



# **Innovative Cold Forming Technologies in the field of Thread- and Profile rolling, Spline rolling and Ring rolling**

**Martin Bellin**

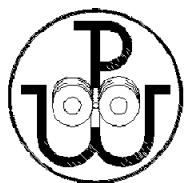
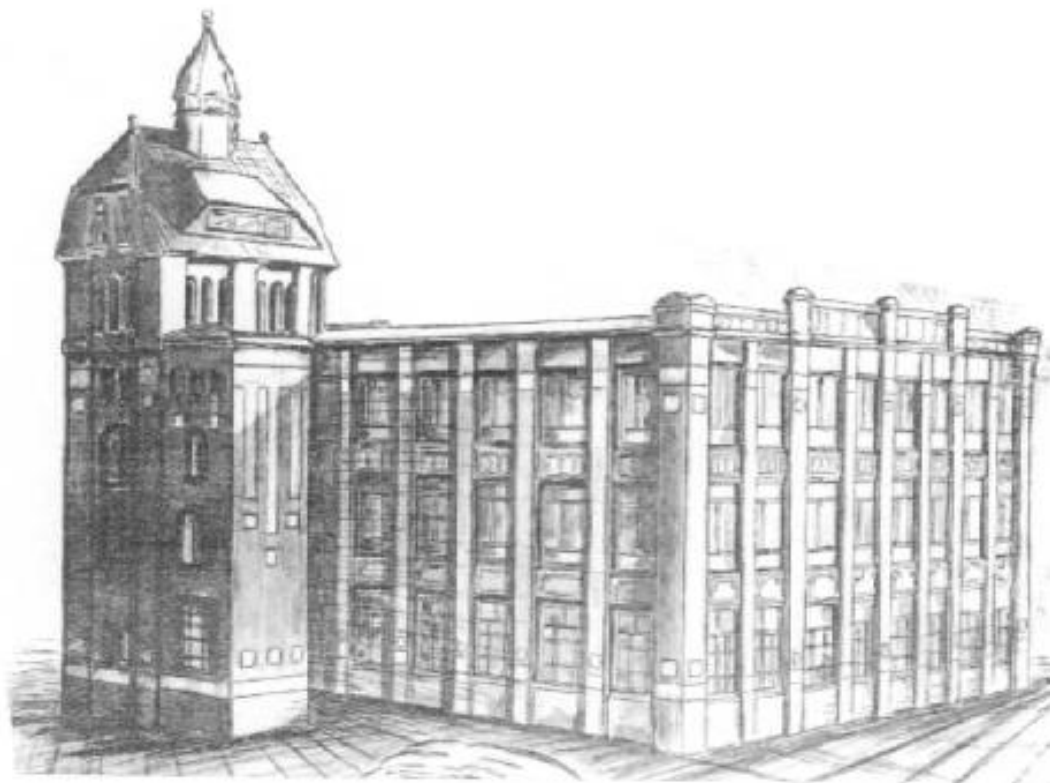
**VDW Symposium 2026**

# PROFIROLL



Die deliveries: approx. 60.000 per year  
Machine deliveries: approx. 75 per year

# HISTORY



1943

1945

1949

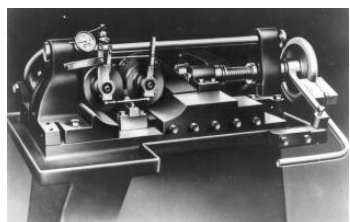
1953

1991

1993

2000

2016



BAD DÜBEN

# PROFIROLL – THE COLD METAL FORMING SPECIALIST



Thread and Profile  
Rolling Technology



Spline Rolling  
Technology



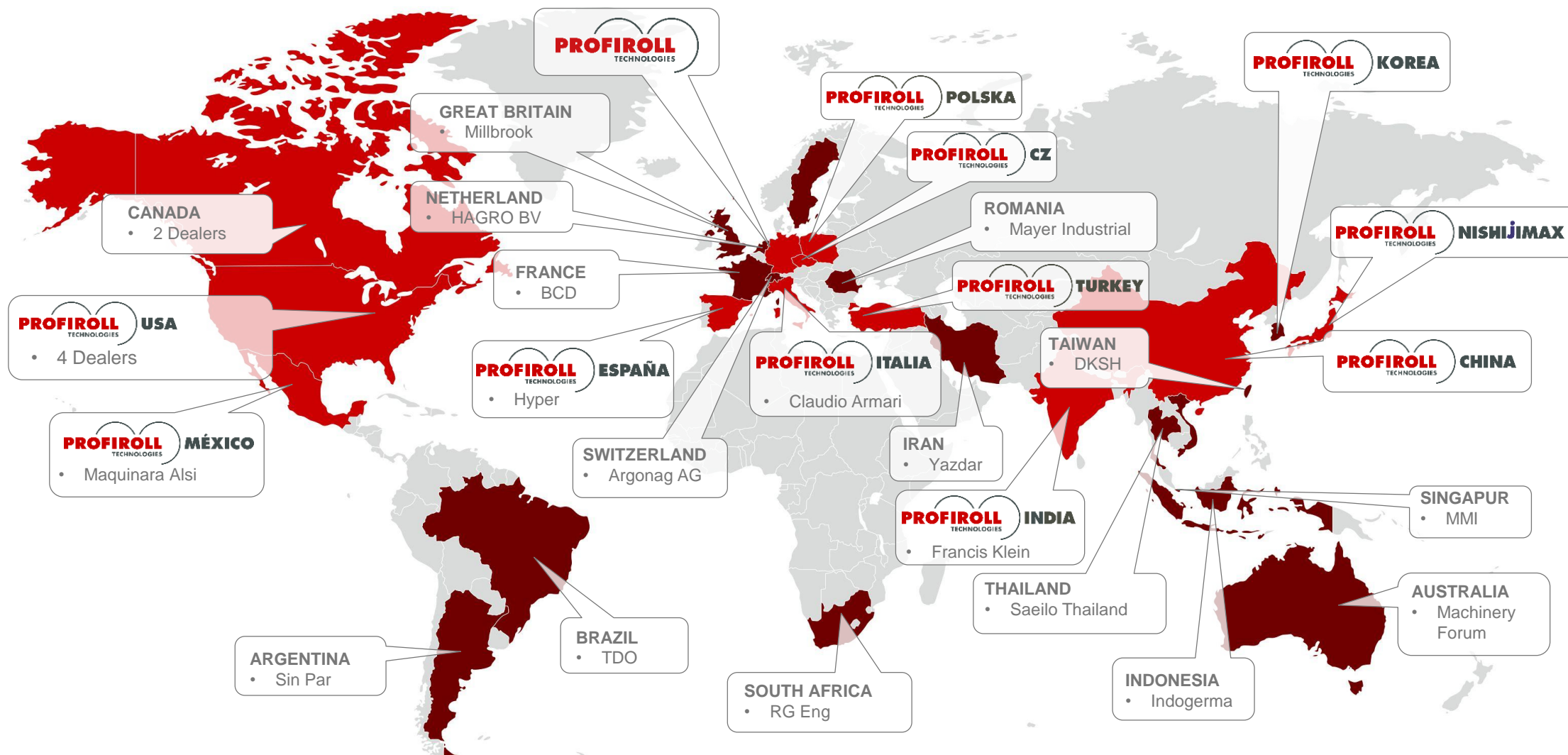
Ring Rolling  
Technology



Rolling Die  
Technology

MACHINE, DIE, PROCESS FROM ONE SOURCE

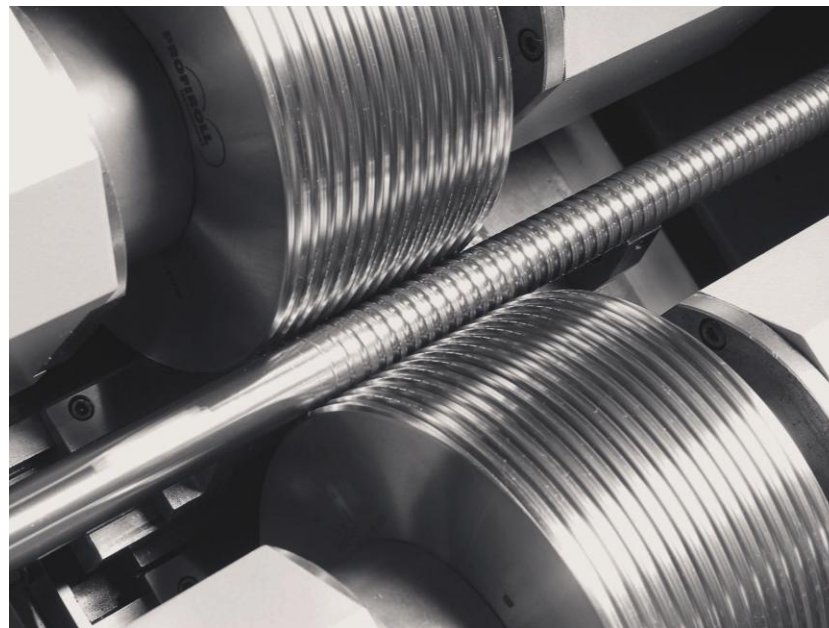
# SALES NETWORKS



# OUR CUSTOMERS - References



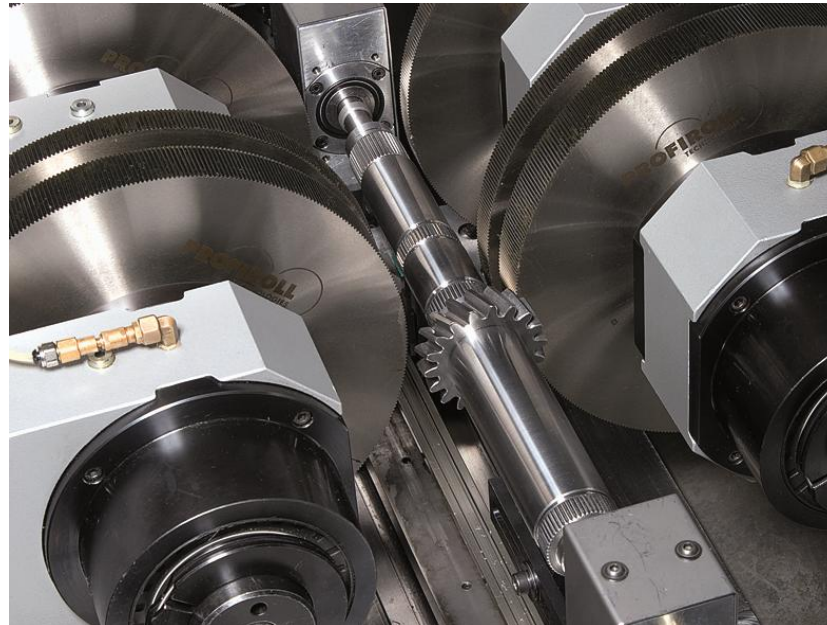
# APPLICATIONS



- All kind of standard threads, metric, acme, UN, withworth
- High precision ball screw profiles
- Worms
- Unsymmetrical profiles

- Grooves
- Serration, knurling and spline profiles
- Bearing rings, cv-cages, shifter sleeves
- Own process development department

# MACHINES



- Big variety of thread and sline rolling machines
- One-, two- and three slide machines
- Rolling force from 10 up 1.000 kN
- Handloaded or fully automated machine systems
- Most modern electromechanical drive system
- Own mechanical, electrical, pneumatical, hydraulical and software design competence

# IN-HOUSE MECHANICAL MANUFACTURING



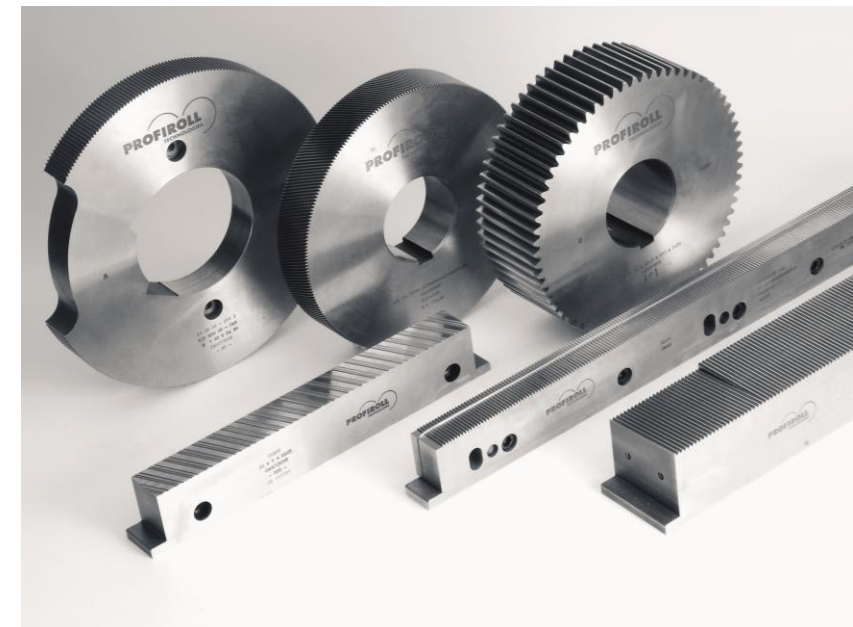
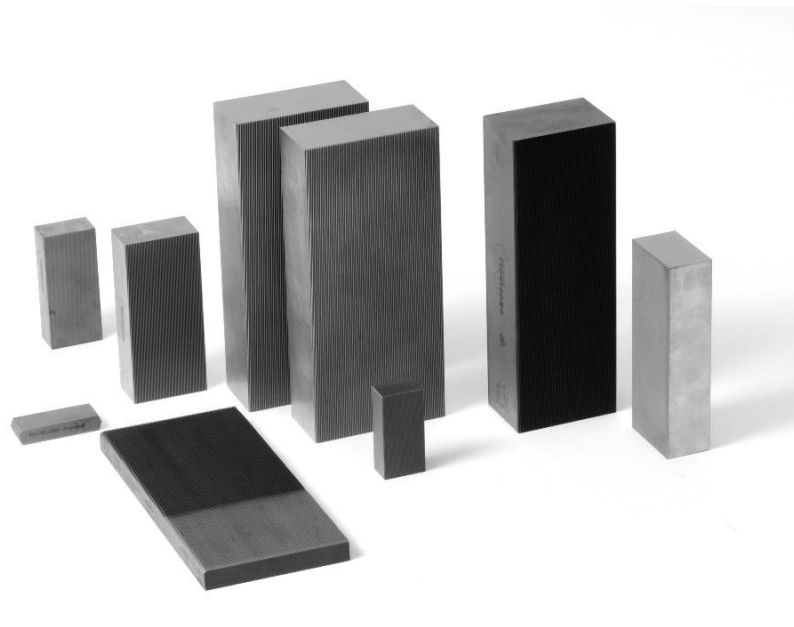
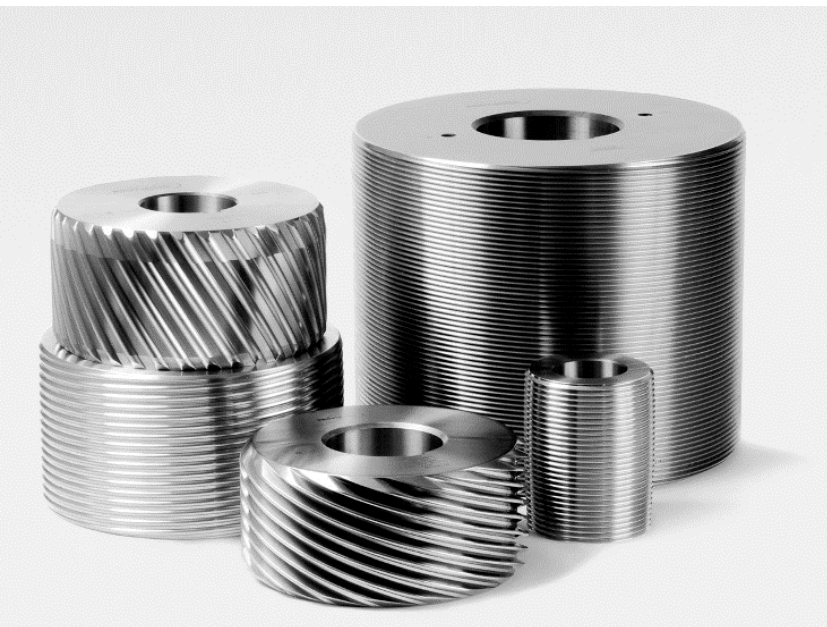
- All soft machining technologies available
- Sawing, turning, milling and drilling technology for parts up to 7000 kg
- High level of Manufacturing depth – vertical integration of production
- Own apprenticeship training centre

# MACHINE ASSEMBLY



- modern temperature stable assembly hall for precision machines
- Mechanical, electrical, pneumatical, hydraulical skills
- Own wiring of machine operator panels
- Production metrology labs for machine capability test

# DIES



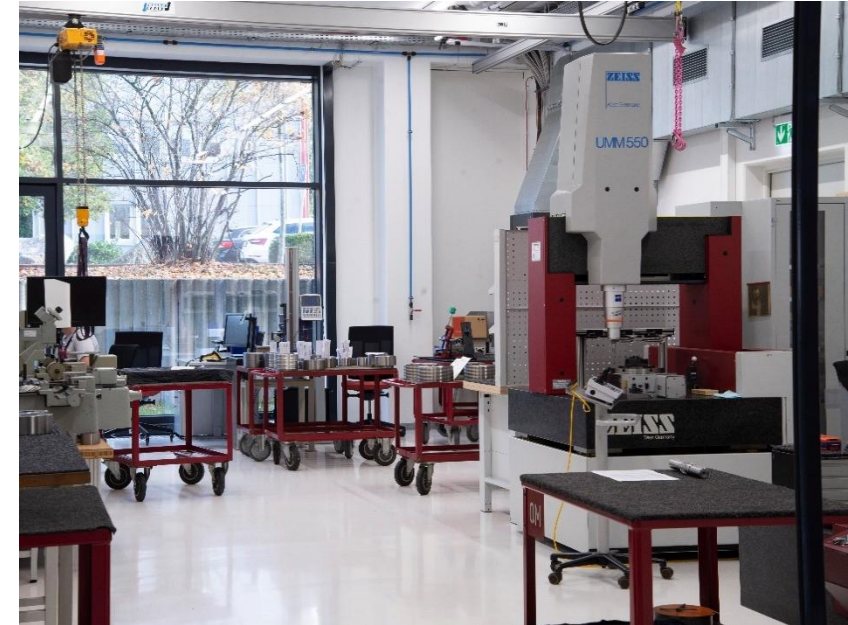
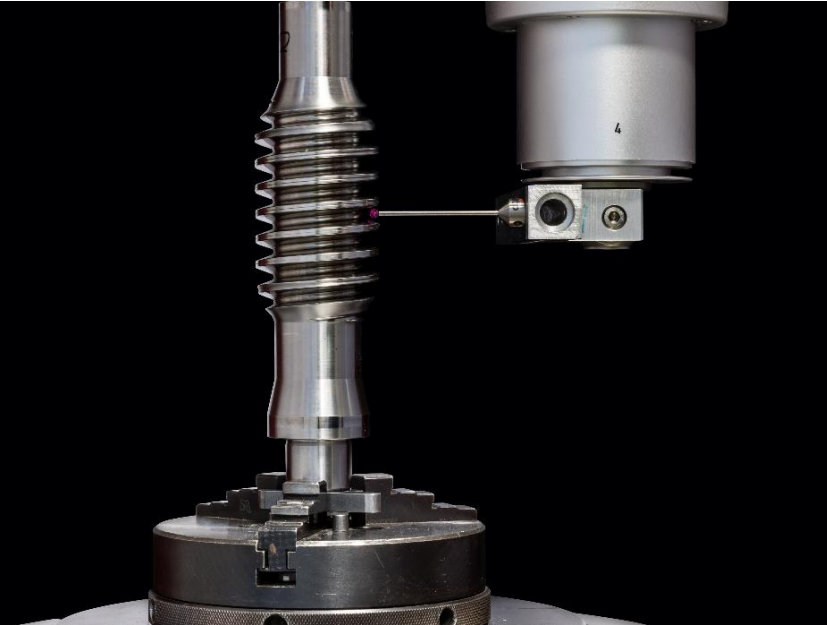
- All kind of thread rolling dies for threads, worms, splines special profiles
- Complete manufacturing process chain in house, state of the art grinding technology including heat treatment
- Own design competence
- Own test center

# STATE OF THE ART GRINDING SHOP

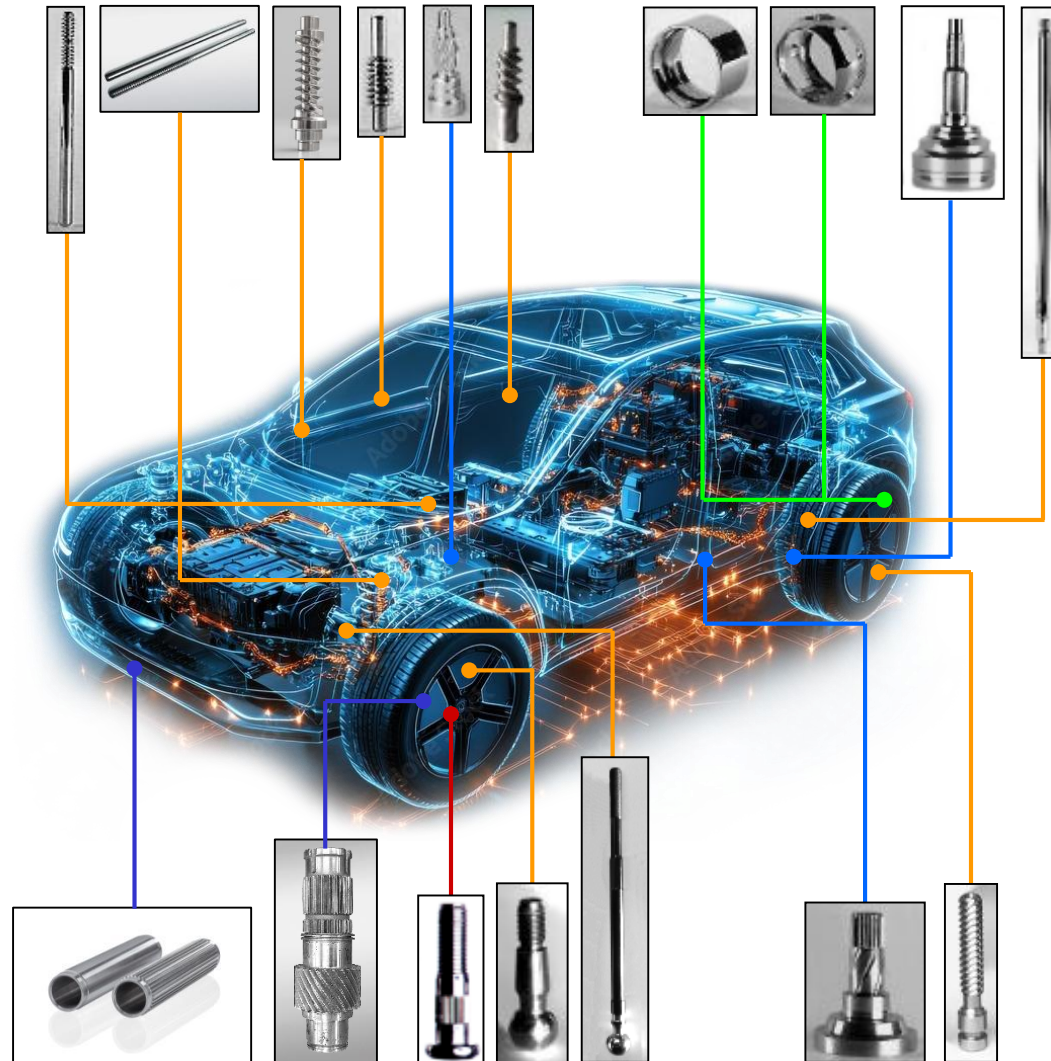


- Grinding shop with best environmental installations
- Central cooling system
- Central filtering system

# QUALITY CHECK

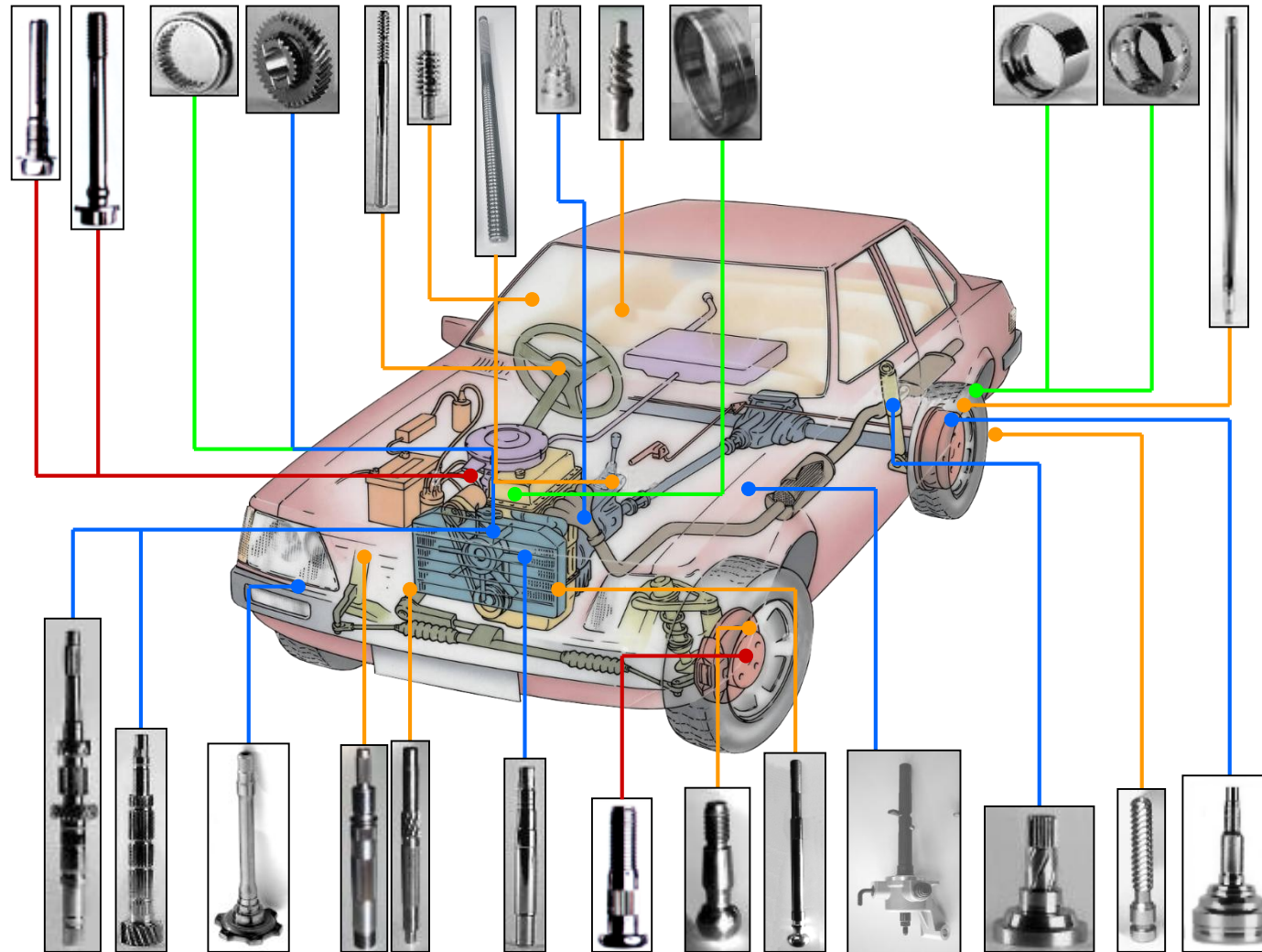


# Automotive Application: E-Mobility



Machine technique:  
ROLLEX HP / L HP  
2-PR 15...40 CNC/AC  
PRX 36E CNC  
URWA 100...250

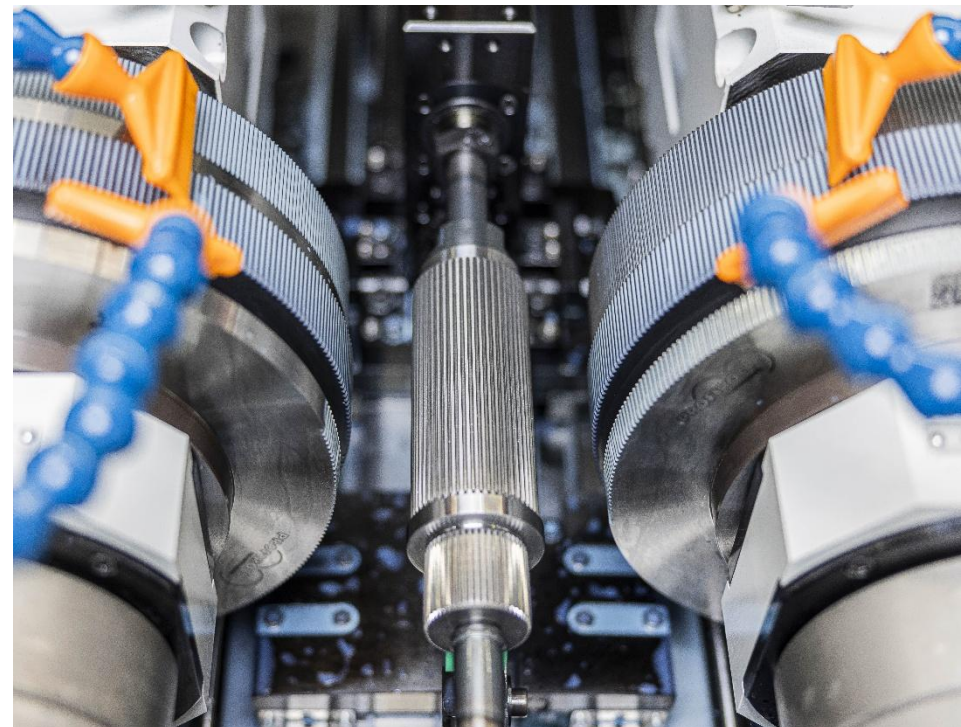
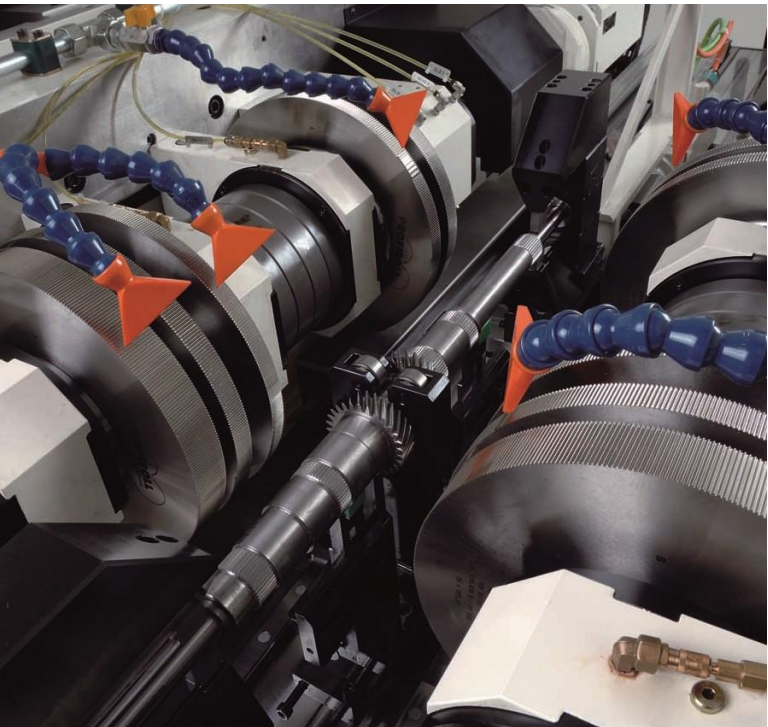
# Automotive Application



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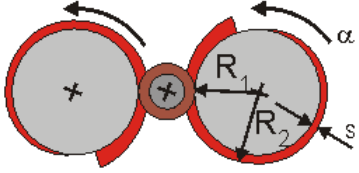
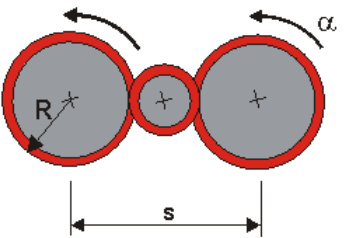
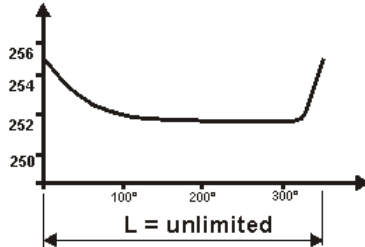
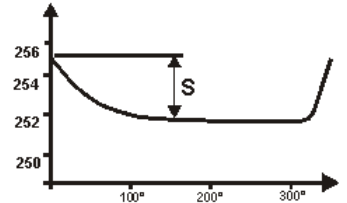
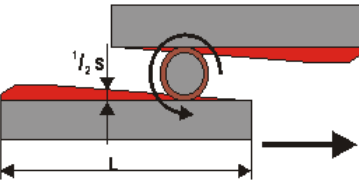
# SPLINE ROLLING

## Drivetrain & Transmission Components



- World leader in quality and flexibility

# INNOVATIVE MACHINE SOLUTIONS

Principle	Die contact length L	Penetration S (Feed rate)
<p><b>Incremental die</b></p>  <p><math>U = 2 \cdot \pi \cdot R</math>   <math>S = 2 \cdot (R_2 - R_1)</math></p>	<p><b>L = fixed</b> limited due to die length</p>	<p><b>S = fixed</b> limited due to die construction</p>
<p><b>Rollex</b></p> 	<p><b>Flexible CNC-axis</b></p>  <p><math>L = \text{unlimited}</math></p>	<p><b>flexible CNC-axis</b></p> 
<p><b>Flat die (Rack)</b></p> 	<p><b>L = fixed</b> limited due to die length</p>	<p><b>S = fixed</b> limited due to die construction</p>

- Rolling Method Comparison

# THREAD ROLLING

## Screws and Bolts



- From M1 to M160
- Machines from 10 kN to 1200 kN rolling force

# THREAD AND PROFILE ROLLING

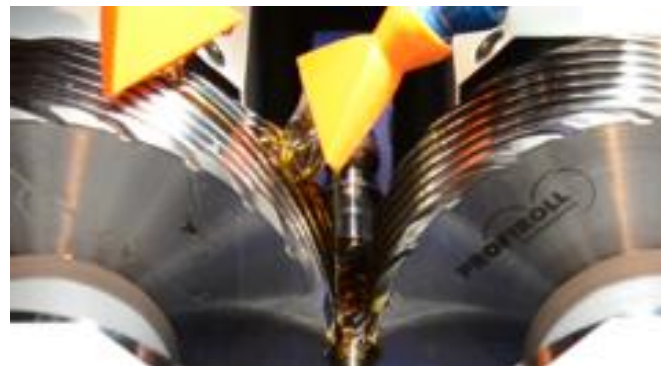
## Profile Rolling Technology for R-EPS



- Replacement of conventional grinding
- within 30 sec cycle time in highest ball screw quality

# Burnishing Rolling

## Finish Burnishing Rolling (FBR) for EPS worms



- Best possible surface quality for e-mobility
- 12 sec cycle time

# COOPERATION - PARTNERSHIP

**Leistritz**  
PRODUCTION TECHNOLOGY

**PROFIROLL**  
TECHNOLOGIES



**Leistritz**  
PRODUCTION TECHNOLOGY

LWN 100 – Whirling Machine

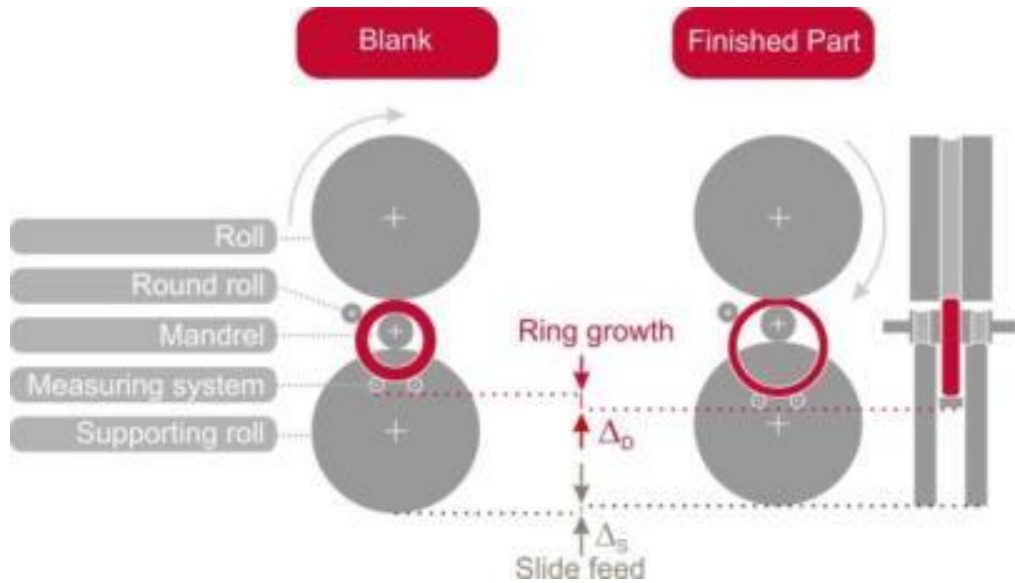
Workpiece range:

- Outside dia. 8 – 30mm
- Length: max. 300 mm



# RING ROLLING

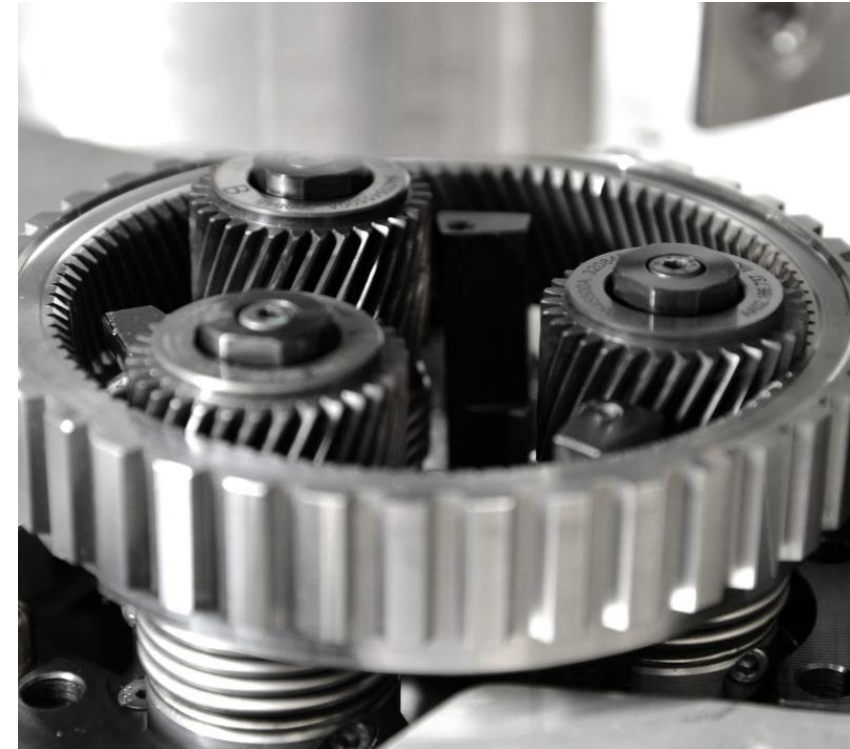
## Ring Rolling for CV cages Drivetrain Components



- Replacement of conventional turning
- From precision tube parts to CV cage within 8s

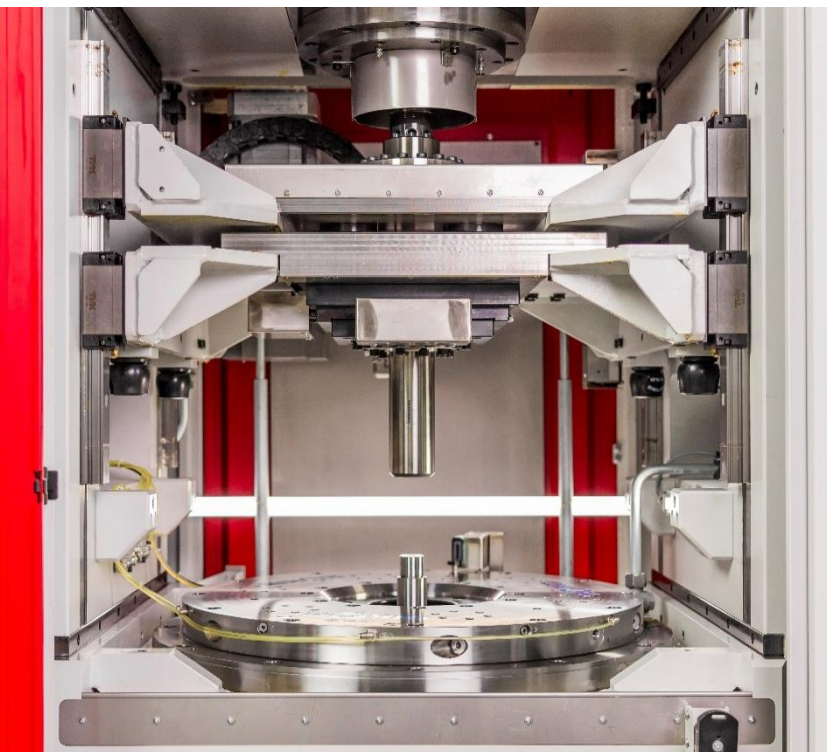
# INTERNAL BEAR BURNISHING ROLLING

## Rolling of pre-broached internal gears



- burnishing, no forming of whole structure
- Processing broached surfaces
- Roughness peaks are planed
- Improved lifetime of broaching tool of pre-process due to acceptable worse pre-condition

# AXIAL SPLINE FORMING

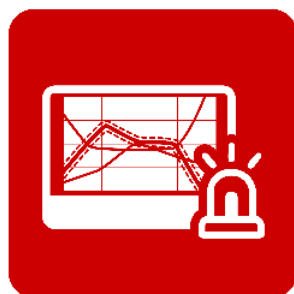


- Compact vertical machine design
- The combination of tool-based forming and NC-controlled kinematics enables internal splines to be formed into components

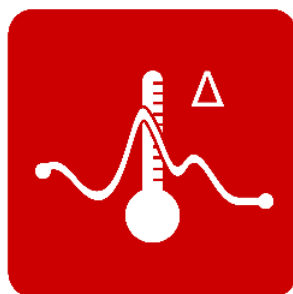
# INTELLIGENT PROCESS FEATURES



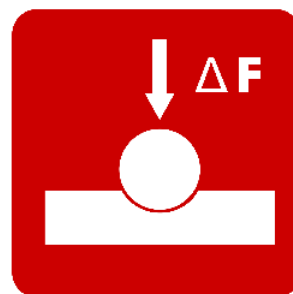
## e ROLLING



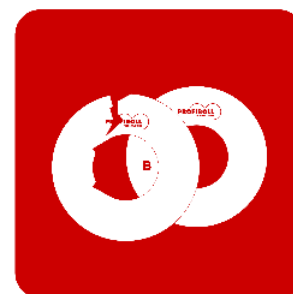
**Process  
Monitoring**



**Temperature  
Compensation**



**Hardness  
Compensation**



**Die  
Monitoring**



**Data Matrix  
Code**



**Data  
Tracking**



THANK YOU

