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:

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

1,164 STUDENTS
Deltrol Fluid Products
6 events benefitting 1,164 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.
$100k  $100k  $100k

In 2012, a $100,000 grant was awarded to Western Michigan University in Kalamazoo, Michigan, where 180 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 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—Angelo State University in San Antonio, Texas, Central Community College in Grand Island, Nebraska, Hennepin Technical College in Eden Prarie, 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.

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

Central Community College
- Fluid Power Laboratory

Cleveland Community College
- Fluid Power in Automation
- Fluid Power and Cloud System Interface

Georgia Institute of Technology
- MS-6401 Pneumatics

Hennepin Technical College
- Hydro-cycle
- Hydrostatic Service Truck
- Multiple Configuration Hybrid Hydraulic Transmission Demonstrator

Iowa State University
- Distributed Sensing and Control of Hydraulic Circuits

Ivy Tech Community College – Columbus
- Fluid Power Trainer

Kansas State University
- Enhanced Hydraulics and Pneumatics Training Initiative

Lawrence Technological University
- Senior Capstone Project – A Gantry Crane Using Fluid Power

Marquette University
- Fluid Power Workshop for Teachers
- Teaching Fluid Dynamics Utilizing Fluid/Power Applications: A Workshop for Secondary Science Teachers

Minnesota State University
- Fluid Power System and Control Module Development

University of Massachusetts
- Introduction of Pneumatics into 2007 – Design and Manufacturing

Milwaukee School of Engineering
- Educational Agile Pneumatic Robot
- Compact Variable Displacement Motor for Human-Powered Vehicles
- TRAX, an Electro-Hydraulic Remote Controlled Robot

Minnesota State College
- 1/4 Scale Tractor Pull

Montana State University
- Laboratory
- Fluid Power System Efficiency Student Laboratory
- Hydraulic Pump Efficiency Student Research Project

University of Nebraska
- Fluid Power System Efficiency Student Laboratory
- Fluid Power System Efficiency Student Research Project

University of Wisconsin
- Fluid Power System Efficiency Student Laboratory

University of Minnesota
- Fluid Power System Efficiency Student Laboratory

University of Wisconsin
- Fluid Power System Efficiency Student Laboratory

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

University of Minnesota
- Hydrostatic Wind Turbine

Vernon College
- Introduction to Fluid Power

Western Michigan University
- Performance Analysis of Hydraulic Systems Components for Fluid Power Curriculum and Capstone Design Project

Western New England University
- Development of Servo-Pneumatic Experimental and Learning Platforms

Worcester Polytechnic Institute
- Hydraulic Turbine

Western Michigan University
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Worcester Polytechnic Institute
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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.

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.

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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

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.

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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

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

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://nfphub.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 414.778.3353 or elanke@nfpa.com.

Gold Members
- Bimba Manufacturing
- Caterpillar
- Daman Products Company
- Danfoss Power Solutions
- Eaton Corporation
- Enfield Technologies
- Hydra-Power Systems
- Pall Corporation
- Parker Hannifin Corporation

Silver Members
- Afton Chemical
- Bobcat
- CNH Industrial
- Deltrol Fluid Products
- Donalddson Company
- Evonik Oil Additives
- Exxom/Mobil
- Fluid Power World Magazine
- Gates Corporation
- HYDAC/Schroeder Industries
- Hydraquip
- Linde Hydraulics
- Lubrizol
- MICO
- Moog
- Netshape Technologies
- Poclain Hydraulics
- Quality Control Corporation
- Siemens
- Trelleborg Sealing Solutions
- Woodward-HRT

Bronze Members
- Bosch Rexroth Corporation
- Concentric AB
- Delta Computer Systems
- DenAir Microtack
- Festo Corporation
- FORCE America/Valve Division
- G.W. Link Company
- HECO Gear
- Hitachi
- HUSCO International
- Idenius Kosan
- Iowa Fluid Power
- JCI
- Kaman Industrial Technologies
- KOB Japan
- Main Manufacturing Products
- Master Pneumatic
- Muncie Power Products
- National Tube Supply
- Neeren
- ROSS Controls
- RYCO Hydraulics
- SMC USA
- Stauff Corporation
- Steelhead Composites
- Sumitomo Heavy Industries
- Sun Hydraulics
- The Toro Company
- Walvoil Fluid Power
- White Drive Products
- Womack Machine Supply

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

Pascal Society Members as of June 10, 2015
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.

Class of 2009-10
Sun Hydraulics Corporation

Class of 2011-12
Emfield Technologies

Class of 2012-13
Benda Manufacturing
Bosch Rexroth Corporation
Caterpillar
Delco Fluid Products
Parker Hannifin Corporation

Class of 2013-14
Danfoss Power Solutions
Eaton Corporation
Gates Corporation
ROSS Controls

Class of 2014-15
CNH Industrial
Pall Corporation
Moog

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

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.

To make a donation, visit: https://secured.nfpa.com/donation/foundationdonation.aspx
2015-16 NFPA Education and Technology Foundation Board of Directors

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