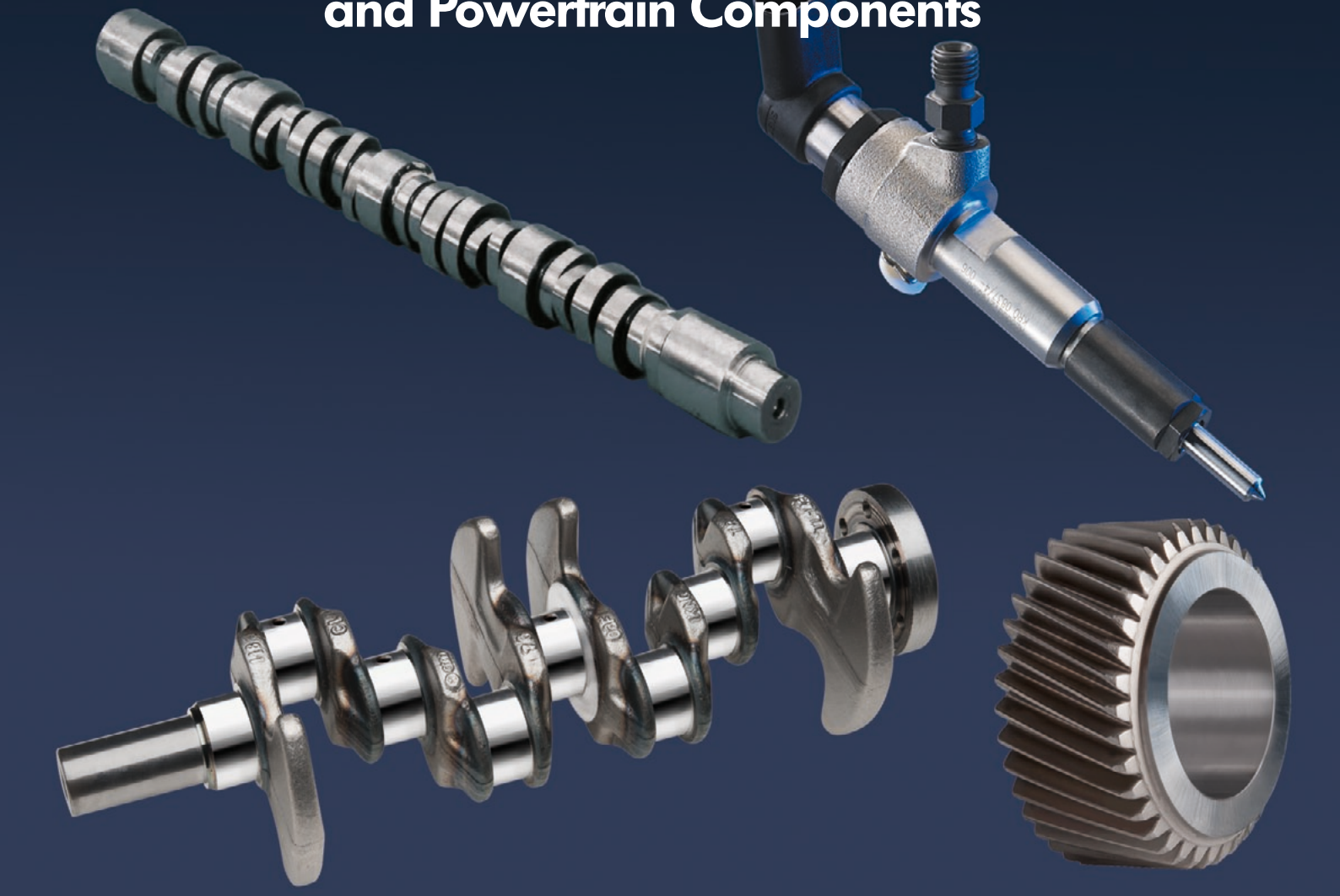
A Service of Thielenhaus Technologies

SUPERFINISH

TECHNICAL SURFACES

Surface & Form Optimization for High Performance Engine and Powertrain Components



Unlock Your Horsepower !

Gain performance from

- crankshafts
- camshafts
- valve seats
- wheel bearings
- transmission gears
- tappets, etc.

UNLOCK YOUR HORSEPOWER

With new rules regulating everything from tire size to engine design, racing teams are struggling to find new ways to improve vehicle performance. Oftentimes this involves time-consuming rebuilds and significant costs incurred for tiny gains. Via SUPERFINISH Technical Surfaces, surface technology leader Thielenhaus Technologies offers racing teams and manufacturers of racing engine and powertrain systems a simple, fast and convenient service to free up extra horsepower that would otherwise remain unused.

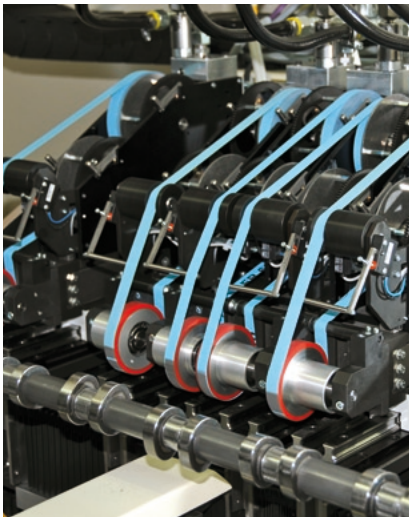
SUPERFINISH Technical Surfaces offers high-precision mechanical finishing, also known as "super-" or "microfinishing", of crankshafts, camshafts, valve seats, wheel bearings, transmission gears, and virtually all other engine and powertrain parts. Our MICROFINISH technology optimizes component surfaces (Rz, Rvk) and geometric values such as waviness, cylindricity, flatness, parallelism, etc., ensuring tightest tolerances and reducing variations to less than 1 micron. Our technology is widely used by leading companies in the automotive, roller bearing, aerospace and medical industries to reduce friction between moving parts and increase load bearing capacity.

REDUCING STATIC FRICTION AND STABILIZING ENGINE PERFORMANCE

Want to free up those 5-10 extra horsepower? Via our machining process static friction in your engine and powertrain system is reduced ensuring a more consistent performance. Not only do engines run faster and more smoothly, but they will do so over a longer period of time. This is achieved via the abrasive MICROFINISH process, which employs finishing stone or tape to:

- remove microscopic peaks on the component surface and generation of a surface structure for optimal tribology
- remove the amorphous surface layer (soft skin) and generation of positive residual compressive stress for significantly higher load bearing capacity
- optimize geometry such as waviness, cylindricity, parallelism, flatness, etc. (see charts on opposing page) for improved performance and vibration reduction

Microfinishing of camshaft journals and cams

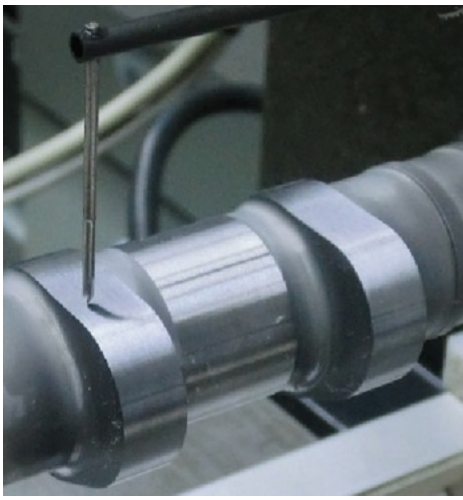


The combination of surface and form improvement results in a smoother and simultaneously harder surface with an increased load bearing capacity. Consequently, friction as well as wear and tear is reduced, so that engine performance is maximized and performance reductions take place more gradually.

In comparison to electrochemical polishing or REM Superfinishing, the mechanical Microfinish process offers numerous advantages: in addition to being fast (6-90 seconds, depending on the component), the process simultaneously optimizes component form, ensuring smooth contact between interacting parts. Microfinish also provides superior control over the amount of material removed and the resulting surface structure. It enables, for example, the generation of microscopic grooves on crankshaft journals for improved oil retention.

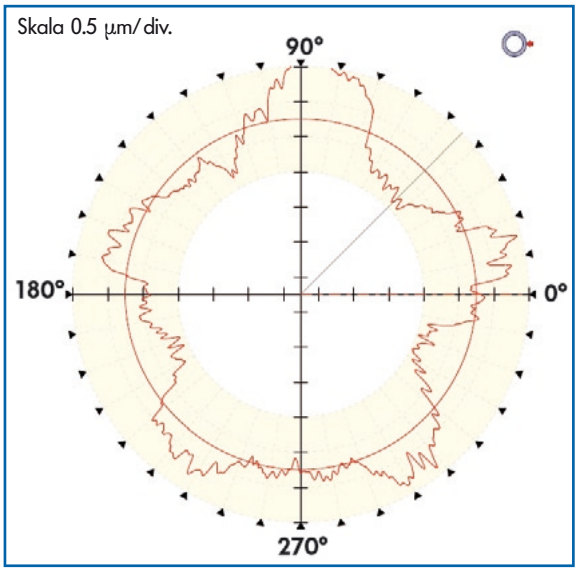
WORKPIECE GEOMETRY

- cylindrical
- conical
- crowned
- spherical

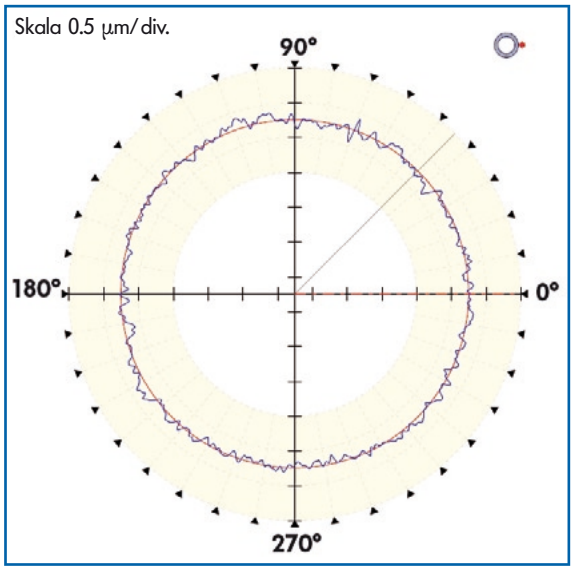


SURFACE QUALITIES

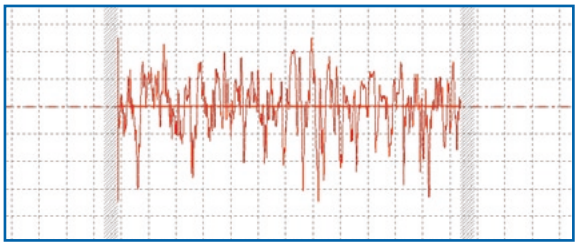
- Roundness
- Waviness
- Roughness
- Evenness
- Cylindricity
- Parallelism



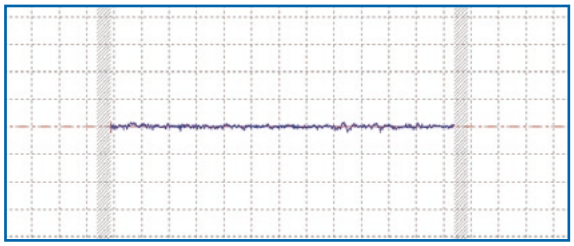
BEFORE MICROFINISH
RONt 1.8 µm



AFTER MICROFINISH
RONt 0.35 µm



BEFORE MICROFINISH
Rz ~2.0 µm
Tp < 20 % Cref = 5 %



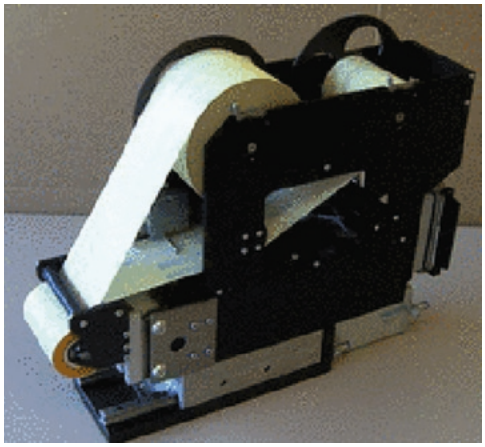
AFTER MICROFINISH
Rz 0.3 µm
Tp < 99 % Cref = 5 %

WE COVER YOUR NEEDS

Thielenhaus Technologies is a globally active company with over 60 years of experience as a supplier of high-tech, extreme precision machining solutions for industry. Since 1962, we have accumulated more than 450 patents in the field of surface finishing technology. Our time-proven MICROFINISH process is widely used among leading companies in the automotive, roller bearing, aerospace, and medical industries to reduce friction, increase load bearing capacity and improve component life span. Whether you are working on prototype components for your new race engine or require high-performance surfaces for your annual output of 20,000 camshafts, our services and products are sure to cover your needs.

SUPERFINISH TECHNICAL SURFACES INCLUDES:

- Best technology and top results: as a leader in our field and ISO 9001 certified company we guarantee use of the best technology and results of the highest quality. As an option, we can provide detailed statistical evaluations of the results.
- Flexibility: with a machine park and staff dedicated to subcontracting, we are extremely flexible in terms of quantity – from single components to 100,000 parts per year. Our machines are capable of microfinishing not only a variety of components and surface types but also a variety of materials such as metals (including titanium), ceramics and carbides.
- Fast service: we can ship out your finished components the same day they arrive. Inquire about our Same-Day Express Service! Subcontracting services are available at our facilities in Wuppertal, Germany (near Cologne) and Detroit, Michigan, USA.
- Discretion: we consider the confidential treatment of our customers' information paramount. All our services take place in our own secure facilities, using our own machines and our own technology.
- Machine-tools, attachments for your own facilities: for teams and manufacturers with the budget and expertise, we offer standard microfinishing devices as well as fully customized machine-tools for mass production.



Superfinishing device

SUPERFINISH
INNOVATION

SAMPLE COMPONENTS

ENGINE

- Crankshaft
- Camshaft
- Connecting rods
- Balancing shafts
- Tappets & roller lifters
- Piston pins
- Intake & exhaust valves
- Push rods

TRANSMISSION

- Gear wheels
- Bearing seats on gear shafts
- Synchronous gear
- Pinion gears
- U-joint / cardan joint

CARRIAGE & STEERING

- Steering shafts
- Shock absorber rods
- Brake discs
- Shim discs
- Ball joint

FUEL INJECTION COMPONENTS

- Injector bodies
- Nozzles
- Sealing seats
- Adapter plates

Please inquire about not listed parts.

CALL OR EMAIL US FOR A FREE CONSULTATION & QUOTE TODAY

Our experienced staff is looking forward to assisting you with your inquiry. Just send us a part description (preferably including a drawing), the quantity of parts and the desired time frame.

CONTACT:

GERMANY

Alexander Wingert – Manager SUPERFINISH Technical Surfaces

Phone: +49 (0) 202 481 291
Fax: +49 (0) 202 450 445
E-Fax: +49 (0) 202 481 5 291
E-Mail: wingert@thielenhaus.com
URL: www.thielenhaus.com
Thielenhaus Technologies GmbH
Schwesterstrasse 50
42285 Wuppertal, Germany

SWITZERLAND

Karl Dörig – Head of Sales

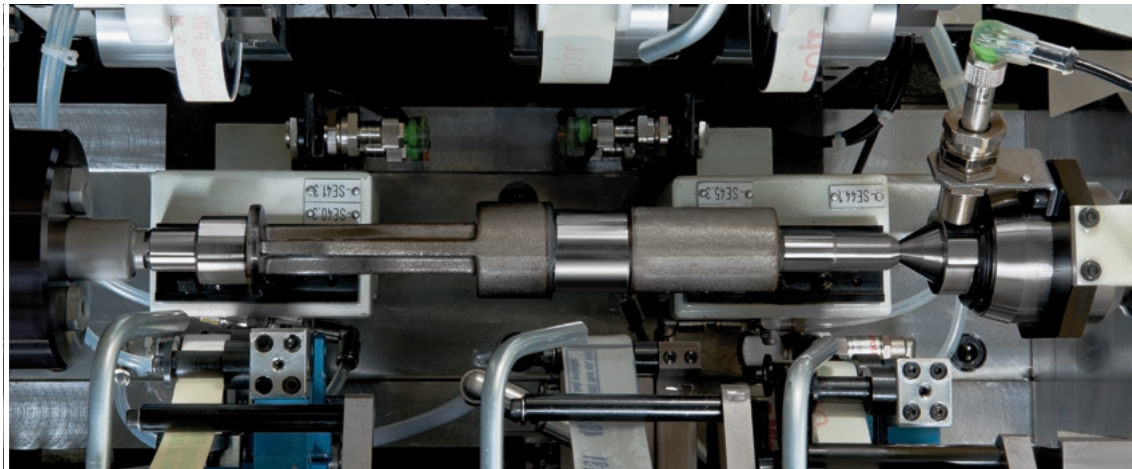
Phone: + 41 (0)52 376 26 20
Fax: +41 (0)52 376 26 19
E-Mail: k.doerig@superfinish.ch
URL: www.superfinish.ch
Superfinish Innovation AG
St. Gallerstr. 52
9548 Matzingen, Switzerland

NORTH AMERICA

David Schrader – Manager Subcontracting North America

Phone: +1 248 347 1628
Fax: +1 248 349 4566
E-Mail: dschrader@thielenhaus.com
URL: www.thielenhaus.com
Thielenhaus Microfinish Inc.
42925 W. 9 Mile Rd
Novi, MI 48375, U.S.A.

SUPERFINISH Technical Surfaces is a service of Thielenhaus Technologies, a global company with 6 locations on three continents.



EXPERIENCIES FROM THE RACE TRACK

"The key advantages of Microfinish are reduced static friction and consistency. After a couple hundred laps at more than 7,000 rpm, components' performance will start to deteriorate. With microfinished components you can not only significantly slow down the rate of performance loss, but also unlock a couple horsepower that you could otherwise not access."

Jeremy Pike

JEREMY PIKE

Hometown	Asheville, North Carolina, U.S.A.
Circuits	NASCAR, United Auto Racing Association (UARA)
Car	Ford Fusion
Engine	Ford Racing Spec, 460 HP, 347 in3 (5.0 l)
Average rpm range during race	4,000 – 7,500
Max. track speed	145 mph (233 kmh)
Acceleration 0 – 60 mph (approx. 0 – 100 kmh)	< 3.7 seconds

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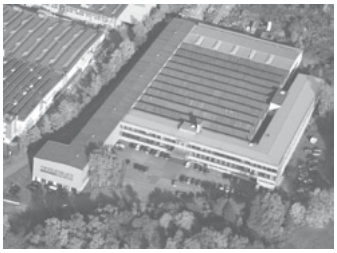
Thielenhaus Microfinish Corporation

42925 W. Nine Mile Road
Novi, MI 48375, U.S.A.
Phone: +1 (2 48) 3 49-94 50
Fax: +1 (2 48) 3 49-94 57
info@thielenhaus.com
www.thielenhaus.com



Thielenhaus Technologies GmbH

Schwesterstraße 50
42285 Wuppertal, Germany
Phone: +49 (0)2 02 - 4 81-0
Fax: +49 (0)2 02 - 45 04 45
info@thielenhaus.com
www.thielenhaus.com

Superfinish Innovation AG

St. Gallerstraße 52
CH-9548 Matzingen, Switzerland
Phone: +41 (0) 5 23 76 26 20
Fax: +41 (0) 5 23 76 26 19
si-ag@bluewin.ch
www.superfinish.ch

Thielenhaus Machinery (Shanghai) Co., Ltd
Jiangtian Dong Lu 212, building 7
Songjiang Industrial Zone
201613 Shanghai, P. R. China
Phone: +86 (21) 67 75 31 57
Fax: +86 (21) 33 52 87 67
info@thielenhaus.cn
www.thielenhaus.cn

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