




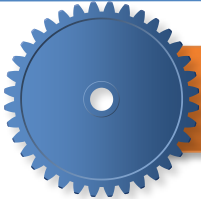


Test methods in standards: requirements and proposals

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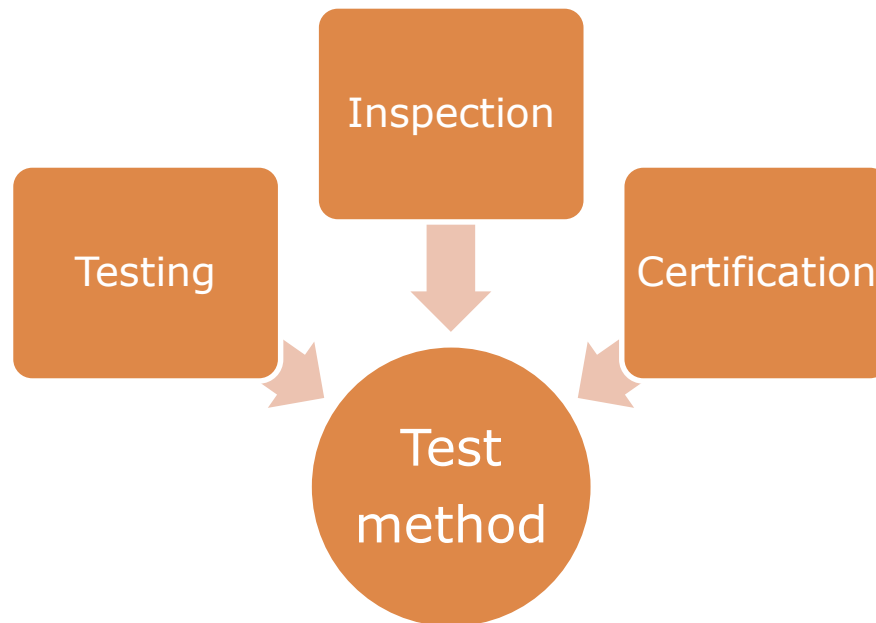
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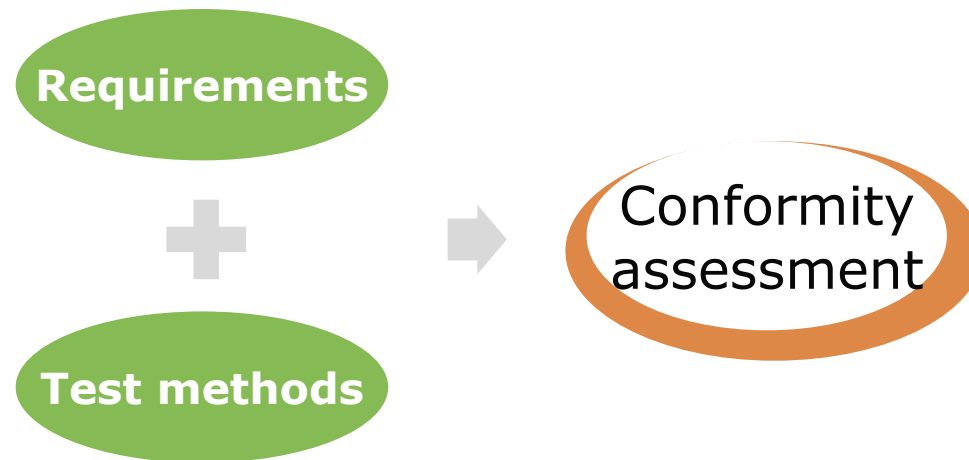


What is test methods ?

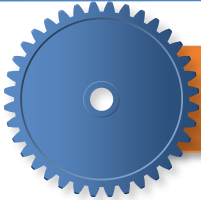
- Measurement and test methods: specify the procedure for determining the values of characteristics or for checking conformity to stated requirements



Why test methods important ?



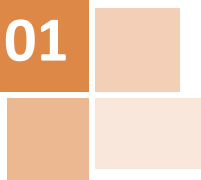
- Using a standardized test method ensures comparability of the results.
- the existence of test methods/procedures for determining compliance with each of the requirements in the standard



When test methods needed ?

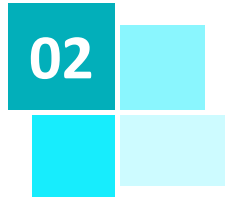
- The test method is a conditional element in a standard
- The standard is best to have test methods under following conditions:

01



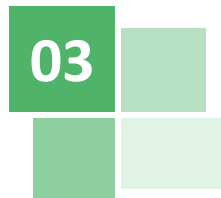
The standard specifies quantitative requirements that need to be judged

02

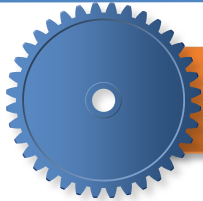


The standard specifies specific characteristics that need to be judged

03

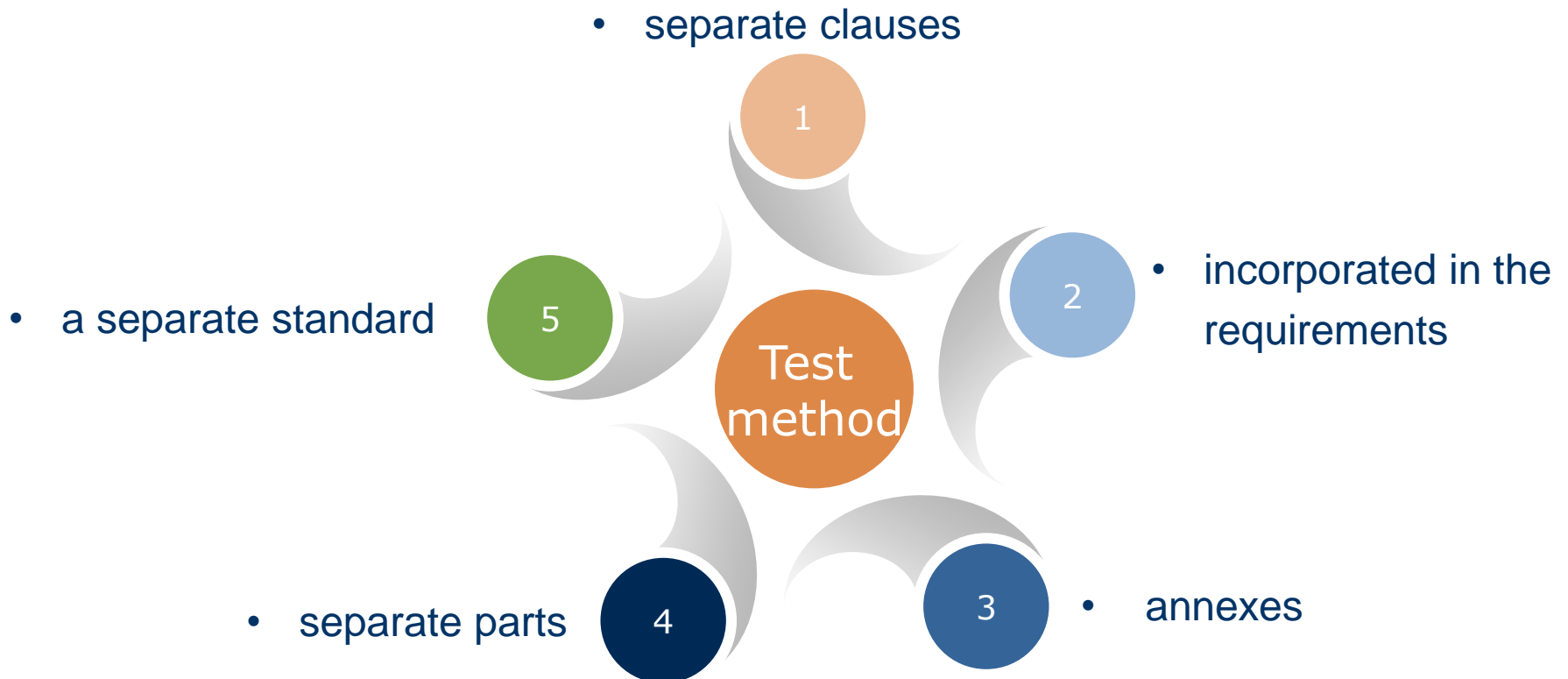


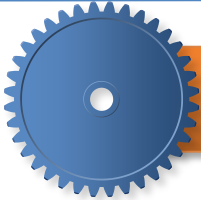
Requirements can not be specified and declared by manufactures



How test methods presented ?

- Measurement and test methods can be presented as follows:








What elements in test methods ?

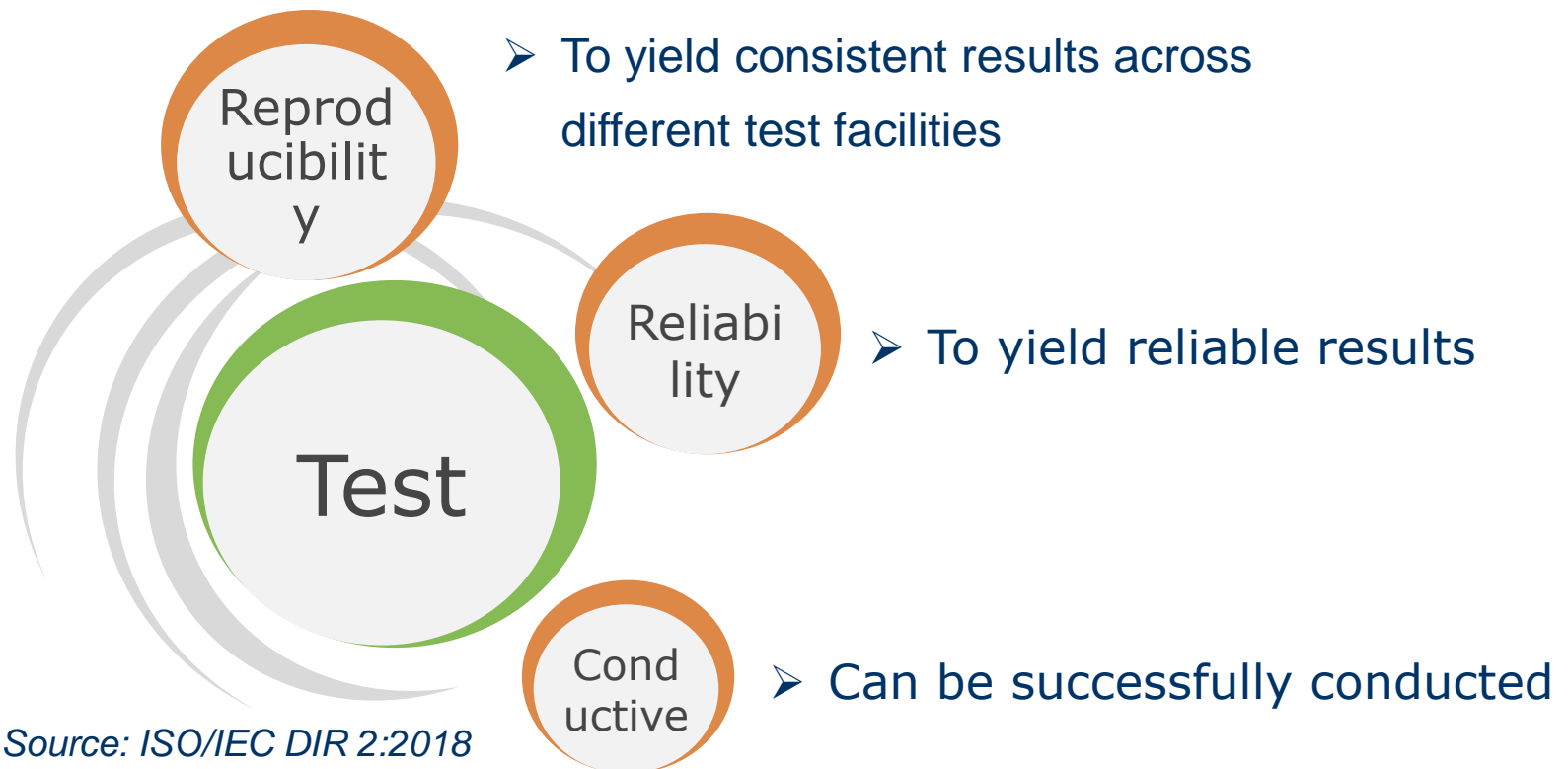
- Measurement and test methods may be subdivided in the following order (where appropriate):
 - a) principle;
 - b) reagents and materials;
 - c) apparatus;
 - d) preparation and preservation of test samples and test pieces;
 - e) procedure;
 - f) expression of results, including method of calculation and precision of the test method, and the measurement uncertainty;
 - g) test report.

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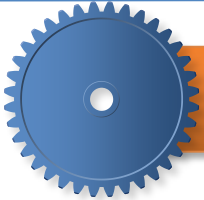
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What are good test methods ?

- Characteristics of good test methods:

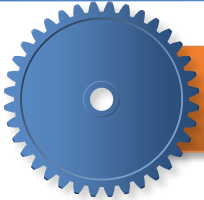


Source: ISO/IEC DIR 2:2018



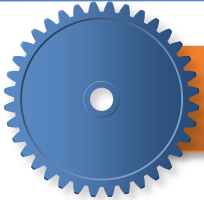
General requirements(1)

- If appropriate, tests shall be identified as type tests, performance tests, sampling tests, routine tests, etc.
- The document shall specify the sequence of testing if the sequence can influence the results
- When a specific sampling method is necessary, this shall be clearly stated in the test method



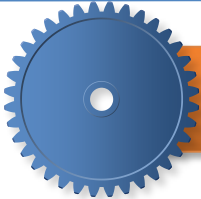
General requirements (2)

- When drafting test methods, it is important to take into account documents for general test methods and of related tests for similar characteristics in other documents.
- Non-destructive test methods shall be chosen whenever they can replace, within the same level of confidence, destructive test methods.



General requirements (3)

- If a test method is, or is likely to be, applicable to two or more types of product, to prevent unnecessary deviations:
 - a document shall be prepared on the method itself
 - each document dealing with a given product shall refer to it , and indicate any modifications that could be necessary



Apparatus

- The apparatus subclause is a conditional element giving a list of the apparatus used in the document:
 - Wherever possible, equipment produced by a single manufacturer should not be specified.
 - Where such equipment is not readily available, this clause shall include such specifications for the equipment as to ensure that comparable testing can be conducted by all parties.

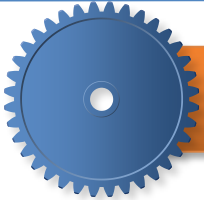
A.2 Apparatus

The usual laboratory apparatus and, in particular, the following.

A.2.1 Sample divider, consisting of a conical sample divider or multiple-slot sample divider with a distribution system, e.g. "Split-it-right" sample divider, such as that shown in Figure A.1.

A.2.2 Steel bowls, of diameter 100 mm \pm 5 mm; seven per test sample.




A.2.3 Balance, which can be read to the nearest 0,01 g.

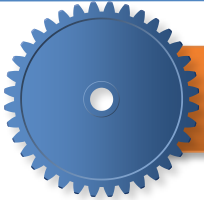


Alternative test methods

- If more than one adequate test method exists for a characteristic, only one should in principle be specified.
- If, for any reason, more than one test method is to be specified, a referee test method (often called reference test method) may be identified in the document to resolve doubts or dispute.

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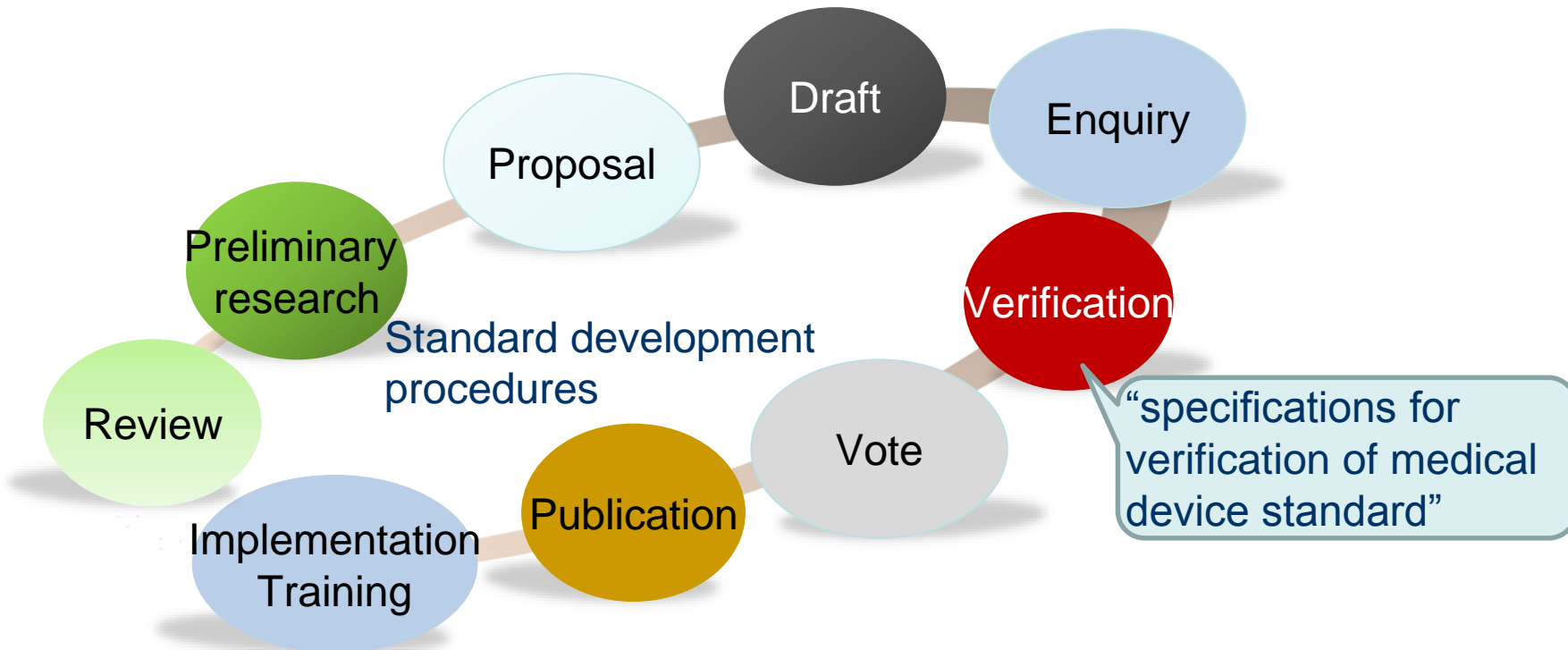
Optimized procedure

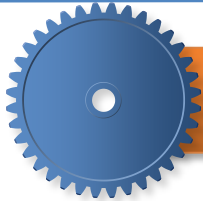
- Test methods should be verified prior to the publication of the standard
- Encouraging testing labs and manufactures to participant in verification.

Proposal for improvement

Best practices in China(1)

- In China, verification is a mandatory procedure in the whole process of standard development :





Best practices in China(2)

- Procedures and requirements for verification:

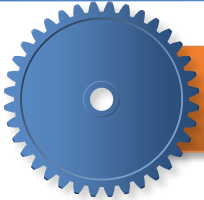


- Requirement reasonability
- test method feasibility and reliability
- Lab test or reference to other standards

- No less than 2 verification units
- One needs to be a testing lab
- Independently

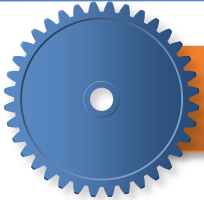
- Analysis and summary
- Problem analysis and suggestion to change

- If failed, redraft standards



Best practices in China(3)

- **Training:** When standard released, TCs need to organize training for regulation, manufactures and other relevant departments. For some important standards, TCs may publish training materials or testing specifications of standards.
- **Assessment:** TCs need to annually evaluate and statically analyze the implementation of standards including questionnaire statistics to all qualified testing labs.



Optimized contents

- Test methods should be described in sufficient detail to ensure that the test can be successfully conducted and consistent results obtained.
- Standards should have a rationale explaining the basis for the test methods in the standard. The rationale should identify and explain test methods and/or other means of demonstrating compliance.
- Whenever alternative test methods are included in a standard and preferences for different alternatives provided, the reasons for the preferences should be explained.

Thank You!

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