

International Rotating Equipment Conference

Pumps and Compressors

Düsseldorf, 28th–29th October 2008



PROGRAMME



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Ladies and Gentlemen,

As a result of continuous research and development, the worldwide pump, compressor and compressed air technology sector now enjoys an excellent reputation for innovative pump and compressor technology and excellent product quality. The pump, compressor and compressed air sector is anxious to further enhance this reputation by effective communication with its customers and suppliers. This conference offers a unique possibility to present possible solutions of the sector, face up to discussions with users and manufacturers and accept suggestions for the coming years.

As the promoter, we are pleased to offer you the first “International Rotating Equipment Conference – Pumps and Compressors” with three International forums consolidated: the 9th Pump Users International Forum, the 2nd Compressor Users International Forum and the 6th EFRC (European Forum for Reciprocating Compressors) Conference. Together with our European partner associations EUROPUMP and PNEUROP and with the additional support from many trade associations and professional bodies, it has enabled us to maximize the collaborative effect.

Whether you are a user, manufacturer, supplier, research & development, pump, compressor and compressed air expert or you are new to the sector, we are certain that you will find the depth and quality of the specialist programme compiled with the International “Call for Papers” of interest and value. On behalf of the VDMA and EFRC, it is with the greatest pleasure that we welcome you to the Conference.



Jürgen Arnold
Chairman of VDMA Pumps + Systems Association



Thomas Kaeser
Chairman of VDMA Compressors, Compressed Air and Vacuum Technology Association



Siegmund Cierniak
Chairman of EFRC European Forum for Reciprocating Compressors

Pump Users International Forum

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ZVEI Automation

Sönke Brodersen, KSB

Guy van Doorslaer, EUROPUMP

Ken Hall, CALPEDA

Jürgen Holdhof, EDUR

Brian Huxley, BPMA

Pierre Plateus, ENSIVAL-MORET

Thomas Scheuring, DECHEMA

Christoph Singrün, VDMA

Urs W. Würsch, CP Pumpen

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Frank Ennenbach, ABS Group

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AGO Energie + Anlagen

Jochen Fritz, KSB

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Rainer Hirschberg, FH Aachen

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Ruhrpumpen

Andreas Höhler, LEWA

Henning Hunecke,
ITT Flygt Pumpen

Roland Jeschke, GRUNDFOS

Lars Kampmeier, WILLY VOGEL

Thorsten Kettner, WILO

Friedrich Klütsch, VDMA

Jürgen Konrad,
DICKOW PUMPEN

Heiner Kösters, Sterling SIHI

Günter Kosyna, TU Braunschweig

Stefan Krämer,
HERMETIC-Pumpen

Werner Kröber, BWB

Andreas Kroll,
WEPUKO-HYDRAULIK

Hannes Lünzmann, Rickmeier

Lutz Mittelbach,
SHELL Deutschland Oil

Rüdiger Nagel,
ingenieur verlag nagel

Klaus Oppermann,
MUNSCH Chemie-Pumpen

Peter Pelz, TU Darmstadt

Christof Plum, Uhde

Thomas Scheuring, DECHEMA

Rudolf Schilling, TU München

Eberhard Schlücker,
Uni Erlangen-Nürnberg

Hans Georg Scholl,
Sulzer Pumpen

Christoph Singrün, VDMA

Frank-Hendrik Wurm, WILO

Compressor Users International Forum

Advisory Committee (AdvCom)

Heinz Werner Blaß,
ZVEI Automation

Christopher Dee, BCAS

Guy van Doorslaer, PNEUROP

Hans-Otto Jeske, MAN Turbo

Thomas Kaeser,
KAESER KOMPRESSOREN

Alexander Peters,
NEUMAN & ESSER

Pierre Plateus, ENSIVAL-MORET

Thomas Scheuring, DECHEMA

Peter Seroczynski, Ingersoll Rand

Christoph Singrün, VDMA

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*Andreas Brümmer,
Universität Dortmund*

Stefan Bosen,
Atlas Copco Energas

Andreas Brand, VDMA

Werner Brinkhoff, Beko

Susanne Fulko, Donaldson Filtration
Deutschland

Jürgen Hütter,
Boge Kompressoren

Hans-Georg Janssen,
Bayer Technology Services

Friedrich Justen,
Gardner Denver Schopfheim

Koen Lauwers,
Atlas Copco Kompressoren

Reinhard Maaz, ILMVAC

Peter Radgen,
Fraunhofer-Institut

Thomas Scheuring, DECHEMA

Roland Schuhmann, BASF

Christoph Singrün, VDMA

Volker Thomassen,
ALMIG Kompressoren

Andreas Weiß,
Fachhochschule Amberg

Wolfgang Zacharias,
SIEMENS Energy Sector

Matthias Zelinger, EUTurbines

6th EFRC Conference

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RWE Energy

Leonhard Keller,
Burckhardt Compression

Peter Steinrück,
HOERBIGER Kompressortechnik Holding

Programme Committee (ProgCom)

Chairman:

Siegmund Cierniak, RWE Energy

Eike Drewes,
PROGNOST Systems

Peter Duineveld,
Thomassen Compression Systems

Klaus Hoff, NEUMAN & ESSER

Heinrich Ochs, BASF

René Peters,
TNO Science and Industry

Georg Samland,
Burckhardt Compression

Johannes Wunderlich,
HOERBIGER Kompressortechnik Holding

Technical Exhibition

During the two days of the “International Rotating Equipment Conference – Pumps and Compressors” a Technical Exhibition will take place. Manufacturers and sub-suppliers will present a lot of product information in the CCD-Stadthalle within Düsseldorf Congress Center. Companies have the opportunity to present themselves in a kind of “meeting-point” (booth). For interested companies standard booths are offered including a qualified and uniform booth design. Please ask for the participation conditions VDMA Pumps + Systems Association, Frankfurt and indicate your request on the registration form.

Opening times of the Technical Exhibition

Tuesday, 28th October 2008, 09.00 h until 18.00 h

Wednesday, 29th October 2008, 09.00 h until 16.00 h

Tuesday, 28.10.2008

9.00 h, Room 1

Opening Plenary Session

Welcome

by the Chairman
of the VDMA Pumps + Systems Association
Jürgen Arnold

by the Chairman
of the VDMA Compressors, Compressed Air and
Vacuum Technology Association
Thomas Kaeser

and by the Chairman
of the European Forum for Reciprocating Compressors
Siegmond Cierniak

Welcome Address

by the President of EUROPUMP
Ken Hall

and by the President of PNEUROP
Peter Seroczynski

Plenary Lectures

Helmut Langanger, OMV
Executive Vice President
The New Era for the Oil & Gas Industry – Challenges & Chances

Wilhelm Otten, Infracor
Vice President Technology
Trends in Technical Service – Sustainable Service Concepts for the
Process Industry



Pump Users
International Forum 2008

Sponsored by



Monday, 27.10.2008
13.00 h to 18.30 h, Room 26

Training Seminar

Safe operation of pumps and compressors – Focussing the interfaces between manufacturer and user*

Time	Topic
13.00–13.15	Introduction to the Programme
13.15–15.25	Interfaces according to explosion protection (ATEX) – Scope, Marking, Inside-Outside, Documentation ... – Responsibilities of manufacturer/user – Maintenance/Retrofit-
15.25–15.40	Discussion
15.40–16.00	Coffee break
16.00–17.50	Interfaces according to the challenges by functional safety (EN 13849; EN 61511/61508, ...) – Scope of relevant standards – Which standard is applicable? – Consequences and responsibilities?
18.00–18.15	Discussion
18.15–18.30	Summary and Conclusions

For participation fee see page 63.

responsible:

Dr. Heino Bothe (PTB),
Dr. Uwe Klausmeyer (PTB),
Dr. Ulrich Johannsmeyer (PTB)
Dr. Rainer Grätz (BAM),
Dr. Heribert Oberhem (Bayer Crop Science),
Konrad Brehm (Bayer Industries Services),
Friedrich Klütsch (VDMA)

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*Possible subject to modifications

Training Seminar

Where does research and development of pumps and compressors go?*

Time	Topic
13.00–13.15	Introduction to the Programme
13.15–14.15	Condition monitoring for pumps and compressors
14.20–15.15	Rotodynamic pump design
15.15–15.30	Discussion
15.30–15.50	Coffee break
15.50–16.50	Pump and Compressor Systems – Cause and effects of pressure pulsation – Network philosophy and energy efficiency of pump and compressor systems
16.50–17.15	Options by using ionic liquids in pumps and compressors
17.15–17.45	Options and borderlines of simulation
17.50–18.30	Summary, discussion and conclusion

For participation fee see page 63.

responsible:

Prof. Paul-Uwe Thamsen (TU Berlin),
Prof. Eberhard Schlücker (Universität Erlangen-Nürnberg),
Prof. Günter Kosyna (TU Braunschweig),
Prof. Peter Pelz (TU Darmstadt),
Prof. Andreas Brümmer (Universität Dortmund),
Prof. Rudolf Schilling (TU München)
Harald Frank (VDMA)

*Possible subject to modifications

Oil, gas and refinery applications

Chairmen: Hannes Lünzmann
Hans Georg Scholl

1-1 Hans-Jürgen Schöner

Multiphase pumping – a contribution to the protection of climate and environment

1-2 Eberhard Schlücker / Andrej Ruschel / Roland Maurischat

Investigation of the flow behaviour and cavitation phenomena in screw pumps using high-speed camera technique

1-3 Charles de Marolles / Nicolas Lagas

Latest development on barrel multistage pumps for refinery application

1-4* David Clark

The safe and reliable application of API 685 magnetic drive pumps

1-5* Thomas Herbers / Michael Schedl

Reduction of maintenance costs by the use of magnet drive pumps in a refinery's bitumen plant

* This Technical Paper will be published in the proceedings. Due to time limits a presentation during the Forum is not foreseen.

Tuesday, 28.10.2008

11.00 h, Room 1

Session 2

Wastewater pumps

Chairmen: Roland Jeschke
Werner Kröber

2-1 Michael Hirschberger / Jörg Kuhlmann / Friedrich-Karl Benra
Computer based development of sewage water pumps for extreme operating conditions and high power consumption

2-2 Brian De Souza
Single-blade-impeller development using the design of experiments method

2-3 Richard McEvoy
Numerical simulation of a single-blade-impeller wastewater pump

Tuesday, 28.10.2008

11.00 h, Room 27

Session 3

Basic Research & Development

Chairmen: Klaus Oppermann
Rudolf Schilling

3-1 Oliver Schade / Eberhard Schlücker
Cavitation in positive displacement pumps (– not a mystery any more –)

3-2 Petra Perez Flores / Günter Kosyna / Detlev Wulff
Performance curve stabilisation of axial flow pumps by passive flow control

3-3 Rok Pavlin
Solution of the suction piping design for the large fluid transport pumps

Tuesday, 28.10.2008

14.00 h, Room 14

Session 4

Maintenance and safety operations

Chairmen: Jürgen Konrad
Kurt Bieniek

4-1 Matthias Himstedt

Explosion protection concept for liquid pumps of ATEX category 1

4-2 Stephan Näckel / Per Karlsson

A 17m long submerged vertical pump as part of a new safety concept at the Kemira Kemi AB plant in Helsingborg, Sweden

4-3 Michael Danitschek

“ReMain” Reliability centred maintenance

4-4* Bernhard Dudenhöffer

Retrofit – Improve pump performance and efficiency

Tuesday, 28.10.2008

14.00 h, Room 1

Session 5

Mixers

Chairmen: Frank Ennenbach
Henning Hunecke

5-1 Dieter-Heinz Hellmann / Lutz Urban / Peer Springer

Design of submersible mixers for highly viscous fluids in ponds of any shape

5-2 Frank Holz / Franka Schneider / Frank-Hendrik Wurm

Optimization of mixers for sewage plants

5-3 Peer Springer

Influence of aeration in activated sludge tanks on the operating conditions of the mixers used

* This Technical Paper will be published in the proceedings. Due to time limits a presentation during the Forum is not foreseen.

Tuesday, 28.10.2008

14.00 h, Room 27

Session 6

CFD Technology

Chairmen: Frank-Hendrik Wurm
Jochen Fritz

6-1 Eberhard Schlücker / Stefan Blendinger / Matthias Sauter
Computational fluid dynamics simulation of reciprocating pumps with respect to the fluid driven valve motion

6-2 Philippe Dupont / Venkatesal Balakrishnan / Mike Cugal
Usage of CFD in the analysis and the optimization of the hydraulic performance of vertical pumps

6-3 Rudolf Schilling / Mathias Bogner / Benedikt Flurl/ Carsten Schmalhorst
Development of a “numerical test rig” for hydraulic turbo-machinery

Tuesday, 28.10.2008

16.00 h, Room 14

Session 7

Special aspects of product development

Chairmen: Günter Kosyna
Eberhard Schlücker

7-1 Friedrich Fröhlig / Saban Caglar / Martin Gabi
Investigations on semi open impellers using Stereo-Particle-Image-Velocimetry and computational fluid dynamics

7-2 Matti Koivikko / Sami Virtanen / Reijo Karvinen
Design procedure of pumps with high efficiency

7-3 Valérie Bischof / Peter Pelz / Bernd Stoffel / Gerhard Ludwig
Self optimisation of pumping modules with hydrodynamic interaction

7-4* Eugeny Spiridonov
Calculation and design of liquid-gas ejectors

* This Technical Paper will be published in the proceedings. Due to time limits a presentation during the Forum is not foreseen.

Tuesday, 28.10.2008

16.00 h, Room 1

Session 8

Wastewater systems

Chairmen: Frank Ennenbach
Henning Hunecke

8-1 Markus Detzler / Wolfram Kuhn

Practical test: Rubberised pump wins endurance test against chrome permanent mould casting and ceramic coating

8-2 Paul Uwe Thamsen / Manfred Oesterle / Manfred Tornow

Optimization of sewage pumping station using system approach

8-3 Werner Kröber / Torben Bubelach

Experiences with speed-controlled operation of sewage pumps at the Berliner Wasserbetriebe

Tuesday, 28.10.2008

16.00 h, Room 27

Session 9

Cleanability and careful conveying

Chairmen: Falk Bahm
Jochen Fritz

9-1 Heiko Kipp / Dieter-Heinz Hellmann / Eberhard Schlücker / Rainer Pfeffer

Validation of velocity distributions in hygienic designed multistage centrifugal pumps

9-2 Judith Brandmayer / Eberhard Schlücker

The Protist *Euglena gracilis* as a biological indicator for the hurtful effect of flow in Pumps and Piping Systems on sensitive biological process suspensions

9-3 Simon Schneider / Dieter-Heinz Hellmann / Oliver Schuster

Investigation of the influence of back shroud blades on the axial thrust of half-open impellers for hygienic design

Chemical and process industry

Chairmen: Andreas Höhler
Lutz Mittelbach

10-1 Axel Binder / Christoph Polzer

Novel centrifugal pump concept solves a major problem in micro process engineering

10-2 Dieter Klefoth / Patrick Uebelherr / Stefan Seemer

Improving efficiency and reliability of a cooling water supply system in a wire manufacturing process by speed controlling the pumps

10-3 Falk Bahm / Ulrich Rennett

First PFA/PTFE lined mag-drive process pumps for up to 550 m³/h – even for highly corrosive media

10-4* Reinhard Kurtz / Katrin Abraham

Surface treatment in general – Pump applications for paintshop in the automotive industry

10-5* Heinz Nägel / Qian Jinguo / Wang Xutao

Application of FELUWA coal slurry pumps in the pressurized coal slurry gasification process

10-6* Dirk Kollmar / Katrin Abraham

Contribution to energy savings

* This Technical Paper will be published in the proceedings. Due to time limits a presentation during the Forum is not foreseen.

Wednesday, 29.10.2008

09.00 h, Room 28

Session 11

Energy efficient pump components

Chairmen: Lars Kampmeier
Thomas Herbers

11-1 Rok Pavlin
Cooling water pumps retrofit

11-2 John Veness
Minimising power losses in sealless pumps

11-3 Ilie Rachieru / Liviu Gheorghiu / Marjan Silovic
Improving efficiency of a district heating system by modernizing the pump operation

Wednesday, 29.10.2008

09.00 h, Room 14

Session 12

Power generation

Chairmen: Michael Hirschberger
Stefan Krämer

12-1 Sohail Ahmed / Reinhard Leithner / Detlev Wulff / Günter Kosyna
Increasing life time and reliability of a large boiler feed water pump by means of coupled FEM-CFD simulations

12-2 Gerd Witte / Manfred Stollenwerk / Klaus Buttmann
Energy saving of cooling water pumps for fossile power plants using adjustable propeller blades

12-3 Stefan Dötsch
Pumps by KSB for FGD in CPS-Design

Wednesday, 29.10.2008

11.00 h, Room 27

Session 13

Pumping of special liquids

Chairmen: Rüdiger Nagel
Peter Pelz

13-1 Andrew Maxwell / Grant Kenworthy / Ken Naylor
Latex pumping

13-2 Siegfried Liegat / Dirk Küllmey
Development on magnetic driven pumps for toxic and critical fluids

13-3 Henning Mollenhauer
New designed pumps for LPG! Technical solutions, advantages

13-4* Stefan Dötsch
Pumps for heat transfer applications

Wednesday, 29.10.2008

11.00 h, Room 28

Session 14

Energy efficient pump systems

Chairmen: Christof Plum
Lars Kampmeier

14-1 Peter Janknecht
Frequency converters and hydrodynamic couplings as pump drives

14-2 Heinz Bohn
Additional energy savings with speed-controlled pumps by optimized impeller trim and adapted switching

14-3 Trinath Sahoo
Strategies to improve energy efficiency of centrifugal pumps

14-4* Bernhard Dudenhöffer
Retrofit – Improve pump performance and efficiency

* This Technical Paper will be published in the proceedings. Due to time limits a presentation during the Forum is not foreseen.

Wednesday, 29.10.2008

11.00 h, Room 14

Session 15

Building applications; Innovative solutions

Chairmen: Jürgen Frisch
Rüdiger Nagel

15-1 Carsten Skovmose Kallesoe / Niels Bidstrup
Adaptive control of domestic circulators

15-2 Joachim Diede
A novel pump management concept saves energy in heating and climatisation systems

15-3 Rainer Hirschberg
Decentral pumps in heating systems – a new hydraulic approach

Wednesday, 29.10.2008

14.00 h, Room 27

Session 16

New technology for SiC components for mechanical seals and sealless pumps

Chairmen: Jürgen Konrad
Thomas Herbers

16-1 Martin Kirchhof / Michael Rieger / Andreas Schrüfer
Diamond coating for mechanical seals in bad-actor applications – pumping gas-containing fluids and slurry

16-2 Stefanie Wildhack / Josef Kracker / Maria Opyd / Andreas Rendtel
SSiC-materials for highly stressed components in sealing and bearing applications

16-3 Anja Dwars / Maïke van Geldern / Jürgen Gröschel
Polycrystalline diamond coatings for extreme tribological applications

Wednesday, 29.10.2008

14.00 h, Room 28

Session 17

Analysis and improvement of system performance

Chairmen: Peter Pelz
Thomas Scheuring

17-1 André Eijk / Carsten Weiß / Gerhard Nendzig / Ulrich Theurer

Static and dynamic optimisation design of the piping of a coal liquefaction plant

17-2 Jan Smeulders

Root cause analysis and reduction of high frequency vibrations in three propane pumps

17-3 Frank-Hendrik Wurm

Optimization of pumping systems

17-4* Bas Tilborghs / Harry Korst

Discharge damper failure of a triplex plunger pump

Wednesday, 29.10.2008

14.00 h, Room 14

Session 18

Building applications; Energy efficiency

Chairmen: Jürgen Frisch
Heiner Kösters

18-1 Niels Bidstrup / Markus Teepe

Circulators in buildings as EuP's

18-2 Dieter Wolff

Efficiency in practice: TOP-A-Level pumps at the Maritim Hannover Airport. Much more savings in future by raising quality of planning and installation

18-3 Rainer Hirschberg

Annual European part load profile of heating pumps in non-residential buildings

* This Technical Paper will be published in the proceedings. Due to time limits a presentation during the Forum is not foreseen.

Contributors

Pump Users International Forum

Abraham, Katrin KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 10
Ahmed, Sohail, M.SC.-Eng. Technische Universität Braunschweig D-38106 Braunschweig	Ses. 12
Arnold, Jürgen Sterling SIHI GmbH D-25524 Itzehoe	AdvCom Plenary
Bahm, Falk, Dr. Richter Chemie-Technik GmbH D-47906 Kempen	ProgCom Ses. 9, 10
Balakrishnan, Venkatesal Sulzer Pumpen AG CH-8404 Winterthur	Ses. 6
Benra, Friedrich-Karl, Prof. Dr. Universität Duisburg-Essen D-47057 Duisburg	Ses. 2
Berge, Gerhard KSB Aktiengesellschaft 67225 Frankenthal	Ses. 20
Bidstrup, Niels, Dr. Grundfos Management A/S DK-8850 Bjerringbro	Ses. 15, 18
Bieniek, Kurt, Dr. BASF AG D-67056 Ludwigshafen	ProgCom Ses. 4
Binder, Axel KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 10
Bischof, Valérie Technische Universität Darmstadt D-64289 Darmstadt	Ses. 7
Blaß, Heinz Werner ZVEI, FV Automation – Elektrische Antriebe D-60528 Frankfurt	AdvCom
Blendinger, Stefan Universität Erlangen-Nürnberg D-91058 Erlangen	Ses. 6
Bogner, Mathias TU München D-85747 Garching	Ses. 6

Bohn, Heinz Grundfos Management A/S DK-8850 Bjerringbro	Ses. 14
Bothe, Heino, Dr. PTB D-38116 Braunschweig	TraiSem
Brandmayer, Judith Universität Erlangen-Nürnberg D-91058 Erlangen	Ses. 9
Brehm, Konrad Bayer Technology Services D-51368 Leverkusen	TraiSem
Brodersen, Sönke, Dr. KSB AG D-67227 Frankenthal	AdvCom
Brümmer, Andreas, Prof. Universität Dortmund D-44227 Dortmund	TraiSem
Bubelach, Torben Technische Universität Berlin D-10623 Berlin	Ses. 8
Buttmann, Klaus Sterling SIHI GmbH D-67061 Ludwigshafen	Ses. 12
Caglar, Saban, Dr. Universität Karlsruhe D-76131 Karlsruhe	Ses. 7
Clark, David HMD Sealless Pumps Ltd GB-BN22 9AN Eastbourne	Ses. 1
Cugal, Mike Sulzer Pumpen AG CH-8401 Winterthur	Ses. 6
Danitschek, Michael i-for-T GmbH D-83026 Rosenheim	Ses. 4
Detzler, Markus Entsorgungsverband Saar D-66130 Saarbrücken	Ses. 8
Diede, Joachim KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 15
Doorslaer, Guy van EUROPUMP B-1030 Bruxelles	AdvCom

Dötsch, Stefan KSB Aktiengesellschaft D-91257 Pegnitz	Ses. 12, 13
Dudenhöffer, Bernhard Sulzer Pumpen (Deutschland) GmbH D-76646 Bruchsal	Ses. 4, 14
Dupont, Philippe, Dr. Sulzer Pumpen AG CH-8404 Winterthur	Ses. 6
Dwars, Anja, Dr. KSB Aktiengesellschaft D-91257 Pegnitz	Ses. 16
Grätz, Rainer, Dr. BAM D-12205 Berlin	TraiSem
Eijk, André TNO-TPD Netherlands Organizat. NL-2600 JA Delft	Ses. 17
Ennenbach, Frank ABS Group D-53797 Lohmar	ProgCom Ses. 5, 8
Evoy, Richard, Mc University of Limerick IE-Limerick	Ses. 2
Flurl, Benedikt TU München D-85747 Garching	Ses. 6
Frank, Harald VDMA Fachverband Pumpen + Systeme D-60528 Frankfurt	ProgCom TraiSem
Frisch, Jürgen AGO AG Energie + Anlagen D-95326 Kulmbach	ProgCom Ses. 15, 18
Fritz, Jochen, Dr. KSB Aktiengesellschaft D-67227 Frankenthal	ProgCom Ses. 6, 9
Fröhlig, Friedrich Universität Karlsruhe (TH) D-76131 Karlsruhe	Ses. 7
Gabi, Martin, Prof. Dr. Universität Karlsruhe (TH) D-76131 Karlsruhe	Ses. 7
Geldern, Maïke van KSB Aktiengesellschaft D-91257 Pegnitz	Ses. 16

Gheorghiu, Liviu S. C. Multigama Tech. S. R. L. RO-021875 Bukarest	Ses. 11
Grätz, Rainer, Dr. BAM D-12205 Berlin	TraiSem
Gröschel, Jürgen KSB Aktiengesellschaft D-91257 Pegnitz	Ses. 16
Hall, Ken CALPEDA GB-OX26 4UL Oxfordshire	AdvCom Plenary
Hellmann, Dieter-Heinz, Prof. Dr. Technische Universität Kaiserslautern D-67663 Kaiserslautern	Ses. 5, 9
Herbers, Thomas, Dr. KLAUS UNION D-44795 Bochum	ProgCom Ses. 1, 11, 16
Himstedt, Matthias Physikalisch-Technische Bundesanstalt D-38116 Braunschweig	Ses. 4
Hirschberg, Rainer, Prof. Dr. Fachhochschule Aachen, FB Architektur D-52066 Aachen	ProgCom Ses. 15, 18
Hirschberger, Michael Ruhrpumpen GmbH D-58453 Witten	ProgCom Ses. 2, 12
Höhler, Andreas, Dr. LEWA GmbH D-71229 Leonberg	ProgCom Ses. 10
Holdhof, Jürgen, Dr. EDUR GmbH & Co. KG D-24113 Kiel	AdvCom
Holz, Frank WILO AG D-44263 Dortmund	Ses. 5
Hunecke, Henning ITT Flygt Pumpen GmbH D-30855 Langenhagen	ProgCom Ses. 5, 8
Huxley, Brian British Pump Manufacturers' Association (BPMA) GB-B70 6PY West Bromwich	AdvCom
Janknecht, Peter, Dr. Stadtwerke Düsseldorf AG D-40589 Düsseldorf	Ses. 14

Jeschke, Roland GRUNDFOS GMBH D-40699 Erkrath	ProgCom Ses. 2
Jinguo, Qian Yankuang Coal Industry PRC-719000 Yulin City	Ses. 10
Johannsmeyer, Ulrich PTB D-38116 Braunschweig	TraiSem
Kallesoe, Carsten Skovmose Grundfos Management A/S DK-8850 Bjerringbro	Ses. 15
Kampmeier, Lars WILLY VOGEL AG D-12277 Berlin	ProgCom Ses. 11, 14
Karlsson, Per Kemira Kemi AB S-25109 Helsingborg	Ses. 4
Karvinen, Reijo, Prof. Tampere University of Technology FIN-33101 Tampere	Ses. 7
Kenworthy, Grant John Crane UK Ltd. GB-SL1 4LU Slough, Berkshire	Ses. 13
Kettner, Thorsten, Dr. WILO AG D-44263 Dortmund	ProgCom
Kipp, Heiko Technische Universität Kaiserslautern D-67663 Kaiserslautern	Ses. 9
Kirchhof, Martin BURGMANN Industries GmbH & Co. KG D-82515 Wolfratshausen	Ses. 16
Klausmeyer, Uwe, Dr. PTB D-38116 Braunschweig	TraiSem
Klefoth, Dieter Deutsche Gießdraht GmbH D-46446 Emmerich	Ses. 10
Klütsch, Friedrich VDMA Fachverband Pumpen + Systeme D-60528 Frankfurt	ProgCom TraiSem
Koivikko, Matti Sulzer Pumps Finland FIN-35800 Mantta	Ses. 7

Kollmar, Dirk, Dr. KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 10
Konrad, Jürgen DICKOW PUMPEN KG D-84478 Waldkraiburg	ProgCom Ses. 4, 16
Korst, Harry TNO Science & Industry NL-2628 CK Delft	Ses. 17
Kösters, Heiner, Dr. rer. nat. Sterling SIHI GmbH D-25524 Itzehoe	ProgCom Ses. 18
Kosyna, Günter, Prof. Technische Universität D-38106 Braunschweig	ProgCom TraiSem Ses. 3, 7, 12
Kracker, Josef ESK Ceramics GmbH & Co. KG D-87437 Kempten	Ses. 16
Krämer, Stefan, Dr. HERMETIC-Pumpen GmbH D-79194 Gundelfingen	ProgCom Ses. 12
Krüber, Werner Berliner Wasser-Betriebe (BWB) D-10623 Berlin	ProgCom Ses. 2, 8
Kroll, Andreas WEPUKO-HYDRAULIK GmbH D-72555 Metzingen	ProgCom
Kuhlmann, Jörg Ruhrpumpen GmbH D-58453 Witten	Ses. 2
Kuhn, Wolfram Herborner Pumpenfabrik D-35745 Herborn	Ses. 8
Küllmey, Dirk Sulzer Pumpen (Deutschland) GmbH D-76646 Bruchsal	Ses. 13
Kurtz, Reinhard KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 10
Langanger, Helmut OMV Aktiengesellschaft A-1090 Wien	Plenary
Lagas, Nicolas Sulzer Pumpen (Deutschland) GmbH D-76646 Bruchsal	Ses. 1

Leithner, Reinhard, Prof. Ses. 12

Technische Universität Braunschweig
D-38106 Braunschweig

Liegat, Siegfried Ses. 13

Sulzer Pumpen (Deutschland) GmbH
D-76646 Bruchsal

Ludwig, Gerhard, Dr. Ses. 7

Technische Universität Darmstadt
D-64289 Darmstadt

Lünzmann, Hannes, Dr. ProgCom

Rickmeier GmbH
D-58802 Balve
Ses. 1

Marolles, Charles de Ses. 1

Sulzer Pumpen (Deutschland) GmbH
D-76646 Bruchsal

Maurischat, Roland Ses. 1

LEISTRITZ Pumpen GmbH
D-90459 Nürnberg

Maxwell, Andrew Ses. 13

Polimeri Europa
GB-SO45 3YY Southampton

Mittelbach, Lutz ProgCom

SHELL Deutschland Oil GmbH
D-25770 Hemmingstedt
Ses. 10

Mollenhauer, Henning Ses. 13

Sterling SIHI GmbH
D-25524 Itzehoe

Näckel, Stephan Ses. 4

FRIATEC Aktiengesellschaft
D-65203 Wiesbaden

Nägel, Heinz M. Ses. 10

FELUWA Pumpen GmbH
D-54570 Mürlenbach

Nagel, Rüdiger ProgCom

ingenieur verlag nagel
D-72631 Aichtal
Ses. 13, 15

Naylor, Ken Ses. 13

Amarinth Ltd.
GB-IP12 2TW Suffolk

Nendzig, Gerhard Ses. 17

URACA PUMPENFABRIK
D-72574 Bad Urach

Oberhem, Heribert, Dr. TraiSem

Bayer Crop Science
D-41538 Dormagen

Oesterle, Manfred, Dr. KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 8
Oppermann, Klaus MUNSCH Chemie-Pumpen GmbH D-56235 Ransbach-Baumbach	ProgCom Ses. 3
Opyd, Maria ESK Ceramics GmbH & Co. KG D-87437 Kempten	Ses. 16
Otten, Wilhelm, Dr. Infracor GmbH D-45772 Marl	Plenary
Pavlin, Rok Turboinstitut d.d. SLO-1000 Ljubljana	Ses. 3, 11
Pelz, Peter, Prof. Technische Universität Darmstadt D-64289 Darmstadt	ProgCom TraiSem Ses. 7, 13, 17
Perez Flores, Petra Technische Universität Braunschweig D-38106 Braunschweig	Ses. 3
Pfeffer, Rainer HILGE GmbH & Co. KG D-55294 Bodenheim	Ses. 9
Plateus, Pierre ENSIVAL-MORET BELGIUM B-4860 Pepinster-Wegnez	AdvCom
Plum, Christof Uhde GmbH D-65812 Bad Soden	ProgCom Ses. 14
Polzer, Christoph KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 10
Rachieru, Ilie RADET Constanta RO-900669 Constanta	Ses. 11
Rendtel, Andreas ESK Ceramics GmbH & Co. KG D-87437 Kempten	Ses. 16
Rennett, Ulrich Richter Chemie-Technik GmbH D-47906 Kempen	Ses. 10
Rieger, Michael BURGMANN Industries GmbH & Co. KG D-82515 Wolfratshausen	Ses. 16

Ruschel, Andrej Universität Erlangen-Nürnberg D-91058 Erlangen	Ses. 1
Sahoo, Trinath Indian Oil Corporation Ltd. IN-281006 Mathura Radesh	Ses. 14
Sauter, Matthias LEWA GmbH D-71229 Leonberg	Ses. 6
Schade, Oliver Linde AG D-82049 Pullach	Ses. 3
Schedl, Michael BAYERNOIL Raffineriegesellschaft mbH D-85053 Ingolstadt	Ses. 1
Scheuring, Thomas, Dr. DECHEMA D-60486 Frankfurt	AdvCom ProgCom Ses. 17
Schilling, Rudolf, Prof. TU München D-85747 Garching	ProgCom TraiSem Ses. 3, 6
Schlücker, Eberhard, Prof. Uni Erlangen-Nürnberg D-91058 Erlangen	ProgCom TraiSem, Ses. 1, 3, 6, 7, 9
Schmalhorst, Carsten TU München D-85747 Garching	Ses. 6
Schneider, Franka, Dr. WILO AG D-44263 Dortmund	Ses. 5
Schneider, Simon Technische Universität Kaiserslautern D-67663 Kaiserslautern	Ses. 9
Schöner, Hans-Jürgen LEISTRITZ Pumpen GmbH D-90459 Nürnberg	Ses. 1
Scholl, Hans Georg Sulzer Pumpen (Deutschland) GmbH D-76646 Bruchsal	ProgCom Ses. 1
Schrüfer, Andreas BURGMANN Industries GmbH & Co. KG D-82515 Wolfratshausen	Ses. 16
Schuster, Oliver KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 9

Seemer, Stefan KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 10
Silovic, Marjan KSB Service GmbH D-67227 Frankenthal	Ses. 11
Singrün, Christoph VDMA Fachverband Pumpen + Systeme D-60528 Frankfurt	AdvCom ProgCom
Smeulers, Jan TNO Science and Industry NL-2628 CK Delft	Ses. 17
Souza, Brian De, Dr. University of Limerick IE-Limerick	Ses. 2
Spiridonov, Eugeny, Dr. Süduraler Staatsuniversität RUS-454080 Chelyabinsk	Ses. 7
Springer, Peer KSB Aktiengesellschaft D-67227 Frankenthal	Ses. 5
Stoffel, Bernd, Prof. Technische Universität Darmstadt D-64289 Darmstadt	Ses. 7
Stollenwerk, Manfred, Dr. Sterling SIHI GmbH D-67061 Ludwigshafen	Ses. 12
Teepe, Markus WILO AG D-44263 Dortmund	Ses. 18
Thamsen, Paul-Uwe, Prof. Technische Universität Berlin D-10623 Berlin	ProgCom TraiSem Ses. 8
Theurer, Ulrich URACA PUMPENFABRIK D-72574 Bad Urach	Ses. 17
Tilborghs, Bas Yara Sluiskil b. v. NL-4540 AA Sluiskil	Ses. 17
Tornow, Manfred Berliner Wasser-Betriebe (BWB) D-10623 Berlin	Ses. 8
Uebelherr, Patrick KSB AG D-51377 Leverkusen	Ses. 10

Urban, Lutz Technische Universität Kaiserslautern D-67653 Kaiserslautern	Ses. 5
Veness, John HMD Sealless Pumps Ltd GB-BN22 9AN Eastbourne	Ses. 11
Virtanen, Sami Sulzer Pumps Finland FIN-35800 Mantta	Ses. 7
Weiß, Carsten URACA PUMPENFABRIK D-72574 Bad Urach	Ses. 17
Wildhack, Stefanie, Dr. ESK Ceramics GmbH & Co. KG D-87437 Kempten	Ses. 16
Witte, Gerd Sterling SIHI GmbH D-67061 Ludwigshafen	Ses. 12
Wolff, Dieter, Prof. Fachhochschule Braunschweig/Wolfenbüttel D-38302 Wolfenbüttel	Ses. 18
Wulff, Detlev, Dr. Technische Universität Braunschweig D-38106 Braunschweig	Ses. 3, 12
Würsch, Urs W. CP Pumpen AG CH-4800 Zofingen	AdvCom
Wurm, Frank-Hendrik, Dr. WILO AG D-44263 Dortmund	ProgCom Ses. 5, 6, 17
Xuntao, Wang Yankuang Coal Industry PRC-719000 Yulin City	Ses. 10



Compressor Users
International Forum 2008

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Monday, 27.10.2008
13.00 h to 18.30 h, Room 26

Training Seminar Safe operation of pumps and compressors – Focussing the interfaces between manufacturer and user*

Time	Topic
13.00–13.15	Introduction to the Programme
13.15–15.25	Interfaces according to explosion protection (ATEX) – Scope, Marking, Inside-Outside, Documentation ... – Responsibilities of manufacturer/user – Maintenance/Retrofit
15.25–15.40	Discussion
15.40–16.00	Coffee break
16.00–17.50	Interfaces according to the challenges by functional safety (EN 13849; EN 61511/61508, ...) – Scope of relevant standards – Which standard is applicable? – Consequences and responsibilities?
18.00–18.15	Discussion
18.15–18.30	Summary and Conclusions

For participation fee see page 63.

responsible:

Dr. Heino Bothe (PTB),
Dr. Uwe Klausmeyer (PTB),
Dr. Ulrich Johannsmeyer (PTB)
Dr. Rainer Grätz (BAM),
Dr. Heribert Oberhem (Bayer Crop Science),
Konrad Brehm (Bayer Industries Services),
Friedrich Klütsch (VDMA)

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*Possible subject to modifications

Training Seminar

Where does research and development of pumps and compressors go?*

Time	Topic
13.00–13.15	Introduction to the Programme
13.15–14.15	Condition monitoring for pumps and compressors
14.20–15.15	Rotodynamic pump design
15.15–15.30	Discussion
15.30–15.50	Coffee break
15.50–16.50	Pump and Compressor Systems – Cause and effects of pressure pulsation – Network philosophy and energy efficiency of pump and compressor systems
16.50–17.15	Options by using ionic liquids in pumps and compressors
17.15–17.45	Options and borderlines of simulation
17.50–18.30	Summary, discussion and conclusion

For participation fee see page 63.

responsible:

Prof. Paul-Uwe Thamsen (TU Berlin),
Prof. Eberhard Schlücker (Universität Erlangen-Nürnberg),
Prof. Günter Kosyna (TU Braunschweig),
Prof. Peter Pelz (TU Darmstadt),
Prof. Andreas Brümmer (Universität Dortmund),
Prof. Rudolf Schilling (TU München)
Harald Frank (VDMA)

*Possible subject to modifications

Tuesday, 28.10.2008

11.00 h, Room 26

Session 19

Drive technologies

Chairmen: Friedrich Justen
Matthias Zelinger

19-1 Markus Sauerborn

Energy recovery by adapting turboexpander stages to integrally geared centrifugal compressors in hydrogen peroxide production process

19-2 Wolfgang Sautter

Selecting the most economical drive system for centrifugal compressors

Tuesday, 28.10.2008

11.00 h, Room 18/19

Session 20

Energy efficient systems – a successful approach**

Chairmen: Gerhard Berge
Christoph Singrün

The VDMA/dena campaign:

Energy efficient pump systems in trade and industry

- Introduction and description (dena/VDMA)
- Assessment process
- Realised energy savings presented by industry partners:
 - Grundfos
 - KSB
 - Sulzer
 - Wilo

** Simultaneous interpretation from English to German will be provided.

Session 21

Oil and gas applications

Chairmen: Hans-Georg Janssen
Andreas Brümmer

21-1 Jan Smeulers / Stefan Belfroid / René Peters / Marco Giachi /
Gilbert Habets

Resolving flow induced pulsations and vibrations in the suction line
of a large volume axial compressor

21-2 Paul Hancock / Hilde Fosse / Bente Egeland

Gas compression modifications for late life conditions on the
Statfjord A. Plattform

21-3 Henning Struck

Special requirements on compressors on LNG Carriers

Session 22

Energy efficiency in compressors and compressed air systems I**

Chairmen: Volker Thomassen
Werner Brinkhoff

22-1 Mercedes Hernandez

Scroll compressors: a unique and value adding technology for many
compressed air applications

22-2 Peter Radgen

Compressor splitting and/or speed control – improving energy
efficiency efficiently

22-3 Jürgen Hütter

Efficient compressed air production

** Simultaneous interpretation from English to German will be provided.

Tuesday, 28.10.2008
16.00 h, Room 26

Session 23

Research & Development

Chairmen: Andreas Brümmer
Hans-Georg Janssen

23-1 Tim Predel / Eberhard Schlücker / Robert Adler
Ionic liquids as operating liquid in oxygen compressors

23-2 Zeynep Yigit
Functional Safety at Turbo Machinery

23-3 Dominik Surek / Silke Stempin
Dynamic pressure oscillations of the impeller in the side channel compressor

Tuesday, 28.10.2008
16.00 h, Room 18/19

Session 24

Energy efficiency in compressors and compressed air systems II**

Chairmen: Peter Radgen
Andreas Weiß

24-1 Reinhard Albert
Environmental and cost advantages through energy efficiency measures in compressed air facilities

24-2 Erwin Ruppelt
Increase availability and reduce costs

24-3 Urban Pettersson
Identify and Implement Energy Savings within a compressed air network

** Simultaneous interpretation from English to German will be provided.

Session 25

Wednesday, 29.10.2008
09.00 h, Room 26

Sealing technologies

Chairmen: Stefan Bosen
Wolfgang Zacharias

25-1 Detlev Steinmann
Separation seal – the seal behind the dry gas seal

25-2 Michael Schiller / Detlev Steinmann
Dry gas seal in high pressure service

25-3 Michael Sattler
Robust dry gas seal “MDGS” for process gas screw and centrifugal compressors

Session 26

Wednesday, 29.10.2008
09.00 h, Room 18/19

Vacuum pump design and manufacturing**

Chairmen: Reinhard Maaz
Friedrich Justen

26-1 Ronald Sachs / Aleksandr Shirinov
OnTool™ Booster – A molecular pump working against atmosphere

26-2 Andreas Brümmer / Knut Kauder / Dirk Stratmann
Operating performance of screw vacuum pumps – experimental and theoretical analysis

** Simultaneous interpretation from English to German will be provided.

Wednesday, 29.10.2008

11.00 h, Room 26

Session 27

Compressor design and manufacturing I

Chairmen: Reinhard Maaz
Thomas Scheuring

27-1 Paul Lefley / Ian Currington / Andrew Hogbin
Energy efficiency advantages of a brushless DC motor for a variable speed compressor

27-2 Ian Currington / Bernard Whicher
Design considerations of a sealless compressor for hazardous duties

27-3 Jürgen Bohn / Ion Ispas / Patrick Peters
Impeller shroud seal influence on performance of centrifugal compressor stages

Wednesday, 29.10.2008

11.00 h, Room 18/19

Session 28

System design and monitoring**

Chairmen: Susanne Fulko
Roland Schuhmann

28-1 Lee Alexander / Xavier Huin
The development of non intrusive compressor monitoring systems

28-2 Herman Geyskens
Efficient operation of turbo compressor systems

28-3 Erwin Ruppelt
Optimisation of systems with intelligent control – modern compressed air management reduces operational costs

** Simultaneous interpretation from English to German will be provided.

Wednesday, 29.10.2008

14.00 h, Room 26

Session 29

Compressor design and manufacturing II

Chairmen: Thomas Scheuring
Roland Schuhmann

29-1 Markus Huhn

CAD-CAM process chain for an axial compressor blade from a designer's point of view

29-2 Bernhard Spiegl / Gunther Machu / Peter Steinrück

New technologies for efficiency improvements on PET air compressors

29-3 Tetsuya Kakiuchi

High pressure oil-injected screw compressor specifications

29-4* Thomas B. Kordik

World novelty: spherical design of the reciprocating compressor, Hüttlin-Kugelkompressor (int. pat.)

Wednesday, 29.10.2008

14.00 h, Room 18/19

Session 30

Compressed air quality**

Chairmen: Jürgen Hütter
Koen Lauwers

30-1 Jens Amberg

Early warning, auto-diagnosis and self-adjustment in compressed air humidity measurement

30-2 Wolfgang Heikamp / Andreas Stephan / Markus Kolczyk

Energy saving with optimized air-oil-separation elements in the filtration chain

30-3 Norbert Otto

Measuring of medical respective pharmaceutical compressed air – Comparison of pharmacopoeia, USP and ISO 8573

* This Technical Paper will be included in the Preprints. A presentation during the Forum is not foreseen.

** Simultaneous interpretation from English to German will be provided.

Contributors

Compressor Users International Forum

Adler, Robert LINDE GAS GmbH A-1030 Wien	Ses. 23
Albert, Reinhard UBA Umweltbundesamt D-06844 Dessau	Ses. 24
Alexander, Lee Navitas (UK) Ltd GB-RG42 1PL Bracknall	Ses. 28
Amberg, Jens TESTO AG D-79853 Lenzkirch	Ses. 30
Belfroid, Stefan TNO Science and Industry NL-2628 CK Delft	Ses. 21
Berge, Gerhard KSB Aktiengesellschaft 67225 Frankenthal	Ses. 20
Blaß, Heinz Werner ZVEI, FV Automation Elektrische Antriebe D-60528 Frankfurt	AdvCom
Bohn, Jürgen, Dr. Atlas Copco ENERGAS GmbH D-50999 Köln	Ses. 27
Bosen, Stefan Atlas Copco ENERGAS GmbH D-50999 Köln	ProgCom Ses. 25
Bothe, Heino, Dr. PTB D-38116 Braunschweig	TraiSem
Brand, Andreas VDMA Fachverband Kompressoren, Druckluft- und Vakuumtechnik D-60528 Frankfurt	ProgCom
Brehm, Konrad Bayer Technology Services D-51368 Leverkusen	TraiSem
Brinkhoff, Werner BEKO TECHNOLOGIES GMBH D-41468 Neuss	ProgCom Ses. 22
Brümmer, Andreas, Prof. Universität Dortmund D-44227 Dortmund	ProgCom TraiSem Ses. 21, 23, 26

Currington, Ian Specto Energy Ltd. GB-RH12 2LT Horsham, West Sussex	Ses. 27
Dee, Christopher British Compressed Air Society Limited (BCAS) GB-W1G 6PY London	AdvCom
Doorslaer, Guy van PNEUROP B-1030 Bruxelles	AdvCom
Egeland, Bente Aibel AS NOR-4066 Stavangar	Ses. 21
Fosse, Hilde Aibel AS NOR-4066 Stavangar	Ses. 21
Frank, Harald VDMA Fachverband Pumpen + Systeme D-60528 Frankfurt	TraiSem
Fulko, Susanne Donaldson Filtration Deutschland GmbH D-42781 Haan	ProgCom Ses. 28
Geyskens, Herman Atlas Copco Airpower n.v. B-2610 Wilrijk	Ses. 28
Giachi, Marco GE Oil & Gas I-50127 Florence	Ses. 21
Grätz, Rainer, Dr. BAM D-12205 Berlin	TraiSem
Habets, Gilbert Shell Global Solutions International BV RUS-693020 Yuzhno-Sakhalinsk	Ses. 21
Hancock, Paul Aibel AS NOR-4066 Stavangar	Ses. 21
Heikamp, Wolfgang MANN+HUMMEL GMBH D-67346 Speyer	Ses. 30
Hernandez, Mercedes Atlas Copco Airpower n.v. B-2610 Wilrijk	Ses. 22
Hogbin, Andrew SynchroPulse Ltd. GB-LN6 9JW Lincoln	Ses. 27
Huhn, Markus MAN TURBO AG D-46145 Oberhausen	Ses. 29

Huin, Xavier Compressor Products International Ltd. GB-RG17 OQP Berkshire, Hungerford	Ses. 28
Hütter, Jürgen BOGE KOMPRESSOREN D-33739 Bielefeld	ProgCom Ses. 22, 30
Ispas, Ion, Dr. Atlas Copco ENERGAS GmbH D-50999 Köln	Ses. 27
Janssen, Hans-Georg, Dr. Bayer Technology Services GmbH D-41538 Dormagen	ProgCom Ses. 21, 23
Jeske, Hans-Otto MAN TURBO AG D-46145 Oberhausen	AdvCom
Johannsmeyer, Ulrich PTB D-38116 Braunschweig	TraiSem
Justen, Friedrich, Dr. Gardner Denver Schopfheim GmbH D-79650 Schopfheim	ProgCom Ses. 19, 26
Kaeser, Thomas KAESER KOMPRESSOREN GmbH D-96450 Coburg	AdvCom Plenary
Kakiuchi, Tetsuya KOBELCO STEEL, Ltd. D-80539 München	Ses. 29
Kauder, Knut, Prof. Universität Dortmund D-44227 Dortmund	Ses. 26
Klausmeyer, Uwe, Dr. PTB D-38116 Braunschweig	TraiSem
Klütsch, Friedrich VDMA Fachverband Pumpen + Systeme D-60528 Frankfurt	TraiSem
Kolczyk, Markus MANN+HUMMEL GMBH D-67346 Speyer	Ses. 30
Kordik, Thomas B. INNOJET TECHNOLOGIES D-79539 Lörrach	Ses. 29
Kosyna, Günter, Prof. Technische Universität Braunschweig D-38106 Braunschweig	TraiSem
Langanger, Helmut OMV Aktiengesellschaft A-1090 Wien	Plenary

Lauwers, Koen ATLAS COPCO Kompressoren D-45141 Essen	ProgCom Ses. 30
Lefley, Paul, Dr. Synchro Pulse Ltd. GB-LN6 5UR Horsham	Ses. 27
Maaz, Reinhard ILMVAC GmbH D-98693 Ilmenau	ProgCom Ses. 26, 27
Machu, Gunther, Dr. HOERBIGER Ventilwerke GmbH & Co KG A-1110 Wien	Ses. 29
Oberhem, Heribert, Dr. Bayer Crop Science D-41538 Dormagen	TraiSem
Otten, Wilhelm, Dr. Infracor GmbH D-45772 Marl	Plenary
Otto, Norbert C-tec Cleanroom-Technology GmbH D-72108 Rottenburg am Neckar	Ses. 30
Pelz, Peter, Prof. Technische Universität Darmstadt D-64289 Darmstadt	TraiSem
Peters, Alexander NEUMAN & ESSER 52531 Übach-Palenberg	AdvCom
Peters, René, Dr. TNO Science and Industry NL-2628 CK Delft	Ses. 21
Peters, Patrick, Dr. Atlas Copco ENERGAS GmbH D-50999 Köln	Ses. 27
Pettersson, Urban Atlas Copco Airpower n.v. B-2610 Wilrijk	Ses. 24
Plateus, Pierre ENSIVAL-MORET BELGIUM B-4860 Pepinster-Wegnez	AdvCom
Predel, Tim Universität Erlangen-Nürnberg D-91058 Erlangen	Ses. 23
Radgen, Peter, Dr. Fraunhofer-Institut D-76139 Karlsruhe	ProgCom Ses. 22, 24
Ruppelt, Erwin KAESER KOMPRESSOREN GmbH D-96450 Coburg	Ses. 24, 28

Sachs, Ronald, Dr. Pfeiffer Vacuum GmbH D-35614 Asslar	Ses. 26
Sattler, Michael BURGMANN Industries GmbH & Co. KG D-82515 Wolfratshausen	Ses. 25
Sauerborn, Markus Atlas Copco ENERGAS GmbH D-50999 Köln	Ses. 19
Sautter, Wolfgang Voith Turbo GmbH & Co. KG D-74564 Crailsheim	Ses. 19
Scheuring, Thomas, Dr. DECHEMA D-60486 Frankfurt	AdvCom ProgCom Ses. 27, 29
Schiller, Michael Flowserve Dortmund GmbH & Co KG D-44388 Dortmund	Ses. 25
Schilling, Rudolf, Prof. TU München D-85747 Garching	TraiSem
Schlücker, Eberhard, Prof. Universität Erlangen-Nürnberg D-91058 Erlangen	TraiSem
Schuhmann, Roland BASF AG D-67056 Ludwigshafen	ProgCom Ses. 28, 29
Seroczynski, Peter Ingersoll Rand Industrial Technologies GB-CW4 8JA Cheshire	AdvCom Plenary
Shirinov, Aleksandr, Dr. Pfeiffer Vacuum GmbH D-35614 Asslar	Ses. 26
Singrün, Christoph VDMA Fachverband Kompressoren, Druckluft- und Vakuumtechnik D-60528 Frankfurt	AdvCom ProgCom Ses. 20
Smeulers, Jan TNO Science and Industry NL-2628 CK Delft	Ses. 21
Spiegl, Bernhard, Dr. HOERBIGER Kompressortechnik Holding GmbH A-1110 Wien	Ses. 29
Steinmann, Detlev Flowserve Dortmund GmbH & Co KG D-44388 Dortmund	Ses. 25

Steinrück, Peter, Dr. HOERBIGER Kompressortechnik Holding GmbH A-1220 Wien	Ses. 29
Stempin, Silke Fachhochschule Merseburg D-06217 Merseburg	Ses. 23
Stephan, Andreas MANN+HUMMEL GMBH D-67346 Speyer	Ses. 30
Stratmann, Dirk Universität Dortmund D-44227 Dortmund	Ses. 26
Struck, Henning, Dr. Atlas Copco ENERGAS GmbH D-50999 Köln	Ses. 21
Surek, D., Prof. Hochschule Merseburg D-06217 Merseburg	Ses. 23
Thamsen, Paul-Uwe, Prof. Technische Universität Berlin D-10623 Berlin	TraiSem
Thomassen, Volker ALMIG Kompressoren GmbH D-73257 Köngen	ProgCom Ses. 22
Weiß, Andreas, Prof. Fachhochschule Amberg-Weiden D-92224 Amberg	ProgCom Ses. 24
Whicher, Bernard Northey Technologies Ltd. GB-BH16 5DG Dorset	Ses. 27
Yigit, Zeynep SIEMENS AG Energy Sector D-47053 Duisburg	Ses. 23
Zacharias, Wolfgang SIEMENS AG Energy Sector D-47053 Duisburg	ProgCom Ses. 25
Zelinger, Matthias EUTurbines D-60528 Frankfurt	ProgCom Ses. 19





EFRC

6th EFRC

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Monday, 27.10.2008
13.00 h to 18.30 h, Room 28

Training Seminar Pulsations – Fundamentals, Effects and Control Learn from the compression industry's leading experts

Again EFRC offers a compressor training session focussing on Pulsations in compressor plants. Young engineers from operators, engineering companies and suppliers will be given an in-depth overview about pulsations from fundamentals to trouble shooting for safe and long lasting operation of the compressor unit.

Time	Topic
13.00–13.15	Introduction to the Programme
13.15–14.00	Fundamentals
14.00–14.45	Effects on compressor performance
14.45–15.30	Effects on compressor reliability
15.30–16.00	Coffee break
16.00–16.45	Effects on compressor valve performance
16.45–17.30	Pulsation control
17.30–18.15	Trouble shooting
18.15–18.30	Summary and Conclusions

For participation fee see page 63.

responsible:

Dr. Peters (TNO Science and Industry)
Harry Lankenau (NEAC Compressor Service)
Andreas Allenspach (Burckhardt Compression)
Dr. Gunther Machu (Hoerbiger Ventilwerke)
Peter Duineveld (Thomassen Compression Systems)
Lau Koop (Thomassen Compression Systems)
Eike Drewes (PROGNOST Systems)

Tuesday, 28.10.2008
11.00 h, Room 16/17

Session 31

Design and Engineering I

Chairman: Eike Drewes

31-1 Lau G. M. Koop

The erection of very heavy 4- and 6-cylinder reciprocating compressors

31-2 Burkhard Lenth / Ulrich P. Dirkmann

Use of modern control systems in compressor stations

31-3 Thomas Kälin / Nicole Retz

Assembly- and operation-conditions for compressor valves and lanterns and optimization of the package for different operation conditions

Tuesday, 28.10.2008
11.00 h, Room 28

Session 32

Pulsations & Vibrations I

Chairman: Peter Steinrück

32-1 Erik Slis / Henk Käyser

Piggyback riding on the FPSO Dumbarton and the power of acoustics

32-2 Shelly Greenfield

Optimizing the pulsation control solution

32-3 Klaus Brun / Edgar B. Bowles / Danny M. Deffenbaugh

Development of a transient fluid dynamic solver for compression system pulsation analysis

Tuesday, 28.10.2008
14.00 h, Room 16/17

Session 33

Design & Engineering II

Chairman: Klaus Hoff

33-1 Georg Samland / Armin Gerland / Volker Peterseim
Reliable sealing technology for high pressure CO₂ applications

33-2 Steffen Gast
Presentation of design versions of piston rods in reciprocating compressors

33-3 Krunoslav Hercigonja
ATEX: from the perspective of a compressor manufacturer

Tuesday, 28.10.2008
14.00 h, Room 28

Session 34

Fundamentals

Chairman: René Peters

34-1 Stefan Tuma
Taking the guesswork out of PTFE seals

34-2 Rainer Kurz / Klaus Brun
Universal efficiency definition for reciprocating and centrifugal compressors

34-3 Herbert Kopecek / Helge Klockow / Michael Schmitz / Simone Pratesi / Carlo Mazzalli / Paolo Battagli
Development and test of an electrical valve actuator for reverse flow capacity control of reciprocating compressors

Tuesday, 28.10.2008
16.00 h, Room 16/17

Session 35

Design & Engineering III

Chairman: Georg Samland

35-1 Klaus Hoff / Egidius Steinbusch
Hydrodynamic calculation method for crosshead pin bearings especially under less rod load reversal loading

35-2 Vassilaq Kacani / Ernst Huttar
Simulation of reciprocating compressor start-up

35-3 Riccardo Traversari / Marco Fareta
Virtual prototyping technique applied to the design of a crank-mechanism of a process reciprocating compressor

Tuesday, 28.10.2008
16.00 h, Room 28

Session 36

Operations & Maintenance I

Chairman: Heinrich Ochs

36-1 Uwe Ladwig / Christian Steinkamp
Avoidance of major secondary damages by early failure detection on a partially fractured piston rod

36-2 Harry Lankenau
Compressor Valves – How much liquid can they handle?

36-3 Andreas Gottmer
Comparison of calculated and measured torsional vibrations on recip cranks with evaluation of mechanical compressor efficiency

Wednesday, 29.10.2008
09.00 h, Room 1

Session 37

EFRC Meeting

Chairman: Siegmund Cierniak

37-1 Leonhard Keller / Peter Steinrück
EFRC – the international platform for reciprocating compressor manufacturers and users

37-2 Siegmund Cierniak
Educating reciprocating compressors engineers at the EFRC

37-3 André Eijk
EFRC Guideline with recommended vibration levels for reciprocating compressor systems

Wednesday, 29.10.2008
11.00 h, Room 1

Session 38

Valves

Chairman: Peter Duineveld

38-1 Kevin Durham
Development of elastomeric materials in reciprocating compressor valves: aerodynamics and springless valve design

38-2 Andrea Raggi / Massimo Schiavone
Electromechanical actuator for reciprocating compressors stepless control

38-3 Bernhard Spiegl
Material Design for valve applications

Session 39

Wednesday, 29.10.2008
11.00 h, Room 16/17

Operations & Maintenance II

Chairman: Ernst Huttar

39-1 Marcel Hempen / Bernd Wagner
Case study of a bearing failure analysis

39-2 Jan Bantjes / Andreas Gottmer
Detection of damaged clearance pocket valve with online pV analysis

39-3 Roland Schuhmann / Christian Prinz
Machinery protection for reciprocating compressors – experiences and outlook

Session 40

Wednesday, 29.10.2008
14.00 h, Room 1

Design & Engineering IV

Chairman: Leonhard Keller

40-1 Horst Becker
Usage of reciprocating compressors inside the liquefaction process in a LNG peak shaving plant

40-2 Arend Jan Pol
Technical and economical aspects in the evaluation for upgrading a reciprocating compressor installation

40-3 Steffen Gast
Reactivation and modernisation of the Bx series

Pulsations & Vibrations II

Chairman: Siegmund Cierniak

41-1 Georg Samland / Nicole Retz

Supporting vibration analysis for the commissioning of a high pressure compressor with foundation problems

41-2 Eugene “Buddy” Broerman / Robert McKee / Christine Scrivner / Gary Bourn

Advancement in pulsation control for reciprocating compressors

41-3 Brian Howes / Tony King / David Pearsall

Torsional vibration case study highlights design considerations

Contributors

6th EFRC Conference

Allenspach, Andreas Burckhardt Compression AG CH-8404 Winterthur	TraiSem
Bantjes, Jan Total NL-4380 AE Vlissingen	Ses. 39
Battagli, Paolo GE Oil and Gas I-50127 Florence	Ses. 34
Becker, Horst RWE Energy AG D-44139 Dortmund	Ses. 40
Bourn, Gary El Paso Corporation USA-Houston, TX 77002	Ses. 41
Bowles, Edgar B. Southwest Research Institute USA-San Antonio, TX 78228	Ses. 32
Broerman, Eugene “Buddy” Southwest Research Institute USA-San Antonio, TX 78228	Ses. 41
Brun, Klaus Southwest Research Institute USA-San Antonio, TX 78228	Ses. 32 Ses. 34
Cierniak, Siegmund, Dr. RWE Energy AG D-44139 Dortmund	AdvCom ProgCom Plenary Ses. 37, 41
Deffenbaugh, Danny M. Southwest Research Institute USA-San Antonio, TX 78228	Ses. 32
Dirkmann, Ulrich P. RWE Energy AG D-44139 Dortmund	Ses. 31
Drewes, Eike, Dipl.-Ing. PROGNOST Systems GmbH D-48432 Rheine	ProgCom Ses. 31 TraiSem
Duineveld, Peter Thomassen Compression Systems BV NL-6990 AB Rheden	ProgCom Ses. 38 TraiSem

Durham, Kevin Cook Compression USA-Stafford, TX 77477	Ses. 38
Eijk, André TNO Science and Industry NL-2600 AD Delft	Ses. 37
Fareta, Marco Mechanical & Civil Engineering Department University of Modena and Reggio Emilia I-41100 Modena	Ses. 35
Gast, Steffen Borsig ZM GmbH D-08393 Meerane	Ses. 33, 40
Gerland, Armin Freudenberg D-79733 Görwihl	Ses. 33
Gottmer, Andreas PROGNOST Systems GmbH D-48432 Rheine	Ses. 36, 39
Greenfield, Shelley BETA Machinery Analysis CA-Calgary AB T3C 0J7	Ses. 32
Hempen, Marcel, Dr. NEUMAN & ESSER GmbH & Co. KG D-52531 Übach-Palenberg	Ses. 39
Hercigonja, Krunoslav Josef Mehrer GmbH & Co. KG D-72336 Balingen	Ses. 33
Hoff, Klaus, Dr. NEUMAN & ESSER GmbH & Co. KG D-52531 Übach-Palenberg	ProgCom Ses. 33, 35
Howes, Brian BETA Machinery Analysis CA-Calgary AB T3C 0J7	Ses. 41
Huttar, Ernst Leobersdorfer Maschinenfabrik A-2544 Leobersdorf	Ses. 35, 39
Kacani, Vassilaq Leobersdorfer Maschinenfabrik A-2544 Leobersdorf	Ses. 35
Kälin, Thomas Burckhardt Compression AG CH-8404 Winterthur	Ses. 31
Käyser, Henk PEB Engineers & Constructors NL-2700 AD Zoetermeer	Ses. 32

Keller, Leonhard, Dr. Burckhardt Compression AG CH-8404 Winterthur	AdvCom Ses. 37, 40
King, Tony AG Equipment USA-Broken Arrow, OK 74012	Ses. 41
Klockow, Helge GE Global Research Europe D-85748 Garching/Munich	Ses. 34
Koop Lau G. M. Thomassen Compression Systems B. V. NL-6990 AB Rheden	Ses. 31 TraiSem
Kopecek, Herbert GE Global Research Europe D-85748 Garching/Munich	Ses. 34
Kurz, Rainer Solar Turbines Incorporated USA-Houston, TX 77040	Ses. 34
Ladwig, Uwe YARA Brunsbüttel GmbH D-25541 Brunsbüttel	Ses. 36
Langanger, Helmut OMV Aktiengesellschaft A-1090 Wien	Plenary
Lankenau, Harry NEAC Compressor Service GmbH & Co. KG D-52531 Übach-Palenberg	Ses. 36
Lenth, Burkhard J. RWE Energy AG D-44139 Dortmund	Ses. 31
Machu, Gunther, Dr. Hoerbiger Ventilwerke GmbH & Co. KG A-1110 Vienna	TraiSem
Mazzali, Carlo GE Oil and Gas I-50127 Florence	Ses. 34
McKee, Robert El Paso Corporation USA-Houston, TX 77002	Ses. 41
Ochs, Heinrich BASF AG D-67056 Ludwigshafen	ProgCom Ses. 36
Otten, Wilhelm, Dr. Infracor GmbH D-45772 Marl	Plenary
Pearsall, David Dresser Rand USA-Tulsa, OK 74112	Ses. 41

Peters, René, Dr. TNO Science and Industry NL-2628 CK Delft	ProgCom Ses. 34
Peterseim, Volker Freudenberg O-Ring KG D-79733 Görwihl	Ses. 33
Pol, Arend Jan Thomassen Compression Systems B.V. NL-6990 AB Rheden	Ses. 40
Pratesi, Simone GE Oil and Gas I-50127 Florence	Ses. 34
Prinz, Christian Hoerbiger Ventilwerke GmbH & Co. KG A-1110 Vienna	Ses. 39
Raggi, Andrea DOTT. ING. MARIO COZZANI S.r.l. I-19021 Arcola	Ses. 38
Retz, Nicole Burckhardt Compression AG CH-8404 Winterthur	Ses. 31, 41
Samland, Georg Burckhardt Compression AG CH-8404 Winterthur	ProgCom Ses. 33, 35, 41
Schiavone, Massimo DOTT. ING. MARIO COZZANI S.r.l. I-19021 Arcola	Ses. 38
Schmitz, Michael GE Global Research Europe D-85748 Garching/Munich	Ses. 34
Schuhmann, Roland BASF AG D-67056 Ludwigshafen	Ses. 39
Scrivner, Christine El Paso Corporation USA-Houston, TX 77002	Ses. 41
Slis, Erik TNO Science and Industry NL-2600 AD Delft	Ses. 32
Steinbusch, Egidius NEUMAN & ESSER GmbH & Co KG D-52531 Übach-Palenberg	Ses. 35
Spiegel, Bernhard Hoerbiger Kompressortechnik Holding GmbH A-1220 Vienna	Ses. 38
Steinkamp, Christian PROGNOST Systems GmbH D-48432 Rheine	Ses. 36

Steinrück, Peter, Dr. Hoerbiger Kompressortechnik Holding GmbH A-1220 Vienna	AdvCom ProgCom Ses. 32, 37
Traversari, Riccardo Compression Service Technology I-50127 Firenze	Ses. 35
Tuma, Stefan Hoerbiger Ventilwerke GmbH & Co. KG A-1110 Vienna	Ses. 34
Wagner, Bernd NEAC Compressor Service GmbH & Co. KG D-52531 Übach-Palenberg	Ses. 39
Wunderlich, Johannes Hoerbiger Kompressortechnik Holding GmbH A-1220 Vienna	ProgCom

Wednesday, 29.10.2008

15.30 h, Room 1

Final Plenary Session

Best paper award

Prior to the Epilogue the best paper awards will be handed over to the selected authors. The submitted papers will be assessed by the programme committee of each Forum. The awards are assigned for the following categories:

Pump Users International Forum:

- Best scientific paper
- Best industry paper

Compressor Users International Forum

- Best paper

Closing remarks

by the Chairman
of the VDMA Pumps + Systems Association
Jürgen Arnold

by the Chairman
of the VDMA Compressors, Compressed Air and Vacuum
Technology Association
Thomas Kaeser

and by the Chairman
of the European Forum for Reciprocating Compressors
Siegmond Cierniak

General information

Proceedings

Proceedings include the Technical Papers of all Sessions of either the Pump Users International Forum, Compressor Users International Forum or EFRC Conference. The proceedings are written in English language. A participation card for the International Rotating Equipment Conference includes one copy of the conference proceedings (Pump Users International Forum, Compressor Users International Forum or EFRC Conference). Additional proceedings have to be ordered on the registration form. (Fees for additional proceedings see below).

Sessions – Technical Papers

After a short introduction by the chairman the author will give a presentation of his paper. His speaking time will be 20 minutes. Directly after the presentation the audience has the opportunity to ask the author for 10 minutes.

Please note that the titles of the Technical Papers and presentations may vary because of later changes made by the authors.

Training Seminars – Explanations

Training Seminars give an in-depth overview about specific technical themes. They offer a good opportunity especially for young engineers from operators, engineering companies and suppliers but also manufacturers or universities to get acquainted with new technical fields. You are kindly asked to mark your request to participate at the registration form (additional fee required!)

Final report

The final report includes the opening and plenary presentations in unabridged text as well as the full text of Technical Papers in English. The final report will be available early 2009 in form of a CD-ROM/DVD.

Languages

The official conference language will be English. Simultaneous interpretation from English to German for the Sessions of the Pump Users International Forum will be offered. One of two Sessions will be simultaneously interpreted at the Compressor Users International Forum, too. You are kindly asked to mark your request for headphones at the registration form.

Internet

You can find further Information about the Conference at <http://www.introequipcon.com>.

Confirmation and participation cards

After paying your invoice you will get your participation card(s) at the Forum office in Düsseldorf.

Participant lists

Participant lists as well as an exhibitions leaflet and documentation which have not been mailed will be made available in the Forum office.

Food and beverages during breaks

Food and beverages will be offered in the CCD-Stadthalle. It includes a lunch snack on 28th/29th October 2008. Beverages during breaks are e.g. available in the Foyer. This is free of charge for participants at the conference.

Best Paper Award

As recognition of excellence best paper awards will be given to selected authors. These awards are intended to honour the authors for their outstanding practice experience or well founded scientific paper. The best paper awards of the Pump Users International Forum and the Compressor Users International Forum will be handed over at the Final Plenary. The Best paper award for young engineers of the European Forum for Reciprocating Compressors will be handed over at the EFRC Meeting at Wednesday, 29.10.2008 (Session 37) 09.00 h in Room 1.

Registration fees

Participation fee for two days*

Early bird registration* **(for two days participation only)**
until 31.08.2008

EUR 750.– (plus VAT 19 %)

Regular registration

EUR 795.– (plus VAT 19 %)

Participation fee for one day
for first day*

EUR 550.– (plus VAT 19 %)

for second day*

EUR 450.– (plus VAT 19 %)

Participation fee for one Training Seminar

EUR 195.– (plus VAT 19 %)

The participation card is not transferable!

Possible bank charges are paid by the participant.

* One issue of the conference proceedings is included.

Additional Proceedings with Technical Papers

EUR 95.– (plus VAT 19 %)

Adverts (4c) in proceedings:

Half page

EUR 950.– (plus VAT 19 %)

Full page

EUR 1.750.– (plus VAT 19 %)

CD-ROM of Technical Papers and final report (only participants)

EUR 30.–

(plus VAT 19 %)

The amounts are payable upon receipt of the invoice of the VDMA-Maschinenbau-Institut GmbH.

The participation fee for two days includes the participation at all events indicated in the Forum programme with the visit of the Technical exhibition, food and beverages, cocktail reception and use of simultaneous interpretation connection. The participation fee for one day is only valid for the day paid including the same offer indicated above.

If cancellation of registration arrives **until 10th October 2008** 30 % of the registration fee will be reimbursed. After this date no reimbursement is offered.

The participation card paid for the conference allows free entrance to all three Forums!

Programme alterations may be possible. For information, contact the Forum office please.

Registration

Your Forum attendance has to be confirmed by sending a registration form. Please mark the intended participation on the attached registration form! For registration of more participants please use copies of this registration form or ask for further copies.

Registration preferably on the attached registration form to be addressed to

**VDMA Pumps + Systems Association,
Compressors, Compressed Air and Vacuum Technology Association
Mrs. Gudrun Rehberger**

Lyoner Strasse 18
60528 Frankfurt/Main
Germany

Phone +49 69 6603-1282
Fax +49 69 6603-2282
E-Mail gudrun.rehberger@vdma.org

Room reservation

Room reservation until **31st August 2008** on the attached form to be addressed to

Düsseldorf Marketing & Tourismus GmbH
Mr. Manuel Kliese
P. O. Box 10 21 63
D-40012 Düsseldorf

Fax +49 211 17202-3220
Phone +49 211 17202-851
E-Mail reservation@dus-mt.de
Internet www.duesseldorf-tourismus.de

Note:

Please be sure that you mention the International Rotating Equipment Conference at your room reservation.

The conditions of the hotels can change after 31st August 2008!

How to get to the conference

A map and a route description to the Congress Center Düsseldorf can be found at http://www.duesseldorfcongress.de/download/anfahrt_ccdstadthalle_p5.pdf.

For further information, look at the website <http://www.duesseldorfcongress.de/en> of the Congress Center Düsseldorf.

Sightseeing

For sightseeing arrangements please contact the Düsseldorf Marketing & Tourismus GmbH (www.duesseldorf-tourismus.de) or look at http://www.duesseldorfcongress.de/en/destination_dus.php4.

Forum office prior to the Forum

For further information please ask the
Forum Manager:

Mr. Christoph Singrün

Phone +49 69 6603-1281

Fax +49 69 6603-2281

E-Mail christoph.singruen@vdma.org

Assistant:

Mrs. Gudrun Rehberger

Phone +49 69 6603-1282

Fax +49 69 6603-2282

E-Mail gudrun.rehberger@vdma.org

Mrs. Michaela Ruhl

Phone +49 69 6603-1297

Fax +49 69 6603-2297

E-Mail michaela.ruhl@vdma.org

Technical officer Pumps:

Mr. Friedrich Klütsch

Phone +49 69 6603-1286

Fax +49 69 6603-2286

E-Mail friedrich.kluetsch@vdma.org

Technical officer Compressors, Compressed Air:

Mr. Andreas Brand

Phone +49 69 6603-1283

Fax +49 69 6603-2283

E-Mail andreas.brand@vdma.org

EFRC Conference:

Dr. René Peters, TNO

Phone +31 15 269-2114

Fax +31 15 269-2111

E-Mail efrc@tno.nl

Forum office during the Forum

The Forum office with organisation staff indicated above will be located in the Foyer of the Congress Centre Düsseldorf and will be open on 28th and 29th October 2008 from 8.00 to 18.00 h.

Enclosure:

- Registration form for participation
- Registration form for room reservation

Notes

[illegible]

Day 0: Monday, October 27 th	
	Training Seminar
Time	Room 26
13.00–18.30	Safe operation of pumps and compressors – Focussing the interfaces between manufacturer and user
	see pages 8, 32

Day 1: Tuesday, October 28 th			
	Pump Users International Forum ¹		
Time	Room 14	Room 1	Room 27
09.00–10.30	Room 1		
	Opening Plenary Session; Welcome; Plenary Lectures		
10.30–11.00	Coffee break		
11.00–12.30	Session 1: Oil, gas and refinery applications	Session 2: Wastewater pumps	Session 3: Basic Research & Development
	see page 10	see page 11	see page 11
12.30–14.00	Lunch break		
14.00–15.30	Session 4: Maintenance and safety operations	Session 5: Mixers	Session 6: CFD Technology
	see page 12	see page 12	see page 13
15.30–16.00	Coffee break		
16.00–17.30	Session 7: Special aspects of product development	Session 8: Wastewater systems	Session 9: Cleanability and careful conveying
	see page 13	see page 14	see page 14
17.30	Break		
18.30	Cocktail Reception at Düsseldorf Congress Center		
22.00	End of day 1		

Technical Exhibition

Day 2: Wednesday, October 29 th			
	Pump Users International Forum		
Time	Room 27	Room 28	Room 14
09.00–10.30	Session 10: Chemical and process industry	Session 11: Energy efficient pump components	Session 12: Power generation
	see page 15	see page 16	see page 16
10.30–11.00	Coffee break		
11.00–12.30	Session 13: Pumping of special liquids	Session 14: Energy efficient pump systems	Session 15: Building applications; Innovative solutions
	see page 17	see page 17	see page 18
12.30–14.00	Lunch break		
14.00–15.30	Session 16: New technology for SIC components for mechanical seals and sealless pumps	Session 17: Analysis and improvement of system performance	Session 18: Building applications; Energy efficiency
	see page 18	see page 19	see page 19
15.30–15.45	Room 1		
	Final Plenary Session: Best paper award; Closing remarks		
15.45	End of 2008 conference		

Technical Exhibition

Note¹: Simultaneous interpretation from English to German will be provided for any session.

Day 0: Monday, October 27 th	
	Training Seminar
Time	Room 27
13.00–18.30	Where does research and development of pumps and compressors go?
	see pages 9, 33

Day 1: Tuesday, October 28 th		
	Compressor Users International Forum ²	
Time	Room 26	Room 18/19
09.00–10.30	Room 1	
	Opening Plenary Session; Welcome; Plenary Lectures	
10.30–11.00	Coffee break	
11.00–12.30	Session 19: Drive technologies	Session 20: Energy efficient systems – a successful approach
	see page 34	see page 34
12.30–14.00	Lunch break	
14.00–15.30	Session 21: Oil and gas applications	Session 22: Energy efficiency in compressors and compressed air systems I
	see page 35	see page 35
15.30–16.00	Coffee break	
16.00–17.30	Session 23: Research & Development	Session 24: Energy efficiency in compressors and compressed air systems II
	see page 36	see page 36
17.30	Break	
18.30	Cocktail Reception at Düsseldorf Congress Center	
22.00	End of day 1	

Day 2: Wednesday, October 29 th		
	Compressor Users International Forum	
Time	Room 26	Room 18/19
09.00–10.30	Session 25: Sealing technologies	Session 26: Vacuum pump design and manufacturing
	see page 37	see page 37
10.30–11.00	Coffee break	
11.00–12.30	Session 27: Compressor design and manufacturing I	Session 28: System design and monitoring
	see page 38	see page 38
12.30–14.00	Lunch break	
14.00–15.30	Session 29: Compressor design and manufacturing II	Session 30: Compressed air quality
	see page 39	see page 39
15.30–15.45	Room 1	
	Final Plenary Session: Best paper award; Closing remarks	
15.45	End of 2008 conference	

Note²: Simultaneous interpretation from English to German will be provided for Sessions 20, 22, 24, 26, 28, 30

Day 0: Monday, October 27 th	
	Training Seminar
Time	Room 28
13.00–18.30	Pulsation – Fundamentals, Effects and Control
	see page 48

Day 1: Tuesday, October 28 th		
	6 th EFRC Conference	
Time	Room 16/17	Room 28
09.00–10.30	Room 1	
	Opening Plenary Session; Welcome; Plenary Lectures	
10.30–11.00	Coffee break	
11.00–12.30	Session 31: Design & Engineering I	Session 32: Pulsations & Vibrations I
	see page 49	see page 49
12.30–14.00	Lunch break	
14.00–15.30	Session 33: Design & Engineering II	Session 34: Fundamentals
	see page 50	see page 50
15.30–16.00	Coffee break	
16.00–17.30	Session 35: Design & Engineering III	Session 36: Operation & Maintenance I
	see page 51	see page 51
17.30	Break	
18.30	Cocktail Reception at Düsseldorf Congress Center	
22.00	End of day 1	

Day 2: Wednesday, October 29 th		
	6 th EFRC Conference	
Time	Room 1	Room 16/17
09.00–10.30	Session 37: EFRC Meeting	
	see page 52	
10.30–11.00	Coffee break	
11.00–12.30	Session 38: Valves	Session 39: Operation & Maintenance II
	see page 52	see page 53
12.30–14.00	Lunch break	
14.00–15.30	Session 40: Design & Engineering IV	Session 41: Pulsations & Vibrations II
	see page 53	see page 54
15.30–15.45	Room 1	
	Final Plenary Session: Best paper award; Closing remarks	
15.45	End of 2008 conference	

Technical Exhibition

Technical Exhibition

Organiser

Maschinenbau-Institut GmbH
Frankfurt am Main
Ust.-IdNr. VAT 114.156.253

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Pumps + Systems Association, Compressors, Compressed Air and Vacuum Technology Association

Lyoner Strasse 18
60528 Frankfurt am Main
Germany

Phone +49 69 6603-1282
Fax +49 69 6603-2282
E-Mail gudrun.rehberger@vdma.org
Internet www.introequipcon.com

Chairmen:

Jürgen Arnold (VDMA Pumps + Systems)
Thomas Kaeser (VDMA Compressors,
Compressed Air and Vacuum Technology)

Managing Director:

Christoph Singrün

EFRC

EUROPEAN FORUM
for RECIPROCATING
COMPRESSORS

European Forum for Reciprocating Compressors e. V. EFRC Conference Secretary TNO

Dr. René Peters
TNO
Stieltjesweg 1, P. O. Box 155
2600 AD Delft
The Netherlands

Phone +31 15 269 2114
Fax +31 15 269 2111
E-Mail efrc@tno.nl
Internet www.introequipcon.com

Chairman:

Siegmund Cierniak