

Part 1

Injection Molding Tolerances: ISO 20457 / DIN 16742

ISO 20457 gives the general and direct tolerances for plastic molded parts (injection molding and other molding processes). Plastics move more than metals: shrinkage, warpage and tooling effects mean that molded parts need much wider tolerances than machined parts. The standard therefore sorts tolerances into **tolerance groups TG1 to TG9**. A drawing names one group as the general tolerance, for example **General tolerances ISO 20457 - TG6**, and every dimension without its own tolerance follows it.

Which standard is current?	
DIN 16742	German standard, edition 2013-10. Withdrawn . Its tolerance tables are still widely quoted by suppliers and drawings.
ISO 20457:2018	First international edition, based on DIN 16742. Replaced by the 2026 edition.
ISO 20457:2026	Second edition, published August 2026 (ISO/TC 61/SC 11). Current . Covers thermoplastics, thermoplastic elastomers and thermosets made by injection molding, injection compression molding, transfer molding, compression molding and rotational molding.
Values in this chart	The tables in Part 2 are the DIN 16742:2013 values (sizes 1 to 315 mm). Published ISO 20457 TG6 tables from suppliers match them. We have not been able to compare against the full ISO 20457:2026 text, so confirm against the current standard for contracts and critical features.

Term	Meaning
Tolerance group (TG1 to TG9)	Sets how wide the tolerance is. Each step up (TG5 to TG6, for example) makes the tolerance wider. TG1 is the tightest, TG9 the widest.
W - tool-specific dimension	A dimension determined by the mold. Uses the tighter value in the table. The standard sets out how each feature is classified; ask us if you are unsure.
NW - non-tool-specific dimension	A dimension not determined by the mold alone. Uses the wider value. In the standard, the NW value for one size range equals the W value of the next range up.
Production series (1 to 4)	Series 1 is normal production and is the only series for general tolerances. Series 2 to 4 give tighter groups for accurate, precision and precision special production, and 3 and 4 always need a separate agreement.
Symmetrical limits	All values in the tables are plus and minus. A tolerance of ± 0.31 mm on a 40 mm dimension means 39.69 to 40.31 mm.

Part 2

Tolerance Tables, Groups TG1 to TG9

Table 1 - W: tolerances for tool-specific dimensions ($\pm$ mm)

Nominal size (mm)	TG1	TG2	TG3	TG4	TG5	TG6	TG7	TG8	TG9
1 to 3	± 0.007	± 0.013	± 0.020	± 0.030	± 0.05	± 0.07	± 0.13	± 0.20	± 0.30
>3 to 6	± 0.012	± 0.020	± 0.031	± 0.05	± 0.08	± 0.12	± 0.20	± 0.31	± 0.49
>6 to 10	± 0.018	± 0.029	± 0.05	± 0.08	± 0.11	± 0.18	± 0.29	± 0.45	± 0.75
>10 to 18	± 0.022	± 0.035	± 0.06	± 0.09	± 0.14	± 0.22	± 0.35	± 0.55	± 0.90
>18 to 30	± 0.026	± 0.042	± 0.07	± 0.11	± 0.17	± 0.26	± 0.42	± 0.65	± 1.05
>30 to 50	± 0.031	± 0.05	± 0.08	± 0.13	± 0.20	± 0.31	± 0.50	± 0.80	± 1.25
>50 to 80	± 0.037	± 0.06	± 0.10	± 0.15	± 0.23	± 0.37	± 0.60	± 0.95	± 1.50
>80 to 120	± 0.044	± 0.09	± 0.15	± 0.23	± 0.36	± 0.57	± 0.90	± 1.40	± 2.25
>120 to 180	n/a	± 0.13	± 0.20	± 0.32	± 0.50	± 0.80	± 1.25	± 2.00	± 3.15
>180 to 250	n/a	± 0.15	± 0.23	± 0.35	± 0.58	± 0.93	± 1.45	± 2.30	± 3.60
>250 to 315	n/a	± 0.16	± 0.26	± 0.41	± 0.65	± 1.05	± 1.60	± 2.60	± 4.05

Table 2 - NW: tolerances for non-tool-specific dimensions ($\pm$ mm)

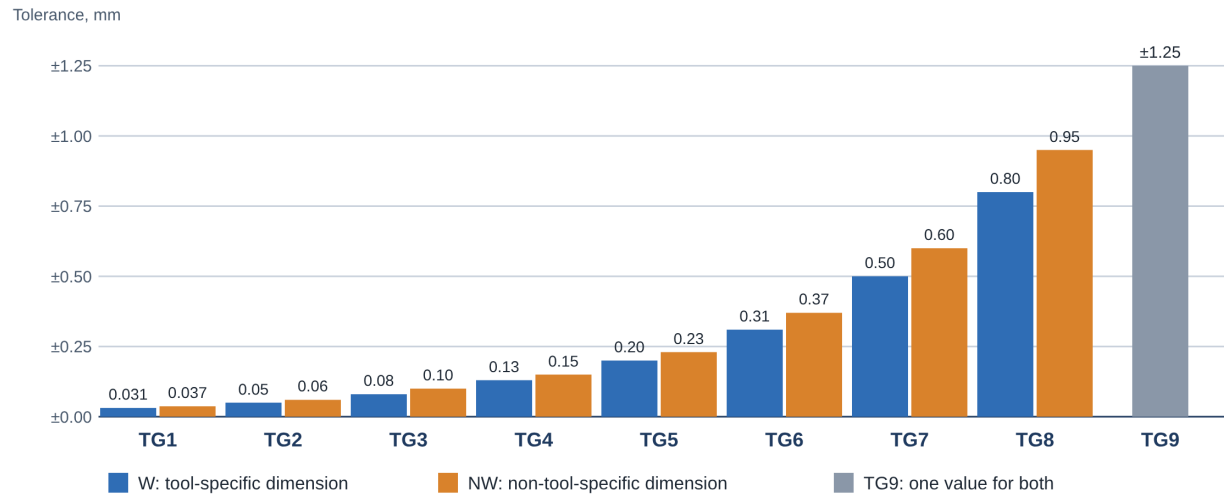
Nominal size (mm)	TG1	TG2	TG3	TG4	TG5	TG6	TG7	TG8	TG9
1 to 3	± 0.012	± 0.020	± 0.031	± 0.05	± 0.08	± 0.12	± 0.20	± 0.31	± 0.30
>3 to 6	± 0.018	± 0.029	± 0.05	± 0.08	± 0.11	± 0.18	± 0.29	± 0.45	± 0.49
>6 to 10	± 0.022	± 0.035	± 0.06	± 0.09	± 0.14	± 0.22	± 0.35	± 0.55	± 0.75
>10 to 18	± 0.026	± 0.042	± 0.07	± 0.11	± 0.17	± 0.26	± 0.42	± 0.65	± 0.90
>18 to 30	± 0.031	± 0.05	± 0.08	± 0.13	± 0.20	± 0.31	± 0.50	± 0.80	± 1.05
>30 to 50	± 0.037	± 0.06	± 0.10	± 0.15	± 0.23	± 0.37	± 0.60	± 0.95	± 1.25
>50 to 80	± 0.044	± 0.09	± 0.15	± 0.23	± 0.36	± 0.57	± 0.90	± 1.40	± 1.50
>80 to 120	± 0.05	± 0.13	± 0.20	± 0.32	± 0.50	± 0.80	± 1.25	± 2.00	± 2.25
>120 to 180	n/a	± 0.15	± 0.23	± 0.35	± 0.58	± 0.93	± 1.45	± 2.30	± 3.15
>180 to 250	n/a	± 0.16	± 0.26	± 0.41	± 0.65	± 1.05	± 1.60	± 2.60	± 3.60
>250 to 315	n/a	± 0.18	± 0.29	± 0.45	± 0.70	± 1.15	± 1.80	± 2.85	± 4.05

"n/a" = not defined by the standard (TG1 stops at 120 mm). TG9 has a single value for both W and NW. Source: DIN 16742:2013 Table 2. Sizes below 1 mm and above 315 mm are not shown here; for them, see the standard or ask us.

Part 3

Choosing and Using a Tolerance Group

Figure 1 - Tolerance by group for a 30 to 50 mm dimension



Each step up in group makes the tolerance roughly 1.4 to 2 times wider. Choosing a tighter group than the part needs raises tooling and inspection cost.

Table 3 - Tolerance group by production series

Production series	A	B	C	D	E	F
Series 1: Normal production	TG4	TG5	TG6	TG7	TG8	TG9
Series 2: Accurate production	TG3	TG4	TG5	TG6	TG7	TG8
Series 3: Precision production	TG2	TG3	TG4	TG5	TG6	TG7
Series 4: Precision special production	TG1	TG2	TG3	TG4	TG5	TG6

Columns A to F are material and process groups assigned in the standard's annexes. Moving one series up (for example 1 to 2) gives one group tighter, which needs better process control. Series 3 and 4 always need agreement between buyer and molder.

Part 4

Worked Examples and Tips

Example 1 - 40 mm dimension, general tolerance TG6

	Value
Dimension	40 mm, size range >30 to 50 mm
W (tool-specific)	±0.31 mm, so limits are 39.690 to 40.310 mm
NW (non-tool-specific)	±0.37 mm, so limits are 39.630 to 40.370 mm

Example 2 - 100 mm dimension, general tolerance TG5

	Value
Dimension	100 mm, size range >80 to 120 mm
W (tool-specific)	±0.36 mm, so limits are 99.640 to 100.360 mm
NW (non-tool-specific)	±0.50 mm, so limits are 99.500 to 100.500 mm

How to show it on a drawing

Put the group in or next to the title block: **General tolerances ISO 20457 - TG6** (older drawings: **General tolerances DIN 16742 - TG6**). If the part uses more than one material, the standard asks for the group to be set for each material. Give a direct tolerance only on the few dimensions that really need a tighter value.

Tips

- Pick the group from what the part has to do, not from habit. TG6 is a common general tolerance on supplier drawings, but critical features may need TG5 or better.
- Tight dimensions on molded parts cost more: more mold work, more process control and more inspection. Tighten only where function needs it.
- ISO 286 fits (H7, g6) are written for metal parts. For molded plastic features use the tolerance groups here, and keep ISO 286 for machined metal parts. See our ISO 286 and ISO 2768 charts.
- Features that depend on the mold parting line, moving mold parts or a later operation can be harder to hold. Talk to the molder early about which dimensions are critical.
- Not in this chart: sizes below 1 mm or above 315 mm, position tolerances, profile tolerances and the point system used to choose the group. Check the standard for these.

Reference summary of the DIN 16742:2013 tolerance tables (basis of ISO 20457). For contracts and critical designs, check the current edition of ISO 20457. Need molded parts? Send your drawings with the tolerance group called out to Ryan@RpProto.com.