PROGRAM

of

THE 6TH INTERNATIONAL CONFERENCE ON ADVANCED MANUFACTURING TECHNOLOGIES ICAMaT 2009

Organized by:

University POLITEHNICA of Bucharest
Department of Machine Manufacturing Technology (**TCM**)
in cooperation with:
Romanian Academy of Technical Sciences
Technical University of Cluj-Napoca
Departament of Manufacturing Engineering
University of Ljubljana
Faculty of Mechanical Engineering
Poznan University of Technology
Institute of Mechanical Technology
University of Źilina
Departament of Automation and Production Systems
University of Novi-Sad
Faculty of Technical Sciences
Czestochowa University of Technology
Institute of Machines Technology

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Scientific papers in the fields:
MANUFACTURING TECHNOLOGIES
APPROACH ON CAD, CAM, CAE, CIM TECHNIQUES
CONCURRENT ENGINEERING
PRODUCTION QUALITY
PRODUCT DESIGN, TECHNOLOGICAL EQUIPMENT, AUTOMATION AND ROBOTICS
MANAGEMENT, MARKETING AND PRODUCTION PLANNING
CUTTING PROCESSES, CUTTING TOOLS
FORMING TECHNOLOGIES
NANOTECHNOLOGIES AND NONCONVENTIONAL SYSTEMS

8th – 10th October 2009
Cluj-Napoca, Romania

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CONFERENCE PROGRAM

Wednesday, October 7th, 2009

16^{00} - 20^{00} Registration – *Students' Culture House –Room 23 (Lucian Blaga Square, No 1-3)*

19^{30} - 22^{00} Welcome cocktail
Students' Culture House -Transilvania Hall

Thursday, October 8th, 2009

08^{00} - 09^{30} **Registration** – *Students' Culture House –Room 23 (Lucian Blaga Square, No 1-3)*

09^{30} – 10^{30} **Opening Ceremony** – *Students' Culture House - Europa Hall*

10^{30}-11^{00} Coffe Break – *Students' Culture House*

11^{00}- 13^{00} **Plenary Session** – *Students' Culture House -Europa Hall*

1. **HIGH SPEED ELECTRIC GRIPPING THAT COMBINES COST AND ENERGY EFFICIENCY WITH EASE OF USE.**
   Joachim LIEHR
   General Manager DE-STA-CO

2. **THE EMOTIONAL INTELLIGENCE IN A TECHNICAL FACULTY**
   Prof..Eng. *Dan-Maniu DUŞE*, PhD, Vice-Rector, Prof..Eng. *Sonia DUŞE*, PhD - "Lucian Blaga" University of Sibiu, Machine Manufacturing Science Department, Bd. Victoriei 10, 550024, Sibiu, Romania

13^{00} - 14^{30} Lunch Break

14^{30} - 16^{00} **Section S 1** *(Room 26)*

16^{00} - 16^{30} Coffee Break

16^{30} - 18^{00} **Section S 2** *(Room 26)*

19^{30} Welcome Party *(Victoria Hotel)*

Friday, October 9th, 2009

09^{30} - 11^{00}	**Section S 3** *(Room 26)*
11^{00} - 11^{30}	Coffee Break
11^{30} - 13^{00}	**Section S 4** *(Room 26)*
13^{00} – 13^{15}	**Closing Ceremony** – *Students' Culture House - Europa Hall*
13^{15} – 14^{30}	Lunch Break – *Transilvania Hall*
15^{00}	Trip to Traditional Transylvanian Castle

Saturday, October 10th, 2009

Cultural Program

CONTENTS

SECTION 1
MANUFACTURING TECHNOLOGIES, CUTTING PROCESSES, CUTTING TOOLS AND FORMING TECHNOLOGIES

Room 26, 14^{30} - 16^{00}, Thursday, October 8th, 2009

Chairmen:
Prof. Slobodan NAVALUŠIĆ, University of Novi Sad, Serbia
Prof. Paul Dan BRINDASU, Lucian Blaga University of Sibiu, Romania
Prof. Eugen STRAJESCU, University POLITEHNICA of Bucharest, Romania
Prof. Aurelian VLASE, University POLITEHNICA of Bucharest, Romania

1. RELATIONSHIP BETWEEN THE SURFACES' ROUGHNESS AND THE PRECISION OF THE TECHNOLOGICAL SYSTEM

Husen AL SAHOU[1], Aurelian VLASE[1] and Ovidiu BLĂJINĂ[1]

1 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 6, Bucharest, Romania;

ABSTRACT: The paper presents certain experimental results obtained by means of two types of lathes in order to establish the relationship between roughness of processed surfaces R_a and the precision of the technological system 6σ.

The processing works were accomplished using the steel OL 50, applying a certain splintering regime corresponding to finishing operations, by using standard knifes with the active part made of P10 Carbide. All equipments and measuring devices involved are in the endowment of the Department of Machine Manufacturing Technology from University POLITEHNICA of Bucharest.

KEY WORDS: roughness, precision, technological system.

2. New functions of the surface roughness when cutting the stainless steel 8NiCr130 and OLC45

Husen AL SAHOU[1], Maturin SIME[1] and Aurelian VLASE[1]

1 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 6, Bucharest, Romania;

ABSTRACT: The paper presents the experimental results and their evaluation when cutting the stainless steel 8NiCr130 and standard steel OLC45, the latest as for comparison. Later on, the regression mathematical relations for roughness Ra are determined, as a function of cutting process parameters, using a standard finishing cutting tool. The study contains three tables, two regression functions and six graphs with the roughness Ra variation, according to the evolution of cutting parameters.

KEY WORDS: roughness, cutting, regression.

3. MILLING FORCES STUDY

Livia Dana BEJU[1], Paul Dan BRINDASU[1], Nicolae Dorel PARAIAN[1]

[1] Lucian Blaga University of Sibiu, Engineering Faculty, Manufacturing Science Department, 4 Cioran code 550025, Sibiu, ROMANIA;

ABSTRACT: The present paper reveals the most important studies related to the forces models of the milling operation. Most of the models offer relations about medium tangential force. It is known that the force variation in time is also very important. A greater medium force but with a small force variation in time can be better than a small medium force but with a high variation. A model that described the instantaneous force was elaborated. Software written in JavaScript language allows simulation of the tangential force that acts on the cutting tool and on the tangential and vertical forces that act on the workpiece and its devices. The variation of the locating angle of the mill deformation offers interesting information for further studies about the quality of the milled surfaces.

KEY WORDS: milling, force, model, chip thickness.

4. Application of Knowledgeware Technology to Helical Surface Modeling

Saša ĆUKOVIĆ[1], Goran DEVEDŽIĆ[1], Suzana PETROVIĆ[1]

1Faculty of Mechanical Engineering Kragujevac, University of Kragujevac, Department of Production Engineering, Sestre Janjić 6, Kragujevac, Serbia.

ABSTRACT: According to the specific requirements in automotive industry and adopted principles of CAD modeling using macros, a parametric model of involute helical surface that corresponds to skeletal cylindrical helix is developed. This model represents knowledge and experience of designers through definition of relational dependences, rules, checks, mathematical laws and other functional features which represent essential knowledge.

In interaction with PLM system, macro enables user to set and manage parameters, observe execution of all commands according to initial values and automatic tool profile generation aimed at determination of parameters for helical surface grinding. Effects of KAx technologies application are reflected to increased effectiveness, creativity and quality.

KEY WORDS: KAx technologies, Macros, Skeletal Helix, Helical Surface, Grinding Tool

5. STUDY CONCERNING THE TYPE OF PARTS USED IN THE MACHINE BUILDING AREA

Roxana GREJDANESCU[1], Eugen STRAJESCU[2]

[1]SC ICTCM SA – Mechanical Engineering and Research Institute, Sos. Oltenitei, no. 103, sector 4, Bucharest, Romania - engineer; Polytechnic University of Bucharest, IMST, Splaiul Independentei, no. 313, sector 6, Bucharest, Romania - PhD student at University

[2]Polytechnic University of Bucharest, IMST, Splaiul Independentei, no. 313, sector 6, Bucharest, Romania - Professor

ABSTRACT: In the methodology of configuration for a new machine tool concept, is starting from a study of representative parts, respectively specific surface of those parts and assurance of possibilities for generating the surfaces. The diversity of the parts which can be processed is huge, but they can be grouped function of their type, function of their constructive and functional characteristics and o the processing technologies. In this paper,

they will be presented the main characteristics of the main types of parts, which are used in the machine building industry. Also there are presented some aspects concerning the complex surfaces which can be processed on CNC machine tools.

KEY WORDS: parts, machine building, processing, machining.

6. CONCEPT OF THE VIRTUAL MANUFACTURING

Slobodan NAVALUŠIĆ[1], Zoran MILOJEVIĆ[1] and Milan ZELJKOVIĆ[1]

1 University of Novi Sad, Faculty of Technical Sciences, Trg D. Obradovića 6, 21000 Novi Sad, Serbia

ABSTRACT: Basic hypothesis of this paper is that the virtual engineering concept significantly decreases time and costs necessary for the product development and increases its quality and market competition. In the paper, also, basic information about virtual engineering components: environment, product and manufacturing are given and emphasized theirs great significance on the concept development. At the end a part of the results, of the virtual manufacturing field, realized at the Faculty of technical sciences of Novi Sad, is shown.

KEY WORDS: virtual engineering, virtual manufacturing, digital mock up – DMU. NC verification

7. STUDY OF THE MILLING FORCES AND DEFORMATIONS IN THE MANUFACTURING OF PARTS WITH THIN WALLS

Ioan TĂNASE[1], Adrian GHIONEA[1], Ionuț GHIONEA[2] and Raluca NIȚĂ[1]

1 University POLITEHNICA of Bucharest, Department of Machine and Manufacturing Systems, Splaiul Independentei 313, 060042, Sector 6, Bucharest, Romania;

2 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 6, Bucharest, Romania;

ABSTRACT: In the paper are presented some results of experimental and by simulation researches in the CAD-CAM field concerning the processing by milling of plane surfaces using end mill tools and establishing the values of the cutting force components. It is used a modern dynamometer and a data acquisition system for the cutting forces measurement. The elastic

deformation and the stress values of the processed part are determined by experimental tests and simulated FEM analysis. Depending on the data that geometrically define the part and the cutting tool, their materials and the cutting parameters are set values of the cutting force and power. There are presented the results of values comparison obtained by measuring during the process with those established by applying FEM. This study results lead to some remarks and useful recommendations for determining the process parameters and the imposed conditions for the technological system in the processing of parts having thin walls with minimum deformations.

KEY WORDS: thin wall milling, cutting conditions, force measuring, stress and deformation analysis.

8. NEW RELATION OF THE CUTTING FORCES FOR TURNING OF THE STAINLESS STEEL 8NICR130

Aurelian VLASE[1], Maturin SIME[1] and Constantin Minciu[1]

1 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 6, Bucuresti, Romania;

ABSTRACT: Due to their exceptional characteristics of durability, hygienic, recyclable and low percent of toxicity characteristics, the stainless steels remain one of the most used groups of materials around the world. In order to ease the researches carried out and the decisions making process when selecting the optimum material within a technological process, it is crucial to understand the mathematical functions of cutting process during various operations. The paper presents a series of experimentally found data concerning the turning of the stainless steel 8NiCr130 and the ways and means to determine the cutting forces with respect to the specific working conditions. The experimental data and their subsequent processing represent the contribution of the authors to the estimation of the polytropic exponents and to the assessment in terms of structure of the cutting forces equation. Afterwards, the paper presents the graphs for the variation of the cutting force components with the parameters of the cutting technology. The obtained results can be implemented in further research, in order to increase the productivity of steel machining.

KEY WORDS: turning, cutting force, stainless steel, polytropic exponents

SECTION 2
MANAGEMENT, MARKETING, PRODUCTION QUALITY AND PLANNING

Room 26, 16^{30} - 18^{00}, Thursday, October 8th, 2009

Chairmen:
Prof. Dan-Maniu DUŞE, Lucian Blaga University of Sibiu, Romania
Prof. Corneliu NEAGU, University POLITEHNICA of Bucharest, Romania
Prof. Constantin MILITARU, University POLITEHNICA of Bucharest, Romania

1. CALCULATION OF MANUFACTURING COST FOR PISTONS ON CONVENTIONAL MACHINE TOOLS AND NC equipment

Adrian Alexandru BREAZU[1], Aurelian VLASE[2],Gabriela MORGAN[3]

[1]Timpuri Noi Factory, Splaiul Unirii 165, 30133, sector 3, Bucharest, Romania
[2] University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 5, Bucuresti, Romania.
[3] University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 5, Bucuresti, Romania.

ABSTRACT: This article presents a procedure that provides an instrument for determining what could be the best recommended technologies and machine tools to be purchased, that would be considered mostly cost efficient, so as to yield the maximum economic efficiency on the investment made in the case of a piston manufacturing that is part of a motor set assembly.

Two comparative alternatives have been provided here: one working on classical machine tools and the other working on numerical control equipment. When preparing the calculations, all the elements were considered that generally affect the manufacturing cost, such as: material, labour at mechanical machining, pay off on the equipment and the machine tools, checking tools and devices, indirect expenses, fixed and variable expenses, expenses for preparation and completion of manufacturing, etc. The calculation of savings has been prepared, which are obtainable in the case of a real situation of piston manufacturing at the „Timpuri Noi" factory of Bucharest.

KEY WORDS: cost, conventional machines, NC equipment, piston

2. SCHEDULING OF JOB-SHOP PRODUCTION PROJECTS WITH MICROSOFT OFFICE EXCEL

Mădălin CATANĂ[1], Corneliu NEAGU[1] and Sergiu TONOIU[1]

1 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 6, Bucuresti, Romania;

ABSTRACT: This paper presents a computer application developed within a Microsoft Office Excel workbook for performing job-shop scheduling tasks concerning production projects. Scheduling workbook includes three worksheets and several Visual Basic for Applications (VBA) code modules. The main worksheet of scheduling workbook is organized with cell ranges for data input through user typing and cell ranges for application output through provided cell formulas or through VBA procedures initiated by user. Several command buttons for performing complex scheduling steps are available on the main worksheet and one command button is provided for centralizing data inputs and outputs on a separate preformatted sheet. An empty worksheet for preserving temporary data needed by the application during complex scheduling steps is also included in the workbook. For a target production project, the developed computer-aided scheduling (CAS) application can deliver a complete Critical Path Method (CPM) analysis and eight scheduling scenarios amongst which user may choose the most suitable one in terms of his criteria. To prove the functionality of scheduling workbook and the quality of its outputs, an example production project is treated within the paper.

KEY WORDS: Scheduling, CAS systems, CPM analysis, Time- and resource-constrained scheduling scenarios.

3. THE EMOTIONAL INTELLIGENCE IN A TECHNICAL FACULTY

Dan-Maniu DUŞE[1], Carmen Sonia DUŞE[2]

1 "Lucian Blaga" University of Sibiu, Machine Manufacturing Science Department, Bd. Victoriei 10, 550024, Sibiu, Romania;

2 "Lucian Blaga" University of Sibiu, Teacher Training Department, Bd. Victoriei 10, 550024, Sibiu, Romania.

ABSTRACT: Within the last twenty years, the problem of education gained new dimensions. These did not go unnoticed by the academic management personnel, as it is known that the promotion of these concepts gave a new sense

to the human personality and explained many of the apparently contradictory problems. The paper started from the analysis of the cultural dimensions at the Faculty of Engineering of the "Lucian Blaga" University of Sibiu, resulted from earlier studies, in order to monitor the manner in which these reveal the presence or absence of emotional abilities. The hypotheses from which the study started can be expressed as follows:

- Cultural dimensions can reveal the emotional intelligence
- Some cultural dimensions are even predictors of the existence of EI.

In order to check these hypotheses, a research was initiated on the dimensions of the emotional intelligence of professors from the Faculty of Engineering of Sibiu, using scientifically validated questionnaires.

KEY WORDS: Emotional intelligence, organisational culture, engineering, academic staff.

4. TRACEABILITY ASPECTS OF THE CAPABILITY CONCEPT OF MANUFACTURING PROCESSES

Constantin MILITARU[1] and Marieana CERNAT[2]

1 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 5, Bucuresti, Romania;

2 Ministry of National Defence, Estate and Infrastructure Division, Intrarea Drumul Taberei 7-9, 061418, Sector 6, Bucuresti, Romania.

ABSTRACT: The paper deals with the capability issue of the manufacturing processes, which represents the fruit of the synergetic effect between the engineering thinking and appropriate putting into practice of the specific mathematical statistics methods. Having the quantitative measure of a manufacturing process, approached for the first time by W. A. Shewhart in the ***1920s*****,** as a starting point, the authors present succinct the capability concept evolution, which represents, actually, the measurement of functional ***parameters (or s***tatic***)*** of the generated product and not the process itself.

KEY WORDS: Traceability, index, capability, manufacturing process, performance.

5. SIX SIGMA METHOD EXTENSIONS TO QUALITY IMPROVEMENT OF PRODUCTS DESIGN

Constantin MILITARU[1] and Marieana CERNAT[2]

1 University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 5, Bucuresti, Romania;

2 Ministry of National Defence, Estate and Infrastructure Division, Intrarea Drumul Taberei 7-9, 061418, Sector 6, Bucuresti, Romania.

ABSTRACT: The paper deals with some aspects related to the applying of the Six Sigma method principles to products design. It highlights the design risks that are associated with the classical methods of tolerance analysis, and introduce Six Sigma method that will eliminate these risks. The paper also presents how the Six Sigma method can improve the product development process and help companies focus on developing and delivering near-perfect products. The Six Sigma method is becoming a proven approach for businesses and organizations to improve their performance.

KEY WORDS: Six Sigma, defect, process, design, performance.

6. SOCIAL ISSUES AND SOCIALLY RESPONSIBLE INVESTMENT BEHAVIOR: AN EXPLORATORY STUDY

Gheorghe MILITARU[1]

[1] University POLITEHNICA of Bucharest, Department of Management, Industrial Management Chair, Splaiul Independentei, no. 313, 060042, Sector 6, Bucharest, Romania;

ABSTRACT: The author present in this paper the results of an exploratory study whose purpose is to determine the main social issues and socially responsible investment behavior of the companies. In this paper, we propose a new way to look at the relationship between business and society that does not threat corporate success and social welfare as a zero-sum game. The paper focuses on: (1) integrating business and society, (2)

investments in social value creation, and (3) increasing the value chain social impact. Technology today can deploy new business processes that support environmentally sound practices and reduce costs by conserving energy and other natural resources. Each company can identify the particular set of societal problems that it is best equipped help resolve and from which it can gain the greatest competitive benefit. This paper provides knowledge which may be useful in the programs promoting CSR in Romania.

KEY WORDS: corporate social responsibility, social reputation, social standards, absorptive capacity

7. INTEGRATED MANAGEMENT SYSTEMS-IMPLEMENTATION ANALYSIS IN ROMANIAN CONTEXT

Cristina SZUDER[1]

[1] - *AFAQ AFNOR INTERNATIONAL RO SRL*
B.dul Ion Ionescu de la Brad, nr.61 - 63, ap.18, sector 1, Bucuresti, Romania

ABSTRACT: The concept of Integrated Management Systems - IMS entails the integration of different management systems which are implemented by organizations. As more and more management systems has emerged is has become increasingly relevant to discuss how these different management systems can be integrated.
IMS is a relevant topic because it is a relatively new concept and the literature regarding IMS is very scarce, particularly in relation to Romania context.
This paper part of a Ph D thesis, seeks to analyze the concept of Integrated Management System (IMS) and analyze the use of IMS in particularly in Romanian SME's and bring a contribution to the set-up of a new definition of the policy and the objectives of the IMS
KEY WORDS: Integrated Management Systems –IMS, ISO 9001, ISO 14000, OHSAS 18001.

8. QUALITY SYSTEM FOR PRODUCTION SOFTWARE – QSPS

Nicolae TUDOR[1], Claudiu KIFOR[2] and Constantin OPREAN[3]

[1] Continental Automotive Systems S.R.L – Team Leader Test Department
[2] "Lucian Blaga" University of Sibiu, Director of the research department
[3] "Lucian Blaga" University of Sibiu, Rector

ABSTRACT: The implementation of the production software is realized, at the moment, based of software techniques and strategies. These software implementation methods do not consider the product quality norms which have to be achieved by the production, a very important criterion to get a qualitative product. The quality level of the product should fulfill the minimum requirements of the customer. The non compatibility with the quality requirements of the product of the implemented software cause in many times completely rework of the software. This paper presents a project for developing a system approach for controlling the implementation of the production software which has to comply with the requirements of the product quality norms. The purpose of the project is to develop a quality tool for the production software, as part of manufacturing process development, in order to assure a properly running of the production and a high quality product, accordingly to the customer requirements.

KEY WORDS: capability, robustness, reliability, ergonomics, control.

SECTION 3
NANOTECHNOLOGIES, NONCONVENTIONAL SYSTEMS AND AND NEW MATERIALS.

Room 26, 09^{30} - 11^{00}, Friday, October 9th, 2009

Chairmen:
Prof. Dan NANU, Lucian Blaga University of Sibiu, Romania
Prof. Niculae Ion MARINESCU, University POLITEHNICA of Bucharest, Romania
Conf. Daniel GHICULESCU, University POLITEHNICA of Bucharest, Romania
Prof. Mihail TITU, Lucian Blaga University of Sibiu, Romania

1. MODELING THE MECHANICAL BEHAVIOR OF COMPOSITE SANDWICH PLATES

Ovidiu BLĂJINĂ[1], Adrian MARINESCU[1] and Constantin OPRAN[1]

[1] University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 6, Bucharest, Romania;

ABSTRACT: The products made of composite materials (particularly sandwich composites) are used in more and more fields (aviation, transport, energy, medicine, chemistry, consumer goods etc.) because of their characteristics such as reliable, resilient, low cost etc. Designing sandwich composites products, which meet the requirements demanded by customers, not be done without knowing their physico-mechanical properties. With this object in view, the present paper establishes the equations for the mechanical behavior of composite sandwich plates.

KEY WORDS: composite sandwich plate, strain field, stress field.

2. COMPARISON BETWEEN GAS BUBBLE LIFE DURATION AT CLASSIC AND ULTRASONIC AIDED edm FINISHING

Daniel GHICULESCU[1], Hans Peter SCHULZE[2] and Niculae MARINESCU[1]

[1] University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 5, Bucuresti, Romania;

[2] Otto-von-Guericke-University Magdeburg, Institute for Fundamental Electrical Engineering and EMC, Universitaetsplatz 2, D-39106 Magdeburg, Germany

ABSTRACT: The paper deals with elucidation of a secondary phenomenon, life duration of gas bubble formed around plasma channel at the discharge between surface of the tool and workpiece. Nevertheless, this phenomenon determines the amount of material removed by dielectric liquid. At classic EDM, life duration lasts much longer after the pulse end and the material melted by discharge is already solidified by the time of bubble collapse. At ultrasonic aided EDM, the gas bubble collapses at each end of dielectric liquid stretching semiperiod. Although, this phenomenon occurs at microscopic scale, it can be confirmed by high speed camera. This is the basis of the major improvement of machining rate at ultrasonic aided EDM at finishing and micromachining.

KEY WORDS: EDM, ultrasonics, bubble, machining rate.

3. RESEARCH REGARDING THE IMPACT BEHAVIOR OF SILICATE/CELLULOSE SANDWICH STRUCTURES

Adrian MARINESCU[1], Cătălina BIVOLARU[2], Constantin OPRAN[3] , Diana MURAR[4] , Victor PĂNUŞ[5]

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ABSTRACT: Research on design and manufacture of new materials products for building industry, aiming to obtain a price as low cost, quality and highest reliability. Using new materials products is a priority for both manufacturers and for customers.
Depending on the characteristics of the materials products, they have a wide use in various areas such as: machinery industry, aviation, aeronautics, civil, industrial, etc.
The objective of this paper is to analysis the impact behavior of sandwich structures with silicate and cellulose for the building industry.

KEY WORDS: behavior, sandwich structures, silicate and cellulose, building industry.

4. PERFORMANCES ENHANCEMENT of EDM+US through Finite element method

Niculae MARINESCU [1] and Daniel GHICULESCU[1]

[1] University POLITEHNICA of Bucharest, Department of Machine Manufacturing Technology, Splaiul Independentei 313, 060042, Sector 5, Bucuresti, Romania;

ABSTRACT: The paper deals with performances enhancement of electrodischarge machining finishing/micromachining aided by ultrasonic longitudinal oscillations of electrode-tool (EDM+US), consisting in increasing of machining rate with up to 500%, decreasing relative volumetric wear and machined surface roughness with up to 50%, comparing to classic EDM, under the same working conditions. The starting point of computerized Finite Element Method (FEM) that we used to improve EDM+US finishing performances is the understanding of the intricate process of material removal mechanism, followed by modelling and simulation of single discharges on different microtopographies, validation of results through comparison with available experimental data, optimization conditions of working parameters and finally, enhancement of main output technological parameters.

KEY WORDS: EDM, ultrasonics, finite element method.

5. EXPERIMENTAL RESEARCH FOR THE MODELLING THE ELECTRIC EROSION PROCESSING

Dan NANU[1], Constantin OPREAN[1] and Mihail TITU[1]

[1] LUCIAN BLAGA University of Sibiu, Department of Machine Manufacturing Technology, Victoriei Street no 10, 550024, Sibiu, Romania;

ABSTRACT: Appeared during the last decades, nonconventional procedures bridge the gap generated by the implementation in industry of certain metals that are difficult to process by classical procedures, by the increasing complexity of the work in this field, and as well by the higher productivity standards, especially in tool rooms. Initially promoted due to certain necessities of the military and space equipment industry, nonconventional processing facilities and technologies, because of their effectiveness, rapidly spread in the developed industries of the western countries and as well in our country. The paper present some case studies about the modelling the electric erosion processing with magnetic field.

KEY WORDS: modeling, optimization, quality, electric erosion processing, magnetic field.

6. PLASMA MECHANICAL PROCESSING – AN APPLICATION TO TECHNOLOGY PARADIGM

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ABSTRACT: This paper aims to present a philosophical approach to the concept of technology, a new approach to the concept of technology, a new approach to discover unexplored areas of technology, therefore its development. In connection with the process of knowledge development and thus the field, are introduced the concepts of paradigm and paradigm shift when resorting to limited processing by cutting with plasma heating (PMP).

KEY WORDS: technology, philosophy, paradigm, machining, plasma.

7. A CASE STUDY FOR THE OPTIMISATION OF THE NONCONVENTIONAL PROCESSING PROCEDURES

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ABSTRACT: The paper presents some experimental and theoretical research regarding rank I and rank II factorial experimental method employed in the process of quality assurance and management. Applications of this type are realized in collaboration with students from "Lucian Blaga" University of Sibiu, Romania, for example the Master Programme entitled Quality Management in discipline Experimental Research and data processing. Currently, the statistical processing of experimental or observation data is encountered almost in all sciences, from the social, medical or economic ones, up to engineering, physics, chemistry, biology or agricultural sciences. Approaching, consequently, experimental and theoretical problems, from a statistical point of view, led to valuable results in the most diverse fields of sciences which apply to the processing of experimental data. In all technical and economic fields, knowing phenomena and processes of any nature is based on the processing and the optimization of some information acquired after making some experiments.

KEY WORDS: Quality management, Factorial experiment, Statistical methods, Parameters, Experimental research.

SECTION 4
NANOTECHNOLOGIES, NONCONVENTIONAL SYSTEMS AND AND NEW MATERIALS.

Room 26, 11^{30} - 13^{00}, Friday, October 9th, 2009

Chairmen:
Prof. Octavian BOLOGA, Lucian Blaga University of Sibiu, Romania
Prof. Cristian DOICIN, University POLITEHNICA of Bucharest, Romania
Conf. Nicolae IONESCU, University POLITEHNICA of Bucharest, Romania

1. USING PROGRAMMABLE LOGIC CONTROLLERS IN PRODUCTION SYSTEMS

Radu-Eugen BREAZ[1], Octavian BOLOGA[1], Gabriel RACZ[1] and Laurean BOGDAN[1]

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ABSTRACT: This paper presents some aspects regarding the use of programmable logic controllers (PLC) to control production systems. The connections between components and various programming techniques for PLC's are also main topics of this work .The experimental research includes an application with an electro-hydraulic motion module suited for use in production systems, controlled by PLC. Hardwired control and flexible control schemes implemented by means of PLC are presented and compared.

KEY WORDS: automation systems, hardware, programmable logic controller, relays, software.

2. ECO-EFFICIENCY OF ENERGY USING PRODUCTS (EUPs)

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ABSTRACT: The paper presents the ecological and economical impacts of a household appliance in its entire life cycle. The researches have been focused on the eco-efficiency of the washing machines. Thus, the authors have analyzed the private household activity related to energy consumption in order to compare the consumer's behaviour by using the Life Cycle Analysis tool and to obtain coherent data regarding different behaviours. The article aims to the creation of a methodology allowing evaluating whether, and to which extent, various energy-using products fulfil the criteria established by the proposal for the selection of products.

KEY WORDS: EuP, eco-efficiency, life cycle assessment, design for the environment (DfE).

3. DEVELOPING THE CORPORATE IDENTITY FOR T.C.M. DEPARTMENT

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ABSTRACT: The present paper summarises the activities carried out for the development of a significant and powerful corporate identity for T.C.M. Department from POLITEHNICA University of Bucharest. In the beginning, the head of department and the identity team evaluated the state of the art of department's identity. Afterwards, there were established the aim and the objectives of the corporate identity development. The corporate identities of the corresponding departments were screened for assessment. A questionnaire was designed for the assessment of the T.C.M. department's mission, position, capabilities and values. The department

members filled the questionnaire and the results were statistically analysed. Using the questionnaire results, a number of 50 logotypes were generated. After successive trials and developments, 15 logotypes were chosen for the final selection. The department members were asked to rank the proposed logotypes. One logotype scored considerably high amongst the others. This logotype was analysed carefully and subsequently improved. Future developments of department's corporate identity are envisaged. There will be designed: business cards, letterhead papers, envelopes etc.

KEY WORDS: corporate identity, design, logotype

4. SKETCH FOR A HISTORY OF ROMANIAN INDUSTRIAL DESIGN

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ABSTRACT: This paper presents some important moments in the history of Romanian industrial design. The birth of every national industrial design is strongly linked to the period when the Industrial Revolution occurred in that particular country. In Romania, the Industrial Revolution took place at the beginning of the 20th century, so, it is considered that Romanian Industrial design was born at about 1900.
The industrial development in the first half of the 20th century marked the evolution of Romanian industrial design, but the evolution was conjunctional more or less. After the so-called communist revolution, the development of industrial design was more sustained and theoretical, but the real results were rather poor. In the recent years, Romanian graphic design made important steps forward to the international recognition.

KEY WORDS: industrial design, history

5. FLEXIBLE ASSEMBLY SYSTEM STRUCTURE AND CONFIGURATION OF INDUSTRIAL ROBOTS' COMPLIANCE DEVICE

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ABSTRACT: Mechanical assembly is one of he most important and interesting operations for the gripping and blocking devices, because the relative position between the blocked part and the outside fixed assembly must be precise and permanently monitored. Generally, the issue of putting an axletree into a borehole occurs frequently during the assembling operations. Usually, the difference between the bore's diameter and the tree's is very small. The parts to be later assembled may have considerable errors as regards position relative orientation. Assembly process involves solving position problems.

In robotics, compliance means the worker's ability and skill to react to the contact forces (or tactile stimuli) during a movement, so that the compliance system has to take over the contact reactions while two parts get assembled. In this work are analyses of the forces in the assembly process.

KEY WORDS: Industrial robot, Assembly process, Compliance system, Compliance device.

6. THE GAIT ANALYSIS OF NEW MODELS OF MERO MODULAR WALKING ROBOT

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ABSTRACT: Modular mobile walking machines represent a special category of robots. Walking robots better protect the environment, as their contact to the ground is discrete, which considerably diminishes the area undergone to crushing; the robot's weight can be optimally distributed all over the supporting surface, by controlling the forces. The performance of a legged system is closely related to the adopted gait. Among the many available gaits, the wave gait possesses the optimum stability and has been applied to walking on perfectly smooth terrain. The selection of the type of gait is a very complicated matter, especially in the real conditions of walking on the unarranged. Therefore, it is necessary that the terrain surface to be selected before the type of gait is chose. These new modular walking robots have three or more modules Every leg, with RRP structure, has three degree of freedom and a tactile sensor for detecting of the ground contact. In the work are analyzed the possibilities of determination of the limit conditions for the stable displacement of the walking robots

KEY WORDS: Walking robot, modular walking robot, gait, static stability.

7. OBTAINING THE PRODUCT QUALITY: APPROACHES AND CHARACTERISTICS

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ABSTRACT: Based on the model of process of product realisation created and tested by the authors containing 13 stages in principal, this article presents two approaches on product quality achievement in relation with the industrial manufacturing status: Off-Line product quality achievement, which means product quality achievement before start of industrial manufacturing and On-Line product quality achievement, which means product quality achievement in the process of industrial manufacturing. For each of the two approaches, this article identifies the principal methods, technics and instruments for quality achievement, such as QFD, Optimizing of the Signal/Noise ratio, TRIZ, Experiment Design, Loss of Quality Function etc. Based on exemples from western and eastern companies, this article provides a survey of the essential characteristics of these two approaches using several criteria, such as: number of solutions, effort and cost required for the intended product quality achievement.

KEY WORDS: Product Development, Robust Design, Off-line and On-line Quality.

8. LIQUID LEVEL MEASUREMENT BY IMAGE ACQUISITION AND PROCESSING

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ABSTRACT: The paper is describing some steps followed while designing the software component of an image acquisition and processing system

used for liquid level measurements in bottles on a production line. The main steps for transforming the acquired image into a black and white image in which the relevant areas are clearly separated were first experimentally determined using a specialized software package. The resulting script was transformed into a graphical programming language diagram and specialized functions and procedures were added to the initial algorithm for performing the image measurements and determining the required characteristic, the liquid level.

KEY WORDS: liquid level, image acquisition and processing.