CFD Analysis of Oil Flooded Twin Screw Compressors

Sham Ramchandra Rane, Ahmed Kovacevic, Nikola Stosic
Centre for Compressor Technology, City University London, United Kingdom
Keywords: Oil Flooded Twin Screw Compressor, CFD, Deforming Grid

Experimental Investigation on the Operating Characteristics of a Semi-Hermetic Twin Screw Refrigeration Compressor by Means of P-V Diagram

Xiaokun Wu, Zhaorui Zhao, Wening Chen, Ziwen Xing
Xi'an Jiaotong University; Suzhou Academy, Xi'an Jiaotong University
Keywords: Screw Compressor, Operating Characteristics, P-V Diagram, Oil Flow Rate

Research on Injected Effect and Heat-Transfer Characteristics of Narrow-Slit Injection Orifice Used for the Screw Compressor

Jia Xie, Jian Li, Kang Lian, Quanke Feng, Weifeng Wu
Xi'an Jiaotong University, China, People's Republic of
Keywords: Screw Compressor; Narrow-Slit Injection Orifice; Numerical Simulation; Experiment Analysis.

Research on the Performance of a High Pressure 5.3MPa Twin Screw Compressor

Zhaorui Zhao, Xiaokun Wu, Feng Hou, Ziwen Xing
Xi'an Jiaotong University, China, People's Republic of
Keywords: High Pressure, Twin Screw Compressor, Semi-Empirical Model, Performance

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Zengli Wang, Yingfeng Shen, Zhenbo Wang
China University of Petroleum, Qingdao, China, People's Republic of
Keywords: Single Screw Refrigeration Compressor, Working Medium, Thermal Dynamic Performance, Effect

Analysis on Lubricant Film Force for Two Types of Meshing Pair Profile in Single Screw Compressor

Feilong Liu, Jia Xie, Davide Ziviani, Quanke Feng, Martijn van den Broek, Michel De Paepe
1 School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an, China; 2 Department of Flow, Heat, and Combustion Mechanics, Ghent University, Ghent, Belgium
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¹Heat and Mass Transfer Technological Center (CTTC) Universitat Politècnica de Catalunya (UPC) - BarcelonaTech ETSEIA T, Colom 11, Terrassa (Barcelona) 08222, Spain; ²Termo Fluids S.L., Avda. Jacquard 97 1-E, Terrassa (Barcelona) 08222, Spain
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¹TU Braunschweig, Germany; ²Volkswagen AG, Germany
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¹Torad Engineering, United States of America; ²Ray W. Herrick Laboratories, Purdue University, West Lafayette, IN
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Konrad Klotsche, Christiane Thomas, Ullrich Hesse  
TU Dresden, Germany  
*Keywords: Cooling, Piston, Piston Rod, Internal Cooling*

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**Thermal Analysis of a Hermetic Reciprocating Compressor Using Numerical Methods**

Stefan Posch¹, Johann Hopfgartner¹, Martin Heimel¹, Erwin Berger¹, Raimund Almbauer¹, Stefan Stangi²  
¹Institute for Internal Combustion Engines and Thermodynamics, Austria; ²Secop Austria GmbH, Austria  
*Keywords: Thermal Model, Reciprocating Compressor, CFD*

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**CFD Approach to Evaluate Heat Transfer in Reciprocating Compressors**

Jônatas Ferreira Lacerda¹, Celso Kenzo Takemori²  
¹Tecumseh Products Company, Brazil; ²Vibroacústica Desenvolvimento e Pesquisa Ltda., Brazil  
*Keywords: Reciprocating Compressors, Heat Transfer, CFD*

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**Experimental Investigation of Heat Transfer in Components of a Hermetic Reciprocating Compressor Under Thermal Transient**

Gustavo Luiz Macedo da Silva, Thiago Dutra, Cesar Jose Deschamps  
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*Keywords: Gas Superheating, Heat Transfer, Thermal Transient.*

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**Experimental Determination of Correlations for Heat Transfer Coefficients in the Suction Muffler of a Hermetic Reciprocating Compressor**

Eduardo Arceno, Thiago Dutra, Cesar Jose Deschamps  
POLO/Federal University of Santa Catarina, Brazil  
*Keywords: Suction Gas Superheating, Heat Transfer Correlation, Suction Muffler*

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Lopez Mas¹, Rigola Joaquim¹, Lehmkuhl Oriol¹,², Oliva Assensi¹  
¹UPC, Spain; ²Termo Fluids S.L.  
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Tobias Göpfert, Christiane Thomas, Ulrich Hesse
Technische Universität Dresden, Germany

**Keywords:** Surface Tension, Lubricant-Refrigerant Mixtures, Pendant Drop Method, Low-Viscous Lubricants, Carbon Dioxide

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**The Evolution of Polymer Bearing Processing for Scroll Compressor Performance and Life Enhancement**

Michael R. Kim, Derek Marsella, Benoit Sidot
GGB Bearing Technologies, United States of America

**Keywords:** Scroll Compressor, Metal Polymer, Plain Bearing, Low Friction, Wear Resistance

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**Evaluating Lubricants for Lower GWP Refrigerant Compressor Operations**

Joseph Karnaz
CPI Fluid Engineering, United States of America

**Keywords:** Lubricants, Refrigerants, GWP, Compressor, Efficiency

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**LGWP & HC Refrigerants Solubility Tests Performed in Running Scroll Compressor**

Pierre Ginies, Guillaume Rebire, Julie Mandon, Jean Guillaume Cheurlin
Danfoss Commercial Compressors, France

**Keywords:** Lubricant, Refrigerant, HC, LGWP, Solubility

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**Numerical Modeling of Capillary Compensated Aerostatic Bearing Applied to Linear Reciprocating Compressor**

Emilio Rodrigues Hulse¹, Alvaro Toubes Prata²

¹Embraco - R&D, Brazil; ²POLO Research Laboratories for Emerging Technologies in Cooling and Thermophysics, Federal University of Santa Catarina, Brazil

**Keywords:** Linear Compressor, Aerostatic Bearing, Finite Volume Methodology, Piston Lubrication

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Mitsuhiro Fukuta¹, Junki Sumiyama², Masaaki Motozawa¹, Akifumi Hyodo², Tadashi Yanagisawa¹

¹Shizuoka University, Japan; ²Graduate school of engineering, Shizuoka University

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1Osaka Electro-Communication University, Japan; 2Mayekawa Mfg. Co., Ltd., Japan; 3Panasonic Corporation Appliances Company, Japan;
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1 CFX Berlin Software GmbH, Germany; 2 TU Dortmund University, Germany
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Matthias Utri, Andreas Brümmer
Chair of Fluidics, TU Dortmund University, Germany
Keywords: Twin-Screw Compressor, Variable Lead, Multi-Chamber Simulation, Geometry Variation, Efficiency Optimization

ID: 1327
Performance Testing of a Vapor Injection Scroll Compressor With R407C
Thomas W. Moesch, Ammar M. Bahman, Eckhard A. Groll
1Institut fuer Energietechnik Bitzer-Stiftungsprofessur fuer Kaelte-, Kryo- und Kompressorentechnik, Technische Universitaet Dresden, Germany;
2Ray W. Herrick Laboratories, Purdue University, United States of America
Keywords: Economized Vapor Injection, Calorimeter, COP, R407C

ID: 1501
Analysis of Indicator Diagrams of a Water Injected Twin-Shaft Screw-Type Expander
Alexander Nikolov, Andreas Brümmer
Chair of Fluidics, TU Dortmund University
Keywords: Twin-Shaft Screw-Type Expander, Water Injection, Time-Dependant Working Chamber Pressure Measurement, Indicator Diagrams, Operational Behavior

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Ye Tao, Yunho Hwang, Reinhard Radermacher, Chunsheng Wang
University of Maryland, United States of America
Keywords: Electrochemical Compressor, Hydrogen, Ammonia

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Thomas Eckert, Leo Dostal, Martin Helm, Christian Schweigler
University of Applied Sciences Munich, Germany
Keywords: Compressor, Sorption, Hybrid, Watersteam, Lithiumbromide

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Mechanistic Model of an Oil-Flooded Single-Screw Expander
Davide Ziviani, Ian H. Bell, Michel De Paepe, Martijn van den Broek
1Ghent University, Belgium; 2University of Liege
Keywords: Single-Screw Expander, ORC, PDSim
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¹School of Chemical Engineering and Technology, Xi’an Jiaotong University, China; ²Zhejiang Qiangsheng Compressor Manufacturing Co., Ltd. China
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¹ARCELIK A.S., Turkey; ²Istanbul Technical University, Mechanical Eng. Department, Turkey
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¹EDF R&D, Energy in Buildings and Territories Department (ENERBAT), France; ²Centre for Energy efficiency of Systems (CES), MINES ParisTech, PSL Research University, France
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A 3-D Transient CFD Model of a Reciprocating Piston Compressor With Dynamic Port Flip Valves
Sujan Dhar¹, Hui Ding¹, Jonatas Lacerda²
¹Simerics, Inc., Bellevue, WA, USA; ²Tecumseh Products Company, São Carlos, SP, Brazil
Keywords: Reciprocating Piston Compressor, Flip Valve, Computational Fluid Dynamics, Transient, Fluid Structure Interaction

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David Henry Rowinski, Kenneth Edward Davis
Convergent Science, Inc., United States of America
Keywords: Reciprocating Compressors, Reed Valves, Computational Fluid Dynamics, Cut-Cell Method, Automatic Meshing

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Weifeng Wu¹,², Zhifang Jian¹, Mingyi Song¹, Zhao Zhang¹
¹Xi’an Jiaotong University, China, People’s Republic of China; ²Faculty of Engineering and Architecture – Department of Industrial System and Product Design/Ghent University, Graaf Karel de Goedelaan 5, B-8500 Kortrijk, Belgium
Keywords: Fluid-Structure Interaction; Discharge Valve; P-V Graph

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Dietmar E. B. Lilie, Rinaldo Puff, Marcos G. D. Bortoli
Embraco, Brazil
Keywords: Linear Compressor, Discharge Manifold, Thermal Efficiency

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Hyunjoo Oh, Sungchul Kong, Wonsik Oh, Kyeong-bae Park
LG electronics, Korea, Republic of (South Korea)
Keywords: Numerical Simulation, Linear Compressor, CFD
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1Agilent Technologies Vacuum Products Division, Lexington, Mass., USA; 2Acentech Incorporated, Cambridge, Mass., USA
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Federal University of Santa Catarina, Brazil
Keywords: Lumped Model, Adjustment of Parameters, Genetic Algorithm, Calibration Procedure

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Marcos Giovani Dropa Bortoli
Embraco, Brazil
Keywords: Reciprocating Compressor, Manifold, Structural Analysis, Cylinder Head

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Jit Guan Edwin Ong, Kim Tiow Ooi
Nanyang Technological University, Singapore
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Marco Carrilho Diniz, Cesar Jose Deschamps
POLO - UFSC, Brazil
Keywords: Air Conditioning, Compressor Comparative Analysis, Thermodynamic Efficiency.

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Design Methodology Improvements of a Rotating Spool Compressor Using a Comprehensive Model
Craig R Bradshaw¹, Greg Kemp¹, Joe Orosz¹, Eckhard A Groll²
¹Torad Engineering, United States of America; ²Purdue University, United States of America
Keywords: Spool Compressor, Comprehensive Model, Design Improvement

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Vasiliaq Kacani
Leobersdorfer Maschinenfabrik GmbH, Austria
Keywords: Reciprocating Compressor, Piston, Piston Rod, Fatigue Strength Calculation

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David Neal Halbrooks
Bristol Compressors, United States of America
Keywords: Compressor, CFD, Finite Volume, Efficiency, Simulation
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¹University of L'Aquila, Italy; ²City University London, United Kingdom; ³Ing. Enea Mattei S.p.A., Italy
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¹Air Conditioning Compressor Team, LG Electronics Inc.; ²Air Conditioning Compressor Development Team, LG Electronics Inc.
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Stefan Posch, Johann Hopfgartner, Martin Heimel, Erwin Berger, Raimund Almbauer, Peter Schöllauf

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Keywords: CFD, Oil Pump, Reciprocating Compressor

A Numerical Friction Loss Analysis of the Journal Bearings in a Hermetic Reciprocating Compressor

Stefan Posch, Johann Hopfgartner, Martin Heimel, Erwin Berger, Raimund Almbauer, Peter Schöllauf

1 Institute for Internal Combustion Engines and Thermodynamics, Austria; 2 Secop Austria GmbH, Austria

Keywords: Friction Loss, Journal Bearing, Reciprocating Compressor

Effect of Refrigerant Gases (HFC134a and R600a) on the Tribological Behaviour of a Multifunctional DLC Coating

Marcio Silverio, Roberto Binder, Emilio Rodrigues Hulse, Jose Daniel Biasoli De Mello

1 Embraco, Brazil; 2 Federal University of Santa Catarina, Brazil

Keywords: Tribology, DLC, Dry Lubrication, Wear

Lubrication Analysis of Journal Bearings in R410A Rotary Compressor

Yongjun Fu, Xingbiao Zhou, Hong Guo, Peipei Mei

Guangdong Meizhi Compressor Limited, China, People’s Republic of

Keywords: Rotary Compressor, Lubrication, Metallic Contact, Journal Bearings

Oil Flow Measurement at the Compressor Discharge

Jiu Xu, Pega Hrnjak

1 Air Conditioning and Refrigeration Center, University of Illinois at Urbana-Champaign; 2 Creative Thermal Solutions Inc., Urbana, Illinois

Keywords: Compressor, Oil, Annular-Mist Flow, Video Processing, OCR

Study on Flow Characteristics of Oil Viscosity Pump for Refrigerant Compressors

Kiyoshi Sawai, Doi Manabu, Noriaki Ishii, Noboru Iida, Kenji Kinjo

1 Hiroshima Institute of Technology, Japan; 2 Osaka Electro-Communication University, Japan; 3 Panasonic Corporation, Japan

Keywords: Oil Pump, Flow Characteristics, Refrigerant Compressor
C-15: Rotary Compressors I

**Time:** Wednesday July 13, 2016: 3:30 PM - 5:30 PM — **Location:** 206

**Session Chair:** Doug Collings

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**ID: 1410**

**Performance Comparison of Single–stage and Two–stage Hermetic Rotary CO2 Compressor**

Li Zhang, Min Yang, Xiaolong Huang

R&D Center, Shanghai Hitachi Electrical Appliances Co., Ltd.,

**Keywords:** CO2, Compressor, Performance Comparison, Single Stage, Two Stage

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**ID: 1356**

**CFD Analysis and Experiment Study of the Rotary Two-Stage Inverter Compressor With Vapor Injection**

Liying Deng, Shebing Liang, Jia Xu, Yusheng Hu

Compressor and Motor Institute of Gree Electric Appliances, Inc. of Zhuhai, China, People’s Republic of

**Keywords:** Vapor Injection, Bias Angle of Crankshaft, Performance

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**ID: 1369**

**Comparative Research on Air Conditioner With Gas-Injected Rotary Compressor Through Injection Port on Blade**

Liu Xingru, Wang Baolong, Shi Wenxing

Tsinghua University, China, People’s Republic of

**Keywords:** Air Source Heat Pump; Vapor Injection; Rotary Compressor; Simulation; Heating Capacity;

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**ID: 1463**

**Development of a New Dual-Cylinder Rotary Compressor for VI System**

Guoyong Yang, Cheng Zhang, Yanping Wu, Siqing Liao

Guangdong Meizhi Compressor Limited, China, People’s Republic of

**Keywords:** Vapor Injection, Rotary Compressor

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**ID: 1502**

**Prediction of Leakage Flow of Radial Clearance in a Rolling Piston Rotary Compressor**

Geon-woo Kim¹, Ki-youl Noh¹, Byung-chae Min¹, Sang-jin Song¹, Sang-kyung Na¹, Tae-seung Yoon¹, Kenichiro Teshima², Jang-sik Yang³, Gyung-min Choi⁴, Duck-jool Kim⁴

¹Graduate School of Mechanical Engineering, Pusan National University, Busan, Republic of (South Korea); ²Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Fukuoka, Japan; ³Rolls-Royce University Technology Centre, Pusan National University, Busan, Republic of (South Korea); ⁴Department of Mechanical Engineering, Pusan National University, Busan, Republic of (South Korea)

**Keywords:** Rolling Piston Rotary Compressor, Radial Clearance, Leakage, Flow Coefficient, Numerical Analysis

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**ID: 1317**

**The Influence of Main Bearing Parameters on the Bearing Wear in Rotary Compressor**

Lingchao Kong, Qingfu Zhao, Liping Ren, Jia Xu, Xiaotong Cheng, Yusheng Hu

Compressor and Motor Institute of Gree Electric Appliances, Inc. of Zhuhai, China, People’s Republic of

**Keywords:** Finite Element Method, Bearing Wear, Contact Stress, Rotary Compressor
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Bernhard Vetsch1, Gabriel Feichter1, Adrian Bachmann2, Stefan S. Bertsch1
1Interstate University of Applied Sciences of Technology NTB, Switzerland; 2V-ZUG COOLING TECHNOLOGY LTD, Switzerland
Keywords: Household Compressor, Compressor Efficiency, Compressor Test-Stand

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1TU Graz, Austria; 2Secop Austria
Keywords: Transient, Measurement, Domestic, Reciprocating Compressor, R600a

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Fernando M. Tello Quendo, Emilio Navarro-Peris, José González-Maciá
Institute for Energy Engineering, Universitat Politècnica de València, Spain
Keywords: Characterization, Scroll Compressor, Vapor-Injection, Calorimetric Bench

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Xinye Zhang1, Bin Yang1, Andres Osorio2, Dylan Bethel2, Orkan Kurtulus1, Eckhard Groll1
1Purdue University, United States of America; 2BlackPak Inc
Keywords: Reciprocating Compressors, Carbon Dioxide, Hot Gas Cycle

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1Purdue University, United States of America; 2BlackPak Inc
Keywords: Reciprocating Compressors, Dynamic Charging Process

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Vikrant Aute1, Cara Martin2
1Center for Environmental Energy Engineering, University of Maryland, College Park; 2Optimized Thermal Systems, Inc., Beltsville, MD, USA
Keywords: Compressor, Performance, Data, Representation, Uncertainty
**C-17: Centrifugal Compressors**

*Time: Thursday July 14, 2016: 9:45 AM - 12:00 PM — Location: 206*

**Session Chair:** Christian Bach

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**ID: 1393**

**Experimental Study on Noise Characteristic of Centrifugal Compressor Surge**

Qichao Yang, Yuanyang Zhao, Yue SHU, Xiaosa LI, Liansheng LI  
Hefei General Machinery Research Institute, Hefei, P.R. China  
**Keywords:** Centrifugal Compressor, Characteristic, Experiment Study, Surge

**ID: 1048**

**The Effects of Blade Fillets on Aerodynamic Performance of a High Pressure Ratio Centrifugal Compressor**

Justin Jong sik Oh  
Danfoss Turbocor, United States of America  
**Keywords:** Centrifugal Compressor, Fillets, Impeller, CFD

**ID: 1456**

**Experimental Research on Surge and Stability Enhancement of Centrifugal Compressor**

Yuanyang Zhao, Qichao Yang, Liansheng Li, Jun Xiao, Guangbin Liu, Le Wang  
Hefei General Machinery Research Institute, China, People’s Republic of  
**Keywords:** Centrifugal Compressor; Casing Treatment; Surge; Active Control

**ID: 1181**

**Performance Gain for Multiple Stage Centrifugal Compressor by Using Non-Equal Impeller Configuration**

Yuanjie Wu, Chris Thilges, Philippe Guillerot  
Ingersoll Rand -Trane Company, United States of America  
**Keywords:** Centrifugal Compressor, Impeller, Compressor Performance

**ID: 1088**

**Design of Oil-Free Turbocompressors for a Two-Stage Industrial Heat Pump Under Variable Operating Conditions**

Adeel Javed¹, Cordin Arpagaus², Stefan Bertsch², Jürg Schiffmann¹  
¹École Polytechnique Fédérale de Lausanne, Switzerland; ²NTB University of Applied Sciences of Technology Buchs, Switzerland  
**Keywords:** Two-Stage Heat Pump, Oil-Free Turbocompressors, Operational Deviations, System Design and Performance Evaluation, Uncertainty Quantification
C-18: Noise, Vibration, & Harshness II

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**Vertical-Vibration Suppressing Design of Accumulator With New Vibration-Measuring Method...**
Hikaru Wada, Hideki Matsuura, Satoru Takanazawa, Ayumi Ogawa
DAIKIN INDUSTRIES, LTD, Japan
Keywords: Swing Compressor, Accumulator, Measurement, Acoustic Resonance, Low Vibration

ID: 1254
**Study on the Contribution of Compressor Noise to Refrigerator Overall Noise...**
Shoufei Wu, Jiayou Song, Gaowei Shen
Jiaxipera Compressor Co., Ltd, China, People’s Republic of
Keywords: Compressor, Refrigerator Noise

ID: 1259
**Analysis and Control of Severe Vibration of a Screw Compressor Outlet Piping System...**
Ying Zhao¹, Bin Zhao¹, Qiang Zhou¹, Xiaohan Jia¹,², Jianmei Feng¹,², Xueyuan Peng¹,²
¹Xi’an Jiaotong University, China, People’s Republic of; ²National Engineering Research Center of Fluid Machinery and Compressors, China, People’s Republic of
Keywords: Screw Compressor, Gas Pulsation, Vibration

ID: 1121
**Prediction of Compressor Muffler Frequency Response Function Using CFD...**
Tadeu Tonheiro Rodrigues, Cristiano Stumpf, Ricardo Mikio Doi
Embraco, Brazil
Keywords: Acoustic, Muffler, CFD, Wave Equation

ID: 1503
**3D Compressible Simulation of a Muffler With Pseudosound Prediction Levels...**
Jesus Ruano, Joan Lopez, Oriol Lehmkühl, Joaquim Rigola, Carles David Pérez Segarra
CTTC, Universitat Politècnica de Catalunya, Spain
Keywords: Computational Methods, Compressor Technologies, Mufflers

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**Gas Pulsation Control by a Shunt Pulsation Trap With Perforated Tubes and an Optional Absorptive Silencer...**
Paul Xiubao Huang¹, Sean Yonkers¹, David Hokey²
¹Hi-Bar MC Tech, LLC, United States of America; ²Howden–Roots LLC
Keywords: PD Compressors, Gas Pulsation Control, Shunt Pulsation Trap, Parallel Dampening
ID: 1037
Development of a Novel Structure Rotary Compressor for Separate Sensible and Latent Cooling Air-Conditioning System
Chunhui Liu, Haifeng Zhang, Lei Zhang, Jin Pan
Shanghai Hitachi Electrical Appliance Co., Ltd, People’s Republic of China
Keywords: Rotary Compressor, SSLC, Performance, Reliability

ID: 1104
A Study on High Efficiency Wing-Vane Compressor - Part.1: A Simulation Analysis of Dynamic Model
Raito Kawamura, Shin Sekiya, Tatsuya Sasaki, Hideaki Maeyama, Shinichi Takahashi, Kanichiro Sugiura
Mitsubishi Electric Corporation, Japan
Keywords: Rotary Vane Compressor, Wing-Vane Compressor, Compression Mechanism, Non-Contact Vane, Friction Loss

ID: 1085
A Study on High Efficiency Wing-Vane Compressor - Part.2: Lubrication Characteristic of the Partial Arc Guide Bearing
Tatsuya Sasaki, Shin Sekiya, Raito Kawamura, Hideaki Maeyama, Shinichi Takahashi, Kanichiro Sugiura
Mitsubishi Electric Corporation, Japan
Keywords: Rotary Vane Compressor, Wing-Vane Compressor, Compression Mechanism, Non-Contact Vane, Friction Loss

ID: 1293
A Study on High Efficiency Wing-Vane Compressor - Part.3: Experimental Evaluation of the Prototype
Raito Kawamura, Shin Sekiya, Tatsuya Sasaki, Hideaki Maeyama, Shinichi Takahashi, Kanichiro Sugiura
Mitsubishi Electric Corporation, Japan
Keywords: Rotary Vane Compressor, Wing-Vane Compressor, Compression Mechanism, Non-Contact Vane, Friction Loss

ID: 1468
Optimal Structural Design of Swing Double-Vane Compressor
Junjie Ma, Xiang Chen, Xu Yang, Zongchang Qu
Xi’an Jiaotong University, China, People’s Republic of China
Keywords: Swing Double-Vane Compressor, Simulation, Structural Design, Efficiency

ID: 1596
Modeling and Testing the Thermal Effect of Lubricating Oil Sprayed in Sliding-Vane Air Compressors Using Pressure-Swirl Nozzles
Gianluca Valentì, Stefano Murgia, Ida Costanzo, Giulio Contaldi, Alessandro Valentì
1Politecnico di Milano, Italy; 2Ing. Enea Mattei S.p.a.; 3Valenti Energie S.r.l.
Keywords: Sliding-Vane Compressor, Positive-Displacement Compressor, Oil Injection, Oil Spray, Pressure-Swirl Nozzle.
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Alexander Lof¹, Chris Millward¹, Azhar Nawaz¹,²

¹Research & Development, voestalpine Precision Strip AB, Sweden; ²Research & Development, voestalpine Precision Strip AB, Sweden

**Keywords:** Flapper Valve, Reed Valve, Hermetic, Semi-Hermetic, Compressors, Stainless Steel, Damping, Fatigue

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**Analysis of Viscous Slip at the Wall in Gas Flows of R134a and R600a Through Metallic Microtubes**.....1030

Ernane Silva¹, Murilo F. Nicoluzzi¹, Marcos Rojas-Cardenas², Cesar J. Deschamps¹

¹Federal University of Santa Catarina, Brazil; ²Université Fédérale Toulouse Midi-Pyrénées, France

**Keywords:** Leakage, Slip Flow, Reed Valve, Microtube

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Sergio Koerich Lohn¹, Evandro Luiz Lange Pereira¹, Humberto Ferreira Camara¹, Cesar Jose Deschamps²

¹Embraco, R&D; ²POLO Research Labs for Emerging Technologies in Cooling and Thermophysics

**Keywords:** Reed, Valve, Damping

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**A Combined Experimental-Numerical Procedure to Estimate Leakage Gap of Compressor Valves**.....1048

Gustavo C. Rezende, Ernane Silva, Cesar J. Deschamps

Federal University of Santa Catarina, Brazil

**Keywords:** Valves, Leakage, Testing & Evaluation

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**Integrating Numerical Models for Efficient Simulation of Compressor Valves**.....1056

Ajay Parihar¹, David Myszka², Benjamin Robinet¹, Thomas Hodapp¹

¹Emerson Climate Technologies; ²University of Dayton, United States of America

**Keywords:** Valves, FSI
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Donglim Nam1,4, Poyoung Lee1, Seungbin Jung1, Geonho Lee2, Yunki Kwon3, Jinho Lee4
1R&D Center of Doowon Heavy Industrial Co., Ltd., Korea, Republic of (South Korea); 2Department of Building Engineering Services, Doowon Technical University College; 3Department of Computer Aided Design, Doowon Technical University College; 4School of Mechanical Engineering, Yonsei University
Keywords: Electric Driven Compressor, Oil Separator, Vortex Finder, Pressure Drop

ID: 1344
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Xiaoli Kang, Yusheng Hu, Caixia Shan, Yun Liu, Xiaojun Gao, Gang Lv
GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI, China, People’s Republic of
Keywords: Enhanced Vapor Injection; Scroll Compressor; the Area of Supplementary Channel; the Position of Supplementary Inlet; gas Force

ID: 1497
Noriaki Ishii1, Eiji Nonoguchi1, Keiko Anami2, Atsushi Sakuda2, Yuya Terada1, Yusuke Imai2, Kiyoshi Sawai3, Charles William Knisely4
1Osaka Electro-Communication University, Japan; 2Panasonic Corporation Appliances Company; 3Hiroshima Institute of Technology; 4Bucknell University, USA; 5Ashikaga Institute of Technology, Japan
Keywords: Scroll Compressor, Thrust Slide-Bearing, Optimization, Design Guideline, Friction Power Loss

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Jiu Xu1, Pega Hrnjak1,2
1Air Conditioning and Refrigeration Center, University of Illinois at Urbana-Champaign; 2Creative Thermal Solutions Inc., Urbana, Illinois
Keywords: Compressor, Oil, CFD, Flow Visualization, Droplet

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Hang Ye1, Zhigang Huang1, Jinduo Ye2
1Danfoss (Tianjin) R&D, Tianjin, PR. China; 2School of Mechanical, Tianjin University of Technology, Tianjin, PR. China
Keywords: Scroll Compressor, Oldham Coupling, Numerical, Experimental, Prediction