

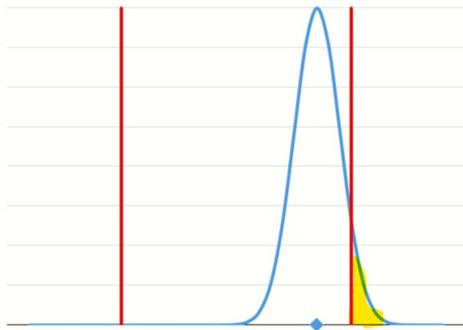
WHAT IS A CONFORMITY STATEMENT INVOLVING A DECISION?

Introduction

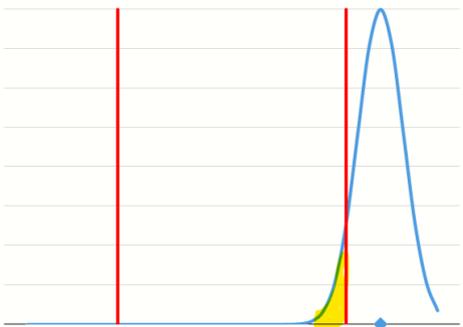
In a first step, a testing or calibration laboratory would produce some kind of **result** according to your order. This result comes by its very nature with an **uncertainty** which the laboratory calculates and usually states in the report document.

This uncertainty is determined using statistical techniques. If you additionally require the laboratory to make a pass-fail statement with respect to some kind of limit or specification value, this is called a **decision** (also called acceptance or rejection). These decisions generally offer a high probability of being correct. But due to their statistical nature, these decisions themselves have an uncertainty which can result in wrong decisions. There are two cases of wrong decisions: false acceptance and false rejection and there are probabilities assigned with them: the **probability of false acceptance (PFA)** and the **probability of false rejection (PFR)**. These probabilities impose certain **risks** to you as customer of the lab.

The risk connected with PFA is sometimes called **consumer's risk** while the risk with PFR is sometimes called **producer's risk**.



Measured value with its uncertainty distribution (blue) and tolerance lines (red): the result is “pass” (accept). However, there is a small area (yellow) which is outside of the limit, This area depicts the probability of false accept (PFA).



Measured value with its uncertainty distribution (blue) and tolerance limits (red); the result is “not pass” (reject). However, there is a small area (yellow) which is inside of the tolerance limits. This area depicts the probability of false reject (PFR).

What is a decision rule?

The way how the laboratory finds the decision based on the result, the uncertainty and the limit is called a **decision rule**. There are various decision rules and these differ in the PFA and PFR values.

As a customer, do I have a choice regarding the decision rule?

There are two general cases:

In many procedure standards (norms), the decision rule is **part of the standard**. In this case, the laboratory will apply this rule, but it will be able to explain the probabilities of this rule.

If the standard does not define a decision rule, you as a customer must reach an **agreement** with the lab on which decision rule(s) the laboratory should apply. The levels of PFA and PFR should be guiding you to the choice considering the intended use of the product to be tested. You should be aware that small risks require small uncertainties and might be more costly since they require more accurate procedures.

Further reading

More detailed information on this topic can be found in the following sources:

- ILAC Guidelines on Decision Rules and Statements of Conformity [ILAC-G8:09/2019](#)
- JCGM 106:2012: Evaluation of measurement data – The role of measurement uncertainty in conformity assessment. [Download from BIPM website](#)
- Eurolab Technical Report: Decision rules applied to conformity assessment. [Download from the EUROLAB website](#)
- Eurolab Cook Book 8: Determination of Conformance with Specifications or Limit Values. [Download from the EUROLAB website](#)