PRÄWEMA Gear Honing SynchroFine®
PRÄWEMA Antriebstechnik GmbH

In Eschwege in northern Hesse, PRÄWEMA Antriebstechnik GmbH produces and develops machines for machining and manufacturing gearing. The focus is on gear wheels, synchronous parts and shafts, which ensure the correct torque in vehicle gearboxes.

The milling of latching grooves, backing and gearing is just as much part of the PRÄWEMA technology portfolio as taper cutting and gear grinding.

PRÄWEMA developed gear honing technology until it was ready to enter the market competitively, resulting in more than 500 machines sold to date by the current market and technology leader.

All over the world, the automotive industry in particular relies on high-precision machine tools made by PRÄWEMA.

DVS TECHNOLOGY GROUP

The DVS TECHNOLOGY GROUP is made up of experienced machining companies focussing on the turning, gear cutting and grinding technologies. The DVS TECHNOLOGY GROUP has more than 1,000 employees worldwide and is one of the leading system suppliers for machines, tools and production solutions for the machining of vehicle powertrain components before and after hardening.

DVS Machine Tools & Automation: Manufactures and sells high-precision machine tools, automation equipment and the associated services.

DVS Tools & Components: Develops, manufactures and sells customised machine components, tools and abrasives.

DVS Production: Series production of components for passenger cars and commercial vehicles using DVS machine tools.

DVS International Sales & Service: Local DVS Contact for Sales and Service on International Markets.

The Technology

Over the past few years, gear honing has prevailed as an economic and high-performance hard finishing process for manufacturing gear wheels or gear shafts. Honed gearing surfaces make a decisive contribution to lower noise levels and reduced component wear in modern vehicle gearboxes. Thanks to consistent advanced development at PRÄWEMA, the technology has become established as standard in large areas of the international vehicle industry.

Gear Cutting – Hardening – PräwemaHoning®

- High economic effects due to a short process
- State of the art gear quality
- Processed results are independent of premachining quality
- Stable process combined with a short cycle time
- Universal application for spur- and helical gears, for shafts and for gears
- Significantly reduced tool costs

- Honing is bias free; bias or no bias, your choice
- High tensile strength on surface avoids pitting
- No danger of surface burn
- Noise-reducing micro structure
- Machining of workpieces with small clearance
The Extraordinary

VarioCrossHoning
A specially developed oscillation method during the honing process enables surface roughness to be reduced even further during “VarioCrossHoning”, resulting in a further increase in the surface quality of geared components. This innovation – through which PRAWEMA is setting a new quality benchmark for geared surfaces once again – allows gearbox manufacturers to further minimise friction losses in gear pairs. In addition, there is a less intensive load on the geared gearbox components, which in turn increases their service life.

VarioSpeedDressing®
The latest generation of PRAWEMA SynchroFine® gear honing machines can be optionally equipped with so-called VSD technology. “VSD” stands for VarioSpeedDressing®, a dressing process during which only the front, completely defined cutting edge of the dressing tool engages with the honing ring.

Compared with a dressing process using conventional diamond dressing gear wheels, the new VSD technology achieves unrivalled flexibility in profile and flank line.

Smart Honing:
In order to shorten the cycle time, the allowance is measured by checking the axis-centre distance on the raw part before machining. Depending on the allowance, the rapid feed is adapted in order to avoid inefficient machining paths.
The cycle times: 1-spindle machine (2-spindle machine)
The Build-conceptions

The single-spindle machine
The application of the ´pick­up´ machine design provi­des extremely straightforward solutions for the auto­mation. The workpieces as well as the dressing tools are loaded and unloaded by the workpiece spindle.

The twin-spindle machine
Extremely short cycle times have been already shown with the standard SynchroFine. For decades Präwema has proven in the production of machines with two or more spindles. Based on this experience the PräwemaHoning® can be used on the twin spindle SynchroFine as well. This leads to auxiliary time being reduced to 3 sec.

The automation
A range of various types of automation for the feeding of workpieces into the machine can be provided. The type of auto­mation can be selected by the customer according to the required capacity and the availability of space for the installation. The connection of external robots or conveyor systems can be done without any problems.

The rollchecker
- Checking of overstock material on raw part
- Checking of ball size before and after the machining (selectable)
- Detection of error on raw part (nicks and runout)
- Screening and storing of the data of all raw parts
The Quality

<table>
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<tr>
<th>Raw part</th>
<th>Finished part</th>
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**Gear Data**

- No. of teeth: 24
- Module: 2.45
- Pressure angle: 21°
- Helix angle: -24°
- Stock removal per flank: 50 - 60 µm
- Dressing cycle: > 500 parts
- Cutting tool: Ceramics

**DVS Tooling - Tool Solutions & Technology Support for PRÄWEMA Gear Honing**

With original tool solutions and global technology support for PRÄWEMA gear honing, DVS TOOLING GmbH – like PRÄWEMA a member of the DVS TECHNOLOGY GROUP – offers decisive added value for manufacturers of gearbox components.

**Global technology support**

DVS Tooling offers a range of training opportunities for users of PRÄWEMA gear honing machines.

- For machine operators: tailor-made operator training with a focus on practical relevance
- For production planners & plant managers: seminars on the subjects of process optimisation and technology development

**ORIGINAL tool. ORIGINAL performance.**

**PRÄWEMA ORIGINAL honing rings from DVS TOOLING**

The honing tools of the PRAWEMA ORIGINAL series guarantee stable processes and long service lives. Honing rings with preliminary gearing are delivered with a gearing quality which is significantly closer to the required series standard quality than comparable honing rings from other suppliers. In addition, the geared machining zone of a PRAWEMA ORIGINAL honing ring is enclosed by a second so-called damping zone which absorbs undesirable vibrations.

**Precise dressing with the VarioSpeedDresser®**

VSD dressers, also known as VarioSpeedDressers® are manufactured at DVS TOOLING using the specially developed “DVS LaserCut” finishing method. This method produces a homogeneous structure of the cutting edge surface on the dresser. The result is an extremely high surface quality which is transferred to the honing ring during the dressing process and thus finally to the workpiece.

Find out more at: www.dvs-tooling.de
Mitglieder der DVS TECHNOLOGY GROUP
Members of the DVS TECHNOLOGY GROUP

DVS MACHINE TOOLS & AUTOMATION

BUDERUS Schleiftechnik GmbH | www.buderus-schleiftechnik.de
Innenrundschleifen – Außenrundschleifen – Gewindeschleifen – Bohrungshonen – Hartdrehen
I.D. grinding – O.D. grinding – Thread grinding – Bore honing – Hard turning

DISKUS WERKE Schleiftechnik GmbH | www.diskus-werke.de
Planseiten-Schleifen – Doppel-Planseiten-Schleifen – Sonderbearbeitung
Face grinding – Double face grinding – Special machining

DVS Universal Grinding GmbH | www.dvs-universal-grinding.de
Kombinierte Hartfeinbearbeitung für Klein- und Mittelserien
Combined Hardfine Machining for small and medium size batches

PITTLER T&S GmbH | www.pittler.de
Vertikal-Drehbearbeitungszentren & Pick-up-Systeme – Verzahnungszentren
Vertical turning centers and Pick-up systems – Gear cutting centers

PRAEWEMA Antriebstechnik GmbH | www.praewema.de
Verzahnungshonen/-schleifen – Verzahnungsfräsen – Anspitz/Hinterlegungsfräsen
Internal and External Gear honing – Gear grinding – Hobbing/Fly-cutting – Chamfering

WMS Werkzeugmaschinenbau Sinsheim GmbH | www.wms-sinsheim.de
Service-Dienstleistungen – Generalüberholungen – Reparatur von Baugruppen
Maintenance – Machine Retrofit – Repairs

WMZ Werkzeugmaschinenbau Ziegenhain GmbH | www.wmz-gmbh.de
Dreh- & Kombinationsbearbeitung wellenförmiger Bauteile – Motorspindeln
Turning & Combined machining of shafts – Motor spindles

DVS TOOLS & COMPONENTS

DVS TOOLING GmbH | www.dvs-tooling.de
Werkzeugsösungen und Technologieaufbau für das PRAEWEMA Verzahnungshonen
Tool solutions and technology support for PRAEWEMA gear honing

NAXOS-DISKUS Schleifmittelwerke GmbH | www.naxos-diskus.de
Konventionelle Schleifwerkzeuge – CBN & Diamantwerkzeuge
Conventional grinding tools – CBN & Diamond tools

DVS PRODUCTION

DVS Production GmbH | www.dvs-production.de
DVS Technologien in der Serienfertigung für PKW-Komponenten
DVS Technologies in mass production for passenger car components

DVS Production South GmbH | www.dvs-production-south.de
DVS Technologien in der Serienfertigung für Nutzfahrzeug-Komponenten
DVS Technologies in mass production for commercial vehicle components

DVS INTERNATIONAL SALES & SERVICE

DVS Technology America, Inc. | www.dvs-technology.com
DVS Sales & Service in USA, Canada & Mexico

DVS Technology (Shenyang) Co., Ltd. | www.dvs-technology.com
DVS Sales & Service in China

DVS Technology Europe GmbH | www.dvs-technology.com
DVS Sales & Service in Europe

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