

TOLERANCES OF THE PIECE

According to the ISO 286-1 standard

If too tight realistic tolerances are taken into account for articles that have to be assembled, one runs the risk on higher rejects rather than to resolve any problem.

The possible deviations to which the piece can be subject, caused by wear, humidity and thermal dilatation should be taken carefully into consideration as well.

Dimensional tolerances of injection moulded pieces with thermoplastic materials

The materials are conventionally subdivided into 3 groups depending on the shrinkage characteristics.

The proposed tolerance ranges refer to two production classes: normal and special.

<p>1st Group <u>materials with shrinkage < 1 %</u></p> <p>all thermoset materials all amorphous thermoplastics ABS - PS - CA - PC PPO – rigid PVC fiberglass loaded PA and POM</p> <p>Tolerance ranges</p> <p>special ISO IT 11 normal ISO IT 12</p>	<p>2nd Group <u>materiali con</u> <u>shrinkage between 1% and 2%</u> Polyolefins PE - PP with thickness < 2 mm</p> <p>non reinforced PA and POM with thickness < 5 mm Thermoplastic polyesters PBTP - PETP; Polyolefins PE - PP loaded</p> <p>Tolerance ranges</p> <p>special ISO IT 13 normal ISO IT 14</p>	<p>3rd Group <u>materials with</u> <u>shrinkage between 2% and 3%</u> Polyolefins PE - PP with thickness > 2 mm non reinforced PA and POM with thickness > 5 mm</p> <p>Tolerance ranges</p> <p>special ISO IT 15 normal ISO IT 16</p>
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Numeric values of the fundamental tolerances

Dimension range from 1 ÷ 500 mm	Values in mm					
	IT11	IT12	IT13	IT14	IT15	IT16
from 1 to 3	0,060	0,100	0,140	0,250	0,400	0,600
from 3 to 6	0,075	0,120	0,180	0,300	0,480	0,750
from 6 to 10	0,090	0,150	0,220	0,360	0,580	0,900
from 10 to 18	0,110	0,180	0,270	0,430	0,700	1,100
from 18 to 30	0,130	0,210	0,330	0,520	0,840	1,300
from 30 to 50	0,160	0,250	0,390	0,620	1,000	1,600
from 50 to 80	0,190	0,300	0,460	0,740	1,200	1,900
from 80 to 120	0,220	0,350	0,540	0,870	1,400	2,200
from 120 to 180	0,250	0,400	0,630	1,000	1,600	2,500
from 180 to 250	0,290	0,460	0,720	1,100	1,850	2,900
from 250 to 315	0,320	0,520	0,810	1,300	2,100	3,200
from 315 to 400	0,360	0,570	0,890	1,400	2,300	3,600
from 400 to 500	0,400	0,630	0,970	1,550	2,500	4,000