

Rapid Prototype Manifolds

Product Data Sheet

RAPID RESPONSE
PROGRAM



D-shaped and O-shaped
channel types available



New process allows for
rapid design iterations



Results similar to acrylic for
cleaner and base solutions



Engineered for easy transition
to our full production process



Learn more at
www.idex-hs.com



Rapid Prototyping Manifolds help accelerate your time to market by providing faster manifold delivery and enabling rapid design iterations. In this process, we work to optimize the form, fit, function, and manufacturability of your fluidic path by collaborating early in a project.

The Technology

Manifolds are formed by curing a photopolymer resin on a build surface. A laser beam traces the part geometry and solidifies the resin. The build surface, immersed in a vat of this resin, is lowered by a fraction of an inch to build the next layer. This additive manufacturing process is called Stereolithography (SLA). Use this sheet to learn more about our capability. Contact a fluidic engineering specialist for additional support and questions.



Material Comparison

| Properties | Rapid Prototype Manifold | Traditional Bonded Acrylic Manifold |
|--|--------------------------|-------------------------------------|
| Composition | Photopolymer | Acrylic (PMMA) |
| Color | Clear | Clear |
| Tensile Strength | 52 MPa (7,500 psi) | 77 MPa (11,250 psi) |
| Tensile Modulus | 2,560 MPa (371,000 psi) | 3,100 MPa (450,000 psi) |
| Elongation at Break | 6% | 6% |
| Flexural Strength | 83 MPa (12,000 psi) | 105 MPa (15,250 psi) |
| Flexural Modulus | 2,330 MPa (338,000 psi) | 3,275 MPa (475,000 psi) |
| Impact Strength (Notched Izod) | 46 J/m (0.86 ft-lb)/in | 20 J/m (0.38 ft-lb)/in |
| Heat Distortion Temperature (HDT) @ 0.45 MPa (66 psi) ASTM D468 | 51°C (124°F) | 110°C (230°F) |
| Heat Distortion Temperature (HDT) @ 1.82 MPa (264 psi) ASTM D468 | 50°C (122°F) | 95°C (203°F) |
| Hardness, Shore D | 85 | 98 |

FROM ORDER
TO DELIVERY IN
1 – 2 WEEKS

SIZES UP TO
15" x 15" x 10"
(38 cm x 38 cm x 25 cm)

Design Considerations

All Rapid Prototype Manifold designs are engineered for easy transition to our full production processes. This is done to minimize differences in the flow path and geometry. This enables faster scale-up for final material and part builds using full-scale production methods.

| Feature Comparison | | |
|--|---------------------------------|-------------------------------------|
| Characteristics | Rapid Prototype Manifold | Traditional Bonded Acrylic Manifold |
| Channel Types: D-shaped, O-shaped | Yes | Yes |
| Minimum Channel ID | 0.030" | 0.020" |
| External Feature Tolerances | +/-0.005 or better ¹ | +/-0.005 or better ¹ |
| Surface Roughness of Channel | 40 microinch | 16 microinch |
| External Surface Finish | <20 microinch | <20 microinch |
| Maximum Manifold Size | 15 x 15 x 4 inches ² | 24 x 24 x 4 inches ² |
| Transparency | Yes | Yes |
| Optical Clarity — External | Yes | Yes |
| Optical Clarity — Internal | No | Yes |
| Secondary Operations, Special Features | Yes | Yes |

¹ Dependent upon design and needs

² Nearly all applications fall within this range. Consult our experts for unique needs

The Rapid Prototype Manifold process produces prototypes intended for initial design analysis. These parts are not warranted for production use as the material used has inherent limitations in terms of chemical compatibility, mechanical strength, working temperature, pH and feature resolution. We will make the best effort to meet all feature specifications provided they are within the limitations of our technology. Specific dimensions, surface finishes, system pressures, etc. should be discussed with our engineers.

Chemical Compatibility: 21-Day Soak Test

| Test Solution | Rapid Prototype Manifold | | Acrylic | |
|------------------|--------------------------|---------------------------|---------|----------|
| | Result | Notes | Result | Notes |
| IPA (70%) | Fair | Some Swelling | Good | |
| Bleach (6%) | Good | | Good | |
| Sodium Hydroxide | Good | | Good | |
| Methanol (90%) | Poor | Swelling & Plasticization | Fair | Swelling |
| Ethanol (95.5%) | Poor | Swelling & Plasticization | Good | |

Testing of materials used an extreme 21-day soak test method. The Rapid Prototype Manifold material has shown similar results to acrylic for cleaner and base solutions such as Isopropyl Alcohol, Bleach, and Sodium Hydroxide. These soak test results show the result of long-term exposure. Each application is different and exposure times and prototype life needs can vary. Send us your application requirements so specific compatibility items can be reviewed and discussed.