NFPA
Education and
Technology
Foundation

2016 DONOR IMPACT REPORT

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 fund programs that:

- Foster awareness and involvement of middle and high school students, helping them understand fluid power's potential as a technology and as a career path.
- Increase the number of technically trained people capable of integrating and applying fluid power, and connect them to careers in the fluid power industry.
- Support universities in the development of fundamental fluid power knowledge, and connect our industry to an increasing number of scientific and engineering leaders in our field.

As a result of our programs, the talent pool available to our industry is changing. More young people are aware of the fluid power 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. And more partnerships between these schools and our industry are increasing access to highly talented candidates.

This is truly **our** mission—yours and ours—and it **is** working. Your support will make sure it works for many years to come.

Best Regards,

Eric Lanke
President and CEO
NFPA Education and Technology Foundation

2016–17 NFPA Education and Technology Foundation Board of Directors

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YOUR GIFTS AT WORK

Inspiring Future Engineering Students

Your gifts to the NFPA Education and Technology Foundation are helping to foster awareness and involvement of middle and high school students, helping them understand fluid power's potential as a technology and as a career path.

13,000+
STUDENTS ENGAGED
through events and classroom activities

NFPA Fluid Power Challenge

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. It:

- 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 practice teamwork, engineering, and problem-solving skills.
- Introduces students to careers in the fluid power industry.

Hundreds of individuals in NFPA member companies and education partner institutions have been involved in mentorship, classroom activities, and events related to the Fluid Power Challenge, which have engaged more than 13,000 students to date.

Fluid Power Challenge Champions

Eleven NFPA member companies and education partners from across the country have been inducted into the Fluid Power Challenge Champions Club to recognize their efforts in organizing and running Fluid Power Challenge events in their local communities. In doing so, they have not only made serious investments of both time and money, but have also helped spread information about our industry and reaped the benefits that come with connecting their organizations to the schools and science classrooms where the industry's future employees are learning fluid power for the first time.

The Fluid Power Challenge Champions are:

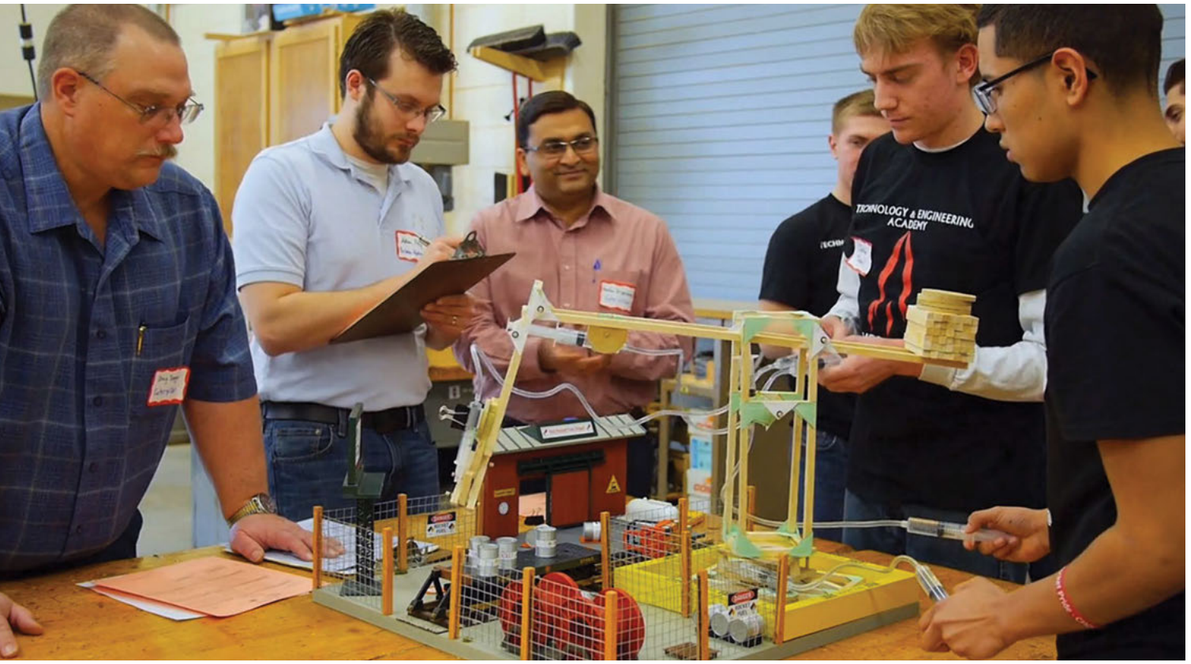
Caterpillar	2 annual events, engaging **184** total students
Daman Products Company	6 annual events, engaging **516** total students
Deltrol Fluid Products	7 annual events, engaging **1,524** total students
FORCE America	1 annual event, engaging **72** total students
Master Pneumatic	2 annual events, engaging **340** total students
Micromatic	1 annual event, engaging **20** total students
Milwaukee School of Engineering	8 annual events, engaging **650** total students
Parker Hannifin	1 annual event, engaging **20** total students
Price Engineering	1 annual event, engaging **36** total students
University of Minnesota	5 annual events, engaging **352** total students
Wojanis Supply Company	6 annual events, engaging **560** total students

Fluid Power Challenge Grants

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

To date, 90 schools have used Fluid Power Challenge materials in their curricula, exposing 6,300 students to fluid power.

6,300 STUDENTS
IN 90 SCHOOLS AFFECTED

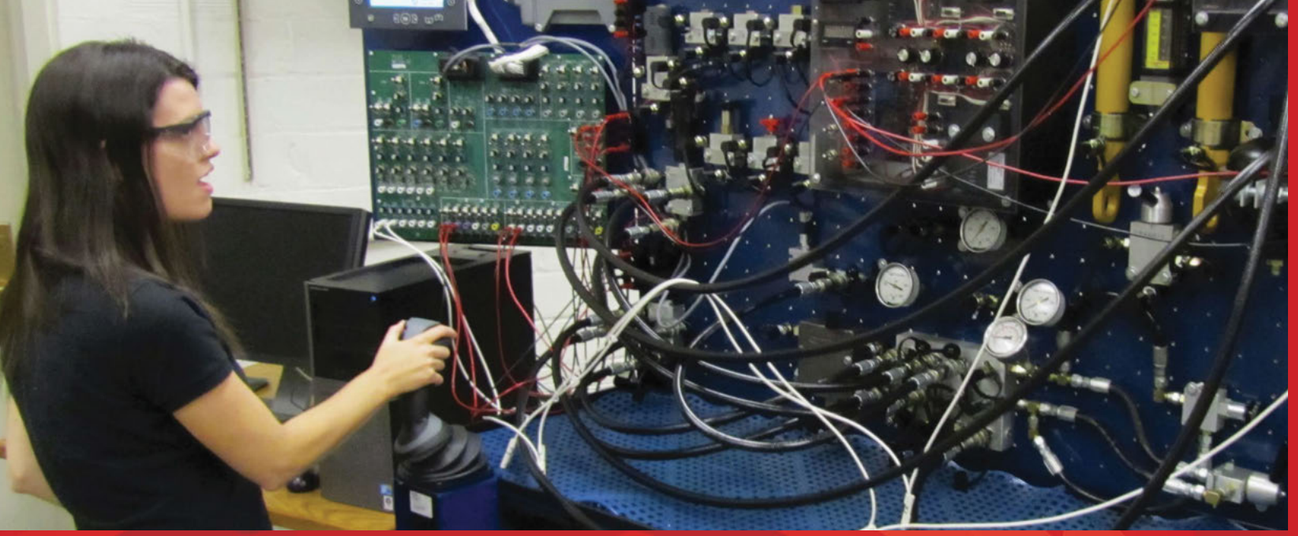


Student Career Connections

Since last year, this free and flexible program has allowed industry professionals to host area high school students at the company facility, give the students a tour, build a fluid power classroom kit with them, and answer questions about the industry and careers. To date, the program has given more than 300 students a peek into real-world fluid power applications and careers.

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

300+
STUDENTS ENGAGED
through company visits and tours



YOUR GIFTS AT WORK

Increasing the Number of Technically Trained People

Your gifts to the NFPA Education and Technology Foundation are helping to increase the number of technically trained people capable of integrating and applying fluid power, and connecting them to careers in the fluid power industry.

Fluid Power Laboratory Grants

Through our Fluid Power Laboratory Grant Program, we are helping schools establish state-of-the-art fluid power labs and trainers to help embed fluid power into training curriculum. Each lab or trainer can educate hundreds of future fluid power technicians and engineers in both hydraulics and pneumatics.

to date

10 LAB GRANTS

have been awarded to

10 SCHOOLS

2015

Eastern Iowa Community College
Davenport, IA

Marshalltown Community College
Marshalltown, IA

South Central College
North Mankato, MN

Triton College
River Grove, IL

2014

Angelina College
Lufkin, TX

Central Community College
Grand Island, NE

Hennepin Technical College
Eden Prairie, MN

Macomb Community College
Warren, MI

2013

Milwaukee School of Engineering
Milwaukee, WI

2012

Western Michigan University
Kalamazoo, MI

Fluid Power Teaching Grants

The Foundation has funded 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 fluid power training in countless ways:

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

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.

to date

42 TEACHING GRANTS

have been given to

24 SCHOOLS

Central Community College
SHINE in Fluid Power

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

Georgia Institute of Technology
ME6404 Pneumatics
Integrating Pneumatics Into Introductory Mechanical Design
Use of Pneumatic Systems in Introductory Mechanical Design Projects

Hennepin Technical College
Hydro-cycle
Hydrostatic Service Truck

Illinois Institute of Technology
Multiple Configuration Hybrid Hydraulic Transmission Demonstrator

Iowa State University
Distributed Sensing and Control of Hydraulic Circuits

Ivy Tech Community College–Columbus
Fluid Power Trainer

Kaskaskia College
Enhanced Hydraulics and Pneumatics Training Initiative

Lawrence Technological University
Senior Capstone Project: A Gantry Crane Utilizing Fluid Power

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

Massachusetts Institute of Technology (MIT)
Introduction of Pneumatics into 2.007—Design and Manufacturing

Milwaukee School of Engineering (MSOE)
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

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

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"
Continuously Variable Hydraulic Transmission for a Small Wind Power Drive Simulator
Fluid Power Mechatronics Demonstrator for Education and Outreach

Rochester Institute of Technology
Fluid Powered Prototype "Green" Vehicles

Texas State Technical College at Waco
Get Technical

Triton College
Student Activity Based Learning Project

University of Illinois at Chicago
Instruction Test Bench for Energy Efficient Electrohydraulic Systems with Independent Metering Valves

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 System Components for Fluid Power Curriculum and Capstone Design Project

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

Worcester Polytechnic Institute
Hydraulic Dynamometer

YOUR GIFTS AT WORK

Growing Fluid Power Within Universities

Your gifts to the NFPA Education and Technology Foundation are helping to support universities in the development of fundamental fluid power knowledge.

The Center for Compact and Efficient Fluid Power (CCEFP) is a network of fluid power research laboratories, academic faculty, graduate and undergraduate students at nine universities:

Georgia Institute of Technology

Marquette University

Milwaukee School of Engineering

North Carolina A&T University

Purdue University

University of California, Merced

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

Center for Compact and Efficient Fluid Power (CCEFP)

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

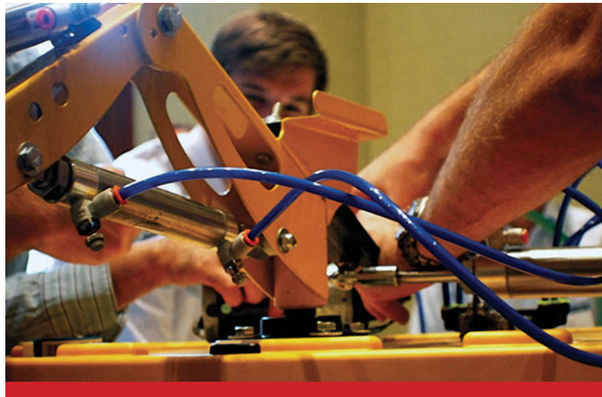
Since its inception in 2007, the CCEFP has added more than 100,000 square feet of fluid power lab space to its universities, increased the number of fluid power advanced degrees awarded by those universities by more than 500%, increased the number of fluid power educators on those campuses by a factor of 10, and engaged more than 14,000 university students in a variety of workforce development programs, including:

Pre-Competitive Fluid Power Research Projects
Directed by industry input on areas of need, these projects help push the technological envelope and shape the fluid power careers of dozens of professors and hundreds of graduate students. To date, 286 individual projects have been funded, enabling more than 1,000 students to earn advanced degrees in fluid power. Sixty-six percent of these students have gone on to work in the fluid power industry, while 26% have remained in academia to continue the work of advancing fluid power within universities.

Fluid Power Scholars Program
This internship program gives industry-selected candidates fluid power "boot camp" training before working at the company location for the summer. To date, 68 students have participated in the Fluid Power Scholars Program, with more than 75% going on to work in the fluid power industry.

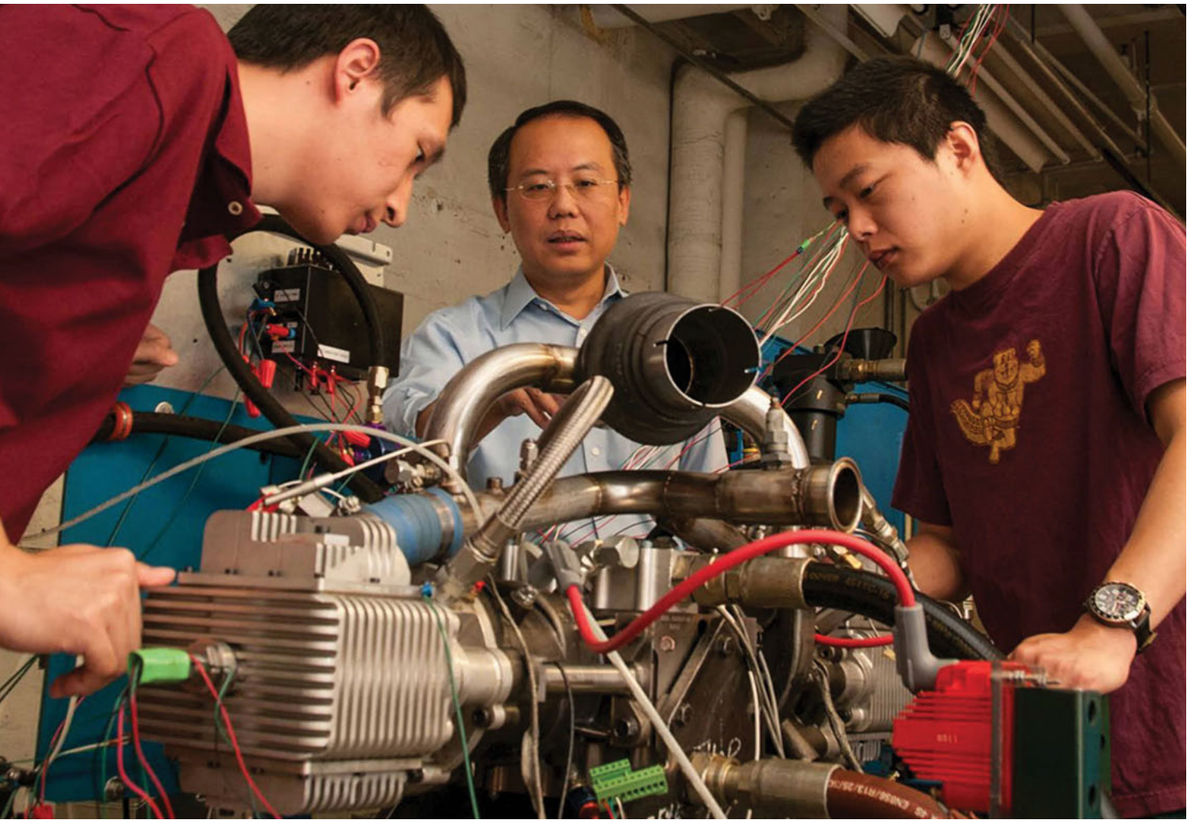
Fluid Power Courses
Fluid power lab exercises, textbook chapters, and online training are developed by CCEFP professors and offered across the nationwide network of undergraduate mechanical engineering programs.

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



Engaging Future Engineers: 3D Printed Excavator Cab Design Contest

As a separate effort to support university engagement in projects related to fluid power, NFPA and CCEFP co-sponsored a cab design contest for the 3D printed excavator that will be on display at IFPE 2017. Student engineering teams from across the country submitted their futuristic cab and human machine interface designs to the contest, which were then judged by industry experts. The team from the University of Illinois at Urbana-Champaign won the contest and was awarded a $2,000 cash prize from NFPA as well as the opportunity to see their design printed at the Oak Ridge National Laboratory.



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.

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

4 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 System Topographies with Integrated Energy Recovery

Vanderbilt University

Pneumatic Exhaust Gas Recovery

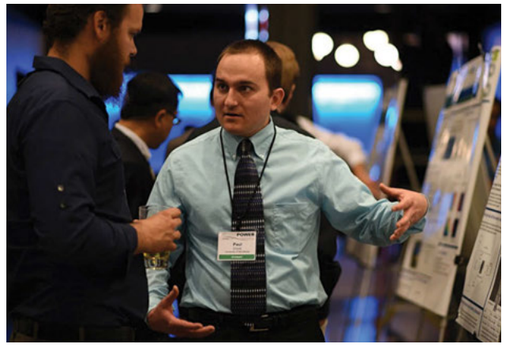
Your gifts to the NFPA Education and Technology Foundation are connecting our industry to an increasing number of scientific and engineering leaders in our field.

FLUID POWER INNOVATION & RESEARCH CONFERENCE 2016 FPIRC16

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.

The inaugural FPIRC was held at Vanderbilt University in 2014, and in 2015 the event was held in conjunction with the ASME/Bath Symposium on Fluid Power in Chicago.



Hundreds of fluid power researchers, students, and industry professionals came together for these events.

In 2016, FPIRC will be held October 10–12 in conjunction with the 2016 ASME Dynamic Systems and Control Conference at the Hyatt Regency Minneapolis.

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.

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 gratitude to the many generous donors who share our mission of meeting the workforce development needs of the U.S. fluid power industry.

The Pascal Society is the NFPA Foundation's annual giving society that has raised more than $1.6 million for fluid power outreach, education, and research programs. Pascal Society funds support the full range of Foundation educational and grant programs highlighted here and also support the sustained efforts of the CCEFP.

Pascal Society members combine their financial and volunteer contributions in one concerted effort, developing the resources, tools, and people needed to meet the future technology and workforce needs of the U.S. fluid power industry.

PASCAL SOCIETY MEMBERS AS OF JUNE 30, 2016

Gold Members
Bimba Manufacturing Company
Caterpillar Inc.
Daman Products Company Inc.
Danfoss
Eaton Corporation – Hydraulics Operations
Enfield Technologies
Hydra-Power Systems, Inc.
Pall Corporation
Parker Hannifin Corporation
Proportion Air, Inc.

Silver Members
Afton Chemical Corporation
Bobcat Company
Chevron
CNH Industrial
Deltrol Fluid Products
Donaldson Company, Inc.
Evonik Oil Additives USA, Inc.
ExxonMobil
Fluid Power World Magazine
Gates Corporation
HYDAC TECHNOLOGY CORPORATION/
Schroeder Industries LLC
Hydraquip, Inc.
Linde Hydraulics Corp.
Lubrizol
Moog Inc.
NetShape Technologies
Poclain Hydraulics, Inc.
QCC – Quality Control Corp.
Simerics Inc.
Trelleborg Sealing Solutions
Woodward HRT

Bronze Members
Bosch Rexroth Corporation
Clippard Instrument Laboratory, Inc.
Concentric Rockford Inc.
Czero
Delta Computer Systems, Inc.
DunAn Microstaq, Inc.
Festo Corporation
FORCE America Inc./Valve Division
GS Global Resources
G.W. Lisk Co., Inc.
HAWE Hydraulik NA
HECO Gear, Inc.
Hitachi America Ltd.
HUSCO International, Inc.
Idemitsu Kosan Co. Ltd.
IMI Precision Engineering
Industrial Hard Chrome, Ltd.
Iowa Fluid Power
JCB
Kaman Industrial Technologies Corporation
KYB Corporation – Japan
Main Manufacturing Products, Inc.
Master Pneumatic-Detroit, Inc.
Muncie Power Products, Inc.
National Tube Supply Company
Nexen Group, Inc.
OEM Controls, Inc.
PARTsolutions
ROSS Controls
RYCO Hydraulics, Inc.
SMC Corporation of America
Stauff Corporation
Steelhead Composites
Sumitomo Heavy Industries Ltd.
Sun Hydraulics Corporation
The Toro Company
Walvoil Fluid Power
White Drive Products, Inc.
Womack Machine Supply Co.

Legacy Builders

The NFPA Education and Technology Foundation extends 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 of more—as of our last recognition year, April 30, 2016.

CLASS OF 2016

Afton Chemical Corporation
Bobcat Company
Chevron
Donaldson Company, Inc.
Evonik Oil Additives USA, Inc.
ExxonMobil
HYDAC TECHNOLOGY CORPORATION/
Schroeder Industries LLC
Hydra-Power Systems, Inc.
Hydraquip, Inc.
Netshape Technologies
Poclain Hydraulics, Inc.

CLASS OF 2015

CNH Industrial
Pall Corporation
Moog Inc.

CLASS OF 2014

Danfoss Power Solutions
Eaton Corporation
Gates Corporation
ROSS Controls

CLASS OF 2013

Bimba Manufacturing Company
Bosch Rexroth Corporation
Caterpillar Inc.
Deltrol Fluid Products
Parker Hannifin Corporation

CLASS OF 2012

Enfield Technologies

CLASS OF 2010

Sun Hydraulics Corporation

Thank You

The NFPA Education and Technology Foundation extends 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 individuals and organizations made a donation in our last recognition year—between May 1, 2015 and April 30, 2016.

ACE Controls, Inc.
Afton Chemical Corporation
Aggressive Hydraulics
Air Logic
Aladco, LLC
Allied Machine & Engineering Corp.
Alro Steel Corporation
AMETEK APT
Applied Industrial Technologies, Inc.
ARGO-HYTOS Inc.
Auburn Gear, Inc.
AVENTICS Corporation formerly Rexroth Pneumatics
Badestnost JSCo
Bimba Manufacturing Company
Bobcat Company
Bosch Rexroth Corporation
Camozzi Pneumatics, Inc.
Caterpillar Inc.
Central Steel & Wire Company
Certified Power
Chevron
CIM-TEK Filtration
Clippard Instrument Laboratory, Inc.
CNH Industrial
Comer Industries Inc.
Concentric Rockford Inc.
Continental Hydraulics
Cross Company
Custom Fluid Power
Czero
Daman Products Company Inc.
Danfoss
Delta Computer Systems, Inc.
Delta Power Company
Deltrol Fluid Products
DLH Fluid Power Inc.
Donaldson Company, Inc.
DunAn Microstaq, Inc.
Dura-Bar
Eaton Corporation – Hydraulics Operations
Enfield Technologies
Evonik Oil Additives USA, Inc.
ExxonMobil
Festo Corporation
Firestone Industrial Products Co.
Flodraulic Group, Inc.
Fluid Power Journal
Fluid Power World Magazine
FORCE America Inc./Valve Division
Gates Corporation
Guidish, Rick
Gulf Controls Company, LLC
G.W. Lisk Co., Inc.
HAWE Hydraulik GmbH & Co KG
HECO Gear, Inc.
Hercules Sealing Products
Hitachi America Ltd.
HUSCO International, Inc.
HYDAC TECHNOLOGY CORPORATION
Hydradyne LLC
Hydra-Power Systems, Inc.
Hydraquip, Inc.
Hydraulex Global
Hydreco Hydraulics
Hydrotech, Inc.
IC-Fluid Power, Inc.
Idemitsu Kosan Co. Ltd.
IMI Precision Engineering
Industrial Hard Chrome, Ltd.
Iowa Fluid Power
JARP Industries, Inc.
JCB
Kaman Industrial Technologies Corporation
KYB Americas Corporation
KYB Corporation – Japan
Lanke, Eric
Lexair, Inc.
Ligon Hydraulic Cylinder Group
Linde Hydraulics Corp.
Lubrizol
Main Manufacturing Products, Inc.
Master Pneumatic-Detroit, Inc.
Meggitt Defense Systems
MFP Seals (A Division of Martin Fluid Power)
Micromatic LLC
Moog Inc.
Mosey's Production Machinists, Inc.
Motion Industries, Inc.
MP Filtri USA Inc.
Muncie Power Products, Inc.
National Tube Supply Company
NetShape Technologies
Nexen Group, Inc.
Niagara LaSalle Corporation
OEM Controls, Inc.
The Oilgear Co.
Ortman Fluid Power
Pall Corporation
Parker Hannifin Corporation
PARTsolutions
Penton Media, Inc.
Plymouth Tube Co.
Poclain Hydraulics, Inc.
Precision Associates, Inc.
Price Engineering
Proportion Air, Inc.
QCC – Quality Control Corp
R & J Cylinder & Machine, Inc.
R.M. Wright Company
R.T. Dygert
ROSS Controls
RYCO Hydraulics, Inc.
Schmalz Inc.
Simerics Inc.
SKF Salt Lake City
SMC Corporation of America
Stauff Corporation
Steelhead Composites
Stucchi S.p.A.
Sumitomo Heavy Industries Ltd.
Sun Hydraulics Corporation
SunSource
Swiss Automation Inc.
Tatman, Scott
TCI Precision Metals
Thermal Transfer Products
Thomas Magnete USA, LLC
Tol-O-Matic, Inc.
The Toro Company
Trelleborg Sealing Solutions
Twin Disc, Inc.
Ultra Clean Technologies Corp.
Walvoil Fluid Power
Wandfluh of America, Inc.
Wendel, Marti
White Drive Products, Inc.
Wojanis Supply Co., Inc.
Womack Machine Supply Co.
Woodward HRT
World Wide Fittings Corporation
World Wide Metric Inc.
Yates Industries, Inc.

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NFPA
Education and
Technology
Foundation

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