

About This Document

This reference sheet summarises the general tolerance standard applied to all CNC Machining orders placed through Shapeways. Where no tolerance is specified on a technical drawing, parts are manufactured to DIN ISO 2768-mK (medium class linear dimensions, class K geometric tolerances). For tighter or specific tolerances, attach a technical drawing with the required tolerances clearly called out — Shapeways will confirm feasibility and pricing before production.

Shapeways standard	DIN ISO 2768-mK	Medium class linear · Class K geometric
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Linear Dimensions — DIN ISO 2768 T1 (permissible deviations in mm)

Highlighted column (green) = Shapeways default class. All values are \pm mm.

Nominal dimension (mm)	f (fine)	m (medium)	c (coarse)
0.5 up to 3	± 0.05	± 0.1	± 0.2
over 3 up to 6	± 0.05	± 0.1	± 0.3
over 6 up to 30	± 0.1	± 0.2	± 0.5
over 30 up to 120	± 0.15	± 0.3	± 0.8
over 120 up to 400	± 0.2	± 0.5	± 1.2
over 400 up to 1000	± 0.3	± 0.8	± 2.0

Angular Dimensions — DIN ISO 2768 T1

Nominal length (mm)	f (fine)	m (medium)	c (coarse)
up to 10	$\pm 1^\circ$	$\pm 1^\circ$	$\pm 1^\circ 30'$
over 10 up to 50	$\pm 0^\circ 30'$	$\pm 0^\circ 30'$	$\pm 1^\circ$
over 50 up to 120	$\pm 0^\circ 20'$	$\pm 0^\circ 20'$	$\pm 0^\circ 30'$
over 120 up to 400	$\pm 0^\circ 10'$	$\pm 0^\circ 10'$	$\pm 0^\circ 15'$
over 400	$\pm 0^\circ 5'$	$\pm 0^\circ 5'$	$\pm 0^\circ 10'$

Geometric Tolerances — DIN ISO 2768 T2 (class K)

Shapeways applies class K for geometric tolerances (straightness, flatness, perpendicularity, symmetry, and run-out). Values below are for class K.

Feature	Nominal range (mm)	Class K tolerance (mm)
Straightness & Flatness	up to 10	0.05

	over 10 up to 30	0.1
	over 30 up to 100	0.2
	over 100 up to 300	0.4
	over 300 up to 1000	0.6
Perpendicularity	up to 100	0.4
	over 100 up to 300	0.6
Symmetry	up to 100	0.6
	over 100 up to 300	0.8
Circular run-out	all ranges	0.2

How to Specify Tolerances

Situation	What to do
No specific tolerance required	No action needed — DIN ISO 2768-mK applies automatically
Tight tolerance on specific features	Attach a PDF technical drawing. Call out the required tolerance on each critical dimension using standard GD&T; notation
Fit class required (e.g. H7/h6)	Specify the ISO fit class on your technical drawing for the relevant bore or shaft feature
Custom surface finish (Ra)	Note the required Ra value and the surfaces it applies to in your order notes
Unsure what tolerance you need	Contact sales@shapeways.com — we will help you define the right specification

m (medium) class linear dimensions and K class geometric tolerances are the Shapeways default for CNC Machining. Green values throughout this document indicate the Shapeways standard. Surface finish standards vary by material — refer to the individual material page for Ra specifications. All tolerance values are based on DIN ISO 2768. This document is prepared by Shapeways and does not reproduce the standard in full.