A developed friction test for sheet metal stretch forming processes

M. A. Hassan, C. J. Tan, K. Yamaguchi

Abstract:

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Keywords:

NULL

Published In:

International Journal of Surface Science and Engineering, Vol 7 No. 2, pp 152-170
Effect of Ultrasonication on Synthesis of Forsterite Ceramics.
Advanced Materials Research


Abstract:

NULL

Keywords:

NULL

Published In:

Advanced Materials Research, Vol 576, pp 252-255
A Fuzzy model for prediction of flow-stress in metal forming, Proceedings of the Int. Conf. on materials processing

M. A. Hassan, K. Yamaguchi and N. Takakura

Abstract:

NULL

Keywords:

NULL

Published In:

A Developed Friction Test for Sheet Metal Forming

M. A. Hassan, C. J. Tan, K. Yamaguchi

Abstract:

Punch friction test is considered to be the best simulator of sheet metal stretching over the punch corner. In this study, an improved punch friction test eliminating the error due to the strain-rate effect was developed. This method enables the direct force measurement and the online evaluation of the friction coefficient. Also, an improved boundary friction model was introduced to predict the friction coefficients and the real contact areas around the punch nose portion. The predicted values were then compared with the experimental one obtained from the newly developed test for verification. A good agreement was obtained between the theoretical and the experimental results. Finite element simulation of the punch friction test under dry friction condition for annealed aluminium was performed using the experimental friction coefficients. Since the simulated force-displacement results are in good agreement with the experimental one, the accuracy of the test is high and reliable.

Keywords:

Materials and Manufacturing; Nanoscience and Nanotechnology; SCIENCE, ENGINEERING AND TECHNOLOGY

Published In:

The Effects of An Unexpected Ceramic Coating Phase at the -Head of a Pipe on Joining and Postprocessing of a Ceramic Lined Composite Pipe.

Mahmoodian R, Rahbari RG, Hamdi M, Hassan MA & Sparham M.

Abstract:

Produced ceramic-lined steel pipe using the self-propagating high-temperature synthesis (SHS) method has found uses in many applications. A SHS centrifugal machine was designed to produce a ceramic-lined steel pipe from ferric oxide and aluminum powder (thermite mixture) under high centrifugal acceleration. The obtained products are expected to be Al2O3 ceramic in the innermost layer and a Fe layer in a region between the outer steel pipes. In the present work, specific regions of a pipe was particularly observed to investigate the stuck (dead) spaces at the pipe head because of its importance in further processes (joining, welding, etc.) which may affect the quality of the next operations. In this article, the product's composition, phase separation, microhardness, and surface finish were studied on three zones of the pipe.

Published In:

Influence of Manganese on the Sintering Properties of Tetragonal Zirconia


Abstract:

The influence of small additions of MnO₂ (up to 1 wt. %) on the sintering behaviour of yttria-stabilized zirconia sintered over the temperature range from 1250°C to 1500°C was investigated. It was found that the mechanical properties of Y-TZP were dependent on the dopant amount and sintering temperature. The results revealed that relative densities above 97.5 % of theoretical (i.e. > 5.95 Mg m⁻³) could be obtained in Y-TZPs sintered at low temperatures, 1250°C and 1300°C, with the additions of ≥ 0.3 wt. % MnO₂. In comparison to the undoped samples, the additions of up to 1 wt. % MnO₂ and for sintering up to 1350°C was found to be beneficial in enhancing the Vickers hardness of the ceramic. The fracture toughness of Y-TZP however, was found to increase only in the 1 wt. % MnO₂-doped samples when sintered above 1400°C. The relation between the measured mechanical properties is discussed with the emphasis on the role of the manganese oxide.

Keywords:

Y-TZP, Zirconia, Manganese Oxide, Mechanical Properties

Published In:

Ceramics Silikaty , Vol.57, No.1 , PP.28-32
Novel Three-phase Asymmetrical Cascaded Multilevel Voltage Source Inverter

Hamza Belkame, Saad Mekhilef, Ammar Masaoud, Mohsen Abdel Naeim

Abstract:

Series connection of power cells in asymmetrical cascaded configurations helps to cancel redundant output levels and maximise the number of different levels generated by the inverter. A new configuration of three-phase multilevel asymmetrical cascaded voltage source inverter is presented. This structure consists of series-connected sub-multilevel inverters blocks. The number of utilised switches, insulated gate driver circuits, voltage standing on switches, installation area and cost are considerably reduced. Cascaded-cell DC voltages in each inverter leg form an arithmetic sequence with common difference of E. With the selected inverter DC sources, high-frequency pulse-width modulation (PWM) control methods can be effectively applied without loss of modularity. Low-frequency and sinusoidal PWM techniques were successfully applied. Hence, high flexibility in the modulation of the proposed inverter is demonstrated. The prototype of the suggested inverter was manufactured and the obtained simulation and hardware results ensured the feasibility of the configuration, and the compatibility of both modulation techniques was accurately noted. Lastly, the semiconductor losses in the converter were calculated using simulation models. Based on the analysis of the total power losses, the proposed inverter provided high efficiency at different operating conditions.

Published In:

IET Power Electronics, Vol. 6, Iss. 8, PP.1696 - 1706
Sintering and mechanical properties of MgO-doped nanocrystalline hydroxyapatite


Abstract:

Hydroxyapatite (HA) has been extensively studied for its exceptional ability in promoting osseointegration as in bone graft substitute and biomimetic coating of prosthetic implants. However poor mechanical properties of HA, in particular its low fracture toughness, has made its widespread adaption in a number of biomedical applications challenging. Here we employ an optimized wet precipitation method to synthesize nanocrystalline HA with significantly improved mechanical properties. In addition doping by MgO is found to effectively suppress grain growth and enhance fracture toughness by nearly 50% while good densification and phase stability in all samples regardless of concentration of dopant are fully maintained. Microstructural analysis further suggests that the exceptionally superior mechanical properties can be explained by migration of MgO to grain boundaries where they transform the more common transgranular fracture into an intergranular mode. Our biodegradation tests also confirm that MgO-doped HA is indeed a suitable candidate for load bearing implants.

Keywords:

C. Mechanical properties; Hydroxyapatite; Sinterability; Synthesis; Relative density

Published In:

A novel fabrication method for TiC Al2O3 Fe functional material under centrifugal acceleration

Reza Mahmoodian, M.A. Hassan, R.G. Rahbari, R. Yahya, M. Hamdi

Abstract:

Compacted powders of titanium (Ti) and carbon (C) in form of pellets were exposed to a massive amount of heat generated from the thermite reaction of Fe2O3 and Al in a graphite–steel tube mounted in a developed centrifugal accelerator machine. The centrifugal force facilitated the formation of multi-component products during the process. Titanium carbide (TiC) product is joined to an Al2O3–Fe layer, which are the products of the thermite reaction. The existence of centrifugal acceleration had a significant effect on both metallurgical alloying and mechanical interlocking between different layers of the sample to form a functional material. A mathematical model developed for this experiment to describe the speed rate of iron infiltration inside the TiC product as well as viscosity rate variation was presented. The composition, microstructure and mechanical properties confirmed the model.

Keywords:

A. Ceramic–matrix composites (CMCs); B. Microstructures; C. Computational modeling; E. Joints/joining; Combustion synthesis

Published In:

Composites Part B: Engineering, Vol.50, PP.187-192
Effect of curvature and thickness of Aluminum shell on the energy absorption in low velocity impact

M. A. Hassan, M. Hamdi, S. Naderi, F. Zahedi

Abstract:

The objective of this study is to investigate the behavior of Aluminum shells AA5083-H116 under low energy impact and the effects of curvature and thickness were assessed under different impact velocities (5.6, 7.5, 9.5, 11.5 m/s). LS-DYNA software was used to evaluate the amount of absorbed energy by the Aluminum shell during impact under different curvature parameter c. The results showed that the amount of absorbed energy increases with increasing curvature in a linear relationship which make it possible to predict the amount of absorbed energy for this aluminum alloy under different impact energy. Also, the amount of absorbed energy has a direct linear relation with the rise of impact energy. The slopes of curves for absorbed energy with respect to the impact energy are similar for all curvatures. Shell thickness has inverse effect on the amount of absorbed energy and the relation shows similar trends with different curvatures. However, thick shells show significant increase in maximum force and better stability in the dynamic behavior with less fluctuations in the impact force as the curvature increases.

Keywords:

Aluminum (Al), Curvature, Energy Absorption, Impact, Low Velocity

Published In:

Advanced Materials Research, Vol 488, pp 40-45
End Formation of a Round Tube into a Square Section having Small Corner Radii

C.J. Tana, W.T. Chonga, M.A. Hassan

Abstract:

Expansion and reduction are the two common end forming processes for tubes. In the tube end expansion process using a square punch, it is difficult to obtain a small corner radii due to the stretching of the tube around the punch corners. The wall thickness around the corners is small when compared to the side wall. Hence, a tube having a poor square look is formed. In this study, a 2-stage end expansion of a round tube end into a square section having an improved square look i.e. small corner radii and increase in wall thickness around corners is developed. In the 1st stage, the tube end is flared into a cone shape using a 30° conical die by axial compression. In the 2nd stage, the conical end of the tube is drawn through a taper square die using a conical bottom square punch, and a near square section is formed. A 15% ironing ratio is applied during the drawing process to flatten the side wall of the square. Experimental and FEM simulation were performed to evaluate and to verify the forming process. Although the height of the square section increases when the punch stroke at the 1st stage is increased. However, this increase is limited by the buckling of the pipe at the circular section of the thick blank tube. Since the conical end is drawn into a square section having different radial lengths, the bottom of the square section is uneven. The uneven bottom end is trimmed off in the later process. A square section having a maximum height of 32 mm after trimming is successfully obtained from the experiment for the punch stroke, S = 44 mm using an API 5 L tube.

Keywords:

End forming; Tube expansion; FEM simulation; Local thickening; Small corner radii

Published In:

High-Precision Machining by Measuring and Compensating the Error Motion of Spindle's Axis of Rotation in Radial Direction.

Ahmed A. D. Sarhan, M. A. Hassan, M. A. Hamdi

Abstract:

NULL

Keywords:

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Published In:

Engineering Letters, Vol 19 No 4, pp 310-315
Effect of Muscle Active Force and Fiber Orientation on the Left Ventricle Mechanics of Human Heart

M. A. Hassan, Ahmed A. D. Sarhan, A. Amano

Abstract:

NULL

Keywords:

NULL

Published In:

Mechanics of Energy Absorption by Progressive Plastic Deformation of a Square Column with an Ellipsoidal Bulge Base

M. A. Hassan Amir Radzi Ab, Zahari Taha M.A.Hamdi

Abstract:

Thin-walled square columns are generally used as energy absorber in various applications due to their ease of fabrication and installation, high energy absorption capacity in terms of progressive plastic deformation and long stroke. However, the main drawback of a standard square column is the high initial peak force. An ellipsoidal bulge base is proposed to overcome this shortcoming and at the same time to improve the crush performance. Static axial crushing were performed by finite element analysis to determine the initial peak force (IPF), crush force efficiency (CFE) and plastic specific energy absorption (SEA) of columns having ellipsoidal bulge bases with various thicknesses. It was found that the bulge base significantly enhanced the column crush performance as well as the deformation characteristics. A comparison with the plain square column was carried out and it was found that the bulge base reduced the initial peak force and increased the crush force efficiency. A simple analytical approach is proposed to predict the reduction of initial peak force with the use of this trigger mechanism.

Keywords:

crush response, energy absorption, progressive failure, square column, finite element analysis

Published In:

Applied Mathematics & Information Sciences, Vol 9- No 11, pp 1-8
Fatigue growth of a surface crack in a V-shaped notched round bar under cyclic tension

Devi CHANDRA, Judha PURBOLAKSONO, Yusoff NUKMAN, Haw-ling LIEW, Singh RAMESH, Mohsen-abdel HASSAN

Abstract:

This paper presents modeling results for fatigue crack growths of a semi-elliptical surface crack in a V-shaped notched round bar under uniform cyclic tension. All the analyses were carried out by using a software package featuring the boundary element method. The J-integral technique was used to compute the stress intensity factors (SIFs), and the NASGRO crack growth rate was chosen to simulate the fatigue crack growths. Mechanical and fracture properties of AZ-6A-T5 magnesium alloy were used for our analysis. Crack shape evolutions for different crack aspect ratios and the corresponding stress intensity factors may be correlated to study the behavior of crack growths. An unstable crack growth was observed when the evolving crack aspect ratio was between 0.6 and 0.7. Careful consideration should be taken if the cylinder contains a defect which has a straight shape on the crack front or a smaller crack aspect ratio.

Keywords:

Fatigue crack growth, Crack aspect ratio, Boundary element method, Stress intensity factor

Published In:

Journal of Zhejiang University SCIENCE A , Vol 15 No. 11 , pp 873-882
Study of Ti+C combustion synthesis reaction in a controlled declining temperature state

R. Mahmoudian, M.A. Hassan, M. Hamdy

Abstract:

The purpose of this article is to synthesize a Ti-C system under a known cooling rate by applying a secondary hybrid system in the form of semi-reacted titanium carbide. The synthesis reaction is performed in a hot, inert, shielded crucible. The portions of reacting and interacting materials are determined using the Rietveld phase quantification method. The product microstructure is studied, and the nanomechanical properties are measured via a nanoindentation technique. The experimental results revealed that the reaction behavior and mechanical properties of Ti+C elemental powder were initiated at a particular temperature level. At 2610°C, the titanium carbide phase formed 14% of the compound composition, with 65 GPa Young’s modulus and 563 MPa hardness.

Keywords:

Combustion synthesis, Microstructure, Nanoindentation, Self-propagating high-temperature synthesis (SHS), Titanium carbide

Published In:

Combustion Science and Technology, Vol 186 No. 6, pp 737-746
Modified smoothed particle hydrodynamics (MSPH) for the analysis of centrifugally assisted TiC-Fe-Al2O3 combustion synthesis

M. A. Hassan, R. Mahmodian, M. Hamdi

Abstract:

A modified smoothed particle hydrodynamic (MSPH) computational technique was utilized to simulate molten particle motion and infiltration speed on multi-scale analysis levels. The radial velocity and velocity gradient of molten alumina, iron infiltration in the TiC product and solidification rate, were predicted during centrifugal self-propagating high-temperature synthesis (SHS) simulation, which assisted the coating process by MSPH. The effects of particle size and temperature on infiltration and solidification of iron and alumina were mainly investigated. The obtained results were validated with experimental microstructure evidence. The simulation model successfully describes the magnitude of iron and alumina diffusion in a centrifugal thermite SHS and Ti + C hybrid reaction under centrifugal acceleration.

Keywords:

Mechanical engineering• Design, synthesis and processing• Computational science

Published In:

Scientific Reports, Vol 4 Article number:3724, DOI: 10.1038/03724
( 18 )

An Inverse Finite Element Method for Determining the Tissue Compressibility of Human Left Ventricle Wall during the Cardiac Cycle

A. I. M. Hassaballah, M. A. Hassan, N.A.Mardi and M.A.Hamdi

Abstract:

The determination of the myocardium's tissue properties is important in constructing functional finite element (FE) models of the human heart. To obtain accurate properties especially for functional modeling of a heart, tissue properties have to be determined in vivo. At present, there are only few in vivo methods that can be applied to characterize the internal myocardium tissue mechanics. This work introduced and evaluated an FE inverse method to determine the myocardial tissue compressibility. Specifically, it combined an inverse FE method with the experimentally-measured left ventricular (LV) internal cavity pressure and volume versus time curves. Results indicated that the FE inverse method showed good correlation between LV repolarization and the variations in the myocardium tissue bulk modulus $K$ ($K = 1/$compressibility), as well as provided an ability to describe in vivo human myocardium material behavior. The myocardium bulk modulus can be effectively used as a diagnostic tool of the heart ejection fraction. The model developed is proved to be robust and efficient. It offers a new perspective and means to the study of living-myocardium tissue properties, as it shows the variation of the bulk modulus throughout the cardiac cycle.

Published In:

In-situ TiC-Fe-Al2O3-TiAl/Ti3Al composite coating processing using centrifugal assisted combustion synthesis

R. mahmoudian, M. A. Hassan, M. Hamdi, Ali Dabagh

Abstract:

The composite coating of a titanium carbide aluminide/alumina-iron composite was synthesized by centrifugal-assisted self-propagating high-temperature synthesis (SHS). The in situ TiC-Al2O3/Fe with intermetallic phases of titanium aluminide (TiAl/Ti3Al) possesses excellent metallurgical properties. This composite was produced from compacted titanium (Ti) and carbon (C) powders in the form of pellets embedded in a tube, which were exposed to very high temperature generated by the thermite Fe2O3 and Al reaction. The process took place in a graphite/steel tube mounted in a centrifugal accelerator machine purposely developed for this function. Functionally graded coating was produced under the centrifugal acceleration field and the product of the thermite reaction (Al2O3 and Fe) infiltrated the TiC pellet and to create a strong, titanium aluminide intermetallic layer. The centrifugal force significantly enhanced both metallurgical alloying and mechanical interlocking between different sample layers during product formation. The purpose of the research addresses the applications of local reinforcement of the ceramic-lined tubes.

Keywords:

Ceramic-matrix composites (CMCs); A. Intermetallics; E. Joints/joining; Functional graded coatings

Published In:

Stability of geostationary flying satellite under combined sliding mode and PID control

Mirhassani S. M., Ahmadian J., Ghorbanian M. J., Hassan M. A.

Abstract:

NULL

Keywords:

NULL

Published In:

Conference Proceeding: 2013 IEEE Business Engineering and Industrial Applications Colloquium, BEIAC 2013, Langkawi; Malaysia; 01/2013 , NULL , pp 115-119
Sliding mode and PID controller in geostationary satellite attitude control

S. M. Mirhassani, J. Ahmadian, M. J. Ghorbanian, M. A. Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

D-Q model of Fuzzy based UPFC to control power flow in transmission network

Fadi Albatish, Saad Mekhelif, Hazlie Mokhlis, Mohsen Hassan

Abstract:

In this paper, a D-Q model of fuzzy based unified power flow controller (UPFC) has been proposed to control the active and reactive power flow through the transmission lines. Power loss reduction also intends with the proposed UPFC controller. The UPFC's shunt and series controllers are developed based on D-Q fuzzy logic (FL) controller, which has been designed in PSCAD environment as an independent module. The proposed UPFC controller is tested by using IEEE-5 and 14 bus systems. The performance of D-Q fuzzy based UPFC reveals better improvement compared to PI based UPFC in terms of power flow control and power loss reduction.

Keywords:

NULL

Published In:

Proceedings of the 7th IET international conference on Power Electronics, Machines and Drives, PEMD-2014, Manchester, UK. , DOI: 10.1049/cp.2014.0397 , pp 5.3. 01-5.3. 01
AXIAL CRUSH BEHAVIOUR OF SQUARE COLUMN WITH EXTERNAL TAPERED PLUNGER

Amir R. A. Ghani and M. A. Hassan

Abstract:

Thin-walled square columns are generally used as impact energy absorber in automotive structures due to their ease of fabrication and installation, high energy absorption capacity in terms of progressive plastic deformation and long stroke. However, the main drawback of standard square column is the high initial peak force. An external tapered plunger is proposed to overcome this shortcoming while at the same time, improving the impact performance. Static and dynamic axial crushing were performed by theoretical and finite element analysis to determine the initial peak force (IPF), crush force efficiency (CFE) and plastic specific energy absorption (SEA) of columns with external plunger of various taper angles. The simulations results were validated by experiments. It was found that the external plunger significantly enhanced the column impact performance and the deformation characteristics as well. Comparison with plain square column was carried out and it was found that the concentric plunger reduced the initial peak force and increased the crush force efficiency for both static and dynamic loading conditions.

Keywords:

Crush behavior, Energy absorption, Progressive failure, Square column, Finite element analysis.

Published In:

Journal of Engineering Sciences, Assiut University, Faculty of Engineering, 41-4,
Investigate the Possibility to Reduce the Residual Stress Level in 2.5D Cutting Using Titanium Coated Carbide Ball Endmill

Masmiati, Ahmed Sarhan, M. A. Hassan, M. Hamdi and H. S. Chan

Abstract:

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Keywords:

NULL

Published In:

Advances in Materials Science and Engineering, 2014 Vol, doi.org/10.1155/2014/485267
Abstract:

The aim of the present paper is to evaluate the residual strength of GFRP laminates following a low-velocity impact event under cyclic loading. The residual strength is calculated using a linear fatigue damage model. According to an investigation into the effect of low-velocity impact on the fatigue behavior of laminates, it seems laminate fatigue life decreases after impact. By normalizing the fatigue stress against undamaged static strength, the Fatigue Damage parameter \( FD \) is presented with a linear relationship as its slope which is a linear function of the initial impact energy; meanwhile, the constants were attained from experimental data. \( FD \) is implemented into a plane-stress continuum damage mechanics based model for GFRP composite laminates, in order to predict damage threshold in composite structures. An S–N curve is implemented to indicate the fatigue behavior for 2 mm thickness encompassing both undamaged and impacted samples. A decline in lifespan is evident when the impact energy level increases. Finally, the \( FD \) is intended to capture the unique GFRP composite characteristics.

Keywords:

Fatigue; Failure-model; Low-velocity-impact; Residual-strength; GFRP

Published In:

Acta Astronautica, Vol 103, pp. 119-128
Modeling the effects of myocardiac fiber architecture and material properties on the left ventricle mechanics during rapid filling phase

A.I.M.Hassaballah, M. A. Hassan, N.A.Mardi and M.A.Hamdi

Abstract:

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Keywords:

NULL

Published In:

Applied Mathematics & Information Sciences, Vol 9 - No1, pp. 161-167
Deep drawing characteristics of square cups through conical dies

M. A. Hassan, L. M. Hezam, M. G. Elsbaie, J. Purbolaksono

Abstract:

NULL

Keywords:

NULL

Published In:

Procedia Engineering, Vol 81, pp 873-880
Influence of temper rolling on tensile property of low carbon steel sheets by application of Hill 48 anisotropic yield criterion

J. Davoud, M. A. Hassan, N.M. Mardi, E. Nezhad

Abstract:

NULL

Keywords:

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Published In:

Procedia Engineering, Vol 81, pp 1222-1227
Monte Carlo Simulation Model for Magnetron Sputtering Deposition

M. A. Hassan, Mohammed Elfiky, Y. Nukman1, Reza Mahmoodian

Abstract:

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Keywords:

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Published In:

Advanced Materials Research, Vol 1105, pp 69-73
Dynamic Power Flow Control in Transmission Lines using Fuzzy Logic Based Unified Power Flow Controller

A. Fadi, M. Saad, Hazli, M. A. Hassan,

Abstract:

NULL

Keywords:

NULL

Published In:

Applied Mathematics & information Sciences, (accepted), NULL
A fuzzy logic based prediction model for kerf width in laser beam machining

Anamul Hossain, Altub Hossain, Y. Nukman, M. A. Hassan, M. Z. Harizam, A. M. Sifullah, P. Parandoush

Abstract:

NULL

Keywords:

NULL

Published In:

Materials and Manufacturing Processes, DOI:10.1080/10426914.2015.1037901, NULL
Mechanical and Chemical characterization of a TiC/C system synthesized using a focus plasma arc

Reza Mahmoodian; M. Hamdi; M.A Hassan; A. Akbari

Abstract:

NULL

Keywords:

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Published In:

PLoS One, Vol 10 N0.6, pp e0130836
Enhancing power transfer capability through flexible AC transmission system devices: A review

FADI ALBATSH, Saad Mekhilef, Shameem Ahmad, Hazlie Mokhlis and M. A. Hassan

Abstract:

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Keywords:

NULL

Published In:

Frontiers of Information Technology & Electronic Engineering, 16, Vol, 658-678 pp
Identification of Critical Load for Scratch Adhesion Strength of Nitride-Based Thin Films Using Wavelet Analysis and a Proposed Analytical Model

MA Hassan, AR Bushroa, Reza Mahmoodian

Abstract:

NULL

Keywords:

NULL

Published In:

Surface and Coatings Technology, Volume 277, No.15, pp.216-221
Deep Drawing of Asymmetric Cups through Conical Die without Blank Holder

MA Hassan, IM Hassab-Allah, LMA Hezam, NA Mardi, M Hamdi

Abstract:

NULL

Keywords:

NULL

Published In:

Investigate the Lubrication Effects on Cutting Force and Power Consumption in Up and Down End Milling

Nik, M. N., Ahmed A. D., Hamdi M., Hassan M. A

Abstract:

Milling is a machining process by which a surface is generated by a progressive chip removal. An experimental investigation has been carried out on the performance of up and down milling under dry and flood conditions when end milling medium carbon steel utilizing titanium coated carbide tools. The performances are evaluated in terms of the cutting force, specific energy and power of cutting tool. The results show that milling in dry condition under up milling mode produce higher cutting force, specific energy and power. However, cutting under down milling mode gives less significant effect either being cut in dry or flood condition.

Keywords:

Cutting Force, Cutting Orientations, Milling, Milling Mode, Power, Specific Energy

Published In:

Advanced Materials Research, Vol 748, pp 264-268
Low-velocity impact damage of woven fabric composites: Finite element simulation and experimental verification

Materials & Design

Abstract:

NULL

Keywords:

NULL

Published In:

Densification behavior of Y-TZP containing zirconium diboride composites

M Amiriyan, S Ramesh, R Tolouei, WJ Kelvin Chew, J Purbolaksono, MA Hassan, M Hamdi, WD Teng

Abstract:

NULL

Keywords:

NULL

Published In:

Square-Cup Deep Drawing of Relatively Thick Sheet Metals through a Conical Die without Blankholder

Walid Mahmoud Shewakh, MA Hassan, Ibrahim M Hassab-Allah

Abstract:

NULL

Keywords:

NULL

Published In:

International Journal of Materials Forming and Machining Processes (IJMFMP) , Vol 2 No 2 , pp 31-46
Characterization of forsterite ceramics

KY Sara Lee, KM Christopher Chin, S Ramesh, J Parbolaksonoa, MA Hassan, M Hamdi, WD Teng

Abstract:

NULL

Keywords:

NULL

Published In:

Journal of Ceramic Processing Research, Vol 14 No 1, pp 131-133
The application of equal channel angular pressing to join dissimilar metals, aluminum alloy and steel, using an Ag-Cu-Sn interlayer

DM Jafarlou, E Zalnezhad, MA Ezazi, NA Mardi, MA Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

Materials & Design, NULL, NULL
Ti-Based Ceramic Composite Processing using Hybrid Centrifugal Thermite Assisted Technique

Reza Mahmoodian, M. Hamdi, M.A Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

39th Int'l Conf & Expo on Advanced Ceramics & Composites (ICACC 2015), NULL, NULL
Investigation of embedded Si/C system exposed to a hybrid reaction of centrifugal-assisted thermite method

R Mahmoodian, R Yahya, A Dabbagh, M Hamdi, MA Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

PLoS One, NULL, NULL
Ti-Based Ceramic Composite Processing using Hybrid Centrifugal Thermite Assisted Technique

R Mahmoodian, M Hamdi, MA Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

39th Int'l Conf & Expo on Advanced Ceramics & Composites (ICACC 2015), NULL, NULL
Novel uses of SiO2 nanolubrication in end milling of medium carbon steel for higher compressive residual stress measured by high-energy X-ray diffraction data

NM NikPa, AAD Sarhan, MA Hassan, MHA Shukor

Abstract:

NULL

Keywords:

NULL

Published In:

Journal of Engineering Tribology, Part J, NULL, NULL
Severe plastic deformation of tubular AA 6061 via equal channel angular pressing

DM Jafarlou, E Zalnezhad, MA Hassan, MA Ezazi, NA Mardi

Abstract:

NULL

Keywords:

NULL

Published In:

Materials & Design, Vol 90 - No 15, Pages 1124-1135
Square-Cup Deep Drawing of Relatively Thick Sheet Metals through a Conical Die without Blankholder

WM Shewakh, MA Hassan, IM Hassab-Allah

Abstract:

NULL

Keywords:

NULL

Published In:

International Journal of Materials Forming and Machining Processes (IJMFMP), NULL, NULL
Power Quality Improvement in Transmission Network using Fuzzy Logic based Unified Power Flow Controller

F. M. Albatsh, S. Ahmad, S. Mekhilef, H. Mokhlis and M. A. Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

in the proceedings of IEEE International conference on Industrial Technology (ICIT), Seville, Spain, March 2015. , NULL , NULL
(49)

Modeling of porosity in hydroxyapatite for finite element simulation of nanoindentation test

S Naderi, A Dabbagh, MA Hassan, BA Razak

Abstract:

NULL

Keywords:

NULL

Published In:

Optimization of cutting conditions for minimum residual stress, cutting force and surface roughness in end milling of S50C medium carbon steel

Nik Masmiatia Ahmed A.D. Sarhanb, Mohsen Abdel Naeim Hassanb, Mohd Hamdib

Abstract:

NULL

Keywords:

NULL

Published In:

Measurement, Volume 86, Pages 253-265
3D FEM Simulation to Predict the Heat Affected Zone during Laser Machining on Stainless Steel 304

A M Sifullah, Y Nukman, and M A Hassan

Abstract:

NULL

Keywords:

NULL

Published In:

International Conference on Mechatronics and Production Processes (ICMPP'2015), Pattaya (Thailand), Vol 1, Pp. 43-46
Implementation of Fuzzy and Adaptive Neuro-Fuzzy Inference Systems in Optimization of Production Inventory Problem

Ahmed Abdel-Aleem, Mahmoud A. El-Sharief, Mohsen A. Hassan and Mohamed G. El-Sebaie

Abstract:

NULL

Keywords:

NULL

Published In:

Applied Mathematics & Information Sciences, Vol. 11, No. 1, pp. 1-10
A PC-based simulation platform for a quadcopter system with self-tuning fuzzy PID controllers

HY Moayad, M.A Hassan, B Mardi, N Azizi

Abstract:

NULL

Keywords:

NULL

Published In:

Computer Applications in Engineering Education, Vol 24, No.6, pp. 934-950
Implementation of Fuzzy and Adaptive Neuro-Fuzzy Inference Systems in Optimization of Production Inventory Problem

Ahmed Abdel-Aleem, Mahmoud A. El-Sharief, Mohsen A. Hassan and Mohamed G. El-Sebaie

Abstract:

Most of the earlier studies in the inventory control and management make assumption that the manufacturing system is reliable and does not fail. However, in the real industrial applications, there is no completely reliable manufacturing system; machine failure occur and the production does not resume before repair. In this paper, we will study and analyze the optimal lot size in a real production system which is not completely reliable. To obtain the optimal production quantity, Fuzzy Inference System (FIS) and Adaptive Neuro-Fuzzy Inference System (ANFIS) have been used for modeling and simulation. This approach combines the advantages of rule-base fuzzy system and the learning capability benefit of neural networks. In the case study of cement industry, ANFIS prediction has shown very good agreement with the real production quantity. This model can be extended for any inventory production quantity problems if the industrial data are available.

Keywords:

Fuzzy, Adaptive neuro-fuzzy, Optimization, inventory, Production Inventory

Published In:

Applied Mathematics & Information Sciences, vol. 11, no. 1, pp. 289–298
Finite element analysis of fusion laser cutting on stainless steel-304

A. M. Sifullah, Y. Nukman, M. A. Hassan and A. Hossain

Abstract:

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Keywords:

NULL

Published In:

Abstract:

Most research studies on the economic production quantity (EPQ) model considered that produced items are of perfect quality. On the other hand, real production systems have some product defects. Considering the imperfect items makes the inventory model more complex, and more difficult to solve analytically rather than it is time consuming. Therefore, an efficient approach like D-optimal response surface methodology (RSM) is required since heterogeneous combination of data can be modeled to generate response surfaces and obtain optimum decision parameters values. This paper solves the EPQ model with sales return, rework, shortage and scrap by RSM optimization technique in order to optimize the long run average cost function. ANOVA analysis of data obtained from the total cost RSM quadratic model has shown that the Model is significant according to F, Prob > F and p-values.

Keywords:

RSM; model; Optimization; EPQ; Imperfect items; Rework; Shortage

Published In:

OPSEARCH , 54 , NULL
Numerical simulation of metal removal in laser drilling using radial point interpolation method

D Abidou, N Yusoff, N Nazri, MAO Awang, MA Hassan, AAD Sarhan

Abstract:

NULL

Keywords:

NULL

Published In:

Engineering Analysis with Boundary Elements, Vol 77, pp 89-96
Numerical simulation of metal removal in laser drilling using symmetric smoothed particle hydrodynamics

D Abidou, N Yusoff, N Nazri, MAO Awang, MA Hassan, AAD Sarhan

Abstract:

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Keywords:

NULL

Published In:

Precision Engineering, NULL, http://dx.doi.org/10.1016/j.precisioneng.2017.01.012
Optimization of reliability based model for production inventory system

Ahmed Abdel-Aleem, Mahmoud A. El-Sharief, Mohsen A. Hassan and Mohamed G. El-Sebaie

Abstract:

Traditional research studies on the Economic Production Quantity (EPQ) model propose that produced items have perfect quality. However, in real production systems the quality of the products depends on the production process reliability. EPQ models that consider reliability and the effect of imperfect items are much more complex, and in turn the objective function becomes much more complicated. It is challenging to solve this type of model analytically, and it is also time consuming. Hence, it is necessary to utilize non-traditional solution techniques, such as numerical methods and heuristic search algorithms, for solving this type of model. In this paper, the optimal solution of the EPQ based reliability model are obtained by analytical solution, a Generalized Reduced Gradient (GRG) algorithm, an Evolutionary Algorithm (EA), a Monte Carlo non-deterministic method and the LINGO® commercial solver. The methodology of this work has been clearly presented, and the computational results are compared and discussed. The computational results show that the GRG, EA, and Monte Carlo methods result in feasible and similar solutions, while the analytical solution is not valid for the model studied. The model can be extended to solve more complicated inventory models considering rework, shortage and multiple products.

Keywords:

Optimization; reliability; production inventory; inventory control; EPQ

Published In:

International Journal of Management Science and Engineering Management, 12, 1-11
A study on the different finite element approaches for laser cutting of aluminum alloy sheet

S Peirovi, M Pourasghar, AF Nejad, MA Hassan

Abstract:

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Keywords:

NULL

Published In:

The International Journal of Advanced Manufacturing Technology, DOI: 10.1007/s00170-017-0599-0, NULL
A contrast adjustment thresholding method for surface defect detection based on mesoscopy

Win, Moe; Bushroa, A.R.; Hassan, M.A.; Hilman, N.M.; Ide-Ektessabi, Ari

Abstract:

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Keywords:

NULL

Published In:

IEEE Transactions on Industrial Informatics, v 11, n 3, p 642-649
Dissimilar friction stir welding between polycarbonate and AA 7075 aluminum alloy

Moshwan, Raza(1); Rahmat, Sahifulddin M.(1); Yusof, Farazila(1); Hassan, Mohsen A.(1,2,3); Hamdi, Mohd(1); Fadzil, Mohd(1)

Abstract:

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Keywords:

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Published In:

International Journal of Materials Research, v 106, n 3, p 258-266
Identification of critical load for scratch adhesion strength of nitride-based thin films using wavelet analysis and a proposed analytical model

Hassan, M.A.; Bushroa, A.R.; Mahmoodian, Reza

Abstract:

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Keywords:

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Published In:

Surface and Coatings Technology, v 277, p 216-221
Alternative methods to determine the elastoplastic properties of sintered hydroxyapatite from nanoindentation testing

Naderi, S.; Hassan, M.A.; Bushroa, A.R.

Abstract:

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Keywords:

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Published In:

Materials and Design, v 67, p 360-368
Novel uses of SiO$_2$ nanolubrication in end milling of medium carbon steel for higher compressive residual stress measured by high-energy X-ray diffraction data

Nikpa, Nik Masmiati; Sarhan, Ahmed Aly Diaa; Abdelnaeim Hassan, Mohsen; Hamdi Abd Shukor, Mohd

Abstract:

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Keywords:

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Published In:

Optimization of cutting conditions for minimum residual stress, cutting force and surface roughness in end milling of S50C medium carbon steel

Masmiatni, Nik; Sarhan, Ahmed A.D.; Hassan, Mohsen Abdel Naeim; Hamdi, Mohd

Abstract:

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Keywords:

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Published In:

Measurement: Journal of the International Measurement Confederation, v 86, p 253-265
Modeling of porosity in hydroxyapatite for finite element simulation of nanoindentation test

Naderi, Sadjad; Dabbagh, Ali; Hassan, Mohsen Abdelnaeim; Razak, Bushroa Abdul; Abdullah, Hadijah; Abu Kasim, Noor Hayaty

Abstract:

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Keywords:

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Published In:

Ceramics International, v 42, n 6, p 7543-7550
A Fuzzy Logic-Based Prediction Model for Kerf Width in Laser Beam Machining

Hossain, Anamul; Hossain, Altab; Nukman, Y.; Hassan, M.A.; Harizam, M.Z.; Sifullah, A.M.; Parandoush, P.

Abstract:
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Keywords:
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Published In:
Materials and Manufacturing Processes, v 31, n 5, p 679-684
Ballistic impact simulation of proposed bullet proof vest made of TWIP steel, water and polymer sandwich composite using Fe SPH coupled technique

Nyanor, P.; Hamada, A.S.; Hassan, M.A.

Abstract:

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Keywords:

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Published In:

Key Engineering Materials, v 786, p 302-313
Constitutive modelling of elastomer/graphene platelet nanocomposites

Abdelsalam, Amir A.; Araby, Sherif; Hassan, M.A.; El-Moneim, A.A.

Abstract:

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Keywords:

NULL

Published In:

IOP Conference Series: Materials Science and Engineering . v 244, n 1 , NULL