0th International

mposium on Automotive Technology & Automation

Florence, Italy 16th - 19th June '97

oid Prototyping in Automotive

Justries

Sponsored by the Rapid
Styping and Tooling Innovation
Sortium

gramme Committee Chair:sssor Hans-Jörg Bullinger, ctor IAO, Universität Stuttgart, nany and Mr Erich Bühler, dedes-Benz AG, Germany

Ser Applications in 3.9 Automotive 3.2 lustries

ponsored by The Laser Institute merica and by the Laser ciation, Russia

gramme Committee Chair:ohnny K Larsson, Body
meering Department, Volvo Car
poration, Sweden

The Largest European Automotive Forum with International Participation

Over 700 high quality refereed papers in 15 simultaneous dedicated conferences



		rage
PLENARY	?	
Generation	y-Government Partnerships Produce the Next Vehicles? Sperling, Director, University of California-Davis, USA	13
Safety and I	Forecasts in Motor Vehicle Kilometrage, Road Environmental Quality ornstra, SWOV Institute for Road Safety Research, The Netherlands	23
	Coatings - Dedicated to Car Lifetime Ierberts Automotive Systems, Germany	35
Industry	e Needs of a Changing Population - The Challenges for the Automotive ve, Head of Mobility Unit, Department of Transport, UK	47
MANAGE	MENT OF RAPID	
97RP002	Future Collaboration Between Controller And Design Engineer In The Development Process Professor P Horvath, Universität Stuttgart, Germany	55
97 RP 003	How to Improve Cost Planning For New Products By Using Prototypes As A Source Of Information Ms J Dittmar, Universität Stuttgart, Germany	65
97 RP 046	Rapid Prototyping In The Industry Mr W Zimmer, Cadform Engineering GmbH, Germany	73
97RP014	The Role Of Coordination In Collaborative Product Development Dr D Fisher, Dr J Warschat, Fraunhofer-IAO, Mr O Schumacher, Institute for Human Factors and Technology Management, Universität of Stuttgart, Germany	79
97RP015	Integration Of Knowledge Within A Development Team A Generic Hierarchical Model For Document Management Mr W Nogge, Fraunhofer-IAO, Germany	85
MANAGE	MENT OF RAPID PROTOTYPE PROCESSES	
97 RP 029	A Completely New Engine In 8 Months Mr B Peters, Mr R Theil, Mr C Bollig and Mr D Rompf, FEV Motorentechnik GmbH & Co. KG, Germany	91

		Page
97RP030	Development Of Complex Systems In Rapid Product Development Using Interval Parameters Ms P Marx, Mr J Kopsch and Professor Gisbet Lechner, Universität Stuttgart, Germany	99
97RP041	Concurrent Engineering Approach To The Die Design Of Metal Forming Processes Using Rapid Prototyping And Finite Element Analysis Mr K Park, Mr J W Yoon, Professor D Y Yang, Kaist, Korea and Mr J R Cho, Korea Maritime University, Korea	105
RAPID PR	ROTOTYPING	
97 RP 016	Advantages Of Using CNC Milling For Rapid Prototyping Mr A F Lennings, Delft University Of Technology, The Netherlands	113
97RP021	Process Enhancement Of Laser Caving Using Adaptive Optics Professor M Geiger, Mrs D Schubart, Dr P Hoffmann, Bayerisches Laserzentrum GmbH and Mr A Otto, Lehrstuhl für Fertigungstechnologie, Germany	121
97RP026	Tensile Tests, Thermal Measurements And Photoelasticity Observations Of Speciamens Produced By Stereolithography Technique (SLA) Professor R Ippolito, Mr L Iuliano, Polytechnic of Torino, Mr A Gatto, and Mr R Ricci, University of Ancona, Italy	129
RAPID PR	COTOTYPING TECHNOLOGIES AND MATERIALS	
97RP028	Rapid Prototyping With Integrated Assessment Of Producibility Mrs H Olschewski, Mr S Jais and Mr J Prenninger, PROFACTOR GmbH, Austria	137
97RP032	Rapid Prototyping And Tooling Strategies For Automotive Components Dr A Venus and Mr S van de Crommert and Mr S Pyi Soe, The University of Sunderland, UK	145
97 RP 033	Intelligent Control Of Laminated Object Manufacturing Machines Mr C Lee, Mr Y Feng Wang and Mr R L Roome, Kingston University, UK	153

		Pag
97RP038	Sand And Investment Cast Parts via The Selective Laser Sintering Process Mr K McAlea, Mr C Nelson, Mr U Hejmadi, DTM Corporation, USA and Ms S Seitz, DTM, Germany	159
RAPID PR	OTOTYPING TECHNOLOGIES AND MATERIALS	
97RP018	Rapid Tooling For Injection Moulding - How Close Are Injection Moulded Prototypes To Series Parts? Ms M L and Professor W Michaeli, Institut für Kunststoffverarbeitung, Germany	169
97RP040	Rapid Prototyping Of EDM Electrodes Of Zirconium- Diboride/Copper Mr W Bradley, Mr B Stucker, Mr P J Eubank, Mr S Norasetthekul, Mr E Kim and Mr B Bozkurt, Texas A&M University, USA	181
MAIN FO	CUS ON MATERIALS	
97 RP 004	Rapid Prototyping For Direct Fabrication Of Metallic Parts Dr Y P Kathuria, Laser X Co Ltd, Japan	185
97 RP 008	Tool Path Generation Of A 5-Axis Micro-Mailing Rapid Prototyping System Ng Peow, L Hui, G Haiqing, Nanyang Technological University, Singapore	193
97 RP 009	Rapid Prototype By Selective CO ₂ Laser Sintering Using Bronze Powder Professor J-D Kim and Mr B-C Jun, Inha University, Korea	201
97RP036	Rapid Prototyping Of Ceramic Tools For Injection Molding Mr C Marshall, Mr W A Ellingson, Argonne National Laboratory, Mr R Abramson, Ford Motor Company and Mr Y A Owusu, Florida State University, USA	209
97RP043	Flexible Tooling And Process Control For Rapid Production Of Sheet Metal Parts Professor D E Hardt, Professor M C Boyce and Dr D C Walczyk, Massachusetts Institute of Technology, USA	217

		Page
INFORMA	ATION TECHNOLOGIES	
97 RP 019	Sharing Engineering Design Across The Whole Supply Chain Mr A Fitzgerald, Syntera (part of BT), UK	225
INFORMA	ATION TECHNOLOGIES AND VIRTUAL PROTOTYPING	
97RP012	Presentation of Abstract and Geometrical Information Spaces For Cooperative Engineering with CAVEEE Ms M Wolber, Fraunhofer-IAO, Germany	233
97RP022	Blowmoulding Modelling On An Industrial Applications Dr G Adorni, ENEA, Italy	237
97RP031	Numerical Simulation Of Press Forming Laser-Welded Tailored Blanks Mr S Blair and Mr T Tran, British Steel Plc, UK	245
97RP042	ASN: Active, distributed Knowledge Base for Rapid Prototyping Professor D Roller, Mr M Bihler and Mr O Eck, Universität Stuttgart, Germany	253
97RP044	From Desktop To Virtual Reality: Analyzing The Thermal Comfort In A Car Cabin Using A Modular Virtual Prototyping Environment Mr D Rantzau, Professorr R Ruehle, Universität of Stuttgart, Germany	263

		Page
PLENARY		
97LA031	From Co ₂ to Nd:YAG Laser, Developments of Tools and Adaption to Production of Volvo 850 and C70 - Mr L Hanicke and Mr G Johansson	271
ROBOTICS	AND SYSTEMS DEVELOPMENT	
97LA014	Laser Welding in Car Body Production - Actual Status and Future Outlook Dr C Emmelmann, Dr T Föcking, Rofin-Sinar Laser GmbH, Germany	281
97LA032	Multispot - Welding with Nd:YAG-Laser Mr A Bachhofer, Mercedes-Benz AG, Germany	289
97LA035	Laser Welding Processing On The New BMW 5-Series Mr J Hornig, BMW AG	297
97LA004	Production Test of Aluminium Welding With Nd-YAG Laser at Volvo Olofstrom Plants Mr T Carlsson, Volvo Car Corporation, Sweden	305
97LA029	Flexible Manufacturing Laser Cell in Automotive Production Mr S-O Roos, Permanova Lasersystem AB, Sweden	315
PANEL DISC	CUSSION	
	CO ₂ Lasers Versus High Power Nd: YAG Lasers	
SIMULATIO	ON AND COMPUTING	
97LA018	Theory And Optimization Of Tailored Blank Welding With Laser Beams Dr AF H Kaplan, Mr J Zimmermann and Mr D Schuöcker, Vienna University of Technology, Austria	323
97LA021	Finite Element Simulations Of Residual Deformations Induced By Laser Welding Mr H Runnemalm and Dr L Karlsson, Lulea University of Technology, Sweden	329
97RP031	Numerical Simulation of Press Forming Laser-Welded Tailored Blanks Mr S J Blair and Mr T Tran, British Steel Plc, UK	337

		Pag
DEVELOP	MENTS AND APPLICATIONS IN WELDING	
97LA024	Laser Beam Welding of High Carbon Steels Professor U Dilthey, Dr U Reisgen, Mr F Lueder, and Mr A Wieschemann, Institut für Schweisstechnische Fertigungsverfahren, Germany	345
97LA005	The Role of Duty Cycle and Modulation in Al-Alloy Welding With High Power Nd-YAG Laser Dr Y P Kathuria, Laser X Co Ltd, Japan	355
97LA020	Welding Of Aluminium Alloys With A 4 kW CW Nd: YAG Laser Fitted With A 600 um Fibre Dr M Naeem, Lumonics Ltd, UK	361
97LA010	6-kW Nd:YAG Laser System for Welding Applications Mr T Beck, Mr G Bostanjoglo, Mr K Richter, Laser und Medizin Technologie Berlin GmbH and Mr H Alder, Technische Universitat Berlin, Germany	369
	ELOPMENTS AND APPLICATIONS IN MODIFICATION	
97LA027	Efficient Hardening with High-Power Solid-State Lasers Mr W Bloehs, INPRO, Germany, Dr F. Dausinger, Universitü Stuttgart, Germany	377
97LA028	A Research Of Special Optical Systems For Heat Treatments By CO ₂ Laser And Applications For Automotive Power Train Parts Mr M Mohko and M Kawashima Honda Engineering Company Japan	385
97LA013	Laser Processing Of Aluminium Automobile Parts With Powder Technologies Mr R Volz, Mr U Reichelt, Mr S Wolf, DLR Institute of Technical Physics, Mr Y T Pei and Mr T C Zuo, Beijing Polytechnic University, China	393
PROCESS O	CONTROL AND QUALITY MONITORING	
97LA015	A New Seam Tracking System For Welding 3-D Fillet Joints With ND:YAG Lasers Professor H K Tönshoff, Dr L Overmeyer and Mr A Ostendorf, Laser Zentrum Hannover eV, Germany	401

		Page
97LA009	Measurement Of The Objects With Spatially Isolated Surfaces By Multi-Reference-Fringe-Pattern Projection Method Dr L Zeng, Japan Science and Technology Corporation, Dr H Matsumoto, National Research Laboratory of Metrology and Dr K Kawachi, University of Tokyo, Japan	409
97LA026	Acurate Measurement Of Mechanical Deviation Using Laser Beams And Computer Vision Mr J Salvi, Mr P Ridao and Dr J Battle, University of Girona, Spain	415
97LA003	Laser Scanning Techniques for Automated Inspection Mr G F Dalgleish, Dr R James, Mr K H Randeree and Mr K G Swift, University of Hull, UK	423
97LA023	An On-Vehicle Non-Contact Automatic Tyre Tread Depth Analyser Dr B L Jones, Mr M Hawkins and Mr D Stollery, Sun Electric UK Ltd, UK	431
LASER MI	ETROLOGY	
97LA001	Investigation Of Cavitation Phenomena Inside Fuel Injector Nozzles Dr P Roosen, Mr O Unruch and Mr M Behmann, RWTH Aachen, Germany	439
97LA006	Automotive Fan Flow Analysis By Laser Doppler Anemometry Mr M Gasparetti, Universita di Ancona and Mr F Losi, Gate SpA, Italy	447
97LA012	Coherent IR Laser Detection For Remote Sensoring and Metrology Mr M L Simpson, Dr C A Bennett, Mr E B Grann, Mr D P Hutchinson, Mr R K Richards and Mr D N Sitter, Oak Ridge National Laboratory, USA	457
97LA030	Laser Metrology Of Products And Components With Delayed, Quasi-Real Time And Real Time Data Output Dr V Petrov, Consultant, Germany	465
LATE SU	BMISSIONS	
97LA011	Investigation of the Ideal Model of Gasoline Direct Injection Engine Through Spray, Flow and Flame Visualization Mr M-S Choi, Mr C-H Lee, Mr K-S Kim and Mr W-T Kim, Hyundai Motor Company, Korea	477
97RP024	Applications of a Hand-Held Scanner for Reverse Engineering of Automotive components Mr P Kingsland 3D Scanners Ltd. LIK	493