SynchroForm V
The modular machine for geared drive components
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.

Gear cutting, pointing and shifterstop milling is just as much part of the PRÄWEMA technology portfolio as pocket groove and castle teeth milling.

PRÄWEMA developed gear honing technology until it was ready to enter the market competitively, resulting in more than 700 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 1,300 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 modular design of the Synchro-Form V machine allows it to be adapted for the production of geared drive components. Set up as a single or twin spindle machine, it excels in series production with extremely profitable cycle times and high-precision machining results. Efficient complete machining in all areas of gearing in soft and hard fine machining can be achieved using the various technology modules.

**Your advantage**
- Versatile range of technologies for precise soft and hard fine machining
- Equipped with either one or two workpiece spindles to match unit requirements
- Efficient complete gearing machining of drive components

**The Modules**

**Skiving/Deburring**
- Skiving
- Pocket groove and shifterstop milling
- Chamfering / Pointing

**Turning/Milling/Drilling**
- Turning
- Hobbing
- Fly-cutting

**Grinding/Internal Gear Honing**
- Drilling
- I.D. & O.D. grinding
- Pocket groove and shifterstop milling

**Technologies for manufacturing synchronizer parts**
- Chamfering/Pointing
- Shifterstop milling
- Pocket groove milling

**Internal Gear Honing**
Maximum precision for hollow wheels with internal gearing

Hollow wheels
The requirements on hollow wheels in planetary gearboxes used in hybrid and electric vehicles have greatly increased recently. Hollow wheels are hardened to cope with the higher speeds and higher contact areas of the gearing in alternative drives. The resulting hardness distortion on the gearing can be compensated precisely and efficiently using the PRÄWEMA internal gear honing technology.

Internal gear honing
This results in a considerably finer surface finish and a defined flank geometry of the internal gearing. The noise behaviour of the hollow wheel thus remains low despite high speeds.

Complete tool solutions from DVS TOOLING
More information at www.dvs-tooling.de
Complete machining of sliding clutches

The sliding clutch
Sliding clutches make gear changing possible in manual gearboxes and transfer the torque from the gear shaft to the gear wheel via synchronous body and coupling body. Internal and external gearings of sliding clutches can be completely machined extremely precisely and at low unit costs using the SynchroForm V.

Pocket groove and shifterstop milling
The hypocycloidal milling method is a method used by PRÄWEMA for the efficient machining of shifterstops and pocket grooves in a metal-cutting process on internal and external gearing.

Skiving
Thanks to the latest developments in manufacturing technology, this efficient and flexible technology is one of the most economic alternatives for cutting gears in workpieces.

Chamfering (tapering)
A wide range of different dog tooth shapes can be performed. These include crowned, rotative and straight chamfering.
System solution for machining running gears

Running gears
The PRAWEIMA SynchroForm V is the ideal machining solution for drive components with running gears as well. The machine carries out turning, gear-cutting and deburring processes reliably in soft machining. The hard skiving process is used to cut gears in components that have already been hardened. PRAWEIMA offers gear honing using the SynchroFine machine type for finishing external gearing.

Skiving
PRAWEIMA achieves maximum efficiency thanks to a high machining volume with the powerful skiving gear-cutting technology.

Deburring
Deburring can be integrated in the process chain without increasing cycle times.

Gear honing
PRAWEIMA gear honing is an extremely precise and economical method used for the hard-fine machining of external gearing up to a reference diameter of approx. 350 mm. Gear honing is used on the SynchroFine machine series.
Mitglieder der DVS TECHNOLOGY GROUP
Members of the DVS TECHNOLOGY GROUP

DVS MACHINE TOOLS & AUTOMATION

BUDERUS Schleiftechnik GmbH | www.buderus-schleiftechnik.de
Innenrundschleifen – Außenrundschleifen – Bohrungshonen – Hartdrehen
I.D. grinding – O.D. 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 hard-fine machining for small and medium-size batches

PITTLER T&S GmbH | www.pittler.de
Vertikal-Drehbearbeitungszentren & Pick-up-Systeme – Verzahnen in der Komplettbearbeitung
Vertical turning center & Pick-up systems – Gear cutting for complete machining

PRÄWEMA Antriebstechnik GmbH | www.praewema.de
Verzahnungshonen/Schleifen – Verzahnungsfresen – Ansitz-/Hinterlegungsfresen
Gear honing – Gear grinding – Hobbing/Fly-cutting – Chamfering

PRÄWEMA Antriebstechnik GmbH | www.praewema.de
Verzahnungshonen/Schleifen – Verzahnungsfresen – Ansitz-/Hinterlegungsfresen
Gear honing – Gear grinding – Hobbing/Fly-cutting – Chamfering

rbc Fördertechnik GmbH | www.rbc-robotics.de
Kamerageführte Roboter-Automationssysteme
Camera-guided robot automation systems

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
Werkzeuglösungen und Technologiesupport für das PRÄWEMA Verzahnungshonen
Tool solutions and technology support for PRÄWEMA 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 PRODUCTION CHINA | www.dvs-technology.com
Serienproduktion von Antriebsteilen für Pkw- und Nutzfahrzeuge auf DVS-Werkzeugmaschinen
Serial production of drivetrain parts for passenger cars and commercial vehicles on DVS machine tools

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 South Europe

PRAEWEMA Antriebstechnik GmbH
Hessering 4
D-37269 Eschwege
Germany
www.dvs-technology.com

Telefon +49 (0) 5651 8008 - 0
Fax +49 (0) 5651 12546
vertrieb@prawema.de
www.praewema.de