

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Material Science

The Effect of Sodium Chloride (NaCl) Coagulant Medium of Polysulfone Ultrafiltration Membrane	
M.F. Shohur, Z. Harun, M.Z. Yunos, S. Hassan and M.R. Jamalludin	3
Performance Studies of Polysulfone-Based Membrane: Effect of Silica Morphology	
M.R. Jamalludin, Z. Harun, H. Basri, M.Z. Yunos and M.F. Shohur	8
Preparation of Macroporous and Hollow Silica Microspheres with Raspberry-Like Organic Composite Particles as Templates	
L. Liu, W.J. Guo, Z. Dai, M.J. Li and J.F. Wei	13
Development and Application of New Design Method by High-Strength Composite Material - Fusing of Optimum Strength Evaluation and Product Design	
H. Iida, H. Sakamoto and Y. Ohbuchi	17
Structure and Magnetostriction of Melt-Spun $\text{Fe}_{81-x}\text{Ni}_x\text{Ga}_{19}$ ($x=0,5,10,15,20,25$) Alloys	
H. Liu, H. Wang, M.X. Cao, W.S. Tan, Y.G. Shi, Q.J. Jia, Y.Y. Huang and Y. Zhang	21
Sensitivity of the CFD Mesh for a Single Rising Bubble in a Hallimond Tube	
A. Azmi, P. Balasubramanian, B. Abdullah and E. Zhalehrajabi	26
Effects of Ni-B Addition on Microstructure and Properties of Sn-1.0Ag-0.5Cu Lead-Free Solder	
J.F. Qu, J. Xu, Q. Hu and F.W. Zhang	30
Comparison of Liquid Phase Sintering and Cu-Melt Infiltration Methods to Consolidate 80W-Cu Composite Using Nickel as Sintering Activator	
I. Hafed, A. Azizan, R. Azmi and M.S. Kahtan	34
Design of the Diffuse Reflector Cup with Microstructure and the Research on the Optical Performance	
S.B. Li, D.M. Wu, X.T. Zheng, Y. Liu and Y. Liu	41
Preparation and Characterizations of Ni Doped Mesoporous $\text{TiO}_2/\text{SiO}_2$	
L. Min and W.H. Yao	45
Scientifically Based Choice of Heat-Resistant Cast Aluminum Alloys of New Generation	
A. Amenova, N. Belov, D. Smagulov and A. Toleuova	49
Investigation of the Effect of Solidification Velocity on the Quality of Single Crystal Turbine Blades	
E. Rzyankina, D. Szeliga, N. Mahomed and A. Nowotnik	54
Mechanochemical Synthesis of Magnesium Doped Hydroxyapatite: Powder Characterization	
S.A.S. Abu Bakar, S. Ramesh, I. Sopyan, C.Y. Tan, M. Hamdi and W.D. Teng	62
Study on Refinement Mechanism of Sc and Zr as-Cast Al-7.2Zn-2.2Mg-1.8Cu Alloys	
Z.G. Wang, J. Xu, B. Li and Z.F. Zhang	66
Mathematical Modeling of Growth Conditions and Interpretation of Phase Diagram for $\text{In}_x\text{Ga}_{1-x}\text{N}$ Epitaxial Layer	
M.S. Hasan, A.K. Saha, M.R. Islam and N. Amin	70
The Surface and Interface Microstructure of Epitaxial $\text{Pr}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ Bilayer Structure	
H. Wang, H. Liu, M.X. Cao, W.S. Tan, P. Dai, Y. Zhang, Q. Gao, Q.J. Jia and X.S. Wu	75
Structure and Properties of A Dimer Complex: $[\text{Co}_2(\text{Hdmg})_2(\text{dien})_2](\text{ClO}_4)_2 \cdot 4.5(\text{H}_2\text{O})$	
X.W. Liu, B.W. Zhong, Y.H. Zhang and R. Guo	80
Interpretation of Carbide Precipitation and Chromium Concentration Distribution of Alloy 690	
K.S. Jang, D.S. Park, Y.J. Yu, J.M. Kim, H.S. Noh and K.J. Lee	84
Reaction Products of Lime Zeolite Stabilized Kaolin Humic Acid	
F.N.L. Ling, K.A. Kassim and A.T. Abdul Karim	88

Renewable Sugars Hydrolyzed from Banana Pseudo-Stem Using Different Chemical Pretreatments	
M. Aisah, S. Siti Norasmah and I. Wan Asma	97
Mechanical Properties of Particleboard from Oil Palm Trunk (<i>Elaeis Guineensis Jacq</i>) Using Phenol Formaldehyde Adhesive in Relation to Particle Sizes and Board Thickness	
M.A.F. Mohd Adnan, J. Kasim and S.N. Sarmin	101
The Application Prospects Of Superconducting Materials In Household Products Design	
S.S. Teng, J.J. Pang and X.L. Liu	104

Chapter 2: Nanomaterials and Nanotechnologies, Ceramic Engineering

Inorganic Nanoparticles Modified Molecular Beacons as Fluorescent DNA Biosensors	
M.M. Song, W.J. Guo, Z. Dai, K.L. Qiu and J.F. Wei	111
Fluorescent DNA Probes Based on Quantum Dots and Core/Shell Quantum Dots	
M.M. Song, W.J. Guo, Z. Dai, K.L. Qiu and J.F. Wei	115
Multiwall Carbon Nanotube Reinforced Aluminum Matrix Composites Prepared by Ball Milling	
J.H. Ahn, Y.J. Kim and S.S. Yang	119
Characterization of $Zn_xCd_{1-x}O$ Nanorods for PV Applications	
U. Mushtaq, S.A.M. Al-Bat'h and R. Othman	123
Surface Modification and Characterization of Photodegradable Polystyrene-TiO₂ Nanocomposites	
A. Buasri, P. Loakhonka, T. Benjapolchai, N. Chusripet and V. Loryuenyong	128
Synthesis of Nickel Nanoparticles Encapsulated in a Hollow Silica Shell	
T. Harada, T. Misaka, T. Sakata, S. Ikeda and M. Matsumura	132
Wettability of Carbon Nanotubes with Molten Sn-Ag-Cu Solder Alloy	
S. Chantaramanee, S. Wisutmethangoon, L. Sikong and T. Plookphol	136
Settling Characteristics of Alumina Nanoparticles in Ethanol-Water Mixtures	
S.U. Ilyas, R. Pendyala and N. Marneni	143
Size Control in ZnO Nanopillar Fabrication Using a Gel-Nanoimprint Process	
Y. Ishikawa, S. Araki, M. Zhang and Y. Uraoka	149
Highly Efficient Degradation of Methylene Blue on Microwave Synthesized FeVO₄ Nanoparticles Photocatalysts under Visible-Light Irradiation	
S.J. Hu, J. Yang and X.H. Liao	153
Study on the Mechanism of Engineering Ceramics in Rotary Ultrasonic-Vibration Grinding	
C.C. Yu	158
Densification Behavior of Nano Y-TZP Ceramics	
A. Norakmal, R. Singh, C.Y. Tan and W.D. Teng	165
Sintered Properties of Y-TZP/ZrB₂ Ceramics	
W.J.K. Chew, R. Singh, C.Y. Tan, M. Amiriyar, R. Tolouei and W.D. Teng	169
Oxygen Vacancy Comparisons for 3Y - TZP Sintered in Air and Argon Gas Atmosphere	
S. Ubenthiran, R. Singh, C.Y. Tan and W.D. Teng	173
Characteristics of Sintered Bovine Hydroxyapatite	
A. Niakan, R. Singh, C.Y. Tan, M.H. Abdul Shukor and W.D. Teng	177
Preparation and Study of the Hot Filament CVD Diamond Coated Tools	
Y.Y. Zheng, C.L. Zhang and X.X. Xu	181

Chapter 3: Building Materials and their Applications, Housing

Biotic Attack in Claddings of Prefabricated Buildings	
D. Kubečková, V. Matějka, M. Kraus, M. Černá, J. Kukutschová and L. Židek	189
Influence of Building Materials on Building Airtightness	
M. Kraus, M. Černá, B. Hrubá, B. Součková and D. Kubečková	195
Thermal Analysis of Hydration Heat in Mass Concrete with Different Cement Binder Proportions	
M.H. Lee, B.S. Khil and H.D. Yun	199

Effects of Shrinkage Reducing Admixture (SRA) on the Tensile Behavior of Strain-Hardening Cement Composite (SHCC) S.J. Han, H.R. Kim and H.D. Yun	203
Shear Behavior of Squat Steel Fiber Reinforced Concrete (SFRC) Shear Walls with Vertical Slits W.G. Lim, S.W. Kang and H.D. Yun	207
Mechanical Properties of Sprayable Fiber Reinforced Strain-Hardening Cement Composite (SHCC) Z.J. Yu, M.H. Lee and H.D. Yun	211
Compressive Properties of High Strength Steel Fiber Reinforced Concrete with Different Fiber Volume Fractions H.R. Kim, S.J. Han and H.D. Yun	215
Damage Tolerance of Reinforced Concrete (RC) Beams with a Layer of PE Fiber Reinforced Strain-Hardening Cement Composite (PE-SHCC) Y.J. Yun, S.J. Jang and H.D. Yun	219
Influence of Fiber Volume Fraction and Aggregate Size on Flexural Behavior of High Strength Steel Fiber-Reinforced Concrete (SFRC) S.J. Jang, Y.J. Yun and H.D. Yun	223
Influences of Vertical Slits on the Shear Behavior of Strain-Hardening Cement Composite (SHCC) Infill Walls Based on FEM Analysis S.W. Kang, L.W. Gyun and H.D. Yun	227
An Experimental Study on Evaluation of Mechanical Properties in High Performance Concrete Using Admixture J.E. Kim, W.S. Park, N.Y. Eom, S.W. Kim, D.G. Kim and M.S. Cho	231
Mechanical Properties of High Strength Concrete Using Mineral Admixtures W.S. Park, J.E. Kim, N.Y. Eom, S.W. Kim, D.G. Kim and M.S. Cho	235
Properties of HPC with Fly Ash, Blast Furnace Slag and Silica Fume S.W. Kim, W.S. Park, J.E. Kim, N.Y. Eom, D.G. Kim and M.S. Cho	239
Effect of Fly Ash, Silica Fume and Blast Furnace Slag on Mechanical Property of High Performance Concrete N.Y. Eom, W.S. Park, J.E. Kim, S.W. Kim, D.G. Kim and M.S. Cho	243
The Application of Seismic Isolation Technology in Civil Engineering Y. Zhang, Y. Zhang and L.G. Jia	247
Energy Savings through Integration of the Illumination Natural and Artificial, Using a System of Automatic Dimming: Case Study D. Milone, S. Pitruzzella, V. Franzitta, A. Viola and M. Trapanese	253

Chapter 4: Construction Dynamics, Strength and Stress, Fatigue and Damage Analysis, Applied Mechanics

Stress Relaxation Behavior of Catheter Reinforced with Braid under Combined Loading for Bending and Torsion Y. Kato and M. Ueda	261
Observation of Three Dimensional Magnetic Fields of Tool Steel (JIS-SKS93) around Vicker's Indentations K. Kida and T. Honda	265
Influence of Repeated Quenching on Bearing Steel Martensitic Structure Investigated by Homology K. Nakane, K. Kida, T. Honda, K. Mizobe and E.C. Santos	270
Quantitative Estimates of Repeatedly Quenched High Carbon Bearing Steel K. Nakane, K. Mizobe, E.C. Santos and K. Kida	273
Research on Residual Fatigue Life Model for Lattice Boom of the Crane In-Service F.H. Cai, F.L. Zhao, X. Wang and L.M. Chen	277
Analysis of Local Stress of Lower Chord of Inverted Triangle Cargo Boom of Tower Crane under the Wheel Pressure B. Li, Y. Zhang, L.Z. Xu and J.F. Jin	284
Creep of Rheocast 7075 Aluminum Alloy at 300 °C S. Thongkam, S. Wisutmethangoon, J. Wannasin, S. Chantaramanee and T. Plookphol	288

Fatigue Life Prediction of Girth Gear-Pinion Assembly Used in Kilns by Finite Element Analysis	
K. Annamalai, S. Sathyanarayanan, C.D. Naiju and M. Shejeer	292
Reliability Analysis of the Hydraulic Support Pin	
D.Y. Liu, D.L. Zou, Y.L. Zhang and X. Fan	297
Transfer Matrix Method for the Determination of the Free Vibration of Two Elastically Coupled Beams	
L.K. Abbas, D. Bestle and X.T. Rui	301
The Calculation Method of Axial Force in the Calculation of the Boom Tower Crane Stability	
B. Li, L.Z. Xu, X. Tao, J.F. Jin and Y. Zhang	305
A Review and Prospect for Dynamic Load and Stability Check Method for Dual Derrick	
L. Zhu and Y. Chen	309
Analysis of Effects of High Temperature and Loading Frequency on Asphalt Binder	
P.C. Cao, Z.Y. Guo, Y.S. Yang and Z.C. Xue	314

Chapter 5: Advanced Manufacturing Technology, Machining and Processing, Welding and Joint Technologies

A Reclamation System via a Pins-Module Tool for Touch Sensing Material Surfaces	
P.S. Pa	321
Monitoring the Coating Thickness of Pharmaceutical Tablets with MaxGWMA Control Chart	
T.L. Nguyen, M.H. Shu and B.M. Hsu	325
Permeable Rice Husk Fibre Shell Mould System	
Z. Harun, N.H. Kamarudin and M.Z. Yunos	331
Feasibility Study on Noncontact Monitoring of Temperature Distributions of Rotating Tool	
A. Kosugi, I. Matsuya and I. Ihara	336
Flow Analysis of Melted Urea in a Perforated Rotating Bucket	
A. Muhammad, N. Rahmanian and R. Pendyala	340
Rule-Based Mamdani-Type Fuzzy Modeling of Heating and Cooling Performances of Counter Flow Ranque-Hilsch Vortex Tubes with Different Geometric Construction for Brass	
D.N. Ozen, A. Berber and K. Dincer	346
Investigation of Performance of Heating and Cooling of Counter Flow Ranque-Hilsch Tubes with L/D=15, 16, 17, 18 for Brass	
K. Dincer, A. Berber and D.N. Ozen	350
The Method of Improving Precision of Micro Injection Molding Machine Temperature Control	
S.D. Tang, H. Xu, D.M. Wu and Y.J. Zhang	354
Study on Waste Aluminum Cans Remelting and Purification Technology	
R.B. Duan, P.K. Bai, J. Yang, W.D. Zhang and H. Ding	360
Tool Vibration due to High Speed Micro End Milling Parameters	
A.R. Mohamed, N. Atiqah, Y.A. Mohammad and M.S.H. Chowdhury	364
Modular Tooling Concept in the Fabrication of the Precision AUV Blade	
A.B. Abdullah, S. Zahurin, H.M.T. Khaleed and M. Husaini	369
Control Problems for Heat-Conducting Viscous Fluid Flow in Manufacturing Processes	
G.V. Alekseev and D. Tereshko	373
Integrated Dexels Geometric Model and Predictive Force Model for Feedrate Optimization in 03 Axis Milling Machine	
S. Abainia and M. Bey	377
R&D of a New De-Icing Device Based on Synthetically De-Icing Techniques	
J.Z. Zhou, X.P. Xu, W.J. Chu, J.Y. Dai, Y.H. Chen, Z.C. Zhu and S.W. Lai	381
Experimental Investigation of Bubbly Flow Mixing inside a Washer Basin with an Immersed Coiled Heater	
Y.H. Lee, K.W. Kim, A. Kvon, M.K. Kwak, C.Y. Lee, G.M. Kim and C.W. Park	387

Finite Element Analysis of Modals Intermixture of Ultrasonic Motor and Separation Technique Z.L. Wang	392
Characteristics of STS630 Based Metal Injection Molding Products on Powder Size, Sintering and Heat Treatment Conditions H.J. Jeong, H.K. Yeo, D.Y. Bae, J.H. Kim, D.W. Kim and S.J. Kim	398
A Study on Deviations of the Jet with Traverse Speeds on Different Materials in Pocket Milling Using Abrasive Water Jet Machining Process T.V.K. Gupta, J. Ramkumar, P. Tandon and N.S. Vyas	402
Parametric Study of Thermal Flow-Reversal Reactor for Ventilation Air Methane Oxidation H.X. Deng, Y.X. Wen, Q. Xiao and Y.H. Xiao	406
The Mechanism of Quasi-Dynamic Expansion Method and the Design of the Equipment for Manufacturing Biaxial Oriented PVC Pipes X. Zhang, D.M. Wu, Y. Liu and G.J. Song	410
Characterization of Forsterite Synthesized by Solid-State Reaction with Ball Milling Method K.M.C. Chin, K.Y.S. Lee, C.Y. Tan, R. Singh and W.D. Teng	416
Effect of Drying on Physical Qualities and Sensory Evaluation of Herbal Germinated Brown Rice by Hot Air: Turmeric and Roselle K. Sangchum, Y. Tirawanichakul and S. Tirawanichakul	420
Study on the Improvement of Lamp Groups Production Line Based on IE L. Zhao	424
The Feasibility Study of Laser Particle Size Analyzer for Thick Pastes S.Y. Zhang, F.Y. Lv, Z.M. Xia, N. Li and M. Wu	428
Effects of Activated Carbon in Microwave Induction of Lateritic Ore H. Chen, R. Guo, N. Su, Y.H. Zhang and X.W. Liu	433
The Study of Three-Way Valve Handling Gripper P.J. Sui, C.C. Li and F. Wang	437
Force Load of Cutting Tool by Turning of Nickel Alloy Inconel 718 with Sintered Carbide Insert I. Mrkvica, R. Konderla, J. Jurko, A. Panda and M. Neslušan	441
Stamp Tooling Application for High Power LED Packaging Fabrication Z.F. Zhao	445
Application of ISF Process for the Throttle Pedal Fixed Plate L.H. Li, L. Tao, J. Wang and C. Zhao	450
Preparation and Testing of the Microstructure Diffuse Reflection Plate Based on the Continuous Extrusion H.J. Wang, D.M. Wu, X.T. Zheng, Y. Liu and P.S. Jing	454
Analysis of the Effect the Modal-Parameter on the Milling Stability M.C. Tsai, T.C. Hsiao and S.C. Huang	459
Artificial Neural Network Approach for Impingement Drying of Germinated Brown Rice Soaking with Turmeric Solution K. Suntaro, K. Sangchum, S. Tirawanichakul and Y. Tirawanichakul	463
Design and Analysis of Compliant Rotary Joint T.P. Dao and S.C. Huang	467
Effect of Welding Speed and Tool Pin Profile on Weld Quality of Friction Stir Welded Semi-Solid Aluminium Alloy 356 P. Muangjunburee and S. Wisutmethangoon	471
Dissimilar Materials Joining between SSM 356-T6 and AA6061-T651 by Friction Stir Welding C. Meengam, M. Tehyo, P. Muangjunburee and J. Wannasin	478
Titanium Alloy Welding Using Middle Range Power Pulsed Wave Laser Z. Mohid, Z.A. Rashid, A. Wagiman, M.N.H. Rafai and E.A. Rahim	486
A New Type of Feed Valve Design and Application J.X. Liu	491
Dry Machining of Brass Using Titanium Carbonitride (TiCN) Coated Tool T.F. Ariff, M.S. Kamarudin and M.A. Haron	495

Chapter 6: Tribology, Automotive and Vehicle Engineering

Comparison of Wear on PEEK-PTFE and PPS-PTFE Radial Bearings under Rolling Contact Fatigue	
H. Koike, K. Mizobe, S. Oyama, Y. Kashima, K. Kanemasu and K. Kida	503
Change in Backlash of Humanoid Robot Joints under High Load	
H. Koike, K. Kanemasu, K. Itakura, S. Okazaki, M. Takamiya and K. Kida	507
Experimental Analysis of Tool Wear when Drilling Carbon Fibre Composite (CFC) without Cutting Fluid, with Cutting Fluid and with a Pre-Cryogenically Cooled Tool	
A.N. Dahnel, S. Barnes and P. Bhudwannachai	512
Fretting Wear of Coated Substrate with Interlayer: Substrate Stress Behaviour	
A.L. Mohd Tobi, M.A. Harimon, A.A. Saad and A.A. Azalan	516
Investigation on the Interaction between Plasticity Response and Fretting Wear under Gross Sliding Condition	
M.A. Harimon, A.L. Mohd Tobi, A.A. Saad and W.M.F.W. Zakaria	522
Vibration Analysis and Improvement of a Vehicle Chassis Structure	
M. Senthil Kumar, C.D. Naiju, S.J. Chethan Kumar and J. Kurian	528
Design and Analysis of Automotive Multi-Leaf Springs Using Composite Materials	
N. Suprith, K. Annamalai, C.D. Naiju and A. Mahadevan	533
Dual Clutch Automatic Transmission Two Clutch Starting Control and Simulation	
G.Z. Jia, X.P. Wu and Z.H. Jia	538
Modeling of Helical Gear Power Tri-Branching Transmission Based on Loaded Tooth Contact Analysis	
X.F. Yang, Z.D. Fang, Y.Z. Zhang and Y.F. Han	543
Vibration Characteristics and Optimization of Variable Cross-Section Cylindrical Shell Structure under Multi-Point Excitation	
L. Chen, X.Z. Xie, Z. Li and F.Z. Pang	547

Chapter 7: Photovoltaic and Solar Energy Engineering

Photovoltaic Systems in University of Miyazaki	
K. Yoshino, K. Nishioka, A. Fukuyama, H. Suzuki and M. Otsubo	555
Heat Release Effect of Thermal Emission Coating on Concentrator Photovoltaic Module	
K. Nishioka and Y. Ota	559
Crystal Quality Improvement of CuInS₂ Thin Film by Two Step Fabrication Method with Bismuth Addition	
S. Fukamizu, D. Hironiwa and T. Minemoto	563
Zn (O,S):Al Films Prepared by Radio Frequency Magnetron Sputtering for Transparent Electrode	
J. Julayhi and T. Minemoto	567
Growth of CuInGaSe₂ Films by RF Sputtering Using CuInGaSe₂ Single Phase Target	
K. Yoshino, T. Tokuda, A. Nagaoka, K. Miseki, R. Mori, S.B. Zhang and S. Doutyoku	571
Effect of Anti-Soiling Coating on Performance of Fresnel Lens for Concentrator Photovoltaic Module	
T. Hirohata, Y. Ota and K. Nishioka	575
Effect of Film Thickness on the Structure and Electrical Properties of CuInSe₂ Thin Films	
A.S. Alageli and M.I. Elsamahi	579
Minimization of Open Circuit Voltage Fluctuation of Quantum Dot Based Solar Cell Using InN	
F.A. Rosli, M.A. Rashid, F. Malek, M. Othman, A.A. Zaidi and M.A. Humayun	586
Design, Fabrication and Performance Analysis of Single Basin Solar Stills	
M. Prakash and E. Natarajan	590

Chapter 8: Computer Technologies in Manufacturing, Simulation Technology, CAD and Software Applications

ANFIS Modelling of Carbon Removal in Domestic Wastewater Treatment Plant M.S. Gaya, N.A. Wahab, Y.M. Sam, A.N. Anuar and S.I. Samsuddin	597
Solution of Working Space about the 4-DOF Parallel Mechanism by ADAMS R.H. Zhang	602
Fault Tolerant Scheme of Switched Reluctance Machines for the Electro-Mechanical Actuation Systems X.Y. Chen	608
The Natural Characteristics of Fluid Conveying Pipe under Different Supporting Conditions R.D. Bao	612
Effect of Beam Profile Size on Bus Superstructure Strength Having Rollover Crash M. Bin Yusof and M.A.A. Bin Afripin	620
Fire Computer-Simulated Fire Scene Verification of Entertainment Establishments C.S. Lin, T.C. Chen and T.Y. Lee	630
Simulation Based Logistics Distribution Planning and Analysis for an Assembly Line of Engineering Machinery Products Z.L. Guan, B.X. Wang, Y.P. Mu, G.J. Lei and L. Yue	635
Fault Diagnostic Equipment of Fire Control System Based on FTA X.Q. Yang, J.H. Han, J.J. Yan and Y. Pan	641
Numerical Simulation of Granite on Pre-Stressed Machining by Discrete Element Method (DEM) Y. Ye and L. Kang	646
Study Effects of Vehicle Velocity on a Road Surface Roughness Simulation K. Reza-Kashyzadeh, M.J. Ostad-Ahmad-Ghorabi and A. Arghavan	650
Total Design of Active Neck Support System for Economy Class Aircraft Seat C.F. Tan, W. Chen and G.W.M. Rauterberg	657
FEM-Based Simulation and Gripper Jaw Trajectory Fitting of Stretch-Bending Process for a Bending Beam of Railway Vehicles S.M. Wang, X.H. Yang and X. Lu	661