

COVID-19 SOLUTIONS

Comprehensive Optofluidic Solutions
for Coronavirus Related Analytical
Instrument Development

We Help You Scale Quickly and Go To Market Faster with Proven Optofluidic Solutions

We work with companies around the world who are creating new assays and instrument platforms to combat the COVID-19 pandemic in these core specialties:





We're Optofluidic Experts Who Protect Your Projects From Risk

We are component and system-level experts who understand the critical inter-dependencies between microfluidics, fluidics, optics, and integrated sub-assemblies. We specialize in the complete optofluidic pathway to help you avoid risks and are uniquely positioned to solve even the most demanding challenges in a wide array of applications.

We Enable Key Technologies to Fight the COVID-19 Pandemic

From the characterization of the new SARS-CoV-2 virus to mass testing, IDEX Health & Science is playing a critical role in supporting our customers whose instruments are being used 24/7 in the fight against COVID-19. We work with diagnostic, sequencing, and biotech companies around the world who are creating new assays and instrument platforms to combat the pandemic. Meanwhile, we are working diligently in compliance with new protocols to ensure employee safety and on time delivery to our customers.

COVID-19 Solutions

IDEX Health & Science is proud to be a part of the fight against COVID-19 by enabling critical health-related applications with vital optofluidic components and subsystems.



VIRUS IDENTIFICATION & EVOLUTION MONITORING

Next Generation
DNA Sequencing

We help you achieve high resolution imaging and precise rapid reagent cycling to drive sequencing throughput.

**PAGES
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MOLECULAR DIAGNOSTICS

Point of Care Testing
(PCR, ddPCR,
LAMP, and CRISPR)

We enable increased fluorescence detection sensitivity and de-risk your microfluidic development with reduced costs and simplified workflows.

**PAGES
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CRITICAL PATIENT DIAGNOSTICS

Immune Response
and Clinical Chemistry

Our experts simplify instrument design to maximize performance of reagent chemistries with optimized fluidic subsystems and components.

**PAGES
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NEW DRUG DEVELOPMENT

Vaccine Development,
Therapeutic Drug
Development, and
Clinical Trial Diagnostics

We enable bioinert
flow paths for LC/MS
analysis that help
shorten time to market
for therapeutic
drug development.

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PUBLIC DISEASE CONTROL & PREVENTION

Water Quality Monitoring
Food Safety Inspection
Environmental Monitoring

We ensure you can
achieve accurate
and reliable test
measurements in a
highly-efficient and
compact manner.

PAGES
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I could not be
prouder of our
employees as
they deliver on
our mission and
take care of each
other during these
extraordinary times.”

JOE RYTELL, PRESIDENT
IDEX HEALTH & SCIENCE



Our NGS Expertise

IDEX Health & Science has long played an enabling role in Next Generation DNA Sequencing with our fluidic and optical products and strong engineering partnerships with sequencing companies. DNA sequencing manufacturers rely on our experts to design and manufacture fluidic and optical components and sub-systems.

① Integrated Fluidic Solutions

Enhance your NGS capabilities with integrated fluidic subsystems that differentiate.

- Minimize external connections and possible leak paths
- Reduce complexity with many modular components united in a flow path
- Simplified assembly and manufacturing service
- Enhance performance

② Low-Volume High-Precision Fluidic Components

Get better results with the most reliable, proven components on the market.

- Reagent selection valves
- Dispense pumps
- Flow cells
- Connection tubing and fittings
- Probes and modular pressure sensors

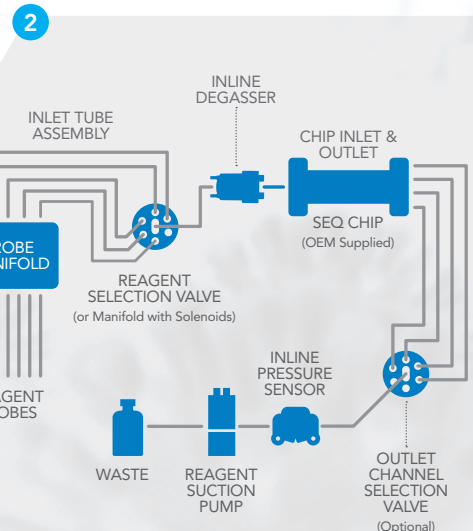
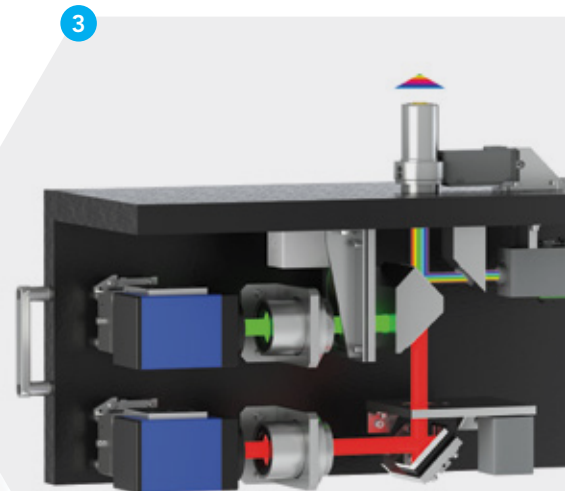
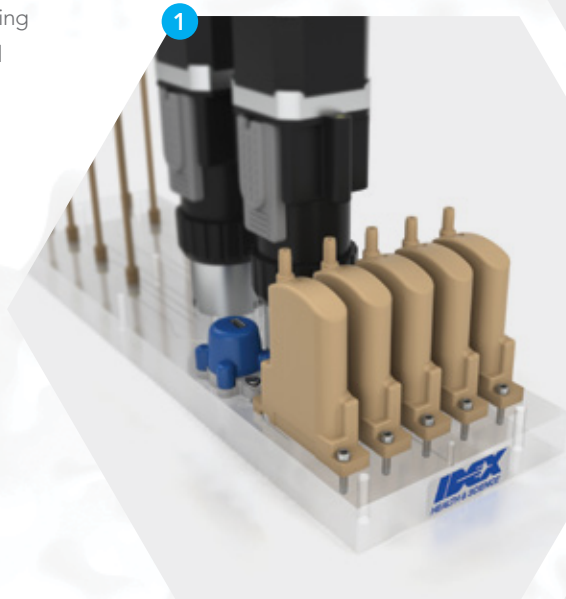
Virus Identification and Evolution Monitoring

The discovery and early identification of SARS-CoV-2, the coronavirus that causes COVID-19, was made possible by Next Generation DNA Sequencing technology (NGS). This discovery was made very quickly after the disease outbreak and was the all-important first step in identifying the virus genome. Sequencing allows for the testing and treatment development processes to kick into high gear. Continual monitoring of the global virus spread and identification of mutations are conducted using NGS tools.

3 Integrated Optical Solutions

Balance performance and cost with wide-ranging, diverse technology optical systems.

- Source-to-sensor imaging
- Custom objectives and tube lenses
- Multi-wavelength wide-field illumination
- SCMOS and CCD detectors
- Autofocus
- Optical filters
- High NA, diffraction limited wide-field objectives
- Laser diode/LED wide-field illumination with flat-top beam shaping
- Autofocusing
- Pre-aligned drop-in assemblies
- Filter wheels and switchers





Molecular Diagnostics

Many molecular diagnostic tests are possible due to a technology known as polymerase chain reaction, or PCR. The invention of PCR more than 30 years ago is considered one of the greatest inventions of the last century. It's a procedure in which millions of copies of a pathogen's genetic material are made so they can be detected from a patient sample. It's essentially an amplification method, whereby small amounts of genetic material that may be present in patient samples can be increased so that there is enough for analysis. Testing is crucial to stem the spread of COVID-19 because it allows for understanding disease prevalence and the effectiveness of countermeasures. This is a critical step in mitigating the spread so that COVID-19 does not overwhelm healthcare systems.

1



Our Point of Care Testing Expertise

We work with many diagnostic companies around the world creating new molecular assays and instrument platforms to combat COVID-19. Our line of Semrock optical filters are utilized in many optical systems to improve detection sensitivity by separating the signal from the noise and for selecting a targeted wavelength of light emitted from a diagnostic probe. In addition, our microfluidics solutions provide instrument manufacturers with high-precision devices for the critical manipulation of molecular fluids and reagents.

2



3



1 High-Precision Dispense Pumps

Dispense small and large quantities of fluids with precision and accuracy.

- Long-life precision dispensing
- Designed for use in a range of clinical, analytical, and laboratory instruments
- Dispense pump volumes from 100 μ L to 5 mL
- Dispense pump lifetimes designed for 5 million cycles



2 Optical Filters

Push the limits of signal-to-noise in your instrument design with our Semrock optical filters.

- BrightLine® fluorescence, RazorEdge® Raman spectroscopy, StopLine® notch, VersaChrome® tunable, and Polarization bandpass
- Hard-coated sputtered thin-film coatings with patented designs
- Steep edges maximize bandwidth
- High transmission or reflection captures every photon possible
- Deep and extended blocking capabilities out of band
- Optimized to your application
- Reduced noise and minimized crosstalk between channels

3 Rotary Shear Valves

Achieve advanced fluid-handling solutions with versatility, reliability, repeatability, and easy maintenance.

- Diagnostics & biotech applications
- Small internal swept volume
- No fluid pumping when actuated
- No temperature change to the fluid
- Directly manifold mountable
- Custom flow paths patterns

4 Microfluidics Solutions

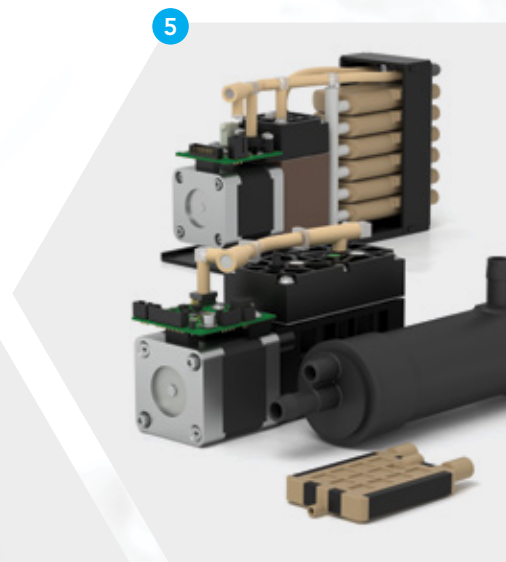
Identify, measure, and research biology with microfluidic cartridges that control complex assays.

- From functionalized flow cells and droplet generators for next generation sequencing, to complex sample-to-answer solutions for point-of-care or in-field testing, we miniaturize an entire laboratory setup into a single device
- On-card reagents, pumps, valves, sensors, and optical interfaces
- Highly-precise microfluidic devices and consumables used for molecular detection of the COVID-19 virus

5 Degassing

Prevent anomalies in data and increase overall productivity.

- Counteract out-gassing that can affect the validity, economics, and even the regulatory approval of your product.
- Improve dispensing precision for manufacturing and production lines
- Gain accuracy and repeatability





Our Immune Response and Clinical Chemistry Expertise

IDEX Health & Science has a long history of enabling technologies that have a direct impact on patient care, evolving clinical chemistry and immunoassay testing in the core clinical laboratories. One of our customers produces an immunoassay analyzer that allows physicians to rapidly monitor the progression of cytokine release in the body. The analyzer, which relies on critical microfluidic consumables from IDEX Health & Science, helps to identify the optimal time to introduce potential therapies that can end the uncontrolled release of cytokines and allow for the recovery process to begin.

① Comprehensive Fluidics Solutions for Core Lab IVD Analyzers

When it comes to clinical diagnostic laboratory instruments, we deliver all kinds of critical fluidic products that work across the flow path. This makes reliable system performance possible to deliver the best testing results.

- High precision sample and reagent dispense pumps
- Reagent selection valves
- Fluidic manifolds for compact design
- Degassers to prevent bubble formation in the flow path
- Tubing assemblies for reliable flow connection
- QuickStart™ Modular Pressure Sensors



Critical Patient Diagnostics

When the COVID-19 crisis hit, the global medical community began to use our customer's assay technology to track disease progression in the most critically ill patients. One of the most severe and potentially life-threatening symptoms of the virus is known as the cytokine release syndrome, or "cytokine storm," which is when an infected patient's immune system is induced to go into overdrive to attack the viral infection. The immune system can become uncontrolled and lead to multiple organ failure, which can be fatal. Until there is a vaccine or anti-viral medications for COVID-19, the treatment for hospitalized patients is to help alleviate their symptoms.

2 Multiplex Immunoassay Microfluidics Cartridge

Although microfluidic consumable devices are undeniably complex, our experts make it easier to develop the right components for your application and testing needs.

- Microfluidic channels enable high-sensitivity with a small sample size
- Complex fluid pathways are replicated in one device for high-throughput
- Consistent microfluidic channels enable low assay variability
- On-card reagents and waste eliminate cross-contamination risk and instrument cleaning
- Combination of multiple materials like Plastics, PDMS, PSA, and glass empower reduced user-workflow and faster results
- Active control microdevices include valves, pumps, debubbling, mixing, and more





New Drug Development

With the advent of SARS-CoV-2, pharmaceutical and biotech companies quickly aligned to devote significant resources into vaccine and therapeutic drug development. In support of these activities, multiple types of advanced analytical technologies, such as UHPLC and Mass Spectrometry, have been put into service in research labs to increase throughput and the pace of discovery.

Our Therapeutic Development Tools Expertise

The SARS-CoV-2 pandemic has only emphasized the need for accessible, real-time process data to help accelerate biological drug development. In addition to developing core technologies that enable cutting-edge HPLC and mass spectrometry bioanalyses, IDEX Health & Science understands the complex applications and pressing challenges faced by users in the biopharmaceutical industry. Our user-focused approach led to the development of the Tridex™ Protein Analyzer, a platform which leverages a range of optofluidic technologies including our bioinert components. Tridex™, the first purpose-built solution for antibody titer in bioprocessing, has already been adopted by leading pharmaceutical companies which are developing lifesaving SARS-CoV-2 vaccines and therapies.

1 Tridex™ Bioprocessing Titer Monitoring

Our Tridex™ protein analyzer enables accurate real-time IgG titer measurement aiding in the development and manufacture of biologic drugs.

Tridex is a complete solution for upstream applications in R&D, process development, and full-scale manufacturing, that provides significant advantages:

- Reliable titer measurements in just five minutes
- No sample manipulation required
- Simple operation so you can be up and running in minutes
- Space-saving compact design

2 BioVersal™ Bioinert Solutions

Our BioVersal™ series of fluidics components are the best fit for biological analyses and are ideal for protein and peptide analysis.

- Optimize sample recovery and reduce carryover with bio-inert PEEK and PEEK-lined components
- UHPLC capable PEEK-lined column hardware for fast bio-separations
- Trouble-free bio-inert connections up to 131MPa without tools



1



Tridex™

2

BioVersal™





Our HPLC Expertise

HPLC is one of the proven technologies that allows analysts to separate a sample of known- or unknown-composition into its components, and then quantify how much of each component is present in the sample. Together with Mass Spectrometry, HPLC is the most recognized advanced method used in quality control labs and academic research centers globally. As a trusted HPLC solution provider, IDEX Health & Science has built a strong partnership with major OEM players worldwide to offer innovative fluidic components across the entire system flow path.

① Fluidic Subsystem for Mass Spectrometry

We create a wide range of purpose-built fluidic front-ends for sample handling and processing.

- Pressure handling up to 5,000 psi
- Flow rates up to 1,000 $\mu\text{L}/\text{min}$
- Extensive valve options
- Seamless integration with instrument UI
- Available Materials: PEEK, Ultem, Stainless Steel and Sapphire

② Fluidics Components for HPLC:

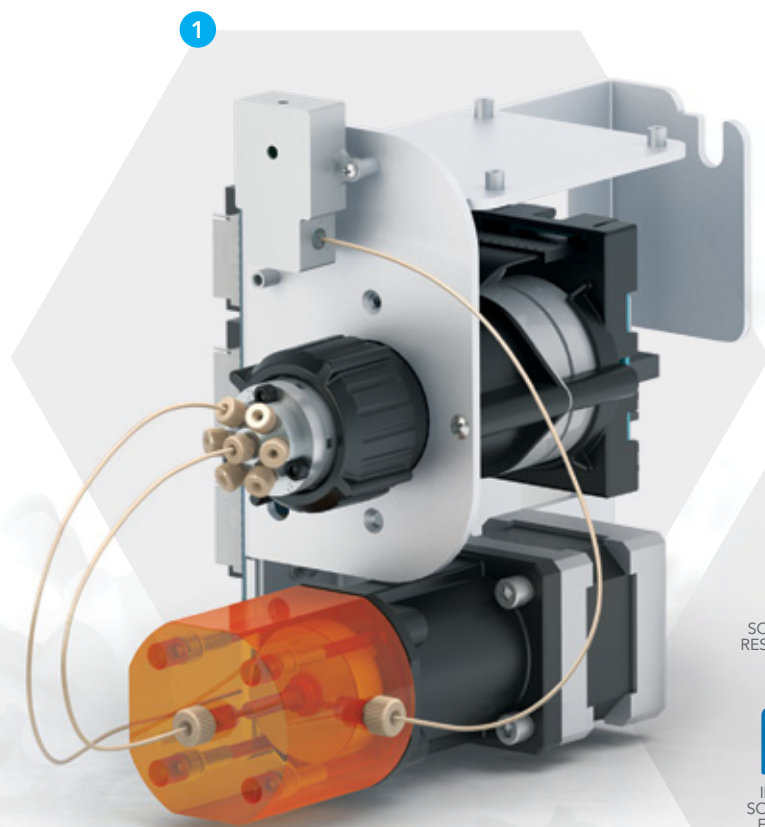
We are world authorities in components that make HPLC more reliable and user friendly.

- Ultra-precise tubing assemblies
- Engineered bio-inert polymers
- Connection solutions for ease-of use and repeatability
- Wide variety of world-class rotary shear valve options
- High efficiency, constant performance degassers



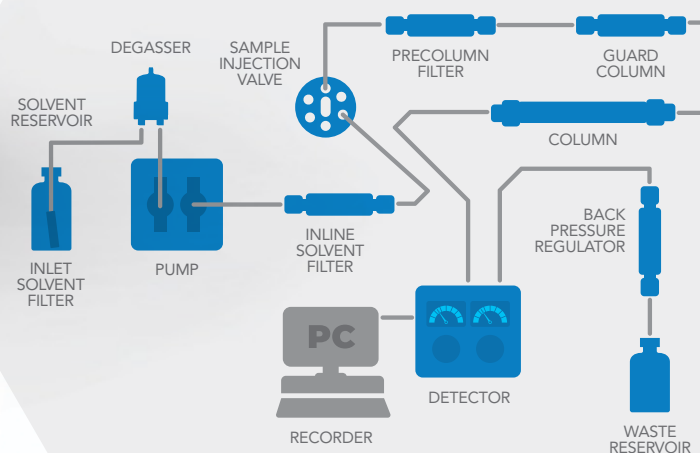
Public Disease Control and Prevention

It is anticipated that the COVID-19 battle will be many rounds of continuous activities throughout the world. As events emerge, a crucial element to the success of these activities is improving public disease control and prevention. This involves increased regulations for food safety, water, and environmental monitoring which depend heavily on the reliable performance of various monitoring analyzers and quality control analytical instruments.



2

Typical HPLC System



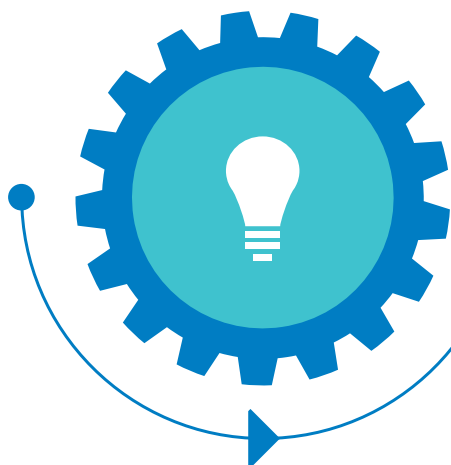
Product Development Process

Launch Products More Effectively

Using our proven process, we solve your unique problems by channeling projects through efficient product development. We deliver quality technology on time, to secure your success in highly competitive markets. The more complex a system becomes, the more complicated the process required to build it becomes. We simplify product development with our disciplined process that aligns our expertise with your business objectives to take you from conception to market easier. Below is a glimpse of what our development process looks like:

New Project Proposals

WE WILL REVIEW YOUR
REQUEST AND JOINTLY SCOPE
THE PROPOSED PRODUCT



Feasibility Phase

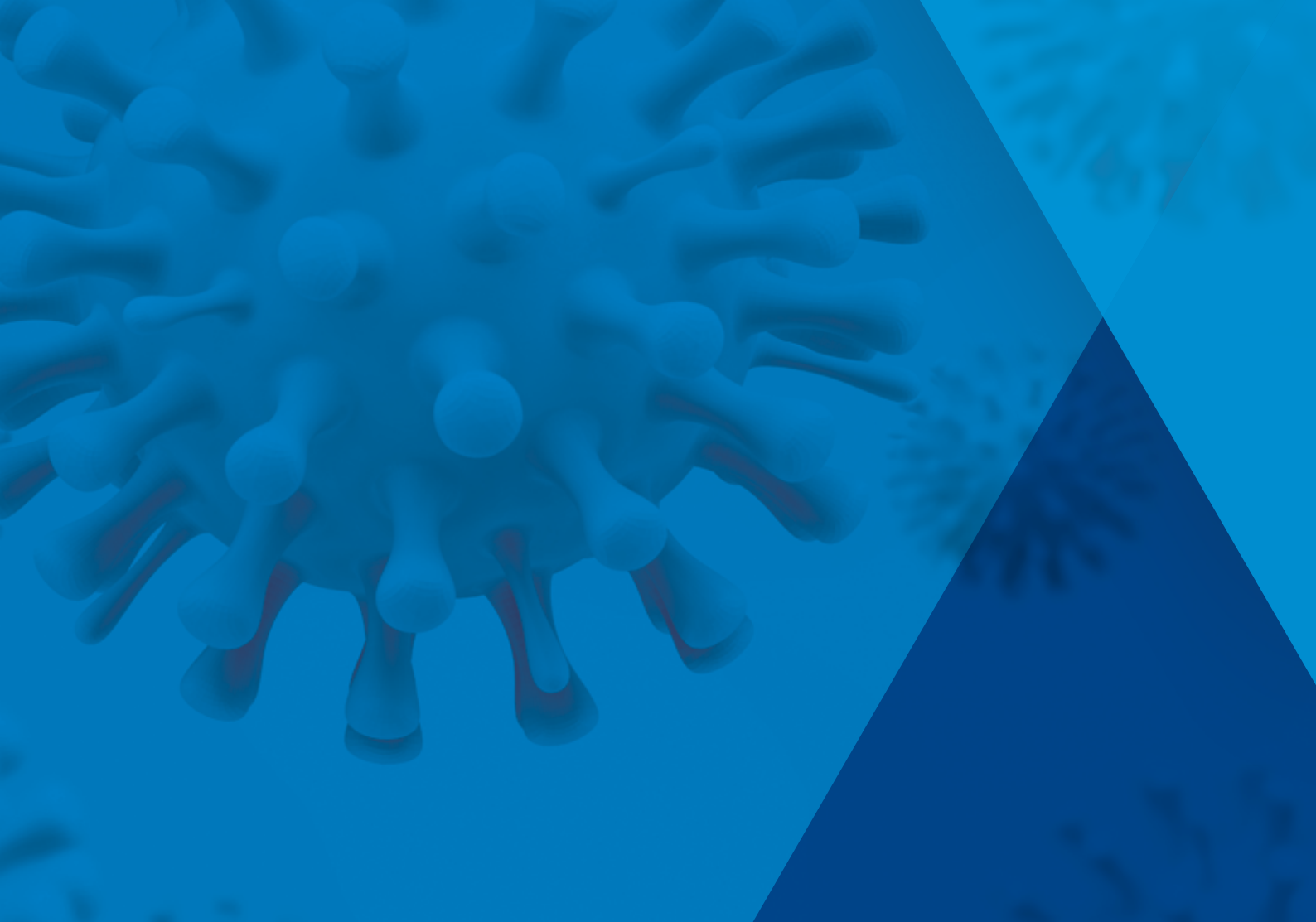
WE EVALUATE THE
TECHNICAL FEASIBILITY OF
YOUR DESIGNS AND IDEAS



Business Phase

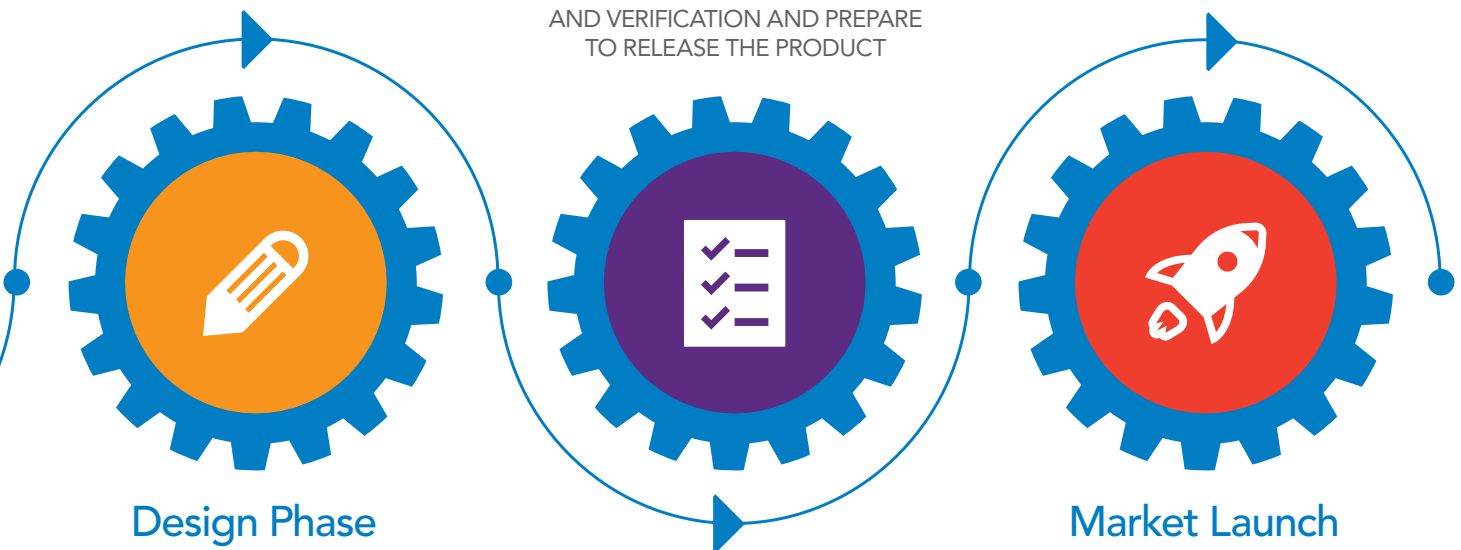
WE PERFORM A TECHNICAL
ASSESSMENT AND DEVELOP
A BUSINESS CASE





Pre-Production Phase

WE COMPLETE TESTING
AND VERIFICATION AND PREPARE
TO RELEASE THE PRODUCT



Design Phase

TOGETHER WE ITERATE THROUGH
DESIGN AND DEVELOPMENT
ROUNDS TO TEST AND VALIDATE

Market Launch

WE ASSIST YOU BEYOND
DEVELOPMENT AND PROVIDE
LIFE-OF-INSTRUMENT SUPPORT

Manufacturing & Quality

We Are Your High Quality Single-Source Partner for the entire optofluidic 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 are critical facets that can make or break a platform. IDEX Health & Science R&D engineering works closely with your 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

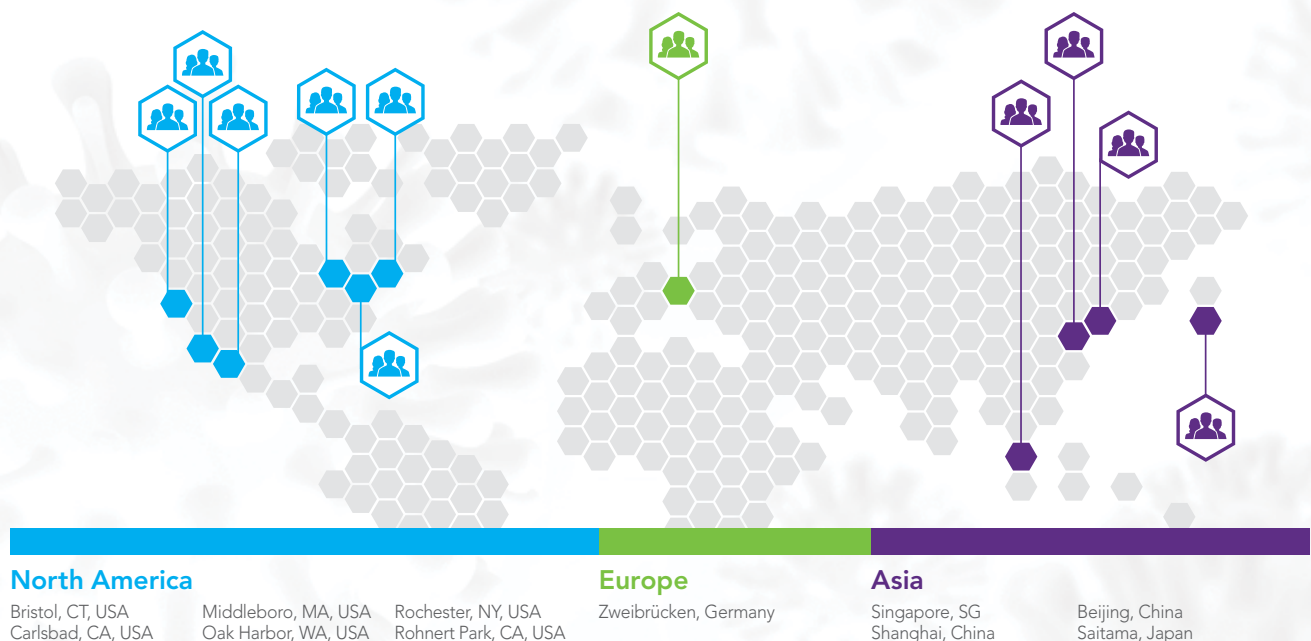
Whether you're pursuing a component or complex instrument design, we support and guarantee your success with extensive experience that unites the intersections of fluidics, optics, chemistry and biology. We are a strong force of committed people and innovative products for your complete optofluidic pathway,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

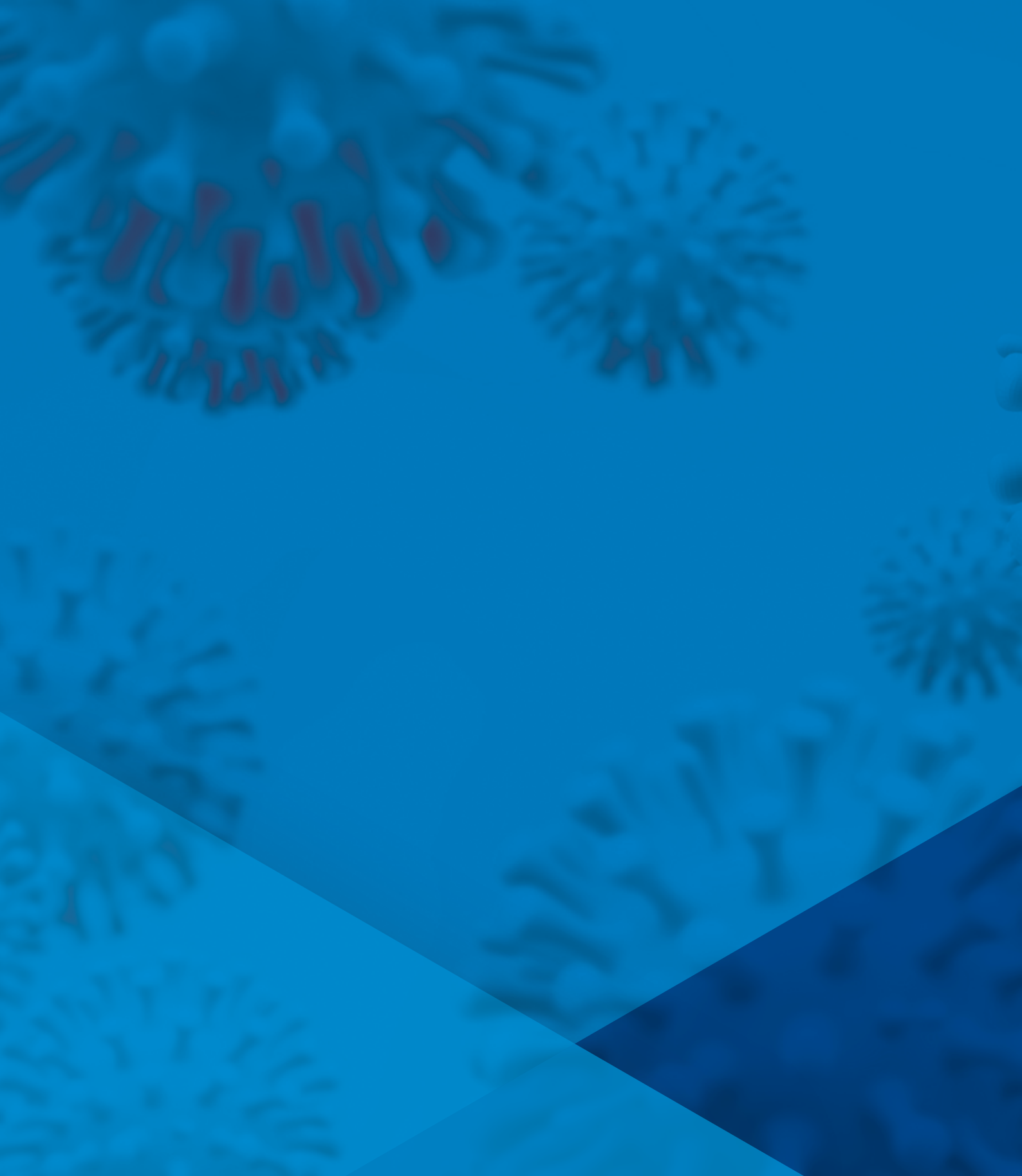
Worldwide Optofluidics

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.





To learn more about solutions that can help fight COVID-19,
contact one of our experts at [idex-hs.com/CovidSolutions](https://www.idex-hs.com/CovidSolutions)