



DIAMAIL

Newsletter from DIAMETAL AG · www.diametal.com

2/12

NEW SOLUTIONS FOR THE PRODUCTION OF HIGH-PRECISION WATCH COMPONENTS

Diametal provides innovative solutions for the watch industry too: support disks with a special recess enable the production of high-precision watch components with a simultaneous reduction of manufacturing costs.

EDITORIAL



Dear Readers

The present issue once again clearly shows how we are continuously developing our products and processes

further – and doing so with success. For instance, we can introduce you for the first time to our new standard range of carbide bushings. These products are now available in various dimensions for our customers working in tool manufacture and micromechanics.

We are today also present you with solutions for the technology of roller burnishing. These enable the reliable production of very small components and also reduce retooling times at the same time.

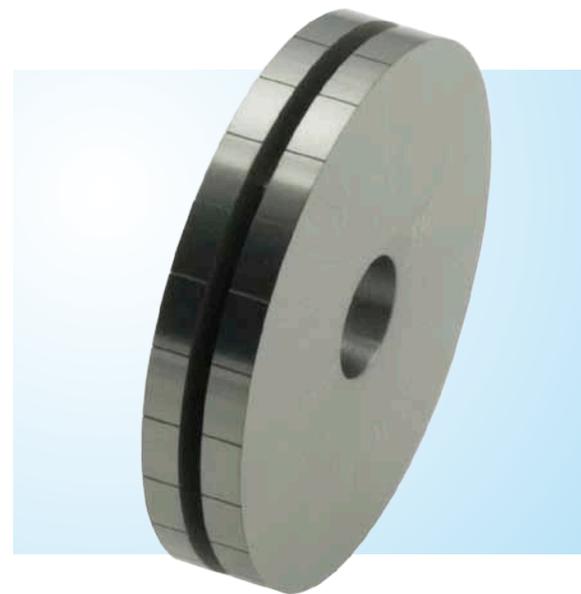
In addition, with the example of a customer of many years' standing, we show you how we can quickly and effectively help achieve a tailored solution through intensive collaboration with the customer. We generally prefer, of course, to present our new developments to you in person. One opportunity to do just that is provided by the EPHJ trade show in Geneva. I wish you interesting and informative reading.

Daniel Brügger, CEO Diametal AG

A look at what the exhibitors are showcasing at the Baselworld World Watch and Jewellery Show reveals the same picture again: watch movements with extraordinarily complex mechanisms are en vogue and becoming increasingly popular. When the movements becomes more complicated, its production calls for a higher and higher standard of precision. As a result, increased demands are made on the manufacture of the individual parts involved.

Technical problems and elaborate operating sequences at the customers are a constant challenge for Diametal in its capacity as a manufacturer of tools and fixtures. The know-how acquired from many years of experience enables the specialists at Diametal to present their customers again with innovative solutions for the manufacture of high-precision watch components. This specially applies in the case of roller-burnished parts as well.

Depending on the shape of the part to be produced, it is very difficult, and sometimes even impossible, to mount it between two grooves. The problem is presented, for example, in the case of the *chaussée* (the cannon pinion that controls the time-stepping mechanism). In order that the diameter of the hand holding fixture can be guaranteed to attain the required precision, an additional mounting pivot has to be included in the process and later removed again by polishing (*poli bloqué* or blocked facet polishing).



Support disk with a longitudinal groove

As a solution to this problem, Diametal proposes using a support disk with a longitudinal groove. In doing so, the roller burnishing disks can be positioned on the toothed side and on the outside diameter of the hand holding fixture. This method ensures a high stability of the workpiece during the burnishing process and therefore guarantees that the length and diameter tolerances are maintained. Shorter cycle times are the result, which in turn leads to a reduction in manufacturing costs.

If the groove diameters are less than 0.07 to 0.09 mm (for instance for an anchor pivot),

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CARBIDE BUSHINGS WITH A TRIPLE PLUS

The carbide bushings from Diametal are valued and appreciated in many industries because of their precision. Their special plus points are the 3 Ps – Precision, Price and Practicality.

Precision carbide bushings are sought-after. They are used for the development of cutting tools and the assembly of watch components, but they are also deployed in many fields of micromechanics.

The production of precision carbide bushings is a demanding procedure. It requires a relatively long machining time for the carbide and the know-how and experience of well-trained precision engineers for the grinding and honing processes. All this can be provided by Diametal. The distinctive merits of the carbide bushings from Diametal are the 3 Ps: highest precision, undisputed qualities in practical application and a fair price.

So as to satisfy the high demand for these products, Diametal offers a broad spectrum of carbide bushings machined within tolerances of a thousandth of a millimetre that can be delivered in a matter of a few days.

MORE INFO

For further information, Dany Warter will be happy to help you at tel. +41 (0)32 344 33 01 or dany.warter@diametal.ch.

Selection from our stock programme

References	Dimensions
411008	Ø 4,00 x Ø 0,500 +0,004/0 x 10 mm MG10
411070	Ø 4,00 x Ø 0,504 +0,004/0 x 10 mm MG10
411071	Ø 4,00 x Ø 0,504 +0,004/0 x 20 mm MG10
411140	Ø 4,00 x Ø 0,508 +0,004/0 x 20 mm MG10
411141	Ø 4,00 x Ø 0,508 +0,004/0 x 10 mm MG10
411142	Ø 4,00 x Ø 0,512 +0,004/0 x 20 mm MG10
411143	Ø 4,00 x Ø 0,516 +0,004/0 x 20 mm MG10
411144	Ø 4,00 x Ø 0,520 +0,004/0 x 20 mm MG10

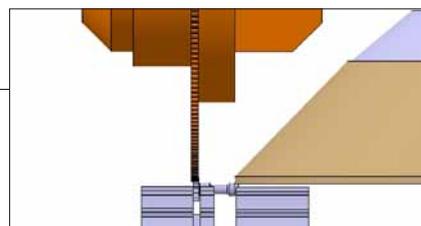
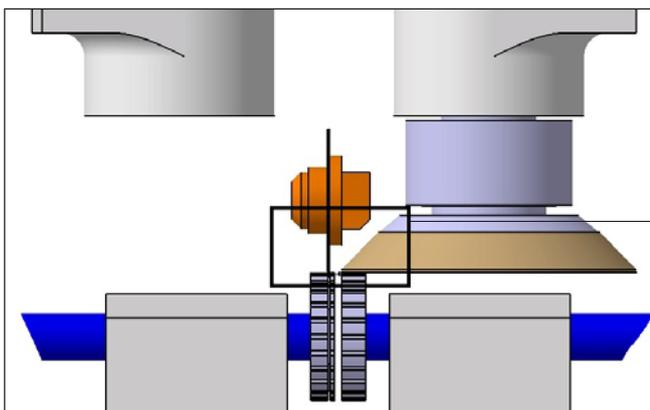
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If the groove diameters are less than 0.07 to 0.09 mm (for instance for an anchor pivot), the setting of the height and of the parallelism of the grooves poses several difficulties in the case of two separate support disks. The result then particularly depends on the skill

and dexterity of the tool setter. The right setting calls for the highest degree of precision and takes up a considerable amount of time. In this case, too, a support disk with a groove provides the ideal solution.

MORE INFO

For further information, Eléonore Girardin will be happy to help you at tel. +41 (0)32 344 32 27 or eleonore.girardin@diametal.ch.



TAPERED SUPPORT DISKS

Again and again, Diametal provides solutions for specific customer problems. One example is the roller burnishing of the secondary axle in the watch industry.

When roller burnishing the secondary axle of watches, the correct adjustment of the support and burnishing disks is very important. Just as decisive is the exact insertion of the secondary axle. If the groove is too deep, there is an increased risk that the burnishing disk will hit the support disk. Diametal has developed a solution for this problem situation. It involves the deployment of a tapered support disk with a specially adapted angle.

Problems can also occur when actually roller burnishing the secondary axle. The greater the conicity of the outside diameter to be burnished and the smaller the conical dia-

meter of the secondary axle, the greater is the danger here too that the burnishing disk hits the support wheel. This is where the Diametal solution adapted to the angle of the finished part is implemented. The adapted support disk allows the roller to work optimally on the standard support disk – without release or corrections of the burnishing disk. The support disk in the format Ø27 mm with a crescent-shaped recess allows the passage of a loading collet with a W20 loader on the automatic roller-burnishing machine. This solution when burnishing can also be applied for press-fit diameters and other tapered parts.

Advantages: the support disk is ready straight away for operation, time is saved, costs are reduced, and the process is user-friendly.

MORE INFO

For further information, Eléonore Girardin will be happy to help you at tel. +41 (0)32 344 32 27 or eleonore.girardin@diametal.ch.



Tapered support disk

DIAMETAL MAKES THE FONDUE SIMMER

The fondue pots or caquelons from Rössler Porzellan AG receive a superfine polishing from Diametal grinding wheels. This allows an optimal heat transfer and prevents scratches on the glass ceramic hob.

The company Rössler Porzellan AG in Ersigen and Diametal in Biel have something in common. Both are Swiss companies with a long tradition that hold a leading position in their fields. It's therefore no surprise that a genuine innovation has emerged out of an intensive collaboration between the two firms.

It involves fondue pots made of ceramic. So that the heat is optimally transferred from the stove top to the pot, the base of the pot has to be polished as finely as possible. A highly polished underside also prevents scratches occurring on the glass ceramic hob. In addition, this is a precondition for being able to apply a thin film of 0.07 mm to it. This application makes it possible in the first place to use the ceramic pot on an induction hotplate because it reacts to the eddy currents of the induction and generates heat.

In order to improve the structural quality of the pot bases, Rössler Porzellan AG turned to Diametal. By working closely together, it has been possible to develop a new process for grinding and polishing the underside of the

pots – a big challenge because grinding of this specific type of ceramics is not an everyday procedure. The proposed solution involves using 6A2 Ø200 cup grinding wheels with a D91 synthetic resin bond from Diametal. This enabled a highly refined and induction-suitable pot base to be attained. Martin Mathys, Managing Director of Rössler Porzellan AG, is pleased with the result and with the collaboration carried out with Diametal: «We have found a competent partner in Diametal, a partner who has taken up the matter in a straightforward and no-fuss manner and with great commitment.»

A machine equipped with Diametal grinding wheels has already been built at the production site in China and put into operation by Rössler staff. A second machine is currently under construction in order to meet the high demand and increase the capacity accordingly. The new technology for refining the underside surface of the pots is being implemented as of immediately in all fondue pots produced by Rössler Porzellan AG.



Fondue pot from Rössler Porzellan AG suitable for induction hobs

RÖSSLER PORZELLAN AG

Flowerpots made of fired clay were among the first products from Rössler AG in Ersigen, which was founded in 1926. 13 years later, earthenware crockery replaced the clay pottery produced up until then. Finally, the manufacture of porcelain started up in 1957. Major changes have taken place in the company in recent years. Following the sale to a holding company for economic reasons, the entire production had to be relocated to China in order to be able to further manufacture the high-quality products profitably. In the form of the company Hui Mei Factory, a production location was found as a partner that satisfies the high demands made in terms of human resources, sustainability and environmental awareness. Rössler staff are regularly in China to assure the high quality of the products.



Grinding process for the fondue pots made of ceramic

DRY GRINDING: STILL UP-TO-DATE TODAY

Most grinding operations are carried out nowadays with modern, programmable machinery using adequate amounts of cooling agent. However, dry grinding is still thoroughly practical and up-to-date in a number of fields.

When manufacturing special tools with small dimensions and for small production runs, processing is often still carried out today on manual machines without cooling. The most familiar machine in this area is probably the Ewag WS11. The requirements for the grinding tool are not lower for these machines than in the case of CNC machines. On the contrary: the conditions are made even more difficult by the dry finishing, and the increased risk of thermal damage to the workpiece has to be taken into account in the composition of the grinding wheel.

Thanks not least to its own experience and the many years of collaboration with its customers, Diametal has developed its own stock programme for grinding wheels intended for use on Ewag WS11 machines. The grinding

wheels in this programme offer the user an optimal level of cutting performance and dimensional stability under the given conditions. It is not uncommon that minimum chipping and maximum surface quality is called for on the tools. In such cases the task of dry grinding is particularly difficult since it requires the use of the smallest grit sizes on the grinding tools. But here, too, the special Diametal stock programme offers a wide and varied selection of tried-and-tested solutions.

MORE INFO

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or beat.gilomen@diametal.ch



LEADING-EDGE CNC TECHNOLOGY WITH DIAMETAL CUTTERS

The long-established company Affolter Technologies from Malleray in Switzerland relies on hob cutters from Diametal for its Gear Line CNC gear-hobbing machines. With success: the versatile machine range represents the forefront of technology in this field.



Cycloid milling cutters from Diametal AG



An Affolter Technologies SA machine in operation

Affolter Technologies is a worldwide supplier of gear-cutting machines for the watch industry and micromechanical applications. The company was founded in Renan, Switzerland, by Louis Affolter in 1919. The Affolter Group today comprises four companies, namely Affolter Pignons SA, Affolter Technologies SA, AF Management SA and Affolter China. Affolter Technologies develops, engineers and fabricates electronic and mechanical machine components and machine tools, employs a staff of 40, and has a worldwide sales network.

The Gear Line CNC machine range deploys Diametal hob cutters of every kind (cycloid/evolvent profile). Equipped with a Leste 8 CNC control, these machines can cut straight, helical, tapered and convex teeth on gears, shafts and pinions by using either the generating or the indexing method of hobbing. Thanks to their versatility, the Gear Line machines can take over the tasks of several

special-purpose machines. The tool and the part are direct-driven by motor spindles and the synchronisation is electronically ensured with a cutting speed of up to 16,000 rpm and constant torque. The CNC control units and motor spindles have been developed and produced by Affolter Technologies itself.

A major plus point of the Gear Line: the machine base design comprises a mineral casting bed, which provides an excellent thermal stability and better vibration dampening. This in turn improves the surface quality on the components produced and extends cutting tool life. Since this product line combines power, rigidity and precision and also offers a high level of universality at the same time, Gear Line represents a truly cutting-edge technology and provides high-quality production units for manufacturing complex parts.

Affolter Technologies counts on Diametal as a reliable partner for this line of machines. «We

purchase Diametal cutters because the company has a lot of experience and the highest quality standards,» says Sébastien Giran. The Head of Sales and Marketing at Affolter Technologies praises the good collaboration enjoyed with Diametal, which ultimately also contributes to the success of the Gear Line range.



Gear line machines from Affolter Technologies SA

MANY THANKS FOR YOUR VISIT!

A few impressions from the trade shows
GrindTec 2012 in Augsburg DE and SIAMS
2012 in Moutier CH.



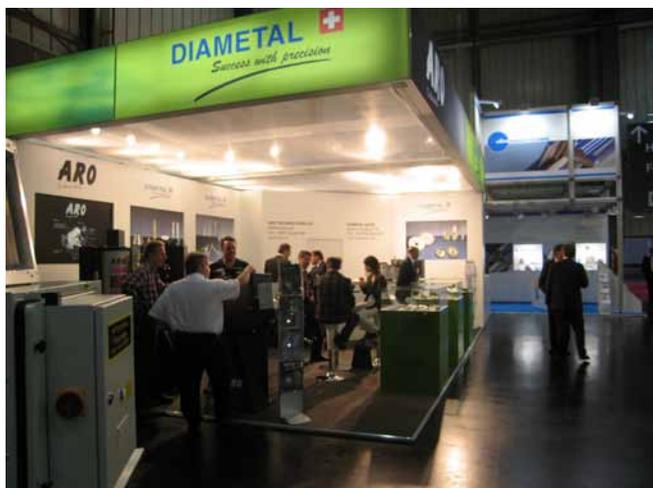
Bruno Lutz, ETA SA in Grenchen



David Baumgarter and Samuel Triponney, Joray & Wyss SA
in Delémont



Roman Nellen and Marco Schneider, Laubscher Precision Ltd. in
Täuffelen



GrindTec 2012, Augsburg DE



GrindTec 2012, Augsburg DE

TRADE SHOWS

EPHJ 2012

Geneva CH
05.-08.06.2012
www.ephj.ch

PRODEX 2012

Basel CH
20.-23.11.2012
www.prodex.ch

CIMES 2012

Peking CN
12.06.-16.06.2012
www.cimes.net.cn/en

Turning Days 2013

Villingen-Schwenningen DE
17.-20.04.2013
www.turning-days.de

AMB 2012

Stuttgart DE
18.-22.09.2012
www.messe-stuttgart.de/amb

Diametal and ARO TECHNOLOGIES are once again exhibiting together at Prodex in Basel CH. Both companies look forward to welcoming you at their stand!



www.aro.ch

IMPRINT

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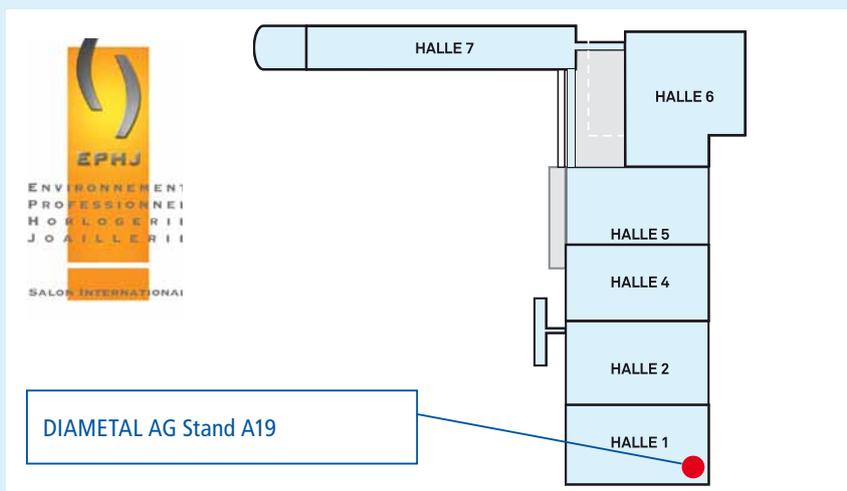
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EPHJ 2012 in Geneva CH



From 5th to 8th June 2012, Diametal AG will be exhibiting at EPHJ 2012 at booth A19. This event will certainly be worth a visit: the EPHJ (Professional Watchmaking-Jewellery Environment) brings together the business community and professions of watchmaking, jewellery making, microtechnology and medical technology in one single place.