



KEYSTONE

PRODUCT DEVELOPMENT

ABOUT US

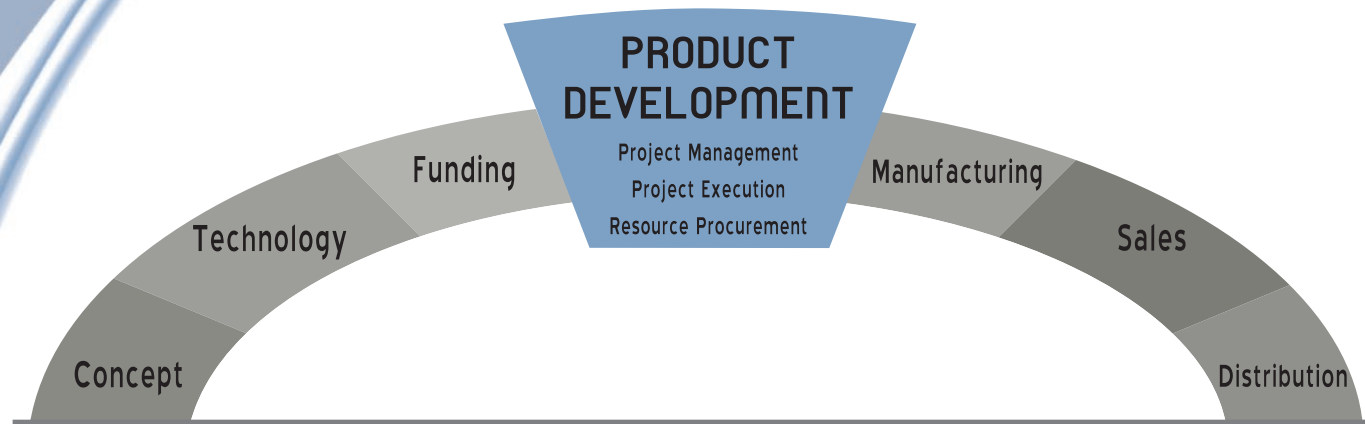
Since 1997, Keystone Product Development has provided turn key product development services to a wide variety of clients and industries. Our 8,000 sq. ft. facility in southwest Michigan is ideally suited for providing services at each stage of the product development cycle. Our design area, coupled with our laboratory and prototyping section, provides our engineers, designers, and technicians with the tools to develop your products. Our team consists of a wide range of talent that includes licensed professional engineers, multiple patent holders, and a Certified Solid Works Professional.

Keystone enables client's ideas and innovations to become reality by providing the optimum path to commercialization.

We have a track record for providing innovative product solutions from concept through production.

Effective program management, execution, and resource procurement are the keystones to our success.

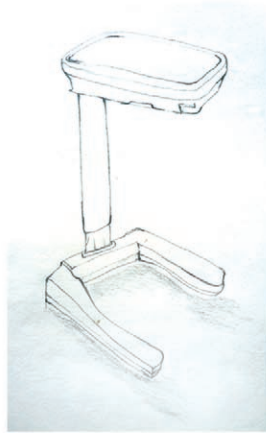
**GIVING YOUR IDEAS TRACTION,
THAT'S THE CONCEPT.**



COMPLETING THE ARCH, THAT'S HOW WE DO IT.

Keystone Product Development is dedicated to providing development, supply chain management, and contract manufacturing services for your products. Keystone provides extensive experience and resources in medical device development and manufacturing.

Our diverse team also serves the automotive, aerospace, and specialty products industries. Keystone is a full service engineering and project management consulting company bridging the gap between concept and distribution.

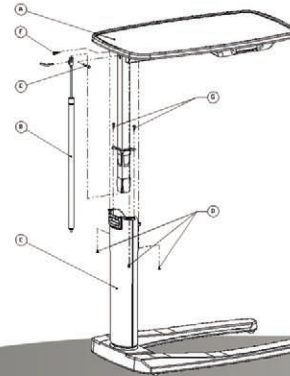


PROJECT EXECUTION

- Marketing research
- Industrial Design
- Manufacturing/ Assembly procedures
- Detailed drawings
- Quality system planning
- Design verification
- Design validation
- Engineering
- Testing

PROJECT MANAGEMENT

- Scheduling
- Budgeting
- Design History
- Coordination of internal and external resources
- Technical Oversight
- Progress reporting
- Design Reviews



RESOURCE PROCUREMENT

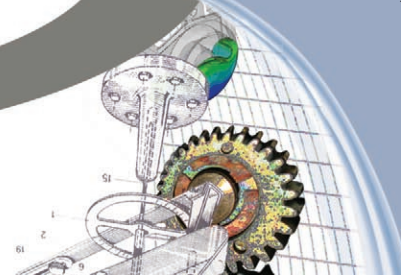
- Regulatory submissions
- Intellectual property management
- Prototype manufacturing
- Independent test labs
- Approvals bodies (UL, TUV, etc.)
- Clinical trials

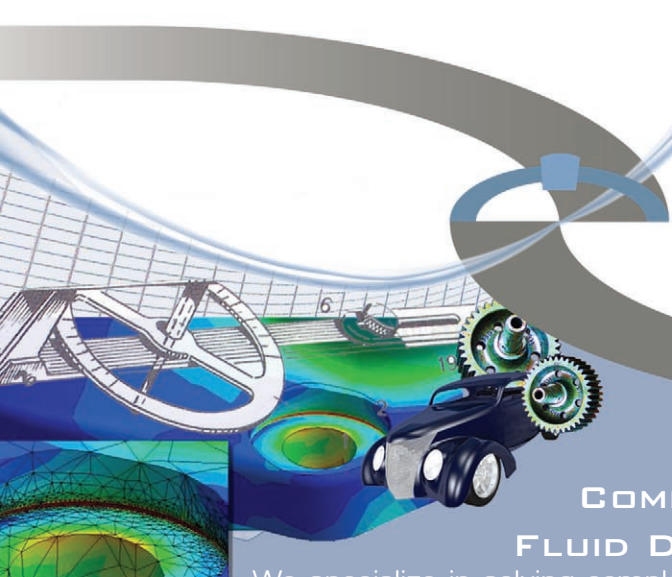


“ KEYSTONE WAS VERY UNDERSTANDING OF OUR VERY TIGHT TIMEFRAME AND DELIVERED FOR US AS PROMISED.”

DUANE BAKER
DIRECTOR OF OPERATIONS
EXTOL, INC.

PRODUCT DEVELOPMENT





COMPUTATIONAL FLUID DYNAMICS

We specialize in solving complex fluid flow and heat transfer problems using Cosmos FloWorks to its fullest extent to provide our customers with the widest range of flow simulation capabilities.

- Internal Flow
- External Flow
- Transient Flow
- Turbulent Flow
- Incompressible Viscous Flow
- Compressible Flow (subsonic, transonic, and supersonic)
- Heat Transfer (conduction, natural and forced convection, and radiation)
- Porous Media (flow through filters and other porous media)
- Non-Newtonian Liquid Flow (blood, toothpaste, etc...)
- Moving Wall Flow
- Rotating Reference Frame (pumps and impellers)
- Cavitation Detection (for water systems only)
- Rotating Reference Frame (pumps and impellers)
- Cavitation Detection (for water systems only)

“KEYSTONE PRODUCT DEVELOPMENT IS A PROVIDER OF DESIGN, PROTOTYPING, AND TRAINING SERVICES TO OUR ORGANIZATION. THEIR “FULL SYSTEMS VIEW” APPROACH AND WIDE SPECTRUM OF ENGINEERING SERVICES REALLY SETS THEM APART FROM THE COMPETITION.”

BILL JUHASZ
DESIGN MANAGER ODL



ANALYSIS

MOLDFLOW PLASTIC FLOW ANALYSIS

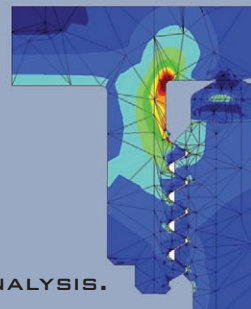
We use Moldflow® software to simulate filling, packing, cooling, and warpage of both filled and non-filled resins. We provide analysis using a traditional mid-plane representation, a hybrid fusion mesh, or a more accurate 3D simulation.

- Injection Molding
- Overmolding
- Gas Assist
- Co-injection
- Interjection-compression
- Reactive Interjection-compression
- RTM
- SRIM
- Multi-barrel Reactive Molding

FINITE ELEMENT ANALYSIS

Keystone Product Development provides finite element analysis services utilizing ANSYS Workbench, COSMOS Advanced Professional, and PTC Mechanica Wildfire 3.0 to simulate a wide range of events.

- Structural
- Modal/Vibration
- Heat Transfer
- Kinetics/Kinematics
- Non-linear



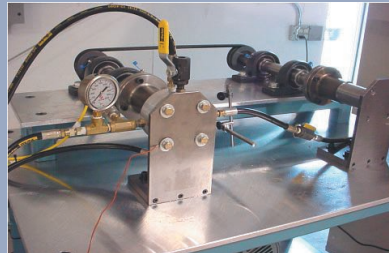
Keystone Product Development can provide a full complement of services to help you design test fixtures and hardware, build prototypes, perform testing, and validate results with a complete array of analytical tools.

- Product Testing
 - Life Cycle
 - Environmental
 - Durability
 - Accelerated Life
- Wear Testing

TESTING



environmental chamber testing



automated rotating test equipment

LET KEYSTONE PRODUCT DEVELOPMENT
CUSTOMIZE A TESTING PROGRAM FOR
YOUR COMPANY.

"WE HAVE DISCOVERED A GREAT RESOURCE WITH KEYSTONE PRODUCT DEVELOPMENT. WITH ENGINEERING EXPERTS AND ATTENTIVE CUSTOMER SERVICE REPRESENTATIVES, WE LOOK FORWARD TO A CONTINUED, HIGHLY PRODUCTIVE AFFILIATION. PROFESSIONALISM, TECHNICAL EXPERTISE AND ENHANCED SERVICE, KEYSTONE IS A GO TO SOURCE FOR OUR ENGINEERING NEEDS."

ALVIN SMELIK
LMR PLASTICS

REVERSE ENGINEERING

Keystone Product Development offers complete Reverse Engineering services utilizing our Romer Infinite Arm and Revworks to provide fast, accurate digitized information. All data covered with our system is parametric.

The result is an accurate, light weight model that is easy to manipulate and modify. We have structured our digitizing service as a quick response, on demand service that can be done on site at your facility or in our lab.

COMMON USES

- Mold Modeling
- Product Reverse Engineering
- Parametric Design
- Quality Control
- Accurate product data
- Effective conversion to CAD
- Great for mirroring components
- Reduced time to market
- Injection molds
- Dies
- Fiberglass parts and tooling
- Casting, forgings, machined components



We have been very fortunate to work with a diverse customer base in a variety of industries including medical, aerospace, and automotive. Please keep in mind that we have built this business mainly through word of mouth by treating each of our customers with respect and integrity. We hope that you will give us a call to help you with your next project.

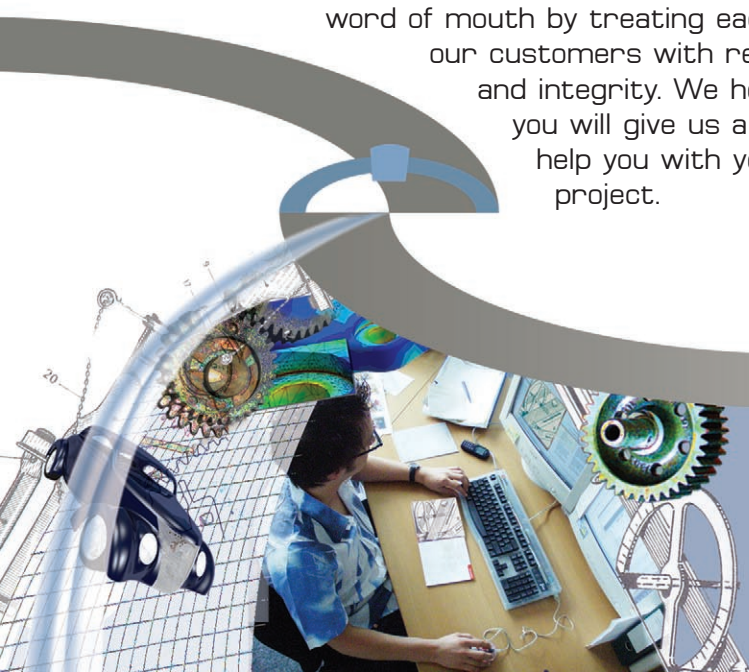


KEYSTONE

PRODUCT DEVELOPMENT

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KALAMAZOO, MI 49048
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WWW.KEYSTONE-PD.COM



“I WANTED TO EXTEND MY THANKS TO YOUR ORGANIZATION FOR THE EXCELLENT SERVICE THAT YOU HAVE PROVIDED WITH THE SEAL VALIDATION TESTING! THE TEST STAND CAME IN BELOW BUDGET, AND THE TOTAL TIME FOR COMPLETION WAS TWO WEEKS AHEAD OF SCHEDULE!”

DREW URYGA
ZATKOFF SEALS AND PACKINGS