Record Nr.	UNINA9910627269103321
Titolo	Life cycle design and engineering of lightweight multi-material automotive body parts : results from the BMBF sponsored collaborative research project MultiMaK2 / / Thomas Vietor, editor
Pubbl/distr/stampa	Berlin : , : Springer, , [2023] ©2023
ISBN	9783662652732 9783662652725
Descrizione fisica	1 online resource (129 pages)
Collana	Zukunftstechnologien fur den multifunktionalen Leichtbau
Disciplina	629.26
Soggetti	Automobiles - Bodies - Design and construction Automobiles - Bodies Composite materials in automobiles
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro Research Campus Open Hybrid LabFactory Contents Editors and Contributors 1 Introduction Abstract 1.1 Demand for Automotive Lightweight Body Parts 1.2 Engineering of Automotive Lightweight Body Parts -the MultiMaK2 Approach 1.2.1 Body Part Design 1.2.2 Body Part Manufacturing 1.2.3 Life Cycle Engineering 1.3 Reference Body Parts of the Project 1.4 Contents and Structure of the Book References 2 Development of Automotive Body Parts in Multi-Material Design-Processes and Tools Abstract 2.1 Introduction 2.2 Review on Development and Lightweight Design Approaches 2.2.1 Development Processes and Goals 2.2.2 Material Selection and Lightweight Design Approaches 2.3 Developing Approach for Multi-Material Automotive Body Parts 2.3.1 Level 0: Requirements Model 2.3.2 Level 1: Material, Geometry and Design Model 2.3.3 Level 2: Generic Topology Model 2.3.4 Levels 3 and 4: Detailed Concept Model and System Model 2.4 Case Study 2.4.1 Case Study 1: Roof Reinforcement 2.4.2 Case Study 2: Centre Tunnel 2.5 Summary and Outlook References 3 Knowledge Management Abstract 3.1

1.

Introduction -- 3.2 Review on Knowledge Management in Product Development -- 3.2.1 Approaches to Knowledge Provision -- 3.3 Providing Knowledge for Multi-Material Designs -- 3.4 Identifying Relevant Knowledge -- 3.4.1 Identify Relevant Knowledge from the Literature -- 3.4.2 Identify Relevant Knowledge Based on Current Applications of Multi-Material Design -- 3.5 Accessing Relevant Knowledge -- 3.6 Identifying Similar Design Rules -- 3.7 Prototypic Knowledge Management System -- 3.7.1 Case Study -- 3.7.2 Discussion -- References -- 4 Levers of Cyber Physical Production Systems for Multi-Material Body Parts Manufacturing -- Abstract -- 4.1 Introduction -- 4.2 Cyber Physical Production Systems. 4.3 CPPS-based Architecture -- 4.3.1 Levers of Data-Based Modelling for the Manufacturing of Multi-Material Body Parts -- 4.3.2 CPPS-Based Architectural Approach -- 4.4 Exemplary Use Case: Deriving Productspecific Energy Consumptions through Data-based Modelling -- 4.5 Summary -- References -- 5 Modeling and Simulation of New Manufacturing Processes for Multi-Material Lightweight Body Parts to Estimate Environmental Impacts -- Abstract -- 5.1 Introduction -- 5.2 Manufacturing Processes for Multi-Material Lightweight Body Parts --5.3 Determining Environmental Impacts of New Manufacturing Processes via Modelling and Simulation -- 5.4 Approach and Implementation for Multi-Material Lightweight Body Parts -- 5.5 Bottom-up Modelling of Processes -- 5.6 Process Chain Modelling Environment -- 5.7 Case Study-Modelling and Simulation of Manufacturing Processes at the Open Hybrid LabFactory -- 5.8 Summary and Outlook -- References -- 6 Consideration of Environmental Impacts of Automotive Lightweight Body Parts During the Conceptual Design Stage -- Abstract -- 6.1 Environmental Assessment of Lightweight Body Part Concepts -- 6.2 Modelling of Systems within the Technosphere -- 6.2.1 Raw Materials, Manufacturing and End-of-Life -- 6.2.2 Use -- 6.3 Implementation --6.4 Case Study 1 - Roof Reinforcement -- 6.5 Case Study 2 - Centre Tunnel -- 6.6 Summary and Opportunities -- References -- 7 Life Cycle Design and Engineering Lab in the Open Hybrid LabFactory --Abstract -- 7.1 Automotive Life Cycle Engineering from the Open Hybrid Lab Factory's (OHLF) Perspective -- 7.2 Background -- 7.3 Understanding LCE through the Eyes of VA -- 7.4 The Life Cycle Design Engineering Lab (LCDEL) -- 7.5 Use Case 1-Life Cycle Engineering in Conceptual Design -- 7.6 Use Case 2 - Open Hybrid LabFactory Nerve Centre -- 7.7 Summary and Outlook -- References. Publications in Course of the MultiMaK2 Project.