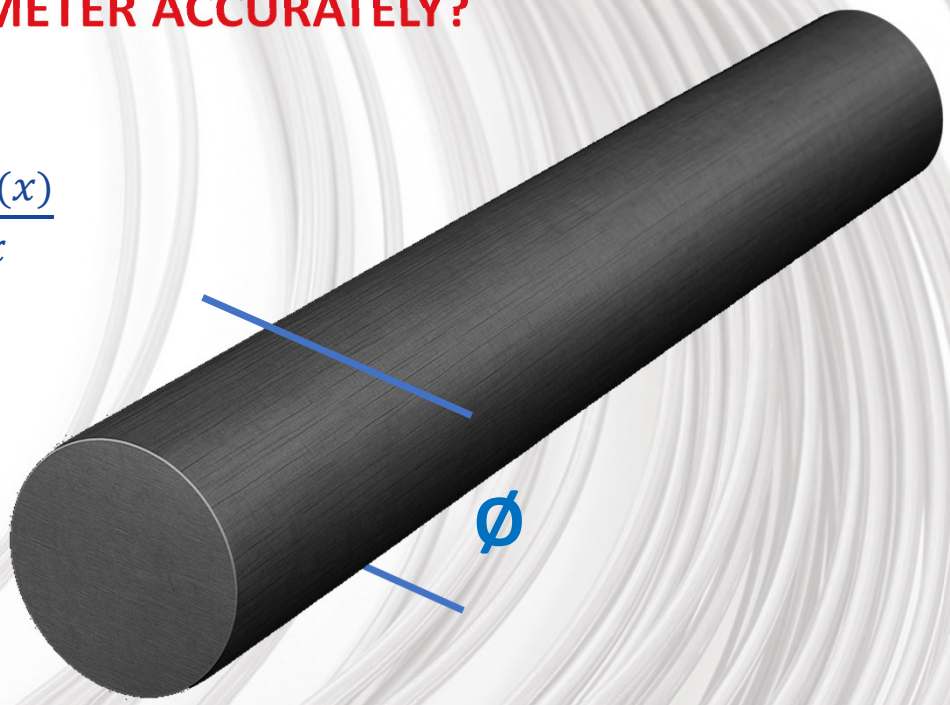


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MEASUREMENT AND CONTROL INSTRUMENTS

SUPERFINE WIRES
HOW TO MEASURE DIAMETER ACCURATELY?



$$\text{sinc}(x) = \frac{\sin(x)}{x}$$



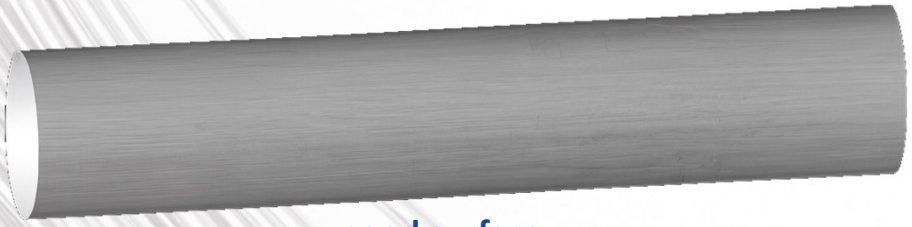
TECHNOLOGY SPECIFICATIONS

- **Measuremnt range:** 5µm to 2mm
- **Repeatibility: down to** +/-0.04% of OD
- **Accuracy:** +/-0.1µm
- **Unaffected by vibration**
- **No moving part**

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SUPERFINE WIRES
HOW TO MEASURE THE SURFACE QUALITY AND DETECT SURFACE DEFECTS?

SURFACE QUALITY CHARACTERIZATION

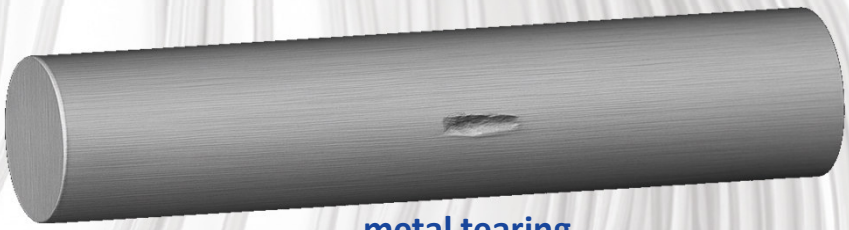


good surface

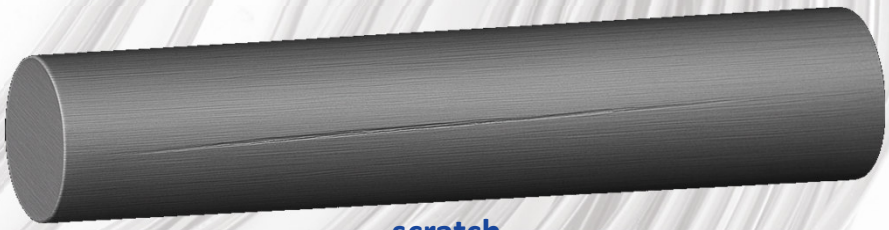


rough surface

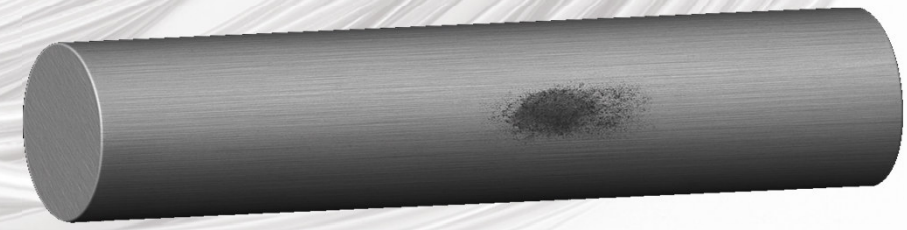
TYPICAL SURFACE DEFECTS



metal tearing



scratch



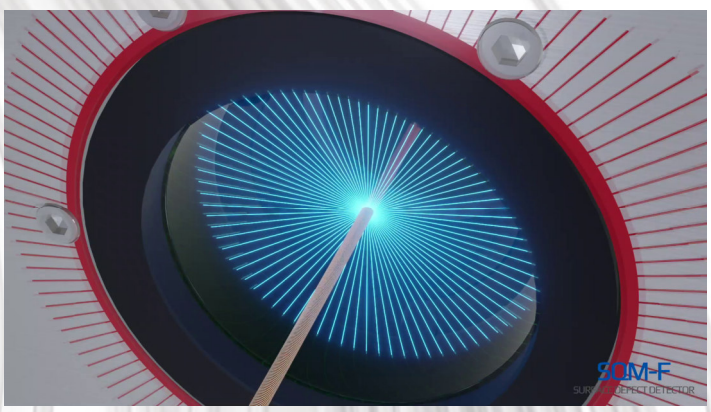
oxidation or lack of plating

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SUPERFINE WIRES
HOW TO MEASURE THE SURFACE QUALITY AND DETECT SURFACE DEFECTS?



LIGHT
REFLECTION

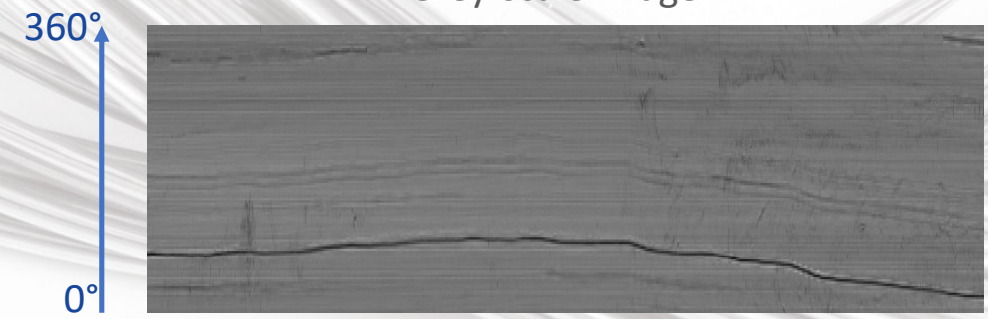


200 000 turns per second



Down to 10µm wire diameter!

Flatten view
Grey-scale image

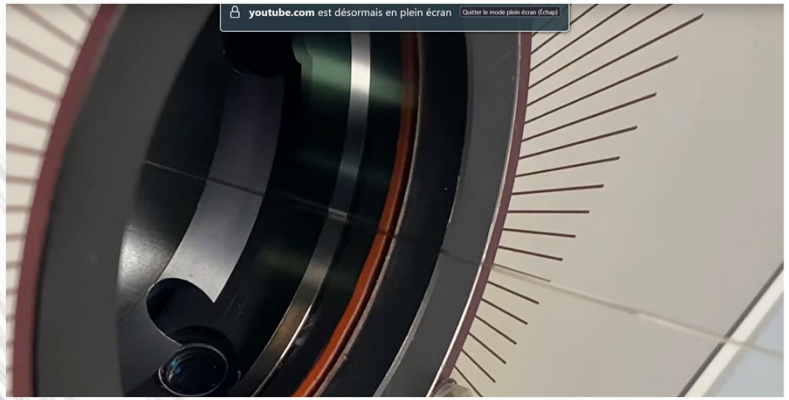


BENEFITS

- Surface quality evaluation, wire categorization
- Wire rejection because of metal tearing and inclusion to avoid breaking during next steps of fine drawing
- Dies exchange anticipation when too many scratches appear on the surface

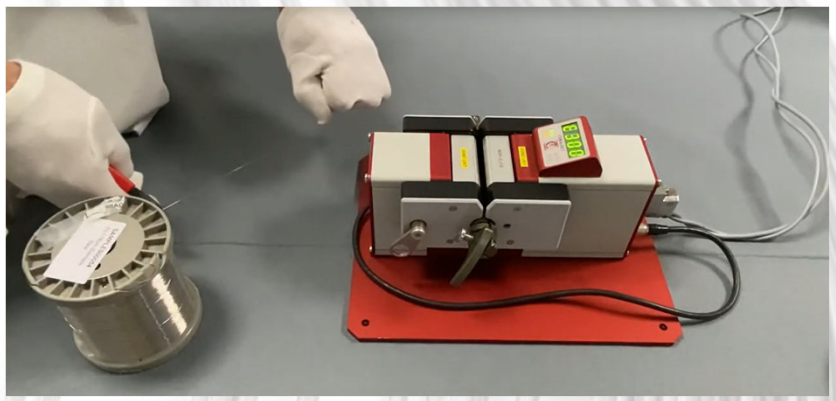
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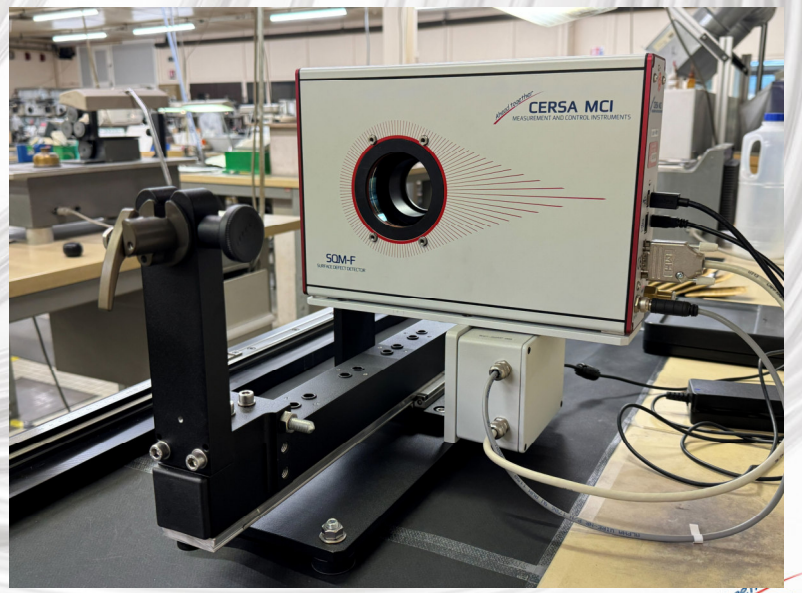
INLINE CONTINUOUS MEASUREMENT





POST-PRODUCTION, INCOMING, SAMPLE MEASUREMENT





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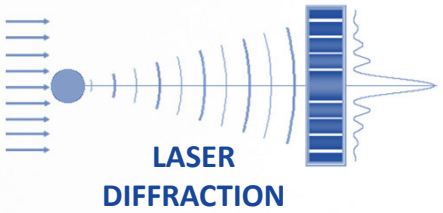
APPLICATION TO
DIES MANUFACTURERS / DIES SHOPS



In cooperation with

BALLOFFET
MADE IN FRANCE

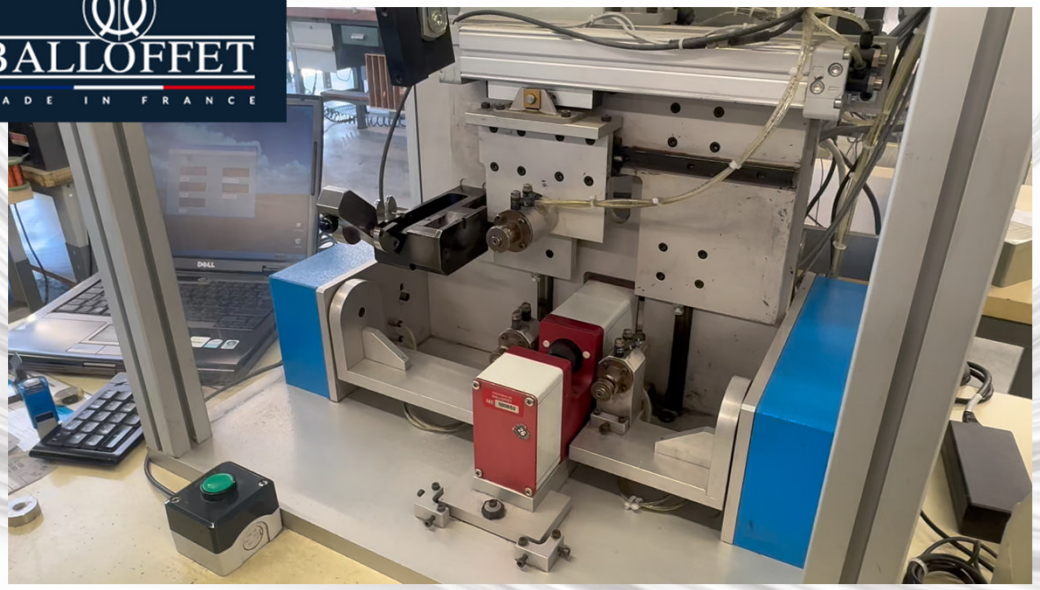
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DIES MAKER / DIES SHOPS
MEASURING A FRESH-DRAWN WIRE TO QUALIFY THE DIE

LASER DIFFRACTION PROVIDES AN ULTRA-ACCURATE DIAMETER AND ROUNDNESS MEASUREMENT

BALLOFFET
MADE IN FRANCE



BENEFITS

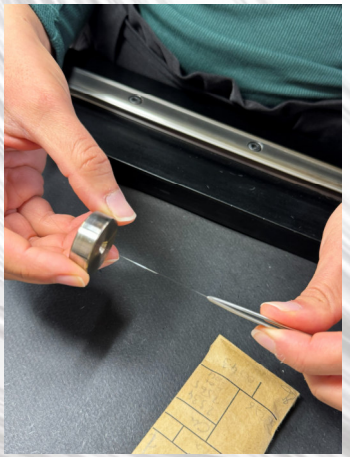
- a solution that provides an automatic accurate and repeatable measurement
- Optimizing your dies set to fit the elongation ratio of your drawing machine
- Dies' lifetime improvment and wire breaks reducing

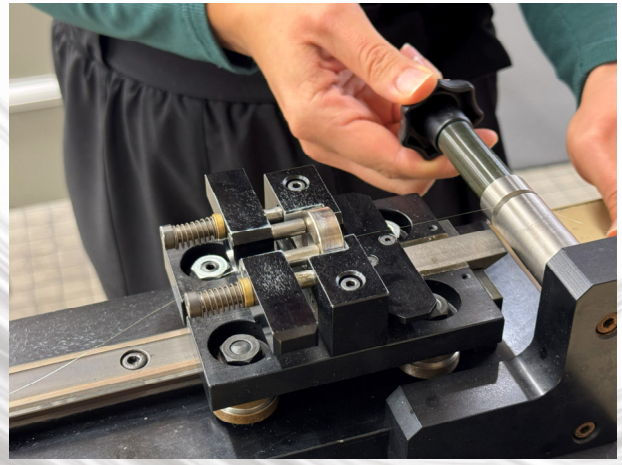
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MEASUREMENT AND CONTROL INSTRUMENTS

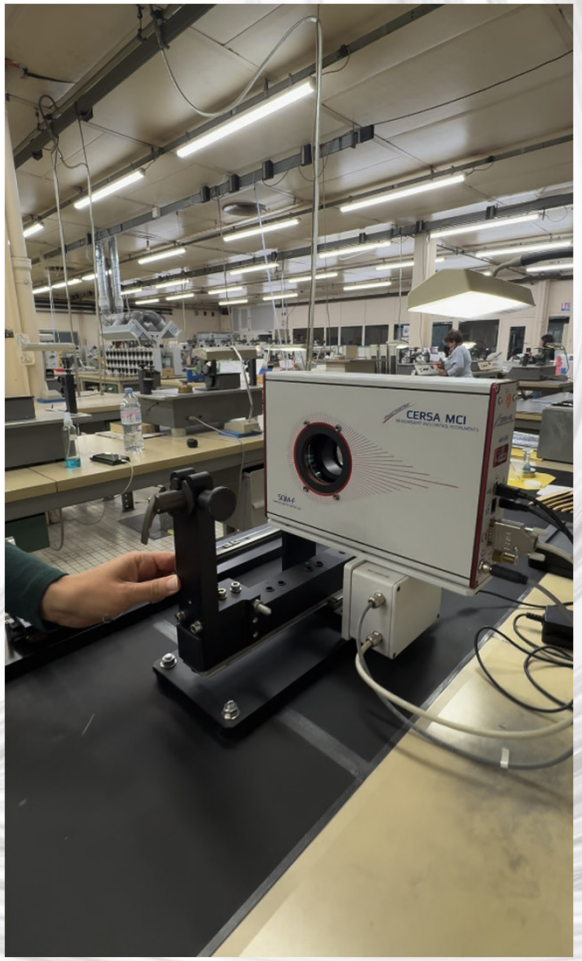
LIGHT
REFLECTION

DIES MAKER / DIES SHOPS
MEASURING A FRESH-DRAWN WIRE TO QUALIFY THE DIE

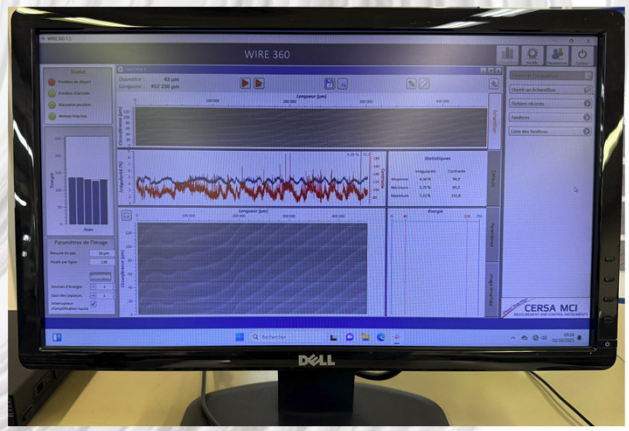
MANUAL WIRE DRAWING







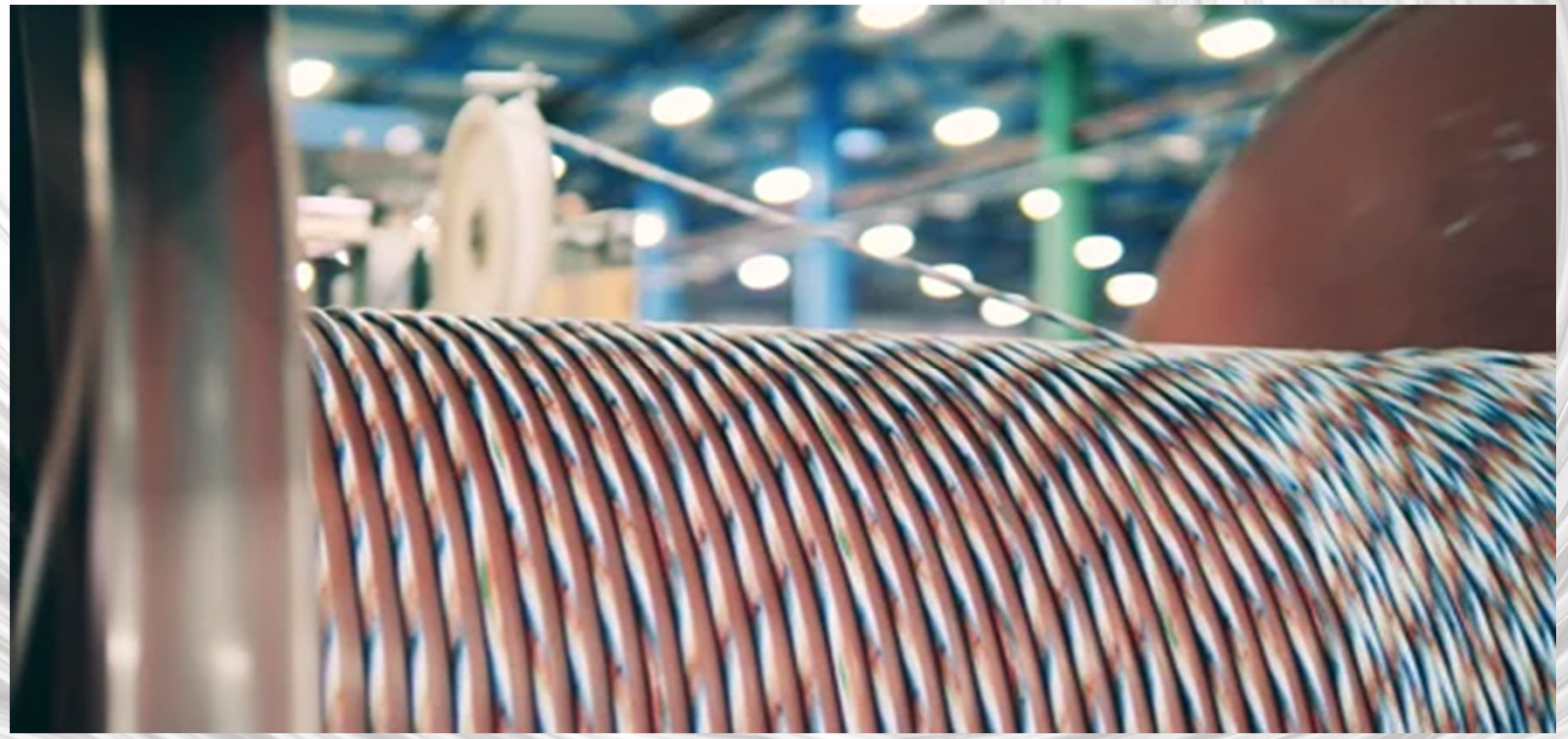
SURFACE QUALITY EVALUATION



In cooperation with

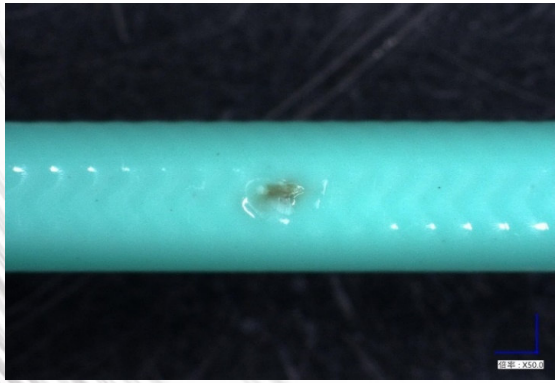
BALLOFFET
MADE IN FRANCE

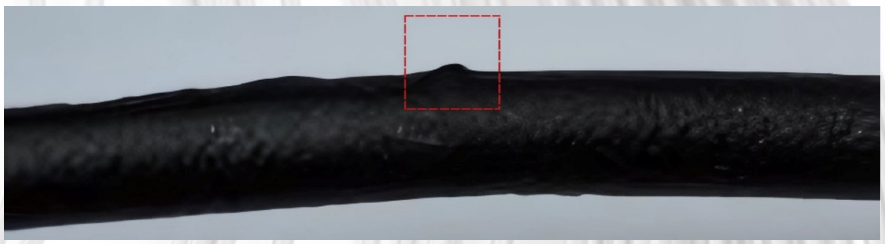
TECHNOLOGY APPLIED TO TO CABLE

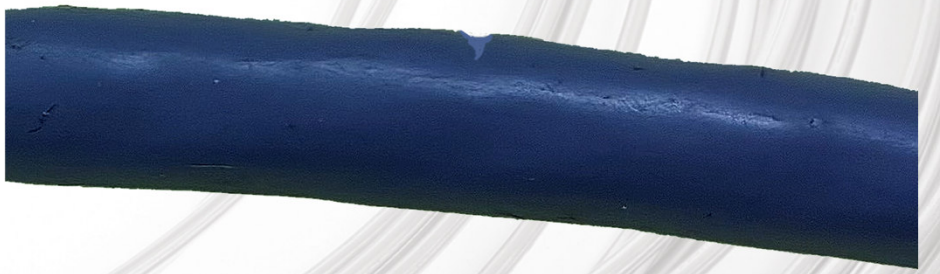


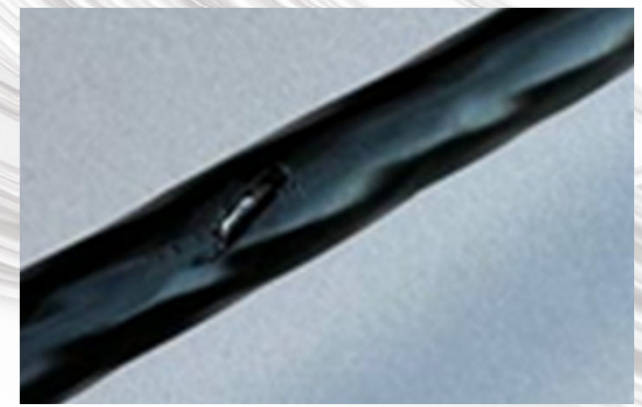
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MEASUREMENT AND CONTROL INSTRUMENTS

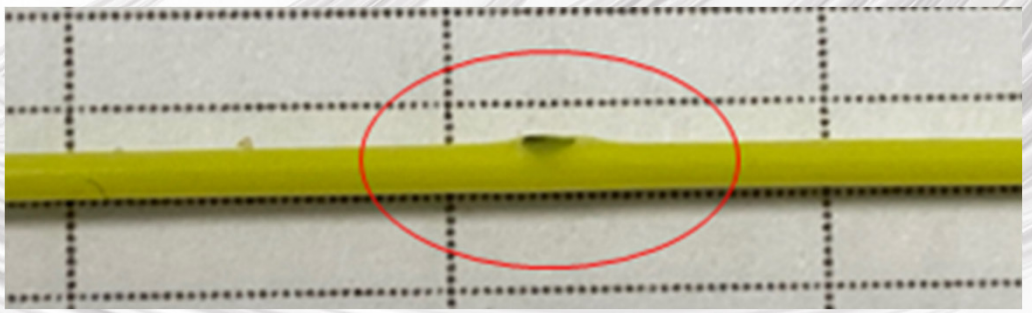
EXTRUDED CABLES AT FAST SPEED
HOW TO DETECT SMALL DEFECTS





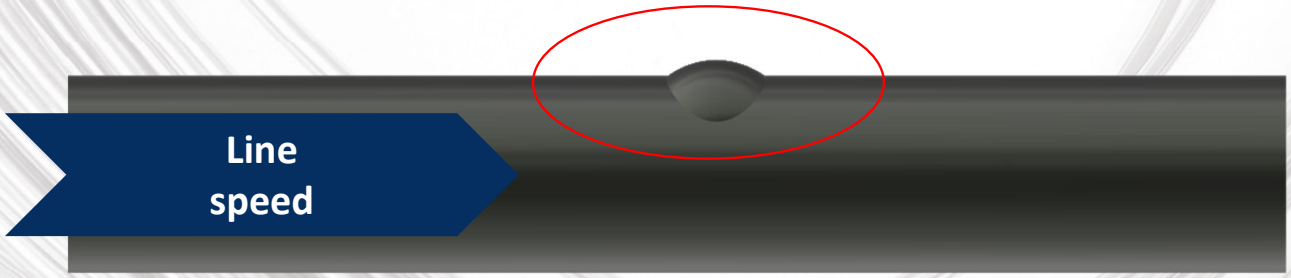






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MEASUREMENT AND CONTROL INSTRUMENTS

KEY CONCEPTS
HOW TO DETECT SMALL DEFECTS

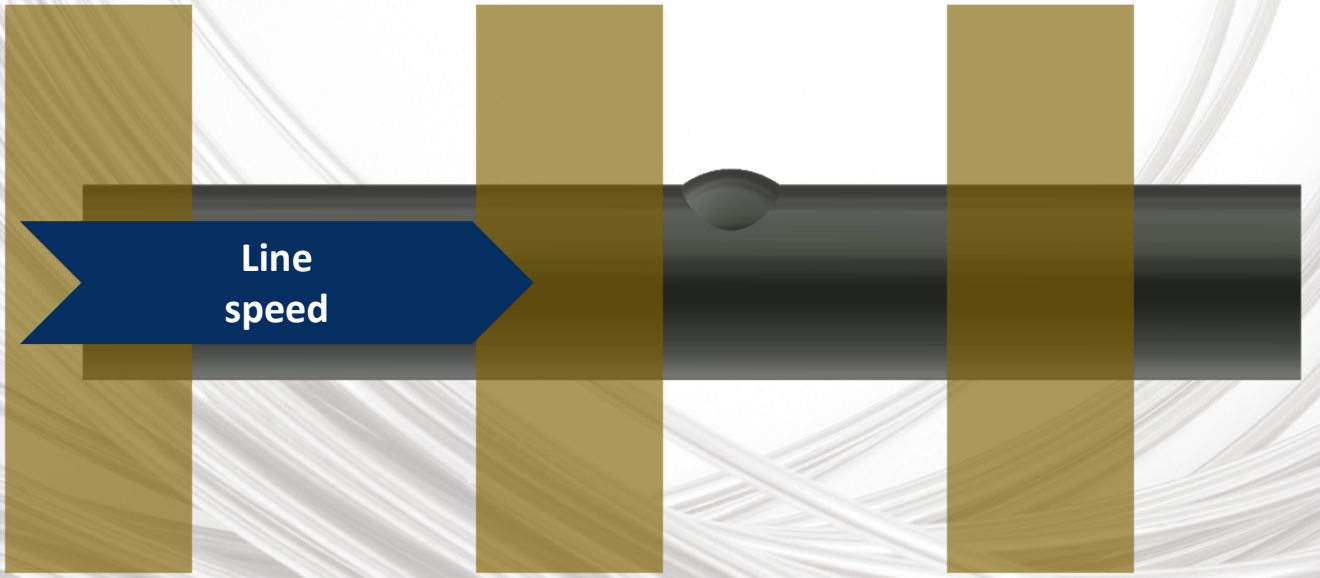


The light beam must be thin enough to insure the detection capability (optical resolution)

+

The measurement frequency must be fast enough

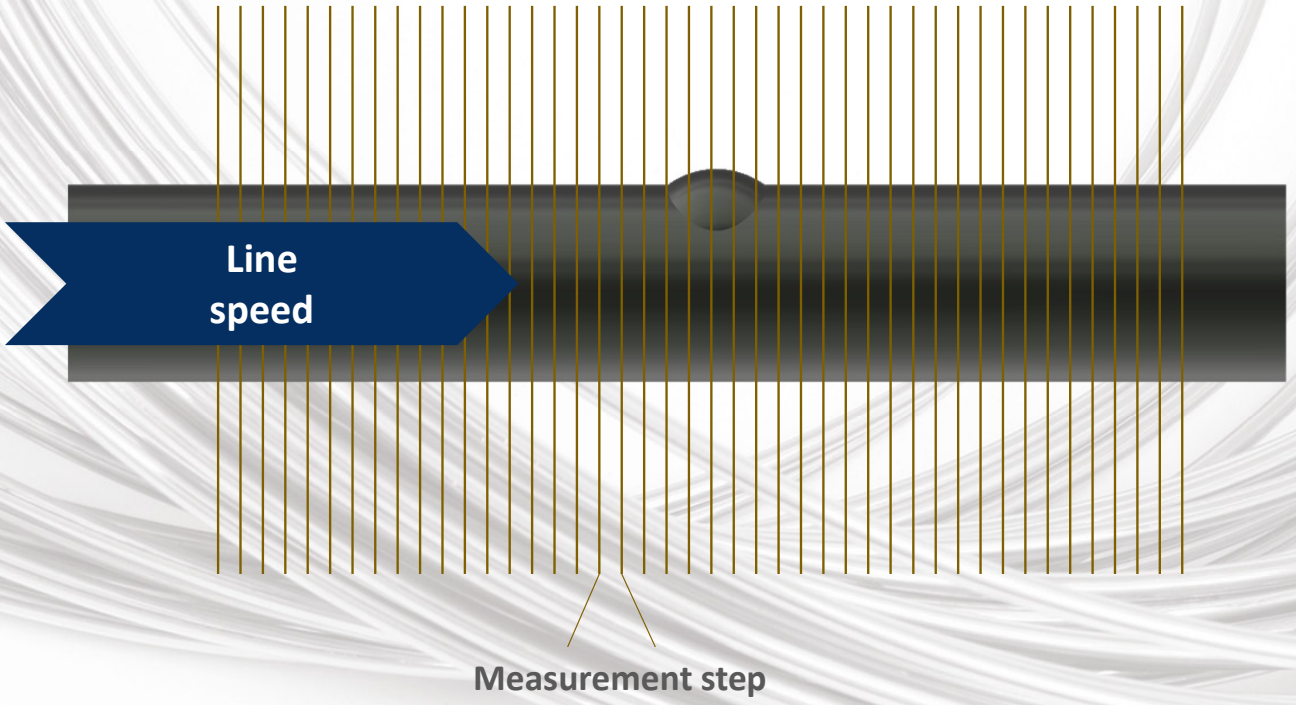
KEY CONCEPTS
HOW TO DETECT SMALL DEFECTS



Measurement frequency is too low

Optical resolution is too low

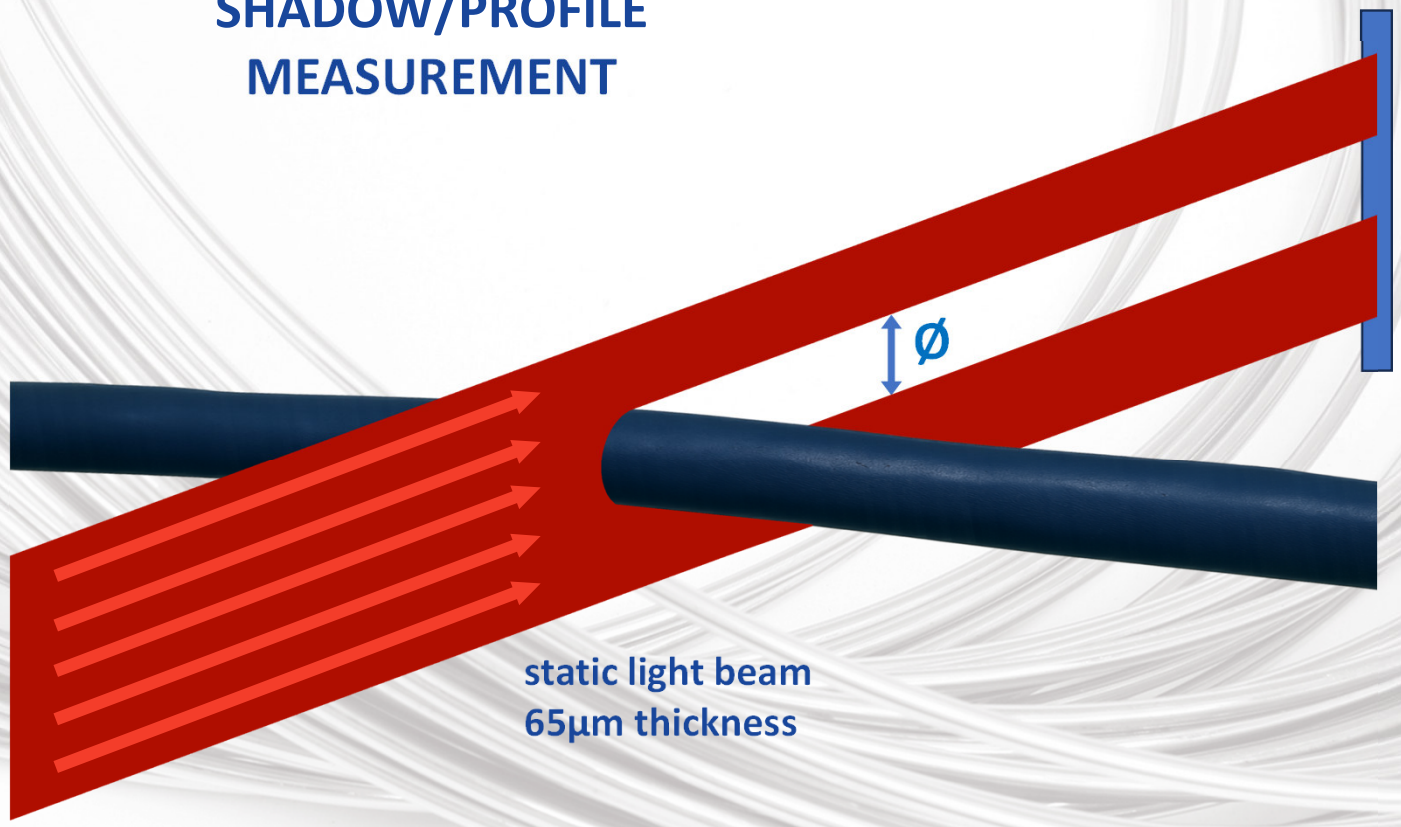
KEY CONCEPTS
HOW TO DETECT SMALL DEFECTS



	Line speed @600m/min
Measurement frequency(Hz)	Measurement step(mm)
10 000	1.00
200 000	0.05

EXTRUDED CABLES AT FAST SPEED
HOW TO DETECT SMALL DEFECTS

SHADOW/PROFILE MEASUREMENT



static light beam
65µm thickness

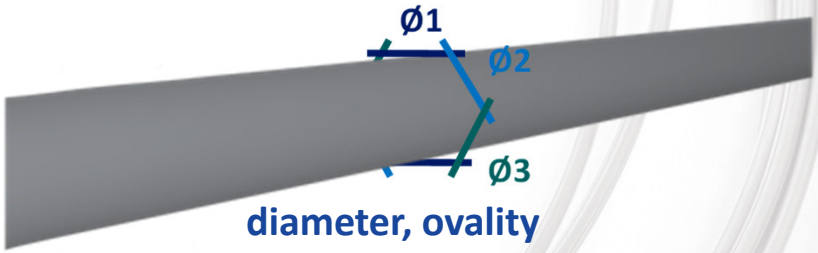
INNOVATIVE SOLUTION !

ultra high speed
CMOS sensor

1µs exposure time
250 000 images/s

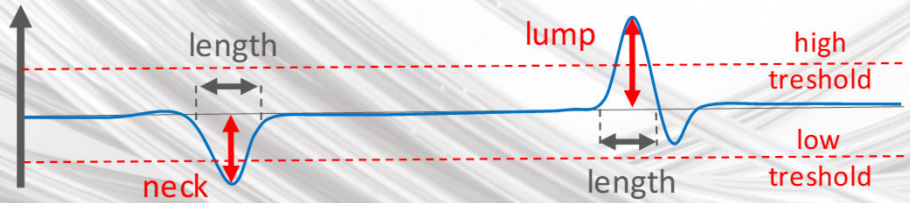
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EXTRUDED CABLES AT FAST SPEED
INVOVATIVE SOLUTION

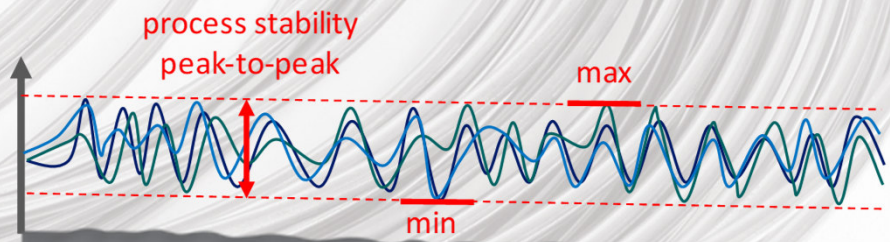


diameter, ovality

REAL-TIME !



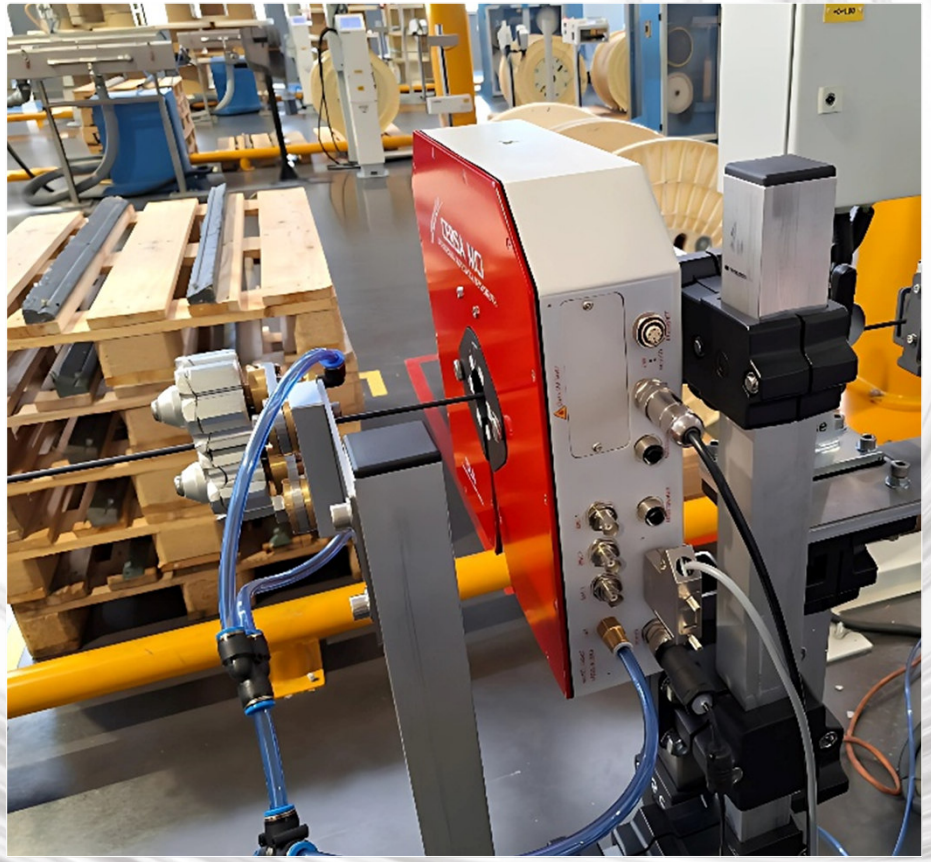
shape defect, lump&neck



Min/max, peak to peak

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EXTRUDED CABLES AT FAST SPEED
INVOVATIVE SOLUTION



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THANK YOU!

ANY QUESTIONS?



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