

Electric Drives Production Conference 2015





5th International Conference **Electric Drives Production** September 15th - 16th, 2015

**Nuremberg, Germany** 

# **Preliminary Program**















































# CONTENT

CONTENT	2
PARTNERS	3
COMMITTEES	4
TIME SCHEDULE - OVERVIEW	5
TIME SCHEDULE	6
FECHNICAL TOURS1	10
<b>SPONSORS</b> 1	0
<b>ON-SITE PLAN</b> 1	1
EXHIBITION1	2
SOCIAL PROGRAM1	3
<b>APPROACH</b> 1	4

# **ABOUT E|DPC**

The international Electric Drives Production Conference and Exhibition has been established as an outstanding platform for the exchange of experiences for researchers, product developers, production experts, purchasers and potential users of electric drives in the last years.

**E|DPC 2015** offers more than 70 technical presentations in a total of 8 tracks within two days: six of them concentrate on the core topics of electric drives production technologies, materials and systems. The focus of the globally accompanying conference on Energy Transfer for Electric Vehicles (**E|TEV**) is set on the technology of wireless power transmission. And last but not least the conference is hosting the **E-MOTIVE** track, organized by the German Engineering Federation (VDMA).

Comprehensive industrial exhibitions, poster presentations, technical tours and an inspiring social program will complement the conference and create a sustainable experience for every participant.

# **ON-SITE ORGANIZATION**

The **registration desk** is located on level 0 in the foyer.

Opening time Conference:

Monday	September 14 <sup>th</sup> , 2015	10:00 AM - 7:00 PM
Tuesday	September 15 <sup>th</sup> , 2015	8:00 AM - 7:00 PM
Wednesday	September 16 <sup>th</sup> , 2015	8:00 AM - 7:00 PM

Phone: +49 (911) 5302 9090

Opening time Exhibition:

Tuesday	September 15 <sup>th</sup> , 2015	9:00 AM - 5:00 PM
Wednesday	September 16 <sup>th</sup> , 2015	9:00 AM - 5:00 PM

**Conference bags** can be picked up at the registration desk. **On-spot registrations** for the conference, the technical tours, and the evening reception will be possible. **On-site payments** can be settled in cash (EUR) and by credit card.

The on-spot **speakers reception** and welcome drink will take place on **Monday, September 14**<sup>th</sup>, **2015 6:00 PM** in the foyer of NCC West.

Free WiFi is available in all rooms of the exhibtion centre.

# **PUBLICATION**

All registered and accepted papers will be included in the conference proceedings and also published at **ieeexplore.org**, **scopus.com** and **scholar.google.com**.

# **PARTNERS**

The 5<sup>th</sup> International Electric Drives Production Conference is kindly supported by the following organizations:



AMA - Association for Sensors and Measurement www.ama-sensorik.de



**IHK Mittelfranken** www.ihk-nuernberg.de



antriebstechnik - Technical Magazine for Engineering www.antriebstechnik.de



IHS Automotive www.ihs.com



**Automation Valley Nordbayern** www.automation-valley.de



**Insitute for Factory Automation and Production Systems** www.faps.de



**Bayern Innovativ** www.bayern-innovativ.de



MHI - German Society for Assembly, Handling and Industrial Robots www.wgmhi.de



**Bühler Mechatronic Award** 

http://www.buehlermotor.com/DE/ Mechatronic-Award



**City of Nuremberg** www.nuernberg.de



Cluster Mechatronik & Automation e.V.

www.cluster-ma.de



**Nuremberg Metropolitan Region** www.metropolregionnuernberg.de



ECPE -

The Industrial Research Network for Power Electronics in Europe www.ecpe.org



PELS -

**IEEE Power Electronics Society** www.ieee-pels.org



Electrical Manufacturing Coil Winding Association

www.emcw.org



The UK Magnetics Society

www.ukmagsoc.org



ETG - The Power Engineering Society of the VDE

www.vde.com/etg



VDMA -

**German Engineering Federation** www.vdma.org



FVA - Research Association for Drive Technology www.fva-net.de

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# TIME SCHEDULE OVERVIEW

Monday, September 14 <sup>th</sup> , 2015					
7:00 PM	Speakers Reception			Foyer NCC West	
		Tuesday, September	15 <sup>th</sup> , 2015		
9:00 AM	Welcome Coffee			Exhibition hall 12	
9:30 AM	Opening Session			Room Paris	
11:00 AM	Coffee Break			Exhibition hall 12	
	E DPC	E DPC	E DPC	E-MOTIVE	
11.20 0.00	Room Paris	Room London	Room Zuerich	Room Amsterdam	
11:30 AM	New Direct Winding Technologies	Connection Processes of Electric Machines	Quality Control in Electric Drives Production	Keynote Session on the Traction Drives	
1:00 PM	Lunch Break & Postersess	sion		Exhibition hall 12	
2:30 PM	Innovative Winding Technologies	Energy-Efficient Insulation Technologies	Magnet Measurement Technologies	Innovations of Electromobility	
4:00 PM	Coffee Break			Exhibition hall 12	
4:45 PM	Analysis of the Winding and Production Process	Insulation Technologies for Electric Drives	Optimized Magnet Assembly Processes	New Electric Traction Motor Concepts	
7:30 PM	Welcome Address Guided walking tours  Historic Townhall of Nuremberg				
		Wednesday, Septembe	er 16 <sup>th</sup> , 2015		
	E DPC	E DPC	E DPC	E TEV	
9:00 AM	Room Paris Validation of Packaging Technologies	Power Electronics and Control Methods	Room Zuerich  Design of Electric  Drives Production  Systems	Dynamic Power Transfer Applications	
10:30 AM	Coffee Break			Exhibition hall 12	
11:15 AM	Properties and Processing of Electric Steel	Computer Integrated Machine Designs	Planing of Electric Drives Production Systems	Electronics for Wireless Power Transfer	
12:45 PM	Lunch Break & Postersession Exhibition hall 12				
2:15 PM	German Research Funding Focus on Drives Production	Innovative Reluctance Machines	Control Methods and Design of Electric Maschines	Broader Considerations for WPT	
3:45 PM	Coffee Break			Exhibition hall 12	
4:15 PM 5:00 PM	Closing Session End of Conference			Room London	

# TIME SCHEDULE Tuesday, September 15<sup>th</sup>, 2015







11:00 AM  Coffee Break in Exhibition Hall 12  Session 1: Room Paris  New Direct Winding Technologies  Winding of Litz Wire on Single Teeth Weyl P, Von Roll Schweiz AG, Breitenbach (CH)  Bickel B, University of Erlangen-Nuremberg (DE) Bickel B, University of Erlangen-Nur			
Session 1: Room Paris   New Direct Winding Technologies   Evaluation of the Influence of Varying Electrode Materials Within the Thermo-Crimping Process Spreng S., University of Erlangen-Nuremberg (DE)   Load-Adapted Design of Laser Welded Copper-Aluminum Connections for Power Electronics Hofmann K., Bayerisches Laserzentrum GmbH, Erlangen (DE)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)   Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coll Winding Manafacturing Applications Processes within the Thermo-Crimping Process of Electric Motors Induction Health Process Process and Energy Deptimization of Insulation Technologies Plc, Bridgend (GB) Universal Analysis for Might Production of Electric Motors Induction Healting & Trickling: It is now Ready Technology (De)   Deptimization of Insulation Technologies Plc Electric Motors Induction Healting & Trickling: It is now Ready Technology (De)   Deptimization of Elec	9:30 AM	Opening Session: Room Paris	
11:30 AM Winding of Litz Wire on Single Teeth Weyl P, Von Roll Schweiz AG, Breitenbach (CH)  12:00 PM Implementation of the Needle Winding Technique for Diamond Coils Bickel B., University of Erlangen-Nuremberg (DE)  12:30 PM Implementation of the Needle Winding Technique for Diamond Coils Bickel B., University of Erlangen-Nuremberg (DE)  12:30 PM Implementation of the Needle Winding Platform: A Flexible and Configurable Solution for Low Volume, High Mix or Mass Production Kiefer D., Marsilli & Co. S.p.A., Castelleone (IT)  10:30 PM Lunch Break & Postersession in Exhibition Hall 12  10:30 PM Innovative Winding Technique Schoek M., ETH Zurich (CH)  10:300 PM Innovative Winding Method for Electric Motors for High Production Volumes of Electric Woltors for High Production Volumes of Electric Vehicles Stoeck M., ETH Zurich (CH)  10:300 PM Impact of the Needle Winding Technique Termination of Innovative Winding Technique Temperation of Hybrid and Electric Motors Impregnation of Hybrid and Electric Motors Indivation of Insulation Processes within the Production of Electric Drives Hofmann B., University of Erlangen-Nuremberg (DE) Impact of the Needle Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  10:300 PM Coffee Break in Exhibition Hall 12  10:300 PM Coffee Break in Exhibiti	11:00 AM	Coffee Break in Exhibition Hall 12	
Weyl P., Von Roll Schweiz AG, Breitenbach (CH)   Materials Within the Thermo-Crimping Process Spreng S., University of Erlangen-Nuremberg (DE)			
for Diamond Coils Bickel B., University of Erlangen-Nuremberg (DE) Bickel B., University of Erlangen-Nuremberg (DE)  NelW-MARSILLI Needle Winding Platform: A Flexible and Configurable Solution for Low Volume, High Mix or Mass Production Kiefer D., Marsilli & Co. S.p. A., Castelleone (IT)  Developments in High Speed, High Quality, Precision Laser Stripping of Enamel Wire for Coil Winding Manufacturing Applications Dr. Dickinson P., Spectrum Technologies Plc, Bridgend (GB)  Lunch Break & Postersession in Exhibition Hall 12  Session 4: Room Paris Innovative Winding Method for Electric Motors for High Production Volumes of Electric Vehicles Stock M., ETH Zurich (CH)  3:00 PM Hardware Guide Winding Zerbe J., Technische Universitaet Berlin (DE)  Dimpact of the Needle Winding Technology on the Operational Behavior of an Asynchronous Machine Stenzel S., AUDI AG, Ingolstadt (DE)  Word Production of Electric Dives Session 7: Room Paris Analysis of the Winding and Production Process Auspis of the Winding and Production Process  Simulation of Orthocyclic Windings Using the Linear Winding Technology (DE)  Session 7: Room Paris Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Staf PM Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Absolute Winds and Avanced Materials In High Efficient Sleeve Applications Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Aluminament Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Aluminament Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)	11:30 AM		Materials Within the Thermo-Crimping Process
and Configurable Solution for Low Volume, High Mix or Mass Production Kiefer D., Marsilli & Co. S.p.A., Castelleone (IT)  1:00 PM Lunch Break & Postersession in Exhibition Hall 12  Session 4: Room Paris Innovative Winding Technologies Innovative Winding Technologies  Ilnovative Winding Method for Electric Motors for High Production Volumes of Electric Vehicles Stoeck M., ETH Zurich (CH)  3:00 PM Hardware Guide Winding Zerbe J., Technische Universitaet Berlin (DE)  Impact of the Needle Winding Technology on the Operational Behavior of an Asynchronous Machine Stenzel S., AUDI AG, Ingolstadt (DE)  4:00 PM  Coffee Break in Exhibition Hall 12  Session 3: Room London Impregnation of Hybrid and Electric Motors Induction Heating & Trickling: It is now Ready Technology Motta C., bdtronic Gelectric Motors Induction Heating & Trickling: It is now Ready Technology Motta C., bdtronic Gelectric Motors Insulation Technologies Friedly Motera C., bdtronic Gelectric Motors Insulation of Orthocyclic Windings Using the Linear Winding Technology Insulation of Orthocyclic Windings Using the Linear Winding Technology Insulation of Orthocyclic Windings Using the Linear Winding Technology Insulation of Orthocyclic Windings Using the Linear Winding Technology (DE)  5:15 PM  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Bance F., Karlsruhe Institute of Technology (DE)  8:455 PM  Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  New Thermosetting Resin Systems as Encapsulants for High Performance Rotating Resir Systems as Encapsulants for	12:00 PM	for Diamond Coils	Aluminum Connections for Power Electronics Hofmann K., Bayerisches Laserzentrum GmbH,
2:30 PM Innovative Winding Method for Electric Motors for High Production Volumes of Electric Vehicles Stoeck M., ETH Zurich (CH)  3:00 PM Hardware Guide Winding Zerbe J., Technische Universitaet Berlin (DE)  3:30 PM Impact of the Needle Winding Technology on the Operational Behavior of an Asynchronous Machine Stenzel S., AUDI AG, Ingolstadt (DE)  4:00 PM Coffee Break in Exhibition Hall 12  Session 7: Room Paris Analysis of the Winding and Production Process Isimulation of Orthocyclic Windings Using the Linear Winding Technology (DE)  5:15 PM Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  5:45 PM Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Session 5: Room London Insulation System for Motors Induction Heating & Trickling: Licrtical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	12:30 PM	and Configurable Solution for Low Volume, High Mix or Mass Production	Laser Stripping of Enamel Wire for Coil Winding Manufacturing Applications
Innovative Winding Technologies   Energy-Efficient Insulation Technologies	1:00 PM	Lunch Break & Postersession in Exhibition Hall 12	
High Production Volumes of Electric Vehicles Stoeck M., ETH Zurich (CH)  Hardware Guide Winding Zerbe J., Technische Universitaet Berlin (DE)  Impact of the Needle Winding Technology on the Operational Behavior of an Asynchronous Machine Stenzel S., AUDI AG, Ingolstadt (DE)  Coffee Break in Exhibition Hall 12  Session 7: Room Paris Analysis of the Winding and Production Process  Simulation of Orthocyclic Windings Using the Linear Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Kuschnerus M., ELANTA5 Beck GmbH, Hamburg (DE)  Universal Analysis Tool for Process- and Energy-Optimization of Insulation Processes within the Production of Insulation of Hybrid and Electric Motors Induction Heating & Trickling: It is now Ready Technology Motta C., bdtronic GmbH, Weikersheim (DE)  Session 8: Room London Insulation Technologies for Electric Drives  Composite Materials in High Efficient Sleeve Applications of Electric Machines Dr. Funck R., CirComp GmbH, Kaiserslautern (DE)  Benefits of Advanced Insulation Systems for High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)			
Zerbe J., Technische Universitaet Berlin (DE)  Optimization of Insulation Processes within the Production of Electric Drives Hofmann B., University of Erlangen-Nuremberg (DE)  Impact of the Needle Winding Technology on the Operational Behavior of an Asynchronous Machine Stenzel S., AUDI AG, Ingolstadt (DE)  Impregnation of Hybrid and Electric Motors Induction Heating & Trickling: It is now Ready Technology Motta C., bdtronic GmbH, Weikersheim (DE)  4:00 PM  Coffee Break in Exhibition Hall 12  Session 7: Room Paris Analysis of the Winding and Production Process  Analysis of the Winding Busing the Linear Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Benefits of Advanced Insulation Systems for High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	2:30 PM	High Production Volumes of Electric Vehicles	
Impact of the Needle Winding Technology on the Operational Behavior of an Asynchronous Machine Stenzel S., AUDI AG, Ingolstadt (DE)  Work Coffee Break in Exhibition Hall 12  Session 7: Room Paris Analysis of the Winding and Production Process  4:45 PM Simulation of Orthocyclic Windings Using the Linear Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes  Wu C., Robert Bosch GmbH, Stuttgart (DE)  Impregnation of Hybrid and Electric Motors Induction Heating & Trickling: It is now Ready Technology (DE)  Session 8: Room London Insulation Technologies for Electric Drives  Composite Materials in High Efficient Sleeve Applications of Electric Machines Dr. Funck R., CirComp GmbH, Kaiserslautern (DE)  Benefits of Advanced Insulation Systems for High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	3:00 PM	_	Optimization of Insulation Processes within the Production of Electric Drives
Session 7: Room Paris Analysis of the Winding and Production Process  4:45 PM Simulation of Orthocyclic Windings Using the Linear Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  S:15 PM Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Benefits of Advanced Insulation Systems for High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	3:30 PM	Operational Behavior of an Asynchronous Machine	Impregnation of Hybrid and Electric Motors Induction Heating & Trickling: It is now Ready Technology
Analysis of the Winding and Production Process  4:45 PM  Simulation of Orthocyclic Windings Using the Linear Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Insulation Technologies for Electric Drives  Composite Materials in High Efficient Sleeve Applications of Electric Machines Dr. Funck R., CirComp GmbH, Kaiserslautern (DE)  Benefits of Advanced Insulation Systems for High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	4:00 PM	Coffee Break in Exhibition Hall 12	
Linear Winding Technique Boenig J., University of Erlangen-Nuremberg (DE)  5:15 PM  Analysis of Wire Tension Control Principles and Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  Applications of Electric Machines Dr. Funck R., CirComp GmbH, Kaiserslautern (DE)  Benefits of Advanced Insulation Systems for High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)			
Algorithms for Highly Dynamic Applications Blanc F., Karlsruhe Institute of Technology (DE)  Parameter Identification for Fault Analysis of Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE)  High Performance Rotating Electrical Machines Bonnett J., Victrex Plc, Thornton Cleveleys (GB)  New Thermosetting Resin Systems as Encapsulants for High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	4:45 PM	Linear Winding Technique	Applications of Electric Machines
Permanent Magnet Synchronous Motors Based on Transient Processes Wu C., Robert Bosch GmbH, Stuttgart (DE) Dr. Hollstein W., Huntsman Advanced Materials GmbH, Basel (CH)	5:15 PM	Algorithms for Highly Dynamic Applications	High Performance Rotating Electrical Machines
7:30 PM Evening Reception at the Historic Townhall of Nuremberg	5:45 PM	Permanent Magnet Synchronous Motors Based on Transient Processes	High Temperature Resistant, Robust and Cost Efficient Power Electronics and E-Drive Applications Dr. Hollstein W., Huntsman Advanced Materials GmbH,
	7:30 PM	<b>Evening Reception at the Historic Townhall of Nurember</b>	

# TIME SCHEDULE

# TIME SCHEDULE Tuesday, September 15<sup>th</sup>, 2015 E | DPC





E DI C		
Opening Session: Room Paris		9:30 AM
Coffee Break in Exhibition hall 12		11:00 AI
Session 3: Room Zürich Quality Control in Electric Drives Production	Session E-MOTIVE a: Room Amsterdam Keynote Session on the Traction Drives	
<b>New Method of Quality Assurance for Laminated Cores</b> Schneider M., University of Erlangen-Nuremberg (DE)		11:30 AM
Fully Automated Rotor Inspection Apparatus With High Flexibility for Permanent Magnet Synchronous Motors Using an Improved Hall Sensor Line Array Heyder A., University of Erlangen-Nuremberg (DE)	Keynote Session on the Traction Drives, organizied by the German Engineering Federation (VDMA)	12:00 PM
Electrical Testing of Rotors and Stators of Small Electrical Motors Scheer K., GDG Gerätebau, Sasbach (DE)		12:30 PM
Lunch Break & Postersession in Exhibition Hall 12		1:00 PM
Session 6: Room Zürich Magnet Measurement Technologies	Session E-MOTIVE b : Room Amsterdam Innovations of Electromobility	
New FPGA-Based and Inline-Capable Measuring Method for Identification of Magnetic Losses in Electrical Steel Veigel M., Karlsruhe Institute of Technology (DE)	Compact Machine Design of an Integrated Multiphase VPMSM Grosse T., RWTH Aachen University (DE)	2:30 PM
<b>100% Inline Measurement of Permanet Magnets and PM Rotors</b> Buettner U., Innovent e.V., Jena (DE)	The Societal Acceptance of Electro Mobility in Germany Prof. Muehlbaeck K., International School of Management, Munich (DE)	3:00 PM
6D Magnetic Field Distribution Measurements of Permanent Magnets With Magnetic Field Camera Scanner Dr. Vervaeke K., Magcam NV, Leuven (BE)	Gearless Electric Traction Systems for Commercial Vehicles and City Busses Dr. Klett S., Ziehl-Abegg Automotive, Kupferzell (DE)	3:30 PM
Coffee Break in Exhibition Hall 12		4:00 PM
Session 9: Room Zürich Optimized Magnet Assembly Processes	Session E-MOTIVE c: Room Amsterdam New Electric Traction Motor Concepts	
Optimized Magnet Assembly Algorithms for Reduced Rotor Unbalance Peter M., Karlsruhe Institute of Technology (DE)	Integration of Electronic Power Components for Electromobility Groß S., Conti Temic micorelectronic GmbH, Nuremberg (DE)	4:45 PM
Selective Assembly of Permanent Magnets for the Optimization of PMSM Meyer A., University of Erlangen-Nuremberg (DE)	Electrical Machine Design with Directly Cooled Laminated Fractional Pitch Windings Dr. Reinap A., Lund University (SE)	5:15 PM
Challenging Aspects of Magnet Assemblies van der Linden H., Bakker Magnetics, Son (NL)	Special Design and Manufacture Features for the Development of a Wound-Filed Synchronous Motor for Traction Applications Stuckmann C., MACCON GmbH, Munich (DE)	5:45 PM
Evening Reception at the Historic Townhall of Nuremberg		7:30 PM







	E DPC	E DPC
	Session 10: Room Paris Validation of Packaging Technologies	Session 11: Room London Power Electronics and Control Methods
9:00 AM	Influence of Punching Edges on the Self-Sensing Capabilities of Permanent Magnet Synchronous Machines with Different Rotor Topologies Quattrone F., Leibniz Universitaet Hannover (DE)	Design and Implementation of a Novel Model Predictive Control Algorithm for Permanent Magnet Synchronous Machines Dr. Serpi A., University of Cagliari (IT)
9:30 AM	Investigation of the Influence of Global Stresses and Strains on the Magnetic Properties of Electrical Steels with Varying Alloying Content and Grain Size Naumoski H., Daimler AG, Ulm (DE)	PWM Strategy for Common-Mode Voltage Reduction in Three-Phase Variable-Speed Drives with Active Front-End Dr. Videt A., University of Lille (FR)
10:00 AM	Investigation on the Mechanical and Electromagnetical Performance of a Squirrel Cage Induction Machine with Radially Laser Welded End Ring Connections Wolf M., Wieland Werke AG, Ulm (DE)	Pattern Recognition in Load Profiles of Electric Drives in Manufacturing Plants Reger A., Fraunhofer IPA, Bayreuth (DE)
10:30 AM	Coffee Break in Exhibition Hall 12	
	Session 13: Room Paris Properties and Processing of Electric Steel	Session 14: Room London Computer Integrated Machine Designs
11:15 AM	Rotary Cutting as an Alternative Method in the Processing of Electrical Steel Strip Hackert J., Vipem Hackert GmbH, Grünbach (DE)	Numerical 2D Methodology for Synchronous Reluctance Motor Rotor Design Armentia S., Mondragon University (ES)
11:45 AM	Towards Efficiency by a Systematic Approach – Efficient Design of Electric Motors by Numerical 'Design of Experiment' and Optimization Killat U., CADFEM GmbH, Grafing (DE)	Different Topologies for Linear Switched Reluctance Motor With Segmental Translator Dr. Ganji K., University of Kashan (IR)
12:15 PM	Examination of Magnetic Properties of Non-Oriented Electrical Steels Using Ring-type Specimens Dr. Lee S., POSCO Technical Research Laboratories, Pohang (KR)	<b>Design of High Performance Induction Motor</b> <b>through Multi Objective and Multi Domain</b> <b>Optimization</b> Ghosh S., Kirloskar Brothers Limited, Pune (IN)
12:45 PM	Lunch Break & Postersession in Exhibition Hall 12	
	Session 16: Room Paris  German Research Funding Focus on Drives Production	Session 17: Room London Innovative Reluctance Machines
2:15 PM	Effects of Twisted Windings on the Impedance of E-Traction Drives Vogt S., Technische Universitaet Muenchen (DE)	A Comprehensive Survey on Thermal Analysis of Switched Reluctance Motors Ramesh R., SSN College of Engineering, Tamil Nadu (IN)
2:45 PM	Introducing ESKAM - Electrically Scalable Axle Module Braeunlich H., Fraunhofer IWU, Chemnitz (DE)	Comparative Study Between Induction Motor and Synchronous Reluctance Motor for Electrical Railway Traction Applications Martínez de Pancorbo S., Mondragon University (ES)
3:15 PM	Analysis of Wear Behavior of Stamping Tools in the Production of Electrical Steel Sheets Kraemer A., Karlsruhe Institute of Technology (DE)	Synchronous Reluctance Motors With and Without Permanent Magnets for High Performance Low Cost Electrical Drives Dr. Serna Calvo E., Siemens AG, Bad Neustadt a.d. Saale (DE)
3:45 PM	Coffee Break in Exhibition Hall 12	
	Closing Session: Room London	
4:15 PM	Buehler Mechatronic Award: Muhr P., Buehler Motor GmbH, Nuremberg (DE)	
4:40 PM	Best Paper Award: Prof. Feldmann K., University of Erlangen-Nürnberg (DE)	
4:50 PM	Closing Words: Prof. Franke J., University of Erlangen-Nürnberg (DE)	

# TIME SCHEDULE Wednesday, September 16<sup>th</sup>, 2015 E | DPC





E DPC	<b>- □ E</b>  7	CEV
Session 12: Room Zürich Design of Electric Drives Production Systems	Session E TEVI: Room Amsterdam Dynamic Power Transfer Applications	
Return on Engineering – Design to Cost for Electric Engine Production Kleine Buening M., RWTH Aachen University (DE)	A Wireless EV / PHEV Charger With a New High Power Density Coil Design Dr. Turki F., Vahle GmbH & Co.KG, Kamen (DE)	9:00 AM
Worker Information Systems Using the Simulation Results of Physical Behavior for High-Voltage Harness Cables Fischer C., University of Erlangen-Nuremberg (DE)	Design of a Beamed Power Transfer System for Feeding Electrical Vehicles Prof. Takano T., Nihon University (JP)	9:30 AM
Economical Evaluation of a Modular Production System for Electric Traction Motors Sachs C., Fraunhofer Institute for Industrial Engineering IAO, Stuttgart (DE)	Compact 7KW Inductive Charging System With Circular Coil Design Dr. Schumann P., Robert Bosch GmbH, Stuttgart (DE)	10:00 AM
Coffee Break in Exhibition Hall 12		10:30 AN
Session 15: Room Zürich Planing of Electric Drives Production Systems	Session E TEV II : Room Amsterdam Electronics for Wireless Power Transfer	
Influence of Production Uncertainties and Operational Conditions on Torque Characteristic of an Induction Machine von Pfingsten G., RWTH Aachen University (DE)	The Energy-Pack APU-Replacement for Catenary Free Operation of Overhead Wired Busses Prof. Haerri V., Lucerne University of Applied Sciences and Arts (CH)	11:15 AM
The Value and Necessity of Using Environmental Direct Comparisons as a Simplified Life Cycle Assessment Method in Industrial Planning Processes Drechsel M., Audi Planung GmbH, Ingolstadt (DE)	Comparison of Magnetic Couplers for Inductive Electric Vehicle Charging Using Accurate Numerical Simulation and Statistical Methods Knaisch K., Karlsruhe Institute of Technology (DE)	11:45 AM
Industry 4.0 – Science Fiction or State of the Art? Examples of Existing Machine Communication in Electronics Manufacturing Services Muegge M., Viscom AG, Hannover (DE)	Innovative Processes and Quality Control Methods in the Production of WPT Pads Glaessel T., University of Erlangen-Nuremberg (DE)	12:15 PM
Lunch Break & Postersession in Exhibition Hall 12		12:45 PM
Session 18: Room Zürich Control Methods and Design of Electric Maschines	Session E TEV III : Room Amsterdam Broader Considerations for WPT	
Bonding Copper Terminals Onto DBC Substrates of Power Modules by Resistance Projection Welding Waltrich U., Fraunhofer IISB, Nuremberg (DE)	<b>Energy Transfer for Electric Traffic</b> Kurczveil T., TU Braunschweig (DE)	2:15 PM
Modeling and Power Flow Analysis of Cascaded Doubly-Fed Induction Machines Loehdefink P., Technische Hochschule Nuernberg (DE)	Grid Voltage Stabilation by High-Power Inductive Charging Wussow J., TU Braunschweig (DE)	2:45 PM
Benchmark Test of a Compact and Low Cost Axial Flux Machine Using Soft Magnetic Composite and Hard Ferrite Kobler R., Linz Center of Mechatronics (AT)	<b>Broader Considerations for Wireless Power Transfer</b> Prof. Meins C., TU Braunschweig (DE)	3:15 PM
Coffee Break in Exhibition Hall 12		3:45 PM
Closing Session: Room London		
Buehler Mechatronic Award: Muhr P., Buehler Motor GmbH	l, Nuremberg (DE)	4:15 PM
Best Paper Award: Prof. Feldmann K., University of Erlangen-Nürnberg (DE)		4:40 PM
Closing Words: Prof. Franke J., University of Erlangen-Nürnb	perg (DE)	4:50 PM

# **POSTERSESSION IN THE EXHIBITION HALL 12**

# Tuesday, September 15<sup>th</sup>, 2015 and Wednesday, September 16<sup>th</sup>, 2015

# A Novel Interior Permanent Synchronous Motor for a High End Ebike Drive Chain

Prof. Haerri V., Lucerne University of Applied Sciences and Arts (CH)

**Torque Ripple Minimization of Reluctance Synchronous Machines by Continuous and Discrete Rotor Skewing** 

Hubert T., Technische Hochschule Nuernberg (DE)

# Design of an Innovative Backlash Free Drive System for Rotation Tables

Koval L., Zentrum für Angewandte Forschung Ingolstadt (DE)

Innovative Developments for Automated Assembly and Fixation of Integrated Permanent Magnets in Rotors of Synchronous Machines

Mahr A., University of Erlangen-Nuremberg (DE)

# TECHNICAL TOURS Monday, September 14<sup>th</sup>, 2015

On Monday the participants of the E|DPC will have the opportunity to visit the research facilities of the University of Erlangen-Nuremberg.

	10:00 AM - 2:00 PM	EUR 100,
Research on Electric Drives	10:00 AM: University of Erlangen-Nuremberg Egerlandstraße 7, Erlangen	FREGNICHALEXANDER UNIVERSITÄT. BLANGEN-KURNBERG
	12:30 PM: E Drive-Center (Bavarian Technology Center for Electric Drives) Fuerther Str. 246b, Nuremberg	E Drive-Center  Experiches Technologiesestrum für elektrische Antriebstechnik

# **SPONSORS**

The Organizing Committee sincerely thanks the following organizations and companies for sponsoring E|DPC 2015:

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**IEEE** 

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# **Copper Sponsor**



Marsilli & Co. S.p.A.

www.marsilli.it

# **ON-SITE PLAN**

## Floor Plan

 $E|DPC\ 2015\ will\ take\ place\ at\ the\ NürnbergConvention Center (NCC) West and hall 12 of NuernbergMesse.$ 

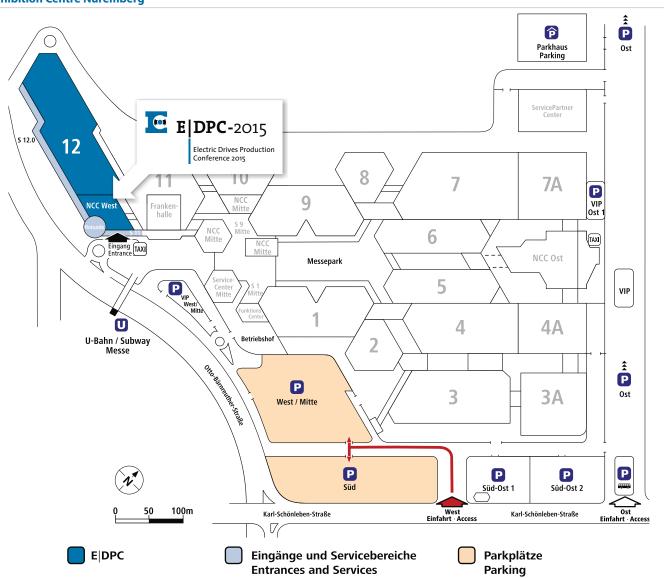
The subway station "Messe" is located at the west entry of the Nuremberg Exhibition.

# You will find the

- · Conference information desk located on level 0
- Exhibition taking place in hall 12
- · Exhibition information desk located in Press Center
- · Conference in level 2



# **Exhibition Centre Nuremberg**



# **EXHIBITION IN HALL 12**

# Tuesday, September 15<sup>th</sup>, 2015 and Wednesday, September 16<sup>th</sup>, 2015

The E|DPC Exhibition showcases components, semi-finished goods and materials as well as production-related cutting-edge processes in the production of electric drives and generators.

Meet German and international providers of this technology. Find out about the latest products, innovations and trends, as well as current issues to produce your electric drive or generator. You will receive trend-setting impulses for the use and processing of new materials, productive and flexible assembly technologies as well as innovative motor topologies and control concepts. Visit the exhibition in hall 12 and take the chance to meet new dialogue partners from industry and science.

The event will appeal to engine manufacturers, looking to strengthen their market position whether based on cost, quality or innovation, as well as to car manufacturers and suppliers, who want to systematically plan their entry into electromobility.

Producers of electric machines and electro-mechanic products receive comprehensive information regarding the production of electric drives.

# **Exhibition topics**

The structure of the product groups are based on the value-chain and the production-related cutting-edge processes in the field of the production of electric drives and generators.

#### Value-chain

- Components
- · Semi-Finished Goods and Materials

# Production-related cutting-edge processes

- Production Techniques / Manufacturing Facilities and Tools
- · Quality, Testing / Measurement / Diagnostic Systems
- Software
- · Electric Drives Manufacturing Services

# Register for your free entry ticket to the exhibition at www.edpc-expo.com/tickets with the code: 1512301042

# **Exhibitors (as of July 2015)**

ATOP SpA

Aumann GmbH

Bakker Magnetics B.V.

bdtronic GmbH

CirComp GmbH

DOMEL D.O.O.

**ELANTAS Beck GmbH** 

Forschungsvereinigung Antriebstechnik e.V. (FVA) im VDMA

Friedrich-Alexander-Universität Erlangen-Nürnberg, Lehrstuhl FAPS

GDG Gerätebau GmbH

**GKN Sinter Metals Engineering GmbH** 

Hans Mayer Elektrotechnik GmbH

**HEDRICH GmbH** 

Hübers Verfahrentechnik Maschinenbau GmbH

LCD LaserCut AG

MagCam NV

Marsilli & Co. S.p.A.

Meier Prozesstechnik GmbH

Rudolf Pack GmbH & Co. KG PACK Feindrähte

PMG Füssen GmbH

Scheugenpflug AG Dosier- & Vergusstechnologie

SCHLEICH GmbH

SICK Vertriebs-GmbH

SMZ Wickel- u. Montagetechnik AG

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# CONTACT MESAGO

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E-Mail: franziska.hesse@mesago.com

Web: www.edpc-expo.com

# **SOCIAL PROGRAM**

# Tuesday, September 15th, 2015

## **EVENING RECEPTION**

The E|DPC 2015 Evening Reception is an official stand-up reception, given by the Lord Mayor of the City of Nuremberg at the historic townhall of Nuremberg, Rathausplatz 2. Detailed technical discussions are guaranteed and accompanied by piano background music and a carried franconian buffet.

All conference participants and exhibitors are eligible to register free of charge for the attendance of the evening reception.

## **GUIDED WALKING TOURS**

Parallel to the evening reception several half-hour guided tours through the historic town of Nuremberg will be offered free of charge.



#### **BUFFET**

A regional buffet will be prepared and served.

# **AGENDA of the Evening Reception**

07:30 PM: Welcome Address

07:45 PM: **Opening of the buffet** 

08:30 PM: Guided Walking Tour A
08:45 PM: Guided Walking Tour B
09:00 PM: Guided Walking Tour A
09:15 PM: Guided Walking Tour B

# **HOTEL RECOMMENDATION**

For hotel recommendation please contact the tourist office Nuremberg:

Tel.: +49 (911) 2336 121 http://www.hotel.nuernberg.de

For your accommodation several hotels are booked all over the city. For prices and reservation, please use the reservation form on our website www.edpc.eu.

# **TOURIST INFORMATION**

Nuremberg Convention and Tourist Office Frauentorgraben 3 90443 Nuremberg

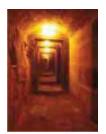
Tel.:+49 (911) 23360

http://www.tourismus.nuernberg.de/

# GUIDED WALKING TOUR A

# **Medieval Dungeons**

Just walk downstairs and take a tour through the vaulted cellars below the historic townhall, built in Nuremberg's golden age. Let these medieval dungeons and the feeling of being imprisoned in the Middle Ages give you some goose bumps.



# **GUIDEDWALKINGTOURB**

# Nuremberg Old Town

Take an exciting walk from the townhall, via the famous fountain "Schöner Brunnen" to the castle of Nuremberg. There you'll enjoy the beautiful view over Nuremberg.

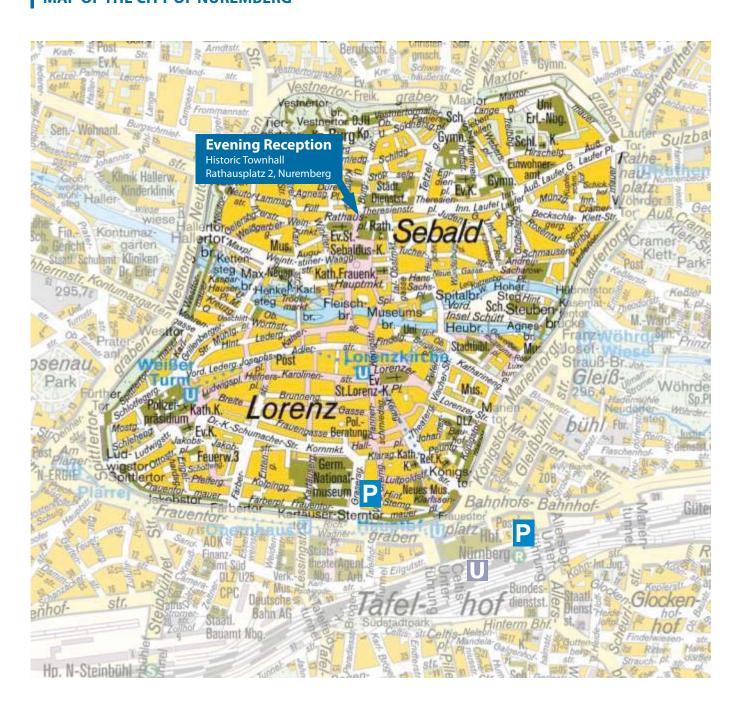


Coypright City of Nuremberg



Historic townhall of Nuremberg

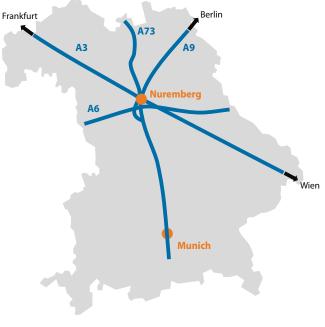
# **MAP OF THE CITY OF NUREMBERG**



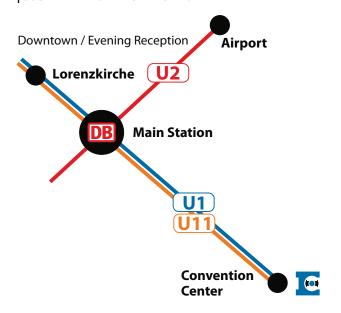


# **APPROACH**

# | HIGHWAYS TO NUREMBERG



# | SUBWAY LINES IN NUREMBERG



# BY CAR

You may reach E|DPC via car from the highway:

- A9: Take exit 52 Fischbach
- A6: Take exit 59 Langwasser
- A73: Take exit 34 Zollhaus

Your navigation system will find NuernbergMesse if you enter "Karl-Schoenleben-Strasse" as address or Messezentrum as a special destination.

# **| BY PUBLIC TRANSPORTATION**

To reach E|DPC from **Nuremberg Main Station:** 

- Take subway no. 1 or 11 in direction "Langwasser"
- Take stop "Messe"

# To reach E|DPC from **Nuremberg Airport:**

- Take subway no. 2 in direction "Roethenbach"
- Take stop "Main Station"
- Take subway no. 1 or 11 in direction "Langwasser"
- Take stop "Messe"

Please find more Information on the website www.vgn.de.

# | EVENING RECEPTION

To reach the E|DPC Evening Reception from the Convention Center by **public transportation**:

- Take subway no. 1 or 11 in direction "Fuerth"
- Take stop "Lorenzkirche"
- 5 min on foot towards "Hauptmarkt"

After crossing the market square, the historic townhall is located on the right hand side.

To reach the Evening Reception from the Convention Center by **car**, enter the address "Rathausplatz 2" as destination in your navigation system. The next parking garage is "Hauptmarkt" located in Augustinerstraße 4.



# **VENUE**

E|DPC 2015 will take place at the NuernbergConvention Center (NCC) West and hall 12 of NuernbergMesse on September 15<sup>th</sup> and 16<sup>th</sup>, 2015. For your accommodation several hotels are booked all over the city. For prices and reservation, please use the reservation form on our website www.edpc.eu. Nuremberg boasts a unique mixture of tradition and modern times. Both people born here and people who moved here appreciate its extraordinary quality of life. At the same time, Nuremberg is a modern city with 500,000 inhabitants, and the centre of a prospering European metropolitan region with 2.5 million inhabitants. Its almost thousand years of history are still obvious in its cityscape. Please find more information at www.nuernberg.de.

# Copyright City of Nuremberg



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# **EXHIBITION**

E|DPC 2015 will be completed by a focussed exhibition. Companies, research institutes and other organizations will be offered the opportunity to present their products and services to all participants. The exhibition is organized by the Mesago Messe Frankfurt GmbH. For any further questions regarding the E|DPC Exhibition please contact Ms. Franziska Hesse (franziska.hesse@mesago.com) or visit the website www.edpc-expo.com.

# **SPONSORSHIP**

Are you interested in supporting E|DPC 2015 and presenting your company or organization as a sponsor? E|DPC 2015 is the ideal platform for the individual advertising of your innovative products and services. For further information, please visit our website www.edpc.eu/sponsoring-partners.

# **REGISTRATION**

By fax: +49 (911) 5302 9070	Online: www.edpc.eu
By email: service@edpc.eu	

For the fax registration please use the following registration form:

Salutation	Title
First Name	
Last Name	
Company Name	
Department	
Street/Unit number	
Postal Code Cit	ty
Country	
Phone	
Fax	Mobile phone

# **CONFERENCE FEE**

email

Includes access to all conference sessions, access to the exhibition, participation at the evening reception, coffee and lunch breaks, conference proceedings (printed and electronic).

Standard Fee Reduced Fee*	o 980,- € plus VAT o 580,- € plus VAT
Voucher code:	
I also register for	

o Evening Reception (included)o Technical Tour 100,- € plus VAT

\* Reduced fee for International Program Committee members, speakers and university members. All prices plus VAT.

# **RELEASE FORM**

By registering to the E|DPC Conference you agree to store, administrate and use your personal data for the generation of your invoice and for informing you continuously about the latest research results and technology transfer activities of the Institute for Factory Automation and Production Systems (FAPS) of the University of Erlangen-Nuremberg and of Mesago Messe Frankfurt GmbH plus affilliates. Your personal data will not be transferred to third parties. If you do not wish to receive further information, please inform us immediately.

With the registration you also agree that photographs of your person can be taken during the E|DPC Conference. The University of Erlangen-Nuremberg shall have the non-exclusive, transferable, worldwide right in perpetuity to exploit such photographs in any and all forms, including, but not limited to reporting on the aforementioned conference.

Cancellations received in writing prior to August 1<sup>st</sup>, 2015 will be refunded less a 100,- € plus VAT administration fee. After August 1<sup>st</sup>, 2015 the fee will be fully charged.

# **Conference Organizer:**

E|DPC office, c/o FAPS-TT GmbH Fuerther Straße 246b, D-90429 Nuremberg

# **VENUE**

NürnbergMesse GmbH - NCC West Messezentrum, 90471 Nuremberg

Conference Coordinators

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email: service@edpc.eu web: www.edpc.eu