

PRELIMINARY PROGRAMME



CIMAC
CONGRESS
HELSINKI | JUNE 6-10, 2016

Meeting the Future of Combustion Engines 28th CIMAC WORLD CONGRESS

Combustion Engine Technology for
Ship Propulsion | Power Generation | Rail Traction



Learn more about the 28th CIMAC World Congress!
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CONTENT

Introduction

Welcome to Helsinki	2
The National Member Association within Finnish Technology Industries welcomes...	3

Technical Programme

Overview Congress	4
Topics and Sessions	5
Monday, June 6, 2016	6
Tuesday, June 7, 2016	8
Poster Session Tuesday, June 7, 2016	12
Wednesday, June 8, 2016	14
Poster Session Wednesday, June 8, 2016	18
Thursday, June 9, 2016	20
Poster Session Thursday, June 9, 2016	24

Technical Tours

Friday, June 10, 2016	26
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Optional Tours

Tuesday – Thursday, June 7 – 9, 2016	28
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Sponsoring and Exhibition

Sponsors	32
Media Partners	34
Accompanying Exhibition	35

General Information

Finland / Helsinki	36
Journey	37
Congress Venue	38
Accommodation	40
Map of Helsinki	42
Registration	44
Time Schedule	45
Quick Facts	46
Organisers	48

CIMAC

About CIMAC	50
Reviewers Technical Programme	51
Congress Organising Committee	52
Members of CIMAC	54

WELCOME TO HELSINKI

Join us in Helsinki

The International Council on Combustion Engines – CIMAC – warmly invites you to the 28th CIMAC Congress on 6 – 10 June 2016 in Helsinki, Finland. The honoured host of this event is the Finnish CIMAC National Member Association, represented by the Branch Group of Combustion Engines and Turbocharger Technology within the Federation of Finnish Technology Industries.

Thirty-five years have passed since the Congress was held in Finland in 1981. During these years, the combustion engine has been further developed into a stronger position than ever, as one of the main sources of energy conversion for powering ships, power plants and rail locomotives, among others. Our work in securing the future for combustion engines is supported by our belief in their ability to attract customers as an environmentally friendly source of energy. We continuously strive to leave the legacy of a clean planet to the next generation. To seriously address our goals, we need to evaluate honestly where we stand in comparison with other energy producers. We also need to actively market combustion engines as an important area of focus for university level studies and research. The entire supply chain also has an important role in our efforts towards these targets, and we should do our utmost to be the preferred partner for our customers.

The 2016 Congress will, once again, bring together the leading expertise from engine manufacturers, component and system suppliers, rail, marine and power plant operators and users, technical universities, classification societies, and oil companies around the globe. The presentations will highlight the latest developments in products and technologies and the values they bring to the customer; they will elaborate on the scientific research that creates the foundation for the next generation of engines and address the needs of the markets to ensure a sustainable, environmentally and economically sound future. Additionally, the Congress offers a unique opportunity to generate business and build lasting networks. In the panel discussions and the keynote speeches, we will be challenged to broaden our perspectives. Customer benefits and values will be strongly emphasised during the Congress. This is clearly an opportunity that will help in making the right decisions for the future.

Helsinki welcomes you in early June. It is a city on the sea with influences from both east and west, full of opportunities, and surrounded by natural beauty. The Congress venue is the famous Finlandia Hall, designed by the Finnish architect Alvar Aalto. The optional tours will showcase the best that Helsinki and its surroundings can offer in terms of culture, nature, shopping, etc. With strong industrial traditions, Finland's innovative design and expertise across multiple sectors will be presented during the technical tours to a number of interesting places.

CIMAC and the Finnish NMA are happy to welcome you all to the 2016 Congress in Helsinki. Besides providing the chance to experience Finland and its natural beauty at a time of the year when the sun hardly sets, we will do our utmost to meet your expectations regarding the Congress.

Welcome!



Christoph Teetz
CIMAC President
Rolls-Royce Power Systems

A handwritten signature in black ink that reads "Christoph Teetz".



Robert Ollus
Congress President
Wärtsilä Corporation

A handwritten signature in black ink that reads "Robert Ollus".

THE NATIONAL MEMBER ASSOCIATION WITHIN FINNISH TECHNOLOGY INDUSTRIES WELCOMES...

The Federation of Finnish Technology Industries welcomes you to Finland and to our beautiful capital Helsinki.



We hope you will fully enjoy the Congress, the fresh Finnish nature and our beautiful cultural atmosphere during your stay in Helsinki.

The Federation of Finnish Technology Industries is the lobbying organisation for technology industry companies. We promote competitiveness and the operational preconditions for this largest and most important export sector in Finland. A constantly developing technology industry creates the basis for the Finnish welfare state. The Federation of Finnish Technology Industries has over 1,600 member companies. The technology industry makes up 50% of Finnish exports and 80% of R&D investments in the private sector. This sector employs almost 280,000 people directly, and 700,000 people in total. This equates to about 30% of the entire Finnish labour force.

Mechanical Engineering and Manufacturing Industry in Finland

The enterprises within the mechanical engineering and manufacturing industry in Finland employ 125,000 people, making this sector the largest employer in the technology industry with a turnover of EUR 24.4 billion. Successful industry products include cruise liners, engines for ships and power plants, pulp and paper machines, rock and mineral processing equipment, lifts, hoists and cranes, forestry and agricultural machinery, and of course the orange-handled Fiskars scissors. Companies in this sector know how to apply new technologies rapidly to customer-driven products and production processes. It is increasingly popular for companies to form cooperation networks that produce total tailor-made solutions to meet the customers' individual needs. This allows each company to successfully focus on their core competencies, creating more jobs also in subcontractor companies.

The National Member Association of CIMAC – Combustion Engine and Turbo Charging Branch Group – within the Federation of Finnish Technology Industries coordinates the cooperation between industry companies in industrial policy, economic policy and environmental issues.

The purpose of the branch group is to monitor and influence international trends, mainly through technological cooperation.

CONGRESS OVERVIEW



MORNING JOGGING

Enjoy an active start to the Congress Day!

In the mornings guided jogging tours will be available for your convenience from selected Congress hotels. You are expected to bring your own running gear, but a complimentary CIMAC T-shirt will be provided. Morning jogging tours will be offered from June 7 – 9, 2016.

Optional Tours
June 7 – 9, 2016

Day	Time	Activities
Monday June 6, 2016	10:00 – 11:30	Opening Ceremony
	12:00 – 13:00	Lunch
	13:30 – 15:00	Technical Sessions
	15:00 – 15:30	Coffee Break
	15:30 – 17:00	Technical Sessions
	18:30	Welcome Reception
Tuesday June 7, 2016	08:30 – 17:00	Poster Session
	08:30 – 10:00	Technical Sessions
	10:00 – 10:30	Coffee Break
	10:30 – 12:00	Technical Sessions
	12:00 – 13:00	Lunch
	13:30 – 15:00	Technical Sessions
	15:00 – 15:30	Coffee Break
	15:30 – 17:00	Technical Sessions
	18:30	ABB Evening
	Wednesday June 8, 2016	09:00 – 17:00
09:00 – 10:30		Technical Sessions
10:30 – 11:00		Coffee Break
11:00 – 12:00		Collin Trust sponsored Key Note Speech
12:00 – 13:00		Lunch
13:30 – 15:00		Technical Sessions
15:00 – 15:30		Coffee Break
15:30 – 17:00		Technical Sessions
15:30	Users Reception	
Thursday June 9, 2016	08:30 – 17:00	Poster Session
	08:30 – 10:00	Technical Sessions
	10:00 – 10:30	Coffee Break
	10:30 – 12:00	Technical Sessions
	12:00 – 13:00	Lunch
	13:00 – 14:30	Technical Sessions
	14:30 – 15:00	Coffee Break
	15:00 – 16:30	Final Panel Discussion
	18:30	Gala Dinner
Friday June 10, 2016	09:00 – 17:00	Technical Tours



TOPICS AND SESSIONS

1. Product Development – Diesel Engines

- 1.1 High Speed Engines
- 1.2 Medium Speed Engines I
- 1.3 Medium Speed Engines II
- 1.4 Low Speed Engines
- 1.5 Field Experience

2. Product Development – Gas & Dual Fuel Engines

- 2.1 High Speed Engines
- 2.2 Medium Speed Engines I
- 2.3 Medium Speed Engines II
- 2.4 Medium Speed Engines III
- 2.5 Low and Medium Speed Engines & Users Aspects

3. Fuel Injection & Gas Admission

- 3.1 Gas Applications I
- 3.2 Common Rail Developments
- 3.3 Diesel Applications
- 3.4 Gas Applications II

4. Turbochargers & Air/Exhaust Management

- 4.1 New Products
- 4.2 2-Stage Turbocharging
- 4.3 Technologies and Applications

5. Components & Tribology

- 5.1 Piston, Liner and Wear
- 5.2 Crankshaft
- 5.3 Bearings
- 5.4 Components Design

6. Controls & Automation

- 6.1 Engine Control Systems
- 6.2 Controls Applications
- 6.3 Combustion Control and Diagnostics

7. Exhaust Gas Aftertreatment

- 7.1 NO_x Reduction – Medium Speed
- 7.2 NO_x Reduction – Low Speed
- 7.3 SO_x, Particulates and Classification

8. Basic Research & Advanced Engineering

- 8.1 Basic Study 1
- 8.2 Basic Study 2
- 8.3 New Simulation
- 8.4 New Concept
- 8.5 New Combustion 1
- 8.6 New Combustion 2
- 8.7 New Measurements
- 8.8 New Systems for Emission

9. System Integration & Optimisation

- 9.1 Ship, System and Component Design
- 9.2 Integration Methodologies
- 9.3 Ship Related Issues

10. Fuels, Lubricants & Fluid Technologies

- 10.1 Traditional Fuels
- 10.2 New Fuels I
- 10.3 New Fuels II
- 10.4 Lube Oil Technology I
- 10.5 Lube Oil Technology II

11. Users' Aspects, Maintenance & Monitoring – Marine Applications

- 11.1 Tribology and Cylinder Oil
- 11.2 Emission Technologies and Choices
- 11.3 Field Experience back to Engineering / Training

12. Users' Aspects, Maintenance & Monitoring – Land-based Applications

- 12.1 Users' Aspects, Maintenance & Monitoring – Land-based Applications

TECHNICAL PROGRAMME MONDAY

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Monday June 6, 2016	1 Product Development – Diesel Engines 1-1 High Speed Engines	3 Fuel Injection & Gas Admission 3-1 Gas Applications I	4 Turbochargers & Air/ Exhaust Management 4-1 New Products	8 Basic Research & Advanced Engineering 8-1 Basic Study 1
13:30 – 15:00	<p>Chairperson: Christoph Teetz, Rolls-Royce Power Systems, Germany</p> <p>266 The New PULSAR Multi-Application High Speed Engine Family Michael Ronchetti, AVL List GmbH, Austria</p> <p>93 UDMZ's New DM-185 Diesel Engine Family Martin Muther, FEV GmbH, Germany</p> <p>164 GE Distributed Powers J616 Diesel Genset – Applying platform strategies to provide fast product solutions Ian Calvert, GE Distributed Power, Austria</p> <p>196 The New MTU Series 4000 IMO 3 Engines Otto Buecheler, Rolls-Royce Power Systems, Germany</p>	<p>Chairperson: Andreas Wimmer, LEC GmbH, Austria</p> <p>39 Simplified L'Orange fuel injection system for Dual Fuel applications Clemens Senghaas, L'Orange GmbH, Germany</p> <p>156 Development Methodology for the new Large Engine Gas Admission Valves by Robert Bosch Peter Christiner, Robert Bosch AG, Austria</p> <p>78 Detailed Assessment of an Advanced Wide Range Diesel Injector for Dual Fuel Operation of Large Engines Constantin Kiesling, LEC GmbH, Austria</p> <p>306 Research on the Influence of Diesel Injection Law to Combustion Process of Micro Ignition Dual Fuel Engine Yue Li, Harbin Engineering University, China</p>	<p>Chairperson: Christian Roduner, ABB Turbo Systems, Switzerland</p> <p>246 New single-stage turbocharger for large high speed diesel engines Michael Gisiger, ABB Turbo Systems, Switzerland</p> <p>76 New Generation Development for Mitsubishi Turbocharger Sakamoto Koichi, Mitsubishi Heavy Industries, Japan</p> <p>105 ETB - Electrical Turbo Blower MAN's EGR Blower Series Arman Garshasebi, MAN Diesel & Turbo, Germany</p> <p>194 Radial Turbocharger for small bore Marine Auxiliary Engines Joel Schlienger, ABB Turbo Systems, Switzerland</p>	<p>Chairperson: Ralf Marquard, FEV GmbH, Germany</p> <p>268 Integrated Simulation Approach for Driveline Development to Meet Future Demands in Large Engine Development Torsten Philipp, AVL Deutschland GmbH, Germany</p> <p>140 Utilization of simulation technology for diesel engine development in Niigata Toshiyuki Saito, Niigata Power Systems Co. Ltd., Japan</p> <p>83 Active cylinder technology in Wärtsilä engines Kaj Portin, Wärtsilä Corporation, Finland</p> <p>234 Wärtsilä 31 – industrial design in a modular engine architecture Jonas Åkerman, Wärtsilä Corporation, Finland</p>
15:00 – 15:30	Coffee Break			

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Monday June 6, 2016	1 Product Development – Diesel Engines 1-2 Medium Speed Engines I	3 Fuel Injection & Gas Admission 3-2 Common Rail Developments	4 Turbochargers & Air/ Exhaust Management 4-2 2-Stage Turbocharging	8 Basic Research & Advanced Engineering 8-2 Basic Study 2
15:30 – 17:00	Chairperson: Paul Flynn, GE, United States	Chairperson: Lars Nerheim, Bergen University, Norway	Chairperson: Alexander Rippl, MAN Diesel & Turbo, Germany	Chairperson: Stefan Pischinger, FEV GmbH, Germany
	135 Update on the extended engine portfolio of Anglo Belgian Corporation Lieven Vervaeke, Anglo Belgian Corporation N.V., Belgium	232 Development of CR Technology In The last Decade – 4 Stroke Wartsila Engines Dave Jay, Wärtsilä Corporation, Finland	191 Experience of 2-stage turbocharged engines Matti Vaarasto, Wärtsilä Corporation, Finland	52 Pros and Cons of Exhaust Gas Recirculation for Emission Reduction of Medium Speed Diesel Engines Carsten Rickert, Caterpillar Motoren GmbH & Co. KG, Germany
	181 The next generation of MDT's large bore diesel engines Sebastian Kunkel, MAN Diesel & Turbo, Germany	215 The new modular MAN Common-Rail System for future HFO-applications Johann Wloka, MAN Diesel & Turbo, Germany	280 Valve Control Management and Power2® - the Answers to Highly Demanding Diesel Engine Applications Christoph Mathey, ABB Turbo Systems, Switzerland	148 Development of Low Fuel Consumption Technology for Medium Speed Diesel Engines Yoshinori Fukui, Yanmar Co. LTD., Japan
	285 Product & Technology Development for Increased Customer Benefits Grant Gassner, Wärtsilä Corporation, Finland	184 New Developments and Service Experience with OMT's Latest Generation Common Rail Injector Marco Coppo, OMT S.p.A., Italy	265 Turbocharger Solutions for New Engine Generations Silvio Risse, Kompressorenbau Bannewitz GmbH, Germany	173 Virtual Design and Simulation in two-stroke marine Engine Development Alexander Brueckl, Winterthur Gas & Diesel, Switzerland
	112 Introducing a Completely New Medium Speed Engine Ben Rogers, Ricardo, United Kingdom	94 An engine layout study for common rail systems in large diesel engines Kornelija Okonji, Peter Fuchs Technology Group AG, Switzerland	281 Power2® – Is 2-Stage Turbocharging Interesting for 2-Stroke Engines? Christoph Mathey, ABB Turbo Systems, Switzerland	208 Aspect of Soot Particles Formation with Optical Measurement on Its in an Acetylene-Air Diffusion Flame Hiroshi Okada, Tokyo University of Marine Science and Technology, Japan
18:30	Welcome Reception			

TECHNICAL PROGRAMME **TUESDAY**

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Tuesday June 7, 2016	1 Product Development – Diesel Engines 1-3 Medium Speed Engines II	6 Controls & Automation 6-1 Engine Control Systems	5 Components & Tribology 5-1 Piston, Liner and Wear	8 Basic Research & Advanced Engineering 8-3 New Simulation
08:30 – 10:00	Chairperson: Robert Beran, AVL List GmbH, Austria	Chairperson: Rick Boom, Woodward, Netherlands	Chairperson: Ioannis Vlaskos, Ricardo, United Kingdom	Chairperson: Peter Heuser, FEV GmbH, Germany
	95 HHM 12MV390 – Heading the new Hudong Medium Speed Engine Family Markus Hermanns, FEV GmbH, Germany	96 Next generation UNIC automation system to enable Wärtsilä 31 performance Jonatan Rösgrén, Wärtsilä Corporation, Finland	67 Interaction between ship operation and cylinder lubrication of marine two-stroke Diesel engines Konrad Räss, Winterthur Gas & Diesel, Switzerland	104 Large-Eddy Simulation on the Effect of Injection Pressure in a Reacting Diesel Spray Heikki Kahila, Aalto University, Finland
	186 New Generation HiMSEN, H21C Engine Ki Hoon Jang, Hyundai Heavy Industries, Republic of Korea	195 Development of HiLS system for HiMSEN Dual Fuel Engine Seunghyup Ryu, Hyundai Heavy Industries, Republic of Korea	231 Valve Wear in lean-burn large bore gas engines – from engine tests of components to a unique tribological test rig Oliver Lehmann, Märkisches Werk GmbH Germany	213 Simulation of a Dual-Fuel Large Marine Engines using combined 0/1-D and 3-D Approaches Jöran Ritzke, University of Rostock, Germany
	225 Wärtsilä 31 - world's most efficient four-stroke engine Ulf Åstrand, Wärtsilä Corporation, Finland	65 Dynamic 2-stroke engine model for Hardware-in-the-Loop testing Steffen Tscherch, Winterthur Gas & Diesel, Switzerland	283 Lubtronic SIP promise remarkably low wear rates with low CLO consumption Peter Jensen, Hans Jensen Lubricators A/S, Denmark	92 Numerical Study on Impinging Wall-Guided DI Gas Jets with RANS and Hybrid LES/RANS Methods Karri Keskinen, Aalto University, Finland
	307 The New Bergen B33:45 Medium Speed Diesel Engine Series - An Essence of 30 Years Experience in the 3x cm Bore Class Peter Koch, Rolls-Royce Power Systems, Norway	211 OpenECS: Universal Engine Control System Platform with open software based on an industrial PLC Martin Greve, AVAT Automation GmbH, Germany	302 How Can We Improve Peripheral Wear of Piston Rings for Low Speed Diesel Engine Minoru Kawanishi, Riken Corporation, Japan	126 Dynamic Behaviour of Gas and Dual-Fuel Engines: Using Models and Simulations to Aid System Integration Ioana Georgescu, Delft University of Technology, Netherlands
				124 Use of 1-D simulation tools with a physical combustion model for the development of Diesel-Gas or Dual Fuel engines Eike Joachim Sixel, Caterpillar Motoren GmbH & Co. KG, Germany
10:00 – 10:30	Coffee Break			

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Tuesday June 7, 2016	1 Product Development – Diesel Engines 1-4 Low Speed Engines	8 Basic Research & Advanced Engineering 8-4 New Concepts	5 Components & Tribology 5-2 Crankshaft	10 Fuels, Lubricants & Fluid Technologies 10-4 Lube Oil Technology I
10:30 – 12:00	Chairperson: Patrick Hupperich, FEV GmbH, Germany 120 The Development of the Modern Low-Speed Two-Stroke Marine Diesel Engine Andreas Kyrtatos, Winterthur Gas & Diesel, Switzerland 149 The Latest Technologies of Mitsubishi UEC Engine Katsumi Imanaka, Mitsubishi Heavy Industries, Japan 116 MAN B&W Two-stroke Engines – Latest design development within engine types, Tier III and multiple gas fuels Susanne Kindt, MAN Diesel & Turbo, Denmark 142 Development of Low Pressure Exhaust Gas Recirculation System for Mitsubishi UE Diesel Engine Naohiro Hiraoka, Mitsubishi Heavy Industries, Japan	Chairperson: Volkmar Hauelsen, ABB Turbo Systems, Switzerland 17 From HERCULES A-B-C to HERCULES-2: A classic cooperative programme in large engine R&D Nikolaos Kyrtatos, National Technical University of Athens, Greece 272 The Large Engines Validation Challenge in the Context of New Exhaust Emissions Regulation Christopher Huber, AVL List GmbH, Austria 128 Advantages of Statistical Methods in Development of Combustion Concepts for Large Engines Michael Engelmayer, LEC GmbH, Austria 244 Performance of a Heavy-Duty Single Cylinder DI Diesel Engine in PCCI mode with Miller Valve Timing Clemens Brückner, ETH Zürich, Switzerland	Chairperson: Simon Brewster, Ricardo, United Kingdom 72 Torsional System Modelling: Balancing and Diagnosis Application in Two Stroke Low Speed Power Plant Diesel Engine Francisco Jimenez Espadafor, Seville University, Spain 151 Influence of Inclusion Size on Fatigue Strength and Stress Assessment for Forged Crankshaft under Multiaxial loading Tomoya Shinozaki, Kobe Steel Ltd., Japan 180 Improved crankshaft simulations and verified methodologies Tero Frondelius, Wärtsilä Corporation, Finland 127 New Technique To Predict Dynamic Pressure and Flow of Lube Oil to Crankshaft Bearings and Piston Cooling Ben Rogers, Ricardo, United Kingdom	Chairperson: Rainer Aufischer, Miba Gleitlager Austria GmbH, Austria 131 Novel Lube Oil Cleaning Concept for 4-Stroke Large Diesel Engines in HFO operation Florian Gruschwitz, MAN Diesel & Turbo, Germany 119 A new lube oil cleaning solution Mats Englund, Alfa Laval, Sweden 121 Performance Assessment of a New Generation Gas Engine Lubricant- Novel Developmental Screening Methodology Dr. Ramakumar Sankara SV, IndianOil Corporation Limited, India 25 B20 fuel effects on engine lubricating oil properties Katriina Sirviö, University of Vaasa, Finland
12:00 – 13:00	Lunch			

TECHNICAL PROGRAMME **TUESDAY**

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Tuesday June 7, 2016	2 Product Development – Gas & Dual Fuel Engines 2-1 High Speed Engines	6 Controls & Automation 6-2 Controls Applications	5 Components & Tribology 5-3 Bearings	8 Basic Research & Advanced Engineering 8-5 New Combustion 1
13:30 – 15:00	Chairperson: Gunnar Stiesch, MAN Diesel & Turbo, Germany	Chairperson: Fredrik Östman, Wärtsilä Corporation, Finland	Chairperson: Edgar Gust, Zollern, Germany	Chairperson: Stefan Mayer, MAN Diesel & Turbo, Germany
	108 The path to 50% elec. efficiency and beyond – the second generation of GE's J920 gas engine Christian Dr. Trapp, GE Jenbacher, Austria	40 Cylinder Individual Combustion Control of Gas and Dual Fuel Engines Klaus Schmid, AVAT Automation GmbH, Germany	218 Understanding and maintaining high bearing life in a reduced friction crank train system Martin Offenbecher, Miba Gleitlager Austria GmbH, Austria	32 Unburned Hydrocarbon Emissions from Lean Burn Natural Gas Engines – Sources and Solutions Joel Hiltner, Hiltner Combustion Systems, United States
	53 MTU Series 4000 for Natural Gas Operation in Ships – Challenges for high Speed Gas Engines in Mobile Applications Udo Sander, Rolls-Royce Power Systems, Germany	56 Gas Engine for Marine Application: Modeling and Control Oleksiy Bondarenko, National Maritime Research Institute, Japan	198 Development trend of Aluminum alloy bearing for medium and high speed engines Akihiro Kose, Daido Metal Co. Ltd., Japan	43 Impact of the Fuel Gas Quality on the Efficiency of a Large Gas Engine Thomas Lauer, TU Wien, Austria
	273 The High Speed Dual-Fuel and Gas Engine – Status and Future Developments Thomas Kammerdiener, AVL List GmbH, Austria	161 State-Based Diesel Fueling for Improved Transient Response in a Dual-Fuel-Engine Ryan Roecker, Southwest Research Institute, United States	141 Theoretical and experimental oil film characteristics of an externally-pressurized crosshead bearing to enhance the load carrying capacity Masaaki Endo, Daido Metal Co. Ltd., Japan	80 Combustion System Development for a Large Bore Gas Engine – Efficient Combination of Simulation and Experiment José Geiger, FEV GmbH, Germany
	296 New Dresser-Rand Guascor EGM Gas Engines - Breaking the Limits. Aitor Larralde, Dresser-Rand, Spain	223 Model-Based Design and Development of Power Turbine Generator Waste Heat Recovery Systems Kalevi Tervo, ABB Marine, Finland	320 Adaptive Tin-Based Journal Bearing Overlays for Future Generations of High- and Medium-Speed Engines Johann Nagl, Miba Gleitlager Austria GmbH, Austria	171 Understanding of combustion process in a premixed lean burn gas engine fueled with hydrogen enriched natural gas Satoshi Kawauchi, National Maritime Research Institute, Japan
15:00 – 15:30	Coffee Break			

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Tuesday June 7, 2016	2 Product Development – Gas & Dual Fuel Engines 2-2 Medium Speed Engines I	6 Controls & Automation 6-3 Combustion Control and Diagnostics	5 Components & Tribology 5-4 Components Design	8 Basic Research & Advanced Engineering 8-6 New Combustion 2
15:30 – 17:00	Chairperson: Joel Hiltner, Hiltner Combustion Systems, United States 189 Improvement of power generation efficiency and heat recovery of cooling energy in Mitsubishi KU30GSI gas engine for better heat and power utilization Hiroshi Yoshizumi, Mitsubishi Heavy Industries, Japan 163 MAN Diesel & Turbo SE's Medium Speed Gas Engine Portfolio – a Modular Matrix Design Matthias Auer, MAN Diesel & Turbo, Germany 292 The New 5 MW Genset from Caterpillar Energy Solutions with 48% Electrical Efficiency Wilhelm Mueller, Caterpillar Energy Solutions, Germany 27 G20CM34 – A highly flexible 10 MW gas engine concept Marius Wolfgramm, Caterpillar Motoren GmbH & Co. KG, Germany	Chairperson: Bert Ritscher, Caterpillar Motoren GmbH & Co. KG, Germany 51 Controlling Tier III Technologies Morten Vejlggaard-Laursen, MAN Diesel & Turbo, Denmark 109 Next generation of four stroke control and monitoring architectures – based on the VW modular kit concept, also considering the electronic condition-based maintenance management Florian Plentinger, MAN Diesel & Turbo, Germany 118 Securing Engine Performance and Safety through Fault Diagnostics Fredrik Östman, Wärtsilä Corporation, Finland 209 Potential and Challenges of Technology Transfer from On Road Applications to Large Bore Diesel Engines Robert Bank, FVTR GmbH, Germany	Chairperson: Yasuhiro Itoh, Niigata Power Systems Co. Ltd., Japan 203 Pre-Chamber design criteria for high efficiency gas engines Franz Koch, Ricardo, Germany 263 Tribology Design for Components of HIMSEN Engine Sangdon Lee, Hyundai Heavy Industries, Republic of Korea 254 3D Printing - Additive Manufacturing Technologies on the Rise Stephan Laiminger, GE Jenbacher, Austria 169 Firing Order Optimisation on Large Bore Engines for Gas Exchange, Mechanical Loading and Fuel Consumption Improvement Franz Koch, Ricardo, Germany 98 Firing order optimization in FEV Virtual Engine Konrad Buczek, FEV Polska sp. z o.o., Germany	Chairperson: Koji Takasaki, Kyushu University, Japan 136 Combustion Behavior in Largest 2-Stroke Gas Engine Takayuki Hirose, IHI Corporation, Japan 147 The examination on the main contributing factors of Lube Oil Pre ignition Shinji Yasueda, GDEC inc., Japan 257 Improving Efficiency of the Premixed Combustion by Reducing Cyclic Variability Emmanuella Sotiropoulou, Prometheus Applied Technologies LLC, United States 185 Optical study on the effect of the air-fuel ratio on the ignition in DF engine Teemu Sarjoavaara, Aalto University, Finland
18:30	ABB Evening			

POSTER SESSION **TUESDAY**

Day	Balcony 3rd floor	
Tuesday June 7, 2016 08:30 – 17:00	1 Product Development – Diesel Engines	190 HiMSEN Engine's Solution for Engine Starting and Low Load Operation Taehyung Park, Hyundai Heavy Industries, Republic of Korea
		242 Developing Fairbanks Morse Next Generation Opposed-Piston Engine Zoltan Bako, Achates Power Inc., United States
	2 Product Development – Gas & Dual Fuel Engines	271 MAN Gas Engine Safety – Handling Technical and Regulatory Challenges from Part to Plant Hans-Philipp Walther, MAN Diesel & Turbo, Germany
		77 Development of the New DAIHATSU 2MW Class Dual-Fuel Engine for Marine Use Tetsuji Yamada, Daihatsu Diesel Mfg.Co.Ltd., Japan
		49 New marine gas engine development in YANMAR Ohashi Issei, Yanmar Co. LTD., Japan
		100 Front-loaded R&D process for high quality – development case Wärtsilä 31 Jaana Tamminen, Wärtsilä Corporation, Finland
		212 Investigation of alternative dual fuel engine concepts Hendrik Lange, Caterpillar Motoren GmbH & Co. KG, Germany
		259 Advanced Pre-Combustion Chamber Technology for Large Bore Natural Gas Engines Luigi Tozzi, Prometheus Applied Technologies LLC, United States
		145 Optimization of Gas Injection in Marine Natural Gas Engine Yang Li-Ping, Harbin Engineering University, China
		48 Introduction of Liquid and Gas Dual Fueled Gas Turbine System for Stand-by Generator Set Masamichi Koyama, Niigata Power Systems Co. Ltd., Japan
		226 Demanding icebreaking – LNG-powered icebreaking features the industry's most advanced technology Magnus Kronholm, Wärtsilä Corporation, Finland
	3 Fuel Injection & Gas Admission	228 Improve the Static Force Performance of High Speed Electromagnet Based on the Parallel Magnetic Circuit Peng Liu, Harbin Engineering University, China
		279 New HEINZMANN Actuator Family for Heavy Duty Applications Such as Diesel-, Gas- and Dual- Fuel Engines Philipp Tritschler, Heinzmann GmbH & Co KG, Germany
		37 Common Rail Injector with 3/2 Way Solenoid Pilot Valve Raphael Fuchsli, Lafei GmbH, Switzerland
		42 Analysis and Testing the Impact of Large Volumes of Water in Diesel Fuel Oil Arthur Killinger, MPR Associates Inc., United States
		63 New Common Rail Injector and Engine Application Performances Kilian Zimmermann, Ganser CRS AG, Switzerland
		122 Large Engines System approach for Diesel, Gas and Dual Fuel Engines Anton Brandstätter, Robert Bosch GmbH, Germany
		179 Common Rail Fuel Injection System for MAN B&W Two-Stroke Small Bore Engines Ole Sørensen, MAN Diesel & Turbo, Denmark

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TECHNICAL PROGRAMME WEDNESDAY

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Wednesday June 8, 2016	1 Product Development – Diesel Engines	11 Users' Aspects, Maintenance & Monitoring – Marine Applications	7 Exhaust Gas Aftertreatment	11 Users' Aspects, Maintenance & Monitoring – Marine Applications
	1-5 Field Experience	11-1 Tribology and Cylinder Oil	7-2 NOx Reduction – Low Speed	11-3 From field experience back to Engineering / Training
09:00 – 10:30	Chairperson: Rune Nordrik, Rolls-Royce Marine, Norway	Chairperson: Charlotte Rojgaard, Bureau Veritas, Denmark	Chairperson: Masahiko Okabe, Mitsubishi Heavy Industries, Japan	Chairperson: Jorn Kahle, Maersk, Denmark
	99 Operation experience of world's first methanol engine in a ferry installation Toni Stojcevski, Wärtsilä Corporation, Finland	153 Cold Corrosion on MAN B&W Tier II Engines and solutions in spirit of mutual cooperation between COSTAMARE and MAN Diesel & Turbo Henrik Rolsted, MAN Diesel & Turbo, Denmark	176 Development of NOx Reduction System that Combines an Oxygen Reduction Membrane with Water Mixed Fuel Kazuyuki Maeda, National Fisheries University, Japan	34 Service Experience of MAN B&W Two Stroke Diesel Engines Stig Baungaard Jakobsen, MAN Diesel & Turbo, Denmark
	309 EPA Tier 4 and IMO Tier 3 Development & Field Experience at GE Rob Mischler, GE Transportation, United States	54 Automatic on-line cylinder lubricant analyzer for in-service monitoring of 2-stroke slow speed engines – a key added value for users in 2-stroke engine management Jean-Philippe Roman, Total Lubmarine, France	111 SCR under pressure - pre-turbocharger NOx abatement for marine 2-stroke diesel Kristoffer Sandelin, Winterthur Gas & Diesel, Switzerland	275 Embedded Turbocharger Performance Monitoring Tobias Spilker, ABB Turbo Systems, Switzerland
	139 Field experience of L28AHX, and development of V28AHX Shoji Kato, Niigata Power Systems Co. Ltd., Japan	87 On-Board Diagnostic: The new onboard tool for Main Engine condition monitoring with special focus on Cylinder Condition Jesper Weis Fogh, MAN Diesel & Turbo, Denmark	305 The World First Commercialized Low Pressure SCR system on 2-Stroke Engine, DeNOx System Changeong Ryu, Doosan Engine, Republic of Korea	294 Connectivity and Analytic Technologies to Ensure Safe and Reliable Operation of Electronic Controlled Engines Bert Ritscher, Caterpillar Motoren GmbH & Co. KG, Germany
	75 Service Experience & Design Improvement of HiMSEN Dong Yeon Kim, Hyundai Heavy Industries, Republic of Korea	291 Save and Cost-effective Operation of Slow Speed 2-Stroke Diesel Engines with Scrape Down Oil Analysis (SDA) Steffen Bots, OELCHECK GmbH, Germany	172 Design of an efficient urea decomposition chamber using urea decomposition catalyst in NoNOx-LP SCR system for 2-stroke engine Mun Kyu Kim, Hyundai Heavy Industries, Republic of Korea	115 Development of Virtual Engine Rooms Simulators – a modern approach to Operator's training Gregory Sudwoj, Winterthur Gas & Diesel, Switzerland
		60 Handling cost accuracy and the analysis methods of Drain Oil Onboard Test Jörg Erdtmann, NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG, Germany		61 Service and Operational Experience with Diesel Engines Jörg Erdtmann, NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG, Germany
10:30 – 11:00	Coffee Break			
11:00 – 12:00	Collin Trust sponsored Key Note Speech			
12:00 – 13:00	Lunch			

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Wednesday June 8, 2016	2 Product Development – Gas & Dual Fuel Engines 2-5 Low and Medium Speed Engines & Users Aspects Chairperson: German Weisser, ABB Turbo Systems, Switzerland	11 Users' Aspects, Maintenance & Monitoring – Marine Applications 11-2 Emission Technologies and Choices Chairperson: Paolo Tonon, Maersk, Denmark	8 Basic Research & Advanced Engineering 8-8 New Systems for Emission Chairperson: Hanne Hostrup Poulsen, MAN Diesel & Turbo, Germany	12 Users' Aspects, Maintenance & Monitoring – Land-based Applications 12-1 Users' Aspects, Maintenance & Monitoring – Land-based Applications Chairperson: Tim Callahan, Southwest Research Institute, United States
	13:30 – 15:00	101 Performance and Emission results from the MAN B&W LGI low-speed engine operating on Methanol Stefan Mayer, MAN Diesel & Turbo, Denmark 233 The 2-stroke low-pressure Dual-Fuel technology: from concept to reality Marcel Ott, Winterthur Gas & Diesel, Switzerland 269 Service Experience With the First MAN B&W Diesel ME-GI Engines Onboard LNG Vessels Lars Ryberg Juliussen, MAN Diesel & Turbo, Denmark 236 The New ACD Medium Speed Gas & Dual Fuel Marine Propulsion Engine Gareth Estebanez, AVL List GmbH, Austria	134 Choice of Tier III technologies – ship owners' viewpoints Christer Wik, Wärtsilä Corporation, Finland 62 The Engine Users and the Implications of IMO Tier III Coming into Force Jörg Erdtmann, NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG, Germany 286 Experience From the World's First Ethane-Powered Multi-Gas Carrier Grant Gassner, Wärtsilä Corporation, Finland 21 Stability and Compatibility issues regarding the use of new ECA fuels Antonio Prada Junior, Petrobras, Brazil	248 Combination of EGR and Fuel-Water Emulsions for Simultaneous NOx and Soot Reduction in a Medium Speed Diesel Engine Panagiotis Kyrtatos, Swiss Federal Institute of Technology, Switzerland 58 Zero NOx emission in large-bore medium-speed engines with exhaust gas recirculation Matteo Imperato, Aalto University, Finland 222 Using 3D CFD to predict Methane emissions from dual fuel engines. Nick Tiney, Ricardo, United Kingdom 130 Method for Analyzing Prechamber NOx Emissions from Large Gas Engines Gerhard Pirker, LEC GmbH, Austria
15:00 – 15:30	Coffee Break			

TECHNICAL PROGRAMME WEDNESDAY

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)
Wednesday June 8, 2016	10 Fuels, Lubricants & Fluid Technologies 10-2 New Fuels I	4 Turbochargers & Air/ Exhaust Management 4-3 Technologies and Applications	7 Exhaust Gas Aftertreatment 7-1 NOx Reduction – Medium Speed
15:30 – 17:00	Chairperson: Kjeld Aabo, MAN Diesel & Turbo, Denmark	Chairperson: Allan-QuingZhou Wang, ABB Turbo Systems, Switzerland	Chairperson: Klaus Heim, OMT, Italy
	91 Visual study on combustion for development of alternative liquid and gas fuels Koji Takasaki, Kyushu University, Japan	290 Turbocharging System Optimization for Kolomna D500 Newly Designed Engine Platform Pierre Jacoby, ABB Turbo Systems, Switzerland	243 Optimization of NOx-Emission Reduction in Medium-Speed Marine Diesel Engines with SCR-Catalyst Peter Eilts, Technical University Braunschweig Institute of Internal Combustion Engines, Germany
	84 Hydrogen as fuel for Wärtsilä gas engines Kaj Portin, Wärtsilä Corporation, Finland	106 Challenge of Environmentally-friendly Low Emission System to Tier 3 for Two Stroke Diesel Engines Masanori Higashida, Kawasaki Heavy Industries, Japan	97 Development aspects of exhaust gas cleaning systems applied to modern high efficiency four-stroke medium-speed engines Heikki Korpi, Wärtsilä Corporation, Finland
	132 Feasibility and Environmental Impact of Alternative Fuels for Shipping Christos Chryssakis, DNV GL, Norway	237 Continuous Condition Monitoring of Operationally Critical Rotating Machinery Mike Congdon, Regulateurs Europa Limited, United Kingdom	26 The MAN SCR System – More Than Just Fulfilling IMO Tier III Andreas Döring, MAN Diesel & Turbo, Germany
	249 A Study on Flame Temperature and Soot Production Characteristics of FAME Mixed Diesel Oil Akihiko Azetsu, Tokai University, Japan	308 Unsteady Flow Pulses Interaction with a Turbine Yuri A. Grishin, Bauman Moscow Technical University, Russia	204 Wärtsilä SCR development and experience for IMO Tier III Anu Solla, Wärtsilä Corporation, Finland
15:30	Users Reception		

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WÄRTSILÄ

POSTER SESSION WEDNESDAY

Day	Balcony 3rd floor	
Wednesday June 8, 2016 09:00 – 17:00	5 Components & Tribology	23 Studies on Tribology to Reduce Friction, Wear and Lubricating Oil Consumption for Internal Combustion Engines Mitsuhiro Soejima, Kyushu Sangyo University, Japan
		250 Effect of Scratches on the Performance of Main Bearings of Large Two-Stroke Marine Diesel Engines Christos Papadopoulos, National Technical University of Athens, Greece
		274 High Performance Sensors Tackling Environmental and Robustness Challenges in Combustion Engines Panu Koppinen, VTT Technical Research Centre of Finland Ltd, Finland
		295 Friction Investigations on Locally Microstructured Cylinder Liner Surfaces using a Floating-Liner Measurement System Henning Pasligh, Institut für Technische Verbrennung, Germany
		301 Mechanical Friction in Large Marine Vessels Edward Smith, University of Central Lancashire, United Kingdom
	8 Basic Research & Advanced Engineering	278 Gas Blending System for Large Engine Testing Applications Dustin Osborne, Southwest Research Institute, United States
		20 Analysis of Temperature Fields of the Cylinder Head and Liner of a 2-stroke Marine Engine by CFD-FEA Coupling Method Liyan Feng, Dalian University of Technology, China
		262 Combustion Analysis in a Natural Gas Engine With Pre-Chamber to Improve Thermal Efficiency Yasuo Moriyoshi, Chiba Univ., Japan
		137 Structural Analysis of Large Diesel Generator in Resilient and Rigid Support Mounting based on Vibration Measurement Don Chool Lee, Mokpo national Maritime University, Republic of Korea
		24 Application of Nonlinear Time Series Analysis to Large Eddy Simulation of a Simplified Engine Flow Jukka-Pekka Keskinen, Aalto University, Finland
		70 Fuel flexibility of the future combustion engine power plants Päivi Aakko-Saksa, VTT Technical Research Centre of Finland Ltd, Finland
		197 Automatic simulation platform to support product design Antti Hynninen, VTT Technical Research Centre of Finland Ltd, Finland
		216 Multibody simulation coupled with control systems in virtual validation Juho Könnö, Wärtsilä Corporation, Finland
		261 A CFD Study on the Influence of Injection Pressure and Chamber Ambient Conditions on the Non-Reacting Spray Properties Hashem Nowruzzi, Amirkabir University of Technology (Tehran Polytechnic), Islamic Republic of Iran
		267 The 60% Efficiency Reciprocating Engine: A Modular Alternative to Large Scale Combined Cycle Power Adam Gurr, Ricardo, United Kingdom
		66 A reverse estimation method calculating the coupling dynamic stiffness applied to fault diagnosis Mengqi Wang, Harbin Engineering University, China
		68 Black carbon measurements using different marine fuels Päivi Aakko-Saksa, VTT Technical Research Centre of Finland Ltd, Finland
		300 Numerical and Experimental Study of In-Cylinder Cleaning Technologies for Medium Speed Diesel Engines Tianhao Yang, Dalian University of Technology, China



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TECHNICAL PROGRAMME THURSDAY

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Thursday June 9, 2016	2 Product Development – Gas & Dual Fuel Engines 2-3 Medium Speed Engines II	9 System Integration & Optimization 9-1 Ship, System and Component Design	3 Fuel Injection & Gas Admission 3-3 Diesel Applications	10 Fuels, Lubricants & Fluid Technologies 10-1 Traditional Fuels
08:30 – 10:00	Chairperson: Diego Delneri, Wärtsilä Corporation, Italy 251 New DF Engine Portfolio (Wärtsilä 4-Stroke) Petri Aaltonen, Wärtsilä Corporation, Finland 86 Latest development of Large Gas Engine MD36G Kento Mayuzumi, Mitsui Engineering & Shipbuilding Co. Ltd., Japan 159 Development of Kawasaki Green Gas Engine for marine, L30KG series Yosuke Nonaka, Kawasaki Heavy Industries, Japan 47 Dual Fuel Engine optimized for marine applications Andreas Banck, Caterpillar Motoren GmbH & Co. KG, Germany	Chairperson: Patrick Frigge, GE, United States 264 Integration of Propulsion System From the Point of View of Efficiency Optimization Elias Boletis, Wärtsilä Corporation, Netherlands 177 Assessment of LNG Carriers electric propulsion configurations via process modeling George Dimopoulos, DNV GL, Greece 199 Waste heat recovery solution for marine applications Michael Sturm, Caterpillar Motoren GmbH & Co. KG, Germany 178 Alfa Laval EGR Boiler – Alfa Laval and MAN joint development of an efficient boiler system for an EGR operated MAN B&W low speed two stroke engine Henrik Rasmussen, Alfa Laval Aalborg, Denmark 303 Joint Operation for Ultra Low Emission Shipping Rolf Nagel, Flensburger Schiffbau-Gesellschaft mbH & Co. KG, Germany	Chairperson: Andrei Ludu, AVL List GmbH, Austria 253 Comparative Investigations of Spray Formation, Ignition and Combustion for LFO and HFO at Conditions relevant for Large 2-Stroke Marine Diesel Engine Combustion Systems Beat von Rotz, Winterthur Gas & Diesel, Switzerland 30 The challenge of EU Stage 5 emissions. Are current injection systems sufficient for future large engine emission limits? Christoph Kendlbacher, Robert Bosch AG, Austria 79 Investigation of cavitation in injection nozzles for two-stroke Diesel engines Simon Matlok, MAN Diesel & Turbo, Denmark 217 Internal diesel injector deposits – Causes and measures with the focus on marine engine applications and fuels Christian Fink, University of Rostock, Germany	Chairperson: Kai Juoperi, Wärtsilä Corporation, Finland 41 The Effect of Renewable Paraffinic Diesel Oil on Engine Performance / NESTE NEXBTTL Toomas Karhu, Turku University of Applied Sciences, Finland 123 The Effect of Boil off on the Knock Resistance of LNG Gases Martijn van Essen, DNV GL, Netherlands 297 Depth-type Filtration Technology - Absolute Protection from Cat Fines in Marine Residual Fuel Albert Leyson, Drew Marine, United States 240 From the Lab to the Field, how new chemistry can solve the operating issues of 2-stroke engines transiting ECA zones Valérie Doyen, TOTAL Marketing & Services - Centre de Recherches de Solaize, France
10:00 – 10:30	Coffee Break			

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Thursday June 9, 2016	2 Product Development – Gas & Dual Fuel Engines 2-4 Medium Speed Engines III	9 System Integration & Optimization 9-2 Integration Methodologies	3 Fuel Injection & Gas Admission 3-4 Gas Applications II	10 Fuels, Lubricants & Fluid Technologies 10-5 Lube Oil Technology II
	10:30 – 12:00 Chairperson: Karl Wojcik, AVL List GmbH, Austria 201 Development of HiMSEN Dual Fuel Engine Line-up Wookhyeon Yoon, Hyundai Heavy Industries, Republic of Korea 214 GE Transportation Dual Fuel Locomotive Development Eric Dillen, GE Transportation, United States 82 Fuel sharing for Wärtsilä gas engines Kaj Portin, Wärtsilä Corporation, Finland 146 Development of Dual Fuel Engine 28AHX-DF Capable of FPP Direct Drive Tetsuya Tagai, Niigata Power Systems Co. Ltd., Japan	Chairperson: Elias Boletis, Wärtsilä Corporation, Netherlands 311 Operating Cost Optimized Engine and Aftertreatment Concepts for Marine Applications Henning Petry, FEV GmbH, Germany 310 Energy Saving Technologies and New Analysis Methods in Cargo Ship Machinery Design Mia Elg, Deltamarin, Finland 219 Simulation-Based Approach for Customer-Specific Optimal Solution Design Kalevi Tervo, ABB Marine, Finland 202 Hybrid Marine Propulsion Simulation in Waves using Co-Simulation Kevin Koosup Yum, Norwegian University of Science and Technology, Norway	Chairperson: Albertus Dijks, Gasunie, Netherlands 168 Development of Mitsui High-Pressure Compressor for Fuel Gas Supply System of ME-GI engine Kouichi Namba, Mitsui Engineering & Shipbuilding Co. Ltd., Japan 162 Methane Slip Reduction from Marine Gas Engines by Stratified Oxygen Concentration using Gas Permeation Membrane Hiroshi Tajima, Kyushu University, Japan 207 Study on Mixture Formation Process in Two Stroke Low Speed Premixed Gas Fueled Engine Takahiro Kuge, IHI Corporation, Japan 170 Impact of Different Combustion Methods on Performance and Exhaust Gas Composition of Natural Gas Engines Yoshitane Takashima, Osaka gas, Japan	Chairperson: Kimihiko Sugiura, MES, China 276 Improving the Efficiency of Next Generation Gas Engines with Lubricant Formulation Choice Jonathan Hughes, Infineum, United Kingdom 241 Lubricant Development Tools for Modern Trunk Piston Engine Oils Jose Luis Garcia, Shell Global Solutions (Deutschland) GmbH, Germany 73 Cylinder Lube Oil Experiences and New Development for the MAN B&W two-stroke engines Dorthe M.S. Jacobsen, MAN Diesel & Turbo, Denmark 143 Development of Cylinder Lubricant for LNG-fuelled 2-stroke Engines Shigeki Takeshima, JX Nippon Oil & Energy Corporation, Japan 45 Advanced filtration of lubrication oil for the hydraulic system in 2-stroke engines Stefan Schmitz, Boll&Kirch Filterbau GmbH, Germany
12:00 – 13:00	Lunch			

TECHNICAL PROGRAMME THURSDAY

Day	Finlandia Room	Wärtsilä Room (Helsinki Hall)	MTU Room (Hall B)	AVL Room (Veranda 4)
Thursday June 9, 2016	10 Fuels, Lubricants & Fluid Technologies 10-3 New Fuels II	9 System Integration & Optimization 9-3 Ship Related Issues	7 Exhaust Gas Aftertreatment 7-3 SOx, Particulates and Classification	8 Basic Research & Advanced Engineering 8-7 New Measurements
13:00 – 14:30	Chairperson: Masaki Ohtsu, Mitsui Engineering & Shipbuilding Co. Ltd., Japan 16 B5 Biodiesel Fuel for Locomotives in the U.S. , Steven Fritz, Southwest Research Institute, United States 29 Performance and emissions of a common-rail non-road diesel engine driven with different renewable fuels Seppo Niemi, University of Vaasa, Finland 238 Alternative fuels from a medium-speed engine manufacturer's perspective Kai Juoperi, Wärtsilä Corporation, Finland 182 Hydrotreated vegetable oil (HVO) as future fuel for the arctic regions Teemu Sarjovaara, Aalto University, Finland 89 Impacts of Minor Components on Knock Tendency of Methane-based Fuels Hiroki Tanaka, Osaka Gas, Japan	Chairperson: Hinrich Mohr, AVL List GmbH, Germany 103 SOLAS new noise regulation impact on engine noise reduction and engine room Kari Saine, Wärtsilä Corporation, Finland 28 Experimental and numerical vibration study into hydraulic top bracings' influence on engine and superstructure vibration Michael Holtmann, DNV GL, Germany 129 Ship Engine In-Service Performance Management, Using a State-of-Art Model-Based Assessment Methodology Panos Theodossopoulos, Propulsion Analytics, Greece 289 OHS – Noise Reduction in Engine Rooms on Board Ships Marius Banica, ABB Turbo Systems, Switzerland	Chairperson: Göran Hellén, Wärtsilä Corporation, Finland 160 Marine Diesel Engines with SCR: Class Societies' Best Practices Fabian Kock, DNV GL, China 247 A regulatory outlook for PM / BC emissions for shipping Torsten Mundt, DNV GL, Germany 221 Detailed analysis of PM emissions from a medium speed diesel engine as a precondition for successful application of DPF Bert Buchholz, FVTR GmbH, Germany 210 Development of Dry Scrubber Technology: New Absorbent Technologies for Two and Four Stroke Applications Robert Bank, FVTR GmbH, Germany	Chairperson: Christer Wik, Wärtsilä Corporation, Finland 205 Study on the measurement method and characteristics of particulate matter from marine diesel engines Hidetsugu Sasaki, Tokyo University of Marine Science and Technology, Japan 110 Particulate and special emission measurement – methods and needs for the future Juha Heikkilä, Wärtsilä Corporation, Finland 165 Impact of sampling conditions and procedure on particulate matter emissions from a marine diesel engine Leonidas Ntziachristos, Tampere University of Technology, Finland 258 Effect of Fuel Composition on its Ignition and Combustion Quality Chiori Takahashi, National Maritime Research Institute, Japan 293 New Style NOx Sensor Based on Selective Ion Conducting Electrolyte Frank Noak, CPK Automotive GmbH & Co. KG, Germany
14:30 – 15:00	Coffee Break			
15:00 – 16:30	Final Panel Discussion			
18:30	Gala Dinner			



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POSTER SESSION THURSDAY

Day	Balcony 3rd floor	
Thursday June 9, 2016 08:30 – 17:00	6	Controls & Automation 50 Energy Management Controller Design for Hybrid Ship Propulsion During Transient Operation Sotiris Topaloglou-Laboratory of Marine Engineering/National Technical University of Athens, Greece
		55 Application Research of Neural Network Control on Diesel Guofeng Zhao, Harbin Engineering University, China
	7	Exhaust Gas Aftertreatment 64 Performance Investigation on New Developed Maritime SCR Catalysts for Medium Speed Engine Jinhee Koo, STX Engine Co.LTD., Republic of Korea
		107 Imitating emission matrix of large natural gas engine opens new possibilities for catalyst studies in engine laboratory Timo Murtonen, VTT Technical Research Centre of Finland Ltd, Finland
		174 Study of an SCR catalytic converter for marine diesel exhaust after-treatment: Effects of high temperature/high pressure Do Yun Kim Kim, Hyundai Heavy Industries, Republic of Korea
		187 Optimized performance, design and manufacturing of compact silencer system for engine exhaust noise Sami Oksanen, Wärtsilä Corporation, Finland
	9	System Integration & Optimization 235 A novel approach to ship energy system integration and optimization Guangrong Zou, VTT Technical Research Centre of Finland Ltd, Finland
		298 Further Opportunities for Flexible Engines and their Generators Nicholas Bellamy, SSS Gears Limited, United Kingdom
	10	Fuels, Lubricants & Fluid Technologies 22 Alternative Methodologies for Ignition Quality of Diesel Fuel Antonio Prada Junior, Petrobras, Brazil
		133 Premium Long-Life Stationary Natural Gas Engine Lube Oil Technology for Increased Up-Time and Reduced Maintenance Virginia Carrick, The Lubrizol Corporation, United States
		33 The quantitative determination of catalytic fines in heavy fuel oil David Atkinson, Parker Kittiwake, United Kingdom
		81 Field Performance Evaluation Essential for Lubricant Development Peter Van Houten, Chevron Oronite, Netherlands
		224 Using Alcohol Fuels in Dual Fuel Operation of Compression Ignition Engines: a Review Jakob Coulier, Ghent University, Belgium
		229 Impacts of HFO and MGO on combustion, primary and secondary emissions Benjamin Stengel, University of Rostock, Germany
		192 The Nature and Cause of Internal Diesel Injector Deposits and the Effectiveness of Fuel Additives Michael Banning, Innospec Limited, United Kingdom
		155 Low Sulfur Liquid Marine Fuels in the Baltic Sea SECA Kalle Lehto, Neste, Finland
		188 Chemical Regulatory Changes and the Potential Impact on Marine Lubricants Luciana Angonesi, Infineum, United Kingdom



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TECHNICAL TOURS JUNE 10, 2016

TOUR DATE: JUNE 10, 2016

Arctic Tour

Finland is an Arctic country

Roughly a third of Finland lies north of the Arctic Circle. Finland is the northernmost country on the European continent, and in winter all its ports can be icebound. The Finnish foreign trade relies heavily on sea transportation. Therefore, strong competencies, innovative products, and services that meet the demands of its challenging winter climate have been developed. The Arctic Tour presents companies with core competencies in Arctic maritime technologies and services:

- Aker Arctic
- ABB Marine and Port
- Arctia Shipping
- Arctech Helsinki Shipyard
- Wärtsilä



Price: € 200* per person
Time: 09:00 – 17:00 h
Departure: Finlandia Hall
Participants: Min. 25 persons / Max. 50 persons

TOUR DATE: JUNE 10, 2016

Fuel Tour

Finland is a forerunner in sustainable fuels

Finnish companies have taken a leading position in the development and use of environmentally sustainable fuels that comply with the most stringent EU quality standards and specifications. With a strong emphasis on renewable energy sources and the development of technologies enabling greater use of clean natural gas, Finland is playing an important role in reducing emissions from ships, power plants and vehicular traffic. The Fuel Tour will visit leading company facilities in this field:

- Neste Refinery
- Neste Jacobs
- Lamor

The tour includes a Wärtsilä LNG terminal presentation.



Price: € 200* per person
Time: 09:00 – 17:00 h
Departure: Finlandia Hall
Participants: Min. 25 persons / Max. 50 persons

TOUR DATE: JUNE 10, 2016

Research & Competence Tour

Finland has world-class competencies

The international success of Finnish companies in the technology sector is based on innovation and the readiness to adopt the latest technologies and concepts. This strong know-how and dedication to continuous development has given Finland global recognition in the internal combustion engine field, among others. Strategic cooperation between companies and research institutes has been the basis for building this world-class competence.

The Research & Innovation Tour takes you to the Aalto University with visits to the following units:

- [Aalto University Engine Laboratory](#)
- [Mechatronics Innovation Lab](#)
- [Aalto Design Factory](#)

Aalto University is a multidisciplinary scientific and arts community working in the fields of technology, business and art. In addition to excellence in education, research and artistic activities, Aalto aims to have a major impact on society.

The Tour also includes visits to:

- [VTT Technical Research Centre of Finland Engine Laboratory](#)
- [Wärtsilä Propulsion Test Centre](#)

Price: € 200* per person
Time: 09:00 – 17:00 h
Departure: Finlandia Hall
Participants: Min. 25 persons / Max. 100 persons

TOUR DATE: JUNE 10, 2016

The Roots of Industry in Finland

The Tour will go to [Fiskars Village](#) and [Svartå Manor](#). Fiskars Ironworks was founded in 1649 to manufacture cast iron and forged products. Today, Fiskars Corporation is an international company whose operations are consumer-centered and grow through strong specialist brands for home, garden and outdoors renowned for their functionality and cutting-edge design.

Svartå Manor is one of the most illustrious manor houses in Finland with a history of more than 200 years.

Price: € 200* per person
Time: 08:30 – 17:00 h
Departure: Finlandia Hall
Participants: Min. 25 persons / Max. 50 persons



Organiser of the Technical Tours:

Woltti Group

Aleksis Kiven katu 17 A
FI-00510 Helsinki
<http://wolttigroup.fi/en/>

OPTIONAL TOURS JUNE 7 – 9, 2016

TOUR DATES: JUNE 7 – 9, 2016

Fork in Hand – Culinary Walk in Helsinki

Listen to stories about Helsinki and Finnish food as you enjoy tasting on the go. Meet local vendors and café owners and hear their stories. Experience the culinary Helsinki from the largest food hall in the city to the smallest local deli, visit the market hall and the market square, etc.



Price: € 100* per person
Time: 09:00 – 13:00 h and 14:00 – 18:00 h
Departure: Finlandia Hall
Participants: Min. 10 persons / Max. 16 persons
Including: Taste samples, beer tasting menu and coffee

TOUR DATES: JUNE 7 – 9, 2016

Visit to Suomenlinna Sea Fortress, Helsinki

The sea fortress Suomenlinna is an impressive witness to Finnish history. It is listed among the UNESCO World Heritage sites. From the boat you are able to see Helsinki from the sea and get a view of the coastal archipelago. During your stay at Suomenlinna you will get to know the museum fortress on a guided 1.5 h tour.



Price: € 80* per person
Time: 12:00 – 16:30 h
Departure: Finlandia Hall
Participants: Min. 30 persons / Max. 100 persons
Including: Lunch

TOUR DATES: JUNE 7 – 9, 2016

Design Brand Store Visits, Helsinki

Are you interested in design? The most famous Finnish design brands Litala and Marimekko warmly welcome you to a special visit to learn about their brands. You will get a discount coupon of 15% for each store. Lunch will be served in a restaurant with a unique location by the rapids of the Vantaa river.



Price: € 80* per person
Time: 09:00 – 14:00 h and 12:00 – 17:00 h
Departure: Finlandia Hall
Participants: Min. 12 persons / Max. 32 persons
Including: Lunch

TOUR DATES: JUNE 7, 2016 AND JUNE 9, 2016

Music City Walk, Helsinki

This guided city walk will take you through the main sights of Helsinki while listening to some of the best music Finland has to offer. Your guide will give you insights into Helsinki as well as a selection of amazing music from Finland. You may dance on the way and sing along or simply enjoy the music quietly.

Price: € 90* per person
Time: 09:00 – 13:00 h
Departure: Finlandia Hall
Participants: Min. 5 persons / Max. 20 persons
Including: Lunch



TOUR DATES: JUNE 8, 2016

Bike Tour in Helsinki

On this entertaining bicycle tour, you will learn what the Helsinki area is all about. We follow the western coastline of the city from island to island to places where you have access only by bike. The trail features numerous attractive parks and green forest areas.

You will be equipped with helmet and a comfortable Pony bike with back pedal, foot break and hand break. The tour length is 17 km.

Price: € 120* per person
Time: 09:00 – 14:00 h
Departure: Finlandia Hall
Participants: Min. 5 persons / Max. 100 persons
Including: Lunch



Tour Operator of the Optional Tours:

Skafur-Tour

Vaskisepäntie 5C
FI-00620 Helsinki
<http://skafur-tour.fi>



MORNING JOGGING

Enjoy an active start to the Congress Day!

In the mornings guided jogging tours will be available for your convenience from selected Congress hotels. You are expected to bring your own running gear, but a complimentary CIMAC T-shirt will be provided. Morning jogging tours will be offered from June 7 – 9, 2016.

OPTIONAL TOURS JUNE 8, 2016

TOUR DATE: JUNE 8, 2016

Dinner Cruise by a Sailing Ship

Evening sailing onboard a traditional sailing ship outside Helsinki offers you an opportunity to get fresh sea air and a touch of nostalgia. The ship has three masts, and it is one of the last original wooden sailing ships. You can admire the sea view, socialise and enjoy a two-course meal in the cabin. After the meal drinks are available for purchase from the deck bar.

Price: € 140* per person
Time: 18:00 – 22:00 h
Departure: Halkolaituri (Pohjoisranta)
Participants: Min. 55 persons / Max. 100 persons
Including: Two-course buffet dinner with fish, meat and vegetarian options
Drinks: Two glasses of wine or beer included

* All prices include VAT



TOUR DATE: JUNE 8, 2016

Evening Tour to Nuuksio National Park

A short hiking tour after a long conference day makes you feel good. The tour takes you to Nuuksio National Park to experience the beauty of typical Finnish nature. After having enjoyed the smoke sauna, and maybe a short swim in a cold lake, you feel even better, and your day is perfectly rounded off by a dinner of Finnish delicacies served in a forest restaurant.

Price: € 140* per person
Time: 18:00 – 22:00 h
Departure: Kiasma bus stop in the city centre
Participants: Min. 30 persons / Max. 100 persons
Including: Sausage or corn snack after hiking, two-course dinner after sauna
Drinks: Two glasses of wine or beer included

* All prices include VAT



MAIN SPONSORS

We thank all the Main Sponsors of the 28th CIMAC World Congress for their extraordinary support!



ABB Turbocharging

5401 Baden, Switzerland

ABB Turbocharging is a technology and market leader in the manufacture and maintenance of turbochargers for 500 kW to 80+ MW diesel and gas engines. Having produced the world's first industrial turbocharger, it has continued to push turbocharging technology forward, providing engine builders and application operators with advanced turbocharging solutions for efficient and flexible application operations and compliance with the most stringent environmental requirements. About 200,000 ABB turbochargers are in operation across the globe on ships, power stations, gen-sets, diesel locomotives and large, off-highway vehicles.



Power. Passion. Partnership.

MTU

88045 Friedrichshafen, Germany

MTU is the core brand of Rolls-Royce Power Systems AG, which is a world-leading provider of high- and medium-speed diesel and gas engines, complete drive systems, distributed energy systems and fuel injection systems for the most demanding requirements.

The product range of MTU is one of the widest and most modern in the sector. It offers comprehensive, powerful and reliable engine solutions for yachts, commercial ships and naval vessels, construction and industrial vehicles, agricultural machinery, mining, rail and military vehicles as well as for the oil and gas industry.

MTU also provides a full line of service products to help its clients maximise uptime and performance.



WÄRTSILÄ

Wärtsilä

00530 Helsinki, Finland

Wärtsilä is a global leader in complete lifecycle power solutions for the marine and energy markets. By emphasising technological innovation and total efficiency, Wärtsilä maximizes the environmental and economic performance of the vessels and power plants of its customers. In 2014, Wärtsilä's net sales totalled EUR 4.8 billion with approximately 17,700 employees. The company has operations in more than 200 locations in nearly 70 countries around the world. Wärtsilä is listed on Nasdaq Helsinki, Finland.

SPONSORS

We thank all the Sponsors of the 28th CIMAC World Congress for their extraordinary support!



AVL List GmbH
8020 Graz, Austria



BOLL & KIRCH Filterbau GmbH
50170 Kerpen, Germany



Caterpillar Motoren GmbH & Co. KG
24159 Kiel, Germany



FEV GmbH
52078 Aachen, Germany



GE Jenbacher GmbH & Co OG
6200 Jenbach, Austria



Geislinger GmbH
5300 Hallwang/Salzburg, Austria



Infineum UK Ltd.
Abingdon, Oxfordshire OX13 6BB, UK



L'Orange GmbH
70435 Stuttgart, Germany



Niigata Power Systems Co. Ltd.
101-0021 Tokyo, Japan



OMT Officine Meccaniche Torino
Rivoli (TO), 10090 Italy



Winterthur Gas & Diesel Ltd.
8401 Winterthur, Switzerland



Woodward, Inc.
Loveland, CO80583 Colorado, United States



Yanmar Co., Ltd.
660-8585 Nagasu Higashidori, Amagasaki Hyogo, Japan

MEDIA PARTNERS

We thank all the Media Partners of the 28th CIMAC World Congress for their extraordinary support!



ACCOMPANYING EXHIBITION

Present your Company

We are pleased to inform you about the excellent opportunity to present your company at the accompanying exhibition of the 28th CIMAC World Congress, which will be held in the Finlandia Hall, Helsinki, Finland. The exhibition takes place from 6 until 9 June 2016 and the application **deadline is 31 January 2016.**

For the application forms, the special conditions of participation and the general terms of participation please visit: **www.cimaccongress.com**

For any questions regarding the exhibition, please contact: **Ms. Sybille Lang**
CIMAC Project Team

Stand Type 1

Package incl. stand construction
(min. 12 sqm / max. 80 sqm)
€ 395.00 / sqm (excl. tax)



Stand Type 2

Light stand approx. 6 sqm incl. stand construction
€ 2,800.00 lump sum (excl. tax)



Stand Type 3

Exhibition space only (min. 48 sqm / max 80 sqm)
€ 255.00 / sqm (excl. tax)

Hamburg Messe und Congress
International GmbH



Messeplatz 1
20357 Hamburg
Germany
Phone +49 40 3569-2293
Fax +49 40 3569-692293
Email: cimac@hamburg-messe.de
Web: hamburg-messe.de/en/exhibitors/trade-fairs-abroad

FINLAND / HELSINKI

Finland

What makes Finland special?

One of the most remarkable features of Finland is light.

The white summer nights are perhaps Finland's most iconic natural phenomenon. The midnight sun is at its strongest during June and July, and the further north you go, the longer and higher the sun stays above the horizon. In the very northernmost parts you can experience a full midnight sun from May to August. When the endless sunshine of summer gives way to the dark winter, the Northern Lights appear like magic and lighten up the sky.

The sauna forms a significant part of the country's heritage and culture: there are over two million saunas in Finland. For a population of 5.4 million, this equals to an average of one per household.

Finland is often called the Land of a Thousand Lakes. A modest name, considering that there are 188,000 lakes in Finland. As many of these lakes are very large in size, a great part of Finland is covered with water, distinguishing Finland from other European countries.

Finland is a true design nation with world renowned designers and architects who have set trends for decades. As these Finnish design icons are still admired worldwide, a new generation of innovative young designers is also appearing.

Helsinki

What makes Helsinki special?

Helsinki, the capital of Finland, is a vibrant seaside city of beautiful islands and great green parks. Design, architecture, culture and shopping are all interesting areas to explore. Large parks, areas, forests, lakes, and the coastline with numerous islands ensure that nature is present everywhere.

The archipelago of Helsinki consists of around 330 islands, providing beautiful settings for days on the beach or weekend camping trips. Many of the islands can be reached by regular ferries from early morning until late at night.

The food culture in Helsinki today is cutting-edge and trendy, represented by pop-up restaurants, restaurant days, and street food festivals. Genuine Finnish food is local, seasonal, wild and fresh – with game, fish, mushrooms and berries at the core of it all.

For more information about Finland please visit:
www.visitfinland.com



JOURNEY



Travelling to Helsinki

■ By plane

Around 200 international flights a day arrive at Helsinki-Vantaa Airport, which is situated 19 kilometres from the centre of Helsinki and can be reached by car in approximately 25 minutes. You can also take a taxi, the Finnair city bus or Bus 615 to the Central Railway Station. A taxi to city centre costs approximately 35-40 euros.

■ By train

There are excellent train connections to Helsinki from all major towns in Finland as well as from Lapland. There is also a daily train service to St. Petersburg and Moscow. The Central Railway Station is a landmark in itself in Helsinki.

■ By bus

Buses from all around Finland travel to the central bus station, from the largest cities approximately every hour.

■ By ferry

There are daily ferry services to Helsinki from Estonia and Sweden, see e.g. Tallink Silja Line, Viking Line or Eckerö Line, as well as from Germany by Finnlines. All the ferry companies also offer the option to take a car with you. Helsinki can be reached by ferry also from Russia by St. Peter Line as well as from Poland.



CONGRESS VENUE

Finlandia Hall

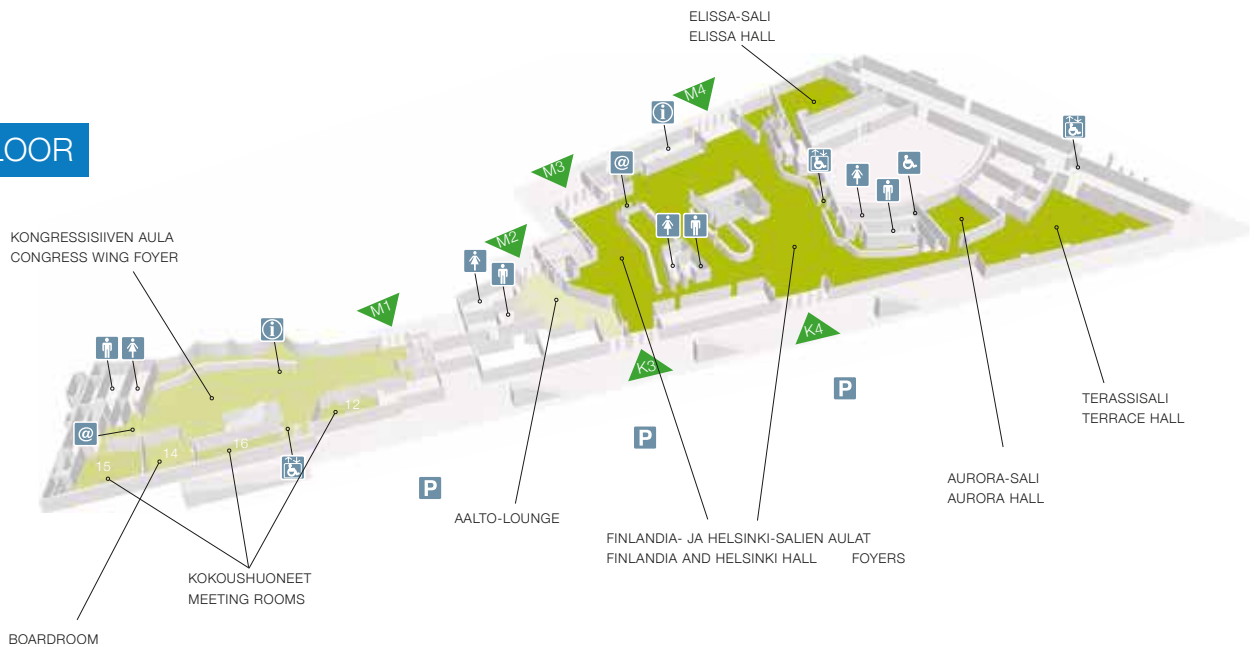
The Congress will take place at the Finlandia Hall. The Finlandia Hall is a masterpiece by the renowned Finnish architect Alvar Aalto and is worth a visit itself. Its combination of an all-embracing aesthetic vision, distinctive atmosphere and functionality is unique. The location in a park by the sea in the centre of Helsinki adds the final touch to a building which has no equivalent, neither in Finland nor anywhere else.

Congress Venue

Finlandia Hall
Mannerheimintie 13 e
FI-00100 Helsinki
Finland

www.finlandiahall.fi

1ST FLOOR

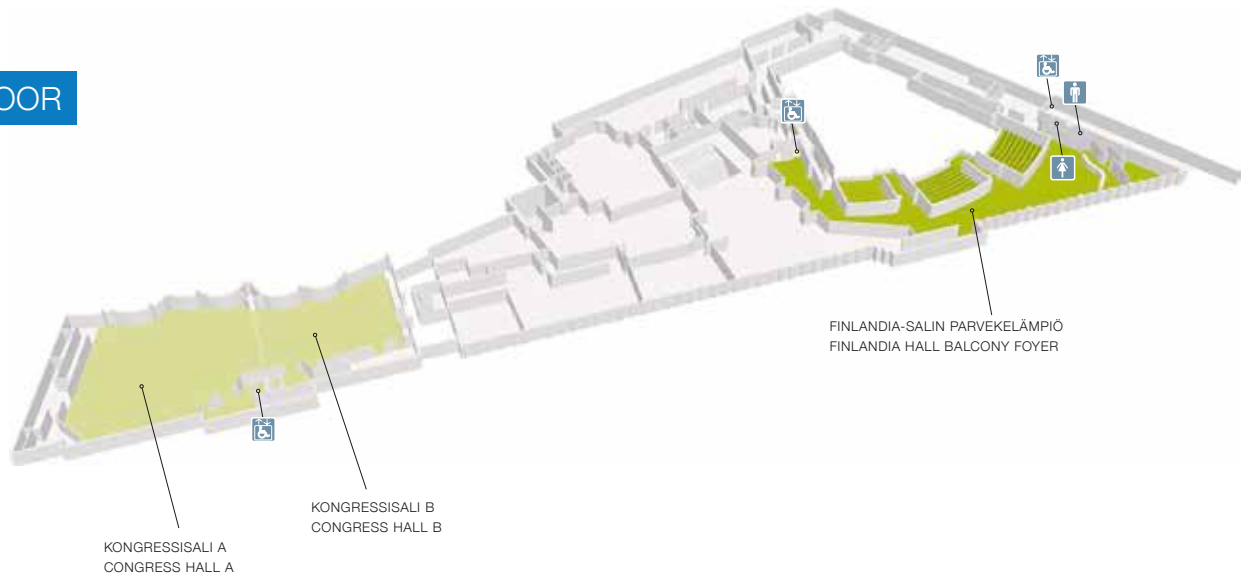


GROUND FLOOR

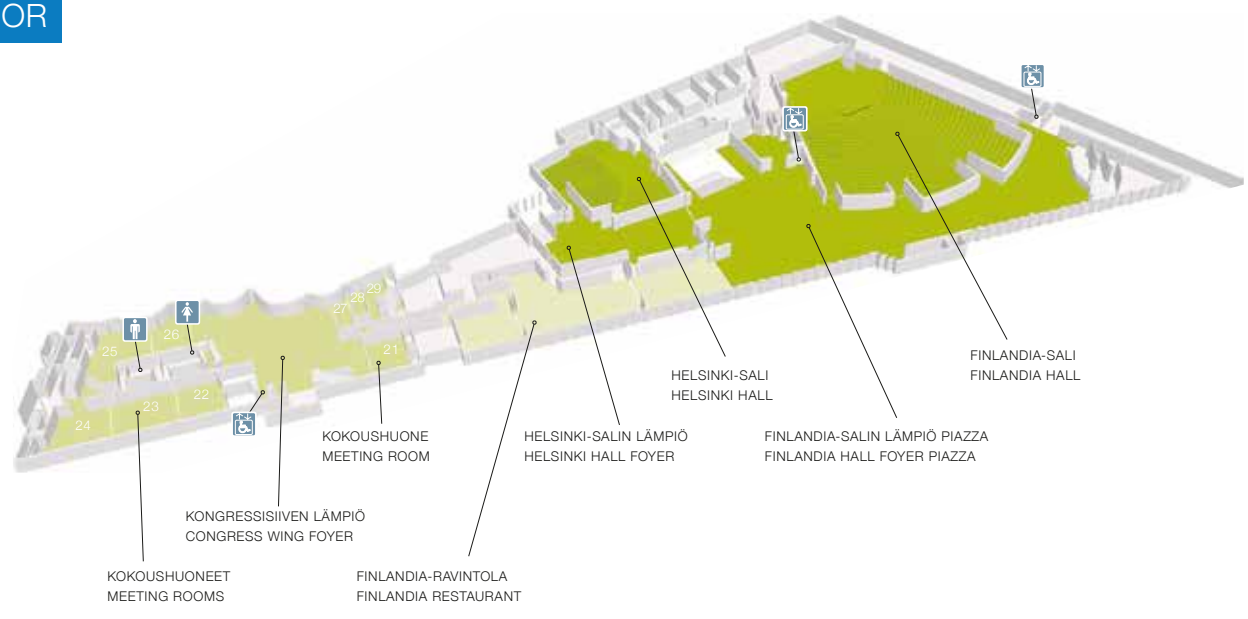




3RD FLOOR



2ND FLOOR



ACCOMMODATION

For all Congress participants special room rates (June 5–11, 2016) have been arranged in the hotels below. Please book directly in the hotel of your choice by using the booking code. We recommend an early reservation due to room limitations. All of our hotels are in the proximity of the Congress venue. For further details please use the hotel links listed below.

1

Hotel Scandic Park

Mannerheimintie 46, FI-00260 Helsinki
Tel: +358 9 47371 | Fax: +358 9 4737 2211
parkhelsinki@scandichotels.com
www.scandichotels.fi

Room rates:

169 EUR | night | standard single room
189 EUR | night | standard double room
189 EUR | night | superior single room
209 EUR | night | superior double room

Booking code: BCIM050616

Deadline: January 15, 2016

2

Hotel Scandic Grand Marina

Katajanokanlaituri 7, FI-00160 Helsinki
Tel: +358 9 16 661 | Fax: +358 9 16 66 500
grandmarina@scandichotels.com
www.scandichotels.fi

Room rates:

159 EUR | night | standard single room
179 EUR | night | standard double room
179 EUR | night | superior single room
199 EUR | night | superior double room

Booking code: BCIM050616

Deadline: January 15, 2016

3

Hotel Scandic Simonkenttä

Simonkatu 9, FI-00100 Helsinki
Tel: +358 9 68 380 | Fax: +358 9 68 38 111
simonkentta@scandichotels.com
www.scandichotels.fi

Room rates:

169 EUR | night | standard single room
189 EUR | night | standard double room
189 EUR | night | superior single room
209 EUR | night | superior double room

Booking code: BCIM050616

Deadline: January 15, 2016

4

Crowne Plaza Helsinki

Mannerheimintie 50, FI-00260 Helsinki
Tel: +358 9 2521 0000 | Fax: +358 9 2521 3999
helsinki.cph@restel.fi
www.crowneplaza-helsinki.fi

Room rates:

195 EUR | night | standard single room
210 EUR | night | standard double room

Booking code: CIMAC2016

Deadline: April 1, 2016

5

Holiday Inn – Helsinki City Centre

Elielinaukio 5, FI-00100 Helsinki
Tel: +358 9 5425 5000 | Fax: +358 9 5425 5299
helsinki.hihcc@restel.fi
www.ihg.com/hotels/gb/en/reservation

Room rates:

178 EUR | night | standard single room
189 EUR | night | standard double room

Booking code: CIMAC2016

Deadline: April 1, 2016

6

Hotel Seurahuone

Kaivokatu 12, FI-00100 Helsinki
Tel: +358 9 69 141 | Fax: +358 9 691 4010
helsinki.seurahuone@restel.fi
www.hotelliseurahuone.fi

Room rates:

178 EUR | night | standard single room
193 EUR | night | standard double room

Booking code: CIMAC2016

Deadline: April 1, 2016

7

Radisson Blu Plaza Hotel

Mikonkatu 23, FI-00100 Helsinki
Tel: +358 20 1234 700 | Fax: +358 20 1234 740
reservations.finland@radissonblu.com
www.radissonblu.com

Room rates:

235 EUR | night | single room
250 EUR | night | double room
250 EUR | night | double room, single occupancy

Booking code (booking by phone or email): CIMAC2016**Reservation code (booking via website): BCIMAC**

Deadline: March 1, 2016

8

Radisson Blu Royal Hotel

Runeberginkatu 2, FI-00100 Helsinki
Tel: +358 20 1234 700 | Fax: +358 20 1234 740
reservations.finland@radissonblu.com
www.radissonblu.com

Room rates:

195 EUR | night | single room
210 EUR | night | double room
210 EUR | night | double room, single occupancy

Booking code (booking by phone or email): CIMAC2016**Reservation code (booking via website): BCIMAC**

Deadline: March 1, 2016

9

Radisson Blu Seaside Hotel

Ruoholahdenranta 3, FI-00180 Helsinki
Tel: +358 20 1234 700 | Fax: +358 20 1234 740
reservations.finland@radissonblu.com
www.radissonblu.com

Room rates:

180 EUR / night / single room
195 EUR / night / double room
195 EUR / night / double room, single occupancy

Booking code (booking by phone or email): CIMAC2016**Reservation code (booking via website): BCIMAC**

Deadline: March 1, 2016

10

Original Sokos Hotel Helsinki

Kluuvikatu 8, FI-00100 Helsinki
Tel: +358 20 1234 600 | Fax: +358 20 1234 640
sokos.hotels@sok.fi
www.sokoshotels.fi

Room rates:

185 EUR | night | single room
200 EUR | night | double room
200 EUR | night | double room, single occupancy

Booking code (booking by phone or email): CIMAC2016**Reservation code (booking via website): BCIMAC**

Deadline: March 1, 2016

11

Original Sokos Hotel Vaakuna

Asema-aukio 2, FI-00100 Helsinki
Tel: +358 20 1234 600 | Fax: +358 20 1234 640
sokos.hotels@sok.fi
www.sokoshotels.fi

Room rates:

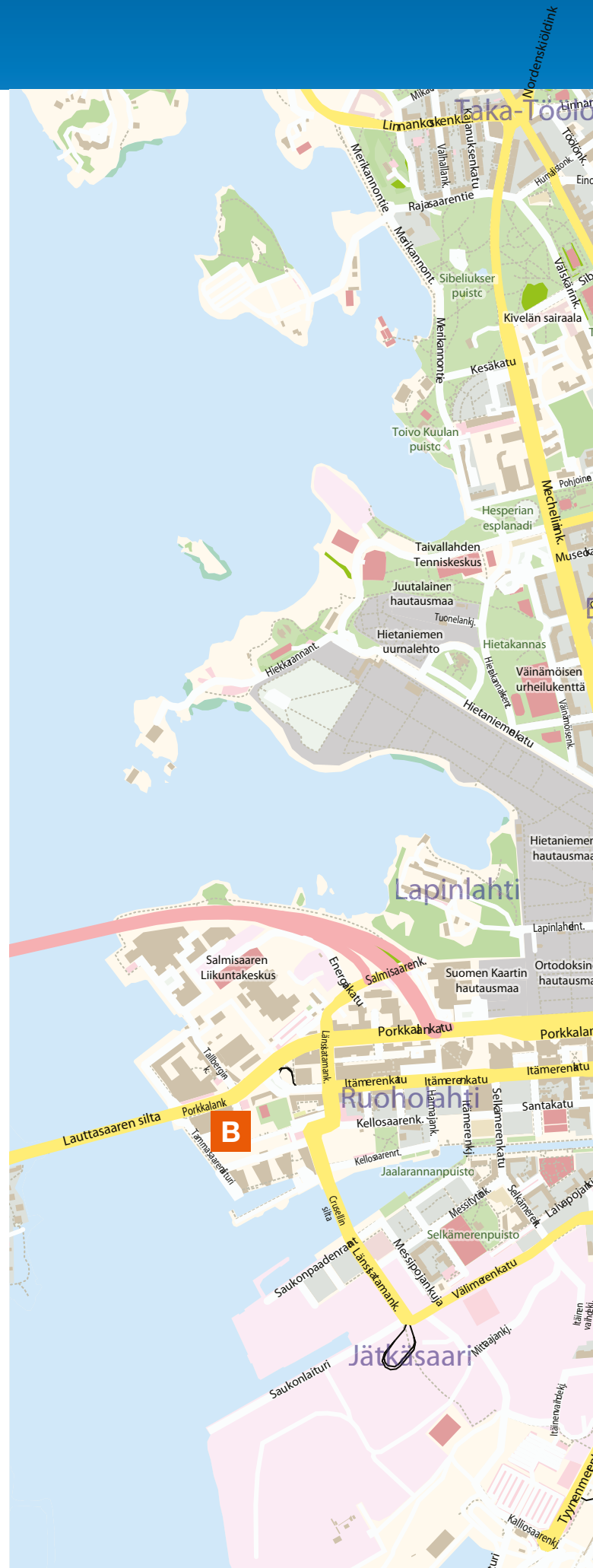
180 EUR | night | single room
195 EUR | night | double room
195 EUR | night | double room, single occupancy

Booking code (booking by phone or email): CIMAC2016**Reservation code (booking via website): BCIMAC**

Deadline: March 1, 2016

MAP OF HELSINKI

- 1** **Hotel Scandic Park**
Mannerheimintie 46, FI-00260 Helsinki
 - 2** **Hotel Scandic Grand Marina**
Katajanokanlaituri 7, FI-00160 Helsinki
 - 3** **Hotel Scandic Simonkenttä**
Simonkatu 9, FI-00100 Helsinki
 - 4** **Crowne Plaza Helsinki**
Mannerheimintie 50, FI-00260 Helsinki
 - 5** **Holiday Inn – Helsinki City Centre**
Elielinaukio 5, FI-00100 Helsinki
 - 6** **Hotel Seurahuone**
Kaivokatu 12, FI-00100 Helsinki
 - 7** **Radisson Blu Plaza Hotel**
Mikonkatu 23, FI-00100 Helsinki
 - 8** **Radisson Blu Royal Hotel**
Runeberginkatu 2, FI-00100 Helsinki
 - 9** **Radisson Blu Seaside Hotel**
Ruoholahdenranta 3, FI-00180 Helsinki
 - 10** **Original Sokos Hotel Helsinki**
Kluuvikatu 8, FI-00100 Helsinki
 - 11** **Original Sokos Hotel Vaakuna**
Asema-aukio 2, FI-00100 Helsinki
-
- A** Finlandia Hall
 - B** Cable Factory
 - C** Helsinki City Hall
 - D** Halkolaituri
 - E** Kiasma





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REGISTRATION

You can register for the 28th CIMAC World Congress via the online booking form or by using the registration booking form on CIMAC Congress website www.cimaccongress.com. After online registration participants will receive a booking confirmation via email. Pre-registration will be open from the end of November until [May 27, 2016](#). After pre-registration closes, you can still register at the CIMAC Registration and Information Desk on site.

Opening Hours for Registration and Information

Sunday	June 5	14:00 – 18:00
Monday	June 6	08:00 – 18:00
Tuesday	June 7	08:00 – 18:00
Wednesday	June 8	08:30 – 18:00
Thursday	June 9	08:00 – 18:00

Pre-registration

Registration Fees

CIMAC Members	€ 1,695*
Non-members	€ 1,995*
Speakers	€ 1,295*
Students	on invitation only
Accompanying persons	€ 295*

One-Day Ticket	€ 495*
Exhibition Ticket per day	€ 50*
Gala Dinner only	€ 195*

* Prices excluding VAT

Registration fees can be paid in EURO via bank transfer or credit card in advance or by cash or credit card on site.

Congress bag, abstract book, participant badge) as well as catering during breaks are included in the Congress fee.

The Congress fee for CIMAC members, non-members and speakers includes: participation in the scientific programme, the Opening Ceremony, the Welcome Reception, ABB Evening and the Gala Dinner. Additional Congress components, such as the accompanying programme (optional tours, technical tours) must be booked and paid for separately. The Congress documents (programme,

Students have the above-mentioned services included – except participation in the Gala Dinner.

The participation fee for accompanying persons includes: admission to the exhibition, coffee breaks and lunch, Opening Ceremony, Welcome Reception, ABB Evening and Gala Dinner.

TIME SCHEDULE

Day	Time	Activities
Sunday June 5, 2016	14:00 – 18:00	Pre-registration Attention!
	14:00 – 18:00	Speakers' Preparation
Monday June 6, 2016	08:00 – 18:00	Registration and Congress Information Desk
	10:00 – 18:00	Speakers' Preparation
	10:00 – 17:00	Exhibition
	10:00 – 11:30	Opening Ceremony Welcome!
	13:30 – 17:00	Technical Sessions
	18:30	Welcome Reception Keep in mind!
Tuesday June 7, 2016	08:00 – 18:00	Registration and Congress Information Desk
	08:00 – 18:00	Speakers' Preparation
	08:30 – 17:00	Exhibition
	08:30 – 17:00	Poster Sessions
	08:30 – 17:00	Technical Sessions
	18:30	ABB Evening Be there!
Wednesday June 8, 2016	08:30 – 18:00	Registration and Congress Information Desk
	08:00 – 18:00	Speakers' Preparation
	09:00 – 17:00	Exhibition
	09:00 – 17:00	Poster Sessions
	09:00 – 17:00	Technical Sessions
	11:00 – 12:00	Collin Trust sponsored Key Note Speech Highlight!
	15:30	Users' Reception
Thursday June 9, 2016	08:00 – 18:00	Registration and Congress Information Desk
	08:00 – 15:00	Speakers' Preparation
	08:30 – 17:00	Exhibition
	08:30 – 17:00	Poster Sessions
	08:30 – 17:00	Technical Sessions
	15:00 – 16:30	Final Panel Discussion
	18:30	Gala Dinner Don't miss the Gala Dinner
Friday June 10, 2016	09:00 – 17:00	Technical Tours



QUICK FACTS

Accommodation

For information about selected hotels in Helsinki please see pages 40 – 41.

Cancellation of Congress Participation

Cancellations are only possible up to **30 April 2016** at the latest. On cancellation of participation, the participation fee will be refunded minus the administrative charge amounting to € 180. Cancellations or refunds at a later date are not possible. There shall be no refunds of participation fees for non-attendance without a cancellation within the stipulated period.

CIMAC

CIMAC is the non-commercial sponsor of the 28th CIMAC World Congress in Helsinki. Further information about CIMAC can be found on the website <http://www.cimac.com/>

CIMAC Membership

If you are uncertain about your membership status or want to apply for membership, please contact the CIMAC Central Secretariat: info@cimac.com

Congress Catering

Catering stations will be integrated in the exhibition area. During the coffee break and lunch break participants will be provided with food and drinks. Enjoy local and international cuisine!

Congress Documents

Reserved and paid Congress tickets will be provided at the registration desk on site. Please collect your Congress badge and bag at the registration desk. Your personal badge is your entrance ticket to all sessions, the exhibition and the social events. Please remember to wear your badge at the Congress and the social events at all times.

Contact for Questions

For questions regarding the technical programme, please contact CIMAC Central Secretariat. For questions regarding the Congress, sponsoring and exhibition, please contact the main and the co-organiser of the Congress. For contact details see page 48.

Cloakroom

Participants may leave their belongings in the designated area.

Language

The official language of the Congress is English. No translation will be provided.

Newsletter

To subscribe to the CIMAC Newsletter please complete the form on the CIMAC website: <http://www.cimac.com/publication-press/newsletter-subscription/index.html>

Mobile App

A mobile app will be available for downloading in [Google Play](#) and [Apple App Store](#) for all Congress participants in early spring. The app contains the technical programme, general information, floor plans and additional information.

Optional Tours

For participating in the optional tours, separate registration will be necessary! Please see pages 28 –31 for further information.

Payment

Fees are charged on behalf of and for the account of the Congress organiser and include the statutory value-added tax. All fees are due immediately after receipt of the invoice. Payments are only accepted in EUR.

Social Media

Fans and followers will find the CIMAC Congress on [LinkedIn](#) and [Twitter](#).

Speakers' Preparation Room

All presentations can be reviewed and delivered at the speakers' preparation room at least 2 hours prior to the speaker's session. Presentations being held during a morning session should be reviewed at the end of the day before. Speakers are kindly requested to follow the instructions of the chairperson and strictly keep to the time of their presentation.

Technical Programme

Admission to all sessions of the technical programme is only possible with a valid Congress ticket. The Congress ticket for **CIMAC Members, Non-members, Speakers and Students** includes: Congress badge, Congress bag, admission to all sessions and the exhibition, coffee breaks and lunch, Opening Ceremony, Welcome Reception, ABB Evening, Gala Dinner (except students). The registration for **accompanying persons** includes: admission to the exhibition, coffee breaks and lunch, Opening Ceremony, Welcome Reception, ABB Evening, Gala Dinner.

Technical Tours

Separate registration is required for participation in the technical tours. Please see pages 26 – 27 for further information.

WIFI

Free WIFI is available in the Finlandia Hall. The login and password will be announced on site.

ORGANISERS



Main Organiser Congress

Gesellschaft zur Förderung des Maschinenbaues mbH (GzF)

Lyoner Strasse 18, 60528 Frankfurt am Main, Germany

Contact: Bettina Fritsch
Phone: +49 69 6603-1887
Fax: +49 69 6603-2887
Email: congress@cimac.com
Web: www.cimaccongress.com
www.gzf-expo.de



Co-Organiser Congress

CIMAC National Member Association The Federation of Finnish Technology Industries (FFTI)

Branch Group Combustion Engines and Turbotechnic

Eteläranta 10, 00131 Helsinki 13, Finland

Contact: Merja Salmi-Lindgren
Phone: +358 9 192 3385
Fax: +358 9 624 462
Email: cimac2016@techind.fi
Web: www.techind.fi



Co-Organiser Exhibition

Hamburg Messe und Congress International GmbH

Messeplatz 1, 20357 Hamburg, Germany

Contact: Sybille Lang
Phone: +49 40 3569-2293
Fax: +49 40 3569-692293
Email: cimac@hamburg-messe.de
Web: www.hamburg-messe.de/en/visitors/trade-fairs-abroad



Non-Commercial Sponsor

CIMAC

Lyoner Strasse 18, 60528 Frankfurt am Main, Germany

Contact: Dorothee Günther
Phone: +49 69 6603-1355
Fax: +49 69 6603-2355
Email: info@cimac.com
Web: www.cimac.com



CIMAC

INTERNATIONAL COUNCIL
ON COMBUSTION ENGINES

**2019
VANCOUVER**

29th CIMAC WORLD CONGRESS

On behalf of CIMAC, the United States National Member Association, and Canadian members, we are happy to announce Vancouver as the host city for the 2019 Congress. Consistently voted 'Best City in the Americas' by Condé Nast Traveller magazine, Vancouver is a vibrant, cosmopolitan city nestled between majestic mountains and the glittering

Pacific Ocean. A modern city on the edge of a spectacular natural playground, Vancouver has built a reputation worldwide as a premier destination for meetings and conventions.

Vancouver looks forward to welcoming CIMAC delegates in 2019!



ABOUT CIMAC

CIMAC: the Global Forum for Large Engines and their Applications

Originally founded in Paris in 1951, CIMAC has become **the leading global association of the internal combustion machinery industry**. It is a non-profit association bringing together and representing the large engine industry to regulators and standardising bodies. In addition to promoting the work of National Member Associations, it supports information exchange and understanding across the large combustion engine industry including:

- Builders of large diesel, gas and dual-fuel engines
- Users of large engines such as owners and operators of ships, power plants, locomotives etc.
- Systems and component suppliers
- Fuel and lubricant suppliers, including oil companies
- Classification societies and other regulatory bodies
- Academic institutions, consultant engineers, scientists
- Other service providers

CIMAC's Mission is to:

- › promote exchange of scientific and technical information via its Congresses, CIMAC Circles and CIMAC CASCADES events
- › improve understanding between engine manufacturers and engine users
- › improve understanding between engine manufacturers and their suppliers
- › focus upon and promote the work and activities of National Member Associations
- › promote exchange on technological developments in a pre-competition state, e.g. in its Working Group meetings
- › contribute to internationally applied technological standards and publications
- › collaborate with other international associations

CIMAC Membership

CIMAC members currently come from **26 countries** across North and South America, Asia and Europe. Membership can take three forms:

- Membership of the official CIMAC National Member Association in your country
- Membership of National Member Groups
- Corporate Membership for individual companies

Please see page 48 for CIMAC contact details.

CIMAC Working Groups: the Consensus Seekers

CIMAC Working Groups are the heart of CIMAC. Led by **international specialists** from CIMAC member organisations, they seek solutions to industry-wide technical issues.

They interface with legislators, standards organisations, and regulators such as the classification societies to develop a united CIMAC recommendation or a position paper, representing the industry as a whole, on a pre-competitive, pre-legislative basis. They have a distinguished record of issuing guidance and published media articles on a wide range of crucial subjects relating to the operation of large diesel, gas and dual-fuel engines.

Consequently, CIMAC Working Group activities encompass the environmental compatibility, efficiency and safety of large engines and their applications.

CIMAC Working Groups currently cover these vital areas of engine technology and operation:

- | | |
|----------------------------------|---------------------------|
| ▪ Classification | ▪ Gas Engines |
| ▪ Crankshaft Rules | ▪ Inland Waterway Vessels |
| ▪ Electronics & Software Systems | ▪ Marine Lubricants |
| ▪ Exhaust Emissions Control | ▪ System Integration |
| ▪ Fuels | ▪ Users |

CIMAC Events

The CIMAC Congress represents the culmination of all CIMAC activities, being held every three years, each time in a different member country. Spanning the globe as well as all technology aspects, the Congress is **a unique gathering of key industry decision makers**, including engine owners and operators, researchers and developers, and representatives from the engine, component and consumables industries.

The Congress programme centres on the **presentation of technical papers** on engine research, development, application engineering on the original equipment side, and engine operation and maintenance on the end-user side. This is complemented by a social programme which promotes friendship and networking among engine builders and engine users.

CIMAC Circles are panel discussions involving CIMAC members debating topical issues. They are hosted at key industry events around the world at least once a year.

CIMAC CASCADES promote the advancement of young engineers and their careers. The events enable them to meet with leading industry experts to exchange information, network and present their projects.

REVIEWERS TECHNICAL PROGRAMME

Person	Company	Place
Aabo, Kjeld	MAN Diesel & Turbo	Copenhagen, Denmark
Aufischer, Rainer Dr.	Miba	Laakirchen, Austria
Beran, Robert Dr.	AVL List	Graz, Austria
Boletis, Elias	Wärtsilä Corporation	Drunen, Netherlands
Boom, Rick	Woodward	Hoofddorp, Netherlands
Brewster, Simon	Ricardo	Shoreham by Sea, West Sussex, United Kingdom
Callahan, Timothy J.	Southwest Research Institute	San Antonio, TX, United States
Delneri, Diego	Wärtsilä Corporation	Trieste, Italy
Dijks, Albertus	N.V. Nederlandse Gasunie	Groningen, Netherlands
Flynn, Paul Dr.	GE Transportation	Erie, PA, United States
Frigge, Patrick	GE Jenbacher	Jenbach, Austria
Gust, Edgar Dipl.-Ing.	ZOLLERN BHW Gleitlager	Braunschweig, Germany
Haeuelsen, Volkmar Dr.	ABB Turbo Systems	Baden, Switzerland
Heim, Klaus M.	OMT	Cascine Vica - Rivoli (Torino), Italy
Hellén, Göran	Wärtsilä Corporation	Vaasa, Finland
Heuser, Peter Dr.	FEV	Aachen, Germany
Hiltner, Joel David Dr.	Hiltner Combustion Systems	Ferndale, WA, United States
Hostrup Poulsen, Hanne Dr.	MAN Diesel & Turbo	Copenhagen, Denmark
Hupperich, Patrick Dr.-Ing.	FEV	Auburn Hills, MI, United States
Itoh, Yasuhiro	Niigata Power Systems	Tokyo, Japan
Juoperi, Kai	Wärtsilä Corporation	Vaasa, Finland
Kahle, Jørn	A.P. Møller - Mærsk	Copenhagen, Denmark
Kjemtrup, Niels	MAN Diesel & Turbo	Copenhagen, Denmark
Ludu, Andrei Dipl.-Ing.	AVL List	Graz, Austria
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Mohr, Hinrich Dr.	AVL List	Beckdorf-Nindorf, Germany
Nerheim, Lars Magne Prof.	Bergen University College	Bergen, Norway
Nordrik, Rune Dr.-Ing.	Rolls-Royce Marine	Godvik, Norway
Oestman, Fredrik Dr.	Wärtsilä Corporation	Vaasa, Finland
Ohtsu, Masaki	MES	Okayama, Japan
Okabe, Masahiko	Mitsubishi Heavy Industries	Tokyo, Japan
Pischinger, Stefan Prof. Dr.-Ing.	FEV	Aachen, Germany
Rippl, Alexander Dr.-Ing.	MAN Diesel & Turbo	Augsburg, Germany
Ritscher, Bert	Caterpillar Motoren	Kiel, Germany
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Rojgaard, Charlotte	BV Inspectorate	Copenhagen, Denmark
Schmuttermair, Herbert Dr.	MAN Diesel & Turbo	Augsburg, Germany
Stiesch, Gunnar Prof. Dr.-Ing.	MAN Diesel & Turbo	Augsburg, Germany
Sugiura, Kimihiko	CMD	Shanghai, China
Takasaki, Koji Prof. Dr.	Kyushu University	Fukuoka, Japan
Tonon, Paolo	Maersk Maritime Technology	Copenhagen, Denmark
Vlaskos, Ioannis Dr.-Ing.	Ricardo Deutschland	Schwäbisch Gmünd, Germany
Wang, Allan-QingZhou	ABB Jingjin Turbo Systems	Shanghai, China
Weisser, German Dr.	ABB Turbo Systems	Baden, Switzerland
Wik, Christer	Wärtsilä Corporation	Vaasa, Finland
Wimmer, Andreas Ao. Univ.-Prof. Dr.	LEC	Graz, Austria
Wojcik, Karl Dipl.-Ing.	AVL List	Graz, Austria

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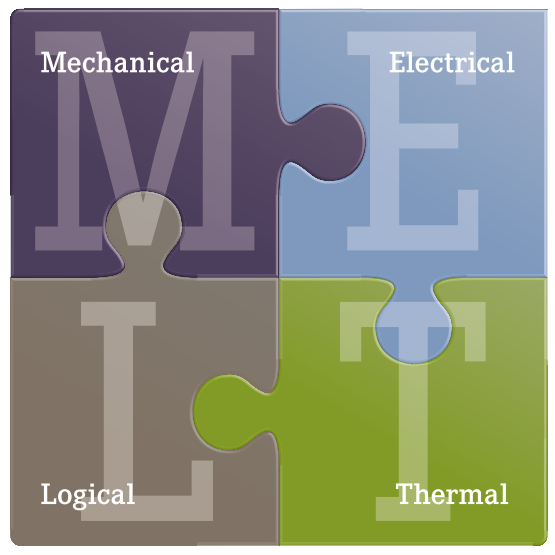
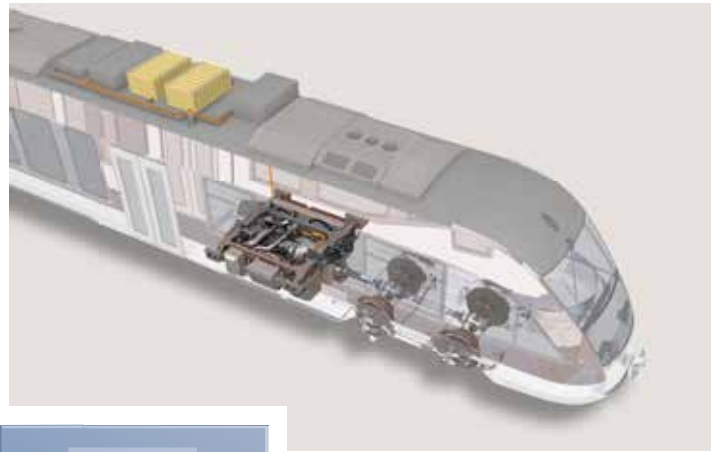
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