



## Tolerance guide



**ALFA** MIMtech

metal injection moulding technologies



The dimensional and geometrical tolerances, finishes and other characteristics are generally based on the norms laid out in the ISO-2768-mK certification. The norm is applied in general terms, but it is possible to achieve greater precision in certain areas, dimensions or characteristics.

| LINEAR DIMENSIONS |      |                           |                             |
|-------------------|------|---------------------------|-----------------------------|
| Dimension (mm)    |      | Tolerance mm(%)           |                             |
| from              | to   | ISO2768-mK Standard       | Optimum achievable          |
| 0,5               | 3    | $\pm 0.1$ ( $\pm 8.0\%$ ) | $\pm 0.025$ ( $\pm 0.8\%$ ) |
| 3                 | 6    | $\pm 0.1$ ( $\pm 1.6\%$ ) | $\pm 0.030$ ( $\pm 0.5\%$ ) |
| 6                 | 30   | $\pm 0.2$ ( $\pm 0.6\%$ ) | $\pm 0.120$ ( $\pm 0.4\%$ ) |
| 30                | 120  | $\pm 0.3$ ( $\pm 0.3\%$ ) | $\pm 0.3$ ( $\pm 0.3\%$ )   |
| 120               | 400  | $\pm 0.5$ ( $\pm 0.3\%$ ) | $\pm 0.5$ ( $\pm 0.3\%$ )   |
| 400               | 1000 | $\pm 0.8$ ( $\pm 0.3\%$ ) | $\pm 0.8$ ( $\pm 0.3\%$ )   |
| 1000              | 2000 | $\pm 1.2$ ( $\pm 0.3\%$ ) | $\pm 1.2$ ( $\pm 0.3\%$ )   |
| 2000              | 4000 | $\pm 2$ ( $\pm 0.3\%$ )   | $\pm 2$ ( $\pm 0.3\%$ )     |

| ANGULAR DIMENSIONS |     |                     |                    |
|--------------------|-----|---------------------|--------------------|
| Dimension (mm)     |     | Tolerance °         |                    |
| from               | to  | ISO2768-mK Standard | Optimum achievable |
| 0                  | 10  | $\pm 1^\circ$       | $\pm 1^\circ$      |
| 10                 | 50  | $\pm 0^\circ 30'$   | $\pm 0^\circ 30'$  |
| 50                 | 120 | $\pm 0^\circ 20'$   | $\pm 0^\circ 20'$  |
| 120                | 400 | $\pm 0^\circ 10'$   | $\pm 0^\circ 10'$  |
| >400               |     | $\pm 0^\circ 5'$    | $\pm 0^\circ 5'$   |



| EXTERNAL RADII AND CHAMFER HEIGHT |    |                     |                    |
|-----------------------------------|----|---------------------|--------------------|
| Dimension (mm)                    |    | Tolerance (mm)      |                    |
| from                              | to | ISO2768-mK Standard | Optimum achievable |
| 0,5                               | 3  | ±0,2                | ±0,2               |
| 3                                 | 6  | ±0,5                | ±0,5               |
| >6                                |    | ±1,0                | ±1,0               |

| STRAIGHTNESS AND FLATNESS |      |                     |                    |
|---------------------------|------|---------------------|--------------------|
| Dimension (mm)            |      | Tolerance (mm)      |                    |
| from                      | to   | ISO2768-mK Standard | Optimum achievable |
| 0                         | 10   | 0,05                | 0,02               |
| 10                        | 30   | 0,1                 | 0,05               |
| 30                        | 100  | 0,2                 | 0,1                |
| 100                       | 300  | 0,4                 | 0,2                |
| 300                       | 1000 | 0,6                 | 0,3                |
| 1000                      | 3000 | 0,8                 | 0,4                |

| PERPENDICULARITY |      |                     |                    |
|------------------|------|---------------------|--------------------|
| Dimension (mm)   |      | Tolerance (mm)      |                    |
| from             | to   | ISO2768-mK Standard | Optimum achievable |
| 0                | 100  | 0,4                 | 0,2                |
| 100              | 300  | 0,6                 | 0,3                |
| 300              | 1000 | 0,8                 | 0,4                |
| 1000             | 3000 | 0,8                 | 0,5                |

| SYMMETRY       |      |                     |                    |
|----------------|------|---------------------|--------------------|
| Dimension (mm) |      | Tolerance (mm)      |                    |
| from           | to   | ISO2768-mK Standard | Optimum achievable |
| 0              | 100  | 0,6                 | 0,5                |
| 100            | 300  | 0,6                 | 0,5                |
| 300            | 1000 | 0,8                 | 0,5                |
| 1000           | 3000 | 1                   | 0,5                |

| OTHER CHARACTERISTICS |                     |                                                                |
|-----------------------|---------------------|----------------------------------------------------------------|
| Characteristic        | ISO2768-mK Standard | Optimum achievable                                             |
| Roughness Ra          | 1µm                 | 0,2µm (after second operation, electropolishing, polishing...) |
| Roundness             | 0,05                | 0,003 (after second operation, hole reworking)                 |