

DRIVE

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R+W[®]
A POPPE + POTTHOFF COMPANY

At Top Speed

Dear readers,

the world is constantly speeding up. We are familiar with this phenomenon in our everyday lives, where news comes in by the minute, where automobiles drive faster and faster, where shorter and shorter intervals dominate our daily rhythms. New top speeds also entail higher risks, both in our everyday lives and in technology/engineering terms. We have therefore developed a new high-torque safety coupling, which delivers a clean disengagement capability even at 16,000 rpm. We present this technology in the new edition of DRIVE.

We regularly showcase our innovations at Hannover Messe. This year our couplings were available primarily in augmented reality format. We were able to showcase our high-performance couplings in an innovative way with the aid of our new app.

25 years of R+W means a quarter of a century of couplings technology innovation. We will be taking you on a journey through our product innovation history and providing you with a brief insight into the future. For we are sure of one thing – our benchmark is continuous enhancement and innovation. Why not see for yourself!



Jörg Stang

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25 Years of Precision



Jörg Stang, Sales Manager



Flexible Safety for High Rotational Speeds

Faster, more powerful – and what about the safety aspect? When technological progress oversteps certain boundaries, safety engineering has to keep pace. Efficient, high-performance drive systems, which reach kilohertz-range rotational speeds, are already in use in many industrial applications. A real challenge for couplings technology.

Expensive high-tech machines, as used in the automotive or printing industries, operate at rotational speeds that subject the valuable components within to enormous stresses and strains. Reliable protection against excessive torque and therefore overload is thus vital. A R+W product innovation offers safe operation at reduced cost. Rainer Benz, the company's Chief Technology Officer explains: "High-speed test rigs in particular make testing under extreme conditions feasible in the first place."

This innovation originated from a customer need. "The customer was looking for a specific automotive industry

test rig solution. Our brief was to design a safety coupling that disengages cleanly at 16,000 revolutions per minute. To achieve this we had to rethink and consider a completely new kind of design", is how Rainer Benz describes the point of departure. R+W factored these issues into its calculations, managed moving loads differently to how it had done in the past, and was consequently able to achieve such rotational speeds on the new product with the aid of the new coupling design. Axial misalignment and vibrations often had to be balanced out or compensated for as well, to ensure the test rig delivered guaranteed reproducible readings. >>

The compact safety coupling

- Featuring high power density
- For high rotational speeds
- Featuring low mass moment of inertia
- Upgrade flexibility



“We see this compact safety coupling as a product for high-torque and high-rotational-speed applications, which reliably reduces the risk of damage and helps to minimize downtimes.”

Compact design for use in the smallest of spaces

R+W developed an extremely compact safety coupling, based on the proven ST model range – this design facilitates integration into the smallest of installation spaces. The entire safety mechanism is integrated in a ring functioning as the key element and specially operated. The end result was a safety coupling that achieves a power density of 1,000 newton meters at 16,000 revolutions per minute within the constraints of the required external dimensions of 150 millimeters diameter and just 140 millimeters total length.

Other benefits include simple handling and hassle-free adjustability of the mechanical safety coupling. If, for example, the mass moment of inertia along the entire drive train is too high, meaning the safety coupling would be regularly triggered every time the drive train slows down and speeds up, the wide range of settings enables disengagement torque to be easily adjusted to match given circumstances. Given a choice of variable installation options, the coupling can be placed exactly along the drive train, where the likelihood of an overload is highest.

Combination flexibility

A particular feature of the new coupling is that it can be upgraded. “We designed the coupling to be flexible in many respects. This applies to torque, rotational speed or add-on options”, Rainer Benz explains. “It can easily be docked on to other products in

our portfolio to create an optimum link between power input and output. The new safety coupling can also, for example, be incorporated into existing printing presses.” Given its low space requirement it could also be integrated into print rollers, instead of on the external drive train only. Furthermore the mechanism can be upgraded by adding electronics or pneumatics, which facilitate automatic engagement and a return to starting positions following disengagement, without requiring manual intervention.

The customer derives an extremely wide range of benefits from this solution, as Rainer Benz explains: “We see this safety coupling as a product for high-torque and high-rotational-speed applications, which reliably reduces the risk of damage and helps to minimize downtimes.” Simple couplings, the destruction of which is regarded as an acceptable predetermined breaking point, can be superseded on a permanent basis. “Expensive sections of any machine can now be disengaged cleanly and are no longer at risk of uncontrolled overload”, Rainer Benz adds.

Docking misalignment-equalizing couplings – like, for example, metal bellows and disc pack couplings as well as vibration-reducing elastomer couplings – on to the compact safety coupling enables specific solutions to be easily integrated into existing systems. Elastomer couplings reduce vibrations and impacts; they are therefore predestined for use in, for example, start-stop systems that are liable

to experience vibrations and impacts. If the drive train requires high torsional rigidity, a metal bellows or disc pack coupling is recommended.

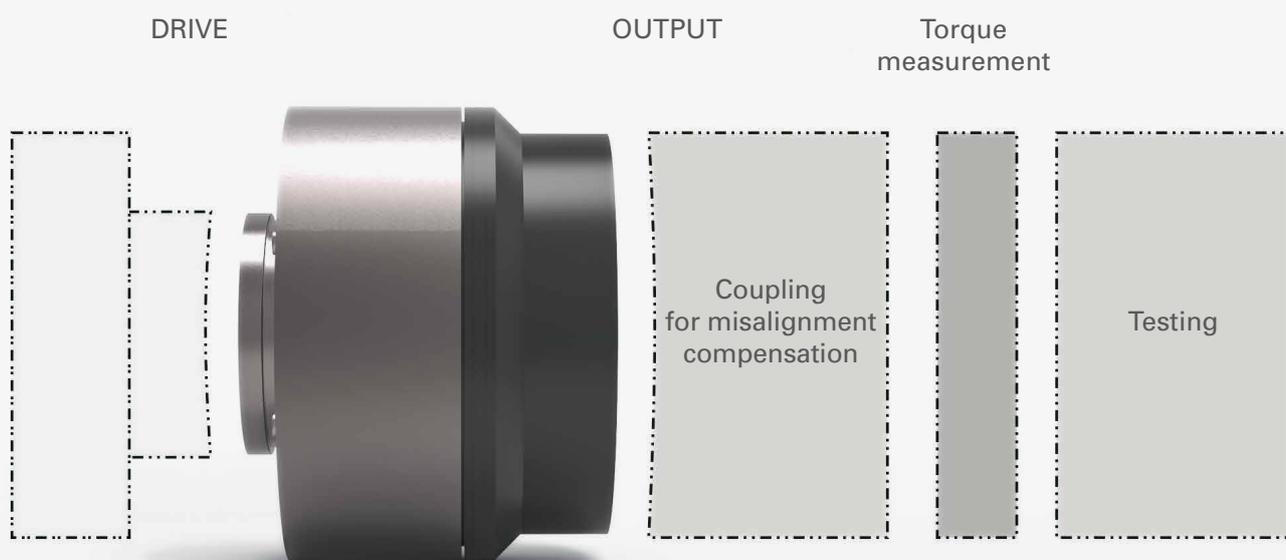
A key requirement is to keep the reset forces resulting from misalignment compensation as low as possible. This lateral, axial and angular misalignment compensation process plays a key role within the entire drive train. If torque was transmitted via a rigid connection between the drive and output shafts, the reset forces generated by the misalignment compensation

process could possibly be too great and could cause bearing damage. A high degree of drive-element operational reliability is therefore vital for the performance of these tasks. Furthermore torsionally rigid couplings guarantee precision positioning of the drive train and can be used for highly dynamic applications.

“The coupling can be adjusted to match given circumstances in conjunction with our other products”, Rainer Benz emphasizes. “On the one hand we reacted to a certain

level of demand and to actual enquiries, whilst on the other we are using this solution to make users aware of what is feasible.” So there is nothing to prevent customers wanting and getting more torque. ■

Typical test structure



Customer-specific



Hanover in Virtual Reality

R+W unveils new app

At this year's Hannover Messe our staff needed strong arms: the stars of the exhibition booth were not actually physically present, they were hovering on iPad displays. Focus was on the new R+W app. 3D-models, animations, videos and information about R+W couplings can be accessed using Augmented Reality technology. Just scan the coupling and the matching model appears as a 3D-animation on the display.

Exhibition visitors weren't going to miss out on this spectacle, and so saw R+W couplings in augmented reality format buzzing in and around the booth. "This year we wanted to try out something completely different", Frank Kronmüller, Executive Vice President of R+W, explained. Couplings have never been showcased like that before. The app is now available at the App Store.

"We wanted to try out something completely different."



Couplings are broken down in 3D augmented reality format into their component parts.

MINIATURE BELLOWS COUPLINGS

LINE SHAFTS

DISC PACK COUPLINGS

PRECISION COUPLINGS

INDUSTRIAL DRIVE COUPLINGS

ELASTIC JAW COUPLINGS

STN

METAL BELLOWS COUPLINGS

SAFETY COUPLINGS

FLEXIBLE GEAR COUPLINGS

EKH

SLP

25 Years of Precision

R+W celebrates anniversary

R+W

1990-2015

THE COUPLING.

R+W has been manufacturing metal bellows couplings for zero-backlash, torsionally rigid joins and connections since 1990. It took just three years before the first major innovation was launched – the mateable metal bellows coupling – and many more were to follow. Improved handling at equal or enhanced levels of precision has been an objective that R+W has always adhered to. In subsequent years the company responded to special customer requests, which

not infrequently resulted in new product ranges. “All our innovations and therefore our standards result from customer requirements”, Frank Kronmüller, Executive Vice President at R+W, explains.

A whole series of couplings technology markers have been put down in the course of 25 years. In partnership with TÜV Süd, R+W developed a testing procedure for safety couplings in 2006, based on the sphere-and-dome

principle. This gave rise to a test featuring disengagement-frequency, precision, rotational speed and constant-temperature follow-up time requirements, which every coupling has to pass nowadays if it wants to acquire the seal of approval. Asked about the future, Frank Kronmüller responded by saying, “The next major step is the smart coupling for Industry 4.0.” R+W is already on the way there. ■

Milestones

1990

Establishment and start of metal-bellows coupling production

since 1993

Zero-backlash, mateable metal-bellows couplings

since 1995

Metal-bellows-based line shafts

since 1999

Elastomer couplings

since 2006

Development of TÜV test procedure

since 2009

Heavy-duty safety couplings

since 2010

Lightweight-design safety couplings



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