

Standard Quality Requirements for Suppliers

1.0 Aim and purpose

These instructions define the standard quality requirements for suppliers of VERWO AG (hereinafter referred to as VERWO). All technical and organisational frame conditions between VERWO and the supplier are regulated with the purpose of ensuring the right quality of the products and services ordered by VERWO.

2.0 Scope

These quality requirements apply to all deliveries of individual components and/or assemblies, including purchased services, and must be complied with by all suppliers. Other quality requirements specified as part of the order (e.g. inspections and test plans, standards, drawings, etc.) supersede requirements made in this document, the rest still applies.

3.0 Responsibility

The supplier/manufacturer is responsible for fulfilling the requirements of this instruction. VERWO quality management is responsible for the content of this work instruction.

4.0 Feasibility

Any ambiguities in the order documents must be clarified in writing with VERWO prior to the start of production. The same applies to changes on the part or service that deviate from the ordered specification.

5.0 Testing methods

Sufficient testing methods ensuring the fulfilment of the specifications ordered must be defined by the supplier and, if necessary, documented in a test report.

6.0 Measuring and testing equipment

The supplier must ensure that suitable measuring and testing equipment is available. All measuring and testing equipment must be subject to regular and documented inspection (calibration).

7.0 Qualification of personnel

The supplier must ensure that all tests are carried out by trained and qualified personnel. If a test must be carried out by a licenced inspector (non-destructive tests, weld seam testing, etc.) the supplier is obliged to provide these licences on request.

8.0 Scope of testing

8.1 First sample

If required (as noted on the order), a first article inspection can be requested for products and services that are being produced for the first time or after a change in specification or manufacturing process. All specified features must be measured/inspected on at least one component and documented in a first article inspection report (FAIR). The printed first article inspection reports (including all measurement and inspection reports) must be sent with the delivery.

8.2 Serial production

Independently of the production batch size, at least two parts must be measured/tested (first and last item manufactured in a production batch) and the results must be documented. These reports must be provided on request. The features to be tested are described in the following table depending on the manufacturing process.

| Manufacturing proces | Dimensional Tolerances | Geometrical Tolerances | Positional Tolerances | Visual Inspection | Surface Quality |
|---|---|------------------------|-----------------------|-------------------|--------------------|
| Primary Shaping (e.g. casting, sintering) | ≤ 1 mm (e.g. $\leq \pm 0.5$ mm $\leq +0.2$ m / -0.8 mm) | ≤ 1 mm | ≤ 1 mm | Yes | - |
| Forming (e.g. bending, deep drawing) | ≤ 1 mm | ≤ 0.5 mm | ≤ 0.5 mm | Yes | - |
| Cutting (e.g. laser cutting, sawing) | ≤ 0.2 mm | ≤ 0.2 mm | ≤ 0.2 mm | Yes | - |
| Machining (e.g. turning, milling) | ≤ 0.2 mm | ≤ 0.2 mm | ≤ 0.2 mm | Yes | $\leq Ra 1.6$ (N7) |
| Joining (e.g. welding, soldering) | - | - | - | Yes | - |
| Coating (e.g. painting) | - | - | - | Yes | - |

Table 1: Features to be tested

In addition to the obligatory test of the first and last item of a manufacturing batch, further measurements/tests may be required (e.g. due to the complexity of the products and services, stability of the manufacturing process, history of errors, modifications to the manufacturing process, etc.). The definition of an appropriate scope for the test (number of components and features to be tested) shall be defined by the supplier.

9.0 Visual requirements

The components to be delivered must be in visual perfect conditions. Serial parts must correspond to the approved sample.

10.0 Raw material

An inspection certificate 3.1 as per DIN EN 10204 can be requested (note on the order). If this certificate cannot be provided, an alternative proof of evidence must be agreed with VERWO.

11.0 Deviations / concession request

If a part does not meet the requirements or specifications, this part may not be delivered without special approval in writing from VERWO (Concession Request).

The 'Concession request' form can be downloaded from the supplier download area on VERWO's home page. If other request forms are used, it is essential that they contain at least the same information as the VERWO form.

12.0 Obligation to retain documents

All documents associated with the delivery must be archived for at least 15 years and must be available to VERWO personnel at any time at least on supplier site.