Before manufacturing a fit

FDM 3D printing · practical reference

Clearance

0.10 / 0.50 mm

Transition

-0.10 / 0.30 mm

Interference

-0.50 / -0.10 mm

Figures: minimum / maximum diameter difference (mm).

Blue: bore · grey: shaft · hatching: shared diameters.

Hypothetical examples, not printing capabilities.

An example worth checking

Shaft 20.00 ± 0.10 · bore 20.30 ± 0.10 mm → clearance 0.10–0.50 mm

Cmin = Cnom - Tbore - Tshaft; Cmax = Cnom + Tbore + Tshaft
T = ± half-width. Diametral differences; negative = interference. No forces or probabilities.

01 Define function

Must it slide, retain, rotate or come apart? Identify the critical surfaces.

02 Set the limits

Tolerance = permitted interval. Clearance = bore minus shaft diameter.

03 Check the extremes

Do not decide from nominal sizes alone. The pair may have clearance or interference.

04 Test a sample

Keep material, orientation, walls and profile. Validate the full assembly afterwards.

05 Measure and check

Agree method, conditions and acceptance. One part does not qualify a batch.

06 Plan finishing

If needed, allow for material, access, workholding, references and inspection.

Your check

Part and version

Dimension / limits

Material / orientation

Method / result / acceptance