



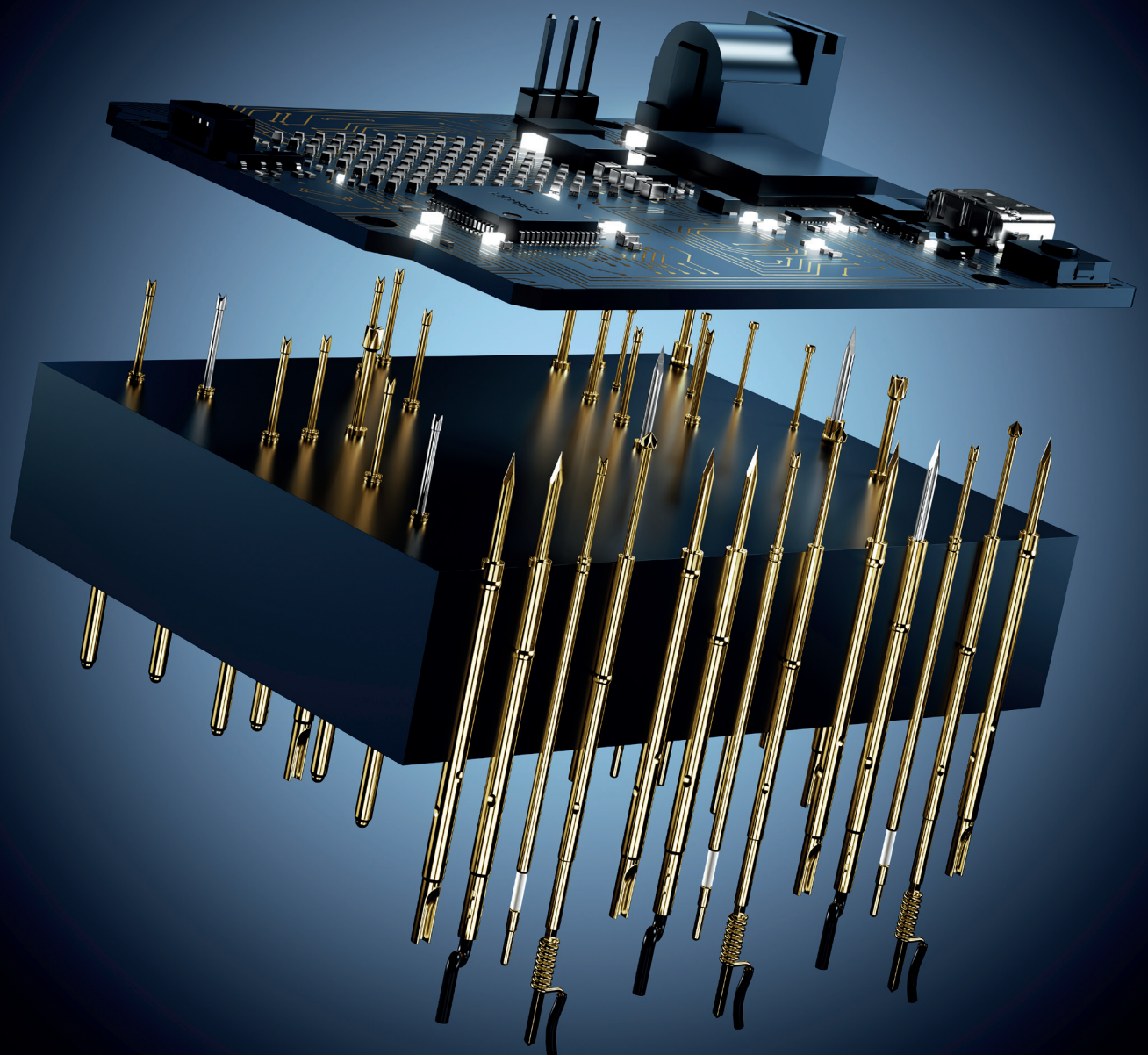
FEINMETALL

Contact Technologies

# PROGRESSIVE SERIES

Developed to achieve outstanding test results  
despite difficult test conditions

> [FEINMETALL.COM](https://www.feinmetall.com)



SOPHISTICATED PROBES FOR  
EVERY APPLICATION

# CUSTOMER BENEFITS

## Our approved solution

FEINMETALL offers a huge variety of different spring contact probes designed to meet a wide range of challenges. However, there are significant problems when contacting lead-free solder pads, heavily contaminated, oxidized boards or OSP coated boards.

The contaminants are difficult to penetrate and adhere to the contact probes. As a result, the electrical connection to the test object is affected or not established at all. In addition, the lifetime of the spring contact probes is reduced.

FEINMETALL already identified this problem more than 10 years ago and consequently developed the PROGRESSIVE SERIES. Therefore we help our customers to master these difficult test conditions.

## Quotes from convinced customers

"With the use of the PROGRESSIVE Series, we were able to significantly increase our first-pass yield."  
*Large OEM supplier*

"Before we became aware of the PROGRESSIVE Series from Feinmetall GmbH, we had significant issues with contacting contaminated printed circuit boards."  
*Circuit board manufacturer*

"Thanks to the longer lifespan of the PROGRESSIVE Series, we were able to reduce testing costs."  
*Engineer field test*



# ICT & FUNCTIONAL TEST: CHALLENGES

## DUT with difficult contacting conditions

- Lead-free solder and surfaces
- Pads or vias with heavy contamination or oxidation
- OSP-coated printed circuit boards
- SMD and THT circuit boards (tinned and untinned)



### Dirt and contamination

Contamination can occur due to dust, grease stains, fingerprints, oils, lubricating films, insufficiently netted paints and plastics. The most challenging contact issues arise from residues of fluxes, soldering pastes, adhesives, and oxidation.



### Lead-free soldering

Lead-free soldering has a corrosive effect on metallic materials, meaning that tools and equipment wear out more quickly in direct contact. Flux residues are also sticky and adhere strongly to contact probes.



### OSP – Organic Surface Protection

OSP is a transparent organic dissolution which is applied to the copper like clear lacquer. It is significantly harder than conventional surface coatings and can lead to contamination at the tip of the plunger and to the degradation of the gold coating.



### Empty or filled vias

Protective layers or other fillings are a problem for reliable contacting of vias. Standard tips cannot penetrate through protective lacquers or sit on non-conductive material and thus prevent an electrical contact.

# TOUGH CONDITIONS, SMART SOLUTIONS

With the PROGRESSIVE SERIES, FEINMETALL has solved the contacting problems during the in-circuit and functional test under the most difficult conditions. This was achieved by the three unique factors of the PROGRESSIVE SERIES. The selection of the optimum coating, tip style and spring force depends on the customer's specific test requirements. A detailed overview can be found in our PCB test catalogue or on our homepage feinmetall.com. We are also pleased to advise you personally.

## Aggressiveness of the probe tip

### Penetration of contaminations and oxide layers

In order to reliably penetrate heavy contaminations and viscous layers, a contact probe must have a highly aggressive tip. So, the choice of tip style is essential. FEINMETALL offers a variety of different aggressive tip styles for applications with difficult contacting conditions.

## Functional coating

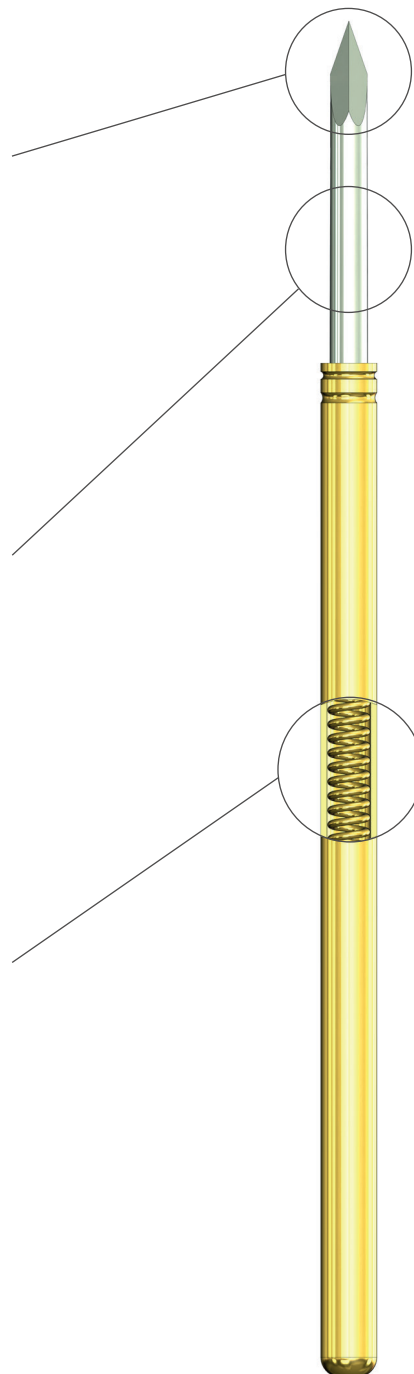
### Reduced contamination of the contact probes

The unique, special PROGRESSIVE coating of the tips has a considerably lower contamination sensitivity compared to conventional gold plating. At the same time, the hardness is 3 times higher. This results in a significantly longer lifetime of the probes even with heavily contaminated contact surfaces.

## Higher preload

### Optimized force characteristic during contacting

Due to an increased preload of the spring, a higher spring force is realized immediately when contacting the test item whereas the nominal spring force at nominal travel remains unchanged. So, the overall load on the test item does not change, but contaminations are penetrated more effectively.

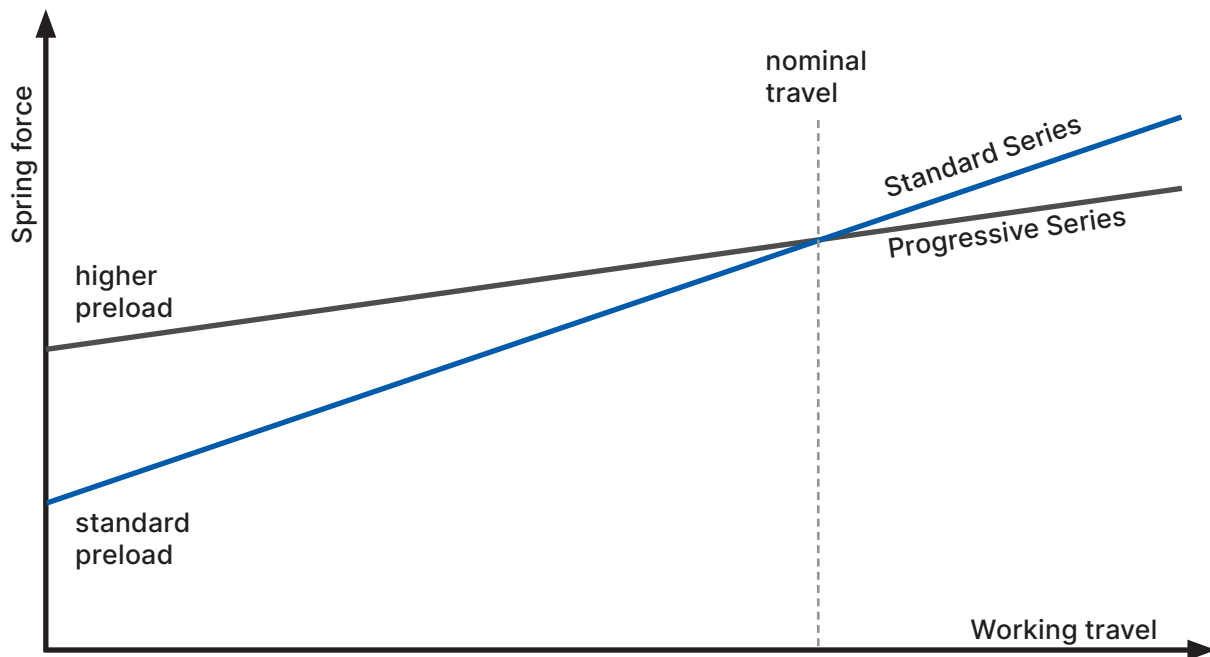


# STANDARD VS. PROGRESSIVE SERIES

## Spring characteristics

The increased spring preload during contact impact ensures better breaking of the surface tension and thus deeper penetration of the contaminated test points. This improves contact reliability. PCB stress is also minimized for sensitive test specimens, as lower nominal spring forces can be used while maintaining the same contact reliability. At maximum spring travel, the PCB stress for the test object is even lower.

## Spring force vs. working travel



# TYPICAL TIP STYLES

The most common aggressive tip styles of the Progressive Series are shown below.

**KF10 - Flexible needle**



**KF35 - 3-point Crown**



**KF14 - 4-point Crown**



**KF37 - 4-point Crown**



**KF15 - Serrated 45°**



**KF38 - Square lance 140°**



**KF21 - 4-point Crown**



**KF43 - Square lance 90°**



**KF32 - Rigid needle**



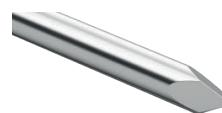
**KF54 - Square lance**



**KF33 - Square lance 38°**



**KF62 - Triangular 30°**



# OVERVIEW PROGRESSIVE SERIES

Type	Order Code	Product name	Center [mm/mil]	Current [A]	Nominal travel	Maximum travel	FM Choice	
F786 HP	1032612	F78610S080P300HP	2.54 / 100	5.0	6.4	8.0	-	
	1015524	F78633S130P500HP	2.54 / 100	5.0	6.4	8.0	-	
	1013217	F78633S130P300HP	2.54 / 100	5.0	6.4	8.0	-	
F772 HP	1013335	F77233S130P300HP	2.54 / 100	5.0	4.0	5.0	-	
F100 HP	1135349	F10005B200P200HP	2.54 / 100	5.0	4.3	6.4	-	
	1019980	F10006B200P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1017617	F10010S060P150HPRP	2.54 / 100	5.0	4.3	6.4	-	
	1039808	F10010S060P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1137199	F10014S150P200HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1001170	F10014S150P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1040481	F10015B150P150HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1036642	F10015B150P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1010207	F10021S090P200HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1010160	F10021S090P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1014293	F10032S090P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1018693	F10033S090P150HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1010205	F10033S090P200HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1009991	F10033S090P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1038017	F10035S150P200HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1036217	F10035S150P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1135612	F10037S050P200HP	2.54 / 100	5.0	4.3	6.4	-	
	1014768	F10037S050P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1132220	F10038S090P300HP	2.54 / 100	5.0	4.3	6.4	-	
	1010206	F10043S090P200HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1010165	F10043S090P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1137813	F10054S157P200HP	2.54 / 100	5.0	4.3	6.4	-	
	1015552	F10062S090P150HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1010208	F10062S090P200HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1010167	F10062S090P300HP	2.54 / 100	5.0	4.3	6.4	FM Choice	
	1137408	F10063B150P200HP	2.54 / 100	5.0	4.3	6.4	-	
	F100 HPL	1010318	F10021S090P200HPL	2.54 / 100	5.0	4.3	6.4	FM Choice
		1010320	F10021S090P300HPL	2.54 / 100	5.0	4.3	6.4	FM Choice
		1014294	F10032S090P300HPL	2.54 / 100	5.0	4.3	6.4	FM Choice
		1017908	F10033S090P130HPL	2.54 / 100	5.0	4.3	6.4	FM Choice
1010258		F10033S090P200HPL	2.54 / 100	5.0	4.3	6.4	FM Choice	
1010324		F10033S090P300HPL	2.54 / 100	5.0	4.3	6.4	FM Choice	
1010319		F10043S090P200HPL	2.54 / 100	5.0	4.3	6.4	FM Choice	
1010325		F10062S090P300HPL	2.54 / 100	5.0	4.3	6.4	FM Choice	
F588 HPS	1043611	F58833S090P300HPS	2.54 / 100	5.0	7.6	10.0	-	
F588 HP	1019480	F58821S090P300HP	2.54 / 100	5.0	9.3	11.7	-	
	1013000	F58833S090P300HP	2.54 / 100	5.0	9.3	11.7	FM Choice	
	1019481	F58837S050P300HP	2.54 / 100	5.0	9.3	11.7	-	
	1019483	F58866B250P300HP	2.54 / 100	5.0	9.3	11.7	-	



# PROGRESSIVE SERIES

Type	Order Code	Product name	Center [mm/mil]	Current [A]	Nominal travel	Maximum travel	FM Choice
F075 HP	1030563	F07514S120P250HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010210	F07521S064P200HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010169	F07521S064P250HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1014301	F07532S064P250HP	1.90 / 75	4.0	4.3	6.4	-
	1016294	F07533S064P130HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010209	F07533S064P200HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010077	F07533S064P250HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1038209	F07535S120P200HP	1.90 / 75	4.0	4.3	6.4	-
	1033612	F07535S120P250HP	1.90 / 75	4.0	4.3	6.4	-
	1135611	F07537B050P200HP	1.90 / 75	4.0	4.3	6.4	-
	1010388	F07543S064P130HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010211	F07543S064P200HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010170	F07543S064P250HP	1.90 / 75	4.0	4.3	6.4	FM Choice
	1145256	F07543S064P300HP	1.90 / 75	4.0	4.3	6.4	-
	1010212	F07562S064P200HP	1.90 / 75	4.0	4.3	6.4	FM Choice
1010171	F07562S064P250HP	1.90 / 75	4.0	4.3	6.4	FM Choice	
F075 HPL	1053951	F07521S064P200HPL	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010292	F07521S064P250HPL	1.90 / 75	4.0	4.3	6.4	FM Choice
	1014299	F07532S064P250HPL	1.90 / 75	4.0	4.3	6.4	-
	1001149	F07533S064L200HPL	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010288	F07533S064P200HPL	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010291	F07533S064P250HPL	1.90 / 75	4.0	4.3	6.4	FM Choice
	1010289	F07543S064P200HPL	1.90 / 75	4.0	4.3	6.4	-
	1010290	F07562S064P200HPL	1.90 / 75	4.0	4.3	6.4	-
F793 HP	1013301	F79333S064P250HP	1.90 / 75	4.0	8.0	10.0	-
	1042075	F79335S120P250HP	1.90 / 75	4.0	8.0	10.0	-
F050 HP	1137414	F05006B090P200HP	1.27 / 50	3.0	4.3	6.4	-
	1010225	F05021S050P200HP	1.27 / 50	3.0	4.3	6.4	FM Choice
	1010224	F05033S050P200HP	1.27 / 50	3.0	4.3	6.4	FM Choice
	1010345	F05043S050P130HP	1.27 / 50	3.0	4.3	6.4	FM Choice
	1010226	F05043S050P200HP	1.27 / 50	3.0	4.3	6.4	FM Choice
	1010227	F05062S050P200HP	1.27 / 50	3.0	4.3	6.4	FM Choice
F050 HPL	1019119	F05033S050P200HPL	1.27 / 50	3.0	4.3	6.4	-
	1026814	F05043S050P200HPL	1.27 / 50	3.0	4.3	6.4	-

## Materials and plating

Plunger	Steel	palladium plated
Barrel	Bronze	gold plated
Spring	Spring steel	silver plated

# FM Choice

## What is FM Choice?

FM Choice is our specially curated selection of the most reliable and frequently used probes in the market. Based on our expertise and experience, we have pre-selected the top-performing probes, so you don't have to choose from hundreds of options. With FM Choice, we make your decision easier by offering the most trusted solutions that meet your needs.

One of the greatest advantages of FM Choice is high availability and fast delivery, as we can often ship directly from our stock. This enables us to meet your demands whenever you need them. Plus, FM Choice offers competitive pricing, even for smaller quantities, making it an attractive solution for all kinds of projects.

Our portfolio includes over 700 contact probes for pitches between 6 and 100 mil, covering a wide range of applications and ensuring we meet most technical requirements quickly and efficiently.

## Benefits at a glance



Most trusted solutions



Competitive prices



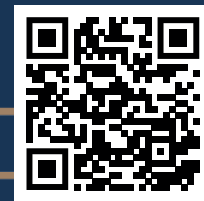
Fast delivery & high availability

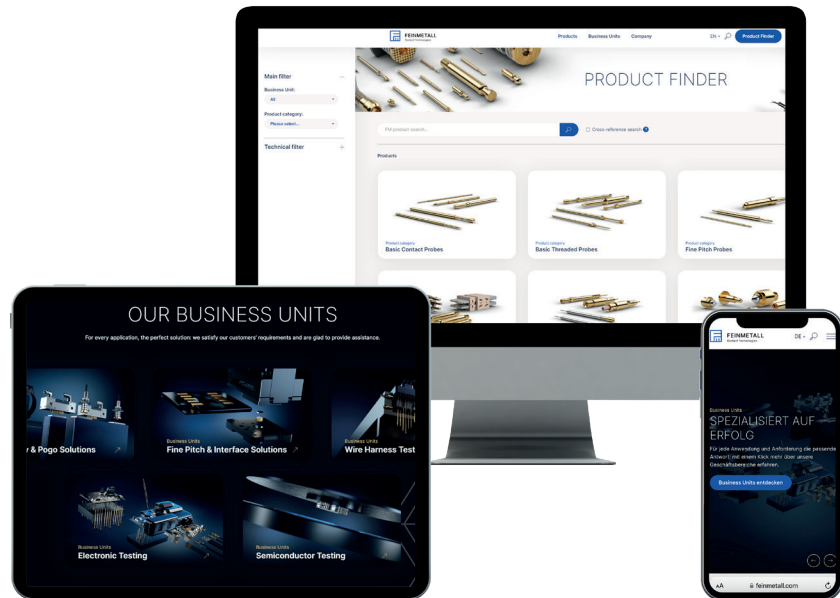
## Discover FM Choice products online

With our new Product Finder, we offer you a complete overview of all FM Choice products that you can easily search through. This high-performance tool allows you to search for specific products and compare them based on their technical features.

In addition to the FM Choice products, we invite you to explore the other categories to discover our complete product portfolio. Start your selection now and experience the variety and quality of our products.

> [FEINMETALL.COM/PRODUCT-FINDER](https://FEINMETALL.COM/PRODUCT-FINDER)





## FIND US ONLINE

### Our website

Welcome to the digital world of FEINMETALL. We offer you innovative contacting solutions that exceed your expectations. Visit our website at FEINMETALL.com and be inspired by the wide range of services customized to industry-specific needs. By using innovative technologies and advanced manufacturing methods, we deliver products of the highest quality and precision that can be used in various industries such as automotive, electronics, aerospace and medical. Our dedicated team is on hand to understand your requirements and help you find the best solutions to your challenges.

> [FEINMETALL.COM](https://www.feinmetall.com)



### Join the community

Connect with us on LinkedIn and stay in touch with us. We take you behind the scenes at FEINMETALL and offer exciting insights into the various areas of the company. With exciting content, we stay true to our passion for precision and technology. Receive regular updates about our company, including new product launches and developments, reports on events and trade fairs, company news and more. We'll also keep you up to date on new career opportunities and job openings. Connect with us now on LinkedIn and become part of our community. Stay up to date and don't miss out on more about FEINMETALL.

> [LINKEDIN.COM/COMPANY/FEINMETALL-GMBH](https://www.linkedin.com/company/feinmetall-gmbh)



PASSION  
FOR FINEST  
TECHNOLOGY.

> FEINMETALL.COM

