

AUTOMOTIVE INTERIOR OF THE FUTURE

Making small parts.
Making a big difference.



NORGLIDE®
Bearings

RENCOL®
Tolerance Rings

SEATING BEARING TECHNOLOGY

Graham Ellis Global Business Development

Benjamin Kümmel Global R&D Manager

Saint-Gobain Webinar
(SprinGlide) 24th April 2019





- **AGENDA**
- **History and timeline of Bearings**
- New Product Family
- Collaboration and support from initial design to serial production

**Making small parts.
Making a big difference.**



WE ARE NO 1 GLOBAL SUPPLIER OF BEARINGS IN AUTOMOTIVE SEATING

Making small parts.
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In 2018 we supplied an average of 11 parts into vehicles built worldwide

A total of 833 million components into seats



Close To The Customer

- R & D and testing
- 📍 Manufacturing sites



THE RIGHT PRODUCT IN THE RIGHT PLACE

TRADITIONALLY, OUR **NORGLIDE®** SOLUTIONS OFFER YOU...



Making small parts.
Making a big difference.



Weight space and cost saving design



Tolerance compensation & efficient assembly



Noise & vibration improvement



Friction control over lifetime & corrosion protection



Making small parts.
Making a big difference.

ENGINEER TO ENGINEER! WE WORK ALONGSIDE OUR CUSTOMERS EVERY DAY

Every customer's needs are unique. We place great value on custom-designing our products, working in close collaboration with customers to meet their specific requirements.



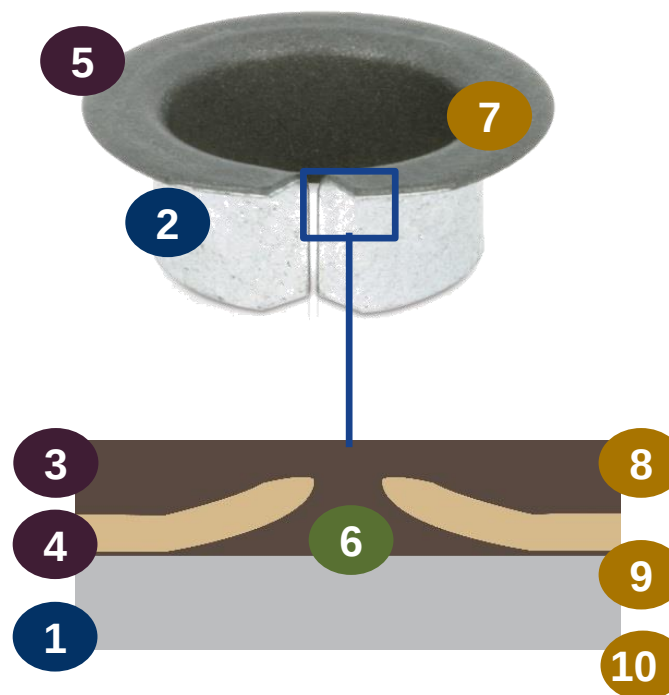
NORGLIDE® HAS UNIQUE FEATURES THAT DELIVER KEY BENEFITS



- 1 Choice of mating metal backing
- 2 Thin walled structure



- 3 Elasticity of PTFE layer
- 4 Intermediate layer for sizing
- 5 Tailored shape and geometries



- 6 Damping by homogenous thick PTFE layer



- 7 Choice of PTFE compound
- 8 Low friction & high wear depth
- 9 High load capabilities
- 10 Choice of metal and protective layer

RENCOL® HAS UNIQUE DESIGN FEATURES THAT DELIVER KEY BENEFITS



- 1 Choice of steel
- 2 Wave height
- 3 Ring & wave shape



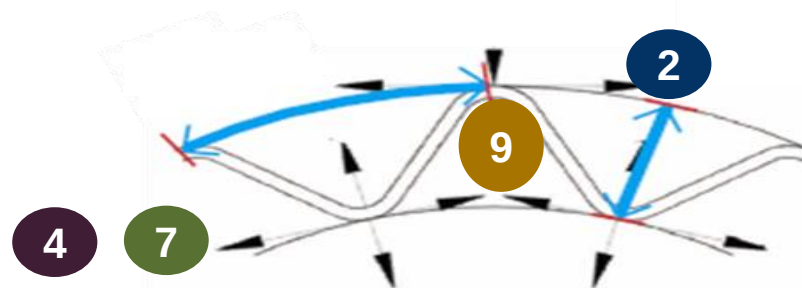
- 4 Overall wave design
- 5 Steel thickness
- 6 Ring shape



- 7 Overall wave design
- 8 Choice of steel & thickness



- 9 Wave height & pitch
- 10 Ring shape
- 11 Steel thickness



Making small parts.
Making a big difference.

SPRINGGLIDE™



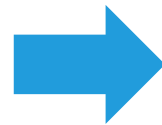
Making small parts.
Making a big difference.

SPRINGGLIDE™ =

RENCOL®
Tolerance Rings



NORGLIDE®
Bearings



Wear rate and damping performance of a
NORGLIDE® bushing

Tolerance compensation, rigidity and
spring rate of a RENCOL® Tolerance Ring



- AGENDA
- History and timeline of Bearings
- New material **SPRINGGLIDE™**
- Collaboration and support from initial design to serial production

Making small parts.
Making a big difference.



NORGLIDE®
Bearings

RENCOL®
Tolerance Rings

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SPRINGGLIDE™



Key Benefits

- Adjustable consistent sliding force under variable loads
- Zero clearance over lifetime
- Tolerance and misalignment compensation





SPRINGGLIDE™ OFFERS UNIQUE MATERIAL / DESIGN COMBINATIONS THAT DELIVER KEY BENEFITS TO OUR CUSTOMERS

Making small parts.
Making a big difference.



- 1 Desired sliding force achievable by design of spring elements
- 2 Thin walled structure



- 3 Stable sliding force over wide tolerance range achievable by design of spring elements
- 4 Different PTFE compound layers available
- 5 Tailored shape and geometries



- 6 Avoiding moving noise by thick PTFE layer
- 7 Desired dampening achievable by design of spring elements



- 8 Low friction & high wear depth
- 9 High corrosion resistance by use of stainless steel



SPRINGLIDE™ FINGER-DESIGN

IDENTIFICATION OF THE OPTIMUM DESIGN

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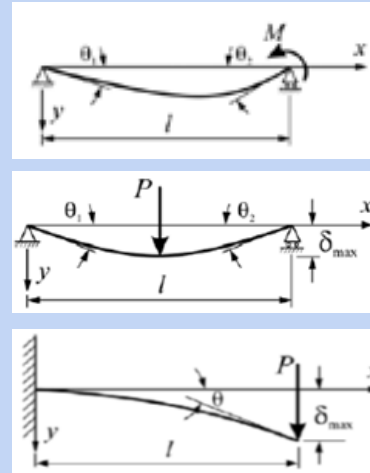


Design parameters

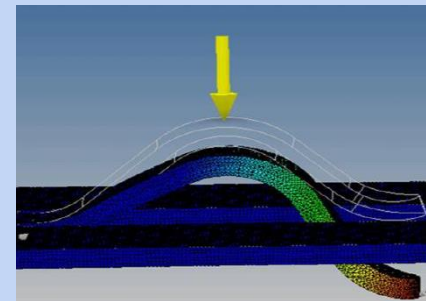
- Material thickness
- Finger width
- Finger curvature
- Finger height
- Finger length

Design Tools

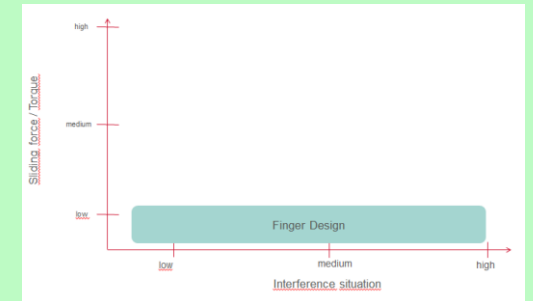
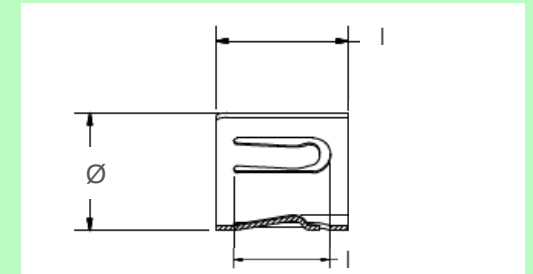
Analytical



Numerical

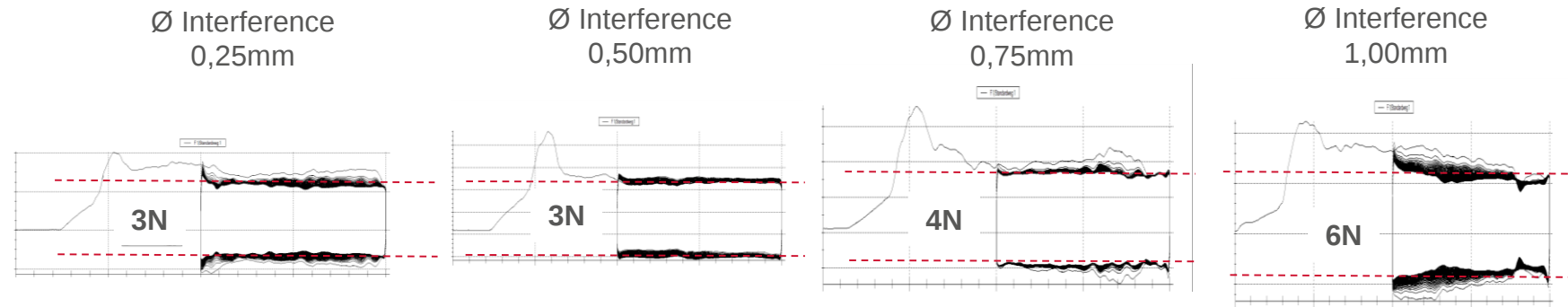


Result



The SPRINGLIDE™ Finger-Design allows to design Low Friction Bearings with Zero Clearance for axial sliding movements. It eliminates Rattle and minimizes variation in moving force coming from tolerances or misalignments over a huge range.

The spring effect of the fingers enables misalignment compensation without any negative effects on adjustment forces or noise creation



**Compensation of
big misalignments**



**Dampening PTFE
layer avoids noise
creation**

SPRINGLIDE™ SLOTTED-RIB-DESIGN

IDENTIFICATION OF THE OPTIMUM DESIGN

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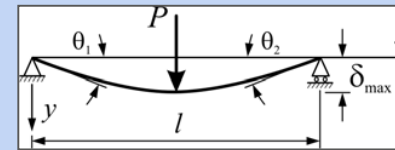
Design parameters

- Material thickness
- Rib width
- Rib curvature
- Rib height
- Rib length

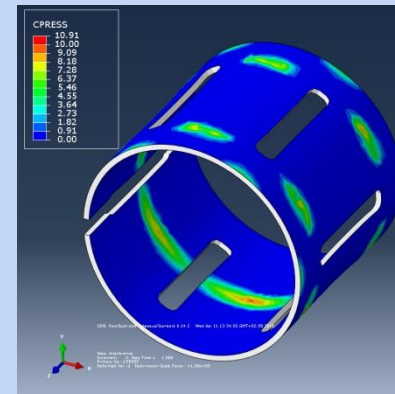
The SPRINGLIDE™ Slotted-Rib-Design allows to design Bearings with desired sliding forces and deflection behavior for rotational and axial sliding movements. It guarantees zero clearance to avoid rattle and constant sliding forces over a wide tolerance range.

Design Tools

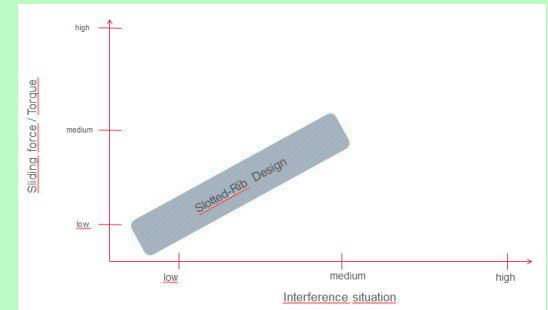
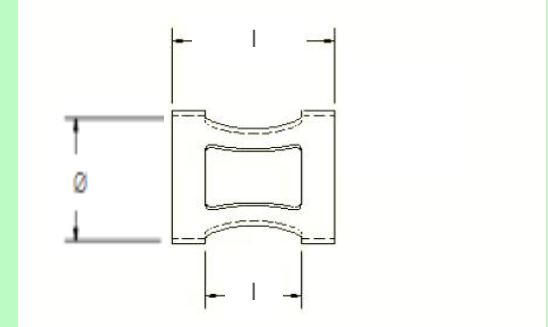
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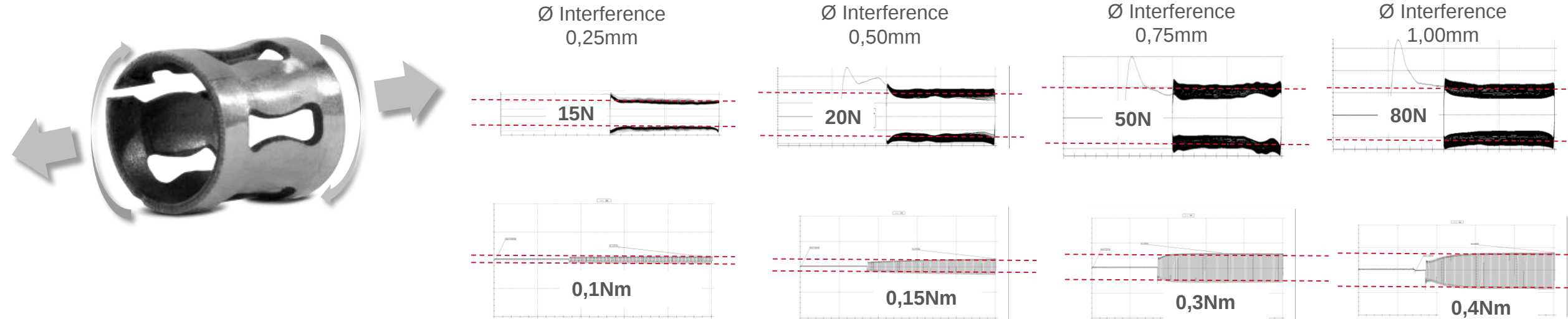
Numerical



Result



The slotted-rib design compensates radial tolerances without influencing the adjustment forces and reduces stick-slip effects (Rotational or Axial)



**SMART
DESIGN**

**Selective design of
desired adjustment
forces**

**PERFECT
FIT**

**Radial tolerance
compensation and
reduced stick-slip
effects**

SPRINGGLIDE™ WAVED-DESIGN

IDENTIFICATION OF THE OPTIMUM DESIGN

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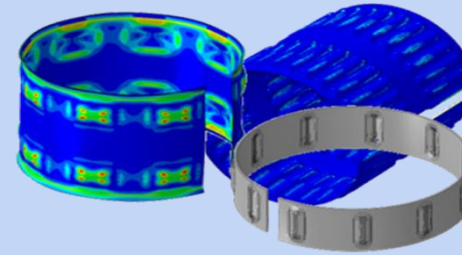
Design parameters

- Material thickness
- Wave width
- Wave curvature
- Wave height
- Wave length

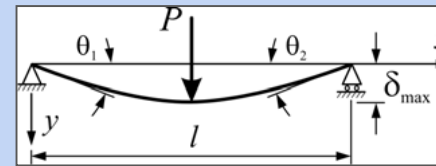
The SPRINGGLIDE™ Waved-Design allows to design Bearings with higher torque for rotational sliding movements. It guarantees zero clearance to avoid rattle and constant sliding forces over lifetime.

Design Tools

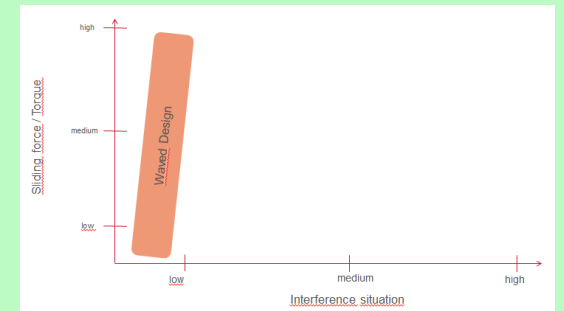
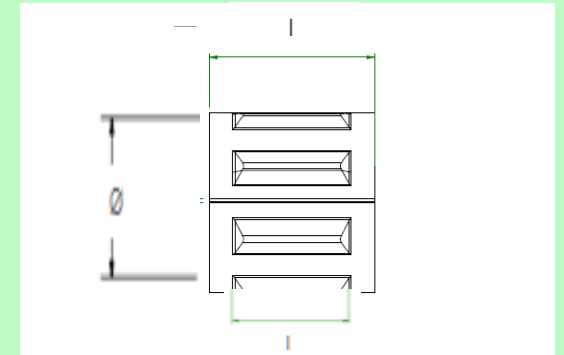
Numerical



Analytical



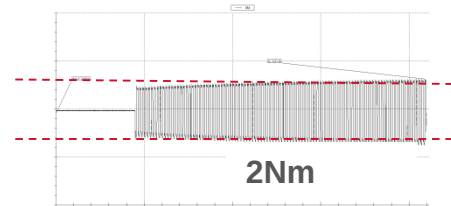
Result



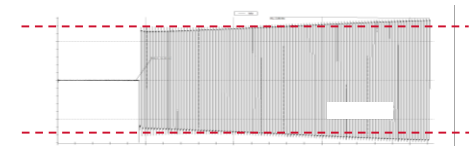
With the waved design selective torque over the complete lifetime can be achieved



Ø Interference
0,1mm



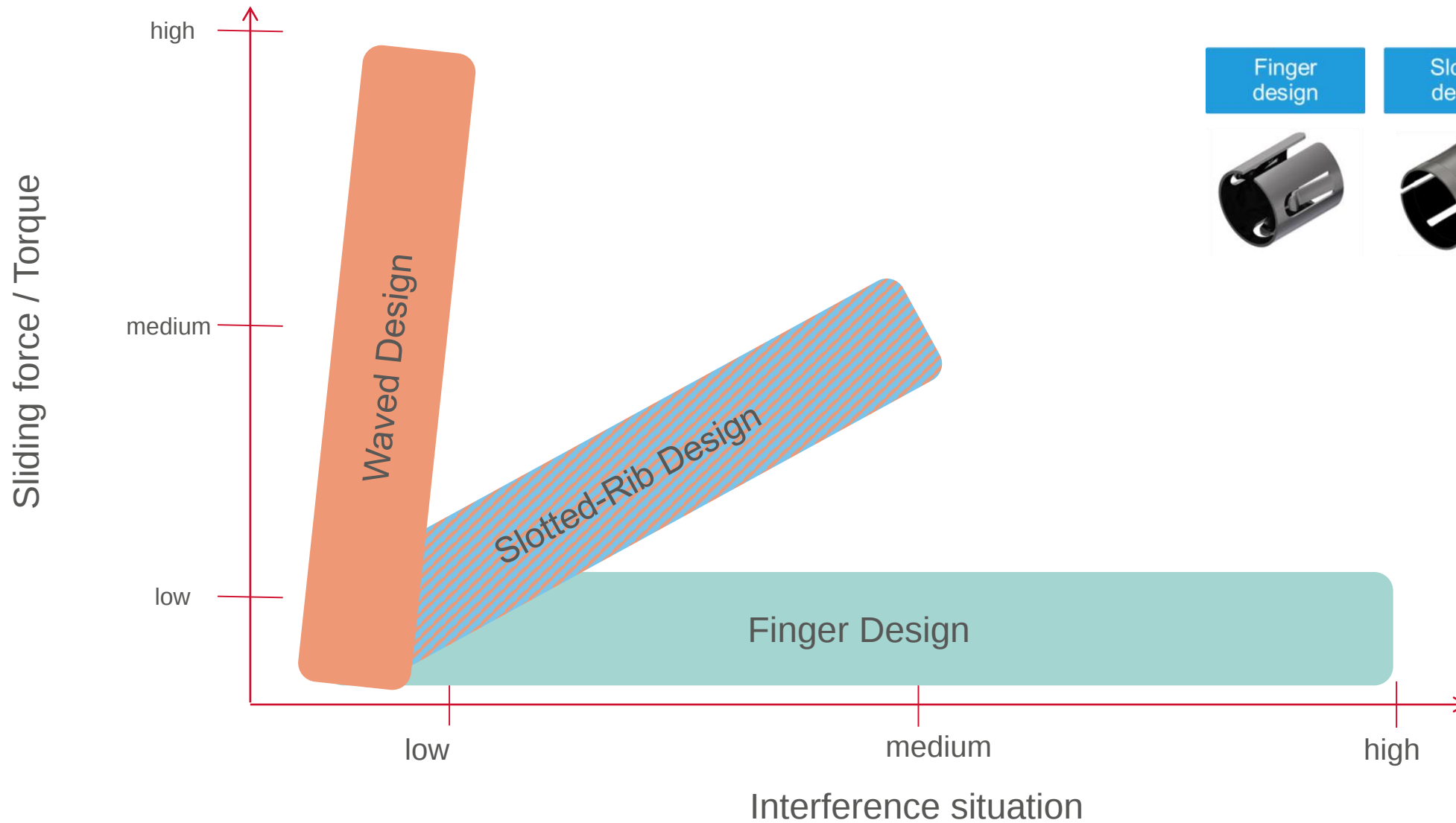
Ø Interference
0,25mm



**Torque adjustment
through wave design
possible**



**Dampening PTFE
layer avoids noise
creation**

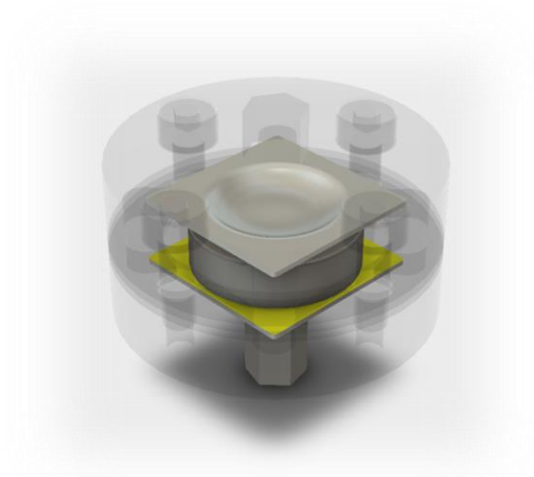
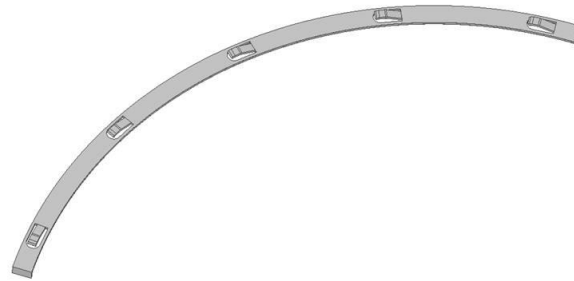




SPRINGGLIDE™

Non ring-bushing products using Springlide™

Making small parts.
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The combination of the thick PTFE layer with the stainless steel enables us to offer also products beyond the bushings for pivot points

Non ring-bushing products using Springlide™



Reduction of system height
and weight



Compensation of axial and
radial tolerances



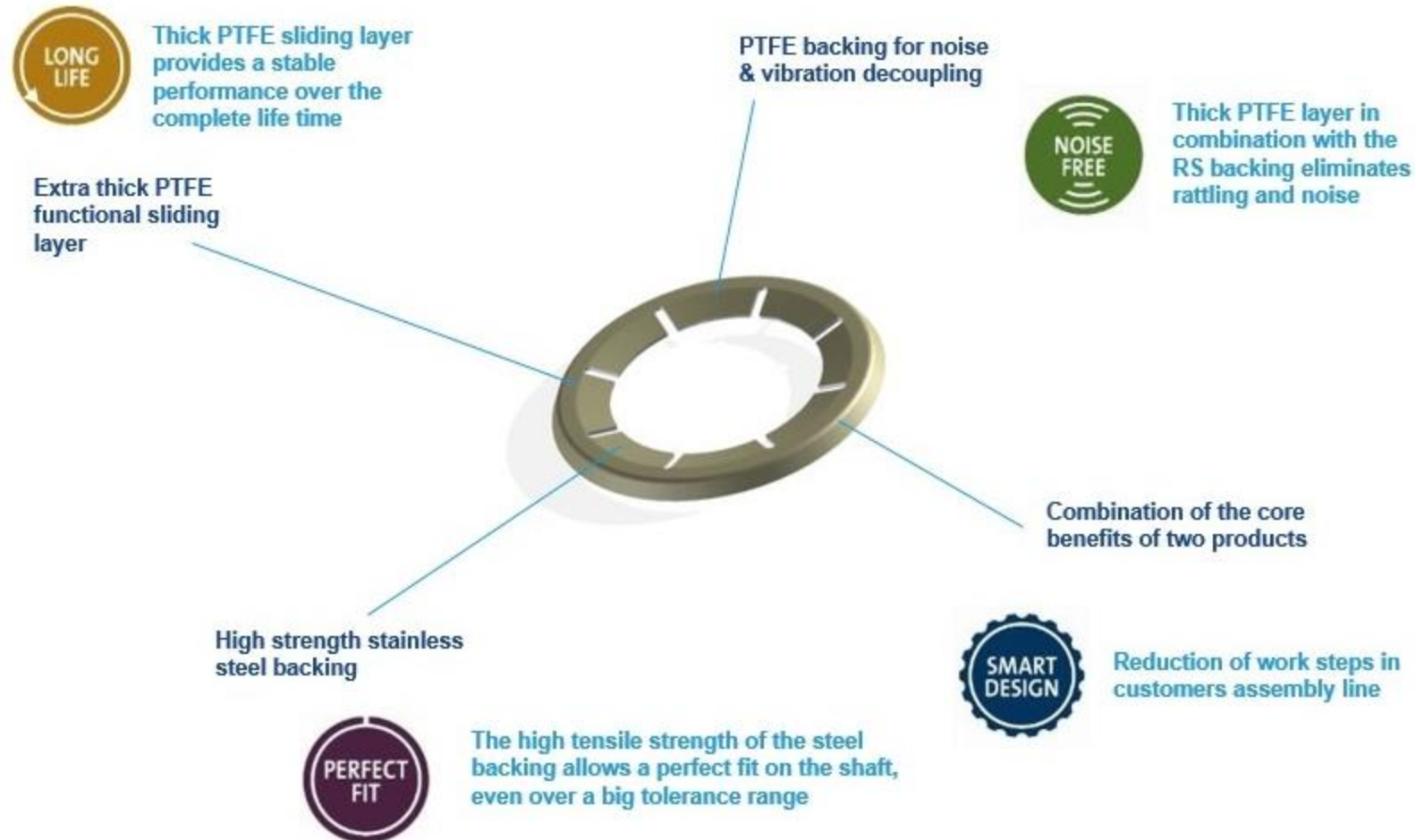
Reduces rattle and decouples
vibrations



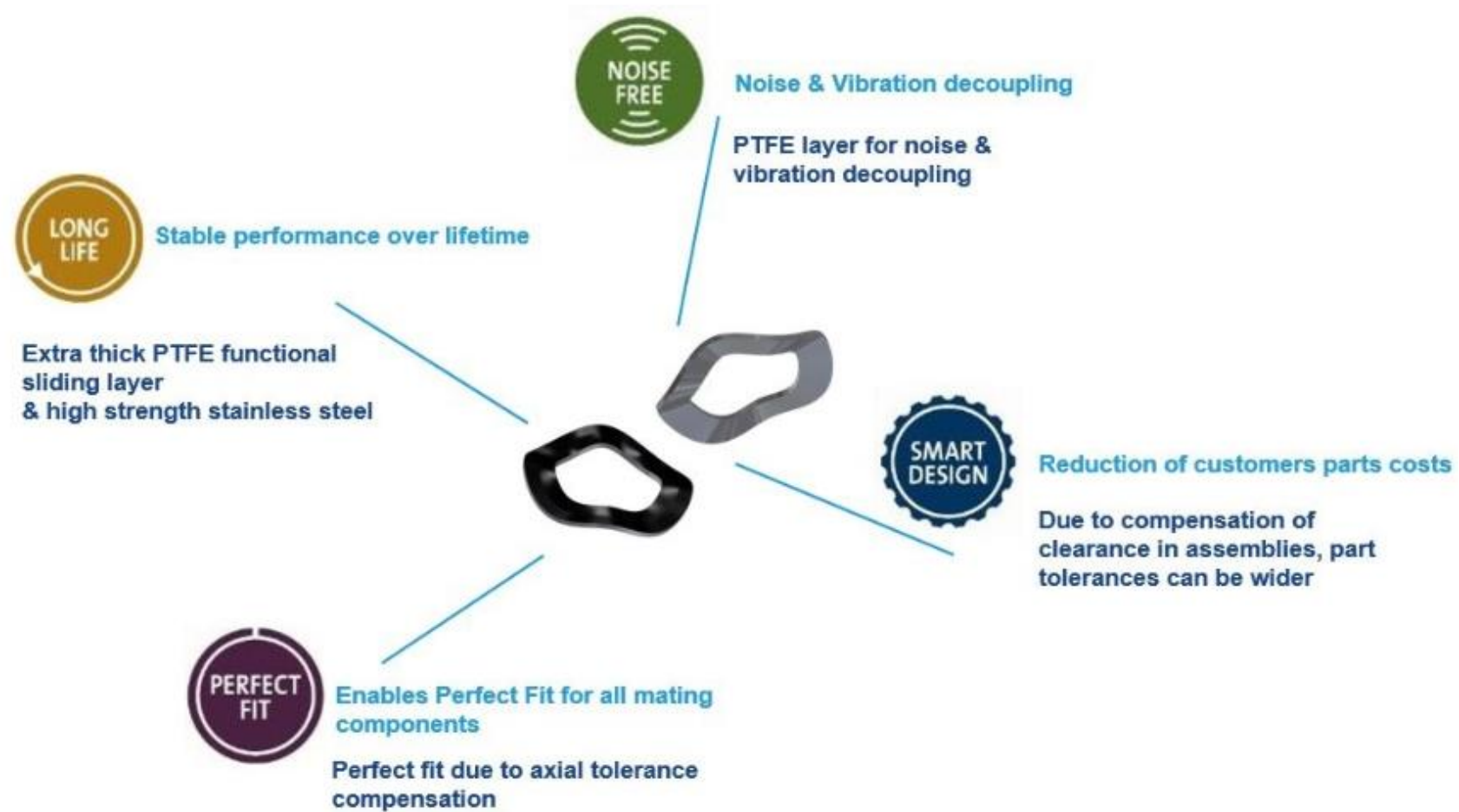
Reliable and consistent
torque performance over
lifetime



Non ring-bushing products using Springlide™



Non ring-bushing products using Springlide™



Non ring-bushing products using Springlide™



Compensation of environmental temperature influence to customized torque



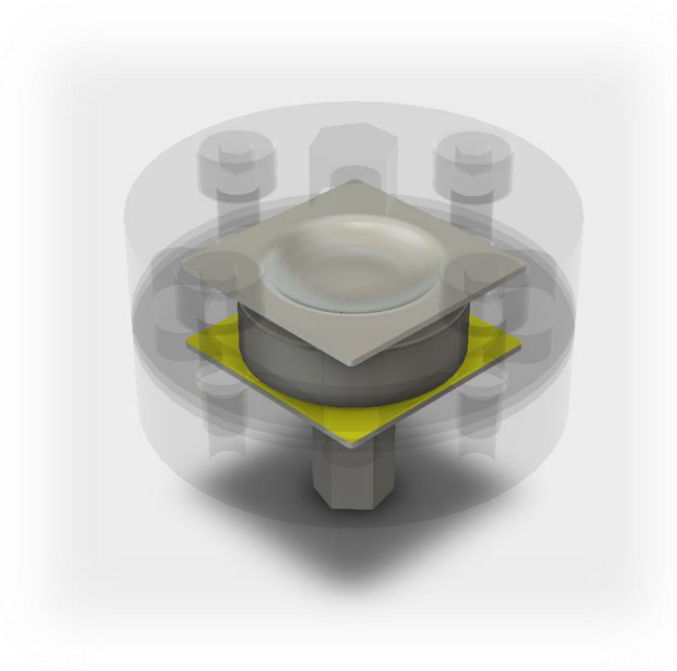
All in one solution due to high customizability



No more stick-slip, squeak, rattle and metal contact noise



The new formulation of functional layer provide stable performance over lifetime





- AGENDA
- History and timeline of Bearings
- New material 
- Collaboration and support from initial design to serial production

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Concept & Prototype



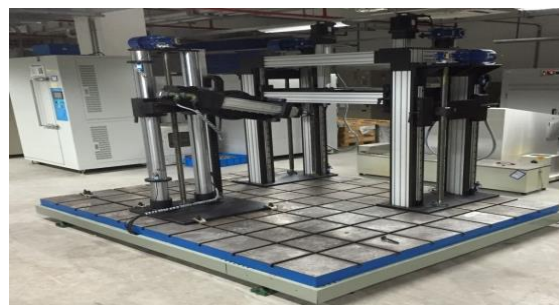
Development & Test



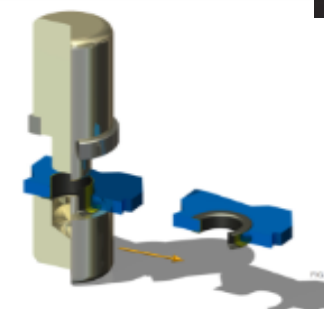
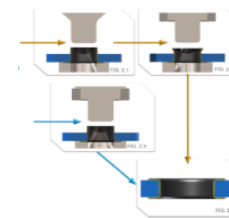
Production



The right material in
the right place



Full development
and test support



Technical support during
and after production



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THANK YOU FOR YOUR ATTENTION

PLEASE VISIT THE BOOTH TO DISCUSS YOUR CHALLENGES



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SAINT-GOBAIN