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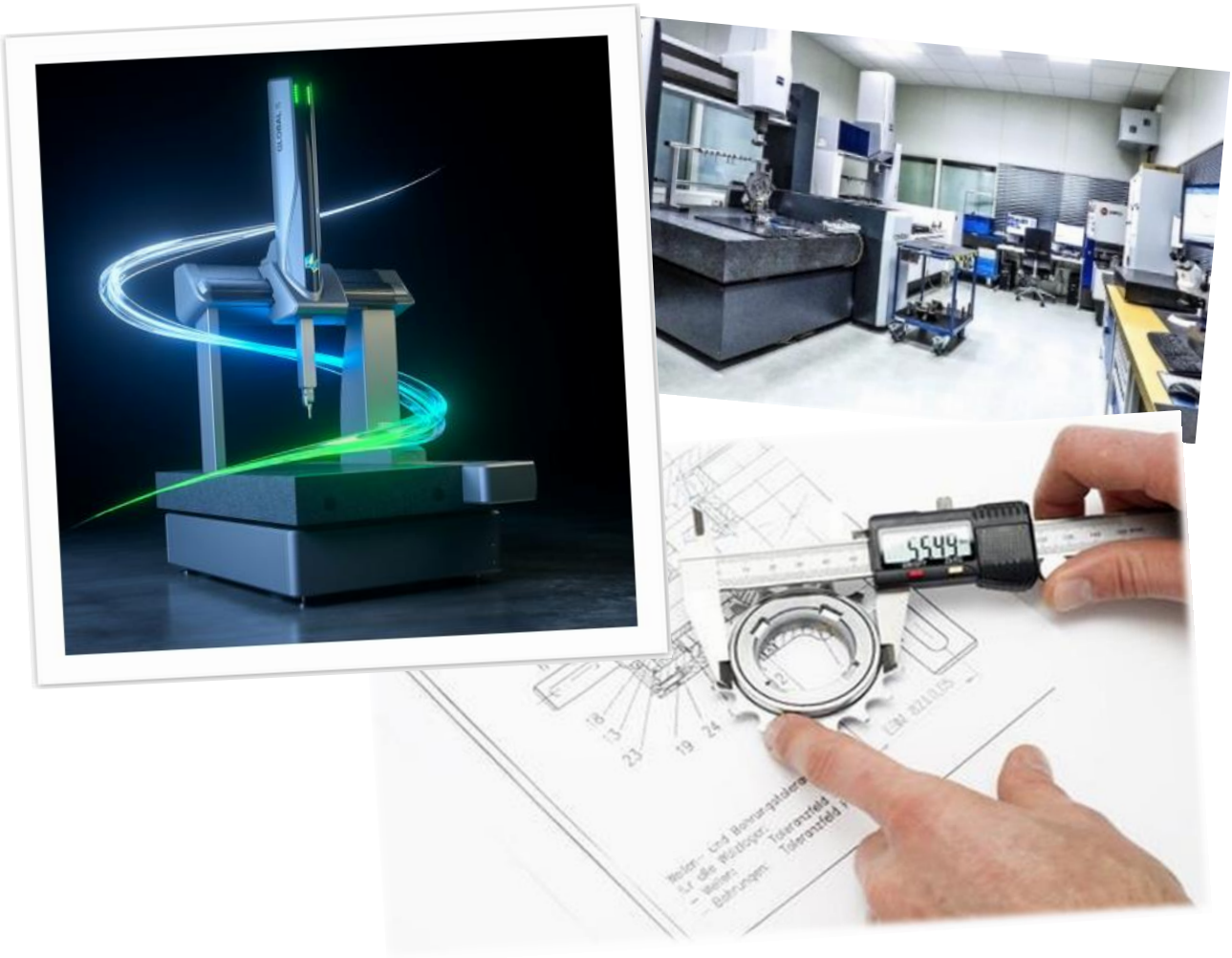
Measurement Basis for Initial Sampling



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Content

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1. Purpose

The purpose of these instructions is to create comparable and transparent measurement results and measurement methods for Hansgrohe, the supplier and the measurement service provider.

2. Scope of Application

The instruction must be applied for all measured values for which no separate agreements have been defined.

3. Basics

Clear and part-specific guidelines for measurement schemes are determined and documented during advanced quality planning (APQP).

The equipment used for testing must be selected depending on the tolerance range of the feature to be tested, the material and the dimensional stability. “For economical testing it [...] may often be advisable to first use a less exact but time- and cost-saving test procedure and only in cases of doubt (measurement value near limit value) use a more precise test procedure. [...]”[1]

The employee carrying out the testing must have the relevant qualifications and must have access to the required measuring equipment. As a matter of principle, the test equipment used must be documented referring to each particular feature in the initial sample inspection report (ISIR) (client as well as supplier).

Measurement reports must generally be attached to the initial sample inspection report.

The choice of test equipment (example: see appendix) for first sampling (PPAP, production part approval process) and serial testing must be performed in an identical way to the APQP at Hansgrohe SE.

If no specifications are stipulated on the technical drawing, the alignments and references selected must be documented in the ISIR.

In case of deviations from the shape specified with regard to roundness, for example, it is advisable to mention the point of measurement.

Deviations from these guidelines are permissible; however, they must be documented.

[1] HENZOLD, Georg, 2011. Form und Lage. 3., überarbeitete Auflage. Berlin: Beuth Verlag GmbH. ISBN 978-3-410-21196-9; author’s translation

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4. Applicable Documents and Standards

- DIN EN ISO 8015, Geometrical Product Specification (GPS) – Fundamentals – Concepts, Principles and Rules
- DIN EN ISO 14405, Geometrical Product Specification (GPS) – Dimensional Tolerancing
- Abbreviations for specification modifiers for linear size are to be taken from DIN EN ISO 14405-1 (table 1).
- DIN EN ISO 5459, Geometrical Product Specification (GPS) – Geometrical Tolerancing – Datums and Datum Systems (ISO 5459:2011); English version EN ISO 5459:2011
- HG 770, Guidelines for First Sampling

5. Definition

- Superposition Principle:
  Technical drawings are generally created according to the superposition principle.

  Example: ISO 8015 / Size ISO 14405

- Envelope Principle:
  Technical drawings are subject to the envelope principle if the "E" indicator is called up in the title block of the drawing.

  Example: ISO 8015 / Size ISO 14405 Ⓔ

- Non-dimensionally stable parts:
  „Part[s] which deform[s] to an extent that in the free state is beyond the dimensional and/or geometrical tolerances on the drawing.“[2]

- Dimensionally stable parts:
  Parts that won’t deform physically after production.

[2] DEUTSCHES INSTITUT FÜR NORMUNG E.V., 1994. *DIN ISO 10579 Bemaßung und Tolerierung nicht-formstabiler Teile.* Berlin: Beuth, 00.03.1994

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6. Measurement Instruction

If a drawing is subject to the superposition principle, each element is considered separately, depending on the definition.

If a drawing is subject to the envelope principle, Min-Max values must be determined for conventional measurements (e.g. caliper gauge, height gauge).

a. References

A reference is a theoretically exact nominal geometry that is defined in the technical drawing.

If the references cannot be clearly read from the drawing, the procedure for creating the reference must be described exactly.

7. Measurement Discrepancies

Measurement discrepancies are deviations of measurement values between client and supplier of about 20% of the tolerance range regarding the exact same feature.

If a discrepancy occurs, the result should be checked by using different testing equipment / different method. The equipment and the method used must be documented in every case where there is a measurement discrepancy.
To evaluate the deviating geometry element it is advisable to record information about the measurement results (e.g. attaching measurement protocols).

8. Measurement Service Provider

If it is not possible to check all elements yourself, this must be carried out by a measurement service provider.

9. Recommendation for Qualification of Measurement Technology Specialists

In order to create globally comparable measurement results, we recommend that measurement technology specialists obtain the internationally standardized qualifications in the Aukom 1, Aukom 2 and Aukom GD&T levels. These 3 levels form the "Aukom measurement technician" certificate.

Further information can be found here:
https://www.aukom.info/en/aukom-training-courses/the-metrologist.html