

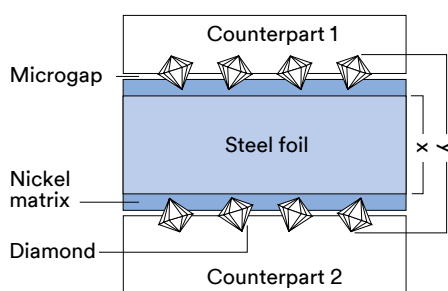
3M™ Friction Shims

Functional properties

Material properties	3M™ Friction-increasing electroless nickel-diamond coating			
	Grade 10	Grade 25	Grade 35	Grade 55
Color	Silver gray metallic			
Shim material (preferably)	C60 S / C75 S (acc. to EN10132-4)			
Thickness of shim (x)	Standard 0.1 mm ± 0.01 mm (others upon request)			
Base part processed by	Laser cutting or stamping			
Matrix material	Electroless nickel-phosphorus			
Hard particle type	Diamond			
Mean particle size	10 µm	25 µm	35 µm	55 µm
Avg. concentration of diamonds on the surface	8 – 16 %	8 – 25 %	10 – 30 %	20 – 60 %
Hardness of nickel-phosphorus matrix	400 – 600 HV 0.025			
Thickness of matrix	5 – 9 µm	13 – 17 µm	14 – 22 µm	22 – 30 µm
Total thickness of coated shim (y) (based on uncoated shim 0.1 mm ± 0.01 mm)	0.13 mm ± 0.02 mm	0.16 mm ± 0.02 mm	0.19 mm ± 0.03 mm	0.23 mm ± 0.05 mm

Application requirements				
Surface roughness R_z or average surface finish R_a of counterpart (transversal to direction of machining)	$R_z < 5.0 \mu\text{m}$ $R_a < 1.0 \mu\text{m}$	$R_z < 12.5 \mu\text{m}$ $R_a < 2.5 \mu\text{m}$	$R_z < 17.0 \mu\text{m}$ $R_a < 3.5 \mu\text{m}$	$R_z < 27.5 \mu\text{m}$ $R_a < 6.3 \mu\text{m}$
Suitable for coated surfaces	No		Yes	
Waviness height W, (total height of W-profile)	Should be smaller than R_z			
Min. contact pressure	$p > 50 \text{ MPa}$			
Max. service temperature	400 °C			

Diagram of an 3M™ Friction Shim



Product is manufactured and sold by 3M Technical Ceramics, Zweigniederlassung der 3M Deutschland GmbH.

Warranty and Limitation of Liability: Many factors beyond our control and uniquely within user's knowledge and control can affect the use and performance of the product in a particular application. User is solely responsible for evaluating the product and determining whether it is fit for a particular purpose and suitable for user's method of application. User is solely responsible for evaluating third party intellectual property rights and for ensuring that user's use of the product does not violate any third party intellectual property rights. Unless a different warranty is specifically stated in the applicable product literature or packaging insert, we warrant that each product meets the applicable product specification at the time we ship the product.

WE MAKE NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OF NON-INFRINGEMENT OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE.

The quality of our products is warranted under our General Terms and Conditions of Sale as now are or hereafter may be in force.

Limitation of Liability: Except where prohibited by law, we will not be liable for any loss or damages arising from the product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability. We accept liability for intent and gross negligence. We are also liable for any culpable breach of major contractual obligations; however, if a breach of major contractual obligations is due to negligence, our liability is limited to the foreseeable damage associated with this type of contract. This does not affect our liability for culpable fatal or bodily injury or damage to health; this also applies to liability under the Product Liability Act (*Produkthaftungsgesetz*). Other claims for compensation are excluded.

Technical Information: Technical information, recommendations, and other statements contained in this document or provided by us are based on tests or experience that we believe are reliable, but the accuracy or completeness of such information is not guaranteed. Such information is intended for persons with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any of our or third party intellectual property rights is granted or implied with this information.



3M Technical Ceramics
Zweigniederlassung der
3M Deutschland GmbH
Max-Schaidhauf-Straße 25
87437 Kempten, Germany
T +49 (0)831 5618-0
F +49 (0)831 5618-345
info.technical-ceramics@3M.com
www.3M.de / Technical-Ceramics

The management system has been
certified according to DIN EN ISO 9001,
DIN EN ISO 50001, DIN EN ISO 14001.

Please recycle. Printed in Germany.
© 3M 2015. All rights reserved.
Issued: 03/2020

3M is a trademark of 3M.
Used under license by
3M subsidiaries and affiliates.