

# **INTERNATIONAL INSTITUTION FOR PRODUCTION ENGINEERING RESEARCH NEWSLETTER**

edited by the Technical Secretary  
**M. SANTOCHI**

N<sub>i</sub> 11 - October 1997

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## **From the Editor**

Dear Colleagues

I wish to inform you the next issue of the CIRP Newsletter is scheduled for

**April 1998**

All your contributions are welcome and will be considered for publication. For a fast and easy transmission of documents, you are invited to use the E-mail at the following address:

**santochi@itm.unipi.it.**

Please consider that the deadline for your contribution is

**March 15th 1998**

In addition I wish to remind you that CIRP has now a web site on Internet at

**<http://www.lurpa.ens-cachan.fr/cirp.html>.**

**Visit the site and test its potentiality !!**

A bibliographical research on CIRP annals by authors, by title and by keyword is possible, reading the text of the CIRP newsletter is also possible and more practical than receiving the yellow pages, links to WEB pages of CIRP members' labs are available and **links to your page are welcome !**

The Technical Secretary  
Prof. Marco Santochi

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## **AWARDS**

It is our pleasure to announce that our Colleague **Ehud Lenz**, Ph.D., Schlesinger Professor in Manufacturing Systems and Head of the Center for Manufacturing Systems and Robotics,

Department of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, has received the Meitner-Humboldt Research Award. This award has been granted to Prof. Lenz in recognition of his accomplishments in research and teaching. Humboldt Research Awards are granted to eminent foreign scientists in recognition of their research achievements and are intended to promote long- term cooperation between foreign and German researchers and their institutes. During 1997, Prof.Lenz will spend four months in Germany where he will cooperate with our colleague, Prof. Spur. Prior to this award, Prof. Lenz has received many other awards, including: CIRP F.W. Taylor Medal, SME Taylor Medal for Research, Charter Fellow of the SME and Fellowship of ASME, and the J. Wallenberg Foundation Scholarship from the Royal Engineering Academy of Sweden.

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It is our pleasure to announce that our Colleague **Richard L. Kegg**, Ph.D., of Cincinnati, Ohio, has been selected by the Society of Manufacturing Engineers (SME) to receive the 1997 SME Gold Medal. He is one of seven leaders in manufacturing engineering, management, education and research who has been honored with an SME 1997 International Honor Award on May 31 at the Westin Hotel, Seattle, Wash. The SME Gold Medal is awarded for contributions to the field by providing insight and understanding about important manufacturing issues to practitioners or to the general public. Dr. Kegg is vice president of Technology and Manufacturing Development at Cincinnati Milacron, Cincinnati, Ohio. He has provided outstanding service to the manufacturing engineering community and Cincinnati Milacron and is recognized for his technical knowledge, practical approach to manufacturing problems and his professional engineering practice. Dr. Kegg has provided technical leadership in many areas of machine tool development ranging from applied research on machining processes to the development of flexible manufacturing systems and cells. He has authored numerous publications which have demonstrated high professional standards in applying manufacturing technology to the needs of the manufacturing practitioner. In addition, Dr Kegg has served on national level advisory boards and has been a frequent participant in national level manufacturing studies. An active SME member since 1971, he is a past international director of the Society. As a registred engineer, Dr. Kegg was honored as an SME Fellow in 1992 . Dr. Kegg received his bachelor's degree, master's degree and doctorate in mechanical engineering from the University of Cincinnati.

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It is our pleasure to announce that the Council of the Institute of Materials has approved the upgrading of our Colleague Prof. **Hintermann** to Fellow (FIM).

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## Meetings, seminars and conferences





- Development
- CASE for CAD
- PMS
- EDM / PDM
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- Virtual Company
- Concurrent/Simultaneous Engineering
- Outsourcing
- Life Cycle Orientation
- Interaction between Virtual and Physical modelling
- Negotiation
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**Timetable:**

Submission of abstracts:	<b>24.10.1997</b>
Determination of contributions:	<b>12.12.1997</b>
Submission of final presentation:	<b>20.03.1998/</b>
Seminar	<b>14./15.05.1998</b>

**Call For Papers and Abstracts:**

Call For Papers can be ordered and abstracts be sent by e-mail: [cirp.seminar@ipk.fhg.de](mailto:cirp.seminar@ipk.fhg.de)

**Further information:**

Prof. Dr.-Ing. F.-L. Krause (Chairman)  
 Pascalstr. 8-9  
 D-10587 Berlin  
 Tel.: +49 (0) 30/3 90 06-2 43  
 Fax: +49 (0) 30/3 93 02 46  
 e-mail: [Frank-L.Krause@ipk.fhg.de](mailto:Frank-L.Krause@ipk.fhg.de)

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## Books and journals

Joint Press Release  
 by Nanyang Polytechnic and Springer Verlag Singapore  
 The Maturity of Asian Technologist in CIM

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"Singapore technologists are ready!" was Professor Andrew Nee's , Dean, Faculty of Engineering, National University of Singapore, confident response to a question raised on the maturity of Asian technologists writing for the international community. Prof Nee was speaking on the launch of a book entitled, The CIM Debacle: Methodologies to Facilitate Software Interoperability by Dr Valdeew Singh. Dr Valdeew Singh' s book is the first of its kind to be written by a Singaporean in the field of Computer Integrated Manufacturing (CIM). He completed his PhD in the area of CIM at Loughborough University of Technology, England. He is currently the Manager in charge of

research and development at the CIM Centre at Nanyang Polytechnic. The Centre is regarded as one of the few CIM research facilities in Singapore. It serves as a focal point for capability development and technology transfer for the benefit of the Polytechnic's students and the manufacturing industry. The book highlights the methodologies, software toolset and enabling mechanisms necessary to facilitate software interoperability, functional interaction and workflow management, and to overcome forms of functional modules. Aspects of enterprise modeling, integrating infrastructures to provide an architectural focus to facilitate systems integration, and systems life-cycle support are also covered. In addition, a 'proof-of-concept' integrated manufacturing system is presented in order to show how such a system can be effectively realised. Prof Nee is not alone on the view that Singaporeans, like Dr Valdeew Singh, have the capabilities to make their mark in new technologies. Professor Richard Weston, Head of Manufacturing System Integration Research Institute, UK and a world-renowned authority in CIM, stated that the "underlying concepts exemplified by Valdeew Singh's approach to software interoperability will be equally applied post the year 2000, when business objects and software components libraries have become an industrial reality". Dr Singh's work, therefore, transcends the 21st century and beyond the boundaries of Asia into the global market. Visit our web site at <http://www.springer.com.sg> for more information. Springer Verlag Singapore 7-III-A, Shreeneth Apts. L.T. Extension Road, Mulund (E), Mumbai 400 081. Tel No: +91-22-565 4304.

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## **Principles of Polymer Engineering**

Second Edition

N.G. McCrum, Department of Engineering Science, University of Oxford,

P.C. Buckley, Department of Engineering Science, University of Oxford,

C.B. Bucknall, School of Industrial and Manufacturing Science,

Cranfield University

Polymers have an important role in manufacturing and their engineering properties form an important part of any course in engineering. This revised and updated second edition develops the principles of polymer engineering from the underlying materials science, and is aimed at undergraduate and postgraduate students in engineering and material science. The opening chapters explain why plastics and rubbers have such distinctive properties and how these are affected by temperature, strain rate, and other factors. The book then explores how these properties can be exploited within these property constraints to produce functional components. Major changes for this second edition include an introductory chapter on the environmental impact of polymers, emphasizing the important issues, and substantially revised sections on fracture testing for toughened polymers, yield, processing, heat transfer, and polymer forming.

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## **Environmental Assessment of Products**

Chapman & Hall

Volume 1 - Methodology, tools and case studies in product development

By H. Wenzel, M. Hauschild and L. Alting

Institute for Product Development, Technical University of Denmark, Lyngby, Denmark<BR<

By M.Hauschild and H.Wenzel

Institute for Product Development, Technical University of Denmark, Lyngby, Denmark

This major two volume work presents a new decision making tool which enables manufacturers and scientists to undertake life cycle assessment (LCA) of new products from the design and development stages. The methodology allows the environmental consequences of a product to enter into decision making in the same way as traditional commercial parameters such as price, quality, etc. Significantly, it is in accordance with international consensus, as defined SETAC (Society of Environmental Toxicology and Chemistry) and ISO (International Organisation for Standardization). Moreover, the individual steps have been made operational through the creation of a collection of tools for assessment. The books are derived from the Environmental Design of Industrial Products (EDIP) programme organized by the Technical University of Denmark and five leading Danish companies. The project was sponsored by the Danish Environmental Protection Agency (EPA) and the Confederation of Danish Industries.

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## **From the labs...**

### **Integration of Heat Treatment into Machine-Tools by Using Advanced Grinding Technology (INTEGRITY)**

#### **Main Objectives**

Common industrial practice for the manufacturing sequence of high-quality steel parts consists of soft machining, hardening by heat treatment and hard machining in separate processes at different locations. This causes inflexibility, throughput disadvantages on time-to-order demands, increased logistic and co-ordination efforts and finally unjustified cost/benefit figures. The main objective of INTEGRITY is to develop an innovative grinding process for the integration of heat treatment, hardening and finishing of steel hardened parts into a single step operation. This new kind of heat treatment process, called grind-hardening, is based upon the induction of martensitic phase transformations caused by a well-aimed heat dissipation during grinding operations. Preliminary experimental investigations proved the capability of grind-hardening for surface strengthening of components. Aim of this project is to develop an adapted process environment like suitable tools, machine-tools and cooling/quenching media considering the industrial demands and to exploit the results to the structural parts selected by the end users. The consortium expects by establishing of this single step operation for heat treatment and machining a reduction of the average cycle times, of the energy consumption and also of the environmental pollution

#### **Work Topics**

To reach a broad fundamental knowledge about the characteristics and the performance of grind-hardening processes basic experiments under defined circumstances will be carried out at the beginning of the project. The most important impacts on the process behaviour and the interrelationships between the different parameters have to be determined. Parallel to the

experimental investigations an analytical approach to simulate the grind-hardening process by FE-based calculations of heat distribution and resulting phase transformations as well as by neural network based process modelling will be done. In the second stage of INTEGRITY real industrial parts have to be produced on experimental demonstrators for grind-hardening operations. To guarantee the stability and reliability of the process a further optimisation will take place with regard to the demands of specific components. Afterwards the grind-hardened parts will be submitted to tribological and fatigue tests to demonstrate their abilities and performance considering the operational loading.

### **Expected achievements**

Within INTEGRITY a machine-tool system concept suitable for grind-hardening will be developed. A new generation of adapted grinding wheels with selected grit and bonding media as well as advanced coolant media with adjustable quenching performance and wear reduction properties will be determined. Different software packages will be given for the simulation of heat dissipation in heat treatment by grinding, for the modal analysis of the machine-tool and for the process parameter correlation. After the successful settlement of the project, the strong exploitation interest of the partners is expected to come to a rapid integration of the new process in the industrial manufacturing sector.

### **Consortium:**

Bosch (DE) ; Danfoss (DK) ; Danobat (ES) ; Pfauter (IT) ; Tyrolit (AT) ; Burmah (DE) ; UoP (GR) ; IWT (DE, Coordinator)

### **Contacts can be made:**

Prof. Dr.-Ing. E. Brinksmeier  
University of Bremen  
Badgasteiner Str. 1  
28359 Bremen (GERMANY)  
Tel: +49-241-218-3218  
Fax: +49-241-218-3272  
e-mail: fb4fg06@zfn.uni-bremen.de