

# M4 Spring Washer Dimensions: 4.1–4.4 mm Inner, 6.8 mm Outer

M4 · Inner / outer diameter, S(b), free height · GB/T 93-2025 Table 1 sourcing · Weight from the catalogue coefficients

M4 normal-type spring lock washer (GB/T 93-2025 Table 1): inner diameter d 4.1–4.4 mm, S(b) nominal 1.1 mm, free height H 2.2–2.75 mm, m ≤ 0.55 mm; outer diameter D 6.8 mm and unit weight about 0.2 g are on our catalogue basis (carbon steel basis, bore taken at the nominal diameter).

### M4 and the other 9 sizes: outer diameter, thickness coefficient and unit weight (catalogue basis)

Outer diameter D and thickness coefficient t come from the product catalogue weight coefficients (spec\_json.weightCalc: method = washer\_formula, version = v2, formula = ring\_area\*thickness); the unit weight is recomputed with the identical parameters and formula  $\pi/4 \cdot (D^2 - d^2) \cdot t \cdot \rho$ , with d at the nominal diameter and  $\rho = 7.85 \text{ g/cm}^3$  for carbon steel (304 / 316L follow the density table below). The figures are the catalogue's rounded\_g basis (1 decimal below 1 g, whole grams at 1 g and above) — the same numbers used on the product pages and in quotations.

| Size | Inner d (Table 1 range, mm) | Outer D (mm) | Thickness coeff. t (mm) | Unit weight (g, carbon steel) | Bulk weight (kg / 1,000 pcs) |
|------|-----------------------------|--------------|-------------------------|-------------------------------|------------------------------|
| M4   | 4.1–4.4                     | 6.8          | 0.9                     | 0.2 g                         | 0.2                          |

### GB/T 93-2025 Table 1: all 24 sizes (1.6–48 mm)

Every value is taken from GB/T 93-2025 Fasteners — Single coil spring lock washers — Normal type, Table 1 (PDF pages 8–9 = text pages 2–3), in millimetres. d = inner diameter; S(b) = the section dimension column of Table 1, quoted here exactly as the standard writes it, with no symbol conversion (GB/T 859-2025, the light series, splits S and b into separate columns — the two standards have different dimension tables and cannot be cited interchangeably); H = free height; m ≤ = the upper limit of m in Table 1. Sizes in parentheses ((14) / (18) / (22) / (27) / (33) / (39) / (45)) are the non-preferred sizes listed in the standard's table note.

| Size (thread major dia.) | d min | d max | S(b) nom. | S(b) min | S(b) max | H min | H max | m ≤  |
|--------------------------|-------|-------|-----------|----------|----------|-------|-------|------|
| 1.6                      | 1.7   | 1.95  | 0.5       | 0.42     | 0.58     | 1     | 1.25  | 0.25 |
| 2                        | 2.1   | 2.35  | 0.5       | 0.42     | 0.58     | 1     | 1.25  | 0.25 |
| 2.5                      | 2.6   | 2.85  | 0.65      | 0.57     | 0.73     | 1.3   | 1.63  | 0.33 |
| 3 ·                      | 3.1   | 3.4   | 0.8       | 0.7      | 0.9      | 1.6   | 2     | 0.4  |
| 4 ·                      | 4.1   | 4.4   | 1.1       | 1        | 1.2      | 2.2   | 2.75  | 0.55 |
| 5 ·                      | 5.1   | 5.4   | 1.3       | 1.2      | 1.4      | 2.6   | 3.25  | 0.65 |
| 6 ·                      | 6.1   | 6.5   | 1.6       | 1.5      | 1.7      | 3.2   | 4     | 0.8  |
| 8 ·                      | 8.1   | 8.5   | 2.1       | 2        | 2.2      | 4.2   | 5.25  | 1.05 |
| 10 ·                     | 10.2  | 10.7  | 2.6       | 2.45     | 2.75     | 5.2   | 6.5   | 1.3  |
| 12 ·                     | 12.2  | 12.7  | 3.1       | 2.95     | 3.25     | 6.2   | 7.75  | 1.55 |
| (14)                     | 14.2  | 14.7  | 3.6       | 3.4      | 3.8      | 7.2   | 9     | 1.8  |
| 16 ·                     | 16.2  | 16.8  | 4.1       | 3.9      | 4.3      | 8.2   | 10.25 | 2.05 |
| (18)                     | 18.2  | 18.9  | 4.5       | 4.3      | 4.7      | 9     | 11.25 | 2.25 |
| 20 ·                     | 20.2  | 21    | 5         | 4.8      | 5.2      | 10    | 12.5  | 2.5  |
| (22)                     | 22.3  | 23.1  | 5.5       | 5.3      | 5.7      | 11    | 13.75 | 2.75 |
| 24 ·                     | 24.3  | 25.3  | 6         | 5.8      | 6.2      | 12    | 15    | 3    |
| (27)                     | 27.3  | 28.3  | 6.8       | 6.5      | 7.1      | 13.6  | 17    | 3.4  |
| 30                       | 30.3  | 31.3  | 7.5       | 7.2      | 7.8      | 15    | 18.75 | 3.75 |
| (33)                     | 33.3  | 34.5  | 8.5       | 8.2      | 8.8      | 17    | 21.25 | 4.25 |
| 36                       | 36.3  | 37.5  | 9         | 8.7      | 9.3      | 18    | 22.5  | 4.5  |
| (39)                     | 39.3  | 40.5  | 10        | 9.7      | 10.3     | 20    | 25    | 5    |
| 42                       | 42.3  | 43.5  | 10.5      | 10.2     | 10.8     | 21    | 26.25 | 5.25 |
| (45)                     | 45.3  | 46.5  | 11        | 10.7     | 11.3     | 22    | 27.5  | 5.5  |
| 48                       | 48.3  | 49.5  | 12        | 11.7     | 12.3     | 24    | 30    | 6    |

The bracketed sizes ((14) / (18) / (22) / (27) / (33) / (39) / (45)) are non-preferred; size 1.6 is new in this 2025 edition, and this edition also changed some d dimensions. Clickable sizes in the first column are the 10 sizes we quote (M3 / M4 / M5 / M6 / M8 / M10 / M12 / M16 / M20 / M24) — open one to see its outer diameter and unit weight. For every other size this page gives the standard dimensions only and no weight: without a weight coefficient we do not invent a figure.

### Edition difference: our catalogue coefficients vs GB/T 93-2025 Table 1 (size by size)

GB/T 93-2025 has replaced GB/T 93—1987 (issued 2025-10-31, effective 2026-02-01) and its Table 1 does not include an outer diameter column. Below, the catalogue coefficients (outer diameter D × thickness coefficient t) sit next to the matching Table 1 columns: thickness difference = our t – Table 1 S(b) nominal; weight difference =

our ring area uses the nominal bore (12 mm for M12) while Table 1 gives the inner diameter as a range (12.2–12.7 mm for M12) — a smaller bore makes the ring area larger, so our unit weight runs above a Table 1 inner-diameter basis; the spread is computed at both ends of the range (d min / d max). The table only describes the relation between the two bases: nothing is changed in the catalogue, and our coefficients are never presented as Table 1 values.

| Size | Our D × t  | Table 1 S(b) nom. | Thickness diff. | Table 1 d range | Our unit weight vs a Table 1 inner-diameter basis |
|------|------------|-------------------|-----------------|-----------------|---------------------------------------------------|
| M3   | 5.1 × 0.8  | 0.8               | same            | 3.1–3.4         | +3.7% – +17.7%                                    |
| M4   | 6.8 × 0.9  | 1.1               | -0.2 mm         | 4.1–4.4         | +2.8% – +12.5%                                    |
| M5   | 8.8 × 1.2  | 1.3               | -0.1 mm         | 5.1–5.4         | +2% – +8.6%                                       |
| M6   | 11.8 × 1.6 | 1.6               | same            | 6.1–6.5         | +1.2% – +6.4%                                     |
| M8   | 14.8 × 2   | 2.1               | -0.1 mm         | 8.1–8.5         | +1% – +5.6%                                       |
| M10  | 18.1 × 2.5 | 2.6               | -0.1 mm         | 10.2–10.7       | +1.8% – +6.8%                                     |
| M12  | 21.1 × 3   | 3.1               | -0.1 mm         | 12.2–12.7       | +1.6% – +6.1%                                     |
| M16  | 27.4 × 4   | 4.1               | -0.1 mm         | 16.2–16.8       | +1.3% – +5.6%                                     |
| M20  | 33.6 × 5   | 5                 | same            | 20.2–21         | +1.1% – +6%                                       |
| M24  | 40 × 6     | 6                 | same            | 24.3–25.3       | +1.4% – +6.7%                                     |

How to use it: quotations, freight and packing go by the catalogue basis (estimate, not an inspection figure); dimensional verification against GB/T 93-2025 Table 1 goes by the first table above. The gap between the two is exactly what this table lists, size by size — no manual back-calculation needed.

Material density conversion

Three material options are quoted (carbon steel / 304 / 316L): the unit weights above are on the carbon steel basis, and other materials scale by the density ratio (weight × factor). GB/T 93-2025 groups materials in Table 2 as spring steel / stainless steel / phosphor bronze, and that table is identical in GB/T 859-2025 — it cannot tell the normal type from the light type; the only dividing lines are Table 1 dimensions and the range limit.

| Material                    | Density (g/cm³) | Factor vs carbon steel |
|-----------------------------|-----------------|------------------------|
| Carbon steel / spring steel | 7.85            | ×1.000                 |
| Stainless 304               | 7.93            | ×1.010                 |
| Stainless 316L              | 7.98            | ×1.017                 |

Anti-loosening limits: washer spread with 10.9 / 12.9 property classes

GB/T 93-2025 carries this note in its scope (PDF page 7 = text page 1): where the spring lock washers specified in this document are used with bolts and screws of property classes 10.9 and 12.9, attention should be paid to the washer spreading (opening-up) phenomenon.

That is a caution stated by the standard, not a prohibition for classes 10.9 / 12.9 — spring washers can still be used, but a high-strength joint carries high preload and the washer may open up radially, changing the fit and the clamping state. In practice: (1) check bolt torque against the target preload (our torque chart for the same size gives ranges by the K-factor method); (2) where the spreading risk is high, use or add another locking method (all-metal prevailing torque nuts, threadlocker, double nuts, other elastic washers), chosen by the designer from the joint load and vibration duty; (3) surface defects follow Table 2 — cracks, rust and harmful dents, scratches and burrs are not permitted. We publish no spring or clamping force figures: GB/T 93-2025 gives none, so any force derived from dimensions or grade would not be a standard value.

Data basis and assumptions

Two kinds of figures, two sources, marked column by column. (1) The standard dimension columns (d / S(b) / H / m) are taken value by value from GB/T 93-2025 Table 1 (PDF pages 8–9) and carried in utils/springWasherCalc.ts; the check script ops/tools/gen-spring-washer-chart-data.mjs --check re-parses the distilled fact layer and compares every cell (9 columns × 24 sizes, all equal). (2) The weight column and the 10 outer diameter / thickness coefficients come from the product catalogue, MySQL prd\_sku.spec\_json.weightCalc (method = washer\_formula, version = v2, formula = ring\_area\*thickness, confidence = estimate): the recomputed raw\_g and rounded\_g match all 53 SW- SKUs in the catalogue exactly. This page copies nothing beyond those standard table values and does not use the dimension table of GB/T 859 (light type).

Limits: (1) the dimensions here are standard table values, not a measurement of the parts in your hands — cite them as "per GB/T 93-2025 Table 1, size N has d ..., S(b) nominal ..., H ..., m ≤ ..." and never as our measured product data; (2) the weights are quotation estimates (quoting, freight, packing), while real unit weight varies with chamfers, the split shape and coating (hot-dip galvanising about +4.5%) — settle on actual weighing; (3) our weights use the nominal bore, and the gap versus the Table 1 inner-diameter range is listed in the edition-difference table, so no manual correction is needed; (4) sizes we do not quote (1.6 / 2 / 2.5 / 14 / 18 / 22 / 27 / 30 / 33 / 36 / 39 / 42 / 45 / 48) carry standard dimensions only and no weight — no coefficient, no figure; ask for a quote by standard and size; (5) this page publishes no spring force, clamping force or test load figures — GB/T 93-2025 gives none, and elasticity, torsion and hydrogen embrittlement resistance are referenced to GB/T 94.1.

References

- GB/T 93-2025 Fasteners — Single coil spring lock washers — Normal type (issued 2025-10-31, effective 2026-02-01, replacing GB/T 93—1987) — source of the standard dimension columns and the scope note on this page, transcribed value by value with page references (Table 1 = PDF pages 8–9, scope note = PDF page 7); the licensed copy is held offline and is not re-hosted on this site
- GB/T 94.1-2008 Specification for spring washers — Single coil spring lock washers (National Standards Information Public Service Platform) — elasticity, torsion, hydrogen embrittlement resistance and test methods are referenced to it; GB/T 93-2025 gives no test method detail — [https://openstd.samr.gov.cn/bzgk/gb/std?std\\_no=GB%2FT%2094.1-2008](https://openstd.samr.gov.cn/bzgk/gb/std?std_no=GB%2FT%2094.1-2008)
- GB/T 859-2025 Fasteners — Single coil spring lock washers — Light type (National Standards Information Public Service Platform) — the companion light series; its table splits S and b, so its values are not used here and it serves only as a system cross-reference — <https://openstd.samr.gov.cn/bzgk/gb/std?>

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- Product catalogue weight coefficients (MySQL prd\_sku.spec\_json.weightCalc, method = washer\_formula, version = v2) — source of the weight column and of the 10 outer diameter / thickness coefficients, identical to the product pages and the weight calculator

Disclaimer: this page is engineering reference material combining standard table values with quotation estimates, for selection, quoting and fit checks; it is not a design basis or an inspection standard — dimensional acceptance follows the standard edition named in your drawing or contract.

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