FLUIDPOWER JOURNAL

IFPE SHOW SUPPLEMENT

Fluid Power Journal is the offical publication of the International Fluid Power Society.
Visit us at **fluidpowerjournal.com**

International Fluid Power™ Society
CELEBRATING 60 YEARS

South 3-4 and Bronze Hall
- Engines, Components, & Electronics

Silver 1-3
- Aggregates Processing
- Asphalt Production
- Land Clearing

Tech Experience
- Festival Grounds
- Silver 3

Bronze Lot
- Concrete Construction & Manufacturing
- Engines, Components, & Electronics
- Infrastructure Support
- Safety & Traffic
- Trucking
- Business Solutions and Jobsite Applications & Solutions

North Hall, Central 1-2, and Festival Hall
- Earth Moving & Material Handling
- Hauling
- Land Clearing
- Lifting (Aerial & Cranes)

South 1-2
- Concrete Construction & Manufacturing
- Infrastructure Support
- Safety & Traffic
- Trucking
- Business Solutions and Jobsite Applicasitons & Solutions

Central 3-5
- Aggregates Processing
- Asphalt Production & Paving
- Underground Construction

Festival Grouds and Blue Lot
- Earth Moving & Material Handling
- Hauling
- Lifting *Aerial & Cranes)
- Underground Construction

2020 OVERVIEW

The purpose of the International Fluid Power Exposition (IFPE) is to be the leading international exposition and educational resource dedicated to the integration of fluid power with other technologies for power transmission and motion control applications.

Held every three years, IFPE is set for March 10-14, 2020 at the Las Vegas Convention Center in Las Vegas, USA. IFPE is co-located with CONEXPO-CON/AGG, one of the world's largest gatherings for the construction industries.

SHOW HOURS:

TUES: 9 a.m. - 5 p.m.

WED: 9 a.m. - 6 p.m.
Fluid Power Hour Reception 4 - 6 p.m.

THURS: 9 a.m. - 5 p.m.

FRI: 9 a.m. - 5 p.m.

SAT: 9 a.m. - 3 p.m.

There will be over 405 exhibitors (see page x) at IFPE showcasing the latest technologies and innovations in equipment, products and services for fluid power/motion control/power transmission. The show also features product-focused exhibit pavilions and international exhibit pavilions.

IFPE features targeted education events (see page x) that provide crucial information on new fluid power, power transmission and motion control technologies to engineers and others involved in the design and manufacturing process.

At IFPE, you're sure to discover innovative new solutions to solve your most pressing technical problems. The show brings together everything new in engineering, and it happens just once every three years.

You will be able to see live, hands-on demos from leading manufacturers and suppliers as they showcase their best new offerings.

IFPE RESEARCH SYMPOSIUM — Hosted by the National Fluid Power Association

When mapping out your IFPE schedule be sure to keep the lunch hours on March 11, 12 and 13 open for the IFPE Research Symposium. Over these three days, the National Fluid Power Association will be presenting a program that showcases the latest fluid power research being performed at U.S. universities with funding provided by a new program within the U.S. Department of Energy to improve the energy efficiency of hydraulic systems on off-road vehicles.

Wednesday, March 11 |11:30 AM to 12:30 PM
Individual Electro-Hydraulic Actuators for Off Road Machines
Andrea Vacca, Purdue University

Thursday, March 12 |11:30 AM to 12:30 PM
Efficient, Compact, and Smooth Variable Propulsion Motor
James Van de Ven, University of Minnesota

Friday, March 13 |11:30 AM to 12:30 PM
Hybrid Hydraulic-Electric Architecture for Mobile Machines
Perry Li, University of Minnesota

IFPE brings together thousands of fluid power professionals from across all sectors and job roles and from around the world-suppliers, service providers, engineers, manufacturers, executives and more. The show focuses on the latest innovations, product advances and expert insights to fully equip engineers and others involved in the design and manufacturing process to increase efficiency, contain costs and improve the performance of their hydraulic and pneumatic systems and applications.

HYDRAULICS? YEAH, WE KNOW A LITTLE SOMETHING ABOUT THAT.

At Hydraulex we stock reman, new aftermarket and new OEM hydraulic pumps, motors, valves, servo & proportional valves, cylinders and replacement parts – all for a variety of component manufacturers. We also repair these components daily.

COME SEE US AT CONEXPO/IFPE
MARCH 10-14, 2020
BOOTH: S82845

HYDRAULEX
The Right Replacement, Right Now®

ATTICA HYDRAULIC EXCHANGE, INC. | GENUINE METARIS | HYDRAULIC REPAIR AND DESIGN | FHi Flint Hydrostatics, Inc.

Reliable and Durable

High Efficient Hydraulic System Solutions

Hengli has strong designing and manufacturing capabilities, we can provide hydraulic systems and product validation solutions for various industries. Hengli's high-performance hydraulic testing bench equipped with self-developed software which is easy to operate and customize. Our system is known for low energy consumption, low noise, reliable and durable.

Hengli's transmission and control components with precise control ability, high efficiency and reliability, are widely used in excavators, cranes, aerial work platforms, and other mobile and marine applications.

CONEXPO-CON/AGG 2020

IFPE 2020

March 10-14, 2020
Las Vegas, NV
***Hengli Booth*:**
IFPE South Hall 3-S81154

For further information, please visit
www.hengliamerica.com

Hengli®

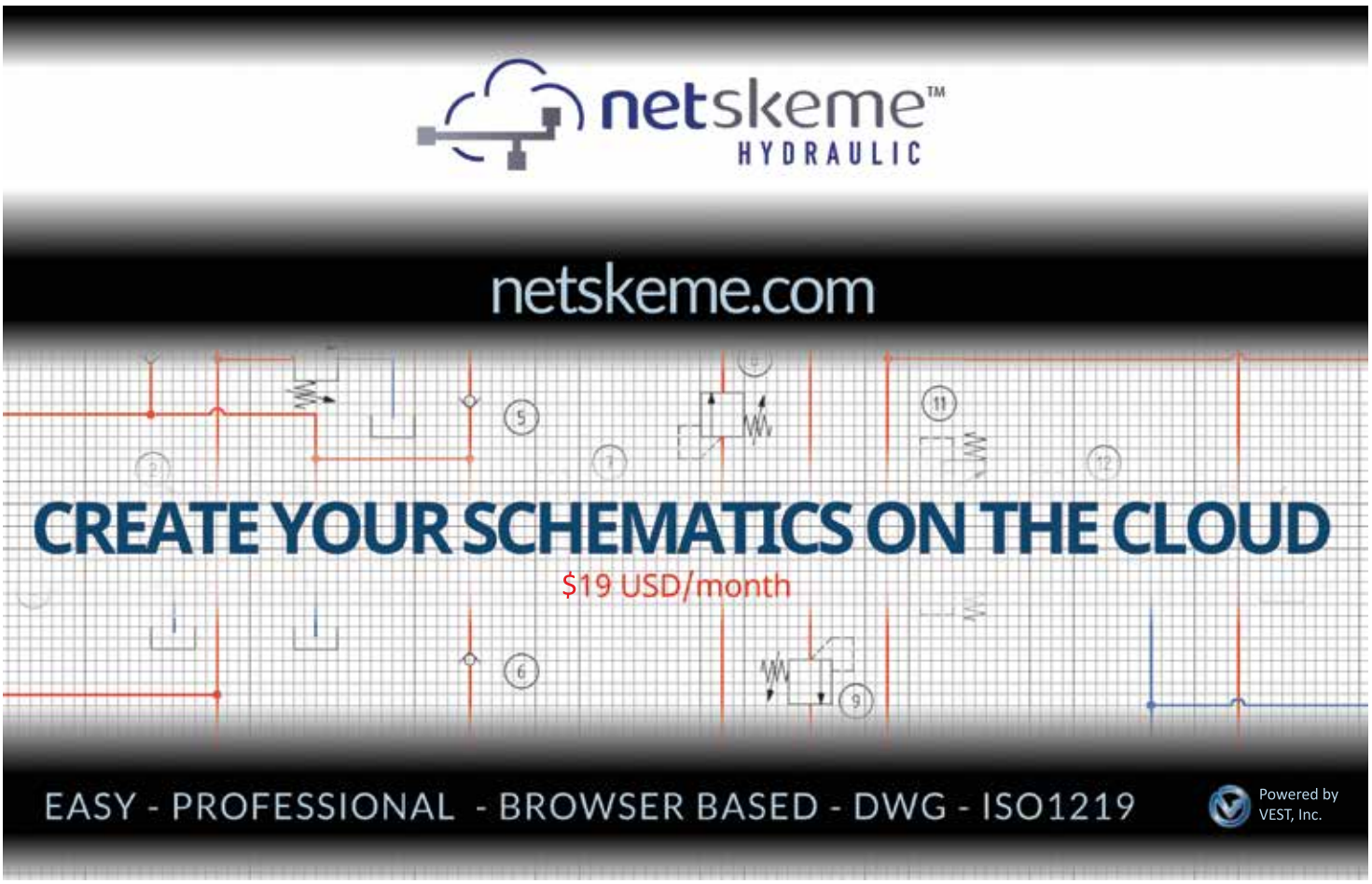
Hengli America
580 West Crossroads Parkway, Bolingbrook, IL 60440
Tel: 630-995-3674 Sales@hengliamerica.com

AEM

NFPA

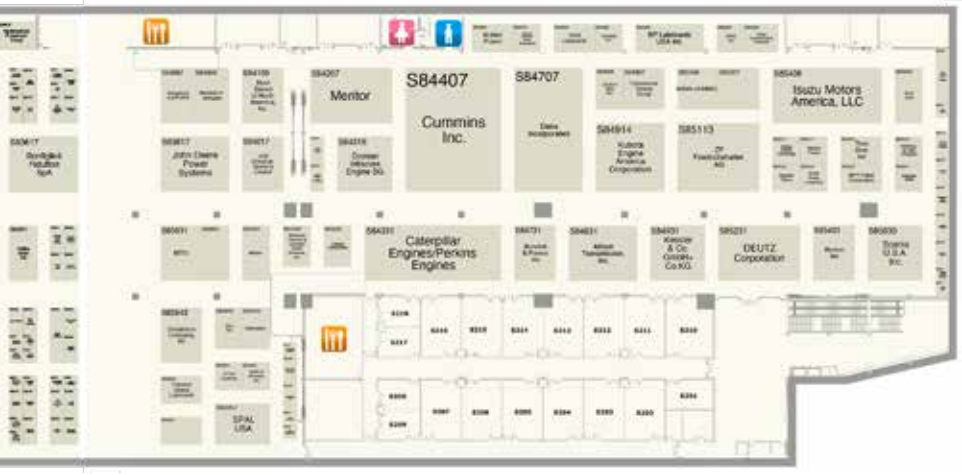
2020 Exhibitor Booth Listing

South Hall 3



AAH FLUID POWER INC S-81359
ABER - Manufacturing Hydraulic Excellence.....SL-80101
AC Business Media.....S-80742
Acme Foundry, Inc.....S-81311
Adaptall.....S-81455
Advanced Technology Products S-82047
AIDRO hydraulics & 3D printing.....S-82506
Air-Way Global Manufacturing S-82442
ALA Industries Limited S-82335
Alkon Corporation S-80756
ALP Kaucuk S-80048
Alro Steel Corporation S-80617
Amalga Composites Inc S-81421
American Iron & Alloys LLC S-82743
AMETEK Factory Automation.....S-82142
AMLOK/Sitema S-82459
Anfield Industries Inc S-81945
Anson Hydraulics Industrial Co., Ltd.....S-83056
API Heat Transfer.....S-81807
APSCO S-81658
ArcelorMittal Tubular Products S-80707
ARGO-HYTOS S-81721
AS Aston Seals SPA.....S-82411
ASA Hydraulik of America S-81355
ASCO Sintering Company.....S-83649
Ashcroft Inc S-82243
Ashun Fluid Power Co., Ltd. S-82953
ASM Sensors, Inc. S-80041
ATC - Mateks S-83300
Atlantex Manufacturing Corporation S-80137
Atlantic Fluid Tech SRL / EBI Motion Controls S-83351
ATOS North America, Inc S-83359
Auburn Gear LLC S-82431
Avic Nanjing Servo Control System Co., Ltd. S-82159
AW-Lake Company.....S-80156
Ayrtec Fittings S-82558
AZ Pneumatics LLC S-82054
AZETA Zeo Asioli Diffusion Srl.....S-80050
B&R Industrial Automation Corporation ...S-83231
B3C Fuel Solutions LLC S-83653
BADESTNOST JSCo.....S-81417
Bailey International LLC.....S-81916
Barbieri Rubber srl.....S-83206
BEDIA Motorentechnik GmbH & Co KG S-83400
Bezares USA.....S-82111
Bimal SrL a Test Industry Company.....S-82349
Black Hawk Seals International, LLC S-81959
Boden Hydraulics Co., Ltd. S-82758
Bonfiglioli Riduttori SpA.....S-83617
Bosch Rexroth Corporation S-80215
Brand Hydraulics Corporation.....S-81516
Brennan Industries Inc.....S-82619

South Hall 4



2020 Exhibitor Booth Listing

Bucher Hydraulics S-82119
Buhler Technologies LLC S-80254
Burnside America Inc. S-83535
BVA Hydraulics S-82149
C Matic SRL S-82610
CAN in Automation e.V. SL-80201
Canfield Industries S-81449
Canimex Inc. S-83321
Caplugs S-83120
Carlisle Brake and Friction S-83731
Casappa Corporation S-81330
Cervis, Inc. S-83111
CEJN ..... C-#23005
CHENG MAO PRECISION SEALING CO., LTD S-82956
Chia Wang Oil Hydraulic Industrial Co., Ltd. S-83058
China Hydraulics Pneumatics & Seals Association SL-80129
China Leemin Hydraulic Co., Ltd S-82158
CN Hydraulic Parts S-83207
Comer Industries Inc. S-82831
Conforti Oleodinamica Srl S-82510
Continental Hydraulics S-81217
Continental Industrial Fluid Solutions S-80855
Coronet Parts Mfg Co Inc S-82248
Crissair, Inc. S-82055
Cross Manufacturing Inc S-81323
CSB Americas Inc. S-83755
Curtiss-Wright S-83131
CW Bearing USA, Inc. S-83510
Dalton Bearing & Hydraulics LLC SL-80027
Danfoss Power Solutions, Inc S-80931
Delta Power Co. - Tecnord S-83043
Deltrol Fluid Products S-80635
DEMAC SRL S-82413
Dezhou Yuli Hydraulic Co., Ltd S-80049
DICSA - Distribuidora Interacional Carmen SA S-83217
Diesel Progress (DP) S-82131
Diesel Progress International (DPI) S-82131
Diesse Rubber Hoses spa S-82449
Dinamic Oil North America S-81554
Doering Company S-80142
Dura-Bar S-81920
Dynamic Fluid Components Inc./ PVS Sensors Inc. S-82747
E-T-A Elektrotechnische Apparate GmbH SL-80201
Eagle Hydraulic Inc. S-82318
Eagle Pro Industrial Tools, Inc S-82554
Eaton S-80231
EBI Motion Controls S-83351
ECMT SRL S-82613
Eisele Connectors, Inc. S-83211
Elettrotec Srl S-82612
Emmegi Heat Exchangers Inc S-83431
Engineered Inserts & Systems, Inc. S-83106
Engineered Seals & Components S-82311
Engineering Technology Services (ETS) S-82631
Engis Corporation S-82842
Enovation Controls S-80917
Eskridge S-81949
ESP International / Goetze Authorized Distributor S-80037
Essentra Components S-83834
European Industrial Products Inc. S-82319
Everison International Group Inc. SL-80132
Famic Technologies Inc. S-81345
Faster SpA S-80917
FB Chain S-81647
FD-Groups America, Inc. S-82251
Federtec S-82511
Femco Drain Technology, Inc. S-82452
Fernsteuergeraete Kurt Oelsch GmbH – FSG Sensors S-81655
Filtrec North America Inc. S-82007
Fittings Unlimited S-83411
Flaretite Inc. S-82525
Fluid Gear Products S-83742
Fluid Power Journal SL-80125
Fluid Power World S-80752
FluidPowerNet S-82154
FluiDyne Fluid Power S-80715
Fonderia Zardo S-82613
FONDERIE DI MONTORSO SPA S-82059
Fondershell S-82613
FOR S.p.A. S-83710
Force America, Inc S-82331
G H Media Business Pvt. S-83711
Galland Henning Nopak, Inc. S-80631
Galtech - brand of Walvoil Spa S-81743
Gates Corporation S-80731
Gear Pump Manufacturing S-83607
Geartek S-80714
GLT SL-80026
Grayhill S-81558
Green Hydraulic Power SL-80002
GS Global Resources, Inc. S-81409
Guarnitec SRL S-82606
GW Lisk Co Inc S-80621
H B Hydraulics Co., Ltd. S-83053
Hallite Seals Inc. S-83631
Han Dok Hydraulic Co S-83243
Hangzhou Sino-Deutsch Power Transmission Equipment Co., Ltd. S-83306
Hansa-Tmp Srl S-82407
Harrison Hydra-Gen S-83047
Hartmann Controls Inc S-80643
HAWE Hydraulik S-81142
Hayes Manufacturing, Inc. S-83759
HCH Bearing Americas S-80207
Heavy Motions Inc S-82207
Hebei Fitexcasting Trading Co., Ltd. S-82156
HED (Hydro Electronic Devices) Inc. S-82021
Hefei Changyuan Hydraulics Co., Ltd. S-83659
HEMA Endustri AS S-81855
Hengli America Corporation S-81154
Hengong Machinery Technology Co., Ltd. S-83200
Hercules Sealing Products S-82443
Hirlekar Precision SL-80103
HOF Hydraulic S-82254
Holmbury Inc S-83358
Honor Pumps/Youli-America/Power Valve/Clean Filtration S-82144
Huai'an Shengjie Hydraulic

The BETTER Solution Provider

Largest range of gear reducers for the mobile industrial applications. Planetary, Helical, Worm, Slew Drives, Stationary Construction Equipment, and More. From fractional HP to several thousands HP and many combinations to fit all possible applications.

Exclusive North American Partner of: STM team

Visit Us at Booth # S83154

Young Powertech inc.

610-558-0760
youngpowertech.com

Machinery Co., Ltd. S-83500
Hunger Hydraulics Ltd S-80359
Husco....S-80815
Hy-Pro Filtration S-81931
HYDAC Technology Corp./ Schroeder Industries....S-80843
Hydra Dyne Technology Inc. S-81743
HydraForce Inc S-80431
Hydraulex....S-82845
Hydraulics & Pneumatics S-80160
Hydreco....S-81217
Hydro Leduc S-82300
Hydrocontrol - brand of Walvoil Spa S-81743
Hydromotion....S-80507
Hydrosila JSC....S-83311
Hydrotechnik USA, Inc. S-83435
IC-Fluid Power, Inc....S-80515
IFM Efector Inc S-81107
IFP-EHA....S-80806
Impro Group S-83210
Industrial Nut Corporation S-82560
Innovative Hydraulics LLC S-83611
Intercontrol Hermann Kohler Elektrik Gmbh & Co KG....SL-80201
International Fluid Power of America S-83249
International Fluid Power Society SL-80126
Interpump Group S.p.A. S-81743
Intradin (Shanghai) Machinery Co. Ltd S-82812
IoT Diagnostics S-80044
Isspro Inc....S-80054
ITT Enidine....S-82200
IVT – Industrial Vehicle Technology International SL-80130
J.R. Merritt Controls Inc....S-82346
Jason Industrial by Megadyne S-83354
Jiangyin Hongteng Machinery Co., Ltd....S-80060
Jihostroj a.s....S-81259
Jinmyung Powertech Co., Ltd. S-82655
Joral LLC....S-81409
Joseph Industries S-81907
Kar-Tech, Inc....S-81955
Kastas Sealing Technologies S-82718
Kawasaki Precision Machinery (U.S.A.) Inc. S-80907
KAZELOGULLARI SAN. VE TIC. LTD. STI...S-80144
KGBAL Manufacturing S-80154
KHL Group LLP (Power)....S-82131
Kinematics Mfg....S-80138
King Intl....S-83709
Kingstar Enterprises Corp S-80252
Kracht Corporation....S-83213
KTI Hydraulics, Inc S-80653
KTR Corporation....S-82820
Kuriyama of America Inc....S-83331
Kurt Manufacturing Company....S-83852
Kvaser Inc....SL-80201
KYB Americas Corporation....S-81243
LFK Bearing (America) Co., Ltd. S-82659
Ligon Ind. S-82521
Lillbacka USA/Finn-Power....S-83511
Linde Hydraulics Corporation....S-81631
Lodar....S-83406
Logan Clutch Corporation S-83113
LOR Manufacturing Company, Inc S-83707
Lynch Fluid Controls S-82017
Magister Hydraulics....S-82819
Magnetek....S-82043
Manuli Hydraulics S-82011
Marzocchi Pumps USA....S-81521
Maxma Fluid Power Inc. S-82161
MCS North America, Inc. S-81647
Mexicali Hard Chrome Corp. S-82347
MFP Seals (Martin Fluid Power) S-81317
MICO, a WABCO Company S-81430
Mid-West Instrument S-83409
Midland Industries S-80649
Milwaukee School of Engineering....SL-80036
Mitsuboshi Belting Limited....S-83806
MJ DE-YI International Ltd....S-83754
MOCAP S-82051
Monarch Industries....S-83647
Montanhydraulik GmbH....S-80057
Moog Inc....S-80519
Moseys Production Machinists, Inc....S-80718
Motion Industries, Inc S-83451
Mountop Precision Industrial Co., Ltd. S-83057
MOVO Hydraulics S-82057
MP Filtri USA Inc S-81542
MTE Hydraulics S-82545
MTS Sensors....S-80719
Muncie Power Products S-81743
Murrelektronik Inc. S-83408
Nachi America Inc....S-80443
NAF AG S-83030
Nanjing High Speed & Accurate Gear Group Co.,Ltd....S-83343
Nason....S-83545
National Filters, Inc. S-82531
National Fluid Power Association....S-81530
NBB Controls Inc....S-83746
NIMET SRL....S-83531

TRU-WAVE® WAVE SPRINGS

Wave Springs

Pack **More Force** Into **Less Space!**

- Up to 50% reduced work heights for more compact applications.
- Easily customized for your application needs.
- Available in standard carbon or stainless steels, as well as exotic alloys for extreme operating conditions.

Contact Us for Free Samples and Expert Advice:

sales@rotorclip.com +1 732.469.7333

www.rotorclip.com

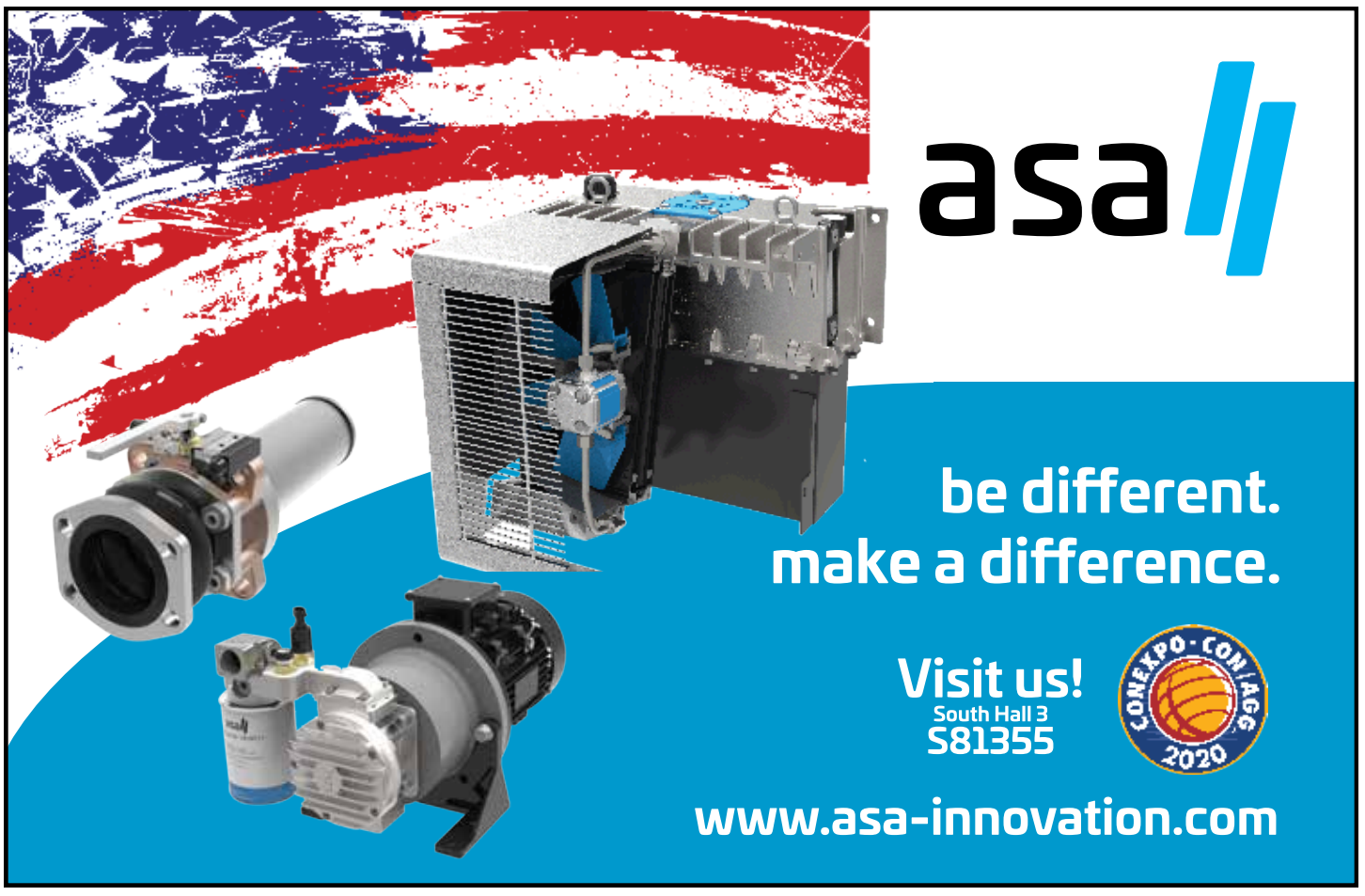
IATF 16949 • ISO 9001 • AS9100 • ISO 14001

Designed for Quality

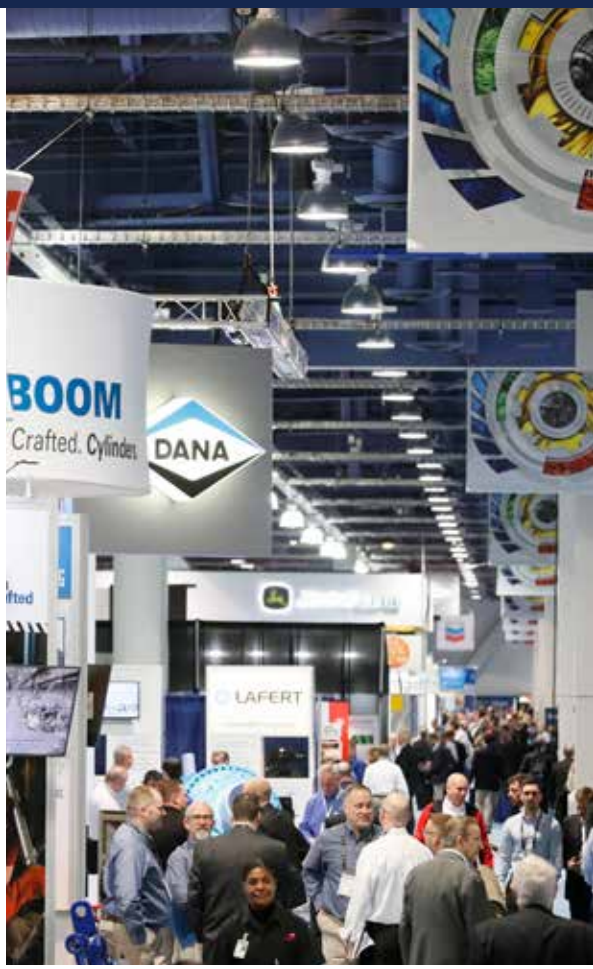
ROTOR CLIP®

2020 Exhibitor Booth Listing

Ningbo bolev Hydraulics Co., Ltd. S-81659
Ningbo Hanshang Hydraulic Co., Ltd. S-83310
Ningbo HOYEA Machinery Manufacture Co., Ltd. S-83209
Ningbo Longteng Hydraulic Components Co., Ltd. S-81461
Ningbo PHP Hydraulics Co., Ltd. S-80039
Ningbo Wanerf Hydraulic Co.,Ltd S-82859
Ningbo Yinzhou Longway Tech Co., Ltd. S-82058
Ningbo Zhongtian Union Mechanical & Electrical Manufacturing Co., Ltd S-82707
Ningbo Zhongyi Hydraulic Motor Co., Ltd. S-83116
Nissens Cooling Solutions Inc. S-83830
Norrhydro Oy S-80042
North American Hydraulics, NAHI LLC S-82419
NOSHOK, Inc. S-82342
OEM Controls, Inc. S-81506
Ognibene North America LLC S-82645
Oiles America Corporation S-83706
Oilgear S-80507
Oilpower Hydraulics Private Limited S-80148
Omni Gear S-82143
OP USA INC S-83551
Optibelt S-80045
Oriental Export Corporation S-82260
Ozcelikler Hydraulic S-81755
Pamas GmbH S-83758
PARCACI IS MAK. LTD. STI. S-83259
Parker Hannifin Corporation S-80245
PC Hydraulics (USA),Inc S-81307
Permco Inc S-80745
Petseals Industries Ltd. S-83059
PistonPower GmbH S-81759
Plymouth Tube Company S-80720
Poclain Hydraulics Inc S-81613
Polygon Composites Technology S-82555
Polymer Molding Inc S-81445
Poppelmann Plastics USA LLC S-82549
Posi Lock Puller S-82723
Powermach Import & Export Co., Ltd. S-83507
PQ Controls Inc. S-80056
Pressure Connections Corporation S-82247
Prince Manufacturing Corporation S-83445
Proemion Corporation S-80807
Progressive Automations SL-80033
ProPulse SL-80030
PSP Seals, LLC S-81959
Pun Teh Industrial Co., Ltd. S-82959
QA1 Precision Products Inc S-81351
QCC S-80615
QP Hydraulics SL-80032
RAM Industries Inc S-81717
RGM S-81407
Ronzio Oleodinamica srl S-82513
Roquet Hydraulics, SL S-83846
Rosenboom Machine & Tool S-81643
Rota Engineering S-82307
Rotary Power S-82155
Rotor Clip Company S-82450
ROTZLER Inc. S-83842
RTS Cutting Tools S-82258
RVI S-83810
RYCO Hydraulics Ltd. S-80453
SAE International SL-80001
Safeplast N/A S-82249
SAFiM Spa S-83506
Salami SpA S-82945
Scenery Hydraulic S-83018
SCF Sealing Technology, Inc S-83753
Schaeffler Group USA S-81607
Scientific Cutting Tools S-83752
SEALCORE, LLC. S-83255
Semperit Industrial Products Inc S-83407
Seven Ocean Hydraulic Industrial Co., Ltd. S-83052
SFC KOENIG S-80647
Shan Hua Plastic Industrial Co., Ltd. S-82957
Shanghai Guorui Hydraulic Technology Co. S-82816
Sharon Tube S-82535
Siko Products Inc S-82846
Smalley S-82754
Smart Protections SRL S-82507
SMC Corporation of America S-82135
Soltech Hydraulics Co., Ltd. S-82961
Specialty Saw Inc. S-83655
SpecSys Inc S-83810
Spectra Premium Industries S-83147



STABILUS.....S-81517
Stauff Corporation S-80753
Stiebel Drive Technology S-83743
Stucchi SRL S-82231
STW Technic, LP S-83517
Suco Technologies.....S-82455
Sun Hydraulics S-80917
Sunfab Hydraulics Inc..... Bronze Hall B93013
SungJi Hydraulics Co., Ltd.....S-82252
SunSource S-81831
Supra Machine Tool S-82353
Swanson Industries S-82357
T-Lon Products Inc S-83143
Taiwan Fluid Power Association.....S-82958
Taizhou Eternal Hydraulic Machine Co., Ltd.....S-82855
Takken Comp. Ind. Co., Ltd.....S-82806
Techflex Inc SL-80031
Tenneco Inc. S-82001
Texas Hydraulics.....S-80507
Texcel S-80459
The Lee Company S-83858
Thomas Magnete USA LLC S-81251
Tieffe s.p.a.....S-83854
Tifco Industries, Inc. S-83307
Tompkins Industries Inc S-82343
Transportide Industrial Ltd.....S-83609
TTP (Formerly Thermal Transfer Products) S-81807
TURCK Inc.....S-82211
Tuson Corporation S-83159
TWG S-83459
Ultra Clean Technologies Corp.....S-82235
Uniflex of America.....S-83158
United Tyrekrafts Pvt Ltd S-83748
Valvole Italia S.r.l. S-83319
Veethree Electronics S-82107
Veljan Hydrair Limited.....S-82257
VIS HYDRAULICS SRL.....S-80657
Vitillo USA.....S-83417
Walterscheid Powertrain Group S-83600
Walvoil Fluid Power Corp.....S-81743
Wandfluh of America, Inc. S-80259
Wetherell Manufacturing S-81321
WIKA USA S-83735
Wilkes & McLean Ltd S-83110
Winner Hydraulics Corporation S-82952
Winters Instruments S-83410
WJB Bearings S-82559
Wooster Hydrostatics Inc S-80746
World Wide Fittings Corporation S-83107
WUXI ZHENHUA MACHINERY CO.,LTD.....S-81459
Xiamen SDTZ Bearing Co., Ltd. S-83661
Xianlong.....S-82345
Yates Cylinders S-81911
YEOSHE HYDRAULICS TECHNOLOGY CO., LTD. S-82808
Ymer Technology, Inc. S-83216
Youli Hydraulic Industrial Co Ltd. S-82649
Young Powertech Inc.....S-83154
Yu Lien Machinery Co., Ltd. S-82960
Yung Lung Air Hydraulics Co., Ltd. S-82446
Zhejiang Ideal Bell Technology Co., Ltd....S-82060
Zhejiang Keister Hydraulic Co., Ltd. S-80035
ZSI-FOSTER S-83643



9S SERIES INVESTMENT CAST SWIVELS

The "9S" Series swivels represent one of the most complete range of sizes and configurations available to the industry. This series has been redesigned to incorporate a one piece barrel arrangement thus eliminating the need for braze joints. These swivels are pressure balanced with operating pressures up to 5,000 psi. All configurations are designed with a 4:1 Safety Factor and include RoHS compliant zinc plating.

HYDRAULICS Inc.
P.O. Box 6479, Fort Worth, TX 76115
V. 817/923-1965
www.hydraulicsinc.com

Brand valves are used across a broad range of industries:

* Agriculture
* Construction
* Industrial
* Material Handling
* Marine
* Entertainment
* Forestry
* Transportation
* Mining

ENGINEERING & MANUFACTURING SOLUTIONS

ISO 9001:2015 CERTIFIED

WITH DESIGN
Certificate #02.002.1

IFPE 2020

Booth: #S81516
March 10-14, 2020

Brand Hydraulics is a global manufacturer of hydraulic & electro-hydraulic components. Many of our products are customized to specifically meet our clients needs for a variety of applications.
Our Mission: Brand Hydraulics will conduct business with integrity & strive to exceed our clients expectations while providing value & innovation in our products and services.

* Phone: 402-344-4434
* www.brand-hyd.com
* sales@brand-hyd.com

BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

HYDAC SMART SOLUTIONS

Accumulators and cylinders are pieces of the puzzle. HYDAC supplies the most comprehensive range of accumulators available and custom engineered cylinders for your specific applications – all made right here in the US.

Using our accumulators and cylinders in conjunction with our comprehensive range of additional hydraulic products – filters, valves, electronics, and coolers to name a few, we can seamlessly synchronize the additional systems in your design. The result is a machine that operates at peak performance. We don't just provide products:

We Optimize Machine Architecture

CONEXPO-CON/AGG 2020 | IFPE 2020

See us at Booth #S80843
March 10-14, 2020

HYDAC INTERNATIONAL

www.HYDAC-NA.com | www.HYDAC.com

HYD2001-2155

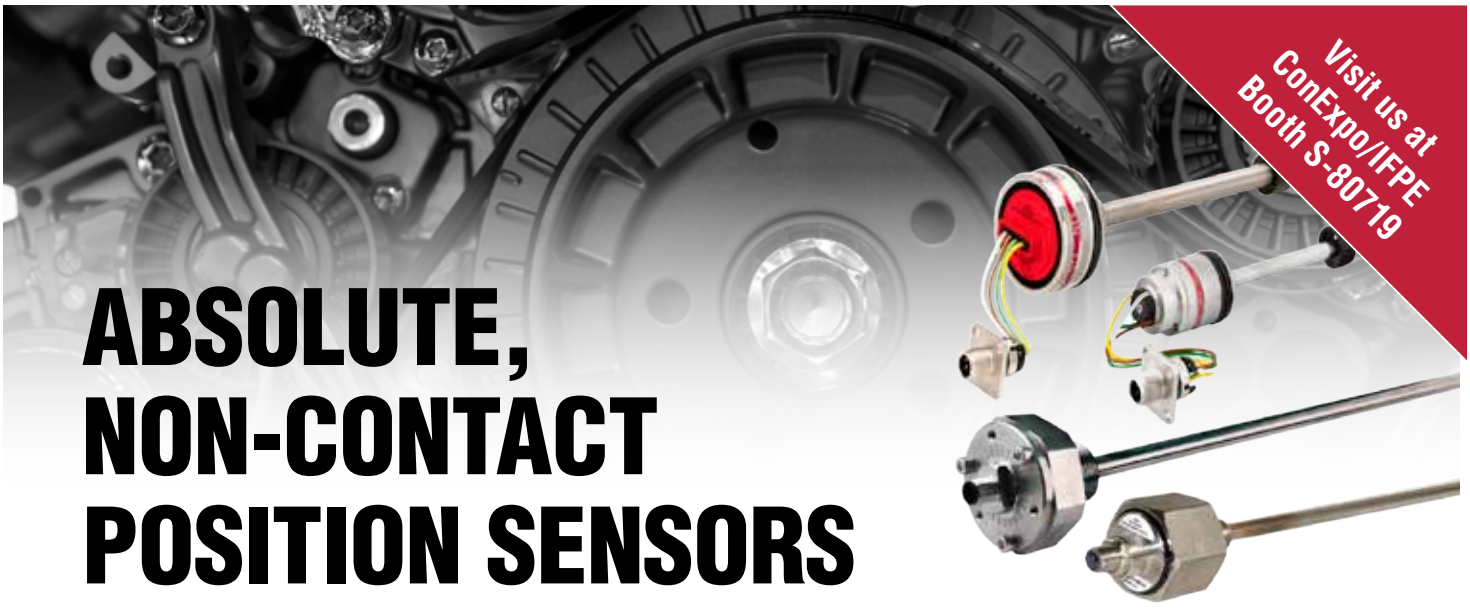
IFPE Technical Education Sessions

> We focused on developing education programs that offer attendees the latest ideas and innovations in fluid power technology, applications and research. Our classes and sessions deliver critical information for engineers and others involved in the design and manufacturing process," said Eric Lanke, President & CEO, NFPA.

Learn about the latest technical topics and trends in hydraulic and pneumatic engineering to optimize energy efficiency and improve interoperability.

Also, along with its prestigious lineup of education sessions, IFPE 2020 will be hosting college course styled speaker sessions at the show. These hands-on sessions will help attendees get the most out of their IFPE experience by providing information critical to the success of companies as the industry continues to expand and develop.

There will be four half-day IFPE "college-level courses" over the course of Monday and Tuesday which will emphasize hands-on technical knowledge. The sessions will explore fundamental concepts such as cutting-edge fluid power technology, the future of machine controls and A.I., the power of IoT and how to correctly harvest it, how hydraulic fluids affect machine performance, clean hydraulic assembly procedures and so much more.



ABSOLUTE, NON-CONTACT POSITION SENSORS

MTS SENSORS | Temposonics®

mtssensors.com

MONDAY, MARCH 9

8:00 AM - 12:00 PM

FUNDAMENTALS OF HYDRAULIC SYSTEMS 101

Speaker: Dr. Medhat Khalil
Director of Professional Education at MSOE at MOSE University

This presentation is made to increase the awareness of the audience about the fundamental concepts of fluid power technology. The presentation covers some rules of physics about the fluid pressure and flow. The lecture is then presents the generic structure of a hydraulic system in addition to construction and principle of operation of the main components, e.g. pumps, motors, valves, cylinders, and rotary actuators. The lecture concludes by how to grab all these components in form of a system that works safely and efficiently.

1:00 PM - 5:00 PM

FUNDAMENTALS OF HYDRAULIC SYSTEMS 201

Presented by: Ryan Webster

TOPIC 1: Introduction to Hydraulic Seal Design, Selection, and Application.

Presented by: Bruce Riley

TOPIC 2: Contamination Control and Clean Hydraulic House Assembly Procedures.

PART 1

We have found a general lack of understanding with the majority of hydraulic hose and tube fabricators for the need to produce and supply cleaned and capped hose and tube assemblies. We start the presentation by educating our audience on the cost of contamination to the end customer, fabricator and equipment manufacturer. We show the cause and effect that contamination has on a hydraulic system so the audience fully understands the need for a clean hydraulic system and the importance of cleaning and capping hose and tube assemblies.

PART 2

Each step of the hose fabrication process is discussed in detail. We show where the contamination is created, how to minimize or avoid the creation of the contamination and how to efficiently remove the created contamination. We explain the importance of capping the cleaned assemblies and then present independent test reports to show the results of different cleaning methods.

PART 3

Normally for Ultra Clean customers we explain the Ultra Clean product line and ROI. We will leave Part 3 out of the power point because we don't want the presentation to become an infomercial for Ultra Clean.

Presented by: Dmitri Terekhov

TOPIC 3: Safety Hydraulics, Best Practices for Modern Machinery.

Presented by: Dale Vanderlaan

TOPIC 4: Electro Hydrostatic Actuation - Highly efficient implement solution with energy recovery.

TUESDAY, MARCH 10

8:00 AM - 12:00 PM

HYDRAULIC FLUID PROPERTIES, EFFICIENCY AND CONTAMINATION CONTROL

Presented by: Paul Michael
Manager of Tribology Research at Milwaukee School of Engineering

In this seminar participants will learn about the composition of oils, the properties of lubricants and how hydraulic fluids can affect machine performance. Conventional, multi-grade, synthetic and biodegradable fluids will be discussed. Research studies examining fluid efficiency effects in hydraulic motors, piston and gear pumps will be presented. The principles of oil analysis and filter selection will be outlined. The seminar concludes with case studies that demonstrates how filter debris analysis can be used to troubleshoot hydraulic system contamination control problems.

1:00 PM - 2:30 PM

DIGITAL DESIGN

TOPIC 1: The Future of Machine Controls: Big Data, Autonomy, and Auto Tune.

Using today's digital technology to simplify complex machine design and control systems.

Three-part presentation covering 2 hours, each roughly being 40 minutes in length with 30 minutes for presentation, and 10 minutes for Q&A.

Future of Machine Controls: Big Data, Autonomy, and Auto Tune *By Zhekang Du*

Simulating Tractor Performance with a Powered Implement – *Presented by Aaron Darnell*

Kuriyama Hydraulic Connections™

QUALITY HYDRAULIC HOSE & ACCESSORIES

Kuriyama Hydraulic Connections Catalog
• Includes new Alfabiotech extra flexible and bio oil resistant hydraulic hoses. • New Flexor TR4XF extra flexible SAE 100 R4 oil return hose.

Kuriyama Hydraulic Quick Couplers Catalog
• For fast and easy connections of hydraulic hoses. • Made from high strength carbon steel with chrome-III zinc plating. • Ideal for agricultural machinery and industrial equipment.

Piranhaflex™ Non-Conductive Hydraulic Hoses
• Series PF267NC has improved flexural rigidity offering increased flexibility for medium pressure hydraulic oil and lubrication lines.
• Series PFLT364 for medium pressure Hydraulic lines for fork trucks in cold storage applications.
• New P400 Portable Service hose crimper.

IFPE 2020

Visit us at Booth S83331

CONEXPO-CON/AGG 2020

Phone: (847) 755-0360 | Fax: (847) 885-0996
360 E. State Parkway • Schaumburg, IL 60173
sales@kuriyama.com
www.kuriyama.com

An investigation into the effectiveness of a fluid powered implement that is towed by a standard agricultural tractor. Simulation is used to estimate tractive effort increases, efficiency increases, and the optimum fluid power solution.

Using Simulation in Value Selling – *Presented by Christian Daley*
Overview of using dynamic simulation in the "value selling process". Example of using dynamic simulation to quickly show benefit of using 2 position bent axis motor with PCOR over fixed bent axis motor for improving the acceleration of high-speed vibration drive. Further use of simulation for optimizing the parameters to reduce the commissioning time.

Presented by: Adam Livesay.

TOPIC 2: Fluid Power IoT Problem Solving Success Stories.

Industrial IoT 1.0 was fancy dashboards and science projects where "IoT" was the "solution" that could solve any problem. Industrial IoT 2.0 is focused around solutions for business problems that are solved with sensors, controllers, edge, mobile, cloud and IoT. IoT is a feature, not the solution.

Presented by: William Campbell

TOPIC 3: Hydraulics in the Digital Age.

WEDNESDAY, MARCH 11

9:30 AM - 10:30 AM

TECHNICAL COMPARISON OF NEXT-GENERATION HYDRAULIC AND ELECTRIC POWERTRAIN ARCHITECTURES

Simon Nielsen

Sr. Systems Engineer at Danfoss

Advances in drivetrain technology and emissions regulations have driven the off-highway machine industry to consider new ways of energy storage and power transfer on machinery. A number of vehicle powertrain architectures are now increasingly relevant, ranging from conventional configurations, to varying levels of hybridization, to fully electric. With these additional architectures come exciting opportunities for performance and efficiency improvement.

This study discusses the factors driving change in the industry and provides a comparison of leading hydraulic and electric architectures, taking into account duty cycle, performance requirements, efficiency, and cost. This study also includes several case studies from the off-highway industry that represent the capabilities of different architectures.

11:00 AM - 12:30 PM

ELECTRO-HYDRAULICS TROUBLESHOOTING WITH LUNCHBOX SESSIONS SIMULATIONS

Carl Dyke

President at CD Industrial Group Inc.

Experiment wildly with hydraulic systems. Join Carl (Industrial Mechanic & Chief Educational Officer at CD Industrial Group Inc.) for a unique fluid power educational experience and see the latest in teaching and learning technology. Carl will demonstrate the utility, effectiveness, and fun of online learning for the challenging topic of hydraulics using LunchBox Sessions. Every attendee will get free limited-time access. Carl is the founder of CD Industrial Group Inc., and has made his mark as a sought-after on-site instructor, and hydraulics video presenter on YouTube (4 million views).

11:00 AM - 12:30 PM

MASTERING FLUID POWER EFFICIENCY WITH IOT

Jeremy Drury

Vice President at IoT Diagnostics

The 2020's will usher in the next industrial revolution with more certainty and speed than what we've witnessed over the past few years. Historically fragmented fluid-power operations will now holistically adapt to real-time changes observed by the latest sensing technology. This presentation provides the road map that connects critical fluid power assets to fluid quality and filtration sensor data. By tracking the real-time efficiencies of each of these components, the data generated will influence field-level decisions, corporate decisions, and strategic partnerships along the supply chain. The three primary learning objectives include a deeper dive (with use-cases) into IoT-enabled efficiency reporting on each of the three critical pillars discussed herein: critical fluid-power assets like pumps, valves, and motors, overall fluid quality (iso, fluid chemistry, etc), and filtration. Attendees will learn proper sensing capabilities, methods of connectivity, and how to best navigate mountains of data to focus on efficiency, and let this scoring set optimize fluid power operations. This presentation could influence every attendee from the production floor to the Executive level.

1:00 PM - 2:30 PM

IOT PREVENTATIVE MAINTENANCE

Sean Grieve

br-automation

Downtime associated with unscheduled repairs of off-highway and heavy equipment can make a significant dent in productivity and profit. Efficient maintenance programs and practices on the part of the equipment owner/ operator definitely help to limit the losses, but modern control technology can also bring significant benefits in the challenge to limit unscheduled downtime.

B&R are bringing 40 years of machine and factory automation experience to the world of off-highway equipment. This presentation will outline the use of modern condition monitoring and analysis technology to enhance equipment performance and boost the bottom line for both OEMs and equipment owners.

1:00 PM - 2:30 PM

MOBILE HYDRAULIC ROBOTICS - AUTONOMOUS MACHINES

John O'Neill — Danfoss

This session will address some of key decision points that system designers face when developing an autonomous machine. This includes software architecture, machine interface options, sensor selection, and user control interface based on the intended application of the machine. Attendees will gain an understanding of software concepts and system components necessary to start planning out their journey to autonomy.

THURSDAY, MARCH 12

9:30 AM - 10:30 AM

ECONOMIC OUTLOOK

Michael Reid

Senior Economist at Oxford Economics

The presentation will begin with an overview of Oxford Economics, its research capabilities, and offerings. This will be followed by a discussion of Oxford's Global Economic Forecast and scenario analysis. Because Oxford's economists judge that the outlook for growth is highly uncertain, especially in the US and Europe, several US outlook scenarios will be reviewed: Oxford's forecast, plus prospects for a renewed global boom, a sub-par trajectory, or renewed crises. Finally, this presentation will conclude by highlighting examples of industry-specific forecasts and scenarios for the manufacturing sector in the US.

9:30 AM - 10:30 AM

INDUSTRY OF THE FUTURE

Prasad Ganorkar— McKinsey & Company

Factory Automation, smart systems, measuring heat speed

11:00 AM - 12:30 PM

ADDITIVE MANUFACTURING - AN EMERGING OPPORTUNITY

Vince Anewenter

Director at MSOE Rapid Prototyping Center

This presentation will provide a comprehensive overview of the technologies that comprise the additive manufacturing industry. I will also provide use case application examples relevant to the IFPE attendees and "Design for Additive Manufacturing" guidelines to help the audience learn how to leverage these technologies in order to deliver maximum value.

THURSDAY, MARCH 12

11:00 AM - 12:30 PM

IFPS CERTIFICATION UPDATE

Donna Pollander — Executive Director at International Fluid Power Society

The International Fluid Power Society certification tests provide an objective, third-party assessment of an individual's technical skill level and are recognized industry-wide. The certification offerings keep pace with changing fluid power and motion control technologies. This session will review training resources and highlight updates taking place with the Society and certification.

1:00 PM - 2:00 PM

HOW TO CONTROL AND LIMIT CONTAMINATION IN A HYDRAULIC SYSTEM

Cameron MacNeil — Global Product Manager-Filtration at Stauff Corporation

The Contamination Control Program provides the background information to understand how to control and limit contamination in a hydraulic system. This educational, non-product related presentation informs the audience of the types of contamination, how it enters the hydraulic system, what damage it causes in the hydraulic system, and how to keep it out. The target cleanliness level chapter works through a weighting system which allows the user to determine how clean their hydraulic systems should be for long life and efficient operation.

1:00 PM - 2:30 PM

WORKFORCE DEVELOPMENT

Lynn Beyer

Director of Workforce Development at National Fluid Power Association

NFPA members consistently rank workforce development as the most challenging issue their companies face. Through member donations to our Foundation, we work to provide the resources necessary to develop fluid power education at multiple grade levels. And through our committees and connection opportunities, we bring our supporters face to face with the new talent being developed by those programs. During this session, Lynn Beyer of NFPA will discuss what NFPA is doing to help increase the number of students educated in fluid power and how we connect them to careers in the industry.

3:00 PM - 4:00 PM

ON-DEMAND HYDRAULIC ASSIST FOR VOCATIONAL TRUCKS

Joe Iberl & Scott Betzen

Poclain

A genuine alternative to mechanical all-wheel drive, our hydraulic system insures optimum mobility for trucks that need to work in difficult conditions and irregular terrains, such as field, forests, and construction sites. Unlike mechanical systems, hydraulic AWD doesn't affect steering, braking, or ride-height. This presentation is designed to show the differences between hydraulic and mechanical all-wheel drive systems, and how the hydraulic is integrated into the truck platform.

3:00 PM - 4:00 PM

POWERTRAIN OPTIMIZATION USING ELECTRO HYDRAULIC SYSTEM - MOBIL HYDRAULICS

Jean Heren — Engineer at Poclain

Partial or full integration of electric solution into off highway vehicle is an opportunity for optimization of working equipment's such as excavators, harvesters or material handling. Hydrostatic drive when used in close loop circuit

offer simple, robust and efficient solution for energy recovery and performance optimization. Poclain Hydraulics and its customer engineering experts have developed innovative solutions taking the best of both worlds thanks to hydraulic high performances solutions and electro hydraulic systems.

FRIDAY, MARCH 13

9:30 AM - 10:30 AM

IOT - SHARING DATA ACROSS COMPANY BOUNDARIES

Adam Livesay

Co-Founder at Elevāt

Industrial IoT 1.0 was fancy dashboards and platforms that failed to deliver real value. Industrial IoT 2.0 is Providing End to End Solutions that provide real ROI to the market. Finding the right partners in the Industrial Ecosystem to make it successful. No one company can do it themselves.

This presentation will have case-studies and real world Fluid Power example of Partner Ecosystems working together to deliver solutions to solve business problems powered by IoT. The presentation will focus on Machine Utilization, Intelligent Maintenance and Service, and Smart Aftermarket Parts & Services, and how every organization in the ecosystem and supply chain are working together to deliver the IoT solution.

9:30 AM - 10:30 AM

THE HYDROSTATIC GEAR DRIVE, THEORY, CONFIGURATION, OPERATION AND SUGGESTIONS TOWARD BEST-PRACTICE DESIGN

Jon Frey

Head of Engineering Systems & Solutions, NA at Bosch Rexroth

Faced with an opportunity to develop a circuit or system design, today's Application Engineers could elect a Mechanical, Electric or Hydraulic solution. However, what choice is possible if the intended, or desired best solution does not fit neatly within any of the three, singular options? Marrying Electric drive content with Mechanical or Hydraulic components has been accomplished successfully, but additional requirements for compactness, energy efficiency, dynamics, accuracy, load carrying ability and other application specific demands may necessitate more than bundling existing components into a classic power unit - satellite manifold - actuator solution. The Hydrostatic Gear drive, or Self-contained Hydraulic Actuator, combines existing technologies into unique, compact, dynamic, efficient configurations that can be designed for a singular application, or toward a serialized solution. This presentation will review fundamental attributes of mechanical and hydraulic linear actuators, and where the hydrostatic gear solution offers strengths. A matrix array of possible pump and actuator solutions will be presented, including the related challenges of control (hydraulic circuit and control structures, including sensors). Additionally, considerations toward achievement of compactness, maintenance and commissioning of a "closed" hydraulic system will be presented. Incorporated within these areas of focus, suggestions toward the avoidance of pitfalls will be offered, including basic, Engineering parameters from our experience and best practices

---

11:00 AM - 12:30 PM

ASSESSING YOUR HYDRAULIC SYSTEM EFFICIENCY (INDUSTRIAL)

Thomas Blansett

Technical Director at IFPS

Designing a 100% efficient industrial hydraulic system is not possible but improving upon the typical energy wasteful designs that populate the industry is easy.

This session will look at some of the areas where hydraulic energy inefficiencies occur and discuss key items for evaluating an industrial hydraulic system to determine recommendations to improve efficiency and lower the total cost of ownership. Specifics include looking at the sizing of prime movers, selection of fluid, contamination control, type of pump utilized along with its controls, valving, and actuator selection.

11:00 AM - 12:30 PM

POWERTRAIN OPTIMIZATION USING ELECTRO HYDRAULIC SYSTEM - MOBILE HYDRAULICS

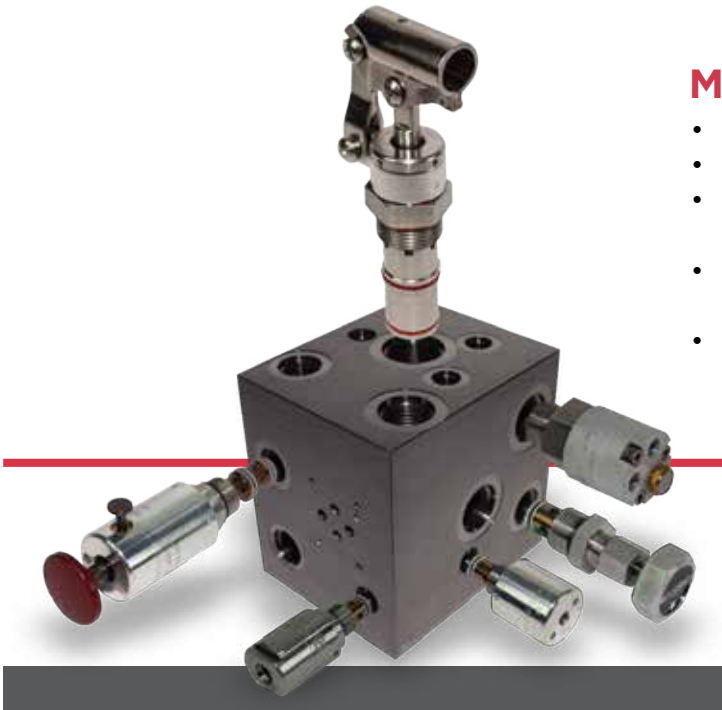
Jean Heren

Engineer at Poclain

Partial or full integration of electric solution into off highway vehicle is an opportunity for optimization of working equipment's such as excavators, harvesters or material handling. Hydrostatic drive when used in close loop circuit offer simple, robust and efficient solution for energy recovery and performance optimization. Poclain Hydraulics and its customer engineering experts have developed innovative solutions taking the best of both worlds thanks to hydraulic high performances solutions and electro hydraulic systems.

DOERING

Proven to Hold Up in the Most Extreme Environments



Manifolds and Assemblies

- Standard and Custom Hydraulic Manifold Blocks
- Aluminum, Stainless Steel and Steel
- Designed, Built and Assembled to Meet Your Needs
- Thousands of Stock Manifolds Available for Immediate Delivery
- Lead Times Better Than Industry Standard

IFPE 2020
March 10 – 14, 2020
Las Vegas, NV
Booth S80142

+1 320.743.2276
doering.com

© 2020 Doering, Inc. All rights reserved.

ZSi Foster

Innovation. Quality. Service.
Connecting you with the best products!

IDEAL TRIDON GROUP

For Great Products and Exceptional Service, Choose ZSi-Foster!

Pneumatic Series Quick Disconnects

♦ Industrial ♦ ARO ♦ TruFlate ♦ Ring Lock
♦ Lincoln ♦ Schrader ♦ Universal ♦ Safety Vent

Hydraulic Series Quick Disconnects

♦ ISO B – FHK ♦ ISO A ♦ Wing Nut ♦ Straight-Through
♦ Snap Tite H ♦ AG / 4000 ♦ ISO 16028 ♦ Enerpac

Pipe, Tube & Hose Connections and Support Systems

♦ Cushioned Clamping ♦ Hydraulic Clamps ♦ Loop Clamps ♦ Pipe Supports ♦ Metal Framing ♦ Hose Systems ♦ No-Hub Couplings

Visit us at booth #S83643 or call ZSi-Foster at (866) 918-3003 or order at zsi-foster.com

Campbell Fittings — FOSTER MANUFACTURING COMPANY — IDEAL TRIDON — Strapbinder®

FRIDAY, MARCH 13

1:00 PM - 2:00 PM

CLEANLINESS REQUIREMENTS FOR HYDRAULICS

Bill Bars

Beckman Coulter

Maintenance operators for aerospace, oil and gas, heavy equipment, and other industries that rely on hydraulics have leaned heavily on Liquid Particle Counting in their daily battle of effectively maintaining their equipment to maximize up-time and performance. Over 90% of catastrophic failures are the result of abrasive internal wear that can cause these critical systems to fail. Part of the role that hydraulic fluids play is lubrication reducing friction and abrasive wear. Determining an appropriate cleanliness specification for your equipment fluids can be accomplished using Liquid Particle Counters that appropriately calibrated and capable of reporting industry recognized and appropriate cleanliness codes, i.e. ISO 4406, SAE AS4059, etc. Some industries have already developed effective SOPs and cleanliness specs and these are easily adapted using Particle Counters. Developing an effective predictive maintenance protocol utilizing Liquid Particle Counting cleanliness codes to detect problems early have proven to be a vital contributor to maximizing equipment life and up-time.

1:00 PM - 2:00 PM

WHAT CONSTITUTES AN EFFECTIVE HYDRAULIC CASTING

Daniele Chiesa

Engineer at Fonder Shell

Current applications require parts more complicated and with higher performance declined on several aspects (value and cost, mechanical behaviour, sustainability of production); This could be looked as an opportunity to face the steps of manufacturing of such parts with an holistic approach. Hydraulic casting is a good example to demonstrate how the properties of a system are not driven by the sum of the components but from the whole system. Aspects of foundry technology are presented to show how they can affect the performance of hydraulic parts. Compacted graphite iron and shell moulding.

3:00 PM - 4:00 PM

MACHINE CONTROL AUTOMATION OF FUNCTIONS ON THE MACHINE

Simon Yardley— Director of Strategic Business Development & Marketing at Husco

Ben Holter— Systems Engineering Manager at Husco

The demand for better performance on machines is relentless, greater productivity and increased efficiency is a rolling responsibility of OEMs and OEM suppliers alike. The semi or full automation of equipment allows more precise, repeatable and efficient use of a machine, however, automation requires digital control where the vast majority of hydraulically operated machines today are developed for analogue control by an human. Husco designed and tested a turn key subsystem to allow the digital control of any pilot operated machine, new or existing, the test vehicle was a 21T excavator. This presentation will detail the challenges faced with control of the excavator and results from the testing.

3:00 PM - 4:00 PM

SYSTEM SIMPLIFICATION WITH MULTI-SERVICE DIGITAL DISPLACEMENT PUMPS

Chris Williamson

Senior Systems Engineer at Danfoss Power Solutions

Digital displacement pumps (DDP) are a new type of hydraulic piston pump where each piston is controlled individually with on/off valves. In addition to higher efficiency than conventional pumps, DDP offers unique opportunities for simplifying hydraulic systems. Because each piston is controlled independently, one DDP may have multiple independent outlet services – essentially two or three pumps in one. Combined with switching valves, a multi-service DDP may dynamically change the connections between pump outlets and machine functions. Multi-service capability unlocks new system architectures, more intelligent machine control and sizable improvements in performance and efficiency. This presentation describes hydraulic system concepts developed by Danfoss Power Solutions for off-highway vehicles. Results of real-world testing will be presented along with a preview of future developments.

MAKING A DIFFERENCE
FOR YOUR BUSINESS

Our cutting-edge line of hydraulic hose and fittings is not just a product division. It's a promise of superior service, quality, technical support and availability. We've built our company on impeccable customer service. Let us know how we can make a difference for your business.

call 800.231.7116 or email sales@texcelrubber.com

TEXCEL HYDRAULICS

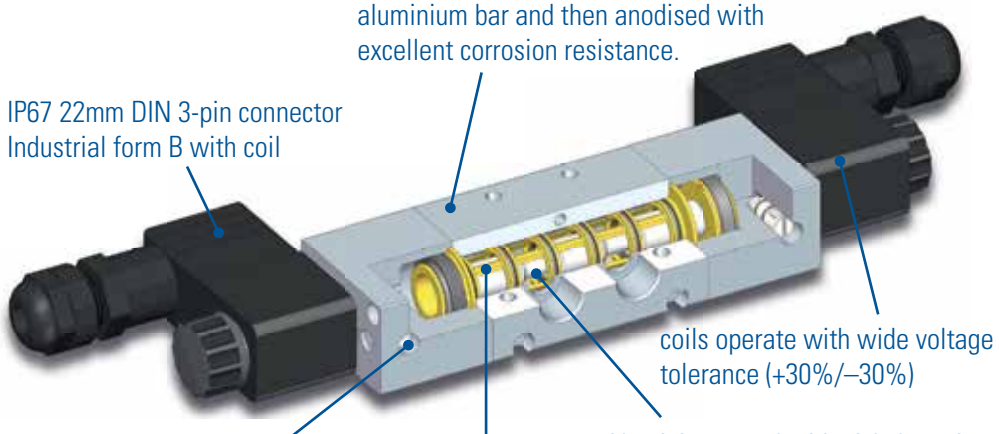
ALASKA XTREME

Las Vegas, NV
March 10 - 14, 2020
IFPE 2020
AZ pneumatica USA
VISIT US:
South Hall 2nd Floor
Booth S-82054

- heavy duty valve series with wide operating temperature range from -40 °F to +140 °F
- robust body with excellent corrosion resistance
- high reliability and long service life
- tested to +5g shock and vibration
- designed to operate with pressures up to 232 PSI

Heavy duty pneumatic valves
Alaska Xtreme Series

Manual, pneumatic, electric, 3/2, 5/2 & 5/3; the Alaska Xtreme valves series are suitable for a multiple heavy duty application. From the industrial field to automotive, all functions are available from 1/8" to 3/8"NPT or BSP using the same design and technology. AZ Pneumatica has been known worldwide as an italian manufacturer of fine valves and pneumatic customized products for the automotive industry and recently has expanded its operations to the USA.



pneumatica USA
agility in automation

azpneumatics.com

Contamination Control

The Ultra Clean Solution

80% of hydraulic failures can be attributed to contamination that is generated during the hydraulic hose and tube fabrication processes. Your equipment is too valuable to suffer from an unexpected failure. The Ultra Clean system removes harmful contamination from your hydraulic hose and tube assemblies. Ultra Clean products are the premier solution for contamination control, decreasing downtime and increasing your profits today.

Clean Easy ***Seal Easy*** ***Sleep Easy***

EXHIBITOR AT

CONEXPO-CON/AGG 2020 IFPE 2020

Booth # S82235

Ultra Clean® TECHNOLOGIES CORP.

1274 HWY 77, Bridgeton, NJ, 08302

1-800-791-9111 | www.ultracleantech.com