

*Innovation in Motion*



# GRIPCOAT<sup>®</sup> Direct

Grip with maximum friction coefficient

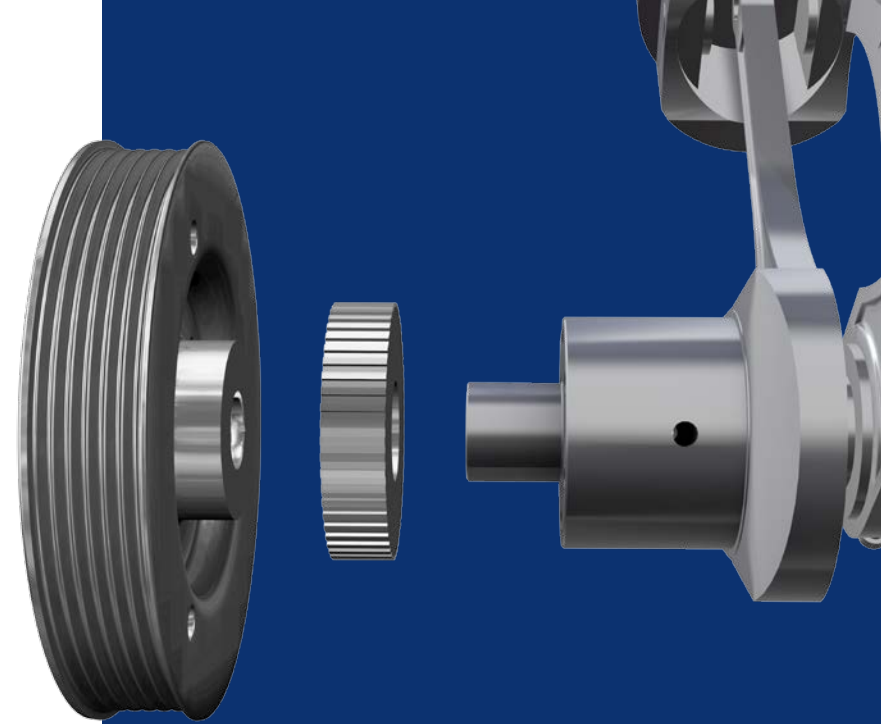
FRICION INCREASE SOLUTIONS



# GRIPCOAT®

## Direct

The Miba Coating Group's innovative coating process increases the friction coefficient – and consequently your business performance.



### Direct and easy

Previously it was only possible to increase the friction coefficient by adding more components. These specially coated metal discs resulted in higher weight and additional assembly effort. GRIPCOAT® Direct is the first process for directly applying a friction-enhancing coating to components. This eliminates the need for additional components and improves engine performance. The process reduces carbon emissions and opens up new possibilities for innovative material combinations with a clear focus on lightweight construction.





# Direct



GRIPCOAT® Direct meets a wide range of requirements in friction-enhancing functional areas. For the first time, it is possible to partially and economically apply hard particles (industrial diamonds) directly to components. The automatic, flexible process can be adapted to your special industrial requirements and does not use wet-chemical processes.

#### **ENGINE/TRANSMISSION/ATTACHMENTS:**

dampers, chain sprockets/chain drives, trigger wheels, variable camphaser systems, driver plates/converters, crown wheels/housing, flange sleeves, assembled camshafts, cooling plates, differentials, equalizers, turbochargers/turbine rotors, crankshafts, bearing blocks, connecting rod threads, housing threads, oil pump shafts, ...

**CHASSIS:** engine suspension mounts, other mounts, steering, convertible tops, ...

**SUSPENSION:** suspension struts drag bearings, pivot bearings, transverse links, wheel bearings, friction discs, ...

**OTHER:** flexplates, connection technique, holding strips, terminal strips

# Your top benefits at a glance

GRIPCOAT® Direct opens new possibilities for developers and producers in the automotive industry:



## PERFORMANCE

- Efficient transmission of higher torques thanks to better adhesion (no risk of fretting)
- Reduction of operating vibration due to reliable grip
- Higher achievable friction factor (up to a factor of 6)



## PROFITABILITY

- Cost-cutting process that can be adapted to special requirements and uses no wet chemicals.
- Simpler and faster assembly since additional friction-enhancing components are no longer needed
- Solvent-free and environmentally friendly
- Friction connections replace form-fitting and adhesive bonds
- Can be repetitively assembled



## CARBON REDUCTION

Since the usual additional components (discs) are no longer needed, the process also results in weight savings. The directly coated components are lighter and smaller, yet more efficient. The lower weight also reduces fuel consumption, indirectly reducing carbon emissions.



## LIGHTWEIGHT CONSTRUCTION

The hard particles (industrial diamonds) are applied at low temperatures. For the first time, even non-conductive substrates can be coated. This opens up innovative material combination opportunities for lightweight construction. The higher friction factor means that the components can be smaller.



## SERVICE

Miba is your reliable and innovative partner. We work together with you to adapt GRIPCOAT® Direct so that the process meets your requirements and needs.

We provide ideal conditions – from professional measurement technology such as 3D laser scans (in-house) to fast prototype development.





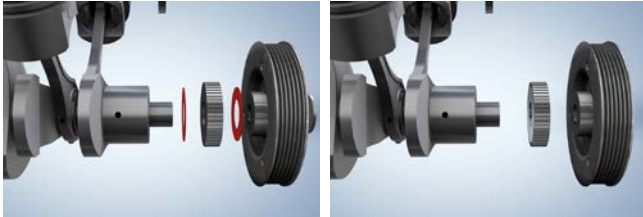
## Ready for serial production

GRIPCOAT® Direct is an automated coating process that is certified for the automotive industry. The industrial process is flexibly extensible, can be adapted to meet your requirements and features exceptionally high availability.



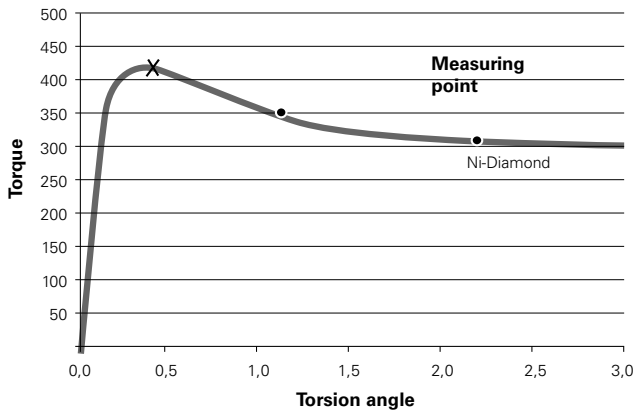
# GRIPCOAT® Direct in detail

Diamond particles are applied to the components using atmospheric plasma. The industrial diamonds that are used are encased in nickel. This metallic casing ensures that the hard particles fuse with the substrate to form a permanent bond. The process itself is also a low-temperature process. Even non-conductive materials such as aluminum alloys, carbon fiber reinforced plastic (CFRP), fiberglass reinforced plastic (FRP), magnesium and polymeric materials are suitable for this process. GRIPCOAT® Direct was developed, tested and qualified in close cooperation with the Chemnitz University of Technology.



With friction-enhancing discs

With GRIPCOAT® Direct

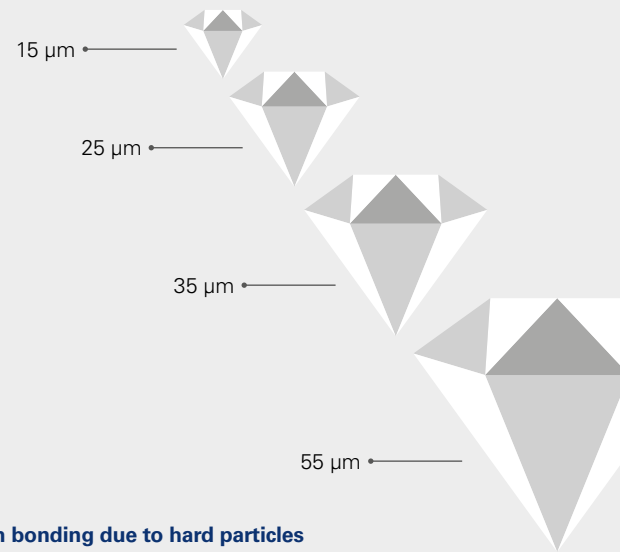


Slip curve

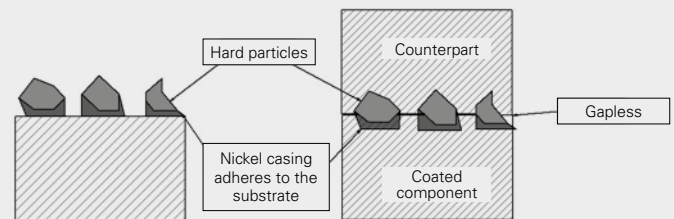
# Flexibility

The size of the hard particles can be varied between 15 and 55  $\mu\text{m}$  to meet your requirements. The achieved friction coefficient is determined by the particle size of the diamonds and also the distribution on the substrate – between 8% and 30% upon request.

## Hard particle size (industrial diamonds)



## Microform bonding due to hard particles without additional retention matrix



***www.miba.com***

**GRIPCOAT® Direct**

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