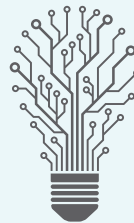
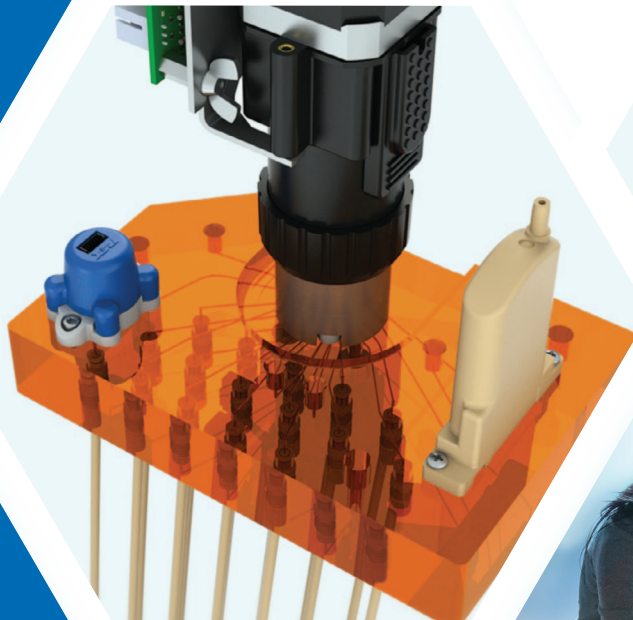


Integrated Fluidic Subsystems

Sparking Creative Solutions
for Your Complex
Fluidic Architecture



Direct Fluid Across Many Applications

WE LET YOU FOCUS ON YOUR CHEMISTRY

As the world of life sciences becomes increasingly complex, developers are challenged to do more with less, while maximizing the performance of reagent chemistries. IDEX Health & Science specializes in controlling and directing fluid so you can automate your fluidic process in a simple package and form factor. Our team of experts has decades of experience in life science applications to help you avoid pitfalls across a broad range of operations and accelerate your time to market.

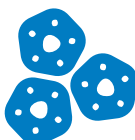


**YOU HAVE
THE CONCEPT,
WE HELP YOU
EXECUTE**

APPLICATIONS



**CLINICAL
CHEMISTRY**



**SPATIAL
BIOLOGY**



HEMATOLOGY



**FLOW
CYTOMETRY**



IMMUNOASSAY



PROTEOMICS



NEXT
GENERATION
SEQUENCING



SYNTHETIC
BIOLOGY

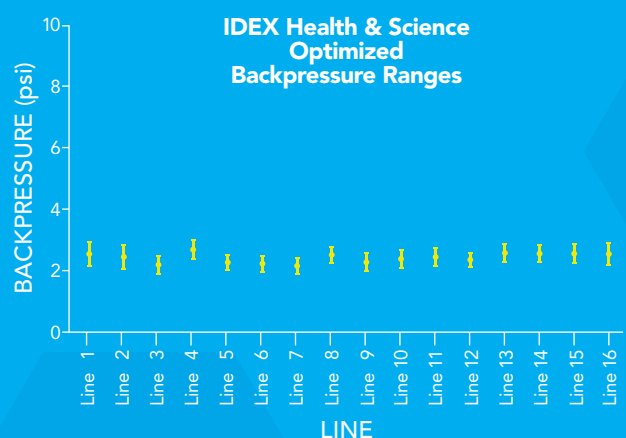
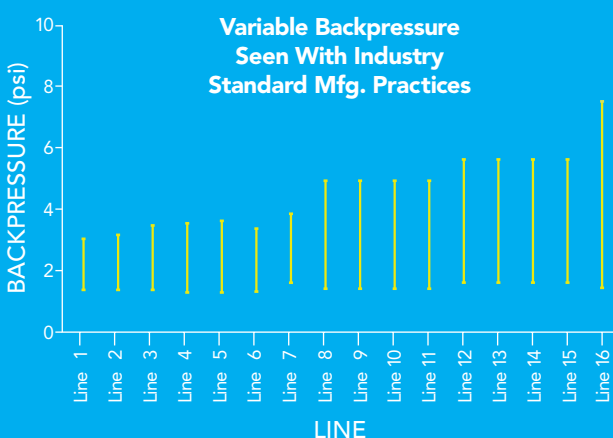
Designing a fluidic system can be a complex puzzle. IDEX Health & Science enables you to connect the pieces.

Unique Challenges in Assay Automation

Designing a reliable, complex fluidic instrument presents many challenges. Assays that utilize expensive reagents have the obstacle of reducing reagent waste, minimizing cost, and maintaining uptime. To conserve reagents, a discretionary reduction of the fluidic channel may be applied, but this can yield unintended engineering consequences, including variation in backpressure, increased cycle time, air intrusion, and outgassing.

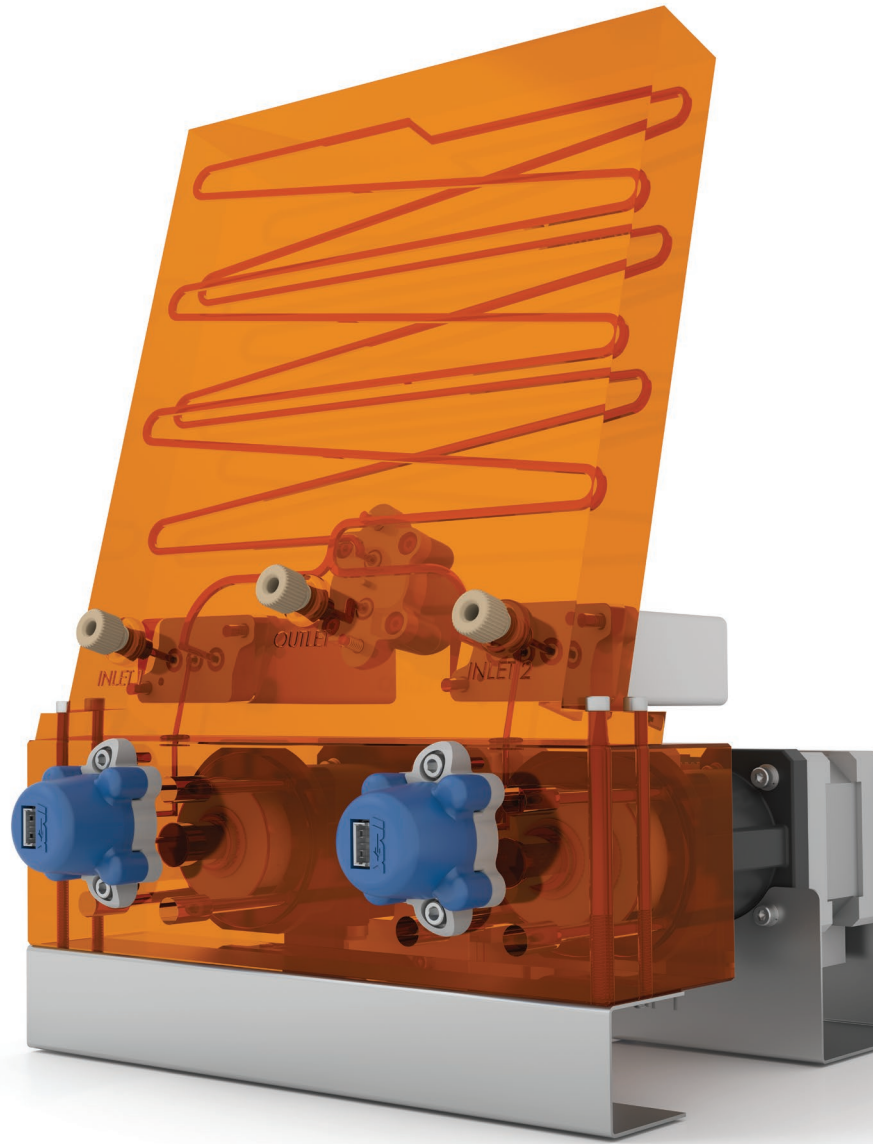
Overall instrument reliability suffers when your manufacturer makes errors in component tolerance calculations. If channel tolerances are not properly managed in the instrument design, the system will be challenged to move fluid. Each component should be considered carefully to ensure optimized performance. A mismatch between the inner diameters of the manifold, valving, tubing, sensors, or connections negatively impacts instrument reliability and performance.

IDEX Health & Science understands your concerns and is uniquely positioned to minimize your risk and accelerate your timeline to market. Through consistent precision manufacturing of components and assemblies we remove unanticipated volume and pressure variability in your fluidic system.



Drive Fluidic Performance Through System Integration

Integrated fluidic subsystems from IDEX Health & Science deliver exceptional instrument performance. Our proven design expertise enables instrument developers to reduce the fluidic complexity of their platform. Our vertically integrated approach to subsystem design and manufacturing mitigates risk, minimizes cost, and maximizes performance.



Benefits of system integration:

- › Precision-controlled dimensions across the full fluidic path
- › Remove unnecessary, labor intensive fluidic connections with vertically integrated solutions
- › Maintains performance with minimized reagent consumption
- › Risk mitigation through computational fluid dynamic analysis
- › Rapid timeline from prototype to production
- › Life of instrument performance
- › Completely customizable with available options:
 - › Valves (rotary and solenoid)
 - › Sensors
 - › Tubing assemblies and probes
 - › Degassers
 - › Pumps

Components

VERTICAL INTEGRATION OF FLUIDIC COMPONENTS ALLOWS FOR PROCUREMENT SIMPLICITY, COLLABORATIVE ENGINEERING, AND GUARANTEED QUALITY

With numerous components of varying complexity necessary to design and manufacture life science instrumentation, IDEX Health & Science streamlines your supply chain management and minimizes risk with our vertically integrated fluidic subsystems. With complete control over component channel tolerancing, we ensure full system-to-system reproducibility.

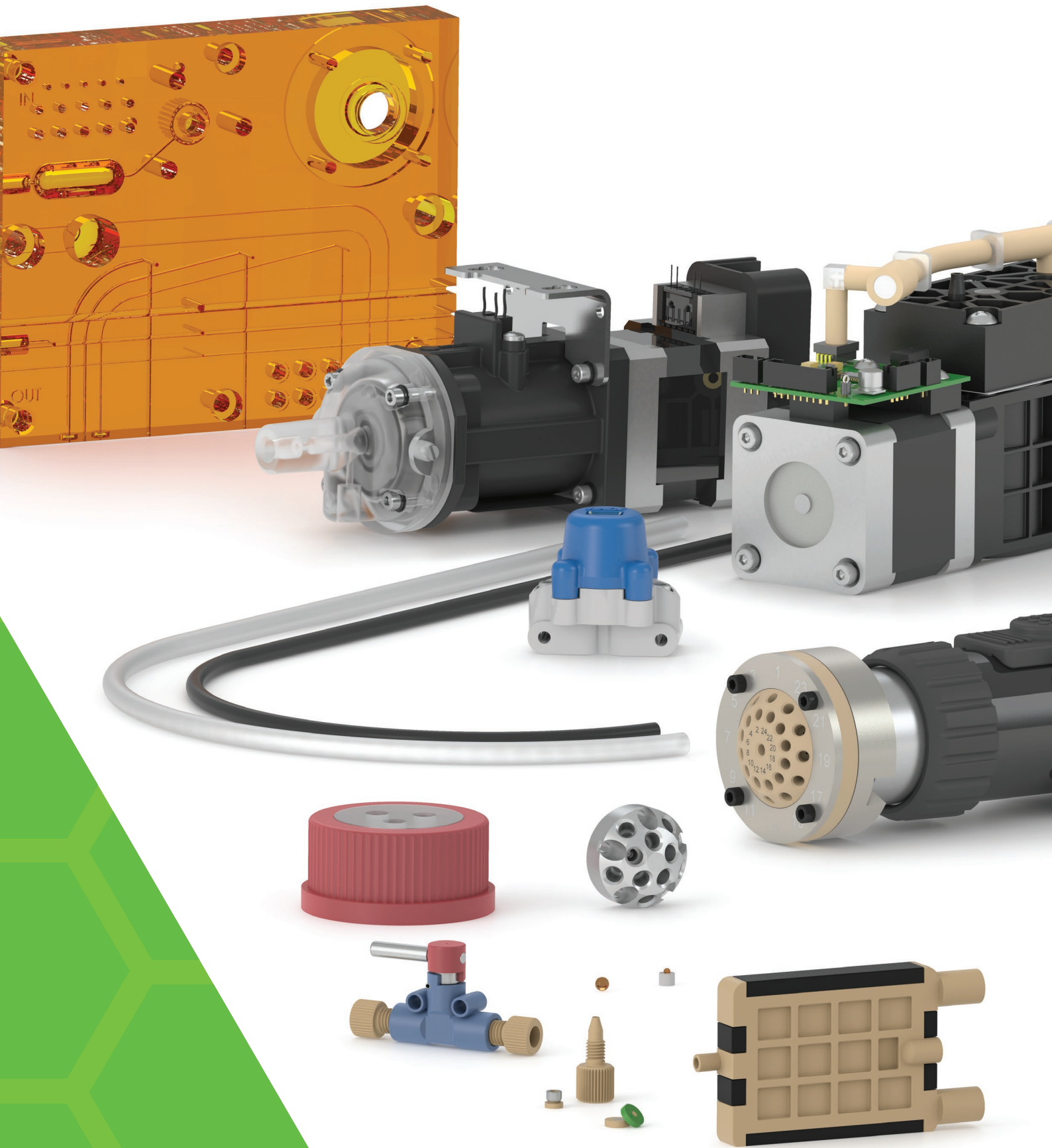
Our history and experience in life science applications allow you to avoid fluidic challenges before they arise:

- › Engineering expertise in the entire fluidic pathway
 - › 60+ years in manifolds
 - › 45+ years in rotary shear valves
 - › 45+ years in tubing and fittings

BROWSE COMPONENTS

Manifolds	8
Custom Rotary Shear Valves	10
Sensors	12
Precision Dispense Pumps	13
Degassers	14
Probe Assemblies	15
Customized Tubing	16
Customized Tubing Assemblies	17







Manifolds

ENHANCE INSTRUMENT CONSISTENCY WITH AN INTEGRATED MANIFOLD SUBSYSTEM ASSEMBLY

Instrument design often begins as a simple sketch on a whiteboard, with tubing and fittings used for early prototyping. Upgrading your design to a manifold provides an elegant, reliable solution for fluid management.

Your customized manifold becomes the heart of fluid management, from which components are incorporated to direct flow, sense pressure, and degas lines. Integrating these components into a unified architecture reduces plumbing complexity, minimizes the risk of leak points, and saves time for installation and servicing.

Many polymers are available for machined manifolds — multilayer manifolds primarily use PMMA (acrylic) for a fully transparent manifold or PEI (Ultem) for applications utilizing more aggressive reagents.

With over 60 years experience making custom manifolds, we've perfected machining and processing.

CAPABILITIES

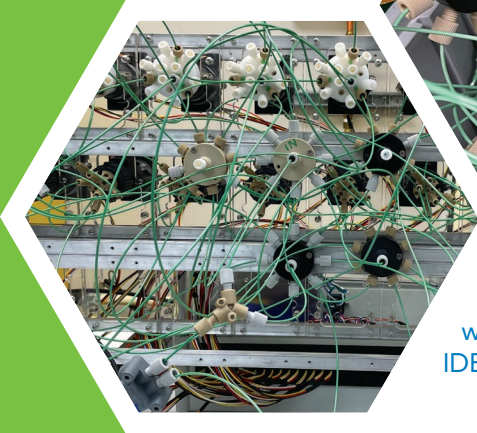
- › 0.020" channel diameter
- › 0.005" tolerancing
- › Square, round, and "D"* channels
- › 16 µin channel surface roughness
- › <20 µin external surface finish
- › 60+ years of DFM experience

*Channel curved on one side and flat on the other to form "D" shape. Most common and manufacturable channel cross-section.

ADDITIONAL BENEFITS

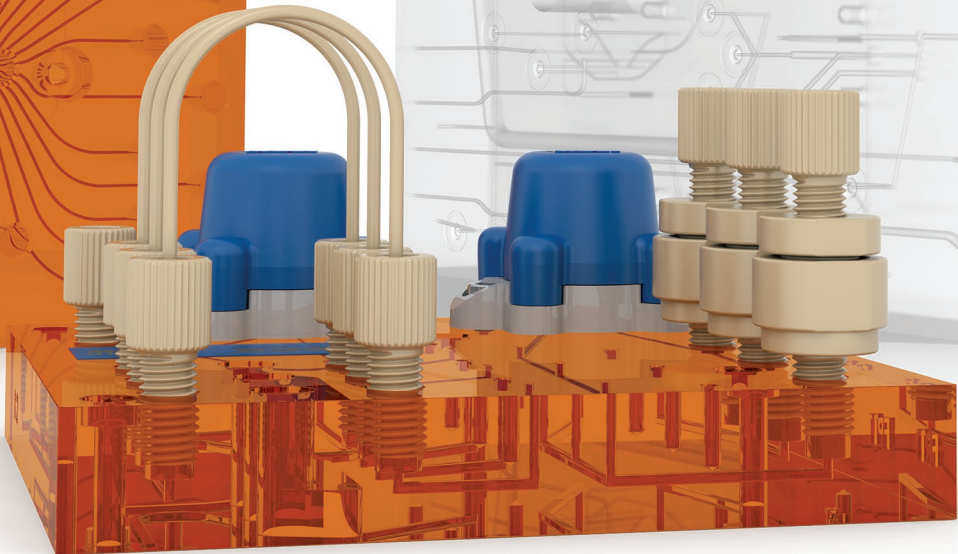
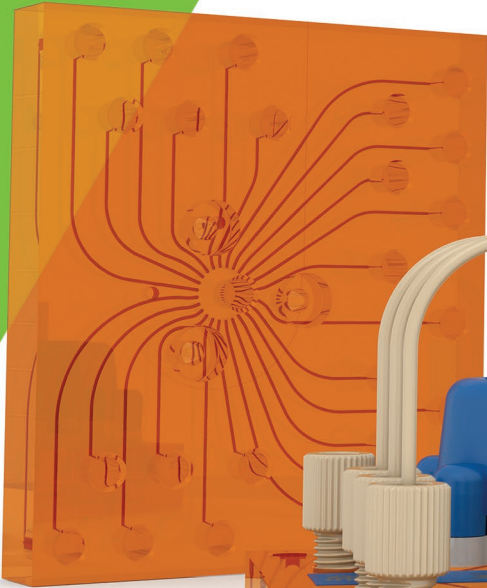
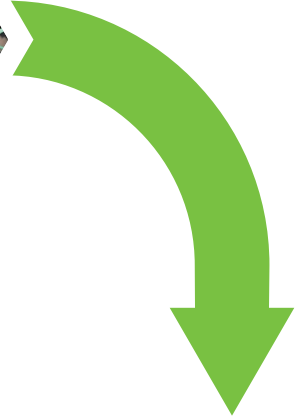
- › Consistent fluidic performance in every instrument, every time
- › Enhanced system reliability
- › Reduced complexity and the number of leak points
- › Simplified installation and servicing
- › Simplified reagent flow paths by integrating multiple fluidic components into a unified fluidic system
- › Completely customizable
- › Compact size for footprint reduction

 Learn more at [idex-hs.com/manifolds](https://www.idex-hs.com/manifolds)



Clusters of tubing and fittings can over-complicate the fluidic pathway making installation and troubleshooting incredibly cumbersome

Streamline your fluidic path and guarantee consistency with a custom manifold from IDEX Health & Science



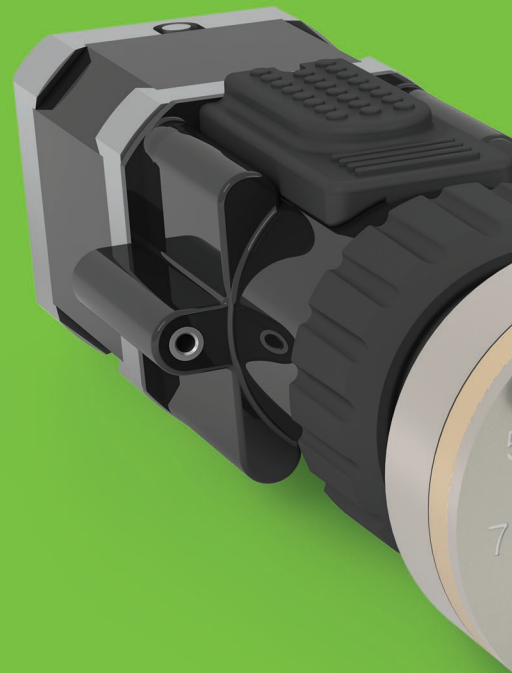
Custom Rotary Shear Valves



SEAMLESSLY MANAGE A HIGH NUMBER OF REAGENT LINES IN YOUR FLUIDIC PATH WITH ROTARY SHEAR VALVES

Streamline your complex reagent flow path with a custom rotary shear valve and integrated manifold assembly. Fully customizable rotor seals and stator materials provide the flexibility to design for cost and optimal performance. A high reagent port count offers significant cost and space savings compared to a bank of solenoid valves.

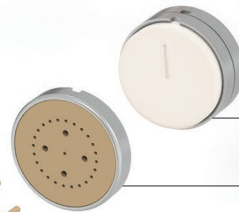
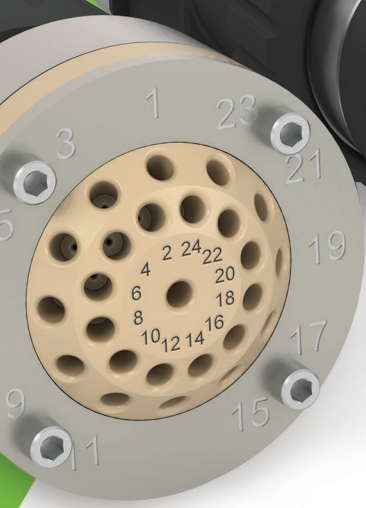
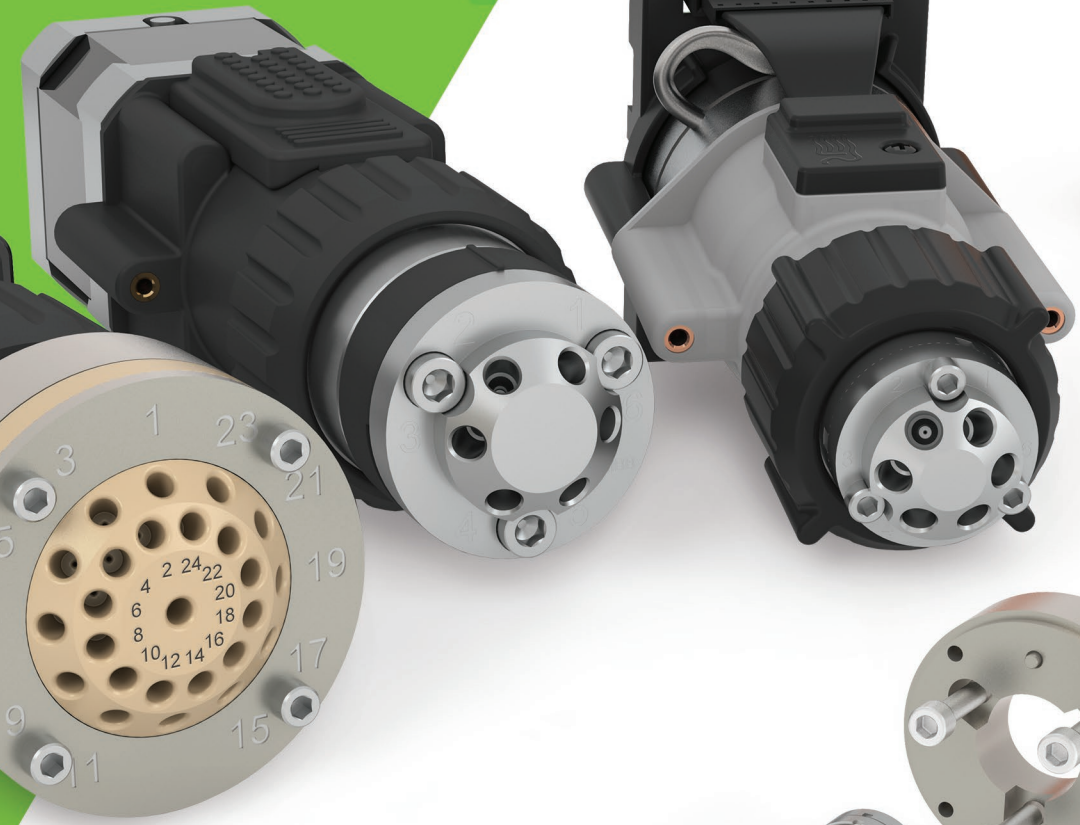
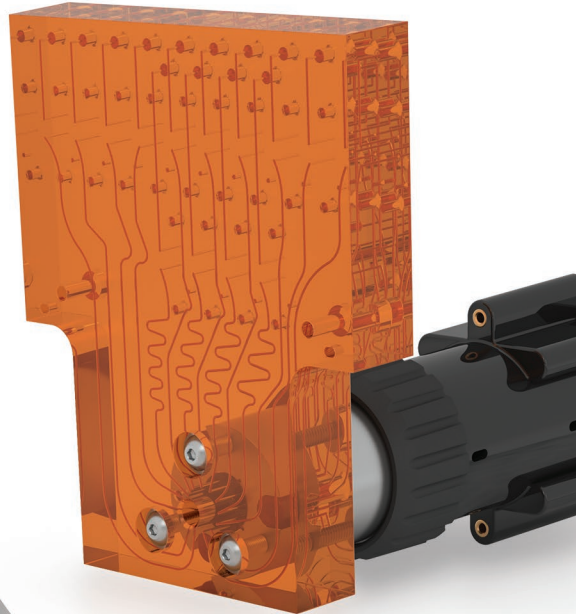
With over 45 years of experience in rotary shear valves, we work with you to create custom solutions for reagent selection.



BENEFITS OF IDEX HEALTH & SCIENCE ROTARY SHEAR VALVES:

- › Reduced reagent waste versus solenoid valves
- › Avoids unwanted reagent mixing
- › Zero dead volume
- › Cost reduction versus multiple solenoids
- › Simplified valve control reduces electromechanical complexity
- › Fast actuation speeds
- › Manifold mountable or standalone design
- › Long lifetime
- › Bio-compatible and stainless-steel options
- › Flexibility in design with control for 4 to 24 streams
- › Optional controller board and access to open-source python-powered IDEX Health & Science Library for rapid integration

 [Learn more at idex-hs.com/rotary-shear-valves](https://www.idex-hs.com/rotary-shear-valves)

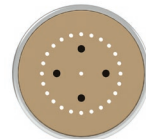


Stator Face Seal

Rotor Seal

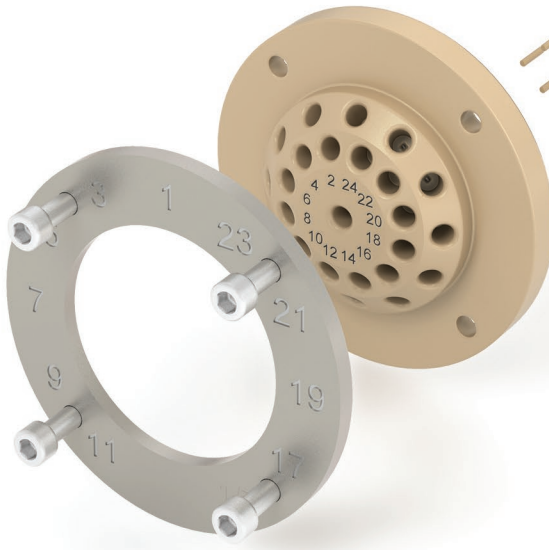
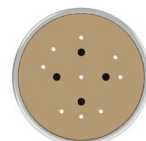
Standard Stator Face Assembly Example

Standard Rotor Seal Example



Custom Stator Face Assembly Example

Custom Rotor Seal Example



Sensors

KEEP A PULSE ON YOUR FLUIDICS WITH PERFORMANCE INLINE PRESSURE SENSING

Our inline pressure sensor provides simplicity and convenience. Featuring an extremely-low internal volume and negligible pressure compliance, this component combines an isolated fluidic pathway, electronics, and I2C communication into a small package. Easily integrate our sensor into your system for precise pressure monitoring and fluid control.

How Inline Pressure Sensors Work

A fully isolated MEMS sensing element reacts instantly to physical pressure changes of the fluid transmitted through a gel-filled cavity. Signal conditioning, analog-to-digital conversion, and I2C are provided by the onboard electronics.

FEATURES

- › Fully swept inline pathway
- › Fluid-isolated sensor
- › Low internal volume
- › Manifold mountable or 1/4-28 UNF/M6 ports
- › Factory-calibrated
- › Fully I2C compliant device

FLUIDIC APPLICATIONS

- › Fluid actuation control
- › System diagnostics
- › Adaptive fluid control
- › Overpressure monitoring

SYSTEM APPLICATIONS:

- › Molecular platforms; e.g. sequencing, protein detection, and interaction, spatial biology
- › Flow cytometry
- › Vacuum-actuated systems

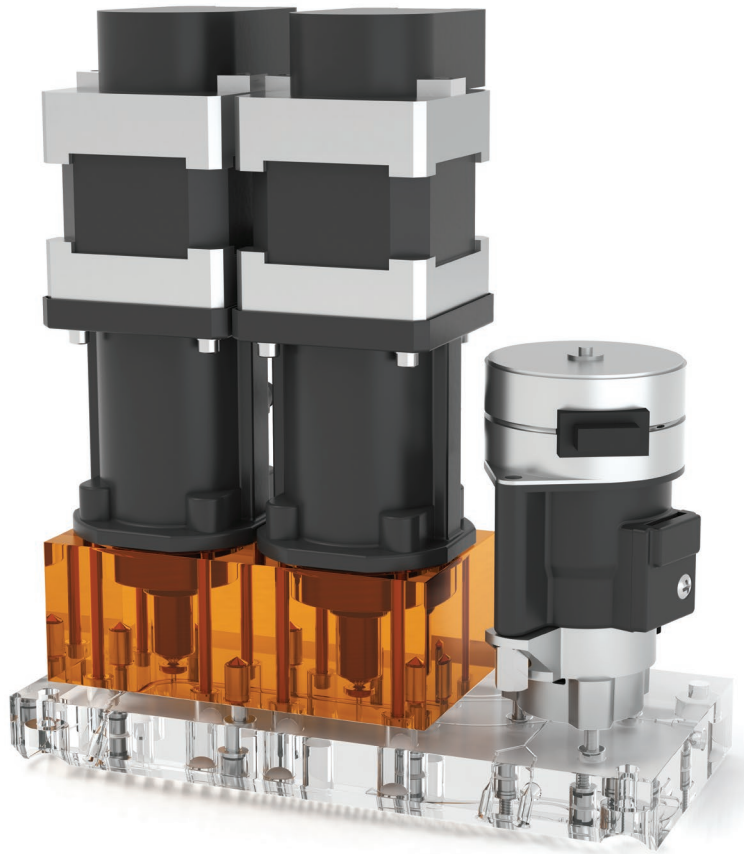


➔ Learn more at [idex-hs.com/sensors](https://www.idex-hs.com/sensors)

Precision Dispense Pumps

ACHIEVE INSTRUMENT RELIABILITY WITHOUT COMPROMISING DISPENSE PRECISION AND ACCURACY

We have proven experience in manufacturing highly-precise, motorized piston pumps for the diagnostic industry. Backed by rigorous testing, pumps from IDEX Health & Science enable you to achieve higher instrument reliability with less downtime for service. With a wide range of customization options, our pumps help you implement sophisticated fluid actuation sequences and de-risk your development efforts.

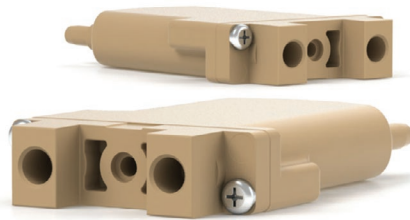


Precision Dispense Pump Features:

- › Precise fluid actuation
- › Ultra-smooth piston
- › Precision drive train
- › Stepper motor drive
- › Handle high-saline and detergent-containing fluids without extra complexity or downtime
- › Abrasion and chemically-resistant sealing technology
- › No seal wash needed
- › Position and motion feedback
- › Manifold integration
- › Custom port locations
- › Valve integration

→ Learn more at [idex-hs.com/pumps](https://www.idex-hs.com/pumps)

Degassers



IMPROVE INSTRUMENT PRECISION BY MITIGATING FLUID OUTGASSING

Degassers are a critical component of fluidic systems in reducing dissolved gasses. Dissolved gases in reagent lines can lead to bubble formation, disrupting analytical results and causing errors in your fluidic system. With inline degassers from IDEX Health & Science, you can eliminate problem-causing bubbles and ensure optimal performance of your instrument. With a fully-swept flow design, our degassers ensure minimal hydrodynamic impact allowing dissolved gas levels to be controlled easily via our adjustable vacuum pumps.

Benefits and features of degassers:

IMPROVE ANALYSIS RESULT QUALITY

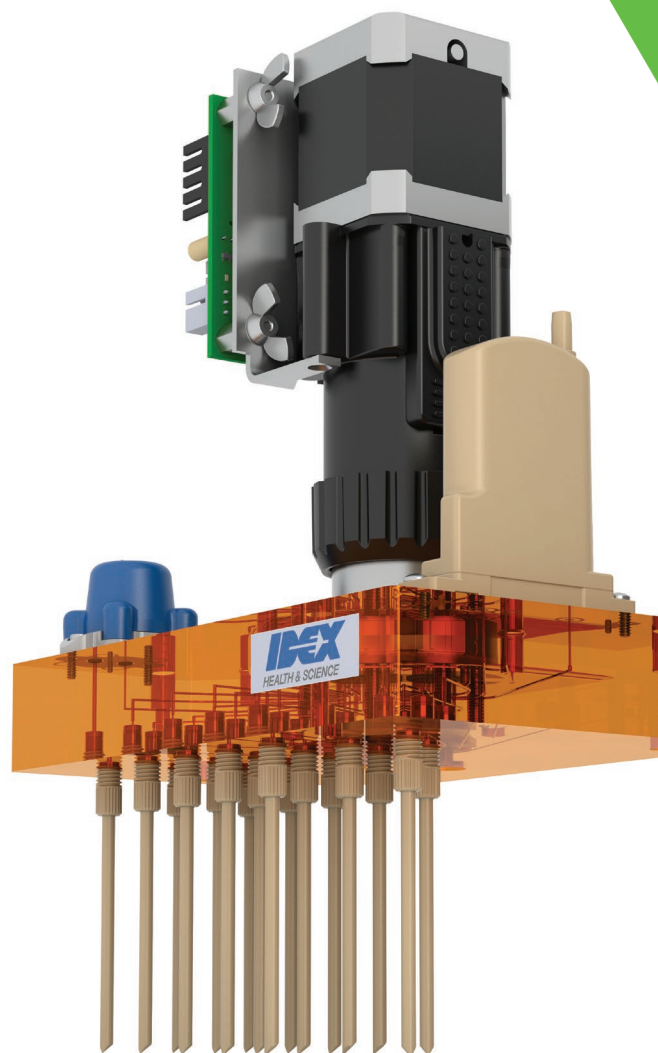
- › Efficient inline dissolved gas and air bubble removal
- › Fully-swept chamber design
- › Adjustable degassing level

INERT MATERIALS OFFER COMPATIBILITY ACROSS A BROAD RANGE OF BUFFERS AND REAGENTS

- › Silicone or Teflon AF degassing membranes
- › PVC or PEEK housing

SIMPLE INTEGRATION

- › Conventional fluidic ports
- › Compact design
- › Self-regulating, long-life vacuum source
- › High-level command set available for serial communication with vacuum pumps
- › Our newest vacuum pumps are compatible with IDEX Health & Science Library for advanced fluidic system control



➔ Learn more at [idex-hs.com/degassing](https://www.idex-hs.com/degassing)

Probe Assemblies

ENABLE SUPERIOR PRECISION AND CHEMICAL COMPATIBILITY WITH PEEK PROBE ASSEMBLIES

Our vertical manufacturing capabilities of polymer probes and assemblies allow us to control specifications and tolerances needed in today's manifolds. PEEK probes provide the strength required for repetitive use with the benefit of biocompatibility and inertness.

Probe connection capabilities:

Our history with fluidic connections allows us to specify the right connection to meet your system requirements.

CUSTOM PROBE CAPABILITIES

- › OD as large as 0.25"
- › ID as small as 0.005"

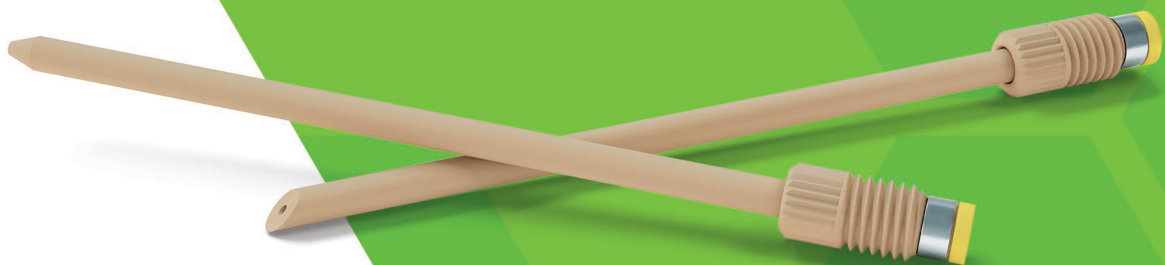
PROBE MATERIALS

- › PEEK
- › Stainless Steel

TIP GEOMETRIES

- › Trocar
- › Single and double bevel
- › Turned cone tips
- › Custom tip capabilities

➔ [Learn more at idex-hs.com/probe-assemblies](https://www.idex-hs.com/probe-assemblies)



Customized Tubing

EXCEED YOUR DESIGN REQUIREMENTS BY UTILIZING IDEX HEALTH AND SCIENCE CUSTOM TUBING CAPABILITIES

We offer a comprehensive line of custom tubing options that meet the increasingly demanding requirements of today's high-performance analytical fluidic systems.

Tubing capabilities include:

COLORS

- › Natural (Clear)
- › Black
- › Red
- › Violet
- › Yellow
- › Blue
- › Orange
- › Green
- › More available upon request

MATERIALS

- › DuPont Teflon® brand resin FEP, PFA, PFA high purity, PFA high purity plus
- › Tefzel (ETFE)
- › PEEK
- › Additional materials and custom blending available upon request

DIMENSIONS

- › Outer diameter range: 360 µm to 7.9 mm
- › Inner diameter range: 20 µm to 6.4 mm
- › ±25 µm typical ID/OD tolerances for 1.6 mm OD tubing
- › ±75-100 µm typical ID/OD tolerances for 3.2 mm OD tubing

→ [Learn more at idex-hs.com/custom-tubing](https://www.idex-hs.com/custom-tubing)

Customized Tubing Assemblies



STREAMLINE YOUR SYSTEM MANUFACTURING WITH CUSTOM TUBING ASSEMBLIES

We are the premier provider of intelligently engineered fluidic assemblies for a wide range of life science applications that require precise control and measurement.

TUBING

- › Material, color, size, pre-formed shape

FITTINGS

- › Material, threads, color, style
(Flanged, Flangeless, and Super Flangeless)

CUSTOM IDENTIFICATION

- › Labels, heat-shrink bands, pad printing to reflect company name, part number, and product revision level

→ Learn more at
[idex-hs.com/
tubing-assemblies](https://idex-hs.com/tubing-assemblies)



Computational Fluid Dynamics: Simulation

ACCELERATE YOUR INSTRUMENT TO MARKET WITH FLUIDIC SIMULATION

Modeling fluidic flow is essential when considering development costs and time to market. Without a preemptive and proactive fluidic analysis, the product development approach inevitably used is "cook-and-look." This happens when one designs a fluidic system, orders the fluidic system, tests the fluidic system, and hopes that it works on the first run. Experience shows that the cook-and-look approach will unavoidably result in multiple prototype iterations, significantly increasing costs and delays to market.

Using computational fluid dynamic modeling, IDEX Health & Science offers instrument developers an option to analyze how their fluidics

will operate before committing to expensive prototypes. Developers in this space can characterize the functionality of their hardware in weeks instead of months in the prototyping feedback loop. Start your project on the right foot with fluidic simulation and modeling with IDEX Health & Science.

Typical characteristics we look for include:

- › Back pressure
- › Flow rate
- › Mechanical stress
- › Unswept volume
- › Cross contamination
- › Fluid forces
- › Mixing
- › Dilution
- › Advection

The diagrams below are computational models simulating fluid flow rate, pressure, forces, and mechanical stress run on complex flow paths.

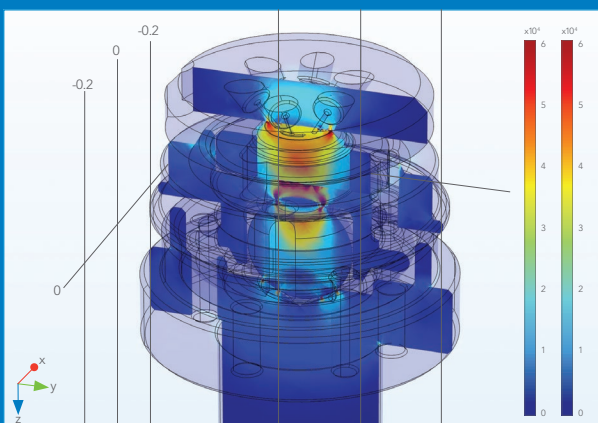


Figure 1: Slice von Mises stress (psi); Surface von Mises stress (psi)

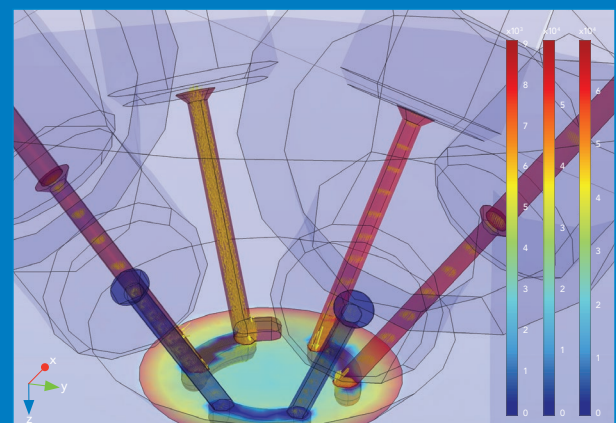
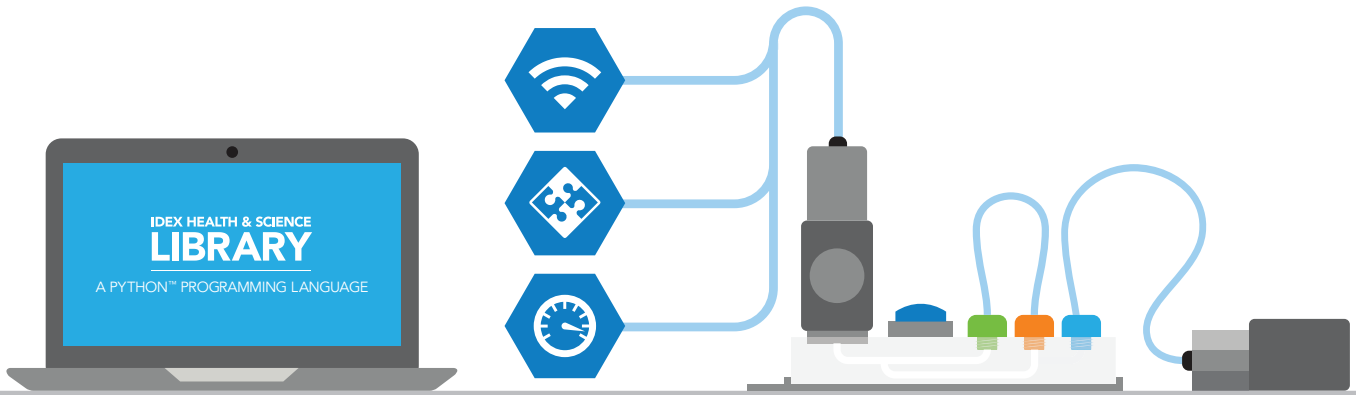


Figure 2: Surface pressure (psi); Surface shear stress (psi); Arrow volume velocity field (spatial frame); Surface contact pressure (psi).



IDEX Health & Science Library, a Software Package Using Python™ Programming Language

STREAMLINE AND SPEED UP YOUR FLUIDIC SYSTEM INTEGRATION

Programming and integrating fluidic hardware components can be a major time burden. Without devoted resources and a specialized team to handle the coding necessary for complex tasks and equipment functions, your instrument development schedule may be unnecessarily delayed. Configuring hardware and interactions without knowledge of the specific components and compatibility may seem like a daunting challenge. Overcome these hurdles with our new IDEX Health & Science Library.

Benefits of the IDEX Health & Science Library:

- › Powerful syntax, easy-to-use for fast development
- › Allows for complex logic programming and data processing
- › Simplified out-of-the-box experience for quickly programming IDEX pumps, valves, degassers, and sensors
- › Fast edit-test-debug cycle



Download the IDEX Health & Science Library* at [idex-hs.com/library](https://www.idex-hs.com/library)

*Must be an existing IDEX Health & Science customer.

Product Development Process

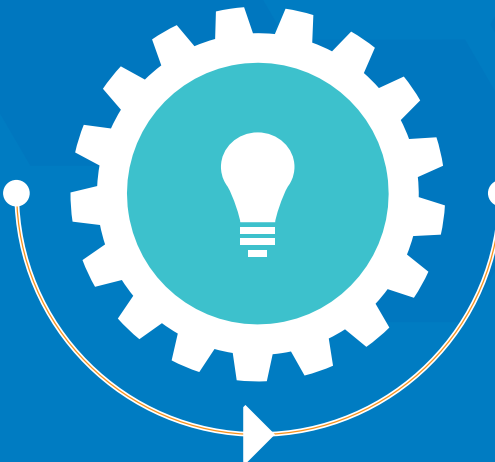


LAUNCH PRODUCTS MORE EFFECTIVELY

Using our proven process, we solve your unique problems by innovating projects through efficient product development. We deliver quality technology on time to secure your success in highly competitive markets. The more complex a system, the more complicated the process required to build it becomes. We simplify product development with our disciplined process, aligning our expertise with your business objectives to efficiently and seamlessly take you from conception to market.

New Project Proposals

WE WILL REVIEW YOUR REQUEST AND JOINTLY SCOPE THE PROPOSED PRODUCT



Feasibility Phase

WE EVALUATE THE TECHNICAL FEASIBILITY OF YOUR DESIGNS AND IDEAS



Business Phase

WE PERFORM A TECHNICAL ASSESSMENT AND ALIGN ON DEVELOPMENT COSTS AND PROJECT SCOPE

Your Roadmap and Our Plan

Through conception and prototyping to final production stages, we solve complex problems with you to advance your vision. We seamlessly bring your complex instrument designs to life through IDEXology and agile engineering, allowing you to design tomorrow's technology today.

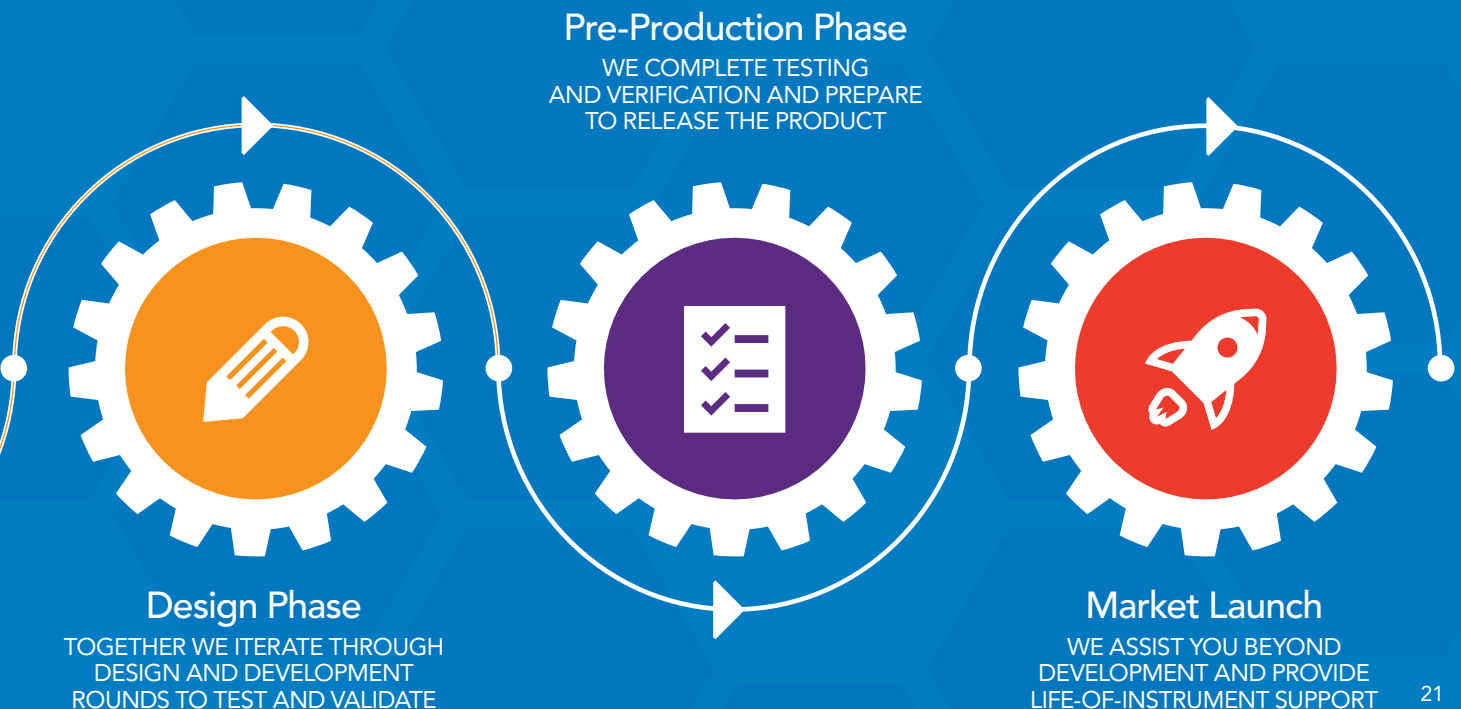
DEDICATED PROJECT MANAGEMENT

When designing, manufacturing, and releasing a complex fluidic instrument, efficient time to market is key for instrument developers. We have partnered on hundreds of collaborations, and we understand the key to successfully bringing a new platform to market on time and in budget is through the utilization of dedicated project management. When you partner with IDEX Health & Science, a cross-functional team of engineering, supply chain, and operations personnel is assigned to your project, with a dedicated project manager to coordinate the project from start to finish.

BENEFITS OF PARTNERING WITH US

- › Single point of contact for internal and external communication
- › Team management through our Product Development Process (PDP)
- › Resource needs identification
- › Budget tracking through each phase of the PDP
- › Project timeline management
- › Risk and issue management
- › Project advocate and champion
- › Reduced development time
- › Guaranteed consistency and increased system reliability

➔ Learn more partnering with IDEX Health & Science at idex-hs.com/IDEXology



Manufacturing & Quality

WE ARE YOUR HIGH-QUALITY SINGLE-SOURCE PARTNER FOR THE ENTIRE FLUIDIC PATHWAY

The accuracy and precision of any instrument in the in vitro diagnostic and biotechnology field is heavily, if not completely, reliant on the tools of the fluidic management system. Our manufacturing facilities utilize the latest technologies to ensure market-leading capabilities. From precision molding and 5-axis CNC automation, to clean assembly and reliable product quality control, IDEX Health & Science possesses a full spectrum of capabilities to fulfill the needs of customized life science and IVD instrumentation.

Having the technology available to meet the precise specifications of our customers is a critical aspect of being an effective partner, but is only one piece of the puzzle. Understanding critical parameters and being able to translate them into manufacturable and scalable solutions is a critical facet that can make or break a platform. IDEX Health & Science R&D engineering works closely with the manufacturing engineering and operations teams from the very beginning of every project to ensure design for manufacturability is considered, from initial conception through full production and platform launch.

HIGH QUALITY STANDARDS

IDEX Health & Science ensures the quality of both new and existing product designs using Statistical Quality Control (SQC) methods to monitor our processes. We are committed to providing top-quality components and subassemblies. We pride ourselves on our commitment to quality and reliability. This is why we've undertaken accreditation from the International Organization for Standardization (ISO) for ISO 9001:2008.

OPERATIONAL EXCELLENCE

- › Six Sigma
- › 5S
- › Kaizen
- › Documented and benchmarked processes
- › Routine audits
- › Sophisticated, accurate measuring and inspection equipment
- › Statistical Quality Control (SQC) methods
- › Lean manufacturing
- › Value stream mapping
- › Visual controls
- › One piece flow
- › Team building
- › Quality at the source
- › Quick changeover and setup reduction
- › Kanban and pull systems
- › Cellular manufacturing
- › Total productive maintenance
- › Continuous Improvement and Kaizen

Global Leaders

YOU SEE INNOVATION, WE SEE INTEGRATION

Whether you're pursuing a complex consumables design or a life-of-instrument flow cell, we support and guarantee your success with extensive experience that unites the intersections of fluidics, optics, and chemistry. We are a strong force of committed people and innovative products for your complete optofluidic pathway, continually increasing our product offering, expanding our market relevance by connecting to new customers, and positioning ourselves as global leaders in optofluidics engineering.

WORLDWIDE OPTOFLUIDICS

As a global company, IDEX Health & Science has an international network of direct sales professionals and distribution partners in place to provide personal service to every customer. Our experts are ready to visit your operation, assess your needs, and develop intelligent solutions for your challenges.

CORPORATE RESPONSIBILITY

IDEX Health & Science is committed to preserving the environment. Our continuous improvement programs hold our facilities accountable to reduce waste, prevent pollution, and conserve resources. Many products comply with REACH and RoHS regulations.



North America

Bristol, CT, USA
Carlsbad, CA, USA
Middleboro, MA, USA
Oak Harbor, WA, USA
Rochester, NY, USA
Rohnert Park, CA, USA

Europe

Zweibrücken, Germany

Asia

Saitama, Japan
Shanghai, China

Beijing, China



For ordering and technical support,
please visit [idex-hs.com/partner](https://www.idex-hs.com/partner)