

# MICRO FORM

CUSTOMIZE | OPTIMIZE | MINIMIZE

Micro molded high performance elastomer components for critical applications



# MicroForm<sup>®</sup> from PPE

*Customize | Optimize | Minimize*

Engineered and customized elastomer solutions for your micro component needs; designed and developed to fully optimize your equipment or application.

## Miniaturization

The world is becoming highly interconnected and *small* at the same time. Portability, analytical performance, agility, cost, automation and environmental sustainability are all driving companies towards miniaturization.

Molding **micro components in high performance materials** is challenging, from conceptualizing the flow of the polymer into the mold to manufacturing because the fluid mechanics are dramatically different at the micro scale.

# MICRO FORM

PPE has carried out extensive research in the flow characteristics of elastomers and are at the forefront of a market leading Technology.

MicroForm<sup>®</sup> components provide the highest degree of precision and endurance, molded from high performance elastomers for the most critical applications, including aggressive media.

**Material:** 200+ compounds including FFKMs and FKMs

Inside Diameter (mm)	Cross Section		
	0.40 - 1.00mm	1.01-1.50mm	1.51-1.78mm
0.40-1.0mm	✓	✓	✓
1.01-2.5mm	✓	✓	✓
2.51-5.0mm	✓	✓	Request quote
5.01-13mm	✓	✓	Request quote

Shapes\*: Gaskets  
Ferrules  
Duckbills  
Vaccum Cups  
End Effector pads  
O-Rings

**Tolerance\*:** Tighter tolerance to ISO3302-1 Class M2 standards

**Additional Capability:** Insert Molding/Over Molding  
Bonding to a variety of substrates

*\*Above dimensions and shapes are to illustrate only some of our capabilities. All you have to do is just ask - contact us with your requirements*



MicroForm<sup>®</sup> fully automated manufacturing cell (ISO Class 6 environment)

## Why choose MicroForm® over alternatives?

MICROFORM® capability	Benefits to you	Comparison to alternative
<b>A wide range of high performance elastomer materials such as FKMs and FFKMs</b>	High temperature performance from -76°C to 325°C. Broad chemical resistance including solvents, steam and amines. FDA and USP Class VI certified materials.	General performance materials are not suitable to handle high temperature or aggressive media, which can lead to failures of the product.
<b>ISO Class 6 cleanroom environment Fully automated robotic handling &amp; camera inspection</b>	Clean, contamination-free components manufactured to tight tolerances (exceeding ISO3302-1 Class M2 standards).	Conventional molding techniques do not lend themselves to manufacturing high precision micro components.
<b>Flow prediction simulation software</b>	Faster development and time to market.	Cost and time increase with every iteration without flow simulation.

## How do we do it?

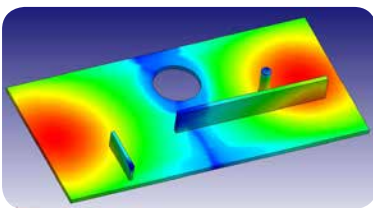
Mold flow simulation analysis



Robotically manufactured



Vision system for in-line optical parts inspection



## Customized micro components

### *Semicon end effector pads*

Height: 2.5mm  
Diameter: 5.33mm  
Rim wall: 0.5mm  
Weight: 0.06g  
Material: Perlast® FFKM



### *Duckbills*

Height: 5.08mm  
Diameter: 5.08mm (OD) 1.67(ID)  
Rim wall: 1.72mm  
Weight: 0.08g  
Material: Perlast® FFKM



### *Ferrule*

Length: 3mm  
Diameter: 2.3mm  
Wall: 0.97mm  
Weight: 0.02g  
Material: Perlast® FFKM



### *Vacuum cups*

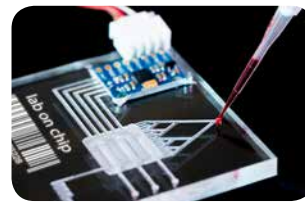
Height: 1.93mm  
Diameter: 7mm  
Cross section: 5.99mm  
Weight: 0.26g  
Material: Perlast® FFKM



## Typical applications

MicroForm® excels in enabling mission-critical, aggressive and precision applications

Application	Market	Products
<b>Microfluidic Flow Control &amp; Dispensing</b>	<ul style="list-style-type: none"> <li>Life science</li> <li>Medical</li> </ul>	LOC connectors, micro pumps, mini valves, micro reactors, miniaturized diagnostic equipment, pipettes, probes and precision syringe.
<b>Analytics</b>	<ul style="list-style-type: none"> <li>Life science</li> <li>Medical</li> </ul>	Mass spectrometer, Chromatogram, Gene Synthesisers.
<b>Measurement Instrumentation</b>	<ul style="list-style-type: none"> <li>Industrial</li> </ul>	Pressure/temperature/monitoring sensors, Mass flow meters & controllers, Pressure meters.
<b>Wafer Handling</b>	<ul style="list-style-type: none"> <li>Semiconductor</li> </ul>	Process Tools.



## High performance materials

Material type	Temperature range	Hardness (IRHD)	Colors	Certification
<b>FFKM</b>	-46 to +327°C -51 to +621°F	64 - 90	Black, brown, translucent	FDA, USP, 3-A
<b>FKM</b>	-46 to +250°C -51 to +482°F	58 - 95	Black	FDA, USP, WRAS, 3-A
<b>EPDM</b>	-60 to +288°C -76 to +550°F	53 - 87	Black, white, blue	FDA, USP, 3-A
<b>NBR</b>	-60 to +135°C -76 to +275°F	57 - 90	Black, white, blue	FDA, 3-A
<b>HNBR</b>	-40 to +180°C -40 to +356°F	70 - 92	Black	FDA, 3-A
<b>Moldable Silicone</b>	-60 to +250°C -76 to +482°F	40 - 80	White, blue, red, grey, translucent	FDA, USP, 3-A

PPE offers an extensive range of elastomer materials that provide unique performance characteristics, compliance to food/pharma industry standards, as well as ultra-high purity grades for semiconductor process equipment. Micro components are available in PPE's leading material brands:

# PERLAST®

The ultimate perfluoroelastomers for sealing applications where chemical resistance and high temperature performance are critical.

# PERLAST® ICE°

Exceptional perfluoroelastomers for extreme low temperature sealing applications.

# KIMURA™

A unique range of fully organic elastomers for semiconductor sealing applications which demand extreme plasma and abrasion resistance.

For further details on our complete range of high performance materials please visit: [www.prepol.com](http://www.prepol.com)

## Testimonials

### MicroForm® - Where reliability & precision matter most

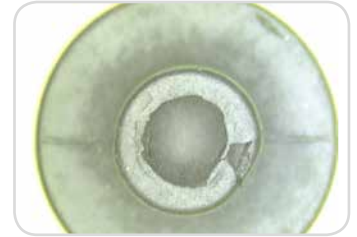
*"MicroForm® duckbill valves made from Perlast® FFKM are clean, consistent & reliable. The valves have passed 2 million cycles, and I'm confident they will pass another 1 million."*

#### Quality & Sustaining Engineer Manager

Manufacturer of solenoid valves & precision pumps for high purity fluids



MicroForm® molded duckbill part offers superior quality and contamination free.



Conventional compression molded duckbill part showing damage and contamination.

### MicroForm® - For meeting tight tolerances

*"The visual quality of Microform part looks superior with tighter tolerances. The lip radius of the Microform parts is significantly smaller and visually looking a lot sharper. This will allow the lip to be readily energised and provide better sealing performance"*

#### Engineer

Semiconductor process equipment manufacturer



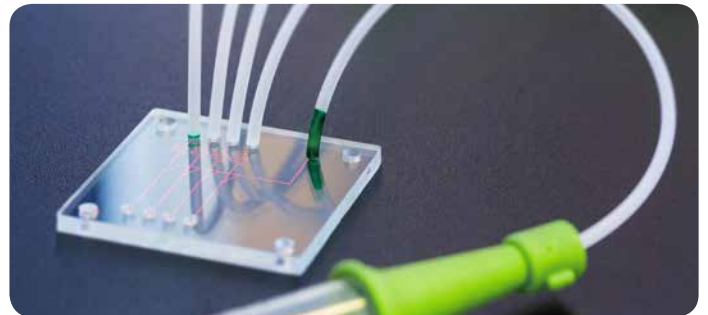
Vacuum cup

### MicroForm® - For high pressure, aggressive applications

*"MicroForm® seals made from Perlast® FFKM create an inert and biocompatible seal between the NanoPort and the chip surface. Perlast® ferrules create a seal between the tubing and the chip, withstanding inline system pressures up to 1,500 psi (103 bar). MicroForm® parts serve as a key component of our NanoPort Connections technology."*

#### Marketing Manager

An industry leader in fluid-transfer components for 'Lab-on-a-Chip' applications



Microfluidic Connectors

## How to start working with PPE

1. Contact your local PPE sales office or manufacturer's representative (see back cover for contact details).
2. Define the scope of work, supply drawings and confirm your requirements.
3. A technical proposal and/or quotation provided by our team of engineers.
4. Project commences.

**MicroForm® - CUSTOMIZE | OPTIMIZE | MINIMIZE**



# MICRO FORM

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