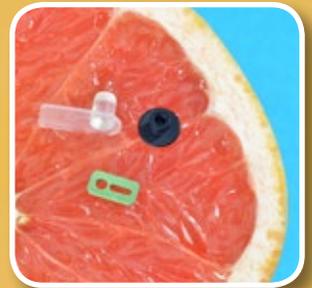


# MICRO FORM

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.

At PPE, we have the ability to manufacture micro elastomer components that will enable you to harness the benefits that result from miniaturization.

## MicroForm<sup>®</sup>

MicroForm<sup>®</sup> components are micro sized parts manufactured in high performance elastomers that solve industry's most critical applications, that require the highest degree of precision and endurance in aggressive media.

The benefits of PPE's design service, technical support, unique elastomer material and short manufacturing lead-times are now available in micro components.

**MICRO  
FORM**



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

## PPE at the forefront of a market leading technology

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.

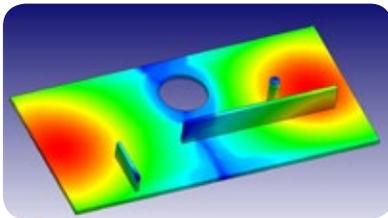
PPE has carried out extensive research in the flow characteristics of polymers and MicroForm<sup>®</sup> helps you solve micro sealing challenges that require high performance elastomers for aggressive media.

## 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 to 325°C (617°F). Broad chemical resistance including solvents, steam and amines. FDA and USP Class VI certified materials.	Non-high performance materials are not suitable to handle high temperature or aggressive media, can fracture causing leaks.
<b>ISO Class 6 cleanroom environment Fully automated robotic handling &amp; camera inspection</b>	Clean, contamination-free components held to tight tolerances (exceeding 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?

Simulation analysis → Robotically manufactured → Robotic camera inspection



## Customized micro components

MicroForm® components are available as custom shapes and designs. Insert molding and bonding to substrate is also possible. Below are some examples of custom micro components.

### Semicon end effector pads

Height: 2.5mm  
Diameter: 5.33mm  
Rim wall: 0.5mm  
Weight: 0.06g (0.002oz)  
Material: Perlast® FFKM



### Grommet

Length: 3.7mm  
Width: 2.6mm  
Diameter: 1.1mm  
Weight: 0.05g (0.002oz)  
Material: NBR



### Ferrule

Length: 3mm  
Diameter: 2.3mm  
Wall: 0.97mm  
Weight: 0.02g (0.0007oz)  
Material: Perlast® FFKM



### Gasket

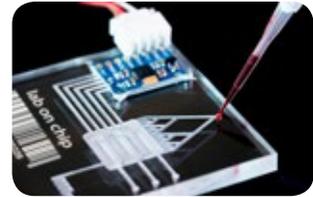
Length: 20mm  
Width: 10mm  
Thickness: 0.5mm  
Weight: 0.13g (0.005oz)  
Material: EPDM



## 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>Food</li> <li>Medical</li> </ul>	LOC, micro pumps, micro valves, micro reactors, analytical chemistry, miniaturized diagnostics and point-of-care applications.
<b>Bio Analytics</b>	<ul style="list-style-type: none"> <li>Life science</li> <li>Food</li> <li>Medical</li> </ul>	Spectrometer, chromatography, assay, probes, gene synthesisers, precision syringe.
<b>Industrial Automation</b>	<ul style="list-style-type: none"> <li>Industrial</li> </ul>	Pressure/temperature/monitoring sensors, chips, counters.
<b>Process Tool</b>	<ul style="list-style-type: none"> <li>Semiconductor</li> </ul>	Wafer handling components.



## High performance materials

Material type	Temperature range	Hardness (IRHD)	Colors	Certification	Semicon clean
<b>FFKM</b>	-10 to +327°C +14 to +621°F	64 - 90	Black, brown, translucent	FDA, USP, 3-A	Yes
<b>FKM</b>	-10 to +250°C +14 to +482°F	58 - 95	Black	FDA, USP, WRAS, 3-A	Yes
<b>EPDM</b>	-60 to +288°C -76 to +550°F	53 - 87	Black, white, blue	FDA, USP, 3-A	No
<b>NBR</b>	-60 to +135°C -76 to +275°F	57 - 90	Black, white, blue	FDA, 3-A	No
<b>HNBR</b>	-40 to +180°C -40 to +356°F	70 - 92	Black	FDA, 3-A	No
<b>Silicone</b>	-60 to +250°C -76 to +482°F	40 - 80	White, blue, red, grey, translucent	FDA, USP, 3-A	No

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)

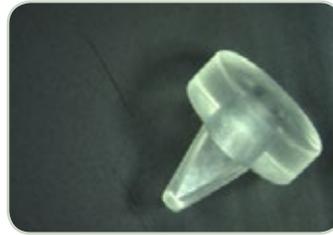
## Testimonials

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

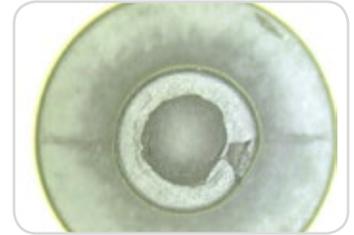
*"MicroForm® duckbill valves made from Perlast® FFKM are clean, consistent & reliable. The valves have passed 2M cycles, and I'm confident they will pass another 1M."*

#### Quality & Sustaining Engineer Manager

Manufacturer of solenoid valves & precision pumps for high purity fluids



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



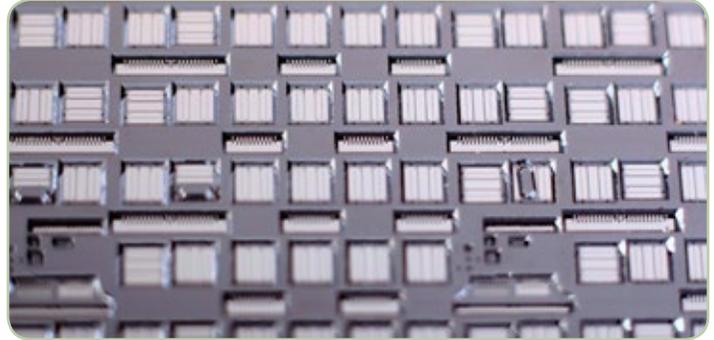
Conventional compression molded duckbill part showing damage and contamination.

### MicroForm® - For meeting tight tolerances

*"MicroForm® O-rings exceeded our expectations by performing even better than the ISO 3302-1 Class M2 standard. MicroForm® achieved  $\pm 0.08\text{mm}$  on internal diameter and  $\pm 0.05\text{mm}$  on cross section. PPE continues to push the boundaries".*

#### Engineer

Manufacturer of sensors/MEMs for industrial automation



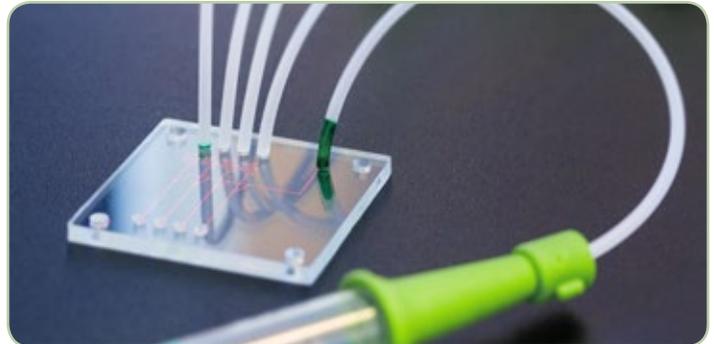
MEMS circuit

### 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



Lab-on-a-chip

## 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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