

2015

Donor Impact Report



NFPA
Education and
Technology
Foundation



Our mission

The NFPA Education and Technology Foundation is committed to meeting the workforce development needs of the U.S. fluid power industry. Through the generous support of our donors, we support programs that:

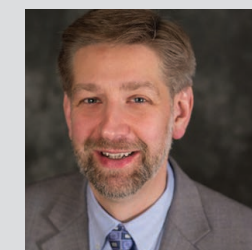
- Engage students at middle and high school grade levels in learning about fluid power.
- Encourage the development of new fluid power laboratories and other teaching resources at 2-year colleges and 4-year universities.
- Support pre-competitive fluid power research initiatives that build academic infrastructure and connect talented graduate students to our industry.
- Foster ongoing forums between educators and industry so that productive partnerships can develop based on mutual interests and priorities.

As a result of these programs, the talent pool available to our industry is changing. More students are aware of our industry. More 2-year college and 4-year university graduates have specific training in fluid power. More universities have research facilities and programs focused on fluid power. More partnerships between industry and academia are increasing our access to highly talented candidates.

This is truly **our** mission—yours and ours—and it is working. Thank you for your critical participation and support.

Best regards,

Eric Lanke
CEO, NFPA Education and Technology Foundation



Your Gifts at Work

Engaging Middle and High School Students

Your gifts to the NFPA Education and Technology Foundation are helping to engage students at middle and high school grade levels in learning about fluid power.

Fluid Power Challenge

The NFPA Fluid Power Challenge is a competition that challenges middle or high school students to solve an engineering problem using fluid power. The students work in teams to design and build a fluid power mechanism, and then compete against other teams in a timed competition.

The Fluid Power Challenge has many benefits:

- Actively engages students in learning about fluid power
- Gives support and resources to teachers for science and technology curriculum
- Creates a learning environment where math and science are fun
- Encourages students to acquire a diversity of teamwork, engineering and problem-solving skills
- Introduces students to careers in the fluid power industry

4,206

 STUDENTS

Hundreds of individuals in NFPA member companies and education partners have been involved in mentorship, classroom activities, and events related to the Fluid Power Challenge. To date, 38 Fluid Power Challenge events have been held, reaching 4,206 students.

Fluid Power Challenge Champions

Seven NFPA member companies and education partners have been inducted into the Fluid Power Challenge Champions Club, recognizing their efforts in organizing and running Fluid Power Challenge events for students in their local communities. In doing so, they have made serious investments of both time and money, and in return have helped spread information about our industry, and have reaped the benefits that come with connecting their organizations to the schools and the science classrooms where some of our industry's future employees are undoubtedly learning about fluid power for the first time.

These Fluid Power Challenge Champions are:

172

 STUDENTS

Master Pneumatic
1 event benefitting 172 students

68

 STUDENTS

Caterpillar
1 event benefitting 68 students

260

 STUDENTS

University of Minnesota
3 events benefitting 260 students

432

 STUDENTS

Wojanis Supply Company
5 events benefitting 432 students

392

 STUDENTS

Daman Products Company
5 events benefitting 392 students

1164

 STUDENTS

Deltrol Fluid Products
6 events benefitting 1164 students

520

 STUDENTS

Milwaukee School of Engineering
7 events benefitting 520 students

Fluid Power Challenge Grants Program

The Foundation also awards grants to middle and high schools to facilitate the teaching of hydraulics and pneumatics. Grant awards defray the costs related to the educational aspects of the Fluid Power Challenge program—either for fluid power kits for use in the classroom or those associated with participating in the Fluid Power Challenge event.

5,263

 STUDENTS

To date, 59 classrooms have brought Fluid Power Challenge materials into their curriculums, impacting 5,263 more students.

As a result of these activities, more middle and high school students than ever before are aware of careers in the fluid power industry.



Your Gifts at Work

Developing Fluid Power at 2-year Colleges and 4-year Universities

Your gifts to the NFPA Education and Technology Foundation are helping to encourage the development of new fluid power laboratories and other teaching resources at 2-year colleges and 4-year universities.

Fluid Power Laboratory Grants

Through our Fluid Power Laboratory Grant Program, we are helping to establish fluid power labs and trainers that will be used by hundreds of budding engineers.

\$100k \$100k \$100k

In 2012, a \$100,000 grant was awarded to Western Michigan University in Kalamazoo, Michigan, where 130 students a year are now receiving hands-on fluid power training in five different undergraduate and graduate fluid power courses.

In 2013, another \$100,000 grant was awarded to the Milwaukee School of Engineering (MSOE) in Milwaukee, Wisconsin, for a new mechatronics/ fluid power laboratory. MSOE is right now engaging its faculty members and students in the design of multiple experiments in motion control, simulation, and instrumentation—all using hydraulic, and pneumatic systems. The resulting laboratory will allow 250 mechanical engineering students a year to experience these technologies in each of their four years at MSOE.

In 2014, four \$25,000 grant awards were given to four community colleges—Angelina College in Lufkin, Texas, Central Community College in Grand Island, Nebraska, Hennepin Technical College in Eden Prairie, Minnesota, and Macomb Community College in Warren, Michigan—to help them buy hydraulic and pneumatic trainers for their fluid power departments. Altogether, these four labs will engage 445 students each year in fluid power instruction and training.

Fluid Power Teaching Grants

The Foundation funds a number of other educational activities through its Teaching Grant Program. With this support, hundreds of students and instructors in 2-year colleges and 4-year universities across the country are engaging in countless ways:

- Holding hands-on student competitions
- Developing fluid power courses and software
- Building fluid power systems and demonstrators
- Designing student capstone projects

To date, 41 teaching grants have been given to 24 different schools:

<p>Central Community College SHINE in Fluid Power</p> <p>Cleveland Community College Fluid Power in Automation Fluid Power and Cloud System Interface Fluid Power Institute</p> <p>Georgia Institute of Technology ME6404 Pneumatics Integrating Pneumatics Into Introductory Mechanical Design Use of Pneumatic Systems in Introductory Mechanical Design Projects</p> <p>Hennepin Technical College Hydro-cycle Hydrostatic Service Truck</p> <p>Illinois Institute of Technology Multiple Configuration Hybrid Hydraulic Transmission Demonstrator</p> <p>Iowa State University Distributed Sensing and Control of Hydraulic Circuits</p> <p>Ivy Tech Community College - Columbus Fluid Power Trainer</p> <p>Kaskaskia College Enhanced Hydraulics and Pneumatics Training Initiative</p> <p>Lawrence Technological University Senior Capstone Project: A Gantry Crane Utilizing Fluid Power</p>	<p>Marquette University Fluid Power Workshop for Teachers Teaching Fluid Dynamics Utilizing Fluid Power Applications: A Workshop for Secondary Science Teachers Fluid Power System and Control Module Development</p> <p>Massachusetts Institute of Technology (MIT) Introduction of Pneumatics into 2.007—Design and Manufacturing</p> <p>Milwaukee School of Engineering Educational Agile Pneumatic Robot Compact Variable Displacement Motor for Human Powered Vehicles TRAXX, an Electro-Hydraulic Remote Controlled Robot Raiders 1/4 Scale Tractor Pull</p> <p>Montana State University Automation Lab Fluid Power System Efficiency Student Laboratory Hydraulic Pump Efficiency Student Research Project</p> <p>Purdue University Multi-Users Load-Sensing System Educational Test Station Test Bench for Energy Efficient Active Oscillation Damping on Mobile Hydraulic Machines Portable Pneumatic Trainer for Hands-On Demonstrations Water Hydraulic Test Rig for "Fluid Power in Fluid Mechanics" Fluid Power Mechatronics Demonstrator for Education and Outreach</p>	<p>Rochester Institute of Technology Fluid Powered Prototype "Green" Vehicles</p> <p>Texas State Technical College at Waco Get Technical</p> <p>Triton College Student Activity Based Learning Project</p> <p>University of Illinois at Chicago Instruction Test Bench for Energy Efficient Electrohydraulic Systems with Independent Metering Valves</p> <p>University of Illinois at Urbana-Champaign Exploring Fluid Power Through Fluid-powered Bicycle Competition Study of Influences of Control Methods on E/H System Responses and Performances</p> <p>University of Minnesota Hydrostatic Wind Turbine</p> <p>Vernon College Introduction to Fluid Power</p> <p>Western Michigan University Performance Analysis of Hydraulic System Components for Fluid Power Curriculum and Capstone Design Project</p> <p>Western New England University Development of Servo-Pneumatic Experimental and Learning Platform</p> <p>Worcester Polytechnic Institute Hydraulic Dynamometer</p>
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As a result of these activities, more 2-year college and 4-year university graduates than ever before have specific training in fluid power technology.

Your Gifts at Work

Supporting Pre-Competitive Research

Your gifts to the NFPA Education and Technology Foundation are helping to support pre-competitive fluid power research initiatives that build academic infrastructure and connect talented graduate students to our industry.

Center for Compact and Efficient Fluid Power (CCEFP)

The CCEFP is a network of fluid power research laboratories, academic faculty, graduate and undergraduate students at seven universities:

- Georgia Institute of Technology
- Milwaukee School of Engineering
- North Carolina A&T University
- Purdue University
- University of Illinois at Urbana-Champaign
- University of Minnesota
- Vanderbilt University

CENTER FOR COMPACT AND EFFICIENT FLUID POWER
nsf A National Science Foundation Engineering Research Center



Starting in 2014, the NFPA Foundation has supported and is helping to expand the pre-competitive fluid power research activities of the CCEFP, dramatically increasing the number of institutions and students impacted by our research program.

13,000

 STUDENTS

Since its inception in 2007, the CCEFP has added more than 100,000 square feet of fluid power lab space to its universities, increased the number of fluid power advanced degrees awarded by those universities by more than 500%, increased the number of fluid power educators on those campuses by a factor of 10, and engaged more than 13,000 university students in a variety of workforce development programs, including:

Pre-competitive Fluid Power Research Projects

Directed by industry to the topics most needed, these projects help build fluid power infrastructure at CCEFP schools and engage promising students in the study of fluid power. To date, 225 individual projects have been funded, enabling more than 250 students to earn their Masters or PhD degrees. Forty-five percent of these students go on to work in the fluid power industry.

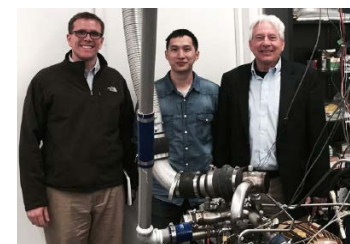
Fluid Power Scholars Program

An internship program where industry-selected candidates receive fluid power "boot camp" training before working at the company location for the summer. To date, 59 students have participated in the Fluid Power Scholars Program, with more than 75% going on to work in the fluid power industry.

Fluid Power Courses

Fluid power lab exercises, textbook chapters and online training developed by CCEFP professors and offered across the nationwide network of undergraduate mechanical engineering programs.

For more information on the CCEFP, please visit www.ccefp.org



Fluid Power Research Grants

In addition to its support of the CCEFP, the NFPA Foundation has also funded individual pre-competitive research projects designed to connect graduate students to the study of fluid power and expand the capabilities of their host institutions to research and teach fluid power.

Four such grants have been awarded:

Iowa State University

- Dielectric Spectroscopic Sensor Development for Hydraulic Fluid Contaminant Detection
- An Investigation of Dielectric Spectroscopic Contamination Sensing in a Compressed Air Stream

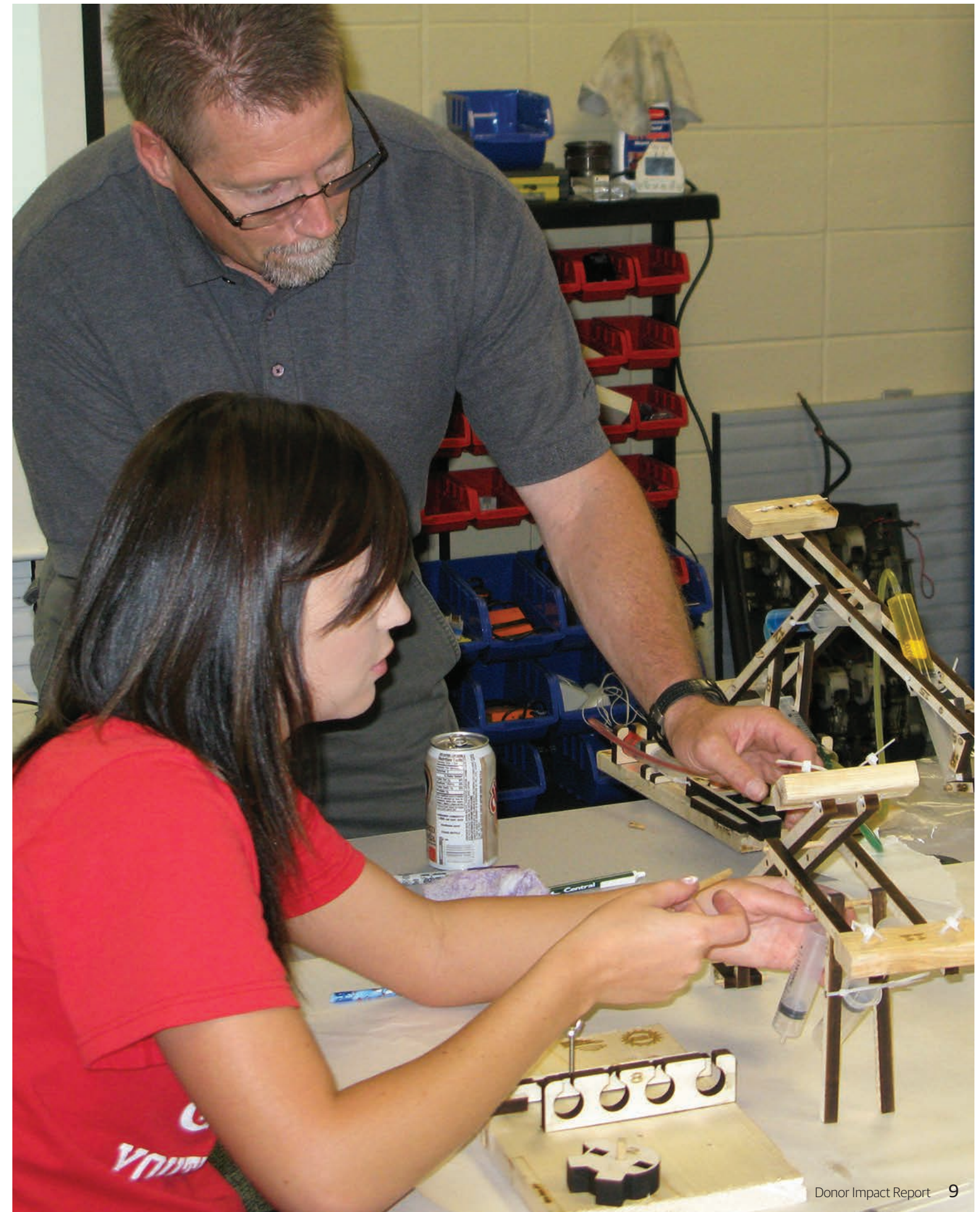
Purdue University

- Design, Simulation and Control of Hydraulic Topographies with Integrated Energy Recovery

Vanderbilt University

- Pneumatic Exhaust Gas Recovery

As a result of these activities, more U.S. universities have more research facilities focused on fluid power than ever before.



Your Gifts at Work

Fostering Industry/Educator Forums

Your gifts to the NFPA Education and Technology Foundation are helping to foster ongoing forums between educators and industry so that productive partnerships can develop based on mutual interests and priorities.

Fluid Power Innovation and Research Conference (FPIRC)

Hosted by the Center for Compact and Efficient Fluid Power (CCEFP), this annual conference features collaborative technical breakout sessions, networking opportunities, tours of local research laboratories, and panel discussions on the technologies and workforce skills transforming the fluid power industry.

In 2014, the inaugural FPIRC was held at Vanderbilt University and was attended by more than 200 fluid power researchers, students, and industry professionals.

In 2015, FPIRC will be held October 14-16, jointly with the ASME/Bath Symposium on Fluid Power at the Radisson Blu in downtown Chicago.

For more information visit: <http://nfpahub.com/events/conferences/fpirc/>



Summits of the CCEFP Industry Engagement Committee

The fluid power industry actively participates on the CCEFP Industry Engagement Committee (IEC), which is responsible for selecting the specific pre-competitive research projects to be funded by the CCEFP, and for mentoring and coaching the principal investigators and students to ensure that an industry perspective is taken into consideration as the research projects progress.

Two summits of the IEC are held each year at universities conducting the fluid power research, providing opportunities for industry members to connect with researchers and students, tour fluid power and other laboratory facilities, and form partnerships that benefit their workforce and technology development goals.

As a result of these activities, more partnerships between industry and academia than ever before are increasing our access to highly talented candidates.





The Pascal Society

The NFPA Education and Technology Foundation extends our gratitude to the many generous donors who share our mission of meeting the workforce development needs of the U.S. fluid power industry.

Named after Blaise Pascal, the French mathematician, physicist and inventor whose famous law describes the fundamental principle that gives fluid power its force multiplier effect, the Pascal Society is the annual giving society of the NFPA Education and Technology Foundation for those seeking to create a similar effect for our industry.

By combining their financial and volunteer contributions into one concerted effort, these organizations are making indispensable contributions towards developing the resources, tools and people needed to meet the technology and workforce needs of the U.S. fluid power industry.

For information on how to join The Pascal Society, contact Eric Lanke at 414.778.3351 or elanke@nfpa.com.



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Pascal Society Members as of June 10, 2015

To make a donation, visit: <https://secured.nfpa.com/donation/foundationdonation.aspx>

Legacy Builders

The NFPA Education and Technology Foundation extends our gratitude to the many generous donors who share our mission of meeting the workforce development needs of the U.S. fluid power industry.

The following organizations have achieved Legacy Builder status—cumulative giving of \$25,000 or more—as of the end of our last recognition year, April 30, 2015.

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Sun Hydraulics Corporation

Class of 2011-12

Enfield Technologies

Class of 2012-13

Bimba Manufacturing
Bosch Rexroth Corporation
Caterpillar
Deltrol Fluid Products
Parker Hannifin Corporation

Class of 2013-14

Danfoss Power Solutions
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ROSS Controls

Class of 2014-15

CNH Industrial
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Thank You

The NFPA Education and Technology Foundation extends our gratitude to the many generous donors who share our mission of meeting the workforce development needs of the U.S. fluid power industry.

The following 158 individuals and organizations made a donation in our last recognition year—between May 1, 2014 and April 30, 2015.

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Air Logic
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HYDAC Technology Corporation
Hydradyne LLC
Hydraforce
Hydra-Power Systems, Inc.
Hydraquip, Inc.
Hydraulex Global
Hydro Electronic Devices,
Inc. (HED®)
Hydrotech, Inc.
IC-Fluid Power, Inc.
Idemitsu Kosan Co. Ltd.

IMI Precision Engineering—
Norgren, Inc.
Industrial Hard Chrome, Ltd.
Iowa Fluid Power
JARP Industries, Inc.
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MFP Seals
(A Division of Martin Fluid Power)
MICO, Incorporated
Moog Inc.
Motion Industries, Inc.
MP Filtri USA Inc.
Muncie Power Products, Inc.
National Filters, Inc.
National Tube Supply Company
NetShape Technologies
Nexen Group, Inc.
OEM Controls, Inc.
Pall Corporation
Parker Hannifin Corp.
PARTsolutions
Penton Media, Inc.
Poclain Hydraulics, Inc.
Precision Associates, Inc.
Price Engineering
Prince Industries, Inc.
PTI Technologies, Inc.

QCC—Quality Control Corp
Quality Filtration, LLC
R & J Cylinder & Machine, Inc.
R.M. Wright Company
R.T. Dygert
ROSS Controls
RYCO Hydraulics, Inc.
S.G. Morris Co.
Sapa Extrusions
Schmalz Inc.
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