1. Record Nr. UNINA9911001465603321

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Titolo	Functional Compliance of Multifunctional Bondlines with Disbond Arrest and Health Monitoring Features for Safe and Efficient Composite Joints / / by Julian Steinmetz
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	3-031-72422-4
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (XVIII, 199 p. 77 illus., 75 illus. in color.)
Collana	Mechanics and Adaptronics, , 2731-622X
Disciplina	621.8
Soggetti	Machinery Engineering design Aerospace engineering Astronautics Materials Machinery and Machine Elements Engineering Design Aerospace Technology and Astronautics Materials Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Novel Multifunctional Bondline for Efficient and Safe Joints in Composite Aircraft -- Approaches to a Functionally Compliant Multifunctional Bondline -- Functional Compliance of Bondlines with Multifunctional Disbond Arrest Feature -- Towards the Implementation of the Multifunctional Bondline in Composite Aircraft -- Extending the Functional Compliance Concept based on the Multifunctional Bondline -- Conclusions and Future Prospects.
Sommario/riassunto	Safe and efficient joints are key for improving the structural efficiency of composite aircraft. Therefore, this thesis investigates the potential of multifunctional bondlines, combining structural bonding, disbond arrest features, and structural health monitoring. The central research question is how to achieve a functionally compliant design. This means ensuring disturbances between these functions do not eliminate their

benefits regarding the objective of safe and efficient joints. The approach is adding discrete multifunctional disbond arrest features, functionally integrating disbond arrest and sensor functions, to epoxy bondlines. Experimental results indicate some major challenges such as a stiffness conflict for the integrated functions. Nevertheless, securing the epoxy bondline without disturbing its static strength proves successful in the end. In addition, the thesis provides some new insights regarding the functional compliance concept. For example, it strongly suggests considering temporal aspects, such as transient material properties. The author Julian Steinmetz is a research associate in the group of Prof. Michael Sinapius at the TU Braunschweig Institute of Mechanics and Adaptronics. His focus area is multifunctional structures. As a doctoral student, he conducted research on multifunctional bondlines in close cooperation with the research groups of Prof. Hühne from the German Aerospace Centre in Braunschweig and Prof. Dietzel from the TU Braunschweig Institute of Microtechnology. Julian Steinmetz obtained his Bachelor's and Master’s degree in mechanical engineering from the TU Braunschweig. He was a visiting student in the research groups of Prof. Jonathan Cooper at the University of Bristol and Profs. Tsuyoshi Inoue and Kentaro Takagi at the Nagoya University.