ASME B89.7.3.3-2002

GUIDELINES FOR ASSESSING THE RELIABILITY OF DIMENSIONAL MEASUREMENT UNCERTAINTY STATEMENTS

AN AMERICAN NATIONAL STANDARD



The American Society of Mechanical Engineers



AN AMERICAN NATIONAL STANDARD

GUIDELINES FOR ASSESSING THE RELIABILITY OF DIMENSIONAL MEASUREMENT UNCERTAINTY STATEMENTS

ASME B89.7.3.3-2002

This is a free page sample. Access the full version online.

Date of Issuance: February 21, 2003

This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda issued to this edition.

ASME will issue written replies to inquiries concerning interpretation of technical aspects of this Standard.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

No part of this document may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

The American Society of Mechanical Engineers Three Park Avenue, New York, NY 10016-5990

Copyright © 2003 by THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS All Rights Reserved Printed in U.S.A.

CONTENTS

Foreword .	ir	V
Committee	Roster	V
Correspond	ence With the B89 Committee	i
Abstract		1
1	Scope	1
	1.1 Objective	1
	1.2 Applicability	1
	1.3 Purpose	I
2	Definitions	1
3	The Nature of Disagreements in Uncertainty Statements	2
	3.1 General	2
	3.2 Disagreements Involving Single Measurement Systems	2
	3.3 Disagreements involving Multiple Measurement Systems	2
4	Causes of Disagreement in Measurement Results Having	
	Uncertainty Statements	4
	4.1 General	4
	4.2 Blunders	4
	4.3 GUM Noncompliance and Uncorrected Systematic Errors	4
	4.4 Poorly Realized or Incompletely Defined Measurand	4
	4.5 Statistically Kare Measurement Results	5
	4.6 Incomplete Oncertainty Statements	J
5	Methods of Resolution	5
	5.1 General	5
	5.2 Significance of Disagreement	5
	5.3 Comparison of Uncertainty Budgets	6
	5.4 Direct Measurement of the Measurand	8
6	References	0
Figures		_
	1 Examples of Measurement Agreement and Disagreement	3
	2 Example of Product Conformance Disagreement	3

FOREWORD

The ISO Guide to the Expression of Uncertainty in Measurement (GUM) is now the internationally-accepted method of expressing measurement uncertainty. The U.S. has adopted the GUM as a national standard. (See ANSI/NCSL Z540-2.) The evaluation of measurement uncertainty has been applied for some time at national measurement institutes but more recently issues such as measurement traceability and laboratory accreditation are resulting in its widespread use in calibration laboratories.

Given the potential impact to business practices, national and international standards committees are working to publish new standards and technical reports that will facilitate the integration of the GUM approach and the consideration of measurement uncertainty. In support of this effort, ASME B89 Committee for Dimensional Metrology has formed Division 7, Measurement Uncertainty.

Measurement uncertainty has important economic consequences for calibration and measurement activities. In calibration reports, the magnitude of the uncertainty is often taken as an indication of the quality of the laboratory, and smaller uncertainty values generally are of higher value and of higher cost. In the sorting of artifacts into classes or grades, uncertainty has an economic impact through the use of decision rules. ASME B89.7.3.1, Guidelines to Decision Rules in Determining Conformance to Specifications, addresses the role of measurement uncertainty when accepting or rejecting products based on a measurement result and a product specification.

With increasing use of measurements from laboratories that are accredited, and subsequent measurement uncertainty statements, significant economic interests are at stake, so it is not surprising that metrologists might disagree over the magnitude of the measurement uncertainty statements. While the selection of a decision rule is a business decision, the evaluation of the measurement uncertainty is a technical activity. This report provides guidance for resolving disagreements involving measurement uncertainty statements.

This report was approved by the American National Standards Institute on April 22, 2002. Comments and suggestions for improvement of this Technical Report are welcomed. They should be addressed to: ASME, Secretary, B89 Committee, Three Park Avenue, New York, NY 10016-5990



This is a free preview. Purchase the entire publication at the link below:

Product Page

S Looking for additional Standards? Visit Intertek Inform Infostore

> Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation