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Titolo	Flame retardant and thermally insulating polymers / / edited by Yanfei Xu
Pubbl/distr/stampa	London, England : , : IntechOpen, , [2021] ©2021
ISBN	1-83968-715-0
Descrizione fisica	1 online resource (130 pages) : illustrations
Disciplina	628.9223
Soggetti	Fireproofing agents
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.

2. Record Nr. UNISA996212478503316

Autore	Mohammadi S (Soheil)
Titolo	Extended finite element method for fracture analysis of structures [[electronic resource] /] / Soheil Mohammadi
Pubbl/distr/stampa	Malden, MA, : Blackwell Pub., c2008
ISBN	1-282-37946-1 9786612379468 0-470-69779-2 0-470-69799-7
Descrizione fisica	1 online resource (282 p.)
Classificazione	BAU 154f UF 3150
Disciplina	518.25 624.1/76
Soggetti	Fracture mechanics Finite element method
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	EXTENDED FINITE ELEMENT METHOD; Contents; 2.5 SOLUTION PROCEDURES FOR K AND G; Dedication; Preface; Nomenclature; Chapter 1 Introduction; 1.1 ANALYSIS OF STRUCTURES; 1.2 ANALYSIS OF DISCONTINUITIES; 1.3 FRACTURE MECHANICS; 1.4 CRACK MODELLING; 1.4.1 Local and non-local models; 1.4.2 Smeared crack model; 1.4.3 Discrete inter-element crack; 1.4.4 Discrete cracked element; 1.4.5 Singular elements; 1.4.6 Enriched elements; 1.5 ALTERNATIVE TECHNIQUES; 1.6 A REVIEW OF XFEM APPLICATIONS; 1.6.1 General aspects of XFEM; 1.6.2 Localisation and fracture; 1.6.3 Composites; 1.6.4 Contact; 1.6.5 Dynamics 1.6.6 Large deformation/shells1.6.7 Multiscale; 1.6.8 Multiphase/solidification; 1.7 SCOPE OF THE BOOK; Chapter 2 Fracture Mechanics,a Review; 2.1 INTRODUCTION; 2.2 BASICS OF ELASTICITY; 2.2.1 Stress -strain relations; 2.2.2 Airy stress function; 2.2.3 Complex stress functions; 2.3 BASICS OF LEFM; 2.3.1 Fracture mechanics; 2.3.2 Circular hole; 2.3.3 Elliptical hole; 2.3.4 Westergaard analysis of a sharp crack; 2.4 STRESS INTENSITY FACTOR, K; 2.4.1 Definition of the stress intensity factor; 2.4.2 Examples of stress intensity factors for LEFM; 2.4.3 Griffith theories of strength and energy 2.4.4 Brittle material2.4.5 Quasi-brittle material; 2.4.6 Crack stability; 2.4.7 Fixed grip versus fixed load; 2.4.8 Mixed mode crack propagation; 2.5.1 Displacement extrapolation/correlation method; 2.5.2 Mode I energy release rate; 2.5.3 Mode I stiffness derivative/virtual crack model; 2.5.4 Two virtual crack extensions for mixed mode cases; 2.5.5 Single virtual crack extension based on displacement decomposition; 2.5.6 Quarter point singular elements; 2.6 ELASTOPLASTIC FRACTURE MECHANICS (EPFM); 2.6.1 Plastic zone; 2.6.2 Crack tip opening displacements (CTOD); 2.6.3 J integral 2.6.4 Plastic crack tip fields2.6.5 Generalisation of J; 2.7 NUMERICAL METHODS BASED ON THE J INTEGRAL; 2.7.1 Nodal solution; 2.7.2 General finite element solution; 2.7.3 Equivalent domain integral (EDI) method; 2.7.4 Interaction integral method; Chapter 3 Extended Finite Element Method for Isotropic Problems; 3.1 INTRODUCTION; 3.2 A REVIEW OF XFEM DEVELOPMENT; 3.3 BASICS OF FEM; 3.3.1 Isoparametric finite elements, a short review; 3.3.2 Finite element solutions for fracture mechanics; 3.4 PARTITION OF UNITY; 3.5 ENRICHMENT; 3.5.1 Intrinsic enrichment; 3.5.2 Extrinsic enrichment 3.5.3 Partition of unity finite element method3.5.4 Generalised finite element method; 3.5.5 Extended finite element method; 3.5.6 Hp-clouds enrichment; 3.5.7 Generalisation of the PU enrichment; 3.5.8 Transition from standard to enriched approximation; 3.6 ISOTROPIC XFEM; 3.6.1 Basic XFEM approximation; 3.6.2 Signed distance function; 3.6.3 Modelling strong discontinuous fields; 3.6.4 Modelling weak discontinuous fields; 3.6.5 Plastic enrichment; 3.6.6 Selection of nodes for discontinuity enrichment; 3.6.7 Modelling the crack; 3.7 DISCRETIZATION AND INTEGRATION; 3.7.1 Governing equation 3.7.2 XFEM discretization
Sommario/riassunto	This important textbook provides an introduction to the concepts of the newly developed extended finite element method (XFEM) for fracture analysis of structures, as well as for other related engineering applications.One of the main advantages of the method is that it avoids any need for remeshing or geometric crack modelling in numerical simulation, while generating discontinuous fields along a crack and around its tip. The second major advantage of the method is that by a small increase in number of degrees of freedom, far more accurate

solutions can be obtained. The method has recen