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Autore	Ekin J. W
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Nota di contenuto	CONTENTS; SYMBOLS AND ABBREVIATIONS; ACKNOWLEDGMENTS; ABOUT THE AUTHOR; CONTACT INFORMATION; DISCLAIMER; PART I: CRYOSTAT DESIGN AND MATERIALS SELECTION; 1 Introduction to Measurement Cryostats and Cooling Methods; 1.1 Introduction; 1.2 Cryogenic liquids; 1.3 Introduction to measurement cryostats; 1.4 Examples of measurement cryostats and cooling methods-low transport current ((omitted) 1 A); 1.5 Examples of measurement cryostats and cooling methods-high transport current ((omitted) 1 A); 1.6 Addenda: safety and cryogen handling; 1.7 References; 2 Heat Transfer at Cryogenic Temperatures 2.1 Introduction2.2 Heat conduction through solids; 2.3 Heat conduction through gases (and liquids); 2.4 Radiative heat transfer; 2.5 Heat conduction across liquid/solid interfaces; 2.6 Heat conduction across solid/solid interfaces; 2.7 Heat conduction across solid/gas interfaces; 2.8 Other heat sources; 2.9 Examples of heat-transfer

calculation; 2.10 References; 3 Cryostat Construction; 3.1 Introduction; 3.2 Material selection for cryostat parts; 3.3 Joining techniques; 3.4 Construction example for a basic dipper probe; 3.5 Sizing of parts for mechanical strength
3.6 Mechanical motion at cryogenic temperature
3.7 Vacuum techniques and seals for cryogenic use; 3.8 Addenda: high and ultrahigh vacuum techniques; 3.9 References; 4 Wiring and Connections; 4.1 Introduction; 4.2 Wire selection; 4.3 Insulation selection; 4.4 Heat sinks for instrumentation leads; 4.5 Solder connections; 4.6 Sensitive dc voltage leads: techniques for minimizing thermoelectric voltages; 4.7 Vacuum electrical lead-throughs; 4.8 Radio-frequency coaxial cables; 4.9 High-current leads; 4.10 Flexible current leads; 4.11 References; 5 Temperature Measurement and Control
5.1 Thermometer selection (1-300 K)
5.2 Selection of thermometers for use in high magnetic fields; 5.3 Thermometer installation and measurement procedures; 5.4 Controlling temperature; 5.5 Addendum: reference compendium of cryogenic-thermometer properties and application techniques; 5.6 References; 6 Properties of Solids at Low Temperatures; 6.1 Specific heat and thermal diffusivity; 6.2 Thermal expansion/contraction; 6.3 Electrical resistivity; 6.4 Thermal conductivity; 6.5 Magnetic susceptibility; 6.6 Mechanical properties; 6.7 References

PART II: ELECTRICAL TRANSPORT MEASUREMENTS: SAMPLE HOLDERS AND CONTACTS
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8.6 Spreading-resistance effect in thin contact pads and example calculations

Sommario/riassunto

Written in an accessible and readable style, the book provides a truly integrated, step-by-step approach to the design and construction of low-temperature measurement apparatus. It presents a practical perspective of heat transfer, materials selection, construction techniques, wiring, thermometry, sample mounting, and electrical contacts, and recent developments in superconductor data analysis and scaling theory. The graphs, clear examples, and seventy appendix data tables are a treasure trove of practical information. - ; This book presents a highly integrated, step-by-step approach to the des
