

TECHNICAL REQUIREMENTS FOR THE DELIVERY OF TUBE PRODUCTS (VERSION SEPTEMBER 2022)



TECHNICAL REQUIREMENTS FOR THE DELIVERY OF TUBE PRODUCTS

1. Scope of application

These technical requirements for the delivery are applicable in case the details in the customer drawing are lacking or non-specific and as supplement to the customer drawing. In any of the above cases these technical requirements for delivery shall be considered as applicable specifications as well. Details on the drawing and customer provided specifications, however, have priority at all times.

We assume no warranty for requirements going beyond the above-mentioned Technical Requirements. It is the customer's responsibility to provide clear specifications.

2. Implementation

2.1. Dimensional tolerances, marks of impact

For dimensions without specification of tolerances DIN ISO 2768-m shall be applicable. Inasmuch as dimensions without specification of tolerances below 0.5 mm exist, the same shall also be treated in compliance with DIN ISO 2768-m (like the dimensions 0.5-3 mm).

Unless agreed to the contrary the parts shipped are handled as bulk. Parts may have marks of impact, which are a result of their handling, always provided they are in compliance with the tolerances specified on the drawing. No consideration shall be made for marks of impact in the process capability studies. For round tube products the mean value of the outer diameter and the mean value of the inner diameter are applicable.

2.2. Influence of the starting material on the finished part

The inner condition of the tubes must be specified when ordering for the first time. If no separate agreement is made, there may be a raised weld seam on the inside for production reasons. When checking the inside diameter, the weld seam is not taken into account in terms of tolerance.

2.3. Angular tolerances

For all angles without specified tolerances a tolerance of $\pm 2^\circ$ will be applied. For chamfered edges and fractured edges with edge lengths ≤ 0.5 mm an angle tolerance of $\pm 5^\circ$ will be applied.

For chamfered edges and smoothed edges without specified tolerances the following tolerances will be applied:

Nominal dimension up to 0.2 mm	→ +/- 0.1 mm
Nominal dimension above 0.2 to 0.5 mm	→ +/- 0.2 mm
Nominal dimension above 0.5 mm to 1.0 mm	→ +/- 0.3 mm
Nominal dimension above 1.0 mm	→ +/- 0.4 mm

2.4. Workpiece edges without dimensions

For all workpieces without dimensions shall be applicable:

Exterior edges -0.2 mm

Interior edges +0.4 mm

Kindly refer to DIN ISO 13715 in this context

Descriptions of edges like "sharp-edged without burr", "sharp-edged and without burr" will be assumed to mean ± 0.1 mm in compliance with DIN 13715, i.e. a minimal chamfer as well as minimal burr may be present. For the "burr removed by vibration grinding"

TECHNICAL REQUIREMENTS FOR THE DELIVERY OF TUBE PRODUCTS

version some burr may remain in the inside diameter. This is due to the process and impossible to avoid. Such remaining burr may infringe upon the tolerance.

2.5. Surface

2.5.1. General surface quality

The surface has an average roughness Ra 4 in compliance with DIN EN ISO 1302 and an average surface peak-to-valley height of Rz 25 provided the measuring length is sufficient for the assessment. Marks of impact as mentioned in 2.1 will have no influence on the result of the surface quality. From a manufacturing point of view it is impossible to meet the condition of a smooth interior surface at all times. From a production engineering point of view scars, like surface scratches, can occur on our parts. As long as the parts are within the agreed tolerances this shall be no reason for a query/complaint.

2.6. Input material = customer supplied material

2.6.1. Liability for non-conforming raw material

We assume no liability whatsoever for non-conforming raw materials.

2.6.2. Special tests

Special tests for the detection of defects in the material itself or quality of materials (e.g. density) must be agreed specifically in writing.

2.6.3. The customer shall deliver the materials he has to provide (e.g. raw materials, unmachined parts, and semi-finished products in good time to our plant.

2.6.4. The materials provided shall be labelled and delivered in a quality that allows a proper further processing thereof. The customer shall be the sole party responsible for the absence of defects and the materials provided being fit for the intended purpose. We assume no obligation to inspect customer provided materials for absence of defects or being fit for purpose.

2.6.5. Inasmuch as we have to make defined arrangements or take precautions in the handling of customer provided materials the customer shall inform us in writing and in good time.

2.6.6. By principle customer provided materials are used for a production order. Has the storage been agreed, we will invoice storage at the cost resulting.

2.6.7. Whenever customer provided materials will be damaged or destroyed we assume no liability for this to the extent where we are not responsible, have acted with a slight degree of negligence only not exceeding a customary failure quota. In such a case the customer shall provide materials again at no cost to us in the quantities required to fill the order. In all other cases our liability shall be limited to a replacement of damaged or destroyed materials, inasmuch as we are not liable for gross negligence of our owner respectively our organs or intent.

2.7. Heat treatment/surface treatment

2.7.1. Heat-treated parts may show irregular discolouration on the surface.

2.7.2. Dimensional changes resulting from heat treatments and/or surface treatments

For all dimensions specified the thickness of the surface layer subsequently to be applied shall be considered. The same applies for dimensional changes resulting from heat treatments. Excepted are dimensions, which are specified by customary commercial materials, unless specific reference is made thereto in the drawing.

TECHNICAL REQUIREMENTS FOR THE DELIVERY OF TUBE PRODUCTS

2.7.3 Zinc flake coatings on parts with an unfavourable geometry may produce parts that cling to each other. This will be no cause for an objection. For this process it is impossible to exclude at all times the formation of drops and lugs, which may impair tolerances.

2.8. Condition when shipped

Parts from low alloy materials will be conserved slightly before they are shipped. Shipments are made bulk in non-returnable cartons, one-way bags or wire mesh pallets unless different packing has been agreed.

3. Quality certificates

Quality certificates in writing (manufacturer's test certificate 2.2 or 3.1 under DIN EN 10204) will be prepared only when they have been ordered in writing before the order is processed.

Unless the drawing or applicable specifications state specific requirements random samples of the parts ordered will be subjected to a dimensional inspection only. Additional tests with respect to the quality of the parts ordered (e.g. tensile strength test, hardness test, decarburization test, renewed tempering test, head impact test, compression test, notched bar impact bending test, torsional test, leak test, check of the technical cleanliness, functional tests, etc.) require a separate agreement.

The compliance with quality agreements, supplier guidelines, etc. may be committed to only on the base of a contract in writing signed by both partners and for the version in force at the time of its signing. We are assuming an incoming goods inspection at the customer in line with § 377 of the Commercial Code. The chemical and mechanical characteristic values of tube products may deviate from the corresponding DIN standard or EN standard for the respective tube (caused by redrawing or annealing).

4. Corrosion protection

When no corrosion protection has been agreed a temporary corrosion protection will be applied to the parts. Corrosion that starts immediately shall be no cause for a query. Surface coating or surface finishing in the interior area may be applied with a layer thickness diminishing to 0μ . Results from corrosion tests can be acknowledged only when the same have been conducted directly following the galvanic surface finishing. Corrosion protection by principle is a technical and no decorative coating. No warranty can be given for a uniform surface.

5. Quality when shipped

From a production technological point of view a defect rate per characteristic of:

- 1000 ppm for unsorted parts
- 100 ppm for manually sorted parts
- 20 ppm for automatically sorted parts

is possible.

TECHNICAL REQUIREMENTS FOR THE DELIVERY OF TUBE PRODUCTS

6. Appearance

Our products are subject to fluctuations in surface appearance, gloss, structure, colour and quality resulting from the production technology applied. The same are no ground to raise a claim.