

**HAFNER PNEUMATIKA – Technical Specifications for Suppliers**

**1. Dimensional tolerances, defects**

- 1.1. For dimensions without specific tolerances, the following standards apply: ISO 2768-1:1989 - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications, class "m" (medium), and ISO 2768-2:1989 - Part 2: Geometrical tolerances for features without individual tolerance indications, class "H" (fine).
- 1.2. Unless explicitly approved by the Customer, components must be free of visible defects under suitable inspection and lighting conditions at 10x magnification.

**2. Undefined edges**

- 2.1. Unspecified edge breaks should comply with DIN ISO 13715:
  - 2.1.1. external edges: max. -0,1 mm
  - 2.1.2. internal edges: max. +0,2 mm
- 2.2. For edge markings such as "sharp-edged, burr-free", "sharp-edged", and "burr-free", a tolerance of  $\pm 0.02$  mm according to DIN ISO 13715 must be applied.
- 2.3. For intersecting bores or bore transitions, the maximum allowable burr is +0.1 mm.

**3. Threading**

**3.1. Thread inspection with gauges**

Tolerances for thread production and inspection:

- External M thread: 6g
- Internal M thread: 6H
- External G thread: A
- Internal G thread: A
- External UNF thread: 2A
- Internal UNC thread: 2B
- For internal threads, the "no-go" side of the gauge may be screwed in no more than two full turns. Similarly, for external threads, the "no-go" side of the ring gauge may be screwed on no more than two full turns (see DIN ISO 1502).
- The "go" side must pass through the full thread length.

**3.2. Thread starts, run-outs, and chamfers**

- Thread starts and run-outs must always be chamfered
- For external threads: minimum corner break = root diameter -0,1 / -0,2 mm
- For internal threads: maximum corner break = thread diameter +0,1 / +0,2 mm
- Chamfer angle:  $45^\circ \pm 5^\circ$
- Thread run-outs according to DIN 76:
  - o External threads:
    - run-out: x2
    - run-out before collar: a2
    - undercut: B2
  - o Internal threads:
    - run-out: e2x
    - undercut: D2

**3.3. Turning stub**

Turning stubs on components are generally not permitted. In problematic cases, prior consultation is required before production. Applicable standard: DIN 6785.

**3.4. Dimensional changes from surface and heat treatment**

The technical drawing includes the finished dimensions of the part after surface or heat treatment. During production, dimensional changes from treatment must be considered based on the relevant technology.