

General Tolerance

ISO 2768 – 1 & 2

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Part 1

General Tolerances ISO 2768-1

ISO 2768-1 is intended to simplify drawing indications and specifies general tolerances in 4 tolerance classes (f-fine, m-medium, c-coarse, v-very coarse). It applies for the linear dimensions and angular dimensions such as external sizes, internal sizes, step sizes, diameters, radii, distances, external radii, and chamfer heights for broken edges.

If general tolerances in accordance with ISO 2768 shall apply, ISO 2768 followed by the tolerance class (Ex: ISO 2768-m) shall be indicated in or near the title block.

The following is the tolerance table corresponding to the 4 class precision levels, you can choose the most suitable one according to machining capabilities and your requirements.

Table 1 – Linear Dimensions

| Permissible deviations in mm For ranges in nominal lengths | Tolerance Class Designation (Description) | | | |
|---|---|-----------|-----------|----------------|
| | f(fine) | m(medium) | c(coarse) | v(very coarse) |
| 0.5 up to 3 | ±0.05 | ±0.1 | ±0.2 | -- |
| over 3 up to 6 | ±0.05 | ±0.1 | ±0.3 | ±0.5 |
| over 6 up to 30 | ±0.1 | ±0.2 | ±0.5 | ±1.0 |
| over 30 up to 120 | ±0.15 | ±0.3 | ±0.8 | ±1.5 |
| over 120 up to 400 | ±0.2 | ±0.5 | ±1.2 | ±2.5 |
| over 400 up to 1000 | ±0.3 | ±0.8 | ±2.0 | ±4.0 |
| over 1000 up to 2000 | ±0.5 | ±1.2 | ±3.0 | ±6.0 |
| over 2000 up to 4000 | -- | ±2.0 | ±4.0 | ±8.0 |

For nominal sizes below 0.5 mm, the deviations shall be indicated adjacent to the relevant nominal size(s).

Table 2 – External Radii and Chamfer Heights

| Permissible deviations in mm For ranges in nominal lengths | Tolerance Class Designation (Description) | | | |
|---|---|-----------|-----------|----------------|
| | f(fine) | m(medium) | c(coarse) | v(very coarse) |
| 0.5 up to 3 | ±0.2 | ±0.2 | ±0.4 | ±0.4 |
| over 3 up to 6 | ±0.5 | ±0.5 | ±1.0 | ±1.0 |
| over 6 | ±1.0 | ±1.0 | ±2.0 | ±2.0 |

For nominal sizes below 0.5 mm, the deviations shall be indicated adjacent to

the relevant nominal size(s).

Table 3 – Angular Dimensions

| Permissible deviations in mm For ranges in nominal lengths | Tolerance Class Designation (Description) | | | |
|---|---|--------------------|--------------------|--------------------|
| | f(fine) | m(medium) | c(coarse) | v(very coarse) |
| up to 10 | $\pm 1^{\circ}$ | $\pm 1^{\circ}$ | $\pm 1^{\circ}30'$ | $\pm 3^{\circ}$ |
| over 10 up to 50 | $\pm 0^{\circ}30'$ | $\pm 0^{\circ}30'$ | $\pm 1^{\circ}$ | $\pm 2^{\circ}$ |
| over 50 up to 120 | $\pm 0^{\circ}20'$ | $\pm 0^{\circ}20'$ | $\pm 0^{\circ}30'$ | $\pm 1^{\circ}$ |
| over 120 up to 400 | $\pm 0^{\circ}10'$ | $\pm 0^{\circ}10'$ | $\pm 0^{\circ}20'$ | $\pm 0^{\circ}30'$ |
| over 400 | $\pm 0^{\circ}5'$ | $\pm 0^{\circ}5'$ | $\pm 0^{\circ}10'$ | $\pm 0^{\circ}20'$ |

Part 2

General Tolerances ISO 2768-2

ISO 2768-2 is for simplifying drawing and fixes general tolerances in 3 tolerance classes (H, K and L), this part including General Geometrical Tolerances range of flatness & straightness, cylindricity, and circularity. You can check the tolerance chart below:

Table 4 – General Tolerances on Straightness and Flatness

| Ranges of nominal lengths in mm | Tolerance Class | | |
|---------------------------------|-----------------|------|-----|
| | H | K | L |
| up to 10 | 0.02 | 0.05 | 0.1 |
| above 10 to 30 | 0.05 | 0.1 | 0.2 |
| above 30 to 100 | 0.1 | 0.2 | 0.4 |
| above 100 to 300 | 0.2 | 0.4 | 0.8 |
| above 300 to 1000 | 0.3 | 0.6 | 1.2 |
| above 1000 to 3000 | 0.4 | 0.8 | 1.6 |

Table 5 – General Tolerances on Perpendicularity

| Ranges of nominal lengths in mm | Tolerance Class | | |
|---------------------------------|-----------------|-----|-----|
| | H | K | L |
| up to 10 | 0.2 | 0.4 | 0.6 |
| above 10 to 30 | 0.3 | 0.6 | 1.0 |
| above 30 to 100 | 0.4 | 0.8 | 1.5 |
| above 100 to 300 | 0.5 | 1.0 | 2.0 |

Table 6 – General Tolerances on Symmetry

| Ranges of nominal lengths in mm | Tolerance Class | | |
|------------------------------------|-----------------|-----|-----|
| | H | K | L |
| up to 10 | 0.5 | 0.6 | 0.6 |
| above 10 to 30 | 0.5 | 0.6 | 1.0 |
| above 30 to 100 | 0.5 | 0.8 | 1.5 |
| above 100 to 300 | 0.5 | 1.0 | 2.0 |

Table 7 – General Tolerances on Circular Run-Out

| Ranges of nominal lengths in mm | Tolerance Class | | |
|------------------------------------|-----------------|-----|-----|
| | H | K | L |
| | 0.1 | 0.2 | 0.5 |

Summary

In summary, tolerance is a very important and vital part of product design. The ISO 2768 standard defines general tolerance values, which greatly simplifies design work and production. Under this standard, we can have more effective communication, we can save more time and cost.