

# Overview of JCGM, WG2 (VIM Committee), and VIM4 1CD

Joint Committee for Guides in Metrology (JCGM)  
Working Group on the International Vocabulary of Metrology (VIM) - WG2

## JCGM/WG2 webinar: An overview of the VIM4

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(Representing OIML on JCGM WG2)

# Joint Committee for Guides in Metrology JCGM, 1997

**Bureau**  
International des  
Poids et  
Mesures



# Charter of JCGM (1997)

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## 1. The Joint Committee

- ... is composed of broadly-based international organizations working in the field of metrology.

## 2. Terms of reference

- to develop and maintain, at the international level, guidance documents (VIM and GUM) addressing the general metrological needs of science and technology, and to consider arrangements for their dissemination;
- to promote worldwide adoption and implementation of the results of its work;
- to be responsible for the overall monitoring of its work and its associated Working Groups.

# JCGM Guides: VIM and GUM

## VIM

First edition published by ISO in 1984  
Second edition published by ISO in 1993  
Third edition published by JCGM in 2008



## GUM

The 'undisputed' reference in  
uncertainty evaluation since 1993



# From VIM4 1 CD Introduction

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- The International Vocabulary of Metrology (VIM) is a **guidance document** that aims at disseminating scientific and technological knowledge about metrology by **harmonizing worldwide the related fundamental terminology**.”
- VIM3 and VIM4 1CD definition of ‘metrology’:  
**science of measurement and its application**
- VIM focuses on fundamental terminology and not applications

# Key Structure-Related Choices

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- The VIM presents a consistent, terminologically correct system of terms and definitions, while striving to be as understandable as possible

(e.g., substitution principle is maintained for definitions, and there must be no circularity among definitions)

(concept diagrams removed, but underlying concept system remains)

- The phraseology has been systematically simplified

(e.g., “quantity value” changed to “value” when there is no chance for ambiguity)

# Key Structure-Related Choices

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- The VIM presents a consistent, terminologically correct system of terms and definitions, while striving to be as understandable as possible
- The phraseology has been systematically simplified
- The structure in chapters has been maintained and updated
- The structure of each entry has been maintained (term(s), definition, optional notes and examples)

# The new Structure of Chapters

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1. *Quantities and units*: the key entities of metrology:  
quantities, units, values, and scales

2. *Measurement*: the process and its models



# The new Structure of Chapters

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3. *Measurement quality:*  
uncertainty,  
error, accuracy, etc

4. *Measuring devices  
and their properties:*  
measuring instruments  
and their  
characterization

5. *Measurement standards  
and metrological traceability:*  
metrological systems  
and calibration

2. *Measurement:* the process and its models

1. *Quantities and units:* the key entities of metrology:  
quantities, units, values, and scales

# The new Structure of Chapters

3. *Measurement quality:*  
uncertainty,  
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2. *Measurement:* the process and its models

1. *Quantities and units:* the key entities of metrology:  
quantities, units, values, and scales

6. *Nominal properties  
and examinations:*  
beyond quantities  
and measurement

# Key Structure-Related Choices

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- The phraseology has been systematically simplified
- The structure in chapters has been maintained and updated
- The structure of each entry has been maintained (term(s), definition, optional notes and examples)
- It will be made available both as a traditional, linear document and as an online, machine readable hypertext

# Key Content-Related Choices

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- The treatment of nominal properties and the process of the evaluation is greatly expanded but considered formally outside metrology

# From VIM4 1CD Introduction

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- A consequence of the more extensive treatment of nominal properties (and, to a lesser extent, ordinal quantities) in the VIM4 was that the definitions of 'measurement' and 'metrology' were considered more carefully.
- In particular, the question arose of whether the definitions of either or both should be expanded beyond quantities to include nominal property examination.
- An inquiry among JCGM member organizations was conducted, yielding sometimes strong opinions on both sides of the question.
- It was therefore decided that for now the time is not right to make such a change, but notes have been added to some relevant entries to indicate that the debate exists and could influence future versions of the VIM on this matter.

# Key Content-Related Choices

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- The treatment of nominal properties and the process of the evaluation is greatly expanded but considered formally outside metrology
- Like in the VIM3, ordinal properties are considered to be (measurable) quantities

## Examples

Hardness on Mohs Hardness Scale

Earthquake Intensity on Earthquakes Magnitude Scale

# Key Content-Related Choices

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- The treatment of nominal properties and the process of the evaluation is greatly expanded but considered formally outside metrology
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- The VIM maintains its focus on physical (including chemical and biological) properties, but not psychosocial properties

# Key Content-Related Choices

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- The treatment of nominal properties and the process of the evaluation is greatly expanded but considered formally outside metrology
- Like in the VIM3, ordinal properties are considered to be (measurable) quantities
- The VIM maintains its focus on physical (including chemical and biological) properties, but not properties like psychosocial properties
- Measurement remains defined as an experimental process
- All features of measurement and its results (uncertainty, error, accuracy, etc) are defined according to operational criteria



# From two-column VIM4 1CD / VIM3

International Vocabulary of Metrology 4th edition Committee Draft

## 2 Measurement

2.1 [VIM3: 2.1; VIM2: 2.1; VIM1: 2.01]

### measurement

process of experimentally obtaining one or more **values** that can reasonably be attributed to a **quantity** together with any other available relevant information

NOTE 1 The quantity mentioned in the definition is an individual quantity.

NOTE 2 The relevant information mentioned in the definition may be about the values obtained by the measurement, such that some may be more representative of the **measurand** than others.

NOTE 3 Measurement is sometimes considered to apply to **nominal properties**, but not in this Vocabulary, where the process of obtaining values of nominal properties is called "**examination**".

NOTE 4 Measurement requires both experimental comparison of quantities or experimental counting of entities at some step of the process and the use of models and calculations that are based on conceptual considerations.

NOTE 5 The conditions of reasonable attribution mentioned in the definition take into account a description of the quantity commensurate with the intended use of a **measurement result**, a **measurement procedure**, and a calibrated **measuring system** operating according to the specified measurement procedure, including the measurement conditions. Moreover, a **maximum permissible error** and/or a **target uncertainty** may be specified, and the measurement procedure and the measuring system should then be chosen in order not to exceed these measuring system specifications.

International vocabulary of metrology – Basic and general concepts and associated terms (VIM) – 3rd edition

## 2 Measurement

2.1 (2.1)

### measurement

process of experimentally obtaining one or more **quantity values** that can reasonably be attributed to a **quantity**

NOTE 1 Measurement does not apply to **nominal properties**.

NOTE 2 Measurement implies comparison of quantities or counting of entities.

NOTE 3 Measurement presupposes a description of the quantity commensurate with the intended use of a **measurement result**, a **measurement procedure**, and a calibrated **measuring system** operating according to the specified measurement procedure, including the measurement conditions.

# Four Documents are being Circulated

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- **VIM4 1CD**
- **Two-column VIM4 1CD / VIM3 (or VIN)**
- **“Significant changes of the VIM4 with respect to the VIM3”**
- **Comment Template**

Links to these documents are available through your JCGM Member Organization, and comments are to be submitted back through your JCGM Member Organization, using the Comment Template.

Thank you for  
your support  
and assistance!

**JCGM/WG2**  
**webinar:**  
An overview of the  
VIM4

Chuck Ehrlich, JCGM WG2 Chairman