

# PUBLICATIONS

Have you read a good book lately? Would you like something to relax with after work? We've got a few books for you that will answer your most demanding questions, whether you need to be introduced to temperature metrology or you're ready to challenge its deepest theories.

Don't let other calibration professionals get ahead of you, and don't wait until the movie comes out—read these books now! If you aren't going to read any of these, you need them on your bookshelf so everybody will think you read them. There's no better way to make others think you're ahead of the game. And yes, we take VISA!



## Traceable Temperatures: An Introduction to Temperature Measurement and Calibration

J. V. Nicholas and D. R. White; John Wiley & Sons, 1994, 326 pages.

Order No. 9393-008 \$145

This book is a 1994 edition written by two New Zealand metrologists. It covers traceability, uncertainties, the temperature scale, calibration, PRTs, LIGs, thermocouples, and radiation. While easy to read, this book is thorough and contains many

small bits of information that are useful. If you're learning calibration for the first time or refreshing your memory, *Traceable Temperatures* will work for you.



## Temperature Measurement

Bela G. Laptak, editor; Chilton Book Company, 1993, 131 pages.

Order No. 9393-003 \$70

The chapters in this book were provided by a number of authors and edited by Laptak. This is basically an entry-level text that covers basic theory without rigorous math. It's suitable for industrial technicians and managers needing a solid but elementary understanding of different devices for temperature measurement.



## Temperature Measurement and Control

J. R. Leigh; IEE Control Engineering Series 33, 1988, 189 pages.

Order No. 9393-009 \$90

This book has several elementary chapters on temperature, thermocouples, thermistors, and other common industrial sensor types. It also looks at heat sources and gives basic information on the differences and uses of heat sources. Half of the text is devoted to temperature control thermometry and tends to be more in-depth than the other chapters.



## Advanced Temperature Control

Gregory K. McMillan; Instrument Society of America, 1995, 218 pages.

Order No. 9393-012 \$90

If you're looking for elementary information in process control involving temperature, this book has it. It explains the basics on measurement, temperature loop analysis, controllers, exchangers, and reactors. The book is easy to read and has reasonable illustrations, along with the elementary

math of temperature control systems. While it does not discuss sensor types or techniques, it does help illustrate the use and purposes of sensors in a temperature control environment.



## Temperature: Its Measurement and Control in Science and Industry

James F. Schooley, editor; American Institute of Physics, 1992, Volume 6, Parts 1 and 2, 1269 pages.

Order No. 9393-001 2-Volume Set \$275

This two-part set is made of many in-depth papers written at the expert level. Part 1 covers thermodynamic temperature determinants, temperature scales, fixed points, resistance thermometry, and

thermocouples. Part 2 covers radiation thermometry, temperature control, electronic thermometry, and calibration methods.



## Techniques for Approximating the International Temperature Scale of 1990

Published by the Bureau International des Poids et Mesures, July 1990, 205 pages.

Order No. 9393-004 \$42

Maybe you've heard of the Blue and Red Books. This is the Blue Book. It's a simple, practical guide to producing accurate measurements that comply with ITS-90. The key word is *approximating*. Most labs don't need to reach the absolute highest

levels of accuracy defined and directed by ITS-90. A more modest level of uncertainty is acceptable if ITS-90 compliance is met. This monograph shows you how to do that.



## Supplementary Information for the International Temperature Scale of 1990

Published by the Bureau International des Poids et Mesures, December 1990, 177 pages.

Order No. 9393-005 \$42

This is the Red Book. It supplies all of the Blue Book's supplemental information you need to reach the maximum levels of ITS-90 calibrations. It covers fixed points, platinum resistance thermometry, gas thermometry, and radiation thermometry.



## Annual Book of ASTM Standards

Vol. 14.03, Sec. 14 Temperature Measurement, ASTM, 570 pages.

Order No. 9393-013 \$80

The *Annual Book of ASTM Standards* consists of 72 volumes divided among 16 sections. This one is volume 14.03, *Temperature Measurement*. While this book may not be the first book on temperature measurement, it's really, really close. There are too many tables and too many papers to list. What

else needs to be said? Join the club and get your copy today.



## Manual on the Use of Thermocouples in Temperature Measurement

PCN 28-012093-40, ASTM Manual 12, fourth edition, 1993, 277 pages.

Order No. 9393-010 \$65

If you want to know about thermocouples, you'll find it in this book. It's sponsored by the ASTM Committee E-20 on temperature measurement. It covers thermocouples from A to Z. In addition to theoretical information, it covers temperature uncertainty and supplies a number of reference tables for key thermocouple information.



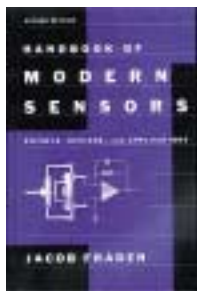
## Guidelines for Realizing the International Temperature Scale of 1990 (ITS-90), NIST Technical Note 1265

B. W. Mangum and G. T. Furukawa; NIST, 1990, 176 pages.

Order No. 9399 \$55

This publication includes, in detail, everything you need to know about the ITS-90. From 0.65 K upward, the authors explain how to realize the scale and offer measurement procedures for all the various

subranges within the scale. For the portion of the scale relating to platinum resistance thermometers, computational examples are included for determining thermometer coefficients. If you're serious about realizing points within the ITS-90, this technical note is a must.



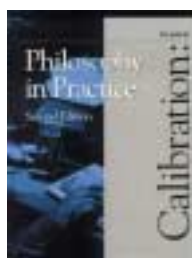
## Handbook of Modern Sensors, Physics, Designs, and Applications

Jacob Fraden; American Institute of Physics, Second Edition, 556 pages.

Order No. 9393-014 \$99

This thorough work is a straightforward guide to the basic principles, design specifications, and uses of a wide array of current sensors—everything from acceleration to vibration. Whether you're using sensors or calibrating them, *Handbook of Modern Sensors* offers a wealth of both

theoretical and practical information. This second edition is updated with new information on temperature and chemical sensors as well as acoustic waves.



## Calibration: Philosophy in Practice

Second Edition, Fluke Corporation, 1994.

Order No. 9393-002 \$85

This is not a temperature calibration book. It primarily discusses DC and low-frequency measurements, and it describes primary and secondary standards as they apply to electrical measurements. The book also has chapters on lab management. While there's no discussion of temperature calibration, the chapters on DC ratios and AC lore

might be interesting to metrologists working with resistance bridges. However, these chapters are not for beginners.



## ANSI/ASQC Q90-94 Guidelines for ISO 9000-9004 (five-volume set)

American Society for Quality Control, 43 pages.

Order No. 9397 \$105

These standards are designed to ensure consistent quality requirements between manufacturers around the world. They were prepared by the Technical Committee ISO/TC 176 on Quality Assurance to help harmonize the large number of international QC standards. Each volume is concise

and easy to read. The five volumes cover the five ISO Guidelines, 9000 to 9004.



## Temperature-Electromotive Force Reference Functions and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90, NIST Monograph 175

G. W. Burns, M. G. Scroger, and G. F. Strouse; NIST 1993, 630 pages.

Order No. 9399-002 \$68

If you work with thermocouples, you rely on published reference functions and temperature-EMF tables. Are you using the right ones? When the International Temperature Scale of 1990 and the new

representation of the volt came into effect in 1990, it became necessary to restate all thermocouple reference functions and tables to match the new definitions.



## ANSI/NCSL Z540 (three-volume set)

Published by the National Conference of Standards Laboratories, 214 pages.

Order No. 9399-003 \$85

This three-volume set is an absolute must. Based on ISO Guide 25 and only 13 pages long, the Z540-1, *Calibration Laboratories and Measuring and Test Equipment—General Requirements*, establishes quality standards for calibration labs. The accompanying *Handbook for the Interpretation and Application of Z540-1* is an invaluable companion text. And the Z540-2, *U.S. Guide to the Expression of Uncertainty in Measurement*, explains all the rules for evaluating uncertainties.

Traceable Temperatures: An Introduction to Temperature Measurement and Calibration forms part of the Wiley Series in Measurement Science and Technology. Chief Editor: Peter Sydenham, Sensor Science and Engineering Group, University of South Australia. This series was founded to coincide with the recognition of measurement science and instrument technology as fields with their own distinct identities. Detailed coverage of traceability: how to make traceable measurements and how to design, carry out and report calibrations. Identification of the main contributing uncertainties for a range of thermometers. Extensive advice on accuracy, with sections devoted to the recognition and treatment of errors.

Calibration Temperature Measurement. Temperature Sensor calibration procedure. Most instrument manuals state there is no calibration of the temperature sensor, but the temperature sensor must be checked to determine its accuracy. This accuracy check is performed at least once per year and the accuracy check date/information is kept with the instrument. Use ice or warm water to adjust the temperature. 2. Place a thermometer that is traceable to the National Institute of Standards and Technology (NIST) and the instrument's temperature sensor into the water. Wait for both temperature readings to stabilize. 3. Compare the two measurements. The accurate measurement of temperature is a vital parameter in many fields. A critically important aspect of applying any temperature sensor is that of traceable calibration - a concept that has been developed to ensure that all measurements made are accurate and legally valid. Product Identifiers. Publisher. John Wiley & Sons LTD, John Wiley & Sons AND Sons LTD. ISBN-10. 0471492914. There the temperature instruments are placed in calibration baths and compared to higher-accuracy temperature standards whose values are traceable to national or international standards (i.e. NIST-traceable). This method produces excellent results, can be used with almost any thermometer and can accommodate a high degree of through put. There are a few reasons that baths are often the first choice. Calibration baths provide a very stable and uniform temperature environment. Stability refers to temperatures remaining constant over time and uniformity refers to the sameness of temperature vertic Traceable Temperatures is an introduction to temperature measurement and calibration. We have put an emphasis on calibration not because we want to train everybody to do calibrations, but because calibration is a simple example of sound measurement design. We have tried to cater particularly for the beginner with modest experience who wishes to acquire expertise or knowledge quickly. In preparing this edition of Traceable Temperatures we have completely rewritten the text and restricted some of the scope. This was necessary to present a systematic approach and include our approach to calibration. We have also attempted to capture the trends of recent developments in international standards relating to measurement. @inproceedings{Nicholas2001TraceableTA, title={Traceable Temperatures: An Introduction to Temperature Measurement and Calibration}, author={J. V. Nicholas and D. White}, year={2001} }. J. V. Nicholas, D. White. Published 2001. Computer Science, Mathematics. Preface to First Edition. Preface to Second Edition. General Reading for First Edition. Acknowledgements for First Edition. Acknowledgements for Figures and Tables. 1. Measurement and Traceability. 2. Uncertainty in Measurement. 3. The ITS-90 Temperature Scale. 4. Use of Thermometers. 5. Calibration. 6. Platinum Resistance Thermometry. 7. Li