

Category : Other Related Processes (Thermal Mechanical Treatments, Processes of Polymeric Materials, Die-manufacturing Processes, Rapid Mold and Prototype Making Processes, CAD/CAM/Modeling Techniques, etc.)

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A CLARIFICATION OF THE FLUORINE EFFECT ON THE GRAIN-GROWTH MECHANISM OF α -SIALON CERAMICS VIA TRANSMISSION ELECTRON MICROSCOPY (TEM) TECHNIQUES

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SiAlON ceramics are of major interest for industrial applications due to their superior mechanical properties. The starting Si_3N_4 powder (α or β), the type of cation and sintering conditions govern the microstructural evolution of SiAlON ceramics. Generally, use of β - Si_3N_4 powder results in equiaxed grain morphology and hence low fracture toughness. In order to overcome this problem, in this study, multi cations (Y-Sm-Ca and Ca-Ce) with different molar ratio (30-64-6 and 33-67) is used to design 30 α :70 β SiAlON ceramics by using coarse ($d_{50}=1 \mu\text{m}$) β - Si_3N_4 powder. CaF_2 and CaCO_3 are utilized as Ca sources. An increase in α -SiAlON content in the case of employing CaF_2 , as opposed to CaCO_3 in Y-Sm-Ca system is observed. Despite the fact that α -SiAlON phase cannot be stabilized in Ca-Ce (CaCO_3 as a Ca source) system, α -SiAlON phase stability and unpredictable α -SiAlON grain-growth in both a and c directions is easily achieved. Furthermore, using CaF_2 instead of CaCO_3 gives rise to an increase in densities. To clarify why abnormal grain-growth of α -SiAlON grains and α -SiAlON phase stability occur and why density is increased when the fluorine is introduced to the system, we further employ analytical transmission electron microscopy (TEM) techniques, e.g. energy filtering (EF)TEM, scanning (S)TEM, energy dispersive x-ray spectroscopy (EDXS) and electron energy loss spectroscopy (EELS)-based spectrum imaging (SI). In this presentation we will discuss the abnormal grain growth and α -SiAlON phase stabilization in terms of analytical TEM results.

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Presentation Type : Poster Presentation

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CFD CHARACTERIZATION OF THE HYDRODYNAMICS OF THE MAXBLEND IMPELLER

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In the present study, the hydrodynamic characteristics of the Maxblend impeller have been investigated. 3D finite volume based computational fluid dynamics (CFD) simulations have been carried out. The tank used has a cylindrical shape with a diameter of 300 mm. The liquid height was kept equal to the vessel diameter. The study has been restricted to the laminar and transition regimes with shear thinning fluids, which are typical conditions of polymerization reactions. Analyses concern the effect of the impeller speed, the fluid rheology and some design parameters on the flow patterns induced and the power consumption. Predictions have been compared with literature data and a satisfactory agreement has been found.

FMP003

A DESIGN OF RECIPROCATING EXTRUSION PRESS MACHINE

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OPP009

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PMO011

SEMI-ANALYTICAL SOLUTION FOR THREE-DIMENSIONAL VIBRATION OF FUNCTIONALLY GRADED PIEZOELECTRIC ANNULAR PLATES WITH DIFFERENT BOUNDARY CONDITIONS

Akbar Jodaei, Mohammad H Yas, Heshmat Haghighat

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PMP201

COUPLED STRUCTURAL/THERMAL ANALYSIS OF CYLINDRICAL PART OF MULTILAYERED COMPOSITE VESSEL

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SEP023

SURFACE MODIFICATION OF AL-SI ALLOYS BY TIG SURFACE MELTING

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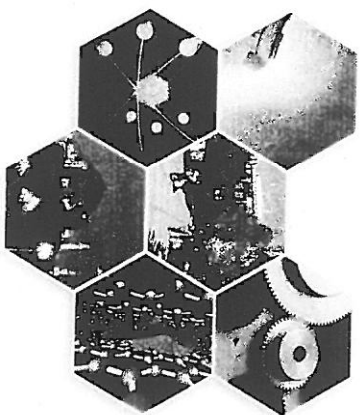
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DPP014

STAMPING PROCESS ANALYSIS USING COMPUTER SIMULATIONS AND REVERSE ENGINEERING AS AN INTEGRATED TOOL IN THE STAMPING DESIGN AND CONSTRUCTION CHAIN

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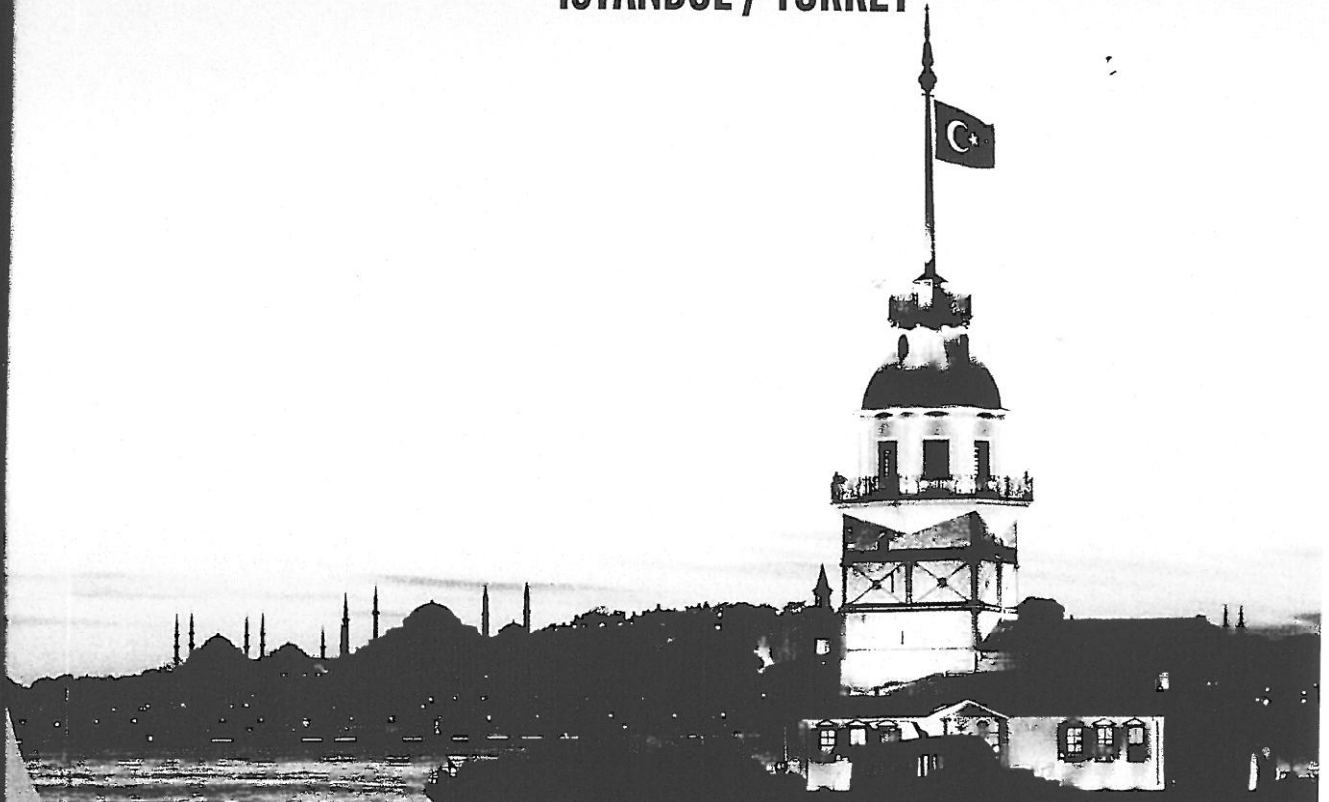
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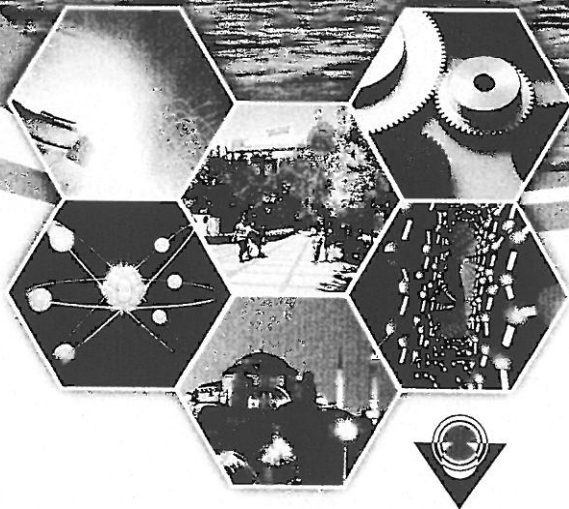
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