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Titolo	Cryostat Design : Case Studies, Principles and Engineering // edited by J.G. Weisend II
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ISBN	3-319-31150-6
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (XVII, 280 p. 197 illus., 147 illus. in color.)
Collana	International Cryogenics Monograph Series, , 0538-7051
Disciplina	537.5352
Soggetti	Low temperature physics Low temperatures Engineering design Thermodynamics Heat engineering Heat transfer Mass transfer Particle acceleration Low Temperature Physics Engineering Design Engineering Thermodynamics, Heat and Mass Transfer Particle Acceleration and Detection, Beam Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	1 Principles of Cryostat Design; J. Weisend -- 2 SSC Magnet Cryostat; T. Nicol -- 3 LHC Magnet Cryostat; P. Lebrun -- 4 SHOOT Dewars; M. DiPirro -- 5 ILC SRF Cryomodule; J. Weisend, T. Peterson -- 6 Segmented SRF Cryomodules; E. Daly, T. Nicol, J. Preble -- 7 MRI Cryostat; E. W. Stautner -- 8 Design & Operation of a Low Background, 50 mK Cryostat for Cryogenic Dark Matter Search; R. Schmitt -- 9 Cryogenic Transfer Lines; J. Fydrych -- 10 Summary & Tips for Successful Cryostat Design; J. Weisend.
Sommario/riassunto	This book enables the reader to learn the fundamental and applied

aspects of practical cryostat design by examining previous design choices and resulting cryostat performance. Through a series of extended case studies the book presents an overview of existing cryostat design covering a wide range of cryostat types and applications, including the magnet cryostats that comprise the majority of the Large Hadron Collider at CERN, space-borne cryostats containing sensors operating below 1 K, and large cryogenic liquid storage vessels. It starts with an introductory section on the principles of cryostat design including practical data and equations. This section is followed by a series of case studies on existing cryostats, describing the specific requirements of the cryostat, the challenges involved and the design choices made along with the resulting performance of the cryostat. The cryostat examples used in the studies are chosen to cover a broad range of cryostat applications and the authors of each case are leading experts in the field, most of whom participated in the design of the cryostats being described. The concluding chapter offers an overview of lessons learned and summarises some key hints and tips for practical cryostat design. The book will help the reader to expand their knowledge of many disciplines required for good cryostat design, including the cryogenic properties of materials, heat transfer and thermal insulation, instrumentation, safety, structures and seals.

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