



TABLE OF CONTENTS	i
RECTOR OF MCBU	ix
PROF. DR. AHMET KEMAL ÇELEBİ	
DIRECTOR OF MANİSA CELAL BAYAR UNIVERSITY ÜSİTEM	xi
ASSOC. PROF. DR. OSMAN ÇULHA	
DIRECTOR OF MANİSA CELAL BAYAR UNIVERSITY TECHNOPARK	xiii
PROF. DR. HÜSEYİN AKTAŞ	
COORDINATOR OF WORKPLACE APPLICATION TRAINING	xv
PROF. DR. KENAN YALINIZ	
DIRECTOR OF MCBU DEFAM	xvii
ASSOC. PROF. DR. MUSTAFA ESKİCİ	
KOCAER GROUP	xix
TOPICS	xxiii
INVITED SPEAKERS	xxiv
EDITORS AND ORGANISING COMMITTEE	xxv
HONORARY AND SCIENTIFIC COMMITTEE	xxvi
ORGANISING AND SUPPORTING INSTUTIONS	xxvii
SUPPORTING INSTITUTIONS	xxviii
PARTICIPATING UNIVERSITIES AND INSTITUTIONS	xxix

A. ORAL PRESENTATIONS

UTILIZATION OF NUMERICAL SIMULATION IN ADDITIVE MANUFACTURING M. WOHLMUTH, H. SCHAFSTALL, A. BUIJK, M. AYGEM and C. ÖNDER	1
CASTING BODY BASED SHEET METAL MOLD DESIGN AND PROTOTYPE MANUFACTURING O.FALAK and G. GUNESGORMEZ	2
PROCESS AND MOLD DESING OF NEW GENERATION LED LIGHTING METAL PANEL S. HANOGLU and I. BULUR	3
DEVELOPMENT OF SMART PHONE ANTENNAS FOR 4G/4.5 G TECHNOLOGY WITH UNIVERSITY-INDUSTRY COOPERATION B. ÖZBAKIŞ, K. YEĞİN, M. SEÇMEN and S. OKUYUCU	4
DISPLAYS INTEGRATED WITH SMART WINDOWS E. KEMIKLIOĞLU and B. ÖZBAKIŞ	5
ELECTROSTATIC HAPTIC Ö.TAMER, B.KIRIŞKEN, T.TÜRKORAL and Ö.ÖZDEN	6
COMPUTER AIDED DESIGN, ANALYSIS & PHYSICAL VERIFICATION OF HEAVY DUTY TRUCK MONOLEAF SPRING O.KELEBEK, G.TOKGÖNÜL, G.KULAÇ and Ç.ŞENOCAK	7
SIMULATION SUPPORTED PROCESS DESIGN AND PROTOTYPE MANUFACTURING OF FLANGED EXTERNAL TORX FASTENER	8



S.BARDAKCI, O. ÇULHA, A. BAYGUT and V. BAŞDEMİR	
INNOVATION MANAGEMENT IN TURKISH ENGINEERING EDUCATION S.A. YILDIZEL	9
AUTONOMOUS PHOTOVOLTAIC PANEL CLEANING ROBOT B.KARAMAN, S.TASKIN, Y.TOPRAK and A.TUNCER	10
INNOVATION ADVISORY BOARD CREATED WITH THE DATABASE AND MATCHING FIRM GROUPS WITH GRAPH THEORY E. ASLAN	11
PRODUCTION PROCESS DESIGN AND PROTOTYPE PRODUCTION ACTIVITIES FOR THE PRODUCTION OF SURFACE GLOSS LEVEL GROUND FLOORING S. KERENCİLER BATAR	12
DEVELOPMENT OF NEW PRODUCTION PROCESSES OF 45 CM X 90 CM DIMENSIONS S. KERENCİLER BATAR	13
R&D AND INNOVATION MANAGEMENT METHODS FOR DEVELOPMENT A NEW PRODUCT IN AKG GAZBETON R. BULUR, U. UZGAN, T. KAVAS, D. SOYAL and G. ERYILMAZ	14
PRODUCTION OF MONOCLONAL ANTIBODY FROM MOUSE FOR ROUTINE USE H. S.VATANSEVER, F.OZDAL KURT and S.GOKALP	15
E-HEALTH SERVICES EVERYWHERE AND FOR EVERYBODY: PATIENT TO PATIENT SCENARIOS I. KAYA, K. BAKANOGU and B.SAVAK	16
SIMULATION AIDED DESIGN AND PROTOTYPE MANUFACTURING OF ASYMMETRICAL SECTIONED STEEL PROFILES M.AKKAŞ, İ.KILERCI, B. KOCAER and A. BAŞSÜLLÜ	17
FINITE ELEMENTS AIDED DESIGN AND INVESTIGATION OF IMPROVING OF ENERGY RECOVERY ON INDUSTRIAL ANNEALING FURNACES B.ÖNDER and İ.KILERCI	18
IMPROVEMENT IN MINI RISERS FIXING SYSTEM FOR AUTOMATIC SAND MOLDING SYSTEMS H. KAHRAMAN	19
THE IMPORTANCE OF BORON FOR TURKEY AND BARIUM METABORATE: A WELL-KNOWN BORON COMPOUNDS, WHICH IS NOT USING IN TURKEY E.AKŞENER	20
DEVELOPMENT PROCESS OF R&D - INNOVATION EXPENDITURES IN TURKEY: AN ECONOMIC PERSPECTIVE M. M. DAM	21
HIGHLY RELIABLE HALF BRIDGE LLC CONVERTER DESIGN AND ANALYSIS FOR OLED TV M.NİL, Y.CAN, M.NİL, H.SÖZEN and Y.ÖZTÜRK	22
SIMULATION-AIDED INVESTIGATION OF THE EFFECT OF WORKPIECE'S AND ROLL TEMPERATURES ON PROCESS PARAMETERS AND WORKPIECE STRESS-STRAIN CHARACTERISTICS ON HOT ROLLING TECHNIQUE A.BASSULLU, İ.KILERCI, S.ARALAR, E. BELEK and O. CULHA	23



INFLUENCING FACTORS OF CURVATURE PROBLEMS IN LARGE FORMAT MONOPOROSA CERAMIC WALL TILES M. TARHAN, B. TARHAN, K. KAYACI and F. KARA	24
A SOFTWARE PROGRAM FOR SOIL LIQUEFACTION ANALYSIS S. DURUKAN and O. ASLAN	25
USAGE OF LOCAL ALKALINE RAW MATERIALS IN CERAMIC SANITARYWARE BODY COMPOSITION B. TARHAN, M. TARHAN and H. SARI	26
NEW SECTION STEEL PROFILES WHICH WILL BE USED IN STEEL CONSTRUCTION BRIDGE MANUFACTURING İ. KİLERCİ, B. KOCAER, E. SEVGİ, M. AKKAŞ, A. BAŞSÜLLÜ	27
THE RESEARCHES ON AERODYNAMICS OF ADVANCED SPLIT AIR CONDITIONER Ö. ÖZER, D. KUMLUTAŞ, İ. GÜMÜŞ and S. SUDA	28
THE CORRELATION BETWEEN REFRIGERATOR NOISE LEVEL AND BOTTOM CABINET CAVITY A. ÖZTÜRK	29
A+ ENERGY CLASS IN OVENS B. ÖZÇELİK YILDIZ	30
OPTIMIZATION OF THE TUMBLE DRYER MACHINE BEARING SYSTEM A. KORKMAZ and M. C. SİDAN	31
NUMERICAL AND EXPERIMENTAL INVESTIGATION OF DIFFERENT AIR FLOW METHODS DEVELOPED IN THE INTERNAL VOLUME OF COOKING DEVICE A. SEVER	32
EXPERIMENTAL AND NUMERICAL STUDY ON THE FLOW AND THERMAL DISTRIBUTION OF THE FREEZER D. C. DEVECİ, L. ALTAY and M. SARIKANAT	33
SIMULATION AIDED ANALYSIS OF DETERMINING OF LOAD-CARRYING CAPACITY OF YIELDING STEEL ARCH SUPPORT A. BASSULLU, B. KOCAER, M. AKKAS, O. IPEK and B. ONES1	34
ENTREPRENEURIAL INTENTIONS AND BIG FIVE: A STUDY ON APPLIED ENTREPRENEURSHIP COURSE TRAINEES A. R. İNCE, M. K. TOPCU and M. ARIKÖK	35
AFFECTS OF DIE COATING AND COATING THICKNESS ON SOLIDIFICATION, MATERIAL PROPERTIES AND MICROSTRUCTURE OF A356 ALUMINUM ALLOY K. MENDEŞ, H. YAVUZ and U. AYBARÇ	36
EVALUATION OF OLIVE OIL INDUSTRIAL BY-PRODUCT POMACE IN OIL INDUSTRY T. GÖLDELİ, P. GÜNÇ ERGÖNÜL and B. CAN PEHLİVAN	37
EFFECT OF HEAT TREATMENT CONDITIONS ON THE CRYSTALLIZATION OF DENTAL GLASS-CERAMICS E. YALAMAÇ, M. SÜTÇÜ and E. S. ERGANİ	38
CHARACTERIZATION OF FELDSPATIC BASED DENTAL GLASS-CERAMICS M. SÜTÇÜ, E. YALAMAÇ, A. ÇİDEM and G. TUNAYDIN	39



A GENERALIZED PERSPECTIVE FOR GOVERNMENT-UNIVERSITY-INDUSTRY COLLABORATION S. CARBAS and S.A. YILDIZEL	40
SIGN LANGUAGE FINGERSPELLING RECOGNITION USING CONVOLUTIONAL NEURAL NETWORKS C. GÜNDÜZ	41
THE IMPORTANCE OF RENEWABLE ENERGY RESOURCES IN TURKEY WITHIN THE SUSTAINABLE DEVELOPMENT PERSPECTIVE M. H. YALÇINKAYA and F. ERATAŞ SÖNMEZ	42
WATER RECOVERY AT DISHWASHER SYSTEMS H. SAYIR	43
ECO-FRIENDLY BOARD ERASER M. M. DAM and T. ÇOBANOĞLU	44
THE EFFECT OF TEA TREE OIL ON TYPICAL MICROORGANISMS AND THE USE OF IT AS DISINFECTANT A.ZEYREK, P.DINSEL, G.TÜRKÖZ BAKIRCI, F.BAKIRCI	45
COMPUTER-AIDED OPTIMIZATION METHODS FOR INNOVATIVE INDUSTRIAL DESIGN H. ÖZDEN	46
ENHANCEMENT OF ELECTROCHEMICAL SENSING PERFORMANCE BY NANOMATERIALS İ.POLATOĞLU	47
THE SAMPLES OF APPLICATION PERFORMED BY GENETIC ALGORITHM IN DATA MINING Ş. CAN, M. GERŞİL, T. ÖZDİL and C. YILMAZ	48
DETERMINATION OF THE FACTORS AFFECTING STUDENT SUCCESS BY APPLYING WEKA AND LOGISTIC REGRESSION ANALYSIS IN DATA MINING Ş. CAN, T. ÖZDİL and C. YILMAZ	49
MICRO/NANO ENCAPSULATION OF NATURAL COMPOUNDS AND PLANT EXTRACTS FOR INDUSTRIAL APPLICATIONS M.D. KÖSE and O. BAYRAKTAR	50
NOVEL TECHNIQUE FOR THE SIMULTANEOUS ISOLATION AND ENCAPSULATION OF VOLATILE COMPOUNDS FROM ESSENTIAL OILS E.T. DUMAN and O. BAYRAKTAR	51
FROM INDUSTRY 4.0 TO WATER 4.0 M.E. TURAN, T. ÇETİN and M. A. YURDUSEV	52
FACILE AND CONTROLLED PRODUCTION OF ANTIBACTERIAL SILVER BORATE COMPOUNDS FOR CERAMIC GLAZE APPLICATIONS O.AGUŞ, Y.ABALI, O.ARSLAN and N.O. SAN KESKİN	53
CARBON BLACK NANO-SIZED PARTICLE REINFORCED COMPOSITE COATINGS: MECHANICAL BEHAVIOR-STRUCTURE RELATION O. SANCAKOĞLU and T. AKSOY	54
THE ASSESSMENT OF THE PRESSURE FROM THE COASTAL WATERS OF THE MARMARA SEA AND THE AEGEAN SEA BY USING THE NEW METHOD MARINE FLORISTIC ECOLOGICAL INDEX (MARFEI) E. TAŞKIN, K. TSİAMIS and S. ORFANİDİS	55



TOPOLOGY OPTIMIZATION FLANGE YOKE APPLICATION E. IŞIK and Ç. ÖZES	56
TOTAL QUALITY MANAGEMENT AND INNOVATION Y. KUMCU and İ. AYDEMİR	57
AFFECTS OF DIE COATING AND COATING THICKNESS ON SOLDIFICATION, MATERIAL PROPERTIES AND MICROSTRUCTURE OF A356 ALUMINUM ALLOY K.MENDEŞ, H.YAVUZ and U.AYBARÇ	58
THE IMPROVEMENTS TO THE COUPLING OF THE TRANSMISSION FOR SAFE MOTIONS İ. KAYNAK	59
INVESTIGATION OF THREE DIMENSIONAL HEMOSTATIC BIOMATERIALS CONTAINING PLANT EXTRACTS M.E. USLU and O. BAYRAKTAR	60
SYNTHESIS AND CHARACTERIZATION OF PHEMA-CHITOSAN NANOSPHERES ENCAPSULATED WITH AN ANTICANCER AGENT, RESVERATROL A. PAMUKCI, H. S. PORTAKAL and E. EROĞLU	61
HOW INNOVATIVE ARE PUBLIC POLICIES? B. TUNÇAY and M. ÖZÇALIK	62
INNOVATION TO BEAT MIDDLE-INCOME TRAP B. TUNÇAY and M. ÖZÇALIK	63
THE FOURTH INDUSTRIAL REVOLUTION AND INNOVATION ECONOMICS S. Y. KUMCU and Ö. S. AKINCI	64
INNOVATION PROJECT INCREASING CONCRETE QUALITY OF WIND TURBINE CONSTRUCTION IN MANISA REGION A.U. OZTURK, E. KANTAR, S. A. YILDIZEL, Y. ERZIN and Y. TUSKAN	65
COLD JOINT REMOVAL OF TRIBUNE-8 CONSTRUCTION E. KANTAR, A.U. OZTURK, S. A. YILDIZEL, Y. ERZIN and Y. TUSKAN	66
A UNIVERSITY- INDUSTRY COOPERATION PROJECT: ESKİŞEHİR INDUSTRIAL DESIGN CENTER F. CURAOĞLU	67
AN INNOVATIVE APPROACH FOR TOURISM INDUSTRY: CREATING R&D CENTER M. GERSİL and T. ÇAYLAN	68
A COMPARATIVE STUDY OF BUCKLING RESTRAINED BRACED FRAMES AND CONCENTRICALLY BRACED FRAMES M.B. BOZKURT and A. ERGÜT	69
INORGANIC ORGANIC HYBRID FUNCTIONAL NANOMATERIALS BY MOLECULAR LEVEL CONTROL AND SURFACE MODIFICATION O.ARSLAN and Y.ABALI	70
ECONOMIC AND SAFELY CONSTRUCTION METHOD FOR EMBANKMENTS WITH NEARBY SOIL MATERIALS E. BAŞARI, A. DEMİR and M. A. YURDUSEV	71



1 DIMENSIONAL (1D) NANOMATERIAL PRODUCTION BY ELECTROSPINNING METHOD FOR THE SMART TEXTILE APPLICATIONS O.ARSLAN and Y.ABALI	72
THE METALLURGICAL EFFECTS OF Sr MODIFICATION AND HOLDING TIME ON AISi7Mg0.3 ALLOYS O. ÖZAYDIN, E. ARMAKAN and E. YILDIRIM	73
RESEARCH AND DEVELOPMENT OF SEISMIC PERFORMANCE OF A PREFABRICATED STRUCTURE A. DEMİR, C. KOZANOĞLU and K. ÇETİN	74
THE EFFECT OF MOLD AND CASTING TEMPERATURE ON THE DISTRIBUTION OF REINFORCEMENT MATERIAL IN COMPOSITE MATERIAL PRODUCTION H. YAVUZ and U. AYBARÇ	75
SIMULATION BASED OPTIMIZATION OF A HOT FORGING PROCESS- AN EXAMPLE OF PRESSURE VESSEL COMPONENT Ç. HOCALAR, İ. KILERCI, O.ÇULHA, N.SAKLAKOĞLU and S.DEMİR	76
EFFECT OF ENVIRONMENTAL PROPERTIES ON EVOLUTIONARY NEURAL NETWORKS OF SELF LEARNING AUTONOMOUS VEHICLES G. ALTINTAŞ	77
INVESTIGATION OF ZINC BORATE PRODUCTION BY EXPERIMENTAL DESIGN METHOD N. DEMIREL and M. BALBAŞI	78
USE OF UNMANNED AERIAL VEHICLES IN DEFENSE INDUSTRY M.M. KÜÇÜK and S. KURAL	79
DYNAMICS OF PIPES CONVEYING FLUID WITH CONCENTRATED MASSES B.G. SINIR and D. DÖNMEZ DEMİR	80
DEVELOPMENT OF NEW GENERATION HIGH-STRENGTH STEEL COMPOSITION AND THE REALIZATION OF INNOVATIVE FORMING PROCESSES DESIGN O. ÇULHA and A. BAŞSÜLLÜ	81
INVESTIGATION OF LUBRICATION PROPERTIES OF A MINERAL OIL CONTAINING NANOPARTICLES S. ERGÖNÜLTAŞ, G. SARI, S. GENÇALP İRİZALP and M.B. AKGÜL	82
EFFECTS OF USAGE OF NANOMATERIALS ON PROPERTIES OF POLYMER MODIFIED BITUMEN D. UNCU and A. TOPAL	83
A STUDY ON THE USAGE OF BASALT FIBERS AND PIGMENT IN ARCHITECTURAL CONCRETE PRODUCTION M. A. USTUNER, G. KAPLAN, A.U. ÖZTÜRK and E. DOĞAN	84
DEVELOPMENT OF HIGH EFFICIENT ADAPTIVE CHARGING METHOD FOR TRACTION TYPE BATTERIES O. DEMIRCI, S. YILMAZ, A. TURHAN, H. HASSÜMER and A. TURAN	85
AN APPROXIMATE SOLUTION FOR LINEAR FRACTIONAL DIFFERENTIAL EQUATIONS BY USING EULER PLOYNOMIALS A. KONURALP and S. ÖNER	86



DEFINING THE PRINCIPLES OF HUMAN RESOURCES MANAGEMENT FROM SCRATCHES: DIGITAL HUMAN RESOURCES MANAGEMENT A. ÜNAL, G. BİNBOĞA and M. BAŞOĞLU	87
DIGITALIZATION OF THE SCULPTURE OF İZMİR UNIVERSITY MASCOT WITH REVERSE ENGINEERING METHODS AND SMALL-SCALE MANUFACTURING WITH 3D PRINTER A.Ç. ÖNÇAĞ and H. TOSUN	88
A NEW APPROACH TO MINE FEATURES and SENSOR INFORMATION FROM ANDROID BASED MOBILE DEVICES İ. YILDIRIM and S. TAŞKIN	89
A SYNTHESIZING TYPE OF MATERIAL SCIENCE, SOLID STATE SYNTHESIS WITH A SAMPLE DOPED-NiFe ₂ O ₄ COMPOUND İ. ŞABİKOĞLU	90
EFFECT OF PRINTING PARAMETERS ON TENSILE STRENGTH OF 3D PRINTING PRODUCT İ. ÖZTÜRK1 and S. KURAL	91
COMPUTING THE LINK VULNERABILITY OF NETWORKS IN POLINOMIAL TIME Z.N. BERBERLER and E. YİĞİT	92
MICRO-BEAM VIBRATIONS WITH NON-IDEAL BOUNDARY CONDITIONS S. N. DURMUŞ and S. KURAL	93
THE EFFECT OF CLEANING EFFICIENT EPOXY-SILENT-FLUOROCARBON POLYMERS IN LIGHTING ARMATURES M. AKEL and E. ÇERKEZOĞLU	94
B.POSTER PRESENTATIONS	
THE COMPARISON OF QUICK DRYING CHARACTERISTICS OF LIGHT-WEIGHT WARP KNITTED TOWELS F. F. YILDIRIM, E. GELGEÇ, A.C. DENİZ, M. ÇÖREKÇİOĞLU and S. PALAMUTÇU	95
IMPROVING THE FLAME RETARDANT PROPERTIES OF COTTON FABRICS WITH BORON COMPOUNDS E. GELGEÇ, F. F. YILDIRIM, Ş. YUMRU and M. ÇÖREKÇİOĞLU	96
DETERMINATION OF PEROXIDASE ENZYME INACTIVATION PARAMETERS IN VEGETABLES L. AYSU and N. AYDIN	97
REDESIGN OF A DAMAGED BUS PART WITH REVERSE ENGINEERING AND MANUFACTURING OF ITS CASTING MODEL WITH 3D PRINTER A.Ç. ÖNÇAĞ and H. TOSUN	98
COLD FORGING DESIGN AND PROTOTYPE PRODUCTION OF THE STUB AXLE USED IN THE AUTOMOTIVE INDUSTRY E. YÖNDEM	99
AGING TEMPERATURE EFFECT on HARDNESS and MICROSTRUCTURE of A357 ALUMINIUM ALLOY PART WHICH PRODUCED by GDC and LPDC G. ÖZKAN and B. UYULGAN	100



UNRIPE BANANA PULP AND PEEL FLOUR AS INNOVATIVE INGREDIENTS FOR FOOD FORTIFICATION A. TÜRKER, N. SAVLAK	101
DEVELOPMENT OF FUNCTIONAL CRACKERS BY FISH FLOUR FORTIFICATION B. ÖKTEM, Y. GÜMÜŞGERDAN, B. KALAZ and N. SAVLAK	102
OPPORTUNITIES OF USING FUNCTIONAL FOOD'S WASTE PRODUCT IN DEVELOPMENT OF INNOVATIVE DAIRY PRODUCT G. ERK, S. AKÇA and A. AKPINAR	103
POSSIBILITIES OF USING FOOD INDUSTRY WASTE IN BIOTECHNOLOGICAL PROCESSES M. ÇAKIR and S. DAĞBAĞLI	104
ENTREPRENEURSHIP ACTIVITIES AT UNIVERSITIES R.S. SİLME, S. NADEEM and Ö. BAYSAL	105
ANTIBACTERIAL EFFECT OF DNA-DIRECTED SILVER NANOPARTICLES ON GRAPHENE OXIDE S. NADEEM, Ö. BAYSAL and R.S. SİLME	106
DEVELOPMENT OF INKS FOR NEWSPAPER AND BOOK PRINTING WITH REDUCED POLYCYCLIC AROMATIC HYDROCARBON (PAH) CONTENT D. ÖZDEMİR, R. KİTER, M. ÖZDEMİR and E. İ. DENİZ	107
ANTIMICROBIAL ACTIVITY OF CAPPARIS N. KARAGOZLU and H. KURT	108
INNOVATION AND ENTREPRENEURSHIP RELATIONSHIPS IN TECHNOLOGY TRANSFER OFFICES IN TURKEY M. GÜLER and Ş. İ. KIRBAŞLAR	109
SEA-POOL FOOTWEAR C. ÜNER, C. SAATÇI, E. DENİZ and H. SÜMBÜL	110
PREDICTION OF COMPRESSIVE STRENGTH OF STEEL FIBRE-ADDED CONCRETE STRENGTH USING ARTIFICIAL NEURAL NETWORKS A. DEMİR and D. D. DEMİR	111
LOADING MACHINE PROTOTYPE DESIGN FOR INCREASING CARBON RELEASE REDUCTION, PRODUCTIVITY AND WORKING ENVIRONMENT SAFETY M. AKKAS, İ. KILERCİ, A. BASSULLU, B. KOCAER and O. AKINCI	112



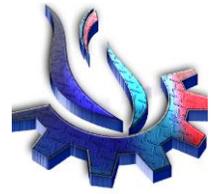
Değerli Araştırmacılar,

Manisa Celal Bayar Üniversitesi eğitimde kaliteye önem veren yenilikçi bir üniversitedir. Farklı inanç, düşünce ve hayat biçimlerinin birlikte yaşadığı hoşgörü ortamında gelişerek değişme ve değişerek gelişmeyi ilke edinmiştir. Ulusal ve uluslararası düzeyde, öncelikle tercih ve takip edilme ve hayata değer katma gayesindedir. Amacımız, öğrencilerimizin rahat ve huzurlu bir ortamda eğitim-öğretim görmeleri; girişimci, özgür, analitik ve eleştiren düşünebilen bireyler olmalarıdır.

Eğitim-öğretimde yeni akımların uygulanması ve geliştirilmesi ile eğitimde kalite artışı sağlama hedefi yanı sıra Üniversite-Sanayi İşbirlikleri, önceliklerimiz arasındadır. Üniversite-Sanayi İşbirliği Teknoloji Uygulama ve Araştırma Merkezi, Manisa Teknokent, Proje Ofisi, Merkezi Araştırma Laboratuvarı gibi arayüz ve araştırma altyapıları ile Üniversitemiz, Bölge ve Ülke sanayisine hizmet veren tercih edilir bir araştırma kuruluşu olarak konumlanmış durumdadır. Üniversitelerdeki mevcut bilgi birikimi ve yetişmiş insan gücü ile sanayinin mevcut tecrübesi ve finansal gücünün bir sistem dahilinde birleştirilmesi ile ortaya çıkan bilimsel, teknolojik ve ekonomik faaliyetler sonucunda, toplum refaha ulaşmakta ve sosyo-ekonomik olarak gelişim sağlamaktadır. Sanayi varlığı ve ekonomik gücü dikkate alındığında Manisa ve Ege Bölgesi önemli derecede Ar-Ge ve Tasarım faaliyeti gerçekleştirmekte, Ulusal ve Uluslararası Ar-Ge fonlarına ulaşım sağlamaktadır. Üniversitemiz ise bu fonlara erişim ve uluslararası işbirlikleri oluşturma aşamasında yer alarak sanayimizin Temel ve Uygulamalı Ar-Ge faaliyetleri ile Deneysel Geliştirme çalışmalarına partner olarak değer yaratma amacındadır.

Bu amaç ve hedefler ile bu yıl ilkinizi düzenleyeceğimiz Uluslararası Üniversite-Sanayi İşbirliği, Ar-Ge ve İnovasyon Kongresine katılan, Ar-Ge ve Tasarım merkezlerine, Teknopark ve TTO'lara, Teknoloji şirketlerine, girişimci, akademisyen ve öğrencilere teşekkür eder, araştırmalarında başarılar dilerim.

PROF. DR. AHMET KEMAL ÇELEBİ
MCBÜ REKTÖRÜ



Dear Researchers,

Manisa Celal Bayar University is an innovative university that attaches importance to education. It is a principle of mutual development and change by developing in an environment of tolerance where different beliefs, thoughts and forms of life coexist. At the national and international level, it is primarily a matter of preference, follow-up, and added value. Our aim is to ensure that our students are educated in a comfortable and peaceful environment; entrepreneurial, independent, analytical and critically thoughtful individuals.

Application and development of new trends in education and training aims to increase quality in education as well as University-Industry Collaborations are among our priorities. University-Industry Cooperation Technology Application and Research Center, Manisa Teknokent, Project Office, Central Research Laboratories, etc., has been positioned as a preferred research organization serving our university, region and country. As a result of the scientific, technological and economic activities arising from the existing know-how and educated human power of the universities and the existing experience and financial power of the industry within a system, the society gets refreshed and develops socio-economically. Manisa and the Aegean Region carry out R & D and design activities at a considerable level and provide access to national and international R & D funds when considering industrial existence and economic potential. Our university aims to create value as a partner for the basic and applied R & D activities and Experimental Development studies of our industry taking place in the process of accessing these funds and establishing international collaborations.

I would like to thank the R & D and Design Centers, Technoparks and TTOs, Technology companies, entrepreneurs, academicians and students who is participated in the International University-Industry Cooperation, R & D and Innovation Congress which will be organized this year with this purpose and objectives.

PROF. DR. AHMET KEMAL ÇELEBİ
RECTOR OF MCBU



Değerli sanayi ortaklarımız ve katılımcılar,

Manisa Celal Bayar Üniversitesi, Üniversite-Sanayi İşbirliği Teknoloji Uygulama ve Araştırma Merkezi (ÜSİTEM), 2011 yılında kurulmuştur. Kuruluş amacı; özel sektör ve kamu kuruluşları ile işbirliği halinde araştırma, eğitim ve toplumsal hizmet alanlarında sinerji oluşturarak; ulusal ve bölgesel boyutlarda ekonomik ve toplumsal kalkınmaya katkı sağlayacak işlerliği olan mekanizmaları kurmak, sürdürmek ve bunlara ilişkin etkinlikleri kapsayan kurumsal alt yapı oluşturmak ve Üniversitemizin temel ve uygulamalı alanlardaki araştırma ve geliştirme (Ar-Ge) faaliyetlerini merkezi bir organizasyon çerçevesinde düzenlemek, rekabete dayalı, yaratıcı ve verimli bir araştırma ve eğitim-öğretim ortamı oluşturmaktır. Merkez hedefleri ise; Bölge sanayisinin Ar-Ge faaliyetlerinde çözüm ortağı olmak, nitelikli Ar-Ge projelerinde işbirliği yapmak, Üniversite araştırma altyapısının sanayi projelerinde kullanımının sağlanması, sanayi ihtiyaçlarına ve stratejilerine yönelik eğitim, kurs, konferans ve etkinlikler düzenlemektir.

Bu yıl ilki düzenlenen 1. Uluslararası Üniversite-Sanayi İşbirliği, Ar-Ge ve İnovasyon kongresinde, Ar-Ge ve Tasarım Merkezleri, Teknoloji şirketleri, girişimciler, Üniversiteler, Teknopark ve TTO'lar katılımcı olarak bilimsel çalışmalarını, akademisyenler için ise ticarileşebilir proje, bilimsel çalışma, yüksek lisans ve doktora tezi, vs. ait sonuçları sunma ve paylaşma fırsatı ortaya çıkmıştır. Ayrıca, Ar-Ge ve Tasarım merkezleri, Ar-Ge şirketleri, girişimci ve akademisyenler arasında planlı ikili işbirliği toplantıları gerçekleştirilerek işbirliğinin somutlaşması sağlanmıştır.

ÜSİTEM ekibi olarak tüm katılımcılara teşekkürlerimizi sunar, Ar-Ge çalışmalarında başarılar dileriz.

DOÇ. DR. OSMAN ÇULHA
ÜSİTEM MÜDÜRÜ

DOÇ. DR. ALİ DEMİR
ÜSİTEM MÜDÜR YARDIMCISI

YRD. DOÇ. DR. SAİM KURAL
ÜSİTEM MÜDÜR YARDIMCISI



Dear Industry Partners and Participants,

Manisa Celal Bayar University, University-Industry Cooperation Technology Application and Research Center (ÜSİTEM) was established in 2011. The purpose of the center is; by creating synergies in the fields of research, education and community services in cooperation with the private sector and public institutions; to establish and maintain the mechanisms that will contribute to economic and social development in the national and regional dimensions and to create an institutional infrastructure covering activities related to these. In addition, to organize research and development (R & D) activities in the basic and applied areas of our university within a centralized organization, to create an innovative, creative and productive research and education environment. Center targets are; To organize training, courses, conferences and events related to industrial needs and strategies, to be a solution partner in the R & D activities of the regional industry, to cooperate in qualified R & D projects, to use the university research infrastructure in industrial projects.

In the 1st International University-Industry Cooperation, R & D and Innovation congress organized this year; R & D and Design Centers, Technology companies, Entrepreneurs, Universities, Technoparks and TTOs have participated in scientific work. For academicians; the opportunity to present and share the results of commercial projects, scientific studies, master's and doctoral dissertations has emerged. In addition, cooperation between R & D and design centers, R & D companies, entrepreneurs and academicians was realized through planned bilateral cooperation meetings.

As a member of ÜSİTEM, we would like to thank all participants and we wish you success in your R & D work.

ASSOC. PROF. DR. OSMAN ÇULHA
MANAGER OF ÜSİTEM

ASSOC. PROF. DR. ALİ DEMİR
DEPUTY MANAGER OF ÜSİTEM

ASST. PROF. DR. SAİM KURAL
DEPUTY MANAGER OF ÜSİTEM

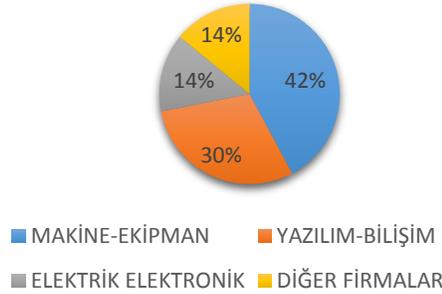


Değerli katılımcı ve sanayicilerimiz;

Ürün ve üretimde dijitalleşme sloganıyla yola çıkan Manisa Celal Bayar Teknoloji Geliştirme Bölgesi Yönetici Şirketi 10.10.2013 tarihinde yasal prosedürleri tamamlayarak kurulmuştur. Kuruluşundan bu yana, üründe ve üretim yöntemlerinde yenilik geliştirilmesi, ürün kalitesinin veya standardının yükseltilmesi, teknolojik bilginin ticarileşmesi, araştırmacı ve vasıflı kişilere iş imkanının yaratılması ve teknoloji transferine katkıda bulunulması en temel amaçları olmuştur.

Nisan 2017 yılında faaliyete başlayan Manisa Teknokent ise 7 aylık kısa bir süre içerisinde 4500 m2 kapalı alanda 63 firmaya ev sahipliği yapmaktadır. Manisa Teknokent reel sektör ağırlıklı ve ürün odaklı yapısı nedeniyle diğer Teknokent yapılarından farklı bir şekilde ayrılmaktadır. Şekil 1’de Manisa Teknokent bünyesindeki firmaların sektörel dağılımı gösterilmiştir.

Firmaların Sektörel Dağılımı



Şekil 1. Firmaların sektörel dağılımı

Yedi aylık kısa bir dönem içerisinde üretim teknolojilerinden gıda teknolojilerine, tarımsal ilaçlama teknolojilerinden enerji üretim teknolojileri ve tüketici elektroniği ürünlerine kadar geniş bir yelpazede bulunan proje çalışmalarının önemli bir bölümü prototipleme aşamasına gelmiştir ve 2018 şubat ayı içerisinde görücüye çıkacaktır. Bu süreçte Teknokent bünyesinde bulunan firmalarımız 6 adet patent başvurusu yapmış olup toplamda 12 adet AR-GE hibe ve teşvik programlarına başvuruda bulunmuştur.

Bununla birlikte, Manisa Teknokent 2 adet Kalkınma Bakanlığı destekli proje yürütmektedir. Bu projelerden birincisi “akıllı ürün ve üretim sistemleri araştırma ve eğitim merkezi” isimli olup toplamda 6.500.000 TL+KDV tutarında bütçeye sahiptir. Bu proje ile teknoent ve Manisa’da faaliyet gösteren firmalarımıza; ürün tasarımı, prototipleme, tersine mühendislik ve endüstri 4.0 konularında çok ciddi destekler verilecektir. Bu proje ile kurulma aşamasında olan merkezin, ülkemizde bir örneği bulunmamaktadır. Bir diğer projemiz ise “Manisa savunma sanayi teknolojileri merkezi” isimli olup toplamda 16.500.000 TL+KDV bütçeye sahiptir. Bu projemiz şuan bakanlıkta onay aşamasındadır. Bu proje ile özellikle Manisa sanayinde savunma teknolojilerine yönelik önemli bir dönüşüm başlatılacaktır. Bu kapsamda Aselsan ve Teknokentimiz arasında bir işbirliği protokolü hazırlanarak imzalanmıştır.

Teknoloji transferinde ise Amerika’dan tarımsal ilaçlamada çok büyük bir dönüşüm başlatacak olan bir teknoloji Teknokentimiz sayesinde bünyemizde bulunan bir firmamıza transfer edilmiş olup bunun dünya çapındaki üretimde Manisa’da yapılacaktır.

PROF. DR. HÜSEYİN AKTAŞ
MCBÜ TEKNOPARK GENEL MÜDÜRÜ



Dear Participants and Industry Partners,

Setting out with the motto of ‘Digitalising in product and production’, Manisa Celal Bayar Technology Development Zone Managing Company was founded upon fulfilling the legal procedures on 10.10.2013. Since its foundation, the main purposes of the company have been innovation in the product and production techniques, improvement in the product quality or standards, commercialization of the technological knowledge, supplying job opportunities for the researchers and qualified people and contribution to the technology transfer.

Manisa Technocity (Teknokent), starting business in April 2017 in a time as short as seven months, hosts 63 companies in an indoor area of 4,500 m². Manisa Technocity is different from others in terms of its real sector dominant and product oriented structure. In Figure 1, the sectorial distribution of firms in Manisa Technocity is given.

Sectorial Distribution of Firms

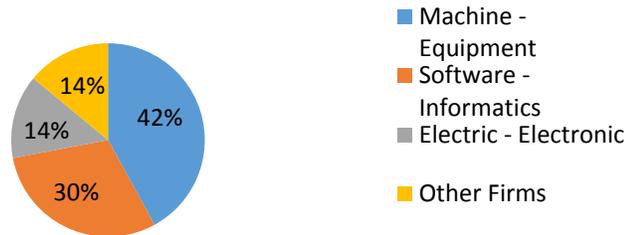


Figure 1. Sectorial Distribution of Firms

In a time as short as seven months, most of the project studies from a wide range – from production technologies to food technologies, from agricultural disinfection technologies to energy production technologies and consumer electronics – are in prototyping stage and will show up in February 2018. Within this period, the firms in Technocity have applied for 6 patents and 12 Research and Development donation and incentive programs in total.

Meanwhile, Manisa Technocity is conducting two projects supported by Ministry of Development. The first of them is “Smart Product and Production Systems Research and Training Center” with a budget of 6.5000.000 TL+VAT. Within this project, a huge support will be given to the firms in the Technocity and Manisa for product designing, prototyping, reverse engineering and industry 4.0. Within our country, the center, which is in the stage of foundation, is unique. The other project is “Manisa Defense Industry Technologies Center” with a budget of 16.500.000 TL+VAT. This project is waiting for approval from the ministry. With this project, a noteworthy transformation in defence technologies will be launched especially in Manisa industry zone. Within this scope, a cooperation protocol has been signed between Aselsan and Manisa Technocity.

Thanks to our Technocity, a new technology that will launch a remarkable transformation in agricultural disinfection has been transferred from United States to a firm in our Technocity and this technology will be produced in Manisa and distributed to the world.



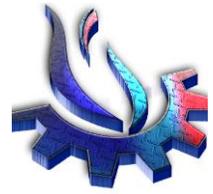
MANİSA CELAL BAYAR ÜNİVERSİTESİ İŞ YERİ UYGULAMA EĞİTİMİ (İŞ YERLERİNDE EĞİTİM): YENİ BİR EĞİTİM MODELİ

Son yıllarda, teknolojideki gelişmeler, küreselleşme ve rekabetçilik açısından önemli bir faktör olmuştur. Ek olarak, Teknoloji deki hızlı artış oranı ve küreselleşme gelişmekte olan ülkelerin rekabet edebilmelerini de zorlaştırmaktadır. Bununla birlikte küreselleşme ve uluslararası rekabet baskısı gelişen ve gelişmekte olan ülkelerin nitelikli insan gücüne olan talebi artırmıştır.

Küreselleşme ve teknolojik gelişmeler ülkemizin uluslararası piyasalardaki rekabet gücünü de olumsuz yönde etkilemektedir. Ülkemizin uluslararası piyasalardaki rekabet gücünü zorlaştıran en önemli nedenlerden biride yetersiz nitelikli insan gücüdür. Özellikle nitelikli insan gücündeki eksikliğin artması ülkemiz ekonomisini olumsuz şekilde etkilemektedir. Bu olumsuzluk üniversiteleri, sanayi ile nitelikli insan gücü talebinin karşılanabilmesi için daha etkin iş birliği yapmaya zorlamaktadır.

Manisa Celal Bayar Üniversitesi nitelikli insan gücünün karşılanabilmesi için klasik eğitim sistemini değiştirmiş, yeni bir eğitim modeli olan “İş Yeri Uygulama Eğitimi” (iş yerlerinde eğitim) modeline geçmiştir. Bu model öğrencileri iş yerlerinde, iş yerlerindeki uzman kişiler ile birlikte yetiştirmeyi amaçlayan bir modeldir. “İş Yeri Uygulama Eğitimi” öğrencilerin öğrenim süresince kazandıkları teorik ve pratik bilgilerini, "İş Yeri Uygulama Eğitimi" dersi adı altı son dönemlerinde iş yerlerinde yapacakları tam zamanlı uygulamalı eğitimle bütünleştirerek, uygulama becerisi yüksek öğrenciler olarak mezun etmek amacıyla uygulamaya konulan yeni bir eğitim modelidir. “İş Yeri Uygulama Eğitimi” kesinlikle bir staj değildir. “İş Yeri Uygulamaları Eğitimi” adı altında iş yerlerinde yapılacak uygulamaları içeren eğitim programların son dönemine konulmuş, %90 zorunluluğu olan bir derstir. Dönem sonunda öğrencilerin başarı notu iş yerleri ile birlikte ortak belirlenecektir. Klasik stajın aksine son dönemde, tüm dönemi (15 Hafta) kapsayacak şekilde işyerlerinde eğitimi amaçlayan bir modeldir. Son dönem öncesi mezuniyet şartlarını sağlayabilen öğrenciler iş yerlerinde alanları ile ilgili uygulamalı çalışmalar yapmak üzere işyerlerine gidebilecekleridir. İş yerlerinde işyeri şartlarına ve kurallarına tabi olacaklardır. Bu model öğrencilerin iş dünyasının ihtiyacını ve taleplerini yerinde görmelerini ve kendi yetenek ve becerilerini ona göre geliştirmelerini sağlayacaktır. Ayrıca, öğrenciler üniversiteden kazandıkları teorik ve pratik bilgilerini iş yerlerinde uygulamaya dönüştürme şansı bulacaklardır. Yeni modelle, eğitim müfredatlarının iş dünyasının talep ve ihtiyaçları ne kadar karşıladığı tespit edilebilecek, gerekirse güncellenecektir. Öğrencileri iş yerlerinde yapacakları uygulamalı çalışmaları süresince iş kazası ve meslek hastalığına karşı sigortaları üniversite tarafından yapılacak ve takip edilecektir.

PROF. DR. KENAN YALINIZ
İŞYERİ UYGULAMA EĞİTİMİ KOORDİNATÖRÜ



MANİSA CELAL BAYAR UNIVERSITY
WORKPLACE APPLICATION TRAINING (LEARNING IN WORKPLACE): A NEW MODEL OF
EDUCATION

In recent years, development in technology is an important factor of globalization and competitiveness. Moreover the increase in the rate of technological change and competitiveness are making more difficult to compete for many developing countries. It is likely that the pressures of globalization and international competition has also caused the increase in demand of qualified workforce in developed and developing countries. Globalization and technological developments also affect the competitiveness of our country negatively in the international market place. It argues that it is hard to success of our country in competitiveness in the international market place for two main reason. One relates to inadequate qualified workforce and the other is the rapidly rising of the young generation. Especially, increasing in demand of qualified workforce affect our country's economy negatively. It has to force the universities to take an active role in university-industry cooperation and need to work together to reduce in demand of qualified workforce.

Manisa Celal Bayar University has changed the classical education model and moved into a new education model named as "Workplace Application Training"(learning in workplace) for providing qualified workforce. This model aimed to educate the students together with the professional employee in the workplace. Workplace application training is not a classical internship. Indeed, it is the name of lesson taking place in the last semester of the academic program. There is no any other lesson, it is the only lesson in the last semester of the academic program. It must be realized at workplaces and has 90% attendance requirement that does not count excused absences. In contrast to classical internship, it is applied through a one semester (15 weeks) and typically under taken during the last semester of the academic programs.

Students are insured against accidents at work and occupational diseases during the period of training by the university. In Addition, students only who fulfill the graduation requirements before last semester can start training in the workplaces Students who succeed the graduation requirements before last semester are placed to workplaces in order to make practical training relevant to their curriculum in their last semester. They have to obey the rules during the working period and in the workplace. This model helps to students to better understand the employers requirements and demands also improve their appropriate skills and capabilities. In addition, through these training period, students will have the opportunity to put your theoretical knowledge into practice. New model also allowed some conclusions to be drawn about relevance of the academic program and work place needs and requirements.

PROF. DR. KENAN YALINIZ
COORDINATOR OF WORKPLACE APPLICATION TRAINING



**MANİSA CELAL BAYAR ÜNİVERSİTESİ DENEYSEL FEN BİLİMLERİ UYGULAMA VE
ARAŞTIRMA MERKEZİ (DEFAM)**

Deneysel Fen Bilimleri Uygulama ve Araştırma Merkezi (DEFAM) Kalkınma Bakanlığının desteklediği proje ile kurulmuş olup son teknolojik analiz cihazları ile donatılmıştır. Merkez 2011 yılından beri 2300 m² alanda test ve analiz hizmeti vermektedir.

Merkez laboratuvar olan DEFAM; üniversitelerdeki araştırmacılara, kamu kurumlarına ve sanayiye test ve analiz hizmeti sunmaktadır. Merkezimizde universal mekanik test cihazı, metal spektrometre, sertlik cihazı, metalografi cihazları, XRD, TG/DTA, DSC, FT-IR, ICP-OES, ICP-MS, LC-MS/MS, GC-MS, AFM vb. cihazlar ile malzeme analizleri, kimyasal analizler, gıda analizleri ve mikrobiyolojik analiz yapılmaktadır.

DOÇ. DR. MUSTAFA ESKİCİ
MCBÜ DEFAM MÜDÜRÜ



MANİSA CELAL BAYAR UNIVERSITY APPLIED SCIENCE RESEARCH CENTER (ASRC)

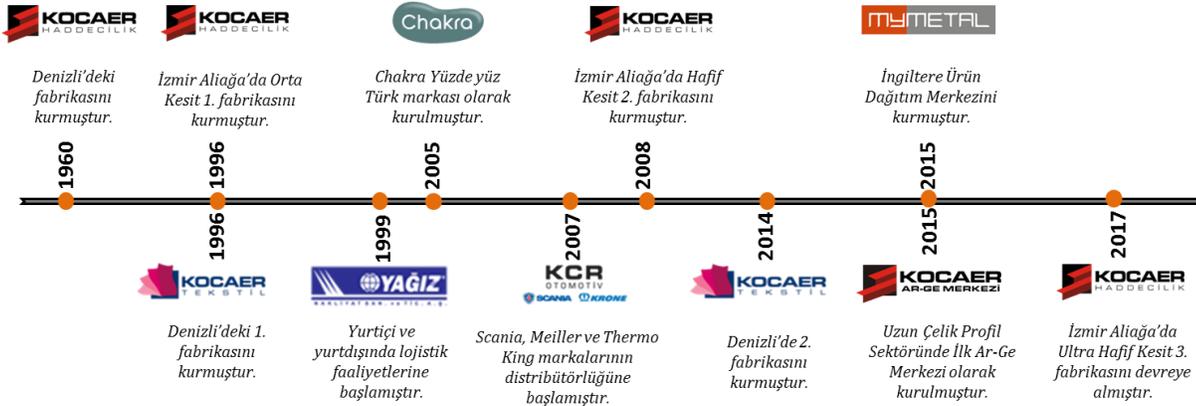
Applied Science Research Center (ASRC) was established with a project supported by the Ministry of Development and equipped with the latest technological instruments for analysis. The center has been providing tests and analysis services in an area of 2300 m² since 2011.

ASRC, the central laboratory provides tests and analysis services to researchers in universities, public institutions and industry. Material analysis, chemical analysis, food analysis and microbiological analysis with universal mechanical tester, metal spectrometer, hardness tester, metallography, XRD, TG/DTA, DSC, FT-IR, ICP-OES, ICP-MS, LC-MS/MS, GC-MS, AFM etc. instrument are performed in the center.

ASSOC. PROF. DR. MUSTAFA ESKİCİ
DIRECTOR OF MCBU DEFAM



KOCAER GRUP



KOCAER GRUP; 120.000 m²'si kapalı alan olmak üzere toplam 400.000 m² alanda kurulu, 6 farklı lokasyondaki tesisleri ve 2000'in üzerinde çalışanı ile demir-çelik, tekstil ve perakende sektörlerinde faaliyet gösteren Türkiye'nin öncü kuruluşlarıdır.

Kocaer Grup şirketlerinden ilki olan Kocaer Haddecilik faaliyetlerine 1960 yılında Denizli'de başlamıştır. 50 yılı aşkın sektörel tecrübesiyle ürün gamındaki çeşitliliğini sürekli artırarak çalışmalarına devam etmektedir. Aliğa/İZMİR'de konumlandırılmış 3 fabrikasında toplamda 290.000 m² 'lik alanda üretim gerçekleştirmekte olup; tamamen yerli sermaye ile yatırımlarına devam etmekte, ithalatı önlemeye yönelik Ar-Ge temelli özgün ürünler üretme yönündeki faaliyetlerini sürdürmektedir.

Yıllık 800.000 ton kapasite ile Yapı/İnşaat, Enerji, Maden/Tünel, Otomotiv, Demiryolu, Tarım ve İş Makineleri sektörlerine hizmet veren KOCAER' in başlıca ürünleri eşkenar köşebent, TH, UPN, IPN, IPE, UAC, RSJ, UPE, T, pencere profili, lama, kare ve yuvarlak kesitli çelik çubuk ve genel yapı çelikleridir. Ayrıca endüstriyel sektörlere yönelik proje bazlı esnek üretim gerçekleştirilen Kocaer Servis Merkezi'nde her türlü müşteri talebi hızlı ve kaliteli bir şekilde karşılanmaktadır.

Kocaer Haddecilik üretim kapasitesinin %60 ve üzerini 120'dan fazla ülkeye ihraç ederek ISO "Türkiye'nin en büyük 500 sanayi kuruluşu", TİM "İlk 1000 ihracatçı firma" ve EİB "Ege Bölgesi en büyük ihracatçı firma" sıralamasında uzun yıllardır üst sıralarda yer almakla beraber, Dış Ticaret Sermaye Statüsüne sahip firmalardan birisidir. Ürettiği uzun çelik profil ürünleriyle sektörde öncü bir konumda bulunan Kocaer; sektöründe Turquality Markalaşma programına kabul edilen ilk firmadır. Aynı zamanda Bilim, Sanayi ve Teknoloji Bakanlığı onayıyla sektöründe ilk Ar-Ge merkezinin sahibi olmuştur.

Kocaer Haddecilik, gelişen teknoloji ve sektör dinamiklerini göz önünde bulundurarak vasıflı ve katma değerli ürün geliştirme çalışmalarına devam etmekte olup verimli, iş ve işçi sağlığını gözetken, maliyet etkin bir yapıda yüksek kaliteli ürün üretme anlayışıyla müşterilerine hizmet sunmaktadır. Teknolojik alt yapısını her geçen gün kuvvetlendiren Kocaer, Endüstri 4.0 uygulamalarında başarılı projelere imza atmaktadır. Bu doğrultuda; hayata geçirdiği akıllı-robotik sistemler ve bilişim uygulamaları ile 2017 yılında Bilim Sanayi ve Teknoloji Bakanlığının Verimlilik Haftası Büyük Ölçekli İşletmeler Ar-Ge kategorisinde birincilik; SAP Kalite Ödülleri İnovasyon kategorisinde altın ödül ile birincilik; IDC Akıllı Üretim Teknoloji Ödülleri Kurumsal Dönüşüm kategorisinde ikincilik olarak başarısını taçlandırmıştır.



KOCAER Ar-Ge Merkezi

Ar-Ge kültürü ve sürekliliğinin sağlanması suretiyle katma değer yaratan yeni ürünler, üretim yöntemleri, makine tasarımları, süreç iyileştirmeleri ve bilişim uygulamaları ile sektördeki tecrübesini kurumsal bir yapıya taşıyan Kocaer, 28 Nisan 2015 tarihinde Uzun Çelik Profil sektöründe Türkiye'nin ilk Ar-Ge Merkezi belgesini almıştır.

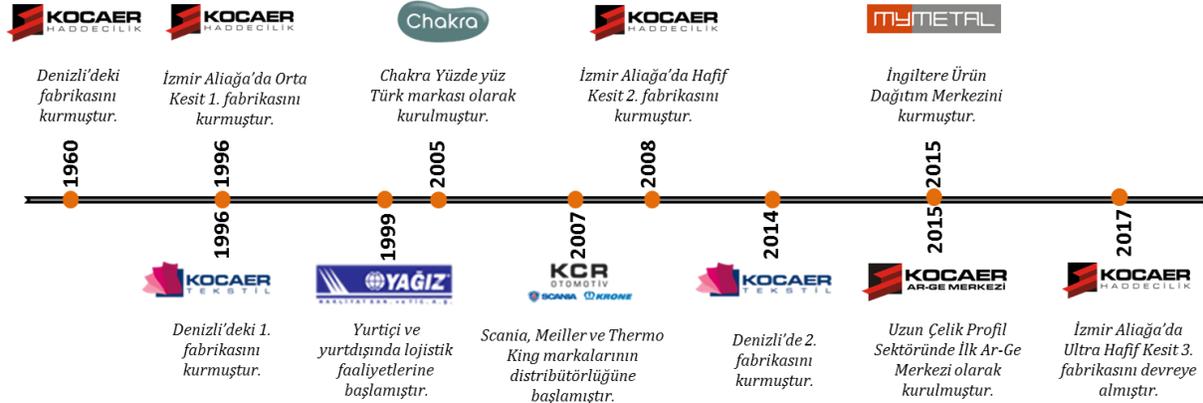
Kocaer Ar-Ge Merkezi; mühendislik, temel ve teknik bilimler disiplinlerinde, uzmanlaşmış kadrosu ve son teknoloji ekipmanlar ile oluşturulmuş zengin test ve karakterizasyon laboratuvarlarında hizmet vermektedir. Lisanslı birçok yazılımı bulunan Ar-Ge merkezi bünyesinde CAD/CAM/CAE uygulamaları ile model-simülasyonları gerçekleştirilmektedir.

Fikri Sınai Haklar konusunda uzmanlaşmış marka, patent, faydalı model ve endüstriyel tasarım tescil çalışmalarını yürüten birimleri bulunan Kocaer Ar-Ge Merkezi aynı zamanda ulusal ve uluslararası (TÜBİTAK, HORIZON, EUREKA vb.) platformlarda birçok projeyi başarılı bir şekilde tamamlamış ve farklı disiplinlerdeki birçok proje ile çalışmalarına devam etmektedir. Üniversite-Sanayi ve Sanayi-Sanayi iş birliğine de büyük önem gösteren merkez, Üniversite iş birliği ile staj, proje ve lisansüstü tez kapsamında faaliyetlerini sürdürmekle beraber, Sanayi iş birliği kapsamında birçok firma ile ortak proje yürütmektedir.





KOCAER GROUP



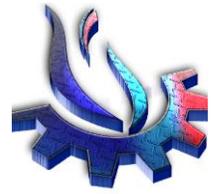
KOCAER GROUP; One of the leading organizations of Turkey which operates in Iron, Steel, Textile and Retail sectors with a total area 400.000 m2 & closed area 120.000 m2 with 6 different locations and over 2000 employees.

Kocaer Rolling Mill started its operations in Denizli at 1960, which is the province of Kocaer Group companies. With more than 50 years of experience in the sector, it continues to work by increasing the diversity of its product range. 3 factories located in İzmir Aliğa in total 290.000 m2 area is performing production, Continues investments with purely domestic capital and continues activities to produce unique products based on R & D to prevent imports.

The main products of KOCAER which serves to the sectors of Construction/Building, Energy, Mining/Tunnel, Automotive, Railway, Agriculture and Construction Machines with an annual capacity of 800.000 tons are equal angles, TH, UPN, IPN, IPE, UAC, RSJ, UPE, T, window profile, flat bar, square and round section steel bars and general structural steels. Moreover, Kocaer Service Center, which is based on project with flexible production for the industrial sectors, all kinds of customer demands quickly and with high quality.

Kocaer Haddecilik has exported more than 60% of production capacity to more than 120 countries and became one of the being ranked in the top rank for many years, such as ISO " The Top 500 Industrial Organizations of Turkey ", TIM " The Top 1000 Exporter Companies' 'and' EİB " Aegean Region is the biggest exporter company " with Foreign Trade Capital Status. Kocaer has a leading position in the sector with long steel products. Meanwhile; first company to be admitted to the Turquality Branding program in the sector. At the same time, with the approval of the Ministry of Science, Industry and Technology, it became the first R & D center in this sector.

Kocaer Haddecilik is continuing efforts to develop qualified and value-added products by taking into consideration the developing technology and sector dynamics and provides its customers with the concept of producing high quality products in a cost effective structure that considers productive, occupational health and safety . Strengthening its technological infrastructure day by day, Kocaer is making successful projects in Industrial 4.0 applications. In this direction; with the intelligent-robotic systems and information applications that it has passed through in the year 2017, the Ministry of Science, Industry and Technology's Productivity Week first place in the Large Scale Enterprises R & D category; SAP Quality Awards winner with a gold award in the Innovation category; IDC Smart Manufacturing Technology Awards have demonstrated its success by taking second rank in the Organizational Transformation category.



KOCAER R & D Center

Carrying the sectoral experience into a corporate structure with new products, production methods, machine designs, process improvements and information applications that create added value by ensuring the culture of research, development and continuity, Kocaer obtained Turkey's first R & D center certificate in Long Steel Manufacturer on 28 April 2015 .

Kocaer R & D Center; engineering, fundamental and technical disciplines, specialist staff and last technology equipment, and has services in various testing and characterization laboratories. Model-simulations are carried out with CAD / CAM / CAE applications within the R & D center with many licensed software.

The Kocaer R & D Center, which has specialized brands, patents, utility models and industrial design registration activities and this center has successfully completed many projects in national and international platforms(TÜBİTAK, HORIZON, EUREKA, etc.). Many projects in different disciplines and continues to work together. The Center, which places great importance on the University-Industry and Industry-Industry cooperation, continues its activities within the scope of internship, project and post-graduate thesis with the University Industry Association.





TOPICS ENGINEERING

1. COMPUTER ENGINEERING
2. BIOENGINEERING
3. ELECTRICAL AND ELECTRONICS ENGINEERING
4. INDUSTRIAL ENGINEERING
5. FOOD ENGINEERING
6. CIVIL ENGINEERING
7. MECHANICAL ENGINEERING
8. METALLURGICAL AND MATERIALS ENGINEERING

SUB-AREAS

1. Software
2. Bioengineering
3. Control Systems
4. Electronic
5. Electric Machines
6. Electromagnetic Fields
7. Industrial Engineering
8. Food Technology
9. Food Sciences
10. Structure
11. Construction Material
12. Hydraulic
13. Geotechnical
14. Transportation
15. Mechanical
16. Machine Theory and Dynamics
17. Construction and Manufacturing
18. Energy
19. Thermodynamics
20. Materials Science
21. Production Metallurgy
22. Simulation
23. Mechatronics
24. Industrial Automation
25. Automotive Primary and Side Industry
26. Information, Communication and Information Technologies
27. Production of Machinery and Equipment
28. Textiles
29. Iron and Non-Ferrous Metals
30. Energy
31. Agriculture
32. Furniture
33. Glass and Ceramic Products
34. Air conditioning
35. Construction
36. Transportation and Logistics
37. Banking and Finance
38. Defense Industry
39. Cement and Cement Products
40. Durable Consumer Goods
41. Medicine
42. Aviation

FUNDAMENTAL SCIENCES

1. BIOLOGY
2. PHYSICS
3. CHEMISTRY
4. MATHEMATICS

SOCIAL SCIENCE

1. BUSINESS ADMINISTRATION
2. ECONOMETRICS
3. ECONOMICS
4. FINANCE
5. LABOR ECONOMICS

SUB-AREAS

1. Innovation and Middle Income Trap
2. Public Policy and Innovation
3. Innovation, Start-Up Law and Intellectual Property
4. Entrepreneurship, Branding and Innovation
5. Financial Technologies and Innovation Investment



INVITED SPEAKERS



Aytaç BAŞSÜLLÜ
KOCAER Haddeliçlik San. ve Tic. A.Ş.



Özgür ARSLAN
OLGUN Çelik San. ve Tic. A.Ş.



Prof. Dr. İbrahim DİNÇER
ONTARIO ÜNİVERSİTY



Doç. Dr. Havva Kazdal Zeytin
TÜBİTAK MAM Malzeme Enstitüsü
Kritik Malzemeler Grup Sorumlusu



Prof. Dr. Hüseyin ÇİMENÖĞLU
İTÜ Metalurji ve Malzeme
Mühendisliği Bölümü



Doç. Dr. Serdal TEMEL
EBİLTEM TTE Genel Müdürü



Gürkan YILMAZOĞLU
TOFAŞ Ar-Ge Metalurji ve Malzeme
Bölüm Yöneticisi



Korkut TAŞAN ve Ferit
SİMSAROĞLU
TİRSAN KARDAN



Zeynep SARILAR
ITEA Chairwoman, Netherlands



Yaşar Burak SAVAK
VESTEL IoT Group Director



Dr. Salih ERGÜT
TURKCELL SR. Expert, 5G R&D



Prof. Dr. Hamit SERBEST
ÜSİMP BAŞKANI-ÇUKUROVA ÜNİ.



EDITORS AND ORGANISING COMMITTEE

Editors

Assoc. Prof. Dr. Osman ÇULHA (MCBU)
Assoc. Prof. Dr. Ali DEMİR (MCBU)
Asst. Prof. Dr. Saim KURAL (MCBU)

Organising Committee

Prof. Dr. Necip KUTLU (MCBU)
Prof. Dr. Yüksel ABALI (MCBU)
Prof. Dr. Ahmet TÜRK (MCBU)
Prof. Dr. Mustafa MİYNAT (MCBU)
Prof. Dr. Hüseyin AKTAŞ (MCBU)
Prof. Dr. Kenan YALINIZ (MCBU)
Prof. Dr. Tayfun UYGUNOĞLU (AKU TTO)
Prof. Dr. A. Hamit SERBEST (ÇU, ÜSİMP)
Assoc. Prof. Dr. Ali ÇİPİLOĞLU (MCBU)
Assoc. Prof. Dr. Mahmut KARGIN (MCBU)
Assoc. Prof. Dr. Sezai TAŞKIN (MCBU)
Assoc. Prof. Dr. Serdal TEMEL (EBİLTEM TTO)
Assoc. Prof. Dr. Abdullah DİKİCİ (Uşak Uni. TTO)
Assoc. Prof. Dr. Osman ÇULHA (MCBU)
Assoc. Prof. Dr. Ali DEMİR (MCBU)
Asst. Prof. Dr. Tülin ÇETİN (MCBU)
Asst. Prof. Dr. M. Erkan TURAN (MCBU)
Asst. Prof. Dr. Seval DAĞBAĞLI (MCBU)
Asst. Prof. Dr. M. Bahattin AKGÜL (MCBU)
Asst. Prof. Dr. Ceyhun ARAZ (MCBU)
Asst. Prof. Dr. Burak ÖZDOĞAN (MCBU)
Asst. Prof. Dr. Pelin MASTAR ÖZCAN (MCBU)
Asst. Prof. Dr. Emel SOKULLU (İKÇ Uni. TTO)
Asst. Prof. Dr. Faruk EBEOĞLUGİL (DPU TTO)
Asst. Prof. Dr. Ayhan GÜN (DPU, KÜSİ)
Asst. Prof. Dr. Saim KURAL (MCBU)
Lecturer H. Zeki DİRİL (MCBU)
Specialist Harun DURACAK (MCBU)
Specialist Enver Akbalık (MCBU)
Specialist Musa GÜLER (MCBU)
Specialist Zafer YÜKSEL (MCBU)
Tolga DEMİRKIRAN (KOCAER)
Aytaç BAŞSÜLLÜ (KOCAER)
İlter KİLERCİ (KOCAER)
Burak KOCAER (KOCAER)
Mehmet AKKAŞ (KOCAER)
Ezgi SEVGİ (KOCAER)
Üniversite-Sanayi İşbirliği Platformu (ÜSİMP)
IEEE MCBU Student Society
MCBU ENSO Club
MCBU İNŞAAT Club
MCBU Metalurji Genç & GAMA Club
MCBÜ OPTİMUM Club
MCBÜ Robot Teknolojileri Kulübü - ROTEK
MCBÜ Kimya Kulübü
MCBÜ Gönüllü Gıdacılar Kulübü



HONORARY and SCIENTIFIC COMMITTEE

HONORARY COMMITTEE

A. Kemal ÇELEBİ (Prof. Dr.) (Rector of MCBU)
Erdal ÇELİK (Prof. Dr.) (Rector of DEU)
Remzi GÖREN (Prof. Dr.) (Rector of DPU)

SCIENTIFIC COMMITTEE

Abderrezek MAHFOUD (Prof. Dr.) (Algeria)
Abdon ATANGANA (Prof.) (South Africa)
Abdulkerim ERGÜT (Asst. Prof. Dr.) (MCBU)
Abdullah KEÇECİLER (Asst. Prof. Dr.) (DPU)
Abdulmecid Nuredin (Assoc. Prof. Dr.) (Macedonia)
Ahmet ATAÇ (Prof. Dr.) (MCBU)
Ahmet ÇETİN (Assoc. Prof. Dr.) (MCBU)
Ahmet Ali KUMANLIOĞLU (Asst. Prof. Dr.) (MCBU)
Ahmet TÜRK (Prof. Dr.) (MCBU)
Akın ÖZÇİFT (Assoc. Prof. Dr.) (MCBU)
Ali Murat ATEŞ (Asst. Prof. Dr.) (MCBU)
Ali Uğur ÖZTÜRK (Assoc. Prof. Dr.) (MCBU)
Ali YURDDAŞ (Asst. Prof. Dr.) (MCBU)
Anarkul URDALETOVA (Prof. Dr.) (Kyrgyzstan)
Ayla TEKİN (Asst. Prof. Dr.) (MCBU)
Bekir SOLMAZ (Prof. Dr.)
Birgit Oberer (Assoc. Prof. Dr.) (Sakarya Uni..)
Burak B. ÖZHAN (Assoc. Prof. Dr.) (MCBU)
Celalettin KOZANOĞLU (Prof. Dr.) (MCBU)
Cemile BARDAK (Asst. Prof. Dr.) (MCBU)
Cüneyt TEMİZ (Prof. Dr.) (MCBU)
Emine KEMİKLİOĞLU (Asst. Prof. Dr.) (MCBU)
Emre YALAMAÇ (Assoc. Prof. Dr.) (MCBU)
Enver ATİK (Prof. Dr.) (MCBU)
Ercan UŞUN (Asst. Prof. Dr.) (MCBU)
Erdal EROĞLU (Asst. Prof. Dr.) (MCBU)
Erdem ATAR (Assoc. Prof. Dr.) (GEBZE)
Esra DOKUMACI (Asst. Prof. Dr.) (DEU)
Fırat TEKİN (Öğr. Gör.) (MCBU)
Funda Ak AZEM (Asst. Prof. Dr.) (DEU)
Gökhan ALTINTAŞ (Prof. Dr.) (MCBU)
GÜREL PEKKAN (Assoc. Prof. Dr.) (DPU)
Gürsel YANIK (Assoc. Prof. Dr.) (DPU)
Hakan ARACI (Asst. Prof. Dr.) (MCBU)
Hasan GÖÇMEZ (Prof. Dr.) (DPU)
Hasan KÖSE (Asst. Prof. Dr.) (MCBU)
Hayati MAMUR (Asst. Prof. Dr.) (MCBU)
Hülya DURMUŞ (Assoc. Prof. Dr.) (MCBU)
Hüsametdin COŞKUN (Prof. Dr.) (MCBU)
Ian Robert MCANDREW (Prof.) (England)
Işıl BİRLİK (Asst. Prof. Dr.) (DEU)
İbrahim AYDIN (Asst. Prof. Dr.) (MCBU)
İbrahim Etem SAKLAKOĞLU (Assoc. Prof. Dr.) (EGE)
İlkay DİLBER (Assoc. Prof. Dr.) (MCBU)

İlker POLATOĞLU (Asst. Prof. Dr.) (MCBU)
İsmail EREN (Asst. Prof. Dr.) (MCBU)
İsmail MARAŞ (Prof. Dr.) (MCBU)
İsmail TAŞLI (Asst. Prof. Dr.) (MCBU)
Kamil KOÇ (Prof. Dr.) (MCBU)
Kamil VURAL (Assoc. Prof. Dr.) (MCBU)
M. Fatih KARAHAN (Asst. Prof. Dr.) (MCBU)
Maurizio Quinto (Prof. Dr.) (Italy)
Mehmet Ali YURDUSEV (Prof. Dr.) (MCBU)
Metin NİL (Vestel)
Morteza NİK (Asst. Prof. Dr.) (İran)
Murat ŞAHİN (Asst. Prof. Dr.) (MCBU)
Necdet BİLDİK (Prof. Dr.) (MCBU)
Neriman BAĞDATLIOĞLU (Prof. Dr.) (MCBU)
Nevzat ONAT (Assoc. Prof. Dr.) (MCBU)
Nurettin ARSLAN (Prof. Dr.) (MCBU)
Nurşen SAKLAKOĞLU (Prof. Dr.) (MCBU)
Orhan ÖZATİK (Asst. Prof. Dr.) (DPU)
Övünç ÖZTÜRK (Asst. Prof. Dr.) (MCBU)
Özlem UZUN ARAZ (Asst. Prof. Dr.) (MCBU)
Pelın GÜNÇ ERGÖNÜL (Assoc. Prof. Dr.) (MCBU)
Pınar MIZRAK ÖZFIRAT (Assoc. Prof. Dr.) (MCBU)
Rahime SANCAR EDİZ (Asst. Prof. Dr.) (MCBU)
Ramazan KARAKUZU (Prof. Dr.) (DEU)
Rasim İPEK (Prof. Dr.) (EGE)
Recep HALICIOĞLU (Asst. Prof. Dr.) (Osmaniye K.A.)
Rosnah Shamsudin (Prof. Dr.) (Malaysia)
S. Alper YILDIZEL (Asst. Prof. Dr.) (KMU)
Sabih ÖZER (Assoc. Prof. Dr.) (MCBU)
Seda VATANSEVER (Prof. Dr.) (MCBU)
Sedat COŞKUN (Öğr. Gör. Dr.) (MCBU)
Semih KÜÇÜKARSLAN (Prof. Dr.) (İTÜ)
Semra KAYAARDI (Prof. Dr.) (MCBU)
Semra TURAN (Assoc. Prof. Dr.) (İBU)
Seval DAĞBAĞLI (Asst. Prof. Dr.) (MCBU)
Sezai TAŞKIN (Assoc. Prof. Dr.) (MCBU)
Süleyman Murat BAĞDATLI (Asst. Prof. Dr.) (MCBU)
Şenay AYDIN (Prof. Dr.) (MCBU)
Tuğba ÖZACAR ÖZTÜRK (Assoc. Prof. Dr.) (MCBU)
Turan GÜNDÜZ (Prof. Dr.) (MCBU)
Tülin AYDEMİR (Prof. Dr.) (MCBU)
Yusuf ARMAN (Assoc. Prof. Dr.) (DEU)
Yusuf ERZİN (Assoc. Prof. Dr.) (MCBU)
Yücel KOÇYİĞİT (Asst. Prof. Dr.) (MCBU)
Zeina KASSAIFY (Assoc. Prof. Dr.) (Dubai)

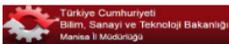


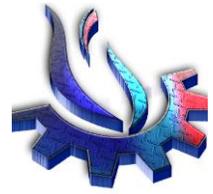
ORGANISING AND SUPPORTING INSTUTIONS





SUPPORTING INSTITUTIONS





PARTICIPATING UNIVERSITIES AND INSTITUTIONS



ANADOLU ÜNİVERSİTESİ



İTÜ





T.C. DÜMLUPINAR ÜNİVERSİTESİ

İleri Teknoloji Tasarım Ar. Ge. ve Uy. Merkezi



T.C. BİLİM, SANAYİ VE
TEKNOLOJİ BAKANLIĞI



TÜBİTAK
TEKNOLOJİ VE YENİLİK DESTEK PROGRAMLARI BAŞKANLIĞI
(TEYDEB)



KOSGEB
KÜÇÜK VE ORTA ÖLÇEKLİ İŞLETMELERİ
GELİŞTİRME VE DESTEKLEME İDARESİ BAŞKANLIĞI









ABSTRACT BOOK

A. ORAL PRESENTATIONS

UTILIZATION OF NUMERICAL SIMULATION IN ADDITIVE MANUFACTURING

M. WOHLMUTH¹, H. SCHAFSTALL¹, A. BUIJK¹, M. AYGEN² and C. ÖNDER²

¹ *Simufact MSC Software Corporation*

² *NETFORM Engineering Machinery Metal Ltd. İzmir/Turkey*

Email: maygen@netformmetal.com

ABSTRACT

This paper describes the status of Metal Additive Manufacturing in an industrial environment. The problems to achieve an economic, robust production are addressed as well as the challenges arising from this situation – to optimize 3D printing processes by means of CAE. An approach of Simufact Additive is presented, which allows industrial users to predict the distortion of AM parts during the build process and to analyze the reasons for its cause. The three-level concept of Simufact Additive is introduced, as well as the methodology to simulate the entire process chain of an AM workflow. Several application examples are presented.

Keywords: Additive manufacturing, Powder bed fusion, Simulation, finite element analysis, Simufact additive



CASTING BODY BASED SHEET METAL MOLD DESIGN AND PROTOTYPE MANUFACTURING

G. GUNESGORMEZ¹, S. HANOĞLU¹, Ö. FALAK¹ and İ. BULUR¹

¹ Teleset Group – Metalsan Industrial Products Industry and Trade Inc. R&D Centre, Manisa, Turkey
Email: g.gunesgormez@telesetgroup.com

ABSTRACT

Steel construction molds and casting body based molds are used in terms dimensional accuracy of the product to be produced in sheet metal moldings, type of product and process efficiency. Depending on the time, in the steel construction molds, there can be problems; such as connection elements of the molds, mounting parts, measurement defects caused by vibration and production during the process, and most importantly, breakage of the mold. Sheet metal mold to be developed within this project; It will be used for the production of metal parts of furnaces and it will be casting based mold. It is currently being imported by companies producing durable consumer goods in our region. During the design of cutting and bending mold with this project; it is desired to create import substitution by performing experimental R & D activities supported by design and simulation based on mold design parameters such as stresses on casting mold body, mold material selection, design, dimensions, rigidity, mold type and tolerance values during production. Furthermore, by analyzing the design stage and prototype molds in the pre-manufacturing simulation environment; have been realized for the first time in the company by verifying the casting mold body design and sample production, examining the mold life and the stresses that are effective in the working environment, producing an efficient design- analysis-revision process, shaping parameters on casting mold body.

Keywords: Sheet metal molding, Simulation supported design, Casting body based mold design



PROCESS AND MOLD DESIGN OF NEW GENERATION LED LIGHTING METAL PANEL

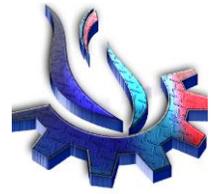
İ. BULUR¹, S. HANOĞLU¹ and Ö. FALAK¹

¹ Teleset Group – Metalsan Industrial Products Industry and Trade Inc. R&D Centre, Manisa, Turkey
Email: s.hanoglu@telesetgroup.com , i.bulur@telesetgroup.com

ABSTRACT

Sheet Metal Forming; is a method of production that is used in many fields of industry, especially automotive and durable consumer goods. In this method, process and mold design is closely related to the production efficiency and quality of the part to be obtained as a result of the production. The sheet metal forming process and mold design to be developed within this project; to be used for the manufacture of parts of new LED lighting metal panel and currently imported by companies producing durable consumer goods in our region. With this project, during the design of sheet metal mold; based on principles such as process design with automation firstly, operation steps (forming, bending, cutting, etc.), material flow in sheet metal, stresses on the mold of during production, training and mold design parameters. And it is desired to create import substitution by carrying out experimental R & D activities supported by design and simulation. In order to increase the added value and operational qualities; a new type of clamping system (tox clinching) that will work in the mold for the connection of the part will be implemented in the mold by designing. It is aimed to increase the clamping force of 7 kgf in a classical system to 20 kgf with the new system design.

Keywords: Sheet metal forming, Simulation supported design, Clamping system



DEVELOPMENT OF SMART PHONE ANTENNAS FOR 4G/4.5 G TECHNOLOGY WITH UNIVERSITY-INDUSTRY COOPERATION

B. ÖZBAKIŞ¹, K. YEĞİN², M. SEÇMEN³ and S. OKUYUCU⁴

¹ Vestel Inc., R&D Department, Manisa, Turkey

² Department of Electrical and Electronics Engineering, Ege University, Izmir, Turkey

³ Department of Electrical and Electronics Engineering, Yaşar University, Izmir, Turkey

⁴ Department of Electrical and Electronics Engineering, Antalya Bilim University, Antalya, Turkey

Email: basak.ozbakis@vestel.com.tr

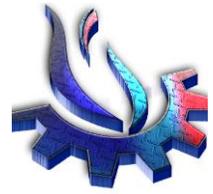
ABSTRACT

Turkey's vision of University-Industry collaboration is specified by the action plan of Public-University-Industry collaboration strategy (KÜSİ). In this scope, a collaboration has been established between VESTEL and researchers from different universities to realize antenna designs of new generation (based on 4G/4.5G technology) smart phones as part of the R&D activity carried out for the production of domestic phones. Goals of the project include increasing the proportion of domestic products in mobile phone production, reducing international dependency by increasing in-house knowledge on antenna designs for Wi-Fi, GPS, Cellular Communication (LTE, GSM, UMTS), and maintaining long-term collaborations in consolidating the cooperation of universities in the development of this critical technology.

In the realization of the project, the research work is divided into two main packages which are the design of Wi-Fi/GPS antennas and cellular antennas (main and diversity antennas). For this purpose, five different antennas covering monopole, IFA and PIFA antenna types have been developed. The antenna designs mainly use metallic parts at especially top and bottom sides of the phone, and printed structures on the back plastic cover, which is implemented with Linear Direct Structuring (LDS) technology. The designed antennas operate at the bands of Wi-Fi 2.4 GHz (between 2.4-2.5 GHz), Wi-Fi 5.2 GHz (between 5.2-5.8 GHz), GPS L1 (around 1575 MHz), 2G/3G/4G/4.5G (between 790-960 MHz and 1710-2690 MHz).

The project provides a substantial know-how especially in the designs of antennas needed for different functions on a smart phone, which can be further improved for the subsequent models of VESTEL's smart phones.

Keywords: Smart phone, Antenna, 4G/4.5G



DISPLAYS INTEGRATED WITH SMART WINDOWS

E. KEMIKLIOĞLU¹ and B. ÖZBAKIŞ²

¹ *Manisa Celal Bayar University, Faculty of Engineering, Bioengineering Department, Manisa, Turkey*

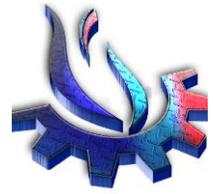
² *Vestel Electronics Corp., 45030 Manisa, TURKEY*

ABSTRACT

Smart windows are the industrial applications of polymer dispersed liquid crystals (PDLCs) which consist of the dispersions of micron-sized LC droplets inside a polymer matrix. The working principle of the PDLC films based on electrical switching between light scattering and transparent states due to index matching between polymer and liquid crystal materials. In the absent of the electrical field, the PDLC films normally scatter incident ambient light and appear milky since the LC molecules orient randomly inside of the droplets. The LC directors align in the direction parallel to the applied field due to index matching between polymer and LC molecules in the presence of the electric field, the PDLC film becomes transparent when viewed along the normal direction. Therefore, the smart windows can be switched to a dark mode, or to a bright, fully transparent mode.

In this study, a new form of PDLC films for smart windows technologies were produced by using the liquid crystal, monomer, and a small amount of catalyst with the help of polymerization-induced phase separation (PIPS) method. In this method, the liquid crystal and thermoplastic polymer are heated to obtain a melting and then mixed to form a single phase. After exposing the prepolymer mixture to an external Ultra-Violet light, the monomer gels into a polymer matrix and liquid crystal phase separates into droplets. The Electro-Optical performances of these films were characterized by analyzing transmittance as a function of switching voltage and response time. The experimental details will be presented in the conference.

Keywords: Smart windows, Liquid crystal, Polymer dispersion, Polymer dispersed liquid crystals



ELECTROSTATIC HAPTIC

Ö. TAMER¹, B. KIRIŞKEN², T. TÜRKORAL¹ and Ö. ÖZDEN²

¹*Dokuz Eylul Universitesi, Elektrik-Elektronik Müh., İzmir, Turkey*

²*Vestel Elektronik ve Tic. A.Ş., 45030 Manisa, TURKEY*

ABSTRACT

Touching to objects is the first tool for the human to discover the world as a baby. Due to this fact, it is the most natural way to sense the world around us. For this reason, very shortly after the emergence of touch screens, they have been rapidly adopted by the general society. Thanks to this technology, a wide portion of society who were not very familiar with computer technology in the past, from pre-school children to elder citizens have begun to benefit from technology.

Touch screen technology, however, also offers technology developers the ability to develop independently of language and habits. For example, if a notebook needs to produce a keyboard according to the language and preferences of the user, a tablet that can only be used with a touch screen can be converted to an interface only with the language and keyboard settings of the operating system.

Touch screens have become widespread in many places due to the preferences of users as well as the opportunities offered by technology. There are now big touchscreens on smartphones, tablets, white goods controls, kiosks and many more. Designed specifically for kiosk and device control, touch screens now include virtual keypads on the screen instead of traditional keypads.

The subject of the project is to create a surface resistance and thus a friction force like effect by loading a controlled static electric charge on the pixels of the digitizer used on the surface of the projected touch screens. This will allow the user to feel a resistance force on the screen. By using this tactile affect surfaces will be stimulated on the screen which will improve the user experience on various applications.

Keywords: Electrostatic haptic



COMPUTER AIDED DESIGN, ANALYSIS & PHYSICAL VERIFICATION OF HEAVY DUTY TRUCK MONOLEAF SPRING

O. KELEBEK¹, G. TOKGÖNÜL¹, G. KULAÇ¹ and Ç. ŞENOCAK¹

¹*Olgun Celik R&D Centre, Manisa, Turkey*
Email: ciler.senocak@olguncelik.com.tr

ABSTRACT

With the developing technology, commercial vehicle manufacturers have adopted the principle of weight reduction studies on many sub-components which assembled under the chassis. The parabolic leaf spring production has been increased in recent years due to the fact that the part weight of the conventional type of leaf springs in the wheel suspension system of the vehicle is larger than that of the parabolic leaf springs. In this study, current three-layered conventional leaf spring designed for the front axle of a heavy commercial vehicle was replaced by a single-layered parabolic leaf spring. Monoleaf spring geometry design was initiated based on the given chassis geometric constraints and stiffness requirements. Afterwards parabolic tapering gradients were optimized related to the desired stress distribution with finite element analysis and fatigue life calculations with Olgun Celik specific Wöhler curves for specified vertical, brake and lateral load inputs.

Before the fatigue tests of the produced samples, strain measurements were carried out with the help of strain gauges and correlation with the analytical findings. As a result of the analytical results' correlation based on stress measurements, fatigue tests have been carried out successfully. As concluded, Monoleaf parabolic leaf spring is a suitable design in terms of stress levels and fatigue for heavy commercial vehicles.

Keywords: Parabolic leaf spring, Stiffness, Stress, Wöhler curve, Fatigue, Finite element analysis



SIMULATION SUPPORTED PROCESS DESIGN AND PROTOTYPE MANUFACTURING OF FLANGED EXTERNAL TORX FASTENER

S. BARDAKCI¹, O. ÇULHA¹, A. BAYGUT² and V. BAŞDEMİR²

¹ TWIN R&D, Eng. Trade Limited Company, Manisa Teknopark, MANİSA, TURKEY

² Bolt Bağlantı Elemanları San. ve Tic. A.Ş., BURSA, TURKEY

Email: serhat.bardakci@twinarge.com

ABSTRACT

In modern fastening technology the majority of fasteners are made using the cold forming procedure. In this procedure, the fastener is formed, usually in multistage processes, by pressure forging, cold extrusion and reducing, or a combination of these procedures. The term solid or cold forming was coined for this type of production. This procedure is usually used for large quantities, because, from an economic aspect, it is the most rational method. In addition, cold forging is an important production process used in the automotive industry. Some of the advantages of this process are; increase in mechanical properties of material, high production speed, realization of process at room temperature, producing with precise dimensional tolerances. In this project, it is aimed to achieve cold forming process design, material selection and die-station design of the self-flanged outer torx fastener. Furthermore simulation of the whole process, material flow, hardening levels of raw materials try to be obtained. The selection of raw materials, mold-station design, process simulation studies are completed within the scope of applied research and experimental development activities.

Keywords: Plastic deformation, Cold forging, Simulation, Fastener



INNOVATION MANAGEMENT IN TURKISH ENGINEERING EDUCATION

S.A. YILDIZEL¹

¹ *Karamanoglu MehmetBey University, Engineering Faculty, Civil Engineering Department, Karaman, TURKEY
Email: sayildizel@kmu.edu.tr*

ABSTRACT

Innovation term can be explained as the composition of new solutions in order to reach the targets. The innovation and management of it have been so popular among various industries, countries, and regions since the fact that effectively directed research and development projects are ended in high profits. The main requirement of this management type is the educated person. Many countries including Turkey have been dealing with decreasing the gap between the demand and availability of skilled talents. This study aims to analyze the factors affecting the innovation management in Turkish higher engineering education. Barriers and drivers of the innovation management education were classified according to their sources. And the improvements of the current engineering programs were also discussed.

Keywords: Innovation, Innovation management, Innovation management education, Turkish higher education



AUTONOMOUS PHOTOVOLTAIC PANEL CLEANING ROBOT

B. KARAMAN¹, S. TASKIN², Y. TOPRAK³ and A. TUNCER⁴

^{1,2,3} *Manisa Celal Bayar University, Faculty of Engineering, Electrical & Electronics Engineering Department,
Manisa, Turkey*

⁴ *Atak Elektrik Engineering Automation Corp., 45030, Manisa, Turkey
Email: bllkrmn9@gmail.com*

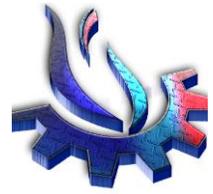
ABSTRACT

Increased interest in renewable energy, particularly solar and wind energy, has been grown due to environmental concerns. A photovoltaic (PV) solar power system consist of solar panels as the main component.

So as to make the solar panel more efficient, it should be receive the maximum intensity of light through to PV cells. Hence, the panel surface shouldn't be covered any dust particles. However, in some areas the dust particles are directly deposited on the solar panel. Therefore, most of the light coming from the sun is reflected due to the dust deposited on the panel. It is need a cleaning solution with determined time intervals to reduce dust effect and to continue same energy efficiency of the panels. It is not easy to clean thousands of PV panels in big solar power plants with human effort. So, it is need a smart robotic based cleaning systems.

In this study, it is aimed to fabricate an autonomous cleaning robotic system for PV panels. The designed prototype of the robot capable of cleaning dusts on the surface of PV panels. The designed system can move horizontally on panel arrays and works autonomously, and preliminary test results are remarkable.

Keywords: Photovoltaic panel, Solar power plant, Dust cleaning autonomous robot



INNOVATION ADVISORY BOARD CREATED WITH THE DATABASE AND MATCHING FIRM GROUPS WITH GRAPH THEORY

E. ASLAN¹

¹ *Turgutlu Vocational Training School, Celal Bayar University, Manisa, Turkey*
Email: ersin.aslan@cbu.edu.tr

ABSTRACT

In some cases, firms need to consult with other companies or sometimes with consultants in some institutions or related sectors to consult and develop innovative ideas. In order to meet the needs and work more coordinated, it is planned to establish an innovation advisory board with experts from more than one sector. With the increase in the number of innovation advisory boards, firms will be more interested and able to better support research-development. Each of the innovation advisory boards will be interaction.

At the beginning, the list of experts to be found at the innovation council will be pooled. Each expert will give points (a rating of 1 to 10) himself / herself. By processing the collected data in the database, innovation consultation groups will be established according to the average score. In an innovation group, there will be an academic staff or a specialist in each service (machine-manufacturing, electronics, chemistry, construction, food, etc.) sector and an innovation advisory board will be composed of 5 experts. The number of innovation advisory board group will be determined by the number of total consultants attending the board. As many as the number of created innovation boards will be created and assigned.

For the groups that will consist of companies; Information to be received from the Chambers of Commerce and Industry (names of companies, business areas, company sector ratings, etc.), information from firms (sector ratings (1-10), research-development activity or new sectors to be entered and etc.), the database will be constituted. By compiling the data in the database, the average scores of the firms for each sector are calculated and the firm groups, which are ordered according to the point order will be constituted.

With the help of graph theory, the innovation advisory group will be modeled with each firm group. Graph theory and matching operation will be performed. This operation will be done in accordance with the average scores.

Keywords: Innovation, Graph theory, Optimization



PRODUCTION PROCESS DESIGN AND PROTOTYPE PRODUCTION ACTIVITIES FOR THE PRODUCTION OF SURFACE GLOSS LEVEL GROUND FLOORING

S. KERENCİLER BATAR

*Graniser Seramik R&D Centre, Manisa, Turkey
Email: sbatar@graniser.com.tr.*

ABSTRACT

The surface properties of the products in the ceramics sector are improving toward customer and sector expectations. We have carried out experimental development activities with the aim of ensuring the creation of a new product, revealing the surface gloss and the effect on the brightness of the production parameters, and significantly improving the surface gloss level of a currently produced product. In the R & D activities carried out within the scope of the project, it was aimed to increase the level of the glossiness of the surface obtained in the current production processes and to revise the production processes and to improve the present product surface characteristics significantly. Optimum process parameters for the glossiness of the surface level measured with Glossy meter at the level of 50 ° -55 ° to 85 ° -90 ° have been obtained by the physical effects created by different variables during mass production, press pressure, drying and glazing processes.

Keywords: Production process, Surface gloss, New product



DEVELOPMENT OF NEW PRODUCTION PROCESSES OF 45 CM X 90 CM DIMENSIONS

S. KERENCİLER BATAR

¹*Graniser Seramik R&D Centre, Manisa, Turkey*
Email: sbatar@graniser.com.tr.

ABSTRACT

While the new generation architectural building, commercial projects, exterior wall and wall covering designs are being realized, the added value created by the original combinations of products originating from the dimensional difference manifests itself at a significant level in the sector. In the context of the project, new product and production process design activities were carried out for the company. The sizes of 45 cm * 90 cm have been selected for the purpose of acquiring a new piece of furniture, investigating the producibility of the products in different sizes and making sample productions. The production of different width sizes is planned to enable this piece to be turned into different designs and sizes later. It is aimed to increase the production-energy efficiency levels in the current process, and the technical and economical feasibility studies with the demand originating from the market. For this reason, revision of existing processes has been made for raw material preparation, mold and process design, prototype production-sintering, time-dependent testing and characterization activities for a new product production.

Keywords: Floor tile, Production process, New Dimension



R&D AND INNOVATION MANAGEMENT METHODS FOR DEVELOPMENT A NEW PRODUCT IN AKG GAZBETON

R. BULUR¹, U. UZGAN¹, T. KAVAS^{1,2}, D. SOYAL¹ and G. ERYILMAZ¹

¹ *AKG Gazbeton R&D Centre, İzmir, Turkey*

² *Department of Material Science and Engineering, Afyon Kocatepe University, Afyon, Turkey*

Email: ramazan.bulur@akg-gazbeton.com

ABSTRACT

Wireless communication technologies using the electromagnetic (EM) waves have significant influences on people's daily life. However, living spaces surrounded by the EM wave sources have harmful effects on human's health in the long term and those effects are investigated in many scientific researches. Although not a commercial product in the building market until present, the building materials absorbing the EM waves are gaining a crucial role to build healthier living areas now and in the future.

To develop a new material that is needed but not on the market, the development processes highly depend on an innovation management of a company's related departments. The innovation management is considered to handle the challenging problems with different methods according to suitable for the company. Research and Development (R&D) Projects are under influenced by the innovation management methods have much more impacts on considering other fields or departments.

Present study includes the patented new product EMIBLOCK (Electromagnetic Interference Block), a building material absorbing the EM waves, and the innovation management method for the product. EMIBLOCK is shielding the EM waves up to 99 % for radiofrequency bands such as GSM 900, GSM 1800, 3G/4.5G and Wi-Fi. R&D project for EMIBLOCK is managed by the innovation management method named as "Innovation Pipeline" which takes roles in process stages from idea to launch for developing the new materials.

Keywords: Building material, Electromagnetic waves shielding, Innovation management method



PRODUCTION OF MONOCLONAL ANTIBODY FROM MOUSE FOR ROUTINE USE

H. S. VATANSEVER^{1,2}, F. OZDAL KURT³ and S. GOKALP¹

¹ *Manisa Celal Bayar University, School of Medicine, Department of Histology and Embryology, Manisa, Turkey*

² *Near East University, Experimental Health Science Research Center, Nicosia, North Cyprus*

³ *Manisa Celal Bayar University, Faculty of Art and Science, Department of Biology, Manisa, Turkey*

Email: sedavatansever@cbu.edu.tr

ABSTRACT

Antibodies are produced as monoclonal and polyclonal and they are produced in mouse and rabbit, respectively. Monoclonal antibody production from mouse, obtained after their immunization and its B lymphocytes fusion with hybridoma cells or injection into peritoneum. Antibodies are purchased from abroad. The aim of the project was to produce Ki-67 monoclonal antibodies from mouse for treatment/diagnostic usage in histopathology and cytology. Mouse was injected with 5doses of antigen to provide immunization and then spleen B lymphocytes were obtained by mechanical dissection. B-lymphocytes were co-cultured with hybridoma cells for 15days for fusion of these cells and amount of Ki-67 antibody in the culture medium was analyzed by ELISA. B lymphocytes were fused with hybridoma cells after 15days of co-culture. The level of Ki-67 antibody after ELISA was not similar in all culture well, but, the titter was obtained between 0.8-1.0. The intensity of produced antibody on tissue section was investigated and both produced and purchased Ki-67 antibodies were stained similar, therefore, produced antibody was specific for Ki-67. In conclusion, Ki-67 antibody was produced after mouse immunization and can be used both routine and research studies.

This project was supported by Manisa Celal Bayar University Research Foundation 2015-026.

Keywords: Antibody, Monoclonal, Mouse



E-HEALTH SERVICES EVERYWHERE AND FOR EVERYBODY: PATIENT TO PATIENT SCENARIOS

I. KAYA¹, K. BAKANOGU¹ and B. SAVAK¹

¹ *Vestel Electronics R&D Centre, Manisa, Turkey*
Email: ilhan.kaya@vestel.com.tr

ABSTRACT

The aim of this study is to provide low cost, and highly efficient e-health services accessed by everyone at everywhere. It builds on top of a high quality video conference framework utilizing home appliances. In order to realize some of the e-health services, project requires expertise from interdisciplinary fields: IoT (Internet of Things) devices to obtain patient specific data for monitoring, and cloud systems for patient data analysis, multimedia streaming and display on embedded home devices for video conferencing. Three major services under patient to patient scenarios can be listed as patient monitoring with IoT components, video conferencing social network among patients, and search and summarize e-health related content gathered from hospitals, health institutions and web. In order to implement video conferencing solution, state of the art WebRTC (Real-Time Communication for web) framework is developed, and audio and video streaming carried out with the popular and widely used video decoding and encoding standards. REST API is used to access cloud based data services. A Set Top Box (STB) unit running on Android platform is the main platform in order to access and use the e-health services with a easy to use interface. An android based mobile client application continues to be developed to make e-Health services accessible from everywhere.

Keywords: E-Health, IoT, Video monitoring, Conferencing, Cloud systems



SIMULATION AIDED DESIGN AND PROTOTYPE MANUFACTURING OF ASYMMETRICAL SECTIONED STEEL PROFILES

M.AKKAŞ¹, İ.KILERCİ¹, B. KOCAER¹ and A. BAŞSÜLLÜ¹

¹ Kocaer Rolling Mill R&D Centre, Aliğa, İzmir
Email: m.akkas@kocaerhadde.com

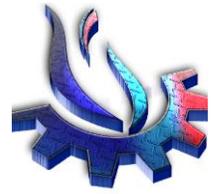
ABSTRACT

Predictive studies such as designing, analyzing and evaluating ship structures are usually carried out by numerical calculation methods while the necessary physical information is provided by experimental studies in the shipbuilding sector. The mechanical and metallurgical characteristics of the elements that bring the ship in the shipbuilding industry play an important role in the certification process of the ship structures. Therefore, the parameters used in the production of the structural elements used in shipbuilding activities need to be regulated in a way that improves the material properties. The mechanical and metallurgical properties of the semi-finished product obtained at the end of the production of the structural elements used for shipbuilding can not be obtained adequately directly affect the mechanical performance of the structural components. These components also have a direct effect on the magnitude of the stress and deformation that affect the elements around them. Therefore, it is essential to optimize the manufacturing processes of the structural elements.

In this study, roll-pass designs were designed and controlled rolling simulations were realized by using of Simufact Forming simulation tool based on finite element method for acquiring an asymmetrical profile with low carbon- micro alloyed steel used in ship buildings. Simulation aided manufacturing studies have been realized for eliminating the manufacturing defects and obtaining stress-strain curves, forces acting on the rollers and torque requirements at the inlets and the outlets of the rolling stands. Optimization studies of the production parameters to improve the final product mechanical properties.

Mechanical tests and metallurgical tests have been applied to the production samples obtained by ensuring that the production parameters obtained in simulated support activities are used in prototype productions and the improvement of the mechanical properties of the profile with asymmetric section is provided.

Keywords: Simulation aided design, Ship building, Controlled rolling, Micro alloyed steel, Finite element method, Asymmetrical profile



FINITE ELEMENTS AIDED DESIGN AND INVESTIGATION OF IMPROVING OF ENERGY RECOVERY ON INDUSTRIAL ANNEALING FURNACES

B. ÖNDER¹ and İ. KILERCİ²

¹ *Manisa Celal Bayar University Mechanical Engineering Dept., Manisa, Turkey/ Kocaeli Rolling Mill R&D Centre, Izmir, Turkey*

² *Kocaeli Rolling Mill R&D Centre, Izmir, Turkey
Email: b.burakonder@gmail.com*

ABSTRACT

In this study, energy improvement study was carried out in the existing recuperator system which is used for energy recovery in the waste air zone of the natural gas fueled rolling mill annealing furnace by using the finite element analysis. In this context, the flow and heat transfer analysis of the current state was analyzed by using Ansys - Fluent module by modeling the recuperator in the waste gas outlet area of the existing furnace and temperature distribution, waste gas speed and pressure values are obtained. The areas where waste heat cannot be recovered were determined by monitoring the flow of the waste gas in the furnace outlet region. Different plate and fin geometries were modeled according to the analysis model and the waste furnace gas was directed and analyzed. The results were shown that the heat transfer between the waste gas and the combustion air was increased, the heat loss was decreased in the unrecoverable heat regions and the temperature of the combustion air from the recuperator was increased compared to the results of the existing system analysis. With the designs that will only direct the gas flow without changing the current recuperator, the temperature of the combustion air is increased and low-cost designs have provided savings from natural gas in the furnace.

Keywords: Industrial annealing furnace, Recuperator, Energy saving, Waste heat recovery, Finite element analysis



IMPROVEMENT IN MINI RISERS FIXING SYSTEM FOR AUTOMATIC SAND MOLDING SYSTEMS

H. KAHRAMAN¹

¹ *Cukurova Kimya Endüstrisi A.Ş., R&D Centre, Manisa, Turkey*
Email: h.kahraman@cukurovakimya.com.tr.

ABSTRACT

Sand casting method is commonly preferred, because of low-cost and easy molding. However molding time can be long for detailed casting parts. The high-pressure automatic molding systems are very effective improvement on casting for mass production integration. Especially for iron based alloy casting, manufacturing rate increases greatly. Also, manpower decreases and casting yield rises up. Mini risers are good alternative for automatic molding system to solve feeding problems. Mini risers have less feeding metal and higher thermal energy. The weakest side of mini risers is their brittle structure. The riser consists of particulate material and inorganic binder, so high compactivity force of molding system can cause damage. There are different fixing systems that have been used for this circumstance. The purpose of these systems is absorbing the molding force on riser. There are various assistant components like spring pins, ductile breaker cores and frictional connectors.

Keywords: Casting, Feeding, Molding system, Mini riser



THE IMPORTANCE OF BORON FOR TURKEY AND BARIUM METABORATE: A WELL-KNOWN BORON COMPOUNDS, WHICH IS NOT USING IN TURKEY

E. AKŞENER¹

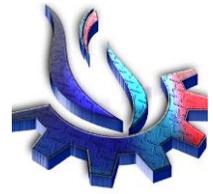
¹ Çukurova Kimya Endüstrisi A.Ş./Manisa, Turkey
Email: e.aksener@cukurovakimya.com.tr

ABSTRACT

The estimated history of boron ores in Turkey dates back to the era of the Eastern Roman Empire. First boron deposits were encountered in the Sultançayırı region within the Susurluk district of Balıkesir. Known boron deposits in Turkey are primarily found in Kırka/Eskişehir, Bigadiç/Balıkesir, Kestelek/Bursa and Emet/Kütahya. The most common boron ores reserve in Turkey are tincal and colemanite. To summarize, Turkey is ranked top with its share of almost 73% in the global boron reserve standing.

Barium borate, also called barium diborate, barium boron oxide, or barium metaborate [(BaB₂O₄ or Ba(BO₂)₂)] is an inorganic compound, a borate of barium. It is available in hydrated (BaB₂O₄ nH₂O) or dehydrated form. BaB₂O₄ is used as an additive in several industries including textile, rubber, paints, wood, and similar sectors, not producing in our country yet. BaB₂O₄ is used particularly in the production of ceramic glazes, luminophores, oxide cathodes, pigments for aqueous emulsion paints, fire retardants, as a mildew inhibitor in latex, plastics, paper, and as a preservative in protein-based glues. In addition, BaB₂O₄ used in corrosion inhibitor packages for the low temperature cure powder coating technologies providing barrier protection. In addition β-barium metaborate crystal is a nonlinear optical crystal and has perfect properties and used in laser technology.

Keywords: Boron ores, Barium metaborate, Fire retardant, Mildew inhibitor, Corrosion Inhibitor, Nonlinear optical crystal.



DEVELOPMENT PROCESS OF R&D - INNOVATION EXPENDITURES IN TURKEY: AN ECONOMIC PERSPECTIVE

M. M. DAM¹

*Adnan Menderes University, Nazilli Faculty of Economics and Administrative Sciences, International Trade and
Finance Department
Email: metindam@adu.edu.tr*

ABSTRACT

In the globalizing world, a number of changes have also taken place in the determinants of economic growth in the competitive environment in which continuous economic cycles and multilateral liberalization are experienced. Today, the most fundamental component that country economies and firms can use as a leverage to provide sustainability and competitive advantage in growth is R&D and innovation.

New developments are taking place every day in R&D and innovation activities in the world. Being the second largest economy in the world, China is the world leader in R&D spending and innovation activities. China's total R&D expenditure is higher than Turkey's Gross Domestic Product (GDP). This indicator alone shows how much China invests in technology. Although Turkey has doubled R&D expenditures in the last 15 years, it is seen that the investments made in technology are lower compared to the developed countries or fast growing developing countries. In this study, the level of technology in Turkey will be compared to developed and developing countries in the macroeconomic framework.

Key Words: R&D, Innovation, Economic Growth, Turkey.

JEL Codes: O32, O40, F43.



HIGHLY RELIABLE HALF BRIDGE LLC CONVERTER DESIGN AND ANALYSIS FOR OLED TV

M. NİL¹, Y. CAN¹, M. NİL², H. SÖZEN² and Y. ÖZTÜRK³

¹ Vestel Electronics Corp., R&D Department 45030 Manisa, Turkey

² Manisa Celal Bayar University, Faculty of Engineering, Electrical and Electronics Department, Manisa, Turkey

³ Ege University, Faculty of Engineering, Electrical and Electronics Department, İzmir, Turkey

Email: metin.nil@vestel.com.tr

ABSTRACT

Due to changing television market conditions and customer demands, companies are required to develop more innovative, better picture quality, cheaper costs and less energy consuming products. OLED displays - new generation display technology - have some important advantages such as self-emissive, wide viewing angle, high contrast ratio, fast pixel response time and physically very thin. Nowadays, OLED displays began to be preferable due to the fact that they provide advantages in consumer electronics.

On the other hand, in order to substitute present LCD displays with OLED displays in TV business, the cost is required to be reduced by solving technical, manufacturing and reliability problems. Reliability is one of the key subject for OLED TV design. The main reliability problem of high power OLED TV is electrical and thermal overstress of electronic components.

In this study, we aimed to present highly reliable and robust 600 W power supply board used in OLED TV. For reliability, the most critical part of this power board is the half bridge LLC resonant converter circuits. Approximate design analysis was made for LLC resonant converter. In order to verification of design, critical reliability tests were performed. Mean Time Between Failure value of power board was calculated by using reliability data are obtained from laboratory under special operating conditions. The design and experimental details will be presented in the conference.

Keywords: Half bridge LLC resonant DC-DC converter, Reliability, OLED TV



SIMULATION-AIDED INVESTIGATION OF THE EFFECT OF WORKPIECE'S AND ROLL TEMPERATURES ON PROCESS PARAMETERS AND WORKPIECE STRESS-STRAIN CHARACTERISTICS ON HOT ROLLING TECHNIQUE

A. BASSULLU¹, İ. KILERCİ¹, S. ARALAR¹, E. BELEK¹ and O. CULHA²

¹ *Kocaeli Rolling Mill R&D Centre, Izmir, Turkey*

² *Manisa Celal Bayar University Metallurgical and Materials Engineering Dept., Manisa, Turkey*
Email: a.bassullu @kocaelihadde.com

ABSTRACT

Computational solid mechanics remains as a highly challenging research area in engineering. Large deformation problems, such as rolling, represent one of the most difficult tasks in engineering. Hot rolling forms metallic materials into various geometries to be used in the construction, automotive and mining industries. Rolling is a complex problem in which the geometrical and material response difficulties have to be considered simultaneously.

This work studied about the effect of rolling process parameters and stress-strain characteristics of the workpiece at different annealing temperatures and roll temperatures of hot rolling process of low carbon steel. Within this scope, roll-pass designs were modelled depend on the inlet and outlet of the rolling stands and the whole processes were simulated by using simufact forming software. The effect of variation of workpiece's and roll temperatures' on the temperature distributions, strain-strain characteristics of the workpiece, rolling forces and torque requirements of the inlet and outlet of the rolling stands have been investigated in simulation aided studies. The results showed that the workpiece annealing temperature and roll temperatures remarkably influenced the hot rolling process parameters and stress-strain characteristics of hot rolled steel.

Keywords: Hot rolling, Simulation, Finite element method



INFLUENCING FACTORS OF CURVATURE PROBLEMS IN LARGE FORMAT MONOPOROSA CERAMIC WALL TILES

M. TARHAN¹, B. TARHAN², K. KAYACI³ and F. KARA⁴

¹ Usak University Faculty of Fine Arts, Ceramic Department, Usak, Turkey

² Usak University Faculty of Fine Arts, Ceramic Department, Usak, Turkey

³ Kaleseramik Çanakkale Kalebodur Seramik San. A.Ş, R&D Centre., Canakkale, Turkey

⁴ Anadolu University, Department of Materials Science and Engineering, Eskisehir, Turkey

Email: muge.tarhan@usak.edu.tr

ABSTRACT

Monoporosa ceramic wall tiles are produced by single firing method and they have high porosity and high water absorption capacity ($E > 10\%$). They are less stable than sintered ones (floor and porcelain tiles) and wall tiles undergo an expansion process when they are varying periods of time in contact with moisture. Therefore ceramic wall tiles display delayed curvatures that are the change in tile curvature after over a period of time that may take several weeks or even months. This phenomenon becomes more problematic as tile size increases. Wall tile bodies consist of two main different phases; amorphous and crystalline phases and each one can make the moisture expansion to increase or decrease. In this study, the influence of chemical and mineralogical composition of ceramic wall tile bodies on the extend of the moisture expansion have been evaluated. Moisture expansion of the samples was determined by dilatometer method. It's found that it was possible to lower the moisture expansion and reduce the amount of curvature of tiles significantly by adjustment of body composition. Moisture expansion of bodies decreases as the content of alkaline oxides and amorphous phases decreases and the content of CaO and crystal phases increases.

Keywords: Ceramic, Wall tile, Curvature, Moisture, Expansion



A SOFTWARE PROGRAM FOR SOIL LIQUEFACTION ANALYSIS

S. DURUKAN¹ and O. ASLAN²

¹Manisa Celal Bayar University/ Manisa Vocational School, Manisa, Turkey

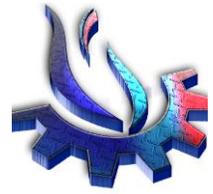
²Manisa Celal Bayar University/ Institute of Natural and Applied Sciences, Manisa, Turkey
and also in Exen Mimarlık Mühendislik, İzmir, Turkey

Email: seda.durukan@cbu.edu.tr

ABSTRACT

Soil liquefaction has long been defined as the loss of the shear strength of saturated cohesionless soils when subjected to dynamic loadings, namely, earthquakes. This condition results in huge settlements and damages and also collapse of the structures. Liquefaction and the damages induced by liquefaction are being considered in soil liquefaction potential analysis. There are many types of soil liquefaction potential analysis proposed by many researchers. Such parameters in soil liquefaction analysis are soil grain size, fine content, clay or silt content, plasticity, density, shear velocity, earthquake magnitude and acceleration, shear stresses and the placement of groundwater table. In literature, these parameters were considered separated or together with empirical and numerical methods. Some of the mostly used analysis are NCEER group, Chinese code, Simplified Seed & Idriss Method, Vancouver Task Force, Japanese highway Bridge Code and more. The numbers of the analysis types cause confusion on the selection of the analysis type for engineers in industry. In practice, the engineers in Turkey are lack of a simplified liquefaction analysis software in Turkish. Due to this phenomenon, a software program in Turkish on soil liquefaction analysis is build up in this study for use of engineers in civil engineering industry. This study covers the basics of the liquefaction analysis and presentation of the software program. The software introduced in this study is designed to be user friendly, simple and effective and supporting variety of field tests and graphical inputs and outputs.

Keywords: Civil engineering, Geotechnic, Soil liquefaction, Earthquake



USAGE OF LOCAL ALKALINE RAW MATERIALS IN CERAMIC SANITARYWARE BODY COMPOSITION

B. TARHAN¹, M. TARHAN¹ and H. SARI²

¹*Uşak University, Fine Arts Faculty, Ceramic Department, Uşak, Turkey*

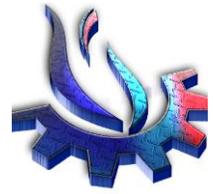
²*Kaleseramik Çanakkale Kalebodur Seramik San. A.Ş., R&D Centre, Canakkale, Turkey*

Email: baran.tarhan@usak.edu.tr

ABSTRACT

Most of the raw materials used in the ceramic Sanitaryware sector are supplied from UK and Europe countries. Shipment cost, storage cost and high foreign exchange rates increase the unit sanitaryware cost. Usage of local raw materials into the production of ceramic production has getting more important day by day. This study aims to bring local raw materials to the economy and minimize the raw material cost by using Can/Canakkale/Turkey regional alkaline materials in production of ceramic sanitaryware of Kaleseramik factory. Can/Canakkale/ Region raw materials were replaced with Cine/Aydın/Turkey region sodium feldspar. Developed compositions chemical analysis, XRD patterns, water absorption, dried and fired shrinkage and strength, deformation values were studied. Test results indicated that Can/Canakkale region alkaline raw materials can be partially replaced with sodium feldspar. Final composition was tested industrial scale and qualities of the products were same with standard continuous production of Kaleseramik. New sanitarware composition were reduce the production cost approximately 3,6%.

Keywords: Ceramic, Sanitaryware, Local raw materials.



NEW SECTION STEEL PROFILES WHICH WILL BE USED IN STEEL CONSTRUCTION BRIDGE MANUFACTURING

İ. KİLERCİ¹, B. KOCAER¹, E. SEVGİ¹, M. AKKAŞ¹ and A. BAŞSÜLLÜ¹

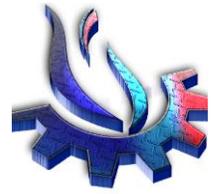
¹KOCAER R&D Centre, İzmir, Turkey,
Email: e.sevgi@kocaerhadde.com

ABSTRACT

Due to high mechanical properties of the long steel profiles which have been used as limited for many years, is increasing demands for production compared to reinforced concrete structures in recent years. It is known that the mechanical properties of the steel profiles are affected the micro alloy element added to the raw material, the deformation rate, the temperature and the cooling processes. The finer grain structure obtained by the controlled cooling process ensures that the product has high strength and durability. Another important parameter that affects the mechanical properties of steel profiles is profile section.

In this study, it is aimed to realize a new section design with different geometries from those of the U-type sections considered especially for use in bridges and other steel carrier elements. Therefore; it had been performed simulation aided design with increasing of web thickness of parallel flanged structural steels having new section, within metallurgical, thermal and mechanical parameter under hot rolling conditions. The micro-alloyed steel was selected for use during this study and to provide better mechanical properties. By optimizing the amount of stress-strain and reduction rates during the hot rolling, effect of these parameters on the metallurgical and mechanical properties was investigated and real production of web thickness-increased profile was produced.

Keywords: New section steel profile, Simulation aided design, Micro-Alloyed steel



THE RESEARCHES ON AERODYNAMICS OF ADVANCED SPLIT AIR CONDITIONER

Ö. ÖZER¹, D. KUMLUTAŞ¹, İ. GÜMÜŞ² and S. SUDA²

¹Dokuz Eylül Uni., İzmir, Turkey

²Vestel White Goods A.S., Manisa, Turkey

E-mail: deniz.deveci@vestel.com.tr

ABSTRACT

Split air conditioners (SAC) are specially designed heat pumps which consist of two separate units. One of these units places at outdoor and the other is to the indoor and each has a heat exchanger, therefore, using the refrigeration cycle they can transfer heat between indoor air and atmosphere. So SACs can both heat and cool and in the cooling process, it can also dehumidify the air. These advantages make SAC's a very suitable choice for single volume Air Conditioning applications.

In this study, Split Air Conditioners Aerodynamics (SAC) were investigated. For succeeding this aim, four University-Industry Cooperation Projects realized. In these projects, aerodynamics design parameters of the indoor and outdoor units were investigated experimentally and numerically. In experimental studies, Particle Image Velocimetry method is used for investigation the flow characteristics. As the result of the study, standalone and overall flow effects of investigated parameters were presented. A full prototype of the design with the optimum outputs was built and investigated using SPIV.

Keywords: Split air conditioner, Volute design, CFD, PIV, Heating, cooling, Cross-fan parameters



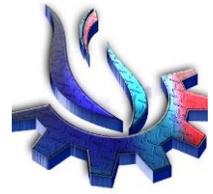
THE CORRELATION BETWEEN REFRIGERATOR NOISE LEVEL AND BOTTOM CABINET CAVITY

A. ÖZTÜRK

*Vestel White Goods A.S., Manisa, Turkey
Email: anil.ozturk@vestel.com.tr*

Noise level is an important factor for selection of whitegoods. In particular, refrigerator noise emission is determinative in the customer choices due to running continuously when compared the other appliances. Therefore, refrigerator manufacturers are trying to suppress the noise from the refrigerator. The most important part of the refrigerator for the noise problem is the bottom cabinet due to the presence of compressor, evaporating tray, pipes and cavity. The compressor noise has a profound significance on the refrigerator's overall noise. The sound generated by the compressor may be radiated directly or indirectly. Propagation from the steel case is direct type, structure-borne noise by exciting other components of the system is indirect type. Basically, the compressor noise is transmitted to air from the bottom cabinet cavity in where the pressure wave source is represented by a compressor inside the cavity. In this study, acoustic behavior of bottom cabinet cavity and the relationship between the overall noise level is investigated. Numerical, analytical and experimental results obtained from the studies are also given briefly. The results indicate that some methods are able to predict the whole modes of acoustic cavity, such that it is possible to noise control by improving acoustic behavior of rectangular cube shaped bottom cabinet cavity. Also, cavity peak frequencies are important for the sound level of the bottom cabinet cavity of the refrigerator to avoid or minimize unwanted noise conditions.

Keywords: Refrigerator noise, Bottom cabinet, Cavity, Natural frequency, Noise control



A+ ENERGY CLASS IN OVENS

B. ÖZÇELİK YILDIZ

Vestel White Goods A.S., Manisa, Turkey
E-mail: benal.ozcelikyildiz@vestel.com.tr

ABSTRACT

Energy class has become an important factor in the design of household appliances by the awareness of environmental effect of energy overuse. In this sense, the revision of energy consumption limits in 2015, in regulation (Commission Regulation (EU) No 66/2014) implementing ecodesign requirements for domestic ovens, has caused the manufacturers to review their product design. According to the new EU regulation, the energy consumption limit of class A is increased and the sale of products having an energy class lower than A such as B or C, is forbidden in market.

In this project, we studied on the construction details for the heat loss. We reevaluated the thickness and the density of the insulation wrapping the oven cavity. We also reviewed the ON / OFF periods of oven heating elements during cooking process. We studied on the control algorithm in order to shorten the ON time and extending the OFF time of heating elements. By performing iterative tests and analyzing the results, we determined the suitable solution. During the tests, it is also determined that the speed of the fan circulating the hot air in the oven cavity should better be variable depending on the working periods of the heating elements.

As a result of the study, we achieved an energy consumption for our ovens, 30% less than A energy class.

Keywords: Oven, Energy class, Energy consumption, Insulation, Heating elements, Fan speed, Control algorithm



OPTIMIZATION OF THE TUMBLE DRYER MACHINE BEARING SYSTEM

A. KORKMAZ¹ and M. C. SİDAN¹

¹*Vestel White Goods A.S., Manisa, Turkey*
E-mail: Omithat.sidan@vestel.com.tr

ABSTRACT

In addition to the population growth in our country and in the world in the last decade, increment in unemployment has increased the immigration to cities from rural areas. Vertical urbanization has become widespread over time in order to meet this increasing population density. As disadvantage, area of the houses has narrowed. In addition to this situation, people's expectation and lifestyles have changed with the increasing work intensity of city people.

An increase in the sales of tumble dryers has also been observed in this period as it provides comfort to the people living in the city and their habits. According to GFK data, 12% increase in sales of tumble dryer in Europe over the past 3 years has been observed. Tumble dryers are being supplied by many brands to the market with this increase in demand. Therefore, the necessity of producing long-lived machines has gained importance in order to get a share from the market.

In the tumble dryer, the drum, which is located between the friction bearings on the rear panel and on the front side, is rotated by means of the torque, generated by the motor, is transferred with the help of a belt.

The purpose of this study is; optimizing the bearing positions on the front side and with analyzing the belt force, reducing the forces on the system and balancing them on the bearings. These mechanical optimizations made it possible to increase the system lifetime, improve the power transmission between the motor and the drum, and increase the energy efficiency.

Keywords: Tumble dryer, Bearing, Optimization, Power transmission



NUMERICAL AND EXPERIMENTAL INVESTIGATION OF DIFFERENT AIR FLOW METHODS DEVELOPED IN THE INTERNAL VOLUME OF COOKING DEVICE

A. SEVER

*Vestel White Goods A.S., Manisa, Turkey
E-mail: aykut.sever@vestel.com.tr*

ABSTRACT

The air flow and temperature distribution in the interior volume of the cooking appliance is one of the most important factors determining the cooking performance of the product. A turbo fan is used in the cooking device to achieve uniform heat distribution. Turbo fan; improves indoor air circulation, reduces vertical temperature differences caused by natural convection and also contributes to increase heat transfer coefficient and thus to cook foods more quickly with increasing inner volume air flow rates. It is expected that the flow of air provided by the turbo fan should be evenly distributed at each shelf level of the cooking appliance. At this point, the air circulation precision achieved by the turbo fan directly affects the cooking performance. In particular, in the process of baking more than one tray at the same time, the hot air flow over the trays determines the multiple cooking performance of the product. In a cooking appliance, it is a challenge in order to obtain a proper air circulation at every level of the shelf where the trays can be placed and also to create an even air distribution in the case of the placement of multiple trays at the same time and it is a problem to be solved. In this study, different air flow methods have been developed in order to regulate the airflow in the cooking device and to be able to cook more than one tray at the same time. The effects of developed methods have been studied numerically and experimentally. In the numerical analysis, the airflows created in the internal volume have been simulated by using the computational fluid dynamics (CFD) program. According to these results, the air flow velocities have been experimentally measured over prototyping the methods giving positive results and compared with the analysis results.

As a result of this work, the influence of the air flows in the cooking device internal volume on the cooking performance has been investigated and a method has been also developed in which more than one tray can be cooked equally.

Key Words: Cooking device, Computational fluid dynamics (CFD), Internal airflow, Air velocity measurement, Cooking performance



EXPERIMENTAL AND NUMERICAL STUDY ON THE FLOW AND THERMAL DISTRIBUTION OF THE FREEZER

D. C. DEVECİ¹, L. ALTAY² and M. SARIKANAT²

¹*Vestel White Goods A.S., Manisa, Turkey*

²*Ege University, Engineering Faculty, Mechanical Engineering, Turkey*

E-mail: deniz.deveci@vestel.com.tr

ABSTRACT

Home appliances are the main reason for energy consumption in residential houses. For this reason, energy savings in household appliances are increasingly attracting attention from manufacturers and customers. Legislation is becoming more severe on acceptable energy levels and low energy consumption is a major marketing point for many products. Therefore, reduction in energy consumption from a refrigerator has become an important issue over the last decade and energy-free operation is becoming the preferred choice of customers in the domestic refrigerators. Among domestic refrigerators, the energy consumption in the freezer types is expected to be higher than the other types of refrigerators since freezing requires more power than standard cooling. In order to increase the energy efficiency and change the energy declaration of one freezer, the main idea is to obtain homogeneous temperature distribution inside the freezer during the designing stage of the product according to the International Standards. Also, No-frost featured domestic refrigerators are one of the preferred choice of customers, since there is no ice-accumulation inside of the freezer. Ice-accumulation in the freezer compartment emanates between the shelf surfaces and the freezer door if there is air flow at low speeds.

In this study, air flow and thermal distribution of a no-frost type freezer was studied by numerical and experimental methods. A numerical model of the air cavity inside the freezer was created with the ANSYS finite elements analysis software. In the numerical model, evaporator, evaporator cover, fan propeller and all accessories including shelves and baskets were modeled as solid and abstracted from freezer volume in order to obtain the final air cavity. The numerical flow analysis model in this study has been validated with laboratory tests on real products. Experimentally validated numerical flow analysis model for the freezer compartment was obtained.

Keywords: Air flow, Energy consumption, Ice-accumulation, Numeric analysis, No-frost, Freezer, Temperature distribution.



SIMULATION AIDED ANALYSIS OF DETERMINING OF LOAD-CARRYING CAPACITY OF YIELDING STEEL ARCH SUPPORT

A.BASSULLU¹, B. KOCAER¹, M. AKKAS¹, O. IPEK¹ and B. ONES¹

¹ Kocaer Rolling Mill /R&D Centre, Izmir, Turkey
Email: a.bassullu@kocaerhadde.com

ABSTRACT

Nowadays, usage of rigid steel support and yielding steel support systems, which are frequently used either separately or in combination with each other in the mining and tunnel construction sectors, seems to be widespread in the mining and tunnelling sector. In order to respond to the new needs for the usage of underground areas, which are tend to increase in our country in recent years, besides the necessity of closely monitoring the developing technology, the load carrying characteristics under dynamic loads of support systems should be determined effectively.

In this study, especially the mining accidents that lived in recent years have come out of the way; Finite element supported simulations have been carried out with respect to the selection of the yielding steel supports with increasing use in mines and tunnels in accordance with the rock characterization. In the scope of this study, stress and deformation behaviors, force-displacement curves and stresses affecting on the support were obtained and the safe load carrying capacity of the support was determined according to the modeled gallery section, after the specimens were bent in the gallery radius measurement.

Keywords: Mining and Tunneling, steel yielding support, finite element simulation, load carrying capacity



ENTREPRENEURIAL INTENTIONS AND BIG FIVE: A STUDY ON APPLIED ENTREPRENEURSHIP COURSE TRAINEES

A. R. İNCE¹, M.K. TOPCU² and M. ARIKÖK³

¹*Cumhuriyet University, Sivas, Turkey*

²*Visiting Fellow, National Defense University, Ankara, Turkey*

³*Independent Researcher, Sivas, Turkey*

Email: topcumustafakemal@gmail.com

ABSTRACT

This study aims to identify entrepreneurial intentions and to determine relationship among them and big five personality characteristics. The survey was conducted in an applied entrepreneurship course organized by a non-governmental organization-funded by İŞKUR in 2016 in Ankara. Trainees were invited to participate in the survey on a voluntary basis and approximately 1000 surveys were distributed. 171 were returned and 160 were included in the analysis. Exploratory factor analysis indicates that entrepreneurial intentions are grouped into four factors; internal control, opportunism, adaptiveness, and proactivity. The highest mean of personality factors is conscientiousness whereas the least one is neuroticism. Factors of entrepreneurial intentions range opportunism to internal control, the least to the highest. Open people are more prone to be entrepreneur. Regarding subfactors, conscientiousness regresses proactivity and internal control, openness does opportunism, and extraversion, openness, and agreeableness do adaptation. There is no significance difference concerning age, gender, marriage, and experience. On the other hand entrepreneurial intentions differ by education. University graduates are less proactive and opportunist than elementary school ones, less internal control than high school ones, and in general, they display less entrepreneurial intentions than others. It is contended that there is motivation for entrepreneur candidates; however, they are risk averted. Also entrepreneurship is considered a substitute to unemployment. Thus the higher education is the less entrepreneurial intention is. On the other hand, number of certificates issued to university graduates is the same with total number of the rest, underlining the significance of selection process. To this end, we may advocate that personality tests like big five are employed in the selection process to raise the success rate of the courses.

Keywords: Entrepreneurial Intentions, Big Five, Personality, Applied Entrepreneurship Course



AFFECTS OF DIE COATING AND COATING THICKNESS ON SOLIDIFICATION, MATERIAL PROPERTIES AND MICROSTRUCTURE OF A356 ALUMINUM ALLOY

K. MENDEŞ¹, H.YAVUZ² and U.AYBARÇ²

¹ *Manisa Celal Bayar University/Material Science and Metallurgy Engineering Dept., Manisa, Muradiye*

² *CMS Light Alloy Wheels/R&D Centre, İzmir, Cigli*

Email: kaan.mendes@outlook.com

ABSTRACT

Due to its low density and high strength/weight ratio, aluminum has a great important place in many sectors such as aerospace, automotive and building materials. The cast alloy A356, which contains 7% silicon and 0.3 Mg in its concentration, is the World's most widely used light metal alloy. The A356 alloy is a frontal alloy with excellent castability, good weldability, high machinability and high corrosion resistance.

High quality, low cost and quick delivery in competitive environment in casting sector are vital importance for competition for casting sector. Beside the proper casting technology, production of aluminum casting parts such a system that has a lot of inputs that interacting each other and affecting the output. For instance, mold coating has an important role in casting of sand and metal. Mold casting is very important because of its attributes such as preventing early solidification, controlling solidification rate, direction, perfection of casting, extending life of mold materials by lowering the thermal shock and it prevents liquid metal to stick on mold surface.

The aim of this project supported by Tübitak 2241-A Industry based graduation thesis support program is to observe the effect of the different materials used for mold coating in wheel sector (Dycote34, Dycote39, R84) in different coating thickness (50-150 μm and 250-350 μm) and mold temperature (50C and 160C) on mechanical and metallurgical characteristics of the produced products. Therefore, sample casting productions and simulations are performed. All the achieved results are comparatively evaluated in details.

Keywords: Aluminum, Die coating, A356, Material properties.



EVALUATION OF OLIVE OIL INDUSTRIAL BY-PRODUCT POMACE IN OIL INDUSTRY

T. GÖLDELİ¹, P. GÜNÇ ERGÖNÜL¹ and B. CAN PEHLİVAN²

¹Manisa Celal Bayar University, Faculty of Engineering, Department of Food Engineering, Manisa, TURKEY

²Zer Best Quality, Akhisar, Manisa, TURKEY

Email: tubagoldeli@hotmail.com

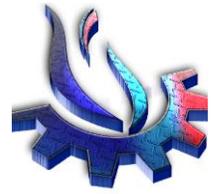
ABSTRACT

Pomace – by product of olive oil factories - is an important biomass variety in Mediterranean countries. The most important product obtained from pomace is pomace oil. Pomace oil can be used in cosmetics and soap industry, as well as it can also be used as edible oil after being processed under suitable conditions. Raw, unrefined pomace oil has own heavy smell, dark green color and very acidic characteristic. Fatty acid composition of pomace oil is similar to fatty acid composition of olive oil. However, it is dangerous for health for consuming as an edible oil without refining. This oil should be refined and after refining process it can be served for consumption.

Since several characteristics of this oil are not in accordance with 'Turkish Food Codex Olive Oil and Pomace Oil Communique', significant amount of pomace oil produced in our country is used especially in cosmetic industry. Thus, high efficiency cannot be obtained from this high-value product and this situation is so important in terms of economic losses. Pomace oil produced in accordance with the standards is available for consumption as edible oil. Thus, by producing high quality pomace oil, it is possible to obtain oil with characteristics similar to olive oil and also it will be an important added- value for our economy.

In this review, it was aimed to investigate the possibilities of evaluation of pomace in oil industry and by taking the optimum processing conditions into consideration and comparing to other oils, superior attributes of pomace oil were revealed.

Keywords: Olive oil, by-product, Pomace, Pomace oil.



EFFECT OF HEAT TREATMENT CONDITIONS ON THE CRYSTALLIZATION OF DENTAL GLASS-CERAMICS

E. YALAMAÇ¹, M. SÜTÇÜ² and E.S. ERGANİ^{1,3}

¹*Metallurgical and Materials Eng. Dept., Manisa Celal Bayar University, Manisa, Turkey*

²*Materials Science and Eng. Dept., İzmir Katip Çelebi University, İzmir, Turkey*

³*Atlas-Enta A.Ş./R&D Department, İzmir, Turkey*

Email: emre.yalamac@cbu.edu.tr, mucahit.sutcu@ikc.edu.tr

ABSTRACT

Glass-ceramics are frequently preferred in dental applications. CAD/CAM milling systems have been developed and evolved in the last decade for fabrication of all-ceramic restorations. Nowadays, dental glass-ceramics can be CAD/CAM milled and comparatively used for dental restorations.

In this study, the effects of crystallization of the dental glass-ceramics produced from amorphous frit powders were investigated. The amorphous frit used was characterized by particle size distribution and phase analysis, morphology and thermal properties. Two stages heat treatment processes (nucleation and crystal growth) were applied to produce glass-ceramics. In both stages, the samples were heated at different soaking temperatures and times.

The thermal expansion coefficient (CTE) and glass transition temperature (T_g) of the produced glass-ceramics were measured by dilatometer and the present phases and their crystal structures were determined by X-ray diffraction method and their microstructures were also investigated.

In conclusion, comparing of produced glass-ceramics and commercial dental glass-ceramics were studied from in view of microstructural and phase.

Keywords: Glass-ceramics, Crystallization, Microstructure



CHARACTERIZATION OF FELDSPATIC BASED DENTAL GLASS-CERAMICS

M. SÜTÇÜ¹, E. YALAMAÇ², A. ÇİDEM^{2,3} and G. TÜNEYDİN³

¹Materials Science and Eng. Dept., İzmir Katip Çelebi University, İzmir, Turkey

²Metallurgical and Materials Eng. Dept., Manisa Celal Bayar University, Manisa, Turkey

³Atlas-Enta A.Ş./R&D Department, İzmir, Turkey

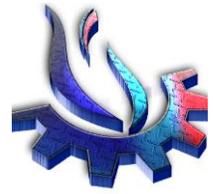
Email: mucahit.sutcu@ikc.edu.tr, emre.yalamac@cbu.edu.tr, gozde.gunduz@atlas-enta.com.tr

ABSTRACT

Glass-ceramics used in dental applications are preferred because of their advantageous properties such as proper aesthetical appearance, high strength, chemical stability and durability for natural-looking tooth restorations. Glass-ceramics are multiphase materials that consist of a glassy matrix and crystalline phases. These dental materials can be classified as mica, feldspatic and lithium disilicate ceramics. Recently, feldspathic based glass-ceramics is one of the most widely used machinable dental ceramics. Feldspatic based dental glass-ceramics could consist of one or more types of crystal phases such as leucite, sanidine, nepheline from the K₂O- and/or Na₂O- SiO₂-Al₂O₃ materials system. CAD/CAM milling systems have been developed and evolved in the last decade for fabrication of all-ceramic restorations. Nowadays, dental glass-ceramics can be machined with CAD/CAM milling and comparatively used for dental restorations.

In this study, three commercial dental glass-ceramic blocks (Vita Mark II, Cerec Sirona and Ivoclar IPS Empress CAD) that mostly used in dentistry were investigated and compared based on their crystal structure, chemical composition, microstructure and dilatometric properties. Microstructures of selected dental blocks were characterized by optical and electron scanning microscopes. Chemical composition of the blocks were analyzed by X-ray fluorescence method. Present phases and their crystal structures were analyzed by X-ray diffraction method and thermal expansion coefficients were measured by dilatometer. All samples are milled also with CAD/CAM milling device and compare their transparence.

Keywords: Glass-ceramics, Feldspathic phases, Characterization, Microstructure



A GENERALIZED PERSPECTIVE FOR GOVERNMENT-UNIVERSITY- INDUSTRY COLLABORATION

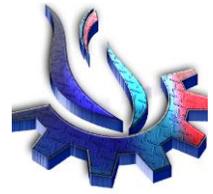
S. CARBAS¹ and S.A. YILDIZEL¹

¹*Karamanoglu Mehmetbey University, Karaman, Turkey*
Email: sayildizel@kmu.edu.tr

ABSTRACT

Change in industry has become a necessity in today's competitive world. While competition is globalizing, in many sectors, profit margins are no longer as high as before. We are in a period where we need to spend our energy and resources to enable our industry to generate more added-value. The way of preserving the industrial share in the globalizing world and not falling into the period of deindustrialization goes beyond increasing the quality. The planning and implementation of the necessary steps, such as research, development, testing, production and improvement, in the production chain in a timely manner brings with it economic growth and social development. The societies those are able to use their creativity and inventing ability when making production have the right to comment on the determination of industrial standards. For this purpose, special attention has been given to research and development (R&D) activities in our country in recent years. In this sense, we have a very critical prescription to transform our industry with the academic knowledge of universities with financial supports of government; so-called government-university-industry collaboration.

Keywords: Government-university-industry collaboration, Research and development, Financial supports



SIGN LANGUAGE FINGERSPELLING RECOGNITION USING CONVOLUTIONAL NEURAL NETWORKS

C. GÜNDÜZ

*Usak University, Usak, TURKEY
Email: cemil.gunduz@usak.edu.tr*

ABSTRACT

Sign language recognition is an important field for human computer interaction since not only it makes deaf people to interact with computers, it also makes them to communicate with other hearing people. Fingerspelling is used by signers to express terms which don't have a special sign, like names and locations. So making fingerspelling recognized by computers can make positive effect on deaf people's everyday lives. In this paper, we explore the applicability of deep learning for fingerspelling and train a convolutional neural network aimed at classifying signs from 2D color images. Evaluation of the trained neural network shows that it works better than traditional neural networks. The network can classify with a %92 accuracy rate after 50 training epochs. Training for more epochs can increase classification accuracy.

Keywords: Deep learning, Convolutional neural networks, Fingerspelling, Sign language recognition, Fingerspelling recognition



THE IMPORTANCE OF RENEWABLE ENERGY RESOURCES IN TURKEY WITHIN THE SUSTAINABLE DEVELOPMENT PERSPECTIVE

M. H. YALÇINKAYA¹ and F. ERATAŞ SÖNMEZ¹

¹Manisa Celal Bayar University / Economics and Administrative Science Faculty Manisa, Turkey
Email: hakan.yalcinkaya @cbu.edu.tr

ABSTRACT

The sustainable development theory, which started after the Industrial Revolution and accelerated with globalization, is accepted as a transition from the traditional society model to the modern society model. Until the 1950s the development of countries was measured only with the increase in GNP and from the 1970s on the significantly effect of environmental factors on economic development began to gain importance. For this reason, it is widely accepted that natural resources will be quickly consumed unless a rational method of use is identified and in order for the quality of today's life to be maintained in the future, the concept of sustainable development in which humans and nature coexist at the center, instead of exponential growth in the economy, is emerged.

For this purpose, in order to minimize the external dependency of energy in Turkey and to completely abolish it in the long term with the technological developments, the role of renewable energy sources has been increasing in the sustainable development model and economic prosperity and development. In Turkey, especially in recent years, renewable energy sources such as solar and wind have made significant improvements in terms of sustainable development.

Compared to many other countries, the geographical location of Turkey is very advantageous in terms of the use of renewable energy sources. Therefore clean, domestic and renewable energy sources are crucial for Turkey's independent future. Rapidly increasing the share of renewable energy resources in energy consumption for sustainable development is an inevitable necessity.

In this study, the importance of energy independence and economic growth of our country, which can be achieved by reducing energy import and dependence by electricity generation from wind and solar power, is emphasized



WATER RECOVERY AT DISHWASHER SYSTEMS

H. SAYIR

*Vestel White Goods A.S., Manisa, Turkey
e-mail: halil.sayir@vestel.com.tr*

ABSTRACT

In this research, it is aimed to achieve less water consumption at dishwasher systems by recovering the water.

In a dishwasher, a washing cycle consists of several main washing steps. These main steps are pre-wash, main wash, cold and hot rinsing steps. At each step, washing machine takes in an amount of water from a water source and drains this water at the end of the step. In the last step called hot rinsing step, 3 L water is used, and it is supposed that this water is clear since dishes are ready to use after this step. The main aim of the study is to store the water used in the last stage, and use it for next washing cycle by adding extra motor and valve. Suggested system helps to recover 3L water for each washing cycle.

According to fact that without an additional pump, it was not possible to use all the water that in the rinse step and free flow system with pump was so complicated. Thus, it was decided to study on an additional pump system. Finally, a tank 2.8 L volume capacity which will put at side wall of the machine was designed.

To catch target of the research on energy and water consumption which are 5,4 L and A+++ , it is also required to make adjustments on software. The algorithm was adjusted, and performance tests performed after algorithm adjustments. Some computer simulations were used to catch those targets and all decisions were given by experience.

Finally the target water consumption level was achieved after all these studies and examinations. That results with an Eco friendly VESTEL Dishwasher product at the end.

Keywords: Dishwasher, Recovering, Water consumption



ECO-FRIENDLY BOARD ERASER

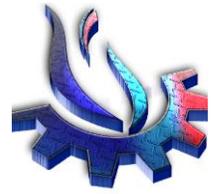
M. M. DAM¹ and T. ÇOBANOĞLU¹

*¹Adnan Menderes University, Nazilli Faculty of Economics and Administrative Sciences, Aydın, Turkey
Email: metindam@adu.edu.tr*

ABSTRACT

Invention; has been conceived and designed for the course materials that are constantly used in the education sector. Thanks to the Eco-Friendly Board Eraser, it is aimed to facilitate the work of people who use writing boards, to make board cleaning better and to throw less plastic into the environment. As an alternative to the wooden eraser used to erase the fonts, which is the subject of the useful model, it is designed to be a cleaner eraser and an environmentally friendly product. It is composed of three parts; Plastic Facing, Velcro Flat Facing and Felt Facing. Since the Eco-Friendly Board Eraser is used intensely in the sector, it is aimed to facilitate the educators' job and to create environmental awareness. Since the felt of the normal erasers gets dirty quickly, the board cleaning is not done well, and the eraser is thrown away. On contrary, it is planned that the felt part of Eco-Friendly Board Eraser will be able to the replaceable and thus it will provide a better board cleaning and will help protect nature preventing disposal of eraser. It is considered that the product is used extensively and the price of the felt assembly to be replaced is cheap, which will make a significant contribution to the economy of the country. Educators can create a widespread impact with eco-friendly eraser by creating a difference in terms of environmental awareness building that will use the Eco-Friendly Board Eraser. The Eco-Friendly Board Eraser project is intended to provide an example of how to provide or reduce the recycling of plastics in nature.

Keywords: Board Eraser, Nature, Recycling.



THE EFFECT OF TEA TREE OIL ON TYPICAL MICROORGANISMS AND THE USE OF IT AS DISINFECTANT

A. ZEYREK¹, P. DINSEL¹, G. TÜRKÖZ BAKIRCI² and F. BAKIRCI¹

¹ Food Control and Research Laboratory, Edge, 35020 Bornova, İzmir, Turkey

² Department of Gastronomy and Culinary Arts, Dokuz Eylül University, 35460 Seferihisar, İzmir, Turkey
Email: aynur.fidanboylu@edge.com.tr

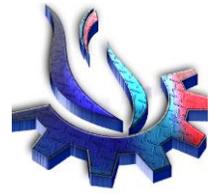
ABSTRACT

Nowadays, aromatic plants and especially their oils are used as antimicrobial preservatives in many industrial fields. The tea tree oil obtained from the leaves of *Melaleuca alternifolia* naturally grown in Australia by steam distillation has a wide range of antimicrobial effect.

In the project, it was aimed to make a natural disinfectant by using the antimicrobial effect of tea tree oil and by examining its effects of *Escherichia coli* (*E. coli*), *Staphylococcus aureus* (*S. aureus*) and *Salmonella typhimurium* (*S. typhimurium*) which is a pathogenic bacterium.

Disinfectant experiments were carried out to determine antimicrobial effects of the tea tree oil on *E. coli*, *S. aureus* and *S. typhimurium* strains at different concentrations and in different solvents. As a result of experiments with the tea tree oil, final concentrations in which microbial growth is not observed have been detected 0.25 ml for *E. coli* and *S. aureus* strains, 0.05 ml for *S. typhimurium* strains. Also, in the results of the tea tree oil and sterilized distilled water mixture (50%: 50%), final concentrations in which microbial growth is not observed have been detected 0.025 ml for *S. typhimurium* and 0.5 ml for *S. aureus* strains. At the same experiment, the lowest concentration for *E. coli* strains was accepted as 0.01 ml inhibition amount because no growth was observed at any concentration determined. In another experiment with glycerol, distilled water and tea tree oil mixture (1.5%: 98.5%: 0.025%), no effect of the solution on the microorganisms was observed.

Keywords: Tea tree oil, Antimicrobial, Bacteria, Disinfectant



COMPUTER-AIDED OPTIMIZATION METHODS FOR INNOVATIVE INDUSTRIAL DESIGN

H. ÖZDEN

Ege University/Mechanical Engineering Department, İzmir, Turkey
Email: huseyin.ozden@ege.edu.tr

ABSTRACT

There are many methods for developing innovative industrial goods and services. Alternative solutions to problems associated with new industrial products currently use computer-aided optimization methods. In this study, information about innovative industrial design and topology, shape and topography optimization methods are given with examples. The computer-aided topology optimization is highlighted here. In addition to saving material, weight and time without sacrificing durability, optimizing topology leads to new ideas and design improvements. In applications of topology optimization, machines and components such as strength, service life, weight-reduced cardan shaft are represented with their numbers and table values. In short, optimization methods in the manufacturing process of manufactured goods and services help create new ideas and inventions, while facilitating designer work and improving design. It makes sense to introduce the company, which is developing with optimization, to the production company. One of the problems with using the method is that the package programs receive large sums abroad and remain dependent on foreign countries.

Keywords: Innovative, Industrial, Design, Optimization, Method, Application



ENHANCEMENT OF ELECTROCHEMICAL SENSING PERFORMANCE BY NANOMATERIALS

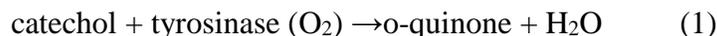
İ. POLATOĞLU¹

¹Manisa Celal Bayar University Bioengineering Department, Manisa, Turkey
Email: ilker.polatoglu@cbu.edu.tr

ABSTRACT

The enzymatic biosensors as a diagnostic device show remarkable advantage with respect to spectrophotometric and chromatographic techniques in order to determine the pesticide residue, phenolic compound and also GDO at low level. It is possible to detect the low level of analyte by enhancing the sensor signal. In this respect, the key factor is immobilization of enzyme to the functional support material. Recently nanomaterials are becoming the focus of researchers due to their special properties such as large surface area provides high enzyme loading. Some stabilizers (surfactants, metal nanoparticles and polymeric compounds) have been used to prevent aggregation of nanomaterials. Among them natural polymer “chitosan” possess several features including biodegradable, biocompatible, bioactive, nontoxic, film forming ability, physiological inertness and high mechanical strength.

In this study, tyrosinase enzyme was immobilized on chitosan nanocomposite film modified with magnetite nanomaterial (Fe₃O₄) and gold nanoparticles (GNP) to design an enzymatic biosensor. Catechol was used as substrate to monitor sensor signal (the electrochemical reduction of enzymatically produced product “*o*-quinones” to the catechol) as follows.



The results explained that the nanomaterials enhanced the sensor signal by providing another pathway for electron transfer evident from electrochemical characterizations (cyclic voltometry and electrochemical impedance spectroscopy). And they are promising candidate to developed high sensitive diagnostic device.

Keywords: Biosensors, Nanomaterials, Diagnostic device



THE SAMPLES OF APPLICATION PERFORMED BY GENETIC ALGORITHM IN DATA MINING

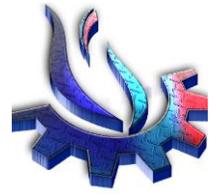
Ş. CAN¹, M. GERŞİL¹, T. ÖZDİL¹ and C. YILMAZ¹

¹Manisa Celal Bayar University, Muradiye-Manisa
Email: sengul.can@cbu.edu.tr

ABSTRACT

Nowadays, requirement to accurate information increases rapidly in competitive environment and the emerging technology. Depending on increasing the information storage capacity of the computer, access to accurate information gets difficult and also, it requires a work beyond of the human ability. For this reason, it is important to carry out the necessary analysis to extract the right information from large amount of the data and the speed to reach to correct information transport. However, the raw data held on computers is not valuable alone, but it expresses something when this information is processed. No matter how large the amount of raw data is, it cannot be used unless it is processed and turned into knowledge. At this point, techniques that can handle large amounts of data are very important. The process of accessing the right information from the raw data can be done through data mining. In this study, it has been explained the definition and importance of data mining, the relationship between data mining and other disciplines, data mining models and techniques used in these models. It is mentioned from working principle of genetic algorithm by giving definition and properties of genetic algorithm from data mining techniques. Applications of data mining using genetic algorithms have been investigated and the contribution of genetic algorithm usage to data mining has been examined.

Keywords: Data mining, Genetic algorithms, Data mining application by genetic algorithms



DETERMINATION OF THE FACTORS AFFECTING STUDENT SUCCESS BY APPLYING WEKA AND LOGISTIC REGRESSION ANALYSIS IN DATA MINING

Ş. CAN¹, T. ÖZDİL¹ and C. YILMAZ¹

*¹Manisa Celal Bayar University, Muradiye-Manisa
Email: sengul.can@cbu.edu.tr*

ABSTRACT

Globalization has increased technological developments and competition. Technological developments have provided storage amount of data. Data mining techniques are used to extract useful information that is hidden from the amount of data. Increasing competition bring with the need for information and quality in every field such as production, business, marketing, education and health. Evaluation of instructors and courses by students; is an application carried out in many higher education institutions in Turkey and abroad. In this study, The factors which affect student success explore with logistics regression analysis by weka. In the 5820 questionnaire data, 12 questions about the course evaluation are divided into 3 groups as per-semester informing, narrative technique and student's contribution to the future. Then two different dichotomous success criteria were defined, which have two result the number of repetitions and course achievements to assess student achievement. If the student repeats the course again on the success criterion of the course, it fails to be accepted. On the success criterion of the course, if the student repeats the course it will be accepted unsuccessful. For the achievement criterion for course achievements, the students were accepted as unsuccessful if they gave 8-12 questions below the student's score of 12 and over if the success was below 12 points. In the Weka program, success criteria were estimated separately with 10-fold cross-validation. It was seen that the results that were obtained in the estimation results showed that the applications which increase the professional development of the students and give new perspectives have a positive effect on success than course repetition success criterion.

Keywords: Data mining, Logistic regression analysis, Weka, Term-end course survey



MICRO/NANO ENCAPSULATION OF NATURAL COMPOUNDS AND PLANT EXTRACTS FOR INDUSTRIAL APPLICATIONS

M.D. KÖSE¹ and O. BAYRAKTAR¹

¹Ege University, İzmir, Turkey
Email: oguz.bayraktar@ege.edu.tr

ABSTRACT

Plant extracts including bioactive natural compounds have widely been used as folk medicines for the treatment various diseases. Recently, considering negative health effects of synthetic antioxidants and antimicrobial agents, plant extracts with both antioxidant and antimicrobial properties became very popular for the applications in medical, cosmetic, food, animal feed and pharmaceutical industries. The main problems of using plant derived natural compounds are either their degradation in gastrointestinal system before reaching the circulation system or loss of their bioactivities due to harsh processing conditions. These problems limit their usage in different industrial applications. Therefore, it is necessary to apply encapsulation systems to preserve their bioactivities.

The aim of this study was to investigate the different encapsulation techniques such as spray-drying, electro-spraying for the preparation of micro/nano particles encapsulating extracts of turmeric, olive leaf, lycopene, resveratrol. Since synthetic polymers have many undesired properties, silk fibroin, and zein which are commonly used encapsulating biopolymers in biotechnological applications have successfully been used to control the solubility and release properties of prepared micro/nano particles having both antimicrobial and antioxidant properties.

Morphologies and sizes of micro/nano particles alone and loaded with extract was investigated using Scanning Electron Microscopy (SEM). The antioxidant activity and antimicrobial activity of extract loaded micro/nano particles were also determined. The desired morphology with narrow size distribution at high extract loading amount along with preserved stability was achieved. The plant extract loaded biopolymeric micro/nano particles developed in this study can potentially be used in cosmetics, food, feed, pharmaceutical, industries.

Keywords: Micro/nano encapsulation, Electro-spraying, Spray drying, Plant extract, Natural compounds



NOVEL TECHNIQUE FOR THE SIMULTANEOUS ISOLATION AND ENCAPSULATION OF VOLATILE COMPOUNDS FROM ESSENTIAL OILS

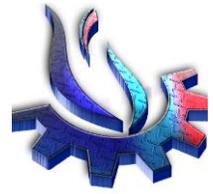
E.T. DUMAN¹ and O. BAYRAKTAR¹

¹ Ege University, İzmir, Turkey
Email: oguz.bayraktar@ege.edu.tr

ABSTRACT

Mediterranean flora is very rich in plants having essential oils with antimicrobial and cytotoxic activities. Many essential oils and their volatile contents are preferably used in pharmaceutical and cosmetic industries due to their desired properties. However, there are several difficulties for applying these lipophilic volatile compounds in cosmetic and pharmaceutical formulations due to their low aqueous solubility and their unstable natures. As a result of their low solubility solvent requirement is one of the main drawbacks for their commercial applications. Encapsulation can successfully be used for overcoming these problems. Electrospraying of Cyclodextrins (CDs) inside a closed chamber, filled with the volatiles compounds of essential oil, allows direct contact of CD cavities with certain volatile molecules. Changing electrospraying process parameters can differ the interactions between CD cavities and volatile molecules such that formed CD nano-capsules could selectively encapsulate certain volatile molecules. CDs are torus-shaped molecules which are used for forming molecule-CD complexes which has increased solubility in aqueous environments and also increased stability of the specific molecule. This molecule-CD interaction is named as inclusion complexes. In this study, first characterization of volatile components of essential oil from of rock rose (*Cistus creticus*) was carried out. Then, development of patent pending method for the selective encapsulation of volatile compounds in essential oil by electrospraying CDs was realized. This technique could certainly led the reduced cost for the separation and purification steps along with simultaneous encapsulation and transforming lipophilic volatile compounds into their water soluble complex forms.

Keywords: Essential oil, Volatile compounds, Encapsulation, Electro-spraying, Inclusion complexes



FROM INDUSTRY 4.0 TO WATER 4.0

M.E. TURAN¹, T. ÇETİN¹ and M. A. YURDUSEV¹

¹Manisa Celal Bayar University, Faculty of Engineering-Manisa, TURKEY
Email: mustafaerkan.turan@cbu.edu.tr

ABSTRACT

One of the most popular topics of recent times is Industry 4.0, which is a conceptual phenomenon in which automation systems become more important after all phases in history. In this framework, it is envisaged that the industry will take a form that consists of robot technologies based on fully automatic, internet services and cyber-physical systems.

In parallel with this ongoing debate on the industrial front, the historical trend of the water industry has been similar. This phenomenon in water industry is called Water 4.0, like Industry 4.0. The first revolution in water, defined as Water 1.0, is the use of piped systems related to water and wastewater. While the cities continued to expand during the water 1.0, public health was harmed by the wastes in the sewers causing water-borne diseases such as cholera and typhoid.

The next revolution in water, called Water 2.0, was the start of using of drinking water treatment processes. Thus, together with Water 2.0, the spread of waterborne diseases is prevented, and great benefits are provided in terms of public health. Following the use of sewage systems, discharge of wastewater has started to cause pollution and destruction in rivers, lakes and seas.

This has led to the emergence of a new revolution in water called Water 3.0. With water 3.0, wastewater treatment plants have become a standard feature of urban water systems. Rapidly growing populations and changes in the climate have made urban water systems unable to meet the needs. In this case, along with a new transformation, the water industry revolution in the coming years will be expressed as Water 4.0.

With Water 4.0, developments in urban water systems will continue to shed light on how we should develop an attitude to make all units, industries, administrations and users involved in the water sector more peaceful, more environmentally conscious and more humane.

Keywords: Industry 4.0, Water 4.0, Water industry



FACILE AND CONTROLLED PRODUCTION OF ANTIBACTERIAL SILVER BORATE COMPOUNDS FOR CERAMIC GLAZE APPLICATIONS

O.AGUŞ,¹ Y.ABALI,² O.ARSLAN³ and N.O. SAN KESKİN⁴

¹ Celal Bayar University/Faculty of Science and Letters, Department of Chemistry, 45140Manisa,TURKEY

² Celal Bayar University/Faculty of Science and Letters, Department of Chemistry, 45140Manisa, TURKEY

³ İstanbul Sabahattin Zaim University/ Faculty of Engineering and Natural Sciences, Food Engineering Department,34303 İstanbul,TURKEY

⁴ Gazi University/Polatlı Faculty of Science&Arts Department of Biology,06900PolatlıAnkara,TURKEY
Email: osmanagus@gmail.com

ABSTRACT

Nanotechnological silver (Ag) borate compounds in their powder form were produced under controlled conditions for the antibacterial ceramic applications. Obtained powder materials were characterized comprehensively for the detection of crystallinity, particle size, morphology and purity. Since obtained borate compounds should be modified and dispersed in ceramic mixtures, their formation parameters must be defined by adjusting the best synthesis variables. Taguchi method allowed the control and deep insight on the variables namely temperature, reaction time, mol ratio and stirring speed.

Structural analysis and crystallinity with X-Ray Diffraction (XRD) showed that temperature has a huge impact on the formation of nanoparticles as compared diffraction patterns revealed. Dispersive X-Ray (EDX) with Scanning Electron Microscopy (SEM) unveiled that morphology of the nanoparticles are relatively spherical and contains no other impurities. Synthesized Borate powders were dispersed in the ceramic glaze coatings and applied on 1x1 cm ceramic samples for antibacterial applications. Results showed highly antibacterial effect as tests revealed and reported.

Keywords: Antibacterial compound, silver borate, nanoparticles, ceramic glaze, antibacterial ceramic

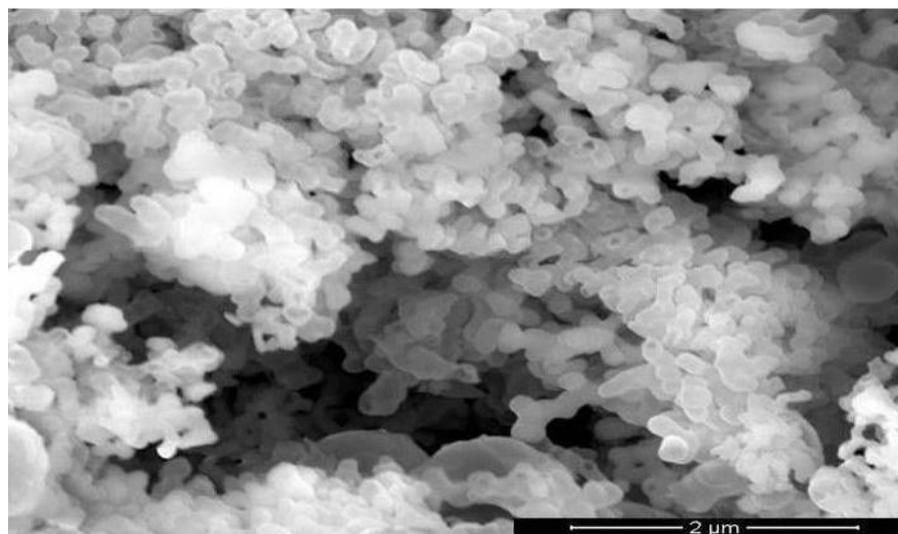


Figure 1: SEM Image of the as – synthesized silver borate nanoparticles



CARBON BLACK NANO-SIZED PARTICLE REINFORCED COMPOSITE COATINGS: MECHANICAL BEHAVIOR-STRUCTURE RELATION

O. SANCAKOGLU¹ and T. AKSOY¹

¹ Dokuz Eylül University, Engineering Faculty, Department of Metallurgical and
Materials Engineering, 35160, Buca, Izmir, Turkey
Email: orkut.sancakoglu@deu.edu.tr

ABSTRACT

Cr-C composite coatings were electro-codeposited in sulfuric acid-based solutions containing nano-sized carbon black particles. The effect of heat-treatment conditions on the carbide phase formation in the composite coatings and their mechanical behaviors were investigated. Another aim of this study is to introduce a relatively new technique, in-situ codeposition method. The obtained results showed that the Cr-C composite coatings can be fabricated successfully and with an additional heat treatment, it is possible to obtain a Cr-Cr₂₃C₆/Cr₂N composite structure. Therefore, change in the hardness and the adhesion behavior suggests the improvement of mechanical properties due to the formation of Cr₂₃C₆/Cr₂N. Besides, residual stress state changed from tensile to compressive. According to the detailed inspections, it is assigned that the definite results are directly correlate with both the magnitude and the direction of the residual stresses. As a result, the mechanical properties of the in-situ electro codeposited coatings are believed to be controlled by microstructure and surface properties of the metallic chromium layer, which is modified by the formation of carbide and/or nitride phase, and can be used for many engineering applications instead of traditional metallic coatings.

Keywords: Composite coating, Co-deposition, Carbon black, Hardness, Adhesion, Residual stress



THE ASSESSMENT OF THE PRESSURE FROM THE COASTAL WATERS OF THE MARMARA SEA AND THE AEGEAN SEA BY USING THE NEW METHOD MARINE FLORISTIC ECOLOGICAL INDEX (MARFEI)

E. TAŞKIN¹, K. TSİAMIS^{2,3} and S. ORFANİDİS⁴

¹*Manisa Celal Bayar University, Faculty of Arts and Sciences, Dept. of Biology, Muradiye, Yunusemre, 45140, Manisa, Turkey*

²*Institute of Oceanography, Hellenic Centre for Marine Research, Anavissos, 19013 Greece*

³*European Commission, Joint Research Centre – Directorate for Sustainable Resources, Water & Marine Resources Unit, Ispra, Italy*

⁴*Fisheries Research Institute, Hellenic Agricultural Organization-Demeter, 640 07 Nea Peramos, Kavala, Greece
Email: ergtaskin@gmail.com*

ABSTRACT

Benthic macrophytes (macroalgae and seagrasses) are proposed as biological elements to assess the Ecological Status Classes (ESC) of coastal and transitional waters in the concept of the EU Water Framework Directive (WFD, 2000/60/EC). In the present study, the new method Marine Floristic Ecological Index (MARFEI) was tested in the Marmara Sea (four sites: Şarköy, İntepe, Erdek and Gemlik) and in the Aegean Sea [two sites in Ayvalık (Turkey) and five sites in Rhodes Island (Greece)]. Random sampling of benthic macrophytes was performed in the upper infralittoral zone of each site at one spatial scales: at an area of ca. 100 x 100 m. Samples were preserved in 2-5% formalin with seawater and were transferred to the laboratory where they were studied by using a stereoscope and/or a light microscope. Taxa were identified at species and Ecological Status Group (ESG) levels. While ESG I is indicative of sensitive taxa the ESG II is indicative of opportunistic taxa. MARFEI classified one site as high, four sites as good, four sites as moderate, and two sites as poor ESC. The linear relationships between pressures data (MA-LUSI index) and the new method MARFEI from Turkish sites were tested. The study of Marmara sites has been supported by Tübitak (project number 114Y238).

Keywords: Aegean sea, Benthic macroalgae, MARFEI, Marmara sea, Water quality



TOPOLOGY OPTIMIZATION FLANGE YOKE APPLICATION

E. IŞIK^{1,2} and Ç. ÖZES³

¹The Graduate School of Natural and Applied Sciences, Dokuz Eylül University, 35397, İzmir, Turkey

²Tirsan Kardan A.Ş. R&D Center, Manisa, Turkey

³Faculty of Engineering, Dokuz Eylül University, 35397, İzmir, Turkey

Email: e.isik@tirsankardan.com.tr

ABSTRACT

The primary purpose of this study is to implement structural topology optimization methods on driveshaft part called flange yoke, which maintains the connection of a driveshaft between gearbox output and differential input flanges.

The first step in this study is to determine the mechanical properties of existing flange yoke part by performing tensile tests. After identifying the mechanical properties, static analysis is carried out on the existing flange yoke 3D model by using FEA methods in order to determine the stress distribution and total displacement. In the meantime, a similar part which is manufactured by a competitor is also modelled and analyzed by FEA methods in order to compare the design with the current one. The next step is to create a concept model which will be used in topology optimization sequence. After creating the concept model, design variables, objective function, optimization constraints are identified and topology optimization is performed by using Altair Optistruct codes on flange yoke concept model.

After completing topology optimization activities, a new geometry is derived from the optimized topology and FEA methods are used to perform static analysis in order to compare the stress distribution and total displacement of the new geometry with the existing ones.

Finally, rig tests which are simulating real operating conditions are used to validate the new geometry of flange yoke which is derived from topology optimization geometry. As a result, the new design of flange yoke is freed and shifted to serial production.

Keywords: Topology optimization, Driveshaft, Flange yoke, Computer aided design and analysis



TOTAL QUALITY MANAGEMENT AND INNOVATION

Y. KUMCU¹ and İ. AYDEMİR¹

¹ *Uşak University, Uşak, Türkiye*
Email: yagmur.kumcu@usak.edu.tr

ABSTRACT

This article explains why technological innovation is seen as an important force in economic growth. Total quality management (TQM), which is a reflection of co-operation learned through competition, can be defined as an open management philosophy for innovations. In this case, TQM, is thought to make management success independent of the size of the business. The quality and quality of production in Turkey, where SMEs form a significant proportion of the industry, is becoming increasingly important. In this study, Total Quality Management criteria applied by big companies in Turkey were examined and it was seen that they focused on quality characteristics that are shaped by innovative understanding. In this context, offers a road map to small businesses that cannot reach the innovation technologies but want to grow and develop.

Keywords: Quality, innovation, economic growth, SME, industrial revolution



AFFECTS OF DIE COATING AND COATING THICKNESS ON SOLIDIFICATION, MATERIAL PROPERTIES AND MICROSTRUCTURE OF A356 ALUMINUM ALLOY

K.MENDEŞ¹, H.YAVUZ² and U.AYBARÇ²

¹ Manisa Celal Bayar University/Material Science and Metallurgy Engineering Dept., Manisa, Muradiye

² CMS Light Alloy Wheels/R&D Centre, İzmir, Cigli

Email: kaan.mendes@outlook.com

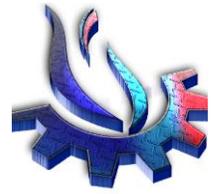
ABSTRACT

Due to its low density and high strength/weight ratio, aluminum has a great important place in many sectors such as aerospace, automotive and building materials. The cast alloy A356, which contains 7% silicon and 0.3 Mg in its concentration, is the World's most widely used light metal alloy. The A356 alloy is a frontal alloy with excellent castability, good weldability, high machinability and high corrosion resistance.

High quality, low cost and quick delivery in competitive environment in casting sector are vital importance for competition for casting sector. Beside the proper casting technology, production of aluminum casting parts such a system that has a lot of inputs that interacting each other and affecting the output. For instance, mold coating has an important role in casting of sand and metal. Mold casting is very important because of its attributes such as preventing early solidification, controlling solidification rate, direction, perfection of casting, extending life of mold materials by lowering the thermal shock and it prevents liquid metal to stick on mold surface.

The aim of this project supported by Tübitak 2241-A Industry based graduation thesis support program is to observe the effect of the different materials used for mold coating in wheel sector (Dycote34, Dycote39, R84) in different coating thickness (50-150 μm and 250-350 μm) and mold temperature (50C and 160C) on mechanical and metallurgical characteristics of the produced products. Therefore, sample casting productions and simulations are performed. All the achieved results are comparatively evaluated in details.

Keywords: Aluminum, Die coating, A356, Material properties



THE IMPROVEMENTS TO THE COUPLING OF THE TRANSMISSION FOR SAFE MOTIONS

İ. KAYNAK¹

¹Uşak University

Email: idris.kaynak@usak.edu.tr

ABSTRACT

In this study, the polyamide molding process is carried out by flow-induced with nano-fibers reinforced. Polyamide is investigated with Mold Flow® software program in order to pre-examine for the fluid-flow process of the material. The polymer testing standard profile of ASTM-D 638 was used for tensile result and for the impact examination result. Coupling; the rotational motion produced in a power source, and therefore the moment is transferred to another system (machine, pump, reducer, conveyor, etc.) In practice, couplings and concepts are used as mechanical contact elements. In couplings, the connection is made by mechanical connection. For this reason, the connection or disconnection between the two shafts is done by attaching and detaching the mechanical connecting element; this is possible only when the returns shaft is stationary. An important task in the transmission of safe motion to the machines; perhaps the simplest in the system, the couplings that look like the cheapest element to the machine they are fitted to; it becomes the most expensive member of production when it is not careful in assembly. The material produced has been experimentally applied on the power steering engine, as 150,000 miles have been covered. When we examine it, there is no damage, no lines and no corruption on the material.

Keywords: Polymer matrix composites (PMC), PA, Nano-fibers, Injection-Compression molding



INVESTIGATION OF THREE DIMENSIONAL HEMOSTATIC BIOMATERIALS CONTAINING PLANT EXTRACTS

M.E. USLU¹ and O. BAYRAKTAR²

¹ Manisa Celal Bayar University, Bioengineering Department, Manisa, Turkey

² Ege University, Chemical Engineering Department, İzmir, Turkey

Email: emin.uslu@cbu.edu.tr

ABSTRACT

Haemostasis in other words a process which causes bleeding to stop is very important in injury. Recent researches were focused on discovery of haemostatic agents and developing biomaterials which transfer them to the injury side. Therefore plant extracts and three dimensional biomaterials were widely investigated. In this research silk fibroin-hyaluronic acid mixture was used for the preparation of three dimensional sponge like biomaterials. Addition of extract into silk fibroin-hyaluronic acid mixture caused proteins to precipitate as a result of interaction between protein and phenolic compounds. As a result of this precipitation significant decrease in the mechanical strength of biomaterial was observed. In order to minimize this interaction, plant extract was encapsulated with hyaluronic acid. As a result, mechanical strength and pore size of the biomaterial were increased and pore distribution became more regular. Also biomaterial gained tubular network on both vertical and horizontal dimensions. This would help the proliferation and migration of the fibroblast cells and moreover prevent the formation of scar tissue.

Keywords: Silk fibroin, Biomaterials, haemostasis



SYNTHESIS AND CHARACTERIZATION OF PHEMA-CHITOSAN NANOSPHERES ENCAPSULATED WITH AN ANTICANCER AGENT, RESVERATROL

A. PAMUKCI¹, H. S. PORTAKAL¹ and E. EROĞLU¹

¹Manisa Celal Bayar University, Manisa, Turkey
Email: erdal.eroglu@cbu.edu.tr

ABSTRACT

The delivery of nucleic acids, drugs or other active molecules into the eukaryotic cells is limited due to the biological barriers such as cell membrane, presence of endonucleases, efflux of active compound and so on. Recently, many efforts are being made to bypass cell barriers using new bio-safe drug delivery vehicles. For the transfer of anticancer agents into the cancer cells with higher efficiency and lower toxicity, synthesis of nano-scale smart materials hold great promise. The aim of this study is to investigate the drug delivery efficiency of the poly (2-hydroxyethyl methacrylate) (pHEMA)-chitosan nanospheres (PCNSs) which have been previously proved to be a good candidate for nucleic acid delivery. In this work, resveratrol (RES), a widely known anticancer agent is encapsulated into pHEMA core and pHEMA-RES nanospheres were coated with a cationic polymer, chitosan. Then, developed PCNSs-RES complexes were characterized using various techniques such as fourier transformed infrared (FTIR) spectroscopy and ultraviolet (UV) visible spectroscopy. As a consequence, UV-visible and FTIR spectra analyses revealed that the synthesis of PCNSs nanoparticles and encapsulation of RES into PCNSs were completed successfully. One of the future aims of this study is to test cytotoxicity and drug delivery efficiency of PCNSs-RES complexes in a fibroblast like cells, Cos-7, and a human prostate cancer cells, PC-3 *in vitro*.

Keywords: Phema-Chitosan, Nanospheres, Resveratrol, Anticancer

Acknowledgement: This work was supported by Manisa Celal Bayar University BAP (project number 2017-015). The authors would like to thank Asst. Prof. Dr. İlker POLATOĞLU for contribution to the FTIR and UV-visible analyses.



HOW INNOVATIVE ARE PUBLIC POLICIES?

B. TUNÇAY¹ and M. ÖZÇALIK¹

¹Manisa Celal Bayar University/Public Finance, Manisa, Turkey
Email: baris.tuncay@cbu.edu.tr

ABSTRACT

In order for countries to be effectively involved in the innovation process, public policy should first state that innovation is necessary. First of all, starting from the fact that employees in public institutions have knowledge about this process, innovation should be seen in public spaces as well. In addition, necessary policies should be applied in order to encourage innovation in the public sector. Moreover, while determining the budgets of countries, it is necessary to allocate a significant share of innovation expenditures within public expenditures. In addition, countries should make the necessary arrangements in public policies in detail on copyright matters.

Keywords: Public policies, Innovation, Globalization.



INNOVATION TO BEAT MIDDLE-INCOME TRAP

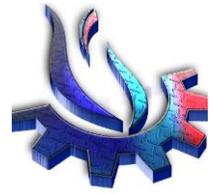
B. TUNÇAY¹ and M. ÖZÇALIK¹

¹Manisa Celal Bayar University/Public Finance, Manisa, Turkey
Email: baris.tuncay@cbu.edu.tr

ABSTRACT

In an environment characterized by increasing globalization, the need for innovative ideas has become more urgent for countries to maintain and increase their market share, and to effectively use their production capacity. In order for countries to cope with the middle-income trap, it is first necessary to raise their saving rate. Countries should also make the necessary investments to increase qualified workforce. In addition, the research and development activities of universities and industrial organizations should be increased. Most importantly, countries must have an economic system that creates added value. Thus, with the added value and innovation, an important way to get out of the middle income quintile will be taken.

Keywords: Technology, Innovation, Middle-Income Trap.



THE FOURTH INDUSTRIAL REVOLUTION AND INNOVATION ECONOMICS

S. Y. KUMCU¹ and Ö. S. AKINCI¹

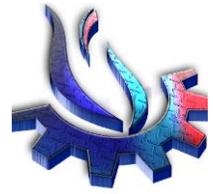
¹ Uşak University, Uşak, Türkiye
Email: yagmur.kumcu@usak.edu.tr

ABSTRACT

In this study, inevitably exposed technological developments in all matters, involving human being; we are discussing what the Fourth Industrial Revolution exactly is and how we should be prepared for. The purpose of this discussion is, to reveal what the current economic understanding is, when it is examined under the bright light of our time, to define the "innovation economy" that emerges by reshaping all production and consumption habits, known. Theoretical explanations of the contribution of the innovation economy to economic growth and development may be the subject of another article. In this study, focusing on the relation of labor and capital; suggestions for application areas are presented. It is important to support policy makers to develop technological infrastructure (especially in the telecommunications / information-communication field) within the context of the Fourth Industrial Revolution needs, to prepare the necessary investment and incentive environment most importantly, to meet long- outs are foreseen. With the understanding of innovation economics to adapt innovations to humanity expect in the future, we can find solutions to the crises of especially business and employment. In order to meet consumer expectations; data-enhanced products, collaborative innovation and new operational models are recommended. According to the predictions made in this approach, we recommended that what to do about employment is.

It is expected that the study will contribute to scientific understanding in order to solve the problems of mankind living in the age of the second machine in our country and in the world.

Keywords: Industrial revolution, Innovation economics, Substructure, Employment, Collaboration



INNOVATION PROJECT INCREASING CONCRETE QUALITY OF WIND TURBINE CONSTRUCTION IN MANISA REGION

A.U. OZTURK¹, E. KANTAR¹, S. A. YILDIZEL², Y. ERZİN¹ and Y. TUSKAN¹

¹ Manisa Celal Bayar University, Manisa, Turkey

² Karamanoglu MehmetBey Univerity, Karaman, Turkey

Email: yusuf.erzin@cbu.edu.tr

ABSTRACT

In this study, optimization of mixture values of grouting concretes to be used in the wind power plant base project and innovative studies on the determination of the desired strength are investigated. For this purpose on mind, a special type of mix with a very fluid consistency, which can protect the balance (cohesion) without causing problems such as decomposition and perspiration, was used. As a result of the examinations performed in the wind turbine foundation at Kırkağaç/Manisa, adherence between concrete masses poured at different times. There was a manufacturing fault that could cause each piece to work separately.

In addition to the effective super-plasticizer in its content, the design has to be done in order to ensure that the design is very careful. Based on the amount of total fine material, viscosity additive use, water/ binder ratio, maximum aggregate size, sand/total aggregate ratio and total coarse aggregate; specific mixtures have been obtained for the purpose of this project.

Keywords: Concrete design, Grout, Optimization



COLD JOINT REMOVAL OF TRIBUNE-8 CONSTRUCTION

E. KANTAR¹, A.U. OZTURK¹, S. A. YILDIZEL², Y. ERZİN¹ and Y. TUSKAN¹

¹ *Manisa Celal Bayar University, Manisa, Turkey*

² *Karamanoglu MehmetBey Univerity, Karaman, Turkey*

Email: yusuf.erzin@cbu.edu.tr

ABSTRACT

In this study, limit strength and optimization of mixture values of casting concretes to be used in the wind turbine project are investigated. For this purpose on mind, set retarding additives was used to eliminate the rapid setting of concrete especially in hot weather. By using adherence increasing chemical additives at the interface, negative effects were minimized. As a result of the examinations performed in the Turbine-8 core area at Kırkağaç/Manisa, adherence between concrete masses poured at different times.

As a result, if the cold joint has to be formed, attention should be paid to roughen the surface of the first cured hardened concrete .By using adherence increasing chemical additives at the interface, negative effects should be minimized.

Keywords: Chemical additives, Concrete design, Grout



A UNIVERSITY- INDUSTRY COOPERATION PROJECT: ESKİŞEHİR INDUSTRIAL DESIGN CENTER

F. CURAOĞLU

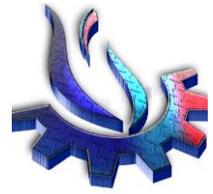
*Anadolu University/Architecture and Design Faculty, Eskişehir, Turkey
Email: fcuraoglu@anadolu.edu.tr*

ABSTRACT

The concept of university-industry cooperation is the priority of innovation-oriented new production models of the 21st century. It has different models made by cooperation of science and technology. It is important that the knowledge of the universities and the experience of the industry come together in different models. Because it is important to reveal the productions of countries' industries which will add value. First of all, inventions and innovations have priority for the industry's national and international competitiveness. The design is an important key to reveal these values. New cooperation opportunities are supported in this context. One of these possibilities is the Regional Development Agencies. The primary objective of the Development Agencies is to uncover the potential of regional values and increase regional development. Effective use of resources and participatory approach are the main objectives of uncovering new production models. In this context, Regional Development Agencies in Turkey supported the establishment of Design Centers especially in 2010 and later. Design Centers are established with the aim of bringing together industry and design, contributing to the economy of the country and creating employment.

The aim of this work is to share the project process and results of Eskişehir Industrial Design Center which is established with the call of BEBKA (Bursa-Eskişehir-Bilecik Development Agency) in 2010. Eskişehir Industrial Design Center, which runs between 2011 and 2013, aims to provide designers employment and gain design awareness for the furniture enterprises manufacturing in the target region.

Keywords: University-Industry cooperation, Industrial design, Furniture SMA, Development agencies, Design center



AN INNOVATIVE APPROACH FOR TOURISM INDUSTRY: CREATING R&D CENTER

M. GERŞİL¹ and T. ÇAYLAN¹

¹ *Celal Bayar University/Manisa, TURKEY*
E-mail: mustafagersil@yahoo.com

ABSTRACT

Producing High-Tech and high value-added products, services are key factors for a country which has sustainable growth and economic development. In order to develop innovative solutions, R&D Centers are the strategic milestones for the countries as our country Turkey.

According to statistics published by Ministry of Science, Industry and Technology, Turkey has currently 678 R&D Centers by the companies are formed in 38 different industries. Moreover, mostly those companies are part of manufacturing process industries. There are over than 40.000 graduated and post-graduated engineers, staffs, experts, etc. are hired by these R&D Centers.

It is expected from R&D Centers that increasing export volumes of Turkey which has been suffering from high foreign trade deficit for years.

If analysed foreign trade statistics of Turkey, it is clearly seemed that Tourism has the highest value for export sales category list. Although Tourism is the first ranked at export sales, there is not any R&D Center for Tourism industry. That could mean, Tourism has conventional techniques, methods and prices for its products and services. This brings price-oriented competition and cost-based customer structure.

In this study, it will be presented benefits if R&D Center is designed for Tourism industry with several statistics. Additionally, there will be discussed that expectations from R&D center with inovative new product/service development, higher value-added and multi-solutions approach for our country which has very popular and rich historical heritages, natural beauties and geopolitics.

Keywords: Tourism, Innovation, R&D Center, Service industry



A COMPARATIVE STUDY OF BUCKLING RESTRAINED BRACED FRAMES AND CONCENTRICALLY BRACED FRAMES

M.B. BOZKURT¹ and A. ERGÜT¹

¹ Manisa Celal Bayar University/Department of Civil Engineering, Manisa, Turkey
Email: mehmet.bozkurt@cbu.edu.tr

ABSTRACT

This study represents differences between buckling restrained braced frames (BRBFs) and concentrically braced frames (CBFs) in terms of behavior and cost. Pursuant to this goal, one archetype with BRBFs and the other archetype with CBFs were designed in accordance with Specification for Structural Steel Buildings (AISC360-16), Seismic Provisions for Structural Steel Buildings (AISC341-16) alongside Minimum Design Loads for Buildings and Other Structures (ASCE 7-16). After elastic analyses and design, cost analyses of two types of lateral load resisting systems were conducted and compared to each other. It is concluded that, a total of 7 percent cost savings was provided for the archetype where buckling restrained braced frames were employed. Afterwards, nonlinear time history analyses of these archetypes were undertaken using OPENSEES software program. Drifts and interstory drifts were compared by using the FEMA P695 procedure. The archetypes represent designs in high seismic regions defined as Seismic Design Category D_{max}. 44 far-field ground motion records were employed to take into account Maximum Considered Earthquake (MCE). According to nonlinear time history analyses, there is no significant difference between the archetype with BRB and the archetype with CBF in terms of drift and interstory drift.

Keywords: Steel, seismic, brace, buckling restrained brace, cost analysis.



INORGANIC ORGANIC HYBRID FUNCTIONAL NANOMATERIALS BY MOLECULAR LEVEL CONTROL AND SURFACE MODIFICATION

O.ARSLAN¹ and Y.ABALI²

¹Istanbul Sabahattin Zaim University, 34303, İstanbul, TURKEY

²Celal Bayar University, 45140, Manisa,, TURKEY

Email: o.arslan@izu.edu.tr

ABSTRACT

In the current nanotechnological perspective, fundamental materials such as ceramics, metals, polymers, composites, glass or wood and their specific characteristics can be combined at the molecular level for the synthesis and implementation of new functional nanomaterials. Therefore, durability or acid-base resistance of the ceramic materials can be supported or modified with the properties of flexible organic polymeric structures to produce unusual hybrid nanomaterials. From this perspective, starting from the molecular precursors, atomic precision and integrated production techniques (sol-gel technology, electrospinning, QD synthesis, hydrothermal method, ALD) were successfully applied for the novel hybrid nanomaterials with distinctive features.

Obtained new nanomaterials were utilized as functional surface coatings or in adsorption, filtration or other optical applications. In the same manner, scratch or corrosion prevention, UV protection, nanofiltration, nanoencapsulation, acid-base resistance, fluorescence character, superhydrophobic/self cleaning features, hardness and many other tailored properties were obtained in one distinctive material. Since developed products usually start with cheap, effective, long lasting and controllable precursors, our new material approach represents a highly attractive route for the synthesis and production of highly desirable novel hybrid structures for different applications.

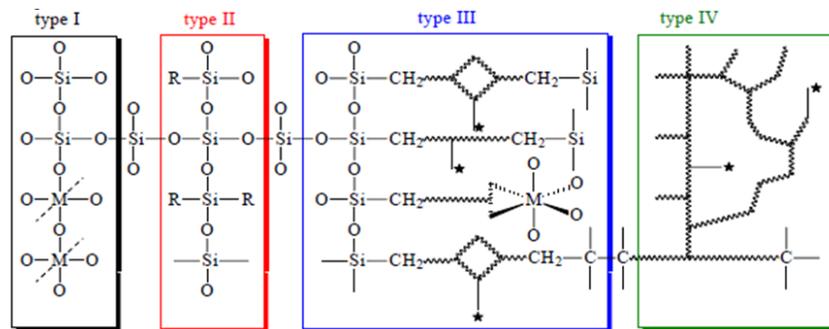
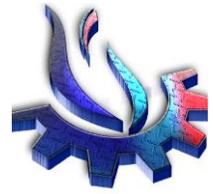


Figure 1: Inorganic organic hybrid nanomaterial structures

Keywords: Nanotechnology, Nanoparticle, Surface coatings, Quantum dots, Hybrid materials, Electrospinning



ECONOMIC AND SAFELY CONSTRUCTION METHOD FOR EMBANKMENTS WITH NEARBY SOIL MATERIALS

E. BAŞARI¹, A. DEMİR¹ and M. A. YURDUSEV¹

¹ *Manisa Celal Bayar University - Civil Engineering Department, Manisa, Turkey*
Email: ali.demir@cbu.edu.tr

ABSTRACT

Embankments have been used in civil engineering field for very long time. Today, embankments are used a lot of purposes such as dam, canal, way etc. constructions. In general, time and cost are limiting factors in engineering work. In order to save cost and time, constructors desire to use the closest materials to the construction site. Frequently, materials are supplied from the nearby area to construction site. Unfortunately, materials supplied from the nearby area usually do not have sufficient features to build the embankments in desired safety. As a result of this experimental study carried out in the laboratory, a construction method has been proposed for the two materials which have not sufficient characteristics. The proposed construction method provides sufficient safety, economy and applicable in the field. This paper introduces to experimental study, results and proposed construction methods for the soil materials which have poorly properties for the embankments.

Keywords: Embankment, Economy, Experimental study



1 DIMENSIONAL (1D) NANOMATERIAL PRODUCTION BY ELECTROSPINNING METHOD FOR THE SMART TEXTILE APPLICATIONS

O.ARSLAN¹ and Y.ABALI²

¹ *Istanbul Sabahattin Zaim University, 34303, İstanbul, TURKEY*

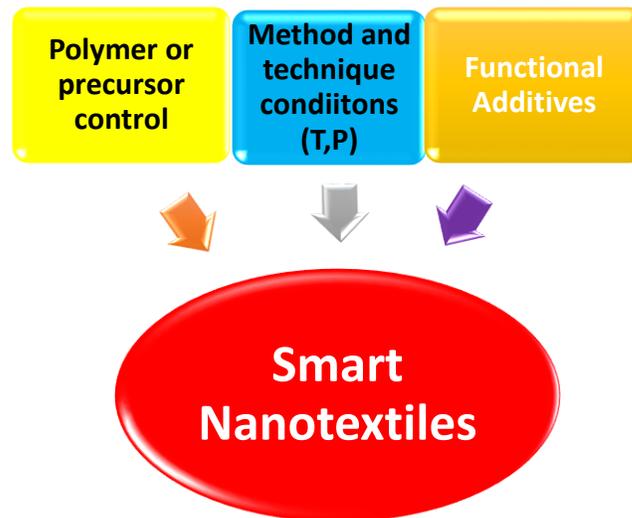
² *Celal Bayar University, 45140, Manisa., TURKEY*

Email: o.arslan@izu.edu.tr

ABSTRACT

One dimensional (1D) or elongated structures are special class of nanomaterials where generally find applications in the textile, filtration, adsorption or other functional areas. Widely utilized polymeric materials such as nanofibers of polyester, PAN, Nylon 6,6 or controllable inorganic-organic silicon/transition metal based hybrid precursors may find a huge interest in this window based on the tailored functional applications. By modifying, copolymerization and/or nanoparticle modification, novel chemical structure or surfaces of the 1D nanofibers can be produced by electrospinning technique. Electrospinning method, additionally allows us the control and manipulation of the final material/external effects interface due to the fine molecular control in each step during the synthesis of 1D electrospun nanomaterials/nanofibers.

Electrospinning concept may find wide applications for the smart textile materials due to the molecular level precursor control and surface alteration for specific purposes. By applying different synthesis techniques such as sol-gel method, ALD, UV technique, MW method or hydrothermal route, it is possible to produce new molecules or particles which can be covalently attached, coated, encapsulated or decorated onto the nanofiber surfaces. Therefore, highly functional and novel textile materials can be produced for the theranostic applications, human protection, ion or pollutant adsorption, optical manipulation (fluorescence) or energy applications.



Keywords: Nanotechnology, Electrospinning, 1D nanomaterials, Nanofibers, Hybrid materials, Nanoparticles



THE METALLURGICAL EFFECTS OF Sr MODIFICATION AND HOLDING TIME ON AlSi7Mg0.3 ALLOYS

O. ÖZAYDIN¹, E. ARMAKAN¹ and E. YILDIRIM¹

¹ Cevher Wheels /R&D Department, İzmir, Turkey
Email: oozaydin@cevherwheels.com

ABSTRACT

AlSi7Mg0.3 is one the most commonly used materials in aluminum alloy wheel production. Inoculant elements such as Sb, Na and Sr modify the morphology of silicon from a coarse to a finer structure. Sr is widely used in industry as an inoculant element and Sr modifies not only silicon particles but also transforms β -phase from 'needle' morphology to 'Chinese script' morphology, hence Sr modification leads to better mechanical properties. On the other hand, high amount of Sr causes porosity in the structure and the average grain size is increased by higher Sr levels.

In this study different Sr levels are examined to obtain an optimum result regarding mechanical properties. Microstructure & macrostructure, porosity level and grain size are also evaluated in material characterization. After the evaluation, the correlations between mechanical properties and material characterization are examined.

Beside the amount of Sr levels holding time after the modification affects the mechanical properties. In the second part of this study different Sr holding time levels are evaluated to see the effect on mechanical properties.

As a conclusion the optimum Sr modification level of AlSi7Mg0.3 and optimum holding time after modification are presented. These results may be helpful to researchers who work on modification in aluminum alloys and engineers in industry who are interested in an optimization of process parameters.

Keywords: AlSi7Mg0.3, Sr modification, Holding time, Metallurgical properties, Material characterization.



RESEARCH AND DEVELOPMENT OF SEISMIC PERFORMANCE OF A PREFABRICATED STRUCTURE

A. DEMİR¹, C. KOZANOĞLU¹ and K. ÇETİN¹

¹ *Manisa Celal Bayar University/Civil Engineering Department, Manisa, Turkey*
Email: ali.demir@cbu.edu.tr

ABSTRACT

The aim of this study is to research seismic performance of a damaged prefabricated industrial structure which has two stories. The structure has moved towards below 10 cm due to problems in the ground. Firstly, the settlement is restrained with cement grouting method. In order to determine seismic capacity of the structure, some workings are done in situ and office. According to these workings, it is concluded that the structure must be quickly strengthened. Then, structure is strengthened by using CFRP and steel profiles and cost accounts are done. The paper is an important part of research and development because problem and solution of the problem of structure are researched.

Keywords: Prefabricated, Structure, Seismic performance, Research and development



THE EFFECT OF MOLD AND CASTING TEMPERATURE ON THE DISTRIBUTION OF REINFORCEMENT MATERIAL IN COMPOSITE MATERIAL PRODUCTION

H. YAVUZ¹ and U. AYBARÇI¹

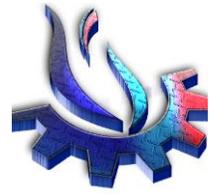
¹ *CMS Light Alloy Wheels/R&D Centre, Izmir, Turkey*
Email: hyavuz@cms.com.tr

ABSTRACT

The interest in composite materials formed by combining two or more materials in order to have higher material properties has increased in recent years. In literature, it is generally observed that the studies are according to the type and amount of additives. But other important issue is the casting mold used for composite production and the produced composite casting temperature. The mold and casting temperature are effective when casting and agglomerating the reinforcement during the solidification.

In this project, the effects of different mold temperatures during composite material production and reinforcement agglomeration during solidification of different casting temperature of composite material produced in liquid state were investigated by simulation studies. In this research, aluminum and 53 μm SiC were used as matrix and reinforcement materials respectively. Mold temperatures and casting temperatures were hold 150, 250, 350 °C and 650, 750, 850 °C respectively. Outputs of the simulated studies were evaluated comparatively and the results were interpreted.

Keywords: Simulation, Composite, Aluminum



SIMULATION BASED OPTIMIZATION OF A HOT FORGING PROCESS- AN EXAMPLE OF PRESSURE VESSEL COMPONENT

Ç. HOCALAR¹, İ. KILERCİ², O.ÇULHA³, N.SAKLAKOĞLU¹ and S.DEMİR⁴

¹ *Manisa Celal Bayar University/Mechanical Eng.Dept. Manisa, Turkey*

² *KOCAER R&D Centre, İzmir, Turkey*

³ *Manisa Celal Bayar University/ Metallurgical and Materials Eng.Dept. Manisa, Turkey*

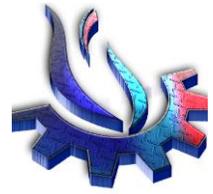
⁴ *EgemetForge/ Kemalpaşa / İZMİR*

Email: nursen.saklakoglu@cbu.edu.tr

ABSTRACT

In this study, it was aimed to design of hot forging process of a pressure vessel component forging using simulation techniques which are based on the filling of the material during closed die forging. The Simufactforming-FV analysis was applied to determine the optimal preform part to form the final part before forging process and the suitable process parameter. Forging simulation makes it possible to accurately predict the pressing forces and initial raw material amount. Thus it can be decided in favor of a smaller and more economical production unit. Based on the results of aforesaid simulation analysis, the amount of initial raw material and the effective stress on the dies were reduced by 15% and 20%, respectively.

Keywords: Hot forging, Preform optimization, Pressure vessel component



EFFECT OF ENVIRONMENTAL PROPERTIES ON EVOLUTIONARY NEURAL NETWORKS OF SELF LEARNING AUTONOMOUS VEHICLES

G. ALTINTAŞ¹

¹ *Manisa Celal Bayar University, Manisa, Turkey*
Email: gokhanaltintas@gmail.com

ABSTRACT

The use of structures and methods based on the nervous systems of living organisms is increasingly used in the construction of controllers of autonomous systems used today.

Increasing computer capacities and processor speeds have led physics based realistic simulation environments to play a crucial role in the development and training of robotics controllers. This has made it possible to handle countless different scenarios outside of the real time scale, especially in the sense that controllers using artificial intelligence can develop themselves.

In this study, the development of the nervous system of virtual organisms in 3D physics based virtual environments with different complexities is examined. Determination of neural network structures of autonomous devices trained in lanes with different obstacle topologies using NE method and performance of these structures in different environments constitute the main point of this study.

The determination of the required artificial neural network structure due to the nature of the environmental obstacles is one of the most important points in the design of self-trainable systems, so that the results obtained in this study are not only theoretical but also feasible in terms of applicability.

Keywords: Autonomous, Artificial Intelligence, Neural Evolution, Self-Driving, Autonomous-Driving



INVESTIGATION OF ZINC BORATE PRODUCTION BY EXPERIMENTAL DESIGN METHOD

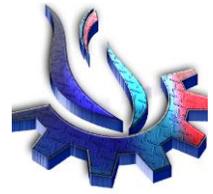
N. DEMIREL¹ and M. BALBAŞI¹

¹ *Gazi University, Department of Chemical Engineering, Ankara, Turkey*
Email: nuraydmr@yahoo.com

ABSTRACT

Turkey is a leader in the world because of the boron reserves and their qualities. To evaluate this national advantage, refined boron products are produced industrially and most of the ore is sold as boron chemistry and equivalent products. Research and development studies on the production of boron endproducts which are used in different areas of the industry and have high added-value are continuing. Zinc borate is one of these. It has usage areas in cables, fire resistant coatings, automotive-aircraft interior parts, textiles, electric-electronic device parts, flame-retardant materials and paper industries. Because of unplanned urbanization due to rapid population growth, plastic materials, climate change and fast industrialization, fire number and its damages increases every year. Zinc borate has been increasingly used as a flame retardant due to its ability to form an insulating barrier by transforming into a glassy phase under the effect of heat and preventing the combustion. It has started to take part in some other flame retardants due to its cheaper price. In this study, production of Zinc Borate production which is the reaction with Zinc Oxide Boric Acid and parameters such as temperature, particle size, mixing speed, filtration and drying methods affecting the production quality have been examined. As a result of the study, Zinc Borate products with different formulations were obtained. In addition, studies have been supported by "factorial design" and "surface response" experimental design methods which allow more than one parameter to be examined with the most economical number of experiments.

Keywords: Zinc oxide, Boric acid, Zinc borate, Experimental design methods



USE OF UNMANNED AERIAL VEHICLES IN DEFENSE INDUSTRY

M.M. KÜÇÜK¹ and S. KURAL¹

¹Manisa Celal Bayar University, Manisa, TÜRKİYE
Email: mehmetmertkucuk@gmail.com

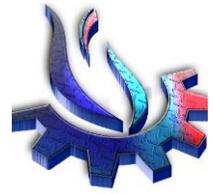
ABSTRACT

With industry 4.0, intelligent production and digitalization in industry have reached remarkable dimensions. As a result, this has also led to an increase in intelligent products in our daily lives. Systems such as intelligent home technologies have become obsolete and our habits have begun to change; such as our shopping habits. We are now able to make our shopping through internet and even shopping from virtual stores in other countries. As a result of these changes in our shopping habits, faster and safer logistics have begun to be sought. These include autonomous controlled vehicles and unmanned aerial vehicles.

Unmanned aerial vehicles are used in many areas such as logistics, defense industry and advertising. These vehicles, which are becoming more and more easy to use, are now being used as toys for children. Many open source simple models have been made easily by accessing information on the internet. Many people, professional and amateur, started to manufacture these vehicles and use them. However, these vehicles, which are open to everyone's use, can sometimes lead to dangerous situations. Unfortunately, there is no country that lives in today's world is not worried about terrorism. It was first agreed in 2015 that unmanned aerial vehicles could be used as a new threat to terrorist organizations. On April 22, 2015, on the roof of the Japanese prime minister's office, an unmanned aerial vehicle was found, 50 centimeters long, with a miniature camera and a plastic bottle on it. A low level of radiation was detected in the vehicle.

With this example we see that the breakthroughs in the production of unmanned aerial vehicles have to be done urgently on unmanned aerial defense methods as well. Our work will examine existing work done in this direction.

Keywords: Unmanned vehicles, Defense industry, Aerial defense methods



DYNAMICS OF PIPES CONVEYING FLUID WITH CONCENTRATED MASSES

B. G. SINIR¹ and D. DÖNMEZ DEMİR²

¹ *Manisa Celal Bayar University, Department of Civil Engineering, Manisa, Turkey*

² *Manisa Celal Bayar University, Department of Mathematics, Manisa, Turkey*

Email: duygu.donmez@cbu.edu.tr

ABSTRACT

The dynamical analysis of Euler-Bernoulli beam adding singular masses on it is introduced in this study. The natural frequency values depending on velocity are obtained in the result of this dynamical analysis. The natural frequency changes with respect to the support conditions of the system and size of locations of masses. As its application in practice, we obtain the value of velocity from the frequency and can calculate flow rate. Thus, we can obtain a flowmeter. The mentioned mathematical model is extensively used in many area such as pipeline, the design of energy line and water supply network.

Keywords: Euler-Bernoulli beam, Concentrated masses, Singular masses, Flowmeter



DEVELOPMENT OF NEW GENERATION HIGH-STRENGTH STEEL COMPOSITION AND THE REALIZATION OF INNOVATIVE FORMING PROCESSES DESIGN

O. ÇULHA¹ and A. BAŞSÜLLÜ²

¹ Manisa Celal Bayar University Dept. of Metallurgical and Material Engineering, MANİSA, TURKEY

² Kocaeli Haddecilik San. Tic. A.Ş. Ar-Ge Merkezi, Aliğa, İzmir TURKEY

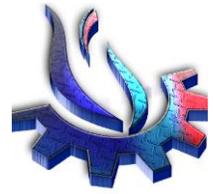
Email: osman.culha@cbu.edu.tr; a.bassullu@kocaelihadde.com

ABSTRACT

World states and public enterprises aim at reducing carbon emission in transports every passing year. Carbon emission value is dragged down to 95g/km in European Union and this value will be limited to 140g/km for light commercial vehicles. This situation closely affects the quality of steel will be used in automotive industry in our country. In this context, the strength and lightness of the vehicles are important design criterions. In this respect, R&D activities based on the production of the light and strength transports depending on the security, aesthetic and design limitations can be carried out at via selection and designment of alloy, design of the forming processes and re-shaping (thermomechanical rolling and forging) of semi-products. During the research, literature and theory supported activities can be carried out within the scope of selection and design of material, solidification properties, simulation of forming, determination of the phase transformations caused by various cooling medium controlled with temperature and deformation by the design of the virtual-simulated and actual production process as a whole. Simulation softwares which are the latest technology will be used in this work within the institutional approach of the project. The effects of the phases, solidification forming temperature, deformation rates, cooling medium on the metallographic and mechanical properties of material will be revealed at the project cycle. Virtual and actual production activities will be implemented by design of the microstructure based on controlled forming and flat and long groups of products in this project. In particular, the development of the native steel composition, pilot production of this steel at a university, high capacity productions can be made with industrial partners when the results obtained are appropriate to the goals of call is the significant advantage of this project.

Our region supplies the 30% of steel production in our country, however; the number of steel manufacturer serving the automotive industry is less. Increasing this number depends on the R & D investment and support. Industry organizations supported this project will have an opportunity in order to go into series production by using the specially developed steel composition with the higher strength. From this point of view, the important contribution to the country's economy and quality of the steel used in sector when performed R&D activities in the work packages. In addition, the results will be contribute to the 2023 targets of our country from the stand point of the production of the domestic automobile and transportation via the developing of the domestic steel composition and production processes.

Keywords: Simulation, Plastic deformation, Thermomechanical rolling and forging



INVESTIGATION OF LUBRICATION PROPERTIES OF A MINERAL OIL CONTAINING NANOPARTICLES

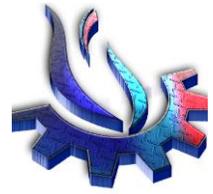
S. ERGÖNÜLTAŞ¹, G. SARI¹, S. GENÇALP İRİZALP¹ and M.B. AKGÜL¹

¹Manisa Celal Bayar University, Faculty of Engineering, Mechanical Engineering Manisa
Email: simge.gencalp@cbu.edu.tr

ABSTRACT

In this study, titanium dioxide, aluminum oxide and copper oxide particles with spherical shape in nano-size is used to prepare suspension in mineral oils with different concentrations and so a new nano-oil is enhanced. Basic reasons of reduce of lifetime and performance of machines and motors which are used in special, commercial or industrial are friction, wear and corrosion. Moreover, the friction is responsible from energy and consumables requirement which rises from the reduction of machine efficiency. Therefore, the friction has importance in machine parts which keep in contact. Nano-oil brings about an effective increase in performance and lifetime in machine parts. Lubrication performance of lubricant is determined by pin-on-disc CSM Instruments wear equipment. During wear test, friction coefficient values save as online and stribeck curves are obtained for each nano-oil. Effects on lubricant of size, type and volume concentration of nanoparticles are investigated in detail. Tribological tests are performed in specimens which have different surface roughness. And so, the behavior of nano-lubrication on the different surface quality will be determined. Wear rates which occur in base oil and nano-oil are determined by mechanical profilometer. At the end of the project, it is aimed that a nano-oil which has superior lubrication properties than classical lubrication oils is developed. Thus, in nano-oil systems, an increase in lifetime and efficiency is expected. Reformed nano-oil assistes to low-energy consumption and environmental protection.

Keywords: Nano-oil, Friction, Wear, Tribological test



EFFECTS OF USAGE OF NANOMATERIALS ON PROPERTIES OF POLYMER MODIFIED BITUMEN

D. UNCU¹ and A. TOPAL²

¹Manisa Celal Bayar University, Manisa, Turkey

²Dokuz Eylul University, Izmir, Turkey

Email: dilay.yildirim@cbu.edu.tr

ABSTRACT

During the service life, there are many deformations such as permanent deformation, low temperature cracking, fatigue cracking, and moisture damage because of the effect of traffic, climate and environmental conditions on pavement surface. Therefore, modification of bitumen with additives against these deformations has become a widely used method. However, when the properties of polymer modified bitumen are examined, it is found that negative results are obtained especially in terms of storage stability values, which is related to the incompatibility due to the density difference between bitumen and polymer. In order to resolve the density difference between polymer and bitumen, a new technology has been developed in recent years including the utilization of nanomaterials within polymer modified bitumen. In this way, the usage of different types of nanomaterials in polymer modified bitumen such as nanoclays, nano metal oxides and nanotubes becomes a current issue. The addition of nanomaterials to modified bitumen has been proved to improve the performance significantly. The physical and rheological properties of polymer modified bitumen are developed thanks to these additives.

Keywords: Modified Bitumen, Polymer, Nanomaterials



A STUDY ON THE USAGE OF BASALT FIBERS AND PIGMENT IN ARCHITECTURAL CONCRETE PRODUCTION

M. A. ÜSTÜNER¹, G. KAPLAN², A.U. ÖZTÜRK¹ and E. DOĞAN¹

¹Manisa Celal Bayar University, Engineering Faculty, Civil Engineering Department, Manisa, TURKEY

²Kastamonu University, Engineering Faculty, Civil Engineering Department, Kastamonu, TURKEY

e-mail: gkaplan@kastamonu.edu.tr

ABSTRACT

The use of colored aggregates, custom colored cements, or pigments with white cement are among the options in order to obtain mixtures in different colors for architectural concrete applications. It is now common to use colored concrete for the production of concrete and reinforced concrete construction elements. Nevertheless, the design of thin-walled structural elements in architectural concrete production has gained importance in today's applications. The most suitable method available to reduce the cross-section of elements is the production of basalt fiber reinforced concrete. Basalt fiber stands out as the best fiber choice with regards to factors such as cost and durability. This study analyzes the properties of architectural concrete designed with basalt fiber and iron oxide pigments. Suitable fiber length was defined in the first section of the study. Basalt fiber lengths of 6, 12, and 24 mm were used. After identifying the optimal fiber length, architectural concrete samples are produced with 2% basalt fiber addition. Fiber length of 12 mm is found to be the most suitable considering the results of strength tests. The use of fibers of 24 mm length, on the other hand, leads to 6-12% reduction in compressive strength. In the second section, architectural concrete samples are produced using yellow, red, black and brown pigments. It was found that brown, yellow and black pigments contributed to the compressive strength, yet the red pigment had an adverse effect on the compressive strength resulting in loss of strength. It was further found that the use of red pigments increases the porosity of the concrete. Therefore, detailed R&D studies are needed for architectural concrete applications which use red pigments. In conclusion, it was found that the use of basalt fibers of 12 mm in length is more suitable in terms of strength of the concrete.

Keywords: Fiber, Pigment, Architectural Concrete



DEVELOPMENT OF HIGH EFFICIENT ADAPTIVE CHARGING METHOD FOR TRACTION TYPE BATTERIES

O. DEMIRCI¹, S. YILMAZ¹, A. TURHAN¹, H. HASSÜMER¹ and A. TURAN¹

¹ İnci GS Yuasa R&D Centre, Manisa, TÜRKİYE
Email: odemirci@incigsyuasa.com

ABSTRACT

Efficient charging of batteries has also started to increase along with the worldwide expansion of electric vehicles and industrial vehicles. Ideally, the battery should be charged as efficiently as possible and should be able to deliver the most cycles.

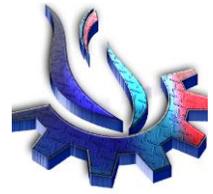
Rectifier manufacturers have been tried different charging profiles to charge of industrial type traction battery and these profiles have adapted their products. The general principle is based on starting with high currents and continuing with decreasing currents. There are two basic structures for how much the current is to be reduced. Constant power is used in the first group and other group is used randomly selected percentages and pulses.

Rectifier manufactures do not use real-time and adaptive charging profiles. These profiles cannot calculate an effective charge current using the battery voltage and temperature.

In this study, the algorithm calculates a new charge current using data on battery voltage and temperature at each sampling point. The algorithm calculates a new charge current by evaluating the voltage and temperature data. Charge current is controlled by PID control method.

A highly efficient charging method has been developed to minimize the energy spent on side reactions (water loss) during the charging of the traction type batteries. With this charging algorithm, electric vehicles will be efficiently charged. In addition, the usable lifespan of energy storage systems will be extended. The improved charging method is independent of battery chemistry. For this reason, the algorithm can be used for new battery systems in the future.

Keywords: Adaptive control, Traction battery, PID control, Battery charge profiles



AN APPROXIMATE SOLUTION FOR LINEAR FRACTIONAL DIFFERENTIAL EQUATIONS BY USING EULER PLOYNOMIALS

A. KONURALP¹ and S. ÖNER²

¹ *Manisa Celal Bayar University, Manisa, Türkiye*

² *Graduate Student, Manisa Celal Bayar University, Manisa, Türkiye*

Email: ali.konuralp@cbu.edu.tr

ABSTRACT

In this study, the approximate solutions of linear fractional differential equations are obtained by using Euler polynomials. The proposed method to solve linear differential equations under mixed conditions is applied to some examples. The data obtained by using this method is well suited with the exact solutions and can be seen from tables and figures.

Keywords: Fractional Differential Equation, Approximate Solution, Euler Polynomials



DEFINING THE PRINCIPLES OF HUMAN RESOURCES MANAGEMENT FROM SCRATCHES: DIGITAL HUMAN RESOURCES MANAGEMENT

A. ÜNAL¹, G. BİNBOĞA¹ and M. BAŞOĞLU¹

*¹Manisa Celal Bayar University, Manisa, TÜRKİYE
Email: aylinunal@yahoo.com*

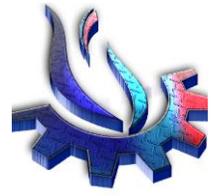
ABSTRACT

In a changing world order, it is not possible for businesses to sustain their assets in the long run unless they abandon traditional methods and leave the old point of view that can not catch the age. This can be said from this point of view; rules and bases related to future human resource management are rewritten with digital codes. The main element that determines these rules is undoubtedly the technological developments and the necessity of businesses to adapt to these developments.

It is human resources qualified as a basic element that has a strategic value in order to develop technologically, to change positively and to be ahead. Concepts such as talent management, lifelong learning and digital management are no longer a luxury but a necessity for businesses. However, this requirement is a fact which should be examined differently from the way that people adapt to technology. Since digital human resources management has different dynamics within itself, it will not be an easy process for enterprises to adapt. One of the key points businesses should be aware of in this process is the right choice of digital platforms. In this process, besides infrastructure works, the senior management's commitment and the incorporation of employees into the system are of great importance. The superficial digitization that will occur if attention is not paid to this issue will not allow us to reach the desired bottom wave, and as a result, the labor, time and cost will be a dead investment.

In this framework, the core of our work is creating new trends in human resource management. Our aim is to provide a broader literature review and the applicability of popular information on this subject in our country's businesses. Our work in this direction is a descriptive and exploratory work.

Keywords: Digital human resources management, Industry 4.0



DIGITALIZATION OF THE SCULPTURE OF İZMİR UNIVERSIADE MASCOT WITH REVERSE ENGINEERING METHODS AND SMALL-SCALE MANUFACTURING WITH 3D PRINTER

A.Ç. ÖNÇAĞ¹ and H. TOSUN²

¹ ESHOT General Directorate, Technology Development Branch Office, Izmir, Turkey

² Celal Bayar University/Metallurgical and Materials Engineering Department, Manisa, Turkey
Email: aoncag@eshot.gov.tr

ABSTRACT

Reverse engineering methods have found more application area for themselves with the development of computer capacities and technology. In this study, a 3 dimensional (3D) laser scanning operation has been implemented on the mascot sculpture of Universiade 2005 İzmir “Efe” which was damaged due to environmental and natural conditions and having no digital design data. After scanning operation by editing the scan data, a scale sculpture has been manufactured with a 3D printer. By doing such studies, it has been seen that the data of designs and arts having importance for urban culture and history can be transferred to digital media as 3D without any damaging. Thus, by using the reverse engineering methods, it is possible to present arts and designs to the next generations in a practical way and as 3D.

Keywords: Reverse engineering, 3D printer, Urban culture



A NEW APPROACH TO MINE FEATURES and SENSOR INFORMATION FROM ANDROID BASED MOBILE DEVICES

İ. YILDIRIM¹ and S. TAŞKIN²

¹ *Vestel Electronics Corp. - R&D Department, 45030 Manisa, TURKEY*

² *Manisa Celal Bayar University, Faculty of Engineering, Electricity –Electronic Engineering Department,
Manisa, Turkey*

Email: ilker.yildirim@vestel.com.tr

ABSTRACT

Domain analysis is an essential activity in software product line engineering to identify common and variable features among the products of a product family. Feature models are commonly used for depicting the identified commonalities and variations. However, it requires significant time and effort to perform domain analysis and to create a feature model.

In this work, we introduce a domain-specific method and a tool for automatic extraction of feature models. We focus on internal and external variability in a product family that is composed of Android based devices. We use a native application deployed on these devices to extract information regarding the available features, deployed software, capabilities, sensors and other peripherals. This application, namely miner APK, is developed as an Android application package (APK) that can run on the Android operating system to collect information. Hence, our approach does not require the availability of the source code. It does not also require any manual effort, for instance, to create (formal) product specifications as input.

We performed an industrial case study with a real product family of VESTEL Company. We observed promising results in which a feature model is automatically constructed and the accuracy of the model is approved.

Keywords: SPL(Software Product Line) , SPLE(Software Product Line Engineering), Feature mining, Software product variants, Feature model, Feature diagram, Domain analysis, Variability modeling, Reverse engineering, Android devices



A SYNTHESIZING TYPE OF MATERIAL SCIENCE, SOLID STATE SYNTHESIS WITH A SAMPLE DOPED-NiFe₂O₄ COMPOUND

İ. ŞABİKOĞLU¹

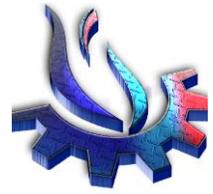
¹Manisa Celal Bayar University Faculty of Science and Letter, Department of Physics, Manisa TURKEY
Email: israfil.sabikoglu@cbu.edu.tr

ABSTRACT

Nowadays specific features of materials are synthesized using different synthesizing method such as sol-gel, hydrothermal, solid state, chemical/physical vapour methods etc. The synthesizing of a material is very important for the chemical and physical properties of the new compounds especially in sensors, magnetic materials area. The solid state synthesizing system includes very high temperature furnace and it can use synthesis of spinel or perovskite type crystal materials. In addition, the magnetic materials based on ferrite (NiFe₂O₄) are significantly analyzed due to their wide range of applications in the fields of electronics, electrochemical science and technology. Therefore, the production phase of magnetic/electronic material is important.

In this study, a kind of magnetic material NiFe₂O₄ doped with lanthanides which have magnetic features, using conventional solid state reaction system is explained. In addition, the stoichiometry of compounds and chemical reaction type are discussed.

Keywords: Solid state synthesis, reaction, nickel ferrite



EFFECT OF PRINTING PARAMETERS ON TENSILE STRENGTH OF 3D PRINTING PRODUCT

İ. ÖZTÜRK¹ and S. KURAL²

¹ Dokuz Eylül University, İzmir, TÜRKİYE

² Manisa Celal Bayar University, Manisa, TÜRKİYE

Email: ilke.ozturk1@gmail.com

ABSTRACT

3D Printers, which are very popular in recent years, are being used for industrial, medical and hobby purposes due to rapid prototyping, easy usage, no mold costs.

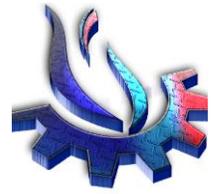
Knowing the mechanical properties of the part which is printed by FDM technology determines the conditions under which the part will work. One of the important test in this regard is the tensile test. Furthermore, parameters such as layer height, printing temperature, filling pattern, printing speed, cooling fan and plastic life affect the strength of the printed part.

In this study, the effect of temperature, layer height and infill pattern on the tensile strength of the printed part was investigated. For samples prepared according to ISO 527-2 Type 1BA standards: 0.1 and 0.2 mm layer height, at 200 and 210 °C degrees and Rectilinear and Fast Honeycomb infill patterned samples were printed. The print speed is 50mm / s for all samples, the cooling fan was used and the fill rate is 100%.

When the test results are examined; when the layer height increases, the tensile strength decreases. Similarly, when the printing temperature increases, the tensile strength decreases. When examined in itself, the layer height and the printing temperature of Fast Honeycomb has no significant effect on the tensile strength. When we examine Rectilinear, the tensile strength decreases in large proportion due to the increases layer height.

Generally, Rectilinear infill pattern should be preferred for 0.1mm layer height. At the layer height of 0.2mm, Fast Honeycomb infill pattern should be preferred, but this infill type causes serious vibrations on printer.

Keywords: 3d printing, Tensile strength, Infill pattern, FDM technology



COMPUTING THE LINK VULNERABILITY OF NETWORKS IN POLYNOMIAL TIME

Z.N. BERBERLER¹ and E. YIĞIT¹

¹ Dokuz Eylul University/Faculty of Science, Department of Computer Science, İzmir, Turkey
Email: zeynep.berberler@deu.edu.tr

ABSTRACT

A wide range of social, biological and technological systems can be described by complex networks. Examples include social networks, communication networks, the Internet, power grids, world wide web, citation networks, biological networks, neural networks, chemical networks, cellular networks, collaboration networks, and protein-protein interaction networks. Vulnerability is a central concept that is used to assess stability and robustness of the performance of complex networks under failures. Different approaches to characterize network vulnerability have been proposed such as integrity, toughness, tenacity, scattering number, rupture degree. From an algorithmic point of view, unfortunately the problem of recognizing these measures of networks is NP-complete in general. This implies that these measures are of no great practical use within the context of complex network. Measure of centrality is fundamental to understand the structural and dynamic properties of complex networks. Link residual closeness is a novel graph-based network vulnerability parameter. Link residual closeness is the most appropriate sensitive approach for modeling the robustness of network topologies in the face of possible link destruction. In this model, nodes are perfectly reliable and the links fail independently of each other. In this study, the advantages of link residual closeness are discussed and a polynomial time algorithm is proposed for measuring the link residual closeness of networks.

Keywords: Complex networks, network topologies, vulnerability, graph theory, closeness, centrality



MICRO-BEAM VIBRATIONS WITH NON-IDEAL BOUNDARY CONDITIONS

S. N. DURMUŞ¹ and S. KURAL¹

¹ *Manisa Celal Bayar University, Manisa, TÜRKİYE*
Email: s.nur_durmus@hotmail.com

ABSTRACT

In this study, nonlinear vibrations of stationary micro-beams will be investigated. In mechanical problems, boundary conditions are often regarded as ideal supports, which provide the expected conditions in a perfect way. However, in actual applications, vibrations occur at the connection points due to physical disturbances caused by softening, loosening or other effects of the ground at the connection point, and boundary conditions may not provide the expected ideal conditions. For example, small slopes or small displacements may occur in a beam with fixed support. It is expected that the solutions made without taking these irregularities into account are not expected to give real results. The non-ideal boundary conditions will be modeled in two different ways.

In the mathematical model of the non-ideal boundary condition, a linear combination of ideal simple and ideal built-in supports will be created to model non-ideal simple and ideal built-in bearings. The non-ideal simple support, while moving the moment in small increments, the non-ideal built-in bearing will be allowed to tilt in small ranks. In order to be able to see the effect of the system being in micro-dimensions, the length scale parameter of the material, which represents the effects of the micro-structure, will be considered, as opposed to the classical continuous-medium theory. By using Hamilton principle, motion equations for immovable micro beams will be obtained.

In order to obtain an independent general solution of the system's material properties and geometry, the motion equations will be dimensionless and approximate solutions of the system will be obtained by applying Multi-Scale Method which is a perturbation method. System parameters such as damping ratio, fluid velocity, beam occupancy ratio, and the effects of non-ideal boundary conditions on natural frequencies will be presented.

Non-linear motion equations for microtubes will be obtained by using Modified Couple Stress Theory (Hamilton principle). The terms originating from the distances during vibration will give the nonlinear property to the equation. The electrical field strength inside the micro-pipe will be taken as the electrical field strength between the parallel plates. The effect of microstructures on natural frequencies will be investigated. Non-linear terms resulting from the elongation will be investigated the effects of the natural frequencies and the solution.

Keywords: Micro systems; micro-beams; Non-ideal boundary conditions; Multi-Scale Method



THE EFFECT OF CLEANING EFFICIENT EPOXY-SILENT-FLUOROCARBON POLYMERS IN LIGHTING ARMATURES

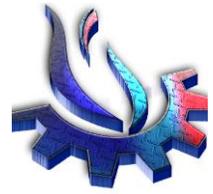
M. AKEL¹ and E. ÇERKEZOĞLU¹

*Akim Metal A.Ş, Arge Merkezi, İstanbul, Türkiye, TR-34953
makel@akimmetal.com.tr, eyalaza@akimmetal.com.tr*

ABSTRACT

In this study, the polymeric structures formed by reaction of the epoxy derivative (3-glycidyoxypropyl) methyl-diethoxysilane (GLYMS) with the primary amine (3-aminopropyl) Triethoxy Silane (ATS) and Perfluorododecyl Triethoxysilane at different ratios were investigated in terms of water repellency and light transmittance. The framework of the emerged material includes a siloxane network with perfluoroalkyl groups. When GLYMS enters the reaction with ATS, the polymeric network also develops on the organic structure, such as the inorganic side, resulting in the formation of silica-epoxy hybrids that are covalently bonded to the inorganic domains of the resulting organic polymer chains. The mechanical effects of perfluoro alkyl groups durable and high light transmittance polymeric structures have been obtained.

Keywords: Epoxy silane Composites, Hydrophobic polymers



B. POSTER PRESENTATIONS

THE COMPARISON OF QUICK DRYING CHARACTERISTICS OF LIGHT-WEIGHT WARP KNITTED TOWELS

F. F. YILDIRIM¹, E. GELGEÇ¹, A.C. DENİZ¹, M. ÇÖREKÇİOĞLU¹ and S. PALAMUTÇU²

¹ *Ozanteks Tekstil R&D Centre, Denizli, Turkey*

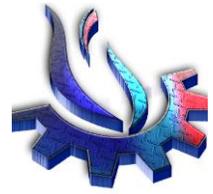
² *Pamukkale University Textile Engineering Department, Denizli, Turkey*

Email: filiz@ozanteks.com.tr

ABSTRACT

Towels can be produced in the range of 300 to 900 gsm, are generally desired to have high water absorption ability and softness. Although high weighted towels absorb more water, they need too much time for washing and drying which causes more energy to be consumed. Light-weighted towels are washed and dried easily. In this study, light weight warp knitted towels are produced and their quick drying characteristics are investigated and compared to the other medium weighted towels.

Keywords: Warp knitting, Light-weight towels, Quick drying, Absorbency



IMPROVING THE FLAME RETARDANT PROPERTIES OF COTTON FABRICS WITH BORON COMPOUNDS

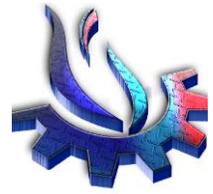
E. GELGEÇ¹, F. F. YILDIRIM¹, Ş. YUMRU and M. ÇÖREKÇİOĞLU¹

¹ *Ozanteks Tekstil R&D Centre, Denizli, Turkey*
Email: filiz@ozanteks.com.tr

ABSTRACT

Flame retardant properties of natural fibers especially cotton fabrics are considerably poor and need to be improved. Boron compounds are used to improve these properties of cotton fabrics. In this study, boron compounds and applications methods used for improving cotton fabrics flame retardant properties are investigated and summarized.

Keywords: Flame retardant, Cotton, Boron, Boric acid



DETERMINATION OF PEROXIDASE ENZYME INACTIVATION PARAMETERS IN VEGETABLES

L. AYSU¹ and N. AYDIN¹

¹ *Kereviş Gıda Sanayi Ve Ticaret A.Ş / R&D Centre, Bursa, Turkey*
Email: lutfu.aysu@kerevitas.com.tr / necdet.aydin@kerevitas.com.tr

ABSTRACT

The peroxidase enzyme found in the vegetables actively causes the discoloration of the products, the change of taste and the decrease of the nutritional values during the processing of the fruits and vegetables. In this study, it was tried to determine the thermal inactivation conditions of peroxidase enzyme at different temperatures in vegetables. Research products are Green beans, peas, chubby okra, okra, corn and broccoli. Enzyme inactivation was investigated according to the temperatures such as (65 ° C - 70 ° C - 75 ° C - 80 ° C - 85 ° C - 90 ° C - 95 ° C) by keeping the steaming times applied to these products constant. Thus, optimum conditions for the inactivation of the peroxidase enzyme have been determined to related vegetables.

Keywords: Peroxidase, Green beans, Peas, Chubby okra, Okra, Sweet corn and broccoli



REDESIGN OF A DAMAGED BUS PART WITH REVERSE ENGINEERING AND MANUFACTURING OF ITS CASTING MODEL WITH 3D PRINTER

A.Ç. ÖNÇAĞ¹ and H. TOSUN²

¹ *ESHOT General Directorate, Technology Development Branch Office, Izmir, Turkey*

² *Celal Bayar University/Metallurgical and Materials Engineering Department, Manisa, Turkey*
Email: aoncag@eshot.gov.tr

ABSTRACT

Some parts of the bus that complete the lifetime must be replaced during maintenance. However, it is difficult to find the parts of aging vehicles or the supply period of the parts to be purchased from abroad can be long. As an alternative to purchasing, a casting model is designed with a CAD program by scanning a damaged part of the bus with a 3D laser scanner. Subsequently the casting model was manufactured with a 3D printer. As a result, it is observed that the production of casting model with 3D printer is advantageous in terms of workmanship compared to other methods, but the production time increases with the increase of the part size.

Keywords: 3D laser scanning, Reverse engineering, 3D printing, Casting model



COLD FORGING DESIGN AND PROTOTYPE PRODUCTION OF THE STUB AXLE USED IN THE AUTOMOTIVE INDUSTRY

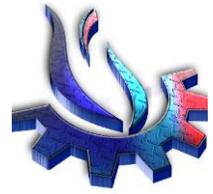
E. YÖNDEM¹

¹Eko Endüstri Kalıp Otomotiv Plastik Ve Spor Aletleri San.Dış. Tic. Ltd. Şti., İZMİR, TURKEY
Email: engin.yondem@ekoendustri.com

ABSTRACT

Cold forging is a process; which occurs at room temperature, formation of oxide layer during the production does not occur, dimension precision final product, tolerances are very low, production flow is fast and the final product surface and mechanical properties are more developed than alternative production methods due to the advantages such as the fact that it is used as a production method to shape for shaped complex workpieces. The prototype stub-axle parts is produced by the cold forging process as a result of R & D activities to develop process design of superficial and mechanical properties studies were carried out to determine material flow, hardening level, residual stress-strain distribution, temperature effect and friction coefficient with (process design, press selection, raw material preparation stages, mold selection and design final product geometry and simulation of the whole process.) by developing. For the prototype production, C35 material used raw material is subjected to cold forging pre-softening in heat treatment, ultimately raw material and surface preparation stages are on the point of being descaling and surface treatment have been completed. In the programs used, selecting for material selection JMatPro software and Simufact forming in software symmetrical axis model, in the FEM analyzes by calculating over equivalent surface area the force values at each station step of the stage and material flow can be controlled with stress distributions. For each operation in 5 operations, press selection and speed, material selection, friction model and coefficient, initial temperatures and solution network structure on workpiece are determined. Within the scope of this study, no cracks or roughness increase is observed on the surface stub axle after production, but hardness values are reached 120-130 HB.

Keywords: Cold forging, Simulation, Stub-Axle,



AGING TEMPERATURE EFFECT on HARDNESS and MICROSTRUCTURE of A357 ALUMINIUM ALLOY PART WHICH PRODUCED by GDC and LPDC

G. ÖZKAN¹ and B. UYULGAN¹

¹*Dokuz Eylul University, İzmir, Turkey*
Email: gazicanozkan@gmail.com

ABSTRACT

A357 Aluminium Alloy (AlSi7Mg0.6) commonly used in automotive, energy, aerospace and engineering applications. In this study, A357 aluminium alloy parts produced by Gravity Die Casting (GDC) and Low Pressure Die Casting (LPDC) methods were used. T6 heat treatment was applied. Firstly, samples are solutionized at 540 ° C during 7 hours, then quenched at room temperature water. After that, artificially aged at different ageing temperatures. Their Vickers hardness changes have observed. For two different casting methods, the hardness increases in the first few hours according to the untreated conditions. Also microstructure has changed after heat treatment. At the beginning, part which produced by Low Pressure Die Casting method shows higher hardness value, lower secondary dendritic arm spacing (SDAS) value and lower porosity against gravity die cast part. After T6 heat treatment LPDC part's advantages against GDC method has partially disappeared.

Keywords: T6 Heat Treatment, A357 Aluminium Alloy, Gravity die casting, GDC, Low pressure die casting, LPDC



UNRIPE BANANA PULP AND PEEL FLOUR AS INNOVATIVE INGREDIENTS FOR FOOD FORTIFICATION

A. TÜRKER¹ and N. SAVLAK¹

¹Manisa Celal Bayar University, Faculty of Engineering, Department of Food Engineering, Muradiye, Manisa
Email: nazli.yeyinli@cbu.edu.tr

ABSTRACT

Cavendish (AAA) banana is a dessert type banana and one of the most produced and consumed food crops in the world. When banana is unripe, it is a good source of dietary fibers and resistant starch. It is rich in Ca, Mg, K, P and vitamins provitamin A, B1, B2 and C. Banana peel constitutes about 40% of the fruit and is an underused by-product of industrial banana processing rich in protein, dietary fibre, total phenolic and antioxidant compounds. In this study, unripe banana pulp and peels, Dwarf cavendish banana (*Musa ssp. AAA*, Gazipaşa, Antalya), were freeze dried and ground in order to obtain UBPUF (Unripe Banana Pulp Flour) and UBPEF (Unripe Banana Peel Flour) under 212 µm. Chemical composition, CIE color, water and oil holding capacity, mineral content, antioxidant activity and phenolic content of flours were determined. Ash and protein contents of UBPUF and UBPEF were 1.92% - 5.49% dm, and 1.22% - 11.16% dm, respectively. Antioxidant activity of UBPUF that was determined by DPPH radical-scavenging activity and FRAP methods were 1.95 mg TE/dry matter and 20.96 mM Fe (II)/g dry matter respectively, while antioxidant activity of UBPEF by DPPH and FRAP methods were 12.99 mg TE/dry matter and 257.23 mM Fe (II)/g dry matter, respectively. It was determined that UBPEF had higher protein and fat content, antioxidant activity, mineral matter, oil and water holding capacity than UBPUF. Due to their high nutritional value, unripe banana pulp and peels have potential use in food fortification as innovative ingredients.

Keywords: Unripe banana, Peel, Functional properties, Antioxidant activity



DEVELOPMENT OF FUNCTIONAL CRACKERS BY FISH FLOUR FORTIFICATION

B. ÖKTEM¹, Y. GÜMÜŞGERDAN¹, B. KALAZ¹ and N. SAVLAK¹

¹Manisa Celal Bayar University, Faculty of Engineering, Department of Food Engineering
Email: nazli.yeyinli@cbu.edu.tr

ABSTRACT

Trout, anchovy and bass are nutritive components for food fortification due to their high protein, mineral and vitamin content. In this study, crackers were fortified with 5,10 and 15% trout, anchovy and bass flour and investigated for their physical (cracker width, thickness, weight, spread ratio, CIE L^* , a^* , b^* , hardness) and sensorial properties comparatively with control crackers. Fish flour was obtained by freeze drying of trout, anchovy and bass followed by grinding. Fish flour under 800 μm were used for cracker fortification. Cracker width and thickness were statistically affected by fish flour incorporation ($p<0.05$). Anchovy and bass fortification resulted in decreased cracker width and thickness with increasing fish flour level. Cracker thickness decreased due to increasing dietary fibre of fish flour. CIE L^* value was not statistically affected, while b^* value was statistically affected by fish flour fortification. Instrumental hardness of crackers decreased with fish flour incorporation level ($p<0.05$). 7 point hedonic scale test propounded that 15% trout flour fortified crackers received the highest overall acceptability score (5.80) which was higher than control crackers (5.25). Crackers except anchovy flour received sensory scores over 4.00, indicating that they were sensorially acceptable. As a result, sensorially acceptable functional and nutritional crackers were developed by trout and bass flour fortification while anchovy incorporated crackers received lower sensory results.

Keywords: Cracker fortification, Fish flour, Functional biscuit, Trout, Anchovy, Bass



OPPORTUNITIES OF USING FUNCTIONAL FOOD'S WASTE PRODUCT IN DEVELOPMENT OF INNOVATIVE DAIRY PRODUCT

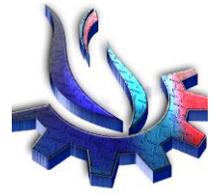
G. ERK¹, S. AKÇA¹ and A. AKPINAR¹

¹ *Manisa Celal Bayar University, Engineering Faculty Department of Food Engineering Muradiye, Manisa,
Turkey
Email: asli.akpinar@cbu.edu.tr*

ABSTRACT

Functional foods are nutrients providing benefits to human physiology and metabolic functions beyond the need to meet essential nutrients of the body. The fact that some foods avoid diseases naturally and their scientifically efficacy in treatment has increased the importance of nutritional support in protecting human health. Positive effects of food ingredients which have functional properties on human health provide that increasing propensity to consume day by day. Functional foods can be a natural, untreated nutrient and also can be functionalized by the addition of phytochemicals, bioactive peptides, Omega-3 polyunsaturated fatty acids, probiotics and / or prebiotics and may be consumed in daily diet. Fruits and vegetables are evaluated as functional foods due to their positive effects on health which is related with antioxidative and antimicrobial effects of phenolic compounds. Not only fruits and vegetables but also their wastes contain nutrients such as dietary fiber, fat, protein, antioxidants, phenolic compounds and vitamins. Food waste obtained from the processing of agricultural products such as apples, pomegranates, citrus fruits (orange, lemon, mandarin, grapefruit, citrus, bergamot), black grapes, olives, tomatoes, potatoes and tea leaves are important potentials due to their phenolic compounds. Milk based products constitute approximately 43% of the functional beverage market, and fermented dairy products are the most common group in this market. Functional dairy products have attracted producers' interest and innovative studies about these product has gained speed. It is considered that development of a new product by adding fruit, vegetable and cereal wastes rich in functional properties into fermented dairy products would be economical in terms of recycling wastes and beneficial for human health.

Keywords: Functional foods, dairy product, waste product



POSSIBILITIES OF USING FOOD INDUSTRY WASTE IN BIOTECHNOLOGICAL PROCESSES

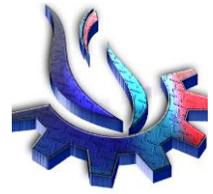
M. ÇAKIR¹ and S. DAĞBAĞLI¹

¹ Manisa Celal Bayar University, Manisa, Turkey
Email: seval.dagbagli@cbu.edu.tr

ABSTRACT

Food waste has an adverse impact on natural resources like water, land and biodiversity. Therefore use of wastes in the production of new products is important in terms of human health, environmental pollution and the country's economy. Food waste is a reservoir of complex carbohydrates, proteins, lipids, and nutraceuticals and can form the raw materials for commercially important metabolites. These waste with organic waste in food processing have great potential as sources of substrate for biotechnological applications. Food waste is inexpensive substrates, such as molasses and sucrose, starch-based materials, cellulosic and hemicellulosic materials, sugars, whey, oils, fatty acids and glycerol. Many studies have reported on various technologies for the conversion of food waste different product such as ethanol, polysaccharides, various enzymes, organic acids by fermentation. For example molasses, which is one of the most important wastes of sugar factories, is used in the production of ethyl alcohol. Lactic acid can be produced from the whey, which is milk industry wastes. Pullulan, microbial polysachharide, can be produced from hydrolysed potato starch waste. In order to make biotechnological products more feasible for industrial application, production costs of its must be reduced. The cost of these products can be reduced through the use of food waste.

Keywords: Food industry, Food waste, Biotechnology, Bioprocess



ENTREPRENEURSHIP ACTIVITIES AT UNIVERSITIES

R.S. SİLME¹, S. NADEEM² and Ö. BAYSAL³

¹ *Istanbul University/Technology Transfer Centre, Istanbul, Turkey*

² *Muğla Sıtkı Koçman University/Faculty of Science,
Department of Chemistry, Muğla, Turkey*

³ *Muğla Sıtkı Koçman University/ Faculty of Science,
Department of Molecular Biology and Genetics, Muğla, Turkey
Email: rsoner@istanbul.edu.tr*

ABSTRACT

Universities are influenced by the social and economic changes as a result of technological developments like other public and private sector institutions and responds with restructuring and transformation activities within itself in order to meet the new demands made by these changes. Entrepreneurship is in priority of the concepts that stand out among the activities. Universities have been transformed into institutions that develop entrepreneurial activities in collaboration with industry in the process of producing and marketing new technological innovations that evolved from research and development of programs which disseminate this concept in the competition of other universities and the mass education that is expected of them. In this study, it is aimed to examine the development process of the concept of entrepreneurship in the context of university and to examine the entrepreneurial activities.

Keywords: Entrepreneurship, University, Education.



ANTIBACTERIAL EFFECT OF DNA-DIRECTED SILVER NANOPARTICLES ON GRAPHENE OXIDE

S. NADEEM¹, Ö. BAYSAL² and R.S. SİLME³

¹ Muğla Sıtkı Koçman University/Faculty of Science,
Department of Chemistry, Muğla, Turkey

² Muğla Sıtkı Koçman University/ Faculty of Science,
Department of Molecular Biology and Genetics, Muğla, Turkey
³ Istanbul University/Technology Transfer Centre, Istanbul, Turkey
Email: rsoner@istanbul.edu.tr

ABSTRACT

Black rot, caused by the bacterium *Xanthomonas campestris* pv. *campestris* (Xcc), is considered the most important and most destructive disease of crucifers, infecting all cultivated varieties of brassicas worldwide. While copper (Cu)-based bactericides have been used for disease management, some of the *X. campestris* strains isolated from kales in Turkey have Cu-resistance. We have developed DNA-directed silver (Ag) nanoparticles (NPs) grown on graphene oxide (GO). These Ag@dsDNA@GO composites has negative effect on cell viability of *X. campestris* in culture and on plants. At the very low concentration of 18 ppm of Ag@dsDNA@GO in culture, composites show enhanced antibacterial activity with improved stability and stronger adsorption properties. Application of Ag@dsDNA@GO at 120 ppm on kale transplants in a greenhouse experiment significantly reduced the severity of bacterial black rot disease compared to untreated plants and no phytotoxicity was observed.

Keywords: Graphene oxide, Nanotechnology, Bacteria.



DEVELOPMENT OF INKS FOR NEWSPAPER AND BOOK PRINTING WITH REDUCED POLYCYCLIC AROMATIC HYDROCARBON (PAH) CONTENT

D. ÖZDEMİR¹, R. KİTER², M. ÖZDEMİR² and E. İ. DENİZ¹

¹*IZTECH Chemistry Department*

²*TOYO INK R&D Department*

Email: mujde.ozdemir@toyoink.com.tr

ABSTRACT

Polycyclic aromatic hydrocarbons (PAHs) are organic compounds having two or more benzene rings and originate from (incomplete) combustion of organic materials. Due to higher solubility characteristics of the products that contain high level of PAHs, existence of this product in the ink formulation is used. However; PAH concentrations greater than 1 mg/kg should be prohibited according to commission regulation (EU) No 1272/2013. More than 100 PAH compounds are present in nature and 16 of them identified by the Environmental Protection Agency (EPA) of the United States have proven to be carcinogenic, mutagenic and toxicological. According to the researches, it has been found that most of the PAHs in newspaper inks come from the base oils, which are main components of the ink formulations (Meike Paschke, Christoph Hutzler, Joep Brinkmann, Frank Henkler, and Andreas Luch; Polycyclic Aromatic Hydrocarbons in Newspaper Inks: Migration, Metabolism, and Genotoxicity in Human Skin; Page 33). The aim of this study was to determine PAH compounds given in the US EPA priority pollutants list in two base oil samples which are used in the formulation of coldset inks. The analysis was carried out with two different HPLC grade PAH free solvents (acetone and 2-propanol) by using gas chromatography–mass spectrometry (GC–MS) according to the TS EN 16143:2013 standard reference method. The results of the initial studies have showed that there is no detectable amount of PAH in base oil samples. Therefore, it was decided to continue method development studies and follow regulations this regard, especially in Europe and Turkey, throughout the project.

Keywords:



ANTIMICROBIAL ACTIVITY OF CAPPARIS

N. KARAGOZLU¹ and H. KURT¹

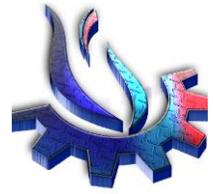
¹ Manisa Celal Bayar University, Manisa, Turkey
Email: nural.karagozlu@cbu.edu.tr

ABSTRACT

Emergence of antibiotic resistant pathogens is a growing problem. The side effects of some chemical antibiotics have also created high demands for medicinal plants as new alternatives. *Capparis spinosa* (Capparidaceae) with nutritional value is a plant traditionally used for treatment of many ailments. It grows in dry to cooler regions of west or central Asia.

C. spinosa fruits or roots may act as antimicrobial agent. Traditional prescription of this plant extracts as natural antibiotics. Due to widespread use of this plant in traditional medicine and evaluated different extracts (aqueous, methanol, ethanol and ethyl acetate) of fruits and roots of this plant against bacteria and fungi causing infections in plants or humans. The total phenolic and flavonoid content of extracts from fruits and roots and the antioxidant activity were evaluated. Other pharmacological effects such as protective effect of *C. spinosa* flowering buds, methanol extract on chondrocytes, anti-quorum sensing and anti-biofilm activity of dried fruits *C. spinosa* methanol extract, anti-proliferative activity against tumor cells and inhibitory effect of fresh *C. spinosa* melons on HIV-1 reverse transcriptase were confirmed.

Keywords: Capparis, antimicrobial activity, traditional food



INNOVATION AND ENTREPRENEURSHIP RELATIONSHIPS IN TECHNOLOGY TRANSFER OFFICES IN TURKEY

M. GÜLER¹ and Ş. İ. KIRBAŞLAR¹

¹*Istanbul University, Engineering Faculty, Istanbul, Turkey*
Email: krbaslar@istanbul.edu.tr

ABSTRACT

The most important factor that constituent and determines the level of welfare of the societies, economic power balances is the work and technological progress made in scientific fields. Today, there is a society structure that lives the age of information and an infrastructure contributes to its development. In recent years, Technology Transfer Offices (TTO) has been pursuing an innovation-centered policy, providing mentors and entrepreneurs with advanced technology and international market opportunities for mentors to produce products with high added value. Especially products are put on the market by means of technology transfer offices, both the economy and the employment are providing serious contributions. Nowadays, assuming innovation, knowledge and production are important places among the countries it is possible to obtain the technical information required by the technology transfer offices by the university-industry-government cooperation and this issue becomes more important with the increase of the number of technology transfer offices in recent years. In addition, technology transfer offices have become more valuable with support for R & D, Intellectual Property Rights (FSMH) and Entrepreneurship in recent years.

In this study, the analysis of the innovation-centered activities of TTOs in Turkey was conducted with the stakeholders involved in the sector, taking into account the influence of entrepreneurship. A qualitative survey was conducted and the participants' perceptions, experiences and perspectives were examined through observational approaches and in-depth analysis. After a carefully prepared questionnaire study, the data obtained were analyzed the Nvivo 10 package program. According to the results of the research, it is aimed to increase the entrepreneurship activities in the field of TTO and as a result more ideas become products and commercialization.

Keywords: TTO, Innovation, Entrepreneurship



SEA-POOL FOOTWEAR

C. ÜNER¹, C. SAATÇI¹, E. DENİZ¹ and H. SÜMBÜL¹

¹*Nayka Textile R&D Centre Denizli, Turkey*
Email:ceylan@naykatekstil.com

ABSTRACT

Walking on pool sides, beaches or in the sea may cause slippage accidents, foot cuts or foot injuries because of the possible presence of cutting stone, glass piece or sea chestnut. To prevent such risks a well-designed, durable, 3-D base shoe, which is not transmitting heat, is very useful and helpful both for children and adult consumers. Additionally such shoe would prevent the microbes from the feet when walking on the sides of the sea and the pool.

In this study a well designed and manufactured sea-pool footwear is introduced. Necessary tests have been made during the production phase and improvements have been made on the product according to the conducted test results. The sea-pool footwear has a top surface made of healthy and durable textile fabric entirely. The base is made from 3D non-slip, elastic and healthy rubber material. Its ergonomic and flexible structure provides great ease of use in terms of being easy to carry even in the pocket. Thanks to these features, it is more convenient, ergonomic and healthy than the existing models. Presentation also includes the characteristics of the shoe, the stage of construction, and the test results.

Keywords: Footwear, Sea-pool, Non-slip, Ergonomic, Functional



PREDICTION OF COMPRESSIVE STRENGTH OF STEEL FIBRE-ADDED CONCRETE STRENGTH USING ARTIFICIAL NEURAL NETWORKS

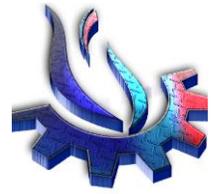
A. DEMİR¹ and D. D. DEMİR¹

*¹Manisa Celal Bayar University/Civil Engineering Department, Manisa, Turkey
Email: ali.demir@cbu.edu.tr*

ABSTRACT

The purpose of this study is to develop an artificial neural network (ANN) model in order to predict the compressive strength of steel fibre-added and non-added concretes. The strengths have been predicted by means of the data that has been obtained from destructive (DT) and non-destructive tests (NDT) on the samples. NDTs are ultrasonic pulse velocity (UPV) and Rebound Hammer Tests (RH). 70 pieces of cylinder samples with a dimension of 150x300 mm have been produced. The first set has been manufactured without fibre addition, the second set with the addition of %0.5 polypropylene and %0.5 steel fibre in terms of volume, and the third set with the addition of %0.5 polypropylene, %1 steel fibre. The water/cement (w/c) ratio of samples parametrically varies between 0.3-0.9. The experimentally measured compressive and bending strengths have been compared with predicted results by use of ANN method.

Keywords: Fibre-added concrete, Hybrid fibre, Compressive, Non-destructive test, Artificial neural network



LOADING MACHINE PROTOTYPE DESIGN FOR INCREASING CARBON RELEASE REDUCTION, PRODUCTIVITY AND WORKING ENVIRONMENT SAFETY

M. AKKAS¹, İ. KILERCI¹, A. BASSULLU¹, B. KOCAER¹ and O. AKINCI¹

¹ *Kocaer Rolling Mill /R&D Centre, Izmir, Turkey
Email: m.akkas@kocaerhadde.com*

ABSTRACT

The project aims to improve the efficiency of the loading operation in our project aimed at solving the high energy / labor need and job security threats in the iron and steel sector loading operations, method inefficiencies, a single system in which all causes of the non-environmental methods are taken in a wide perspective and operation steps are reduced and high efficiency is obtained besides making the design; a compact loading machine that has not yet been used in the industry will have emerged. In our sector which entered into dangerous jobs class, the incidence of work accidents and occupational diseases is high, and the reasons that constitute these risks with our project will be solved on the spot and safer working place will be revealed. We will increase our national technical know-how in the national and international environment by obtaining the patent for the machine which will appear in the result of our project.

Keywords: Operation efficiency, Carbon reduction, Lean operation, Occupational safety and health, Machine design, Finite element analysis