

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**



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A N A M E R I C A N N A T I O N A L S T A N D A R D

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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

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