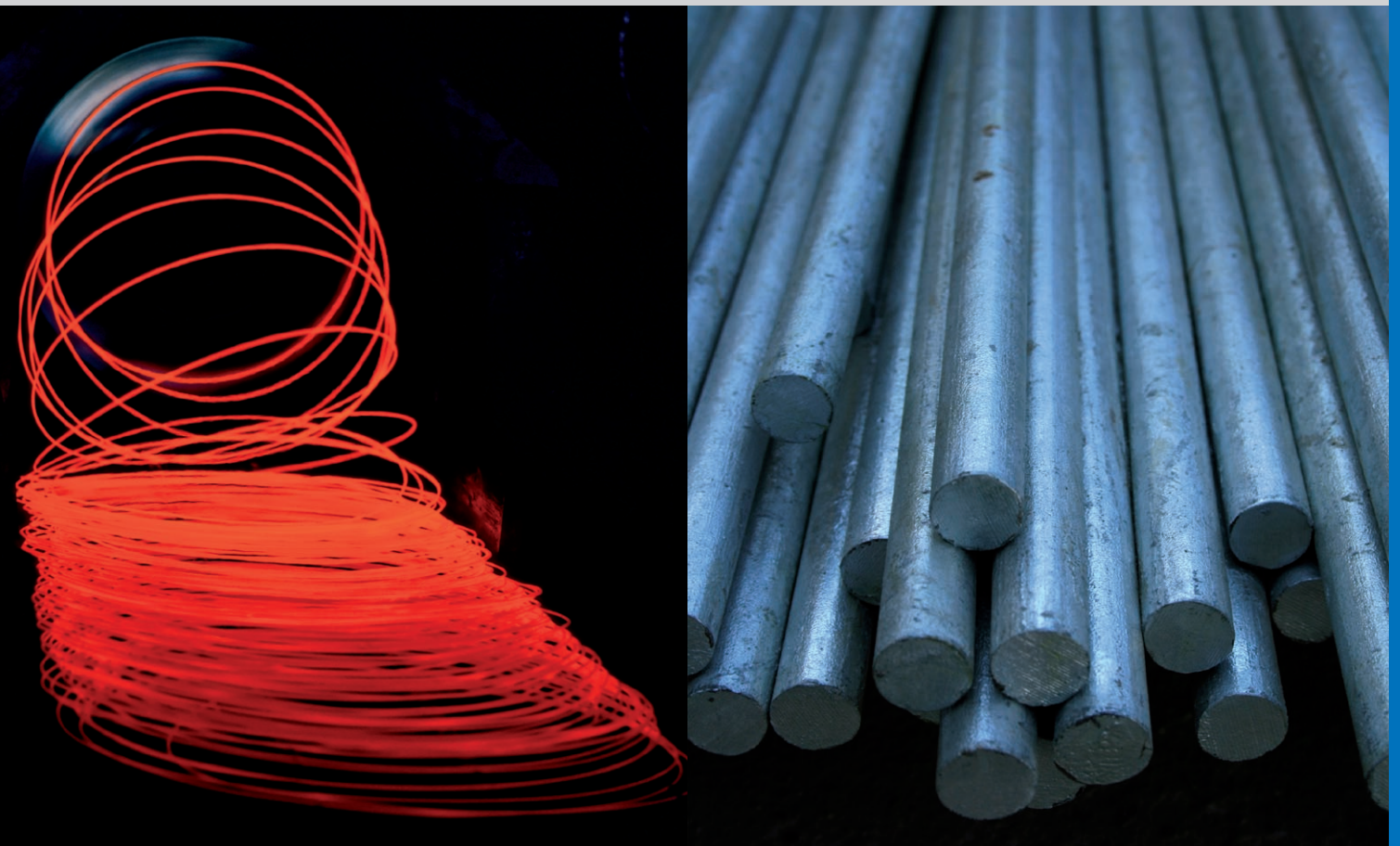
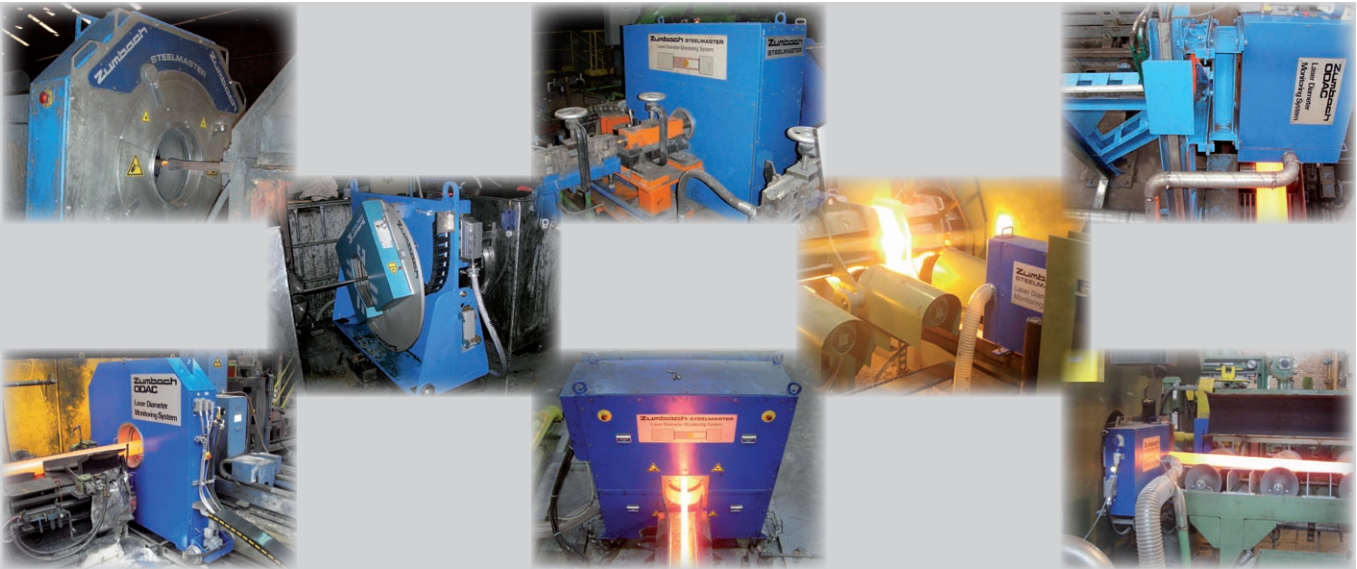


# Steel – Metal



Dependable Measurement & Monitoring Solutions



#### Facts

- Over 65'000 ODAC® laser heads in use for various processes
- Over 500 ODAC® systems in the field for cold steel measurement and in Q.C.
- Over 280 STEELMASTER and PROFILEMASTER® measuring units in hot rolling and in similar processes in steel and metal

ZUMBACH is a Swiss company, founded in 1957. It has been active in the steel and metal industry for over 30 years. It all started with the development and sales of non-contact ODAC® laser gauges for peeling and grinding processes, replacing the usual hand micrometers and callipers.

Today ZUMBACH is a group of 13 companies worldwide. In 1987 the first measuring systems for hot rolling of seamless pipe were sold. Later systems for bar, rod, rebar and profiles followed.

ZUMBACH was a pioneer for numerous achievements, such as:

- ODAC® Laser scanners with HLF High-tech optics
- CSS Calibrated single scan technology
- EPM Enhanced profile measurement
- Measurement rates up to 2'000/s/axis
- Maintenance free protection and oscillation mechanics
- Extremely long lifetime

Zumbach products reflect the extensive experience accumulated in the steel, metal and in other industries.

The cornerstones of our philosophy are

- Top quality
- Highest technology and precision
- Professional service

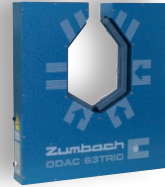
### ODAC® Laser Scanners

ODAC® scanners are the heart of most ZUMBACH systems for in-line dimension measurement in the steel and metal industry. Over 65'000 of them are in use worldwide.

They represent latest technology, including CSS (Calibrated Single Scan), HLF (High-accuracy Large Field) and more exclusive features.

ODAC® models with 1, 2 or 3 axes are used for all cold processes and for quality control lines.

For hot processes, up to 6 scanners are integrated in fully protected STEELMASTER systems.



### STEELMASTER

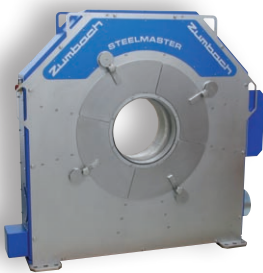
#### Systems for Bar, Rod, Tube

STEELMASTER systems are equipped with up to 6 ODAC® scanners and measure relevant dimensions of products, like billets, bar, rod and tube.

Static SMS systems measure the product dimension simultaneously in up to 6 axes.

Oscillating SMO systems cover a full 360°, finding min. and max. values or faults anywhere on the product circumference.

Standard systems are available for hot rolling and for cold Q.C. systems, Dimensions from 1 up to 500 mm (.04–20 in)



### PROFILEMASTER®

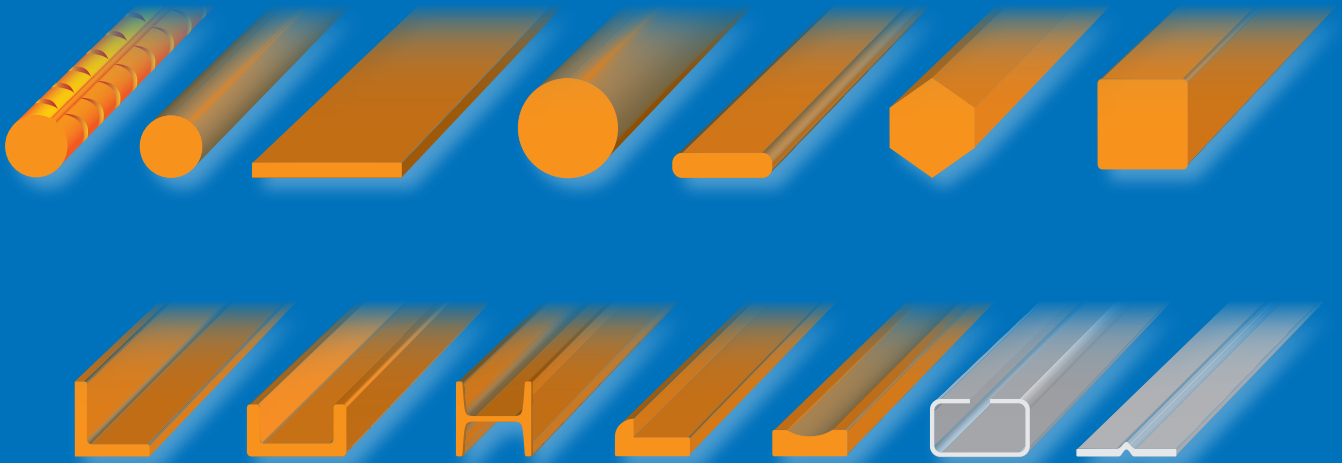
#### Systems for Profiles and Shapes

PROFILEMASTER® systems are based on advanced "Light Cut" technology with laser contouring, CCD matrix cameras and machine vision processing.

They are able to capture and monitor the full profile section, including local faults like convex or concave sections. Critical angles or radii can be measured as well.

PROFILEMASTER® versions are available for cold and for hot products, from small precision profiles up to standard profiles and sections.





## Key Advantages

- Immune to environment
- Rounds, Flats, Square, Hexagon, Rebar with same gauge
- CSS Technology with up to 6'000 measurements/s
- EPM Method (pat. pend.) for polygonal and asymmetric profiles
- Diameters from 5 to 300mm (.2 to 12 in.)
- 1 or up to 6 axes, static or rotating respectively oscillating

## Your Benefits

- Gauge location possible after finishing or intermediate stands
- Faster start-up, less scrap
- Tighter tolerances
- Documented quality

STEELMASTER gauges with tangential laser scanning measure critical dimensions such as diameter, ovality, polygonality, width, height, diagonals of billets, bar, flats, rod, rebar with high accuracy and at high rates.

Processes include hot rolling, extrusion, Pilger, continuous casting/rolling etc.

Up to 4 gauges can be processed by a central PC. High performance real-time processing, optical fibre transmission and ETHERNET for plant networking.



## Key Advantages

- Captures and shows complete profile
- Measures and monitors all relevant dimensions
- Easy teach-in of profile from CAD
- ETHERNET network
- Versions for up to 400mm (16 in.)
- Modular concept, 1 to 6 cameras

## Your Benefits

- Full control on product geometry
- Better process transparency
- Faster start-up, less scrap
- Higher productivity

PROFILEMASTER® systems with advanced "Light Cut" vision technology (laser contouring and CCD Matrix cameras) captures the complete profile. Selected dimensions, angles and radii are measured and monitored accurately.

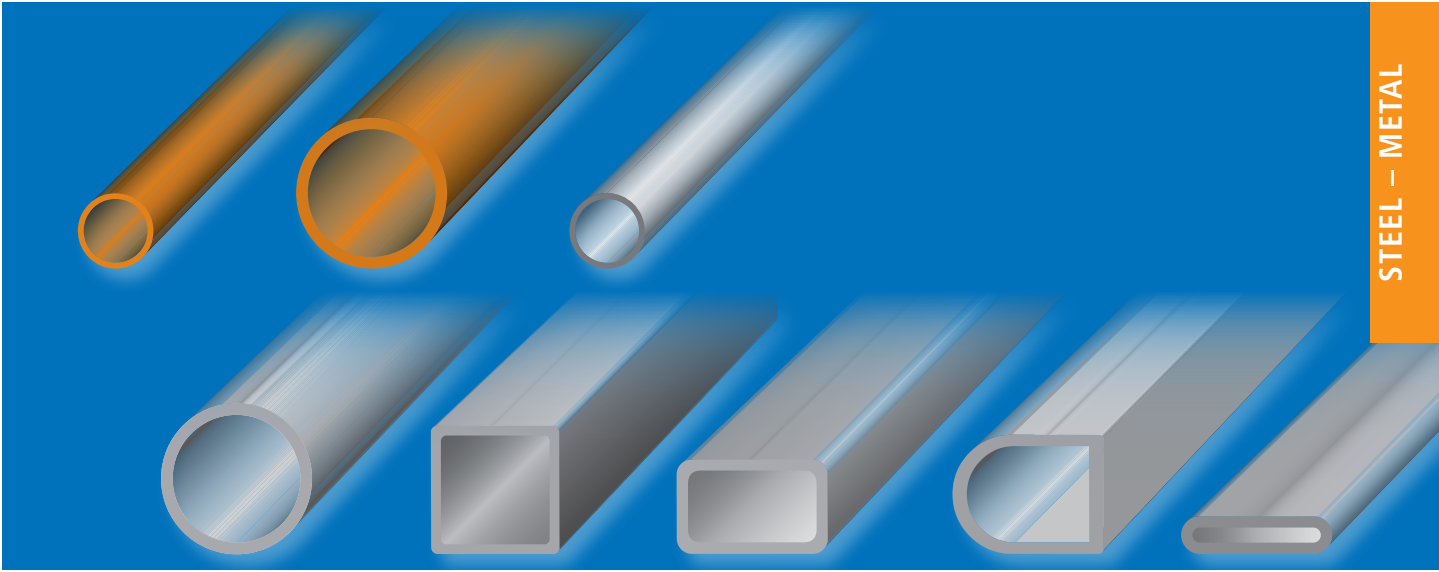
PROFILEMASTER® units are available for use in the hot rolling mill or at the cold end and for final Q.C.

For these products PROFILEMASTER® is the right solution:

- Merchant bar, Standard profiles, Sections, Special Profiles
- Welded Tubes, round or non-round
- Cold formed/rolled Profiles
- Extruded or drawn Profiles







Seamless pipe requires tight specifications for diameter, ovality and shape, especially if for OCTG, API, "High Collapse" or similar specs. ODAC® laser heads and STEELMASTER systems are available for diameters up to 500 mm (20 in.).

With new ODAC® HLF scanners (High-tech Large Field) without dead zone and high accuracy and measuring rate. There are versions available with 1, 2, 3 or 4 axes, static or oscillating or combined. Typical gauge locations are after piercing, intermediate, conveyors, SRM or MPM sizing mills, 2 or 3 roll.

Single axis heads are frequently used in Q.C. stations or in multi NDT lines.

For welded and precision tubes, round and non-round, economic versions for diameter, ovality, side, diagonals etc. are available.

### Key Advantages

- Measuring field up to 550 mm (22 in.) without dead zone
- 1000 measurements/s/axis
- EPM method (pat. pend.) for polygonal or asymmetric shapes.
- Detection of local bulges or flat spots
- Highly accurate and permanent calibration
- Multi-stage protection and auto shutter

### Your Benefits

- Faster start-up, typical OK after 1 billet
- Less scrap
- Higher diameter and ovality precision
- Diameter and centring info for wall thickness control
- Easier threading



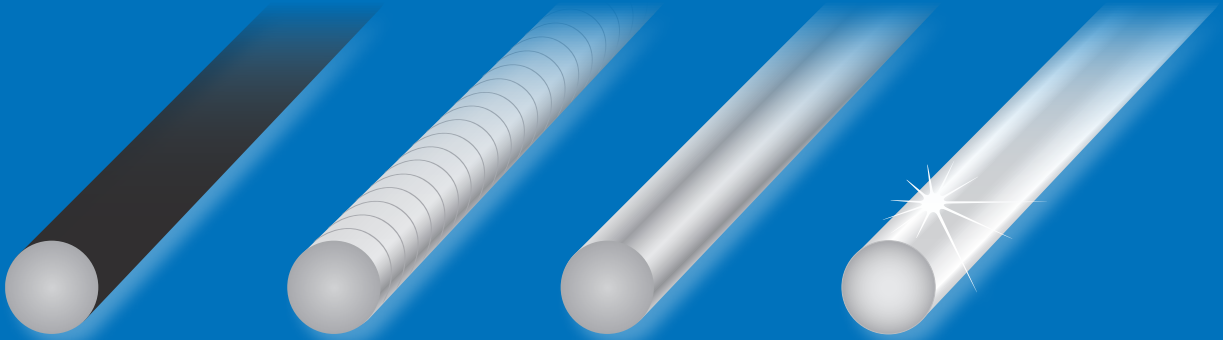
PROFILEMASTER® gauges are the ideal solution, if the complete profile including convex, concave, trapezoidal and radii errors must be detected.

### Key Advantages

- Full coverage of profile
- Dimensions and errors, concave, convex, radius etc.
- Versions from 1 to 300 mm (.04 to 11.8 in.)
- Modular concept, 1 to 6 cameras
- Special version for small precision profiles

### Your Benefits

- Full control of product geometry
- Better process transparency
- Faster start-up, less scrap
- Higher productivity
- Display of shape and dimensions
- Documented quality



#### Key Advantages

- High precision and repeatability, e.g. 0.0005 mm (.00002 in.)
- 1'000 or 2'000 measurements/s/axis
- Calibrated Single Scan CSS
- Combined diameter and shape control
- Well-known robustness and longevity
- Air curtains and other options

#### Your Benefits

- Guaranteed adherence to diameter and ovality specifications
- Early detection of trends, wear etc.
- No more customer complaints
- Increased quality image
- Increased productivity

Cold processed semi products need flawless dimension control before delivery. In particular peeled, rectified or polished bar requires accurate diameter and shape control at high tolerances, e.g. DIN h8.

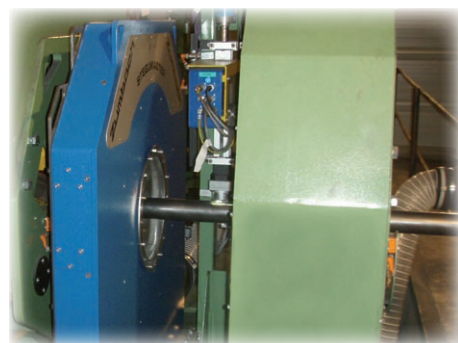
Often the quality data must also be networked with a Q.C. data system. Not only "diameter" is measured, but also "out-of-round" and polygonality.

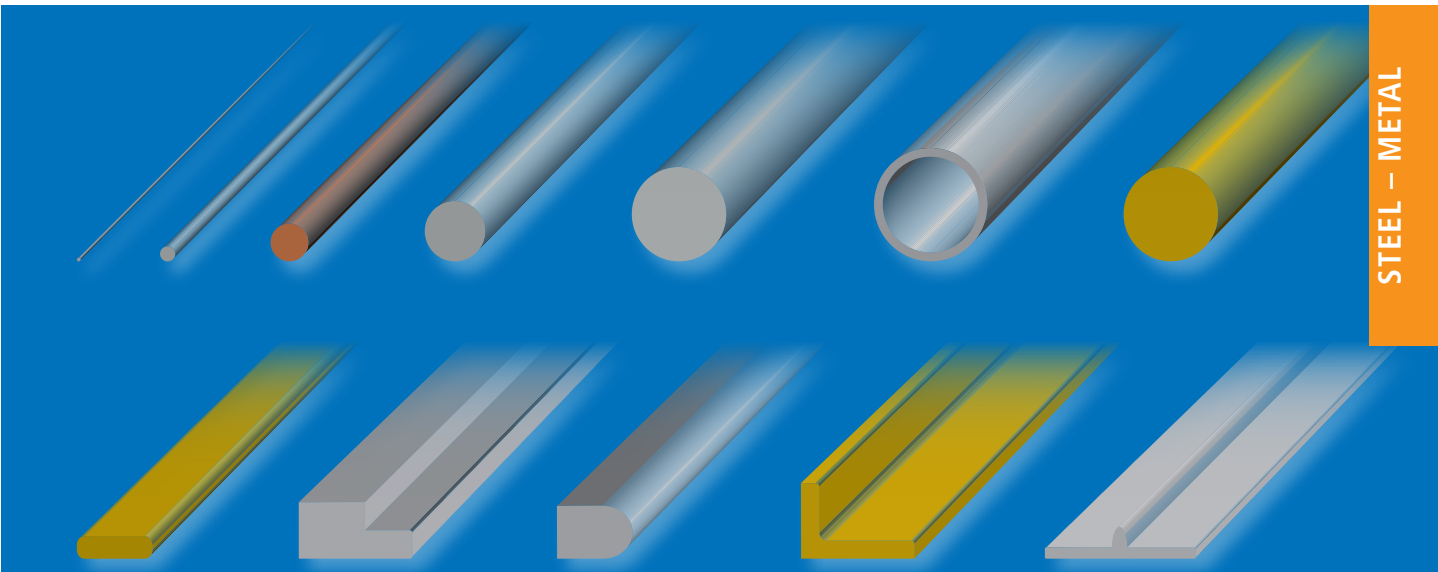
Zumbach offers highly accurate ODAC®/USYS or STEELMASTER systems with up to 6 axes, static or oscillating. Hundreds of systems are in operation worldwide.

Zumbach owns a certified high precision lab, where customer samples can be measured within fractions of a micron and documented for dimensions and shape.

#### Profitable Solutions with ODAC®/USYS systems

- Finishing/Testing lines for black bars
- Peeling
- Centerless grinding
- Cold drawing lines
- Mandrel bar reconditioning
- Q.C. stations, multi test blocks (NDT)





**Wire, round, flat, profiled. Precision Profiles of any kind.  
Cold drawn Bar and Tube.  
Continuous casting/rolling of copper and aluminium rod.**

Most of these products require extremely accurate measurement, while the environment is severe due to vibrations, dust, emulsion, oil etc.

Zumbach developed sensors, protection devices and software which guarantee reliable and precise operation.

For round wire there are thousands of ODAC® laser heads in operation for quality products like steel cord, tungsten wire, magnet wire, medical wire and more.

For flat wire and profiles where thickness and width must be measured, optional devices for sensor orientation are available, since the profile is often too stiff or too sensitive to be guided precisely.

If the complete profile section must be monitored, the high-accuracy PROFILEMASTER® version is the solution.

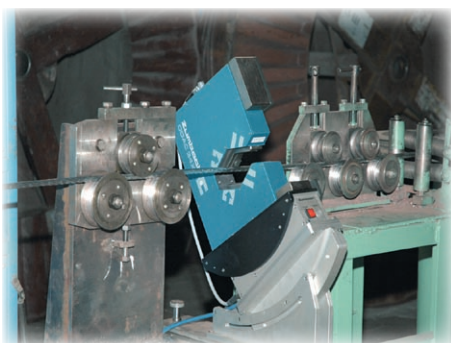
Protective housings, guides, air curtains etc. complete the line.

## Key Advantages

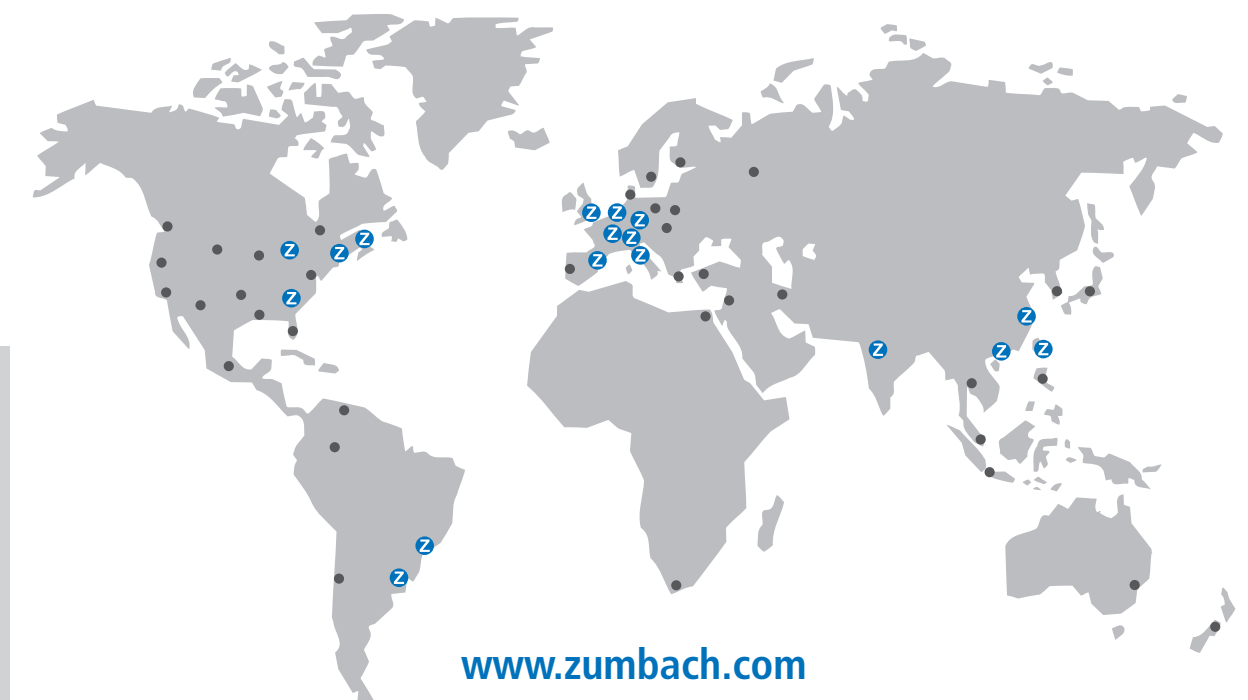
- Accuracy to the 0.1 micron (.000004 in.) fraction
- Diameters as low as 0.015 mm (.006 in.)
- MULTILINE system with central processing
- Thickness and width measurement, also if torsion is present
- Any profile type and shape
- Immune to the environment

## Your Benefits

- Even smallest dimensions are under control
- Guaranteed quality, no customer complaints
- Continuous control and data recording
- Increased productivity
- Closed loop process feedback possible



# Worldwide Sales and Service Network



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