

ISO 7050 Phillips Countersunk Self-Tapping Screw Specification

Engineering Hardware & Fasteners · engineeringhardware.com/guide/standard/iso-7050-cad-svg-028-countersunk

ISO 7050 specifies the dimensions and tolerances for phillips countersunk self-tapping screw. The full dimensional table is reproduced below, followed by the DIN, ISO and ASME parts that match or supersede it.

Standard

ISO 7050

Product

Phillips Countersunk Self-Tapping Screw — GB/T 846 / ISO 7050 (Series 028)

Governing standards

GB/T 846 / ISO 7050

Equivalence between national standards is dimensional, not always metallurgical. Check the property class separately when substituting.



For phillips countersunk self-tapping screw, ISO 7050 is the governing document for the dimensions listed below. Mechanical and performance requirements for this part family are set by its own standards, not by the bolt and screw property-class documents.

ISO 7050 — Scope

The table below lists the dimensions catalogued for phillips countersunk self-tapping screw — gb/t 846 / iso 7050 (series 028) under ISO 7050. The scope of ISO 7050 itself is not summarised here — where a figure matters, confirm it against the published document.

Tolerance & Product Grades

Product grade is a concept from dimensional fastener standards and does not apply to ISO 7050. Tolerances for this part are the limits shown against each dimension in the table.

Dimensions Specified by ISO 7050

Size	Pitch (mm)	Length L (mm)	Head diameter dk (mm)	Head height k (mm)	Cross-section
M3	0.5	20	5.6	1.65	PH1
M4	0.7	25	7.5	2.2	PH2
M5	0.8	30	9.2	2.5	PH2
M6	1.0	40	11.0	3.0	PH3
M8	1.25	50	14.5	4.0	PH3
M10	1.5	60	18.0	5.0	PH4
M12	1.75	80	22.0	6.0	PH4
M14	2.0	80	25.0	7.0	PH4
M16	2.0	100	29.0	8.0	PH4
M18	2.5	100	33.0	9.0	PH4
M20	2.5	120	36.5	10.0	PH4
M24	3.0	150	43.5	12.0	PH4

Equivalent Standards

Where direct equivalents exist (ISO ↔ DIN, ISO ↔ ASME), they are listed on the parent Phillips Countersunk Self-Tapping Screw — GB/T 846 / ISO 7050 (Series 028) page.

Always confirm against the dimensions on this page, since some "equivalent" standards differ in tolerances and head geometry.

When to Specify ISO 7050

Choose ISO 7050 for international engineering work and OEM supply where ISO standards are the contractual reference. It is the default modern specification for phillips countersunk self-tapping screw — gb/t 846 / iso 7050 (series 028).

Custom manufacturing · Made to drawing

Need a screw to this standard in a non-standard size?

Parts built to ISO 7050 are already in the catalog, so a special is usually a variation on existing tooling rather than a new design — which is what keeps the cost down. Made by cold heading or warm forging.

Minimum order from 2,000 pieces; samples within 7 days of drawing approval.

Custom screw manufacturing

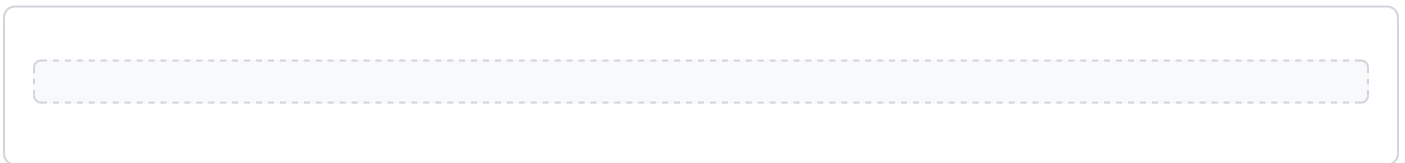
(<https://engineeringhardware.com/custom/screws/>)

(<https://engineeringhardware.com/custom/screws/>)

Send a drawing (<https://engineeringhardware.com/custom/screws/#rfq>)

Technical Drawing

Customize the parameters below — every spec field is editable, and the drawing redraws to match the values you choose. Changing the size will snap the other fields to that size's standard values; you can then override any individual value.



Dimensioned line drawing of M3 Phillips Countersunk Self-Tapping Screw — GB/T 846 / ISO 7050 (Series 028) to GB/T 846 / ISO 7050. Side view and top view, drawn to the dimensions in the table below and redrawn for any size selected.

Opens a short step to confirm the exact specification before you enter contact details.

Request a Quote

Click “Request this configuration” under the drawing to confirm the exact specification, then add your contact details. You can also send the request without a specification — but only an accurate selection gets an accurate quote.

Dimensions & Specifications (GB/T 846 / ISO 7050)

Size	Pitch (mm)	Length L (mm)	Head diameter dk (mm)	Head height k (mm)	Cross-section
M3	0.5	20	5.6	1.65	PH1
M4	0.7	25	7.5	2.2	PH2
M5	0.8	30	9.2	2.5	PH2
M6	1.0	40	11.0	3.0	PH3
M8	1.25	50	14.5	4.0	PH3
M10	1.5	60	18.0	5.0	PH4
M12	1.75	80	22.0	6.0	PH4
M14	2.0	80	25.0	7.0	PH4
M16	2.0	100	29.0	8.0	PH4
M18	2.5	100	33.0	9.0	PH4
M20	2.5	120	36.5	10.0	PH4
M24	3.0	150	43.5	12.0	PH4

Materials & Grades

Select a material class to see the grades we supply it in. Each designation is listed with its ISO/EN, AISI/SAE, JIS and GB equivalents.

Stainless Steel

Carbon Steel66

Alloy Steel41

Bearing Steels5

Spring Steel25

Aluminum and Aluminum Alloys21

Brass17

Bronze11

Copper8

Titanium and Titanium Alloys18

Nickel and Nickel Alloys22

Iron-Nickel and High-Temperature Alloys10

Tool Steel and Specialty Hardened Steels9

Structural and Construction Steel9

Stainless Steel

Austenitic Stainless Steel

A1

AISI 303 · SAE 303 · SUS303 · EN 1.4305 · X8CrNiS18-9

A2

AISI 304 · SAE 304 · SUS304 · EN 1.4301 · X5CrNi18-10 · 06Cr19Ni10

304L

AISI 304L · SUS304L · EN 1.4307 · X2CrNi18-9 · 022Cr19Ni10

302

AISI 302 · SUS302 · EN 1.4310

305

AISI 305 · SUS305 · EN 1.4303

A4

AISI 316 · SAE 316 · SUS316 · EN 1.4401 · X5CrNiMo17-12-2 · 06Cr17Ni12Mo2

316L

AISI 316L · SUS316L · EN 1.4404 · X2CrNiMo17-12-2 · 022Cr17Ni12Mo2

321

AISI 321 · SUS321 · EN 1.4541 · X6CrNiTi18-10

310 / 310S

AISI 310 · AISI 310S · SUS310S · EN 1.4845

302HQ

AISI 302HQ

A3

A5

347

AISI 347 · SUS347 · EN 1.4550 · X6CrNiNb18-10

309 / 309S

AISI 309 · AISI 309S · SUS309S

Martensitic Stainless Steel

AISI 410

SUS410 · EN 1.4006 · X12Cr13 · 12Cr13

AISI 420

SUS420J1 · SUS420J2 · EN 1.4021 · EN 1.4028 · 20Cr13 · 30Cr13

AISI 431

SUS431 · EN 1.4057 · X17CrNi16-2

C1

C3

C4

AISI 440A

AISI 440B

AISI 440C

SUS440C · EN 1.4125

Ferritic Stainless Steel

AISI 430

SUS430 · EN 1.4016 · X6Cr17 · 10Cr17

F1

AISI 434

AISI 444

Precipitation-Hardening Stainless Steel

17-4 PH

AISI 630 · UNS S17400 · SUS630 · EN 1.4542 · X5CrNiCuNb16-4

15-5 PH

UNS S15500

17-7 PH

UNS S17700

Duplex and Super Duplex Stainless Steel

Duplex 2205

UNS S31803 · UNS S32205 · EN 1.4462

Super Duplex 2507

UNS S32750 · EN 1.4410

D2

D4

D6

D8

Lean Duplex 2101

UNS S32101

Super Duplex S32760

UNS S32760 · EN 1.4501

Carbon Steel

Low-Carbon Steel

SAE 1006

SAE 1008

SAE 1010

SAE 1018

SAE 1020

Q195

Q235

SAE 1012

SAE 1015

Q215

ML08

ML08AI**ML10****ML15****ML20****SWRCH6A****SWRCH8A****SWRCH10A****SWRCH12A****SWRCH15A****SWRCH18A****Medium-Carbon Steel****SAE 1035****SAE 1045****S45C****C45****SAE 1030****SAE 1040****SAE 1050****30****35****40****45****50****S35C****S40C****S50C****C35**

C40**High-Carbon Steel****SAE 1060****SAE 1070****65Mn****SAE 1065****SAE 1075****SAE 1080****SAE 1085****SAE 1090****SAE 1095****60****65****70****75****80****85****Cold-Heading Steel****SWRCH22A****10B21****SWRCH22K****SWRCH25K****SWRCH30K****SWRCH35K****SWRCH40K**

ML20Mn**ML25****ML30****ML35****ML40****15B25**

Alloy Steel

Chromium Steel

40Cr**45Cr****AISI 5140****SAE 5140****AISI 5120****SAE 5120****SCr420****SCr440**

Chromium-Molybdenum Steel

35CrMo**42CrMo****AISI 4140****SCM435****SCM440****42CrMo4****30CrMo**

AISI 4130**SAE 4130****SAE 4140****AISI 4142****AISI 4145****SCM415****SCM420****SCM445****EN 1.7220****EN 1.7225****25CrMo4****34CrMo4**

Nickel-Chromium-Molybdenum Steel

AISI 4340**SAE 4340****40CrNiMo****SNCM439****EN 1.6511****36CrNiMo4**

Boron Alloy Steel

10B22**10B21****15B21****15B25****20MnTiB****20Mn2B**

35VB**40MnB**

Bearing Steel

Bearing Steel

GCr15**AISI 52100****SAE 52100 · UNS G52986****SUJ2****100Cr6****EN 1.3505****GCr15SiMn**

Spring Steel

Carbon Spring Steel

SAE 1065**SAE 1070****SAE 1075****SAE 1080****SAE 1095****65****70****75****80****65Mn**

Silicon-Manganese Spring Steel

60Si2Mn**60Si2MnA****SUP6****SUP7**

Chromium-Vanadium Spring Steel

50CrVA**SAE 6150****AISI 6150****SUP10**

Stainless Spring Steel

AISI 301**SUS301****EN 1.4310****AISI 302****AISI 304****AISI 316****17-7 PH**

Aluminum and Aluminum Alloys

Commercially Pure Aluminum

1050**1060****1070****1100**

2xxx Series Aluminum

2024**2011****2014****2017**

5xxx Series Aluminum

5052**5083****5754**

6xxx Series Aluminum

6061**6061-T6****6063****6082****6082-T6**

7xxx Series Aluminum

7075**7075-T6****7005****7050****7075-T73**

Brass

Free-Cutting Brass

C36000

H62

HPb59-1

C3601

C3602

C3604

CuZn36Pb3

CuZn39Pb3

EN CW614N

EN CW617N

H65

Lead-Free Brass

C69300

C27450

CW510L

CW511L

Naval Brass

C46400

CuZn39Sn1

Bronze

Silicon Bronze

C65500**C65100****C65600**

Phosphor Bronze

C51000**C52100****CuSn6****CuSn8**

Aluminum Bronze

C95400**C95500****C63000****CuAl10Ni5Fe4**

Copper

Copper

C11000**T2****C10100****C10200****C12200****T1**

TU1**TU2**

Titanium and Titanium Alloys

Commercially Pure Titanium

Grade 2**Grade 1****Grade 3****Grade 4****TA1****TA2****TA3**

Alpha-Beta Titanium Alloys

Grade 5**Ti-6Al-4V****TC4****UNS R56400**

Low-Interstitial Grade

Grade 23**Ti-6Al-4V ELI****UNS R56407**

Other Titanium Fastener Alloys

Ti-6Al-6V-2Sn**Ti-6Al-2Sn-4Zr-2Mo**

Beta-C titanium**Ti-10V-2Fe-3Al**

Nickel and Nickel Alloys

Commercially Pure Nickel

Nickel 200**UNS N02200****Nickel 201****UNS N02201**

Inconel Alloys

Inconel 625**UNS N06625****Inconel 718****UNS N07718****Inconel 600****UNS N06600****Inconel 601****UNS N06601****Inconel 686****UNS N06686****Inconel X-750****UNS N07750**

Monel Alloys

Monel 400**UNS N04400****Monel K-500****UNS N05500**

Hastelloy Alloys

Hastelloy C-276

UNS N10276

Hastelloy C-22

UNS N06022

Hastelloy B-2

UNS N10665

Hastelloy B-3

UNS N10675

Hastelloy X

UNS N06002

Other Nickel Alloys

Alloy 20

UNS N08020

Alloy 625

Alloy 718

Alloy 825

UNS N08825

Alloy 925

UNS N09925

Iron-Nickel and High-Temperature Alloys

A286

A-286

UNS S66286

EN 1.4980

Invar

Invar 36

Alloy 36

UNS K93600

FeNi36

Alloy 42

Alloy 42

UNS K94100

FeNi42

Tool Steel and Specialty Hardened Steel

Tool Steel and Specialty Hardened Steel

AISI D2

AISI H13

SKD11

Cr12MoV

AISI O1

AISI A2

AISI S7

SKD61

9CrSi

Structural and Construction Steel

Structural and Construction Steel

ASTM A36

Q235B**Q355B****S355JR****Q235C****Q355C****S235JR****S275JR****S355J2**

Applications & Industries

Where Phillips Countersunk Self-Tapping Screw are used, and what decides the specification in each case. Stocked from M3 to M24 (screw size).

Industries that specify Phillips Countersunk Self-Tapping Screw

Roofing & cladding **Profiled sheet and rainscreen fixed to purlins and rails.**

Volume assembly **Appliance and consumer products driven at speed with power tools.**

Construction & fit-out **Fixing board, batten, framing and trim into timber and light-gauge steel.**

Sheet-metal & HVAC **Ducting, enclosures, trunking and cladding assembled without tapped holes.**

Joinery & furniture **Hardware, hinges and fittings into solid timber and wood-based board.**

Typical applications

- **high-volume driving with a bit and a clutch-set driver**
- **forming a thread directly in sheet, board or timber**
- **fixing where there is no access to add a nut behind the panel**

Service conditions to specify against

Marine and coastal

Available in A4 (316) stainless for chloride exposure — coastal structures, pool halls, water treatment and deck hardware, where A2 will eventually pit.

Pilot hole

Selection is really a hole-size decision: too small and the screw snaps or splits the material, too large and it strips. The size is stated per row.

Where to use something else

Not for a joint that will be dismantled and reassembled repeatedly in the same hole — use an insert or a rivet nut instead.

Need help matching Phillips Countersunk Self-Tapping Screw to your application? Send the assembly, the load and the environment with your enquiry and we will specify the size, material and finish against them.

Inside the plant

Manufactured in our own plant

This part is cold-formed, threaded, heat-treated and finished in-house. The stages below are where its class and finish are actually decided.



01

Cold heading

Wire rod is drawn to size and cold-formed into blanks. Forming rather than cutting keeps the grain flow continuous around the head, which is where a bolt is most likely to fail.

Head dimensions and under-head radius checked at set-up and per shift.



02

Thread rolling

Threads are rolled between hardened dies rather than cut. Rolled threads are stronger in fatigue than cut threads and hold pitch and flank angle far more consistently across a batch.

Go / no-go ring gauges to ISO 965 tolerance class 6g.



03

Heat treatment

Quench-and-temper brings carbon and alloy steel to the property class ordered — 8.8, 10.9 or 12.9 — with the furnace charge tracked so a finished lot can be traced back to it.

Core hardness and tensile tested per lot to ISO 898-1.



04

Surface treatment

Zinc, zinc-nickel, hot-dip galvanizing, black oxide, phosphate and Dacromet, selected against the service environment rather than against the price list.

Coating thickness and neutral salt spray hours to ISO 9227.

Frequently Asked Questions

Can I substitute ISO 7050 for the corresponding DIN standard on a drawing?

On modern drawings the ISO standard is the master reference; the older DIN equivalent is a cross-reference. For most dimensional purposes the parts are interchangeable, but check tolerance grades and the head height — these are the most common points of divergence.

Which edition of ISO 7050 does this table follow?

The table reproduces the dimensions we supply phillips countersunk self-tapping screw — gb/t 846 / iso 7050 (series 028) to. We do not publish an edition year against it, so where the edition is contractually significant, cite the edition you require on the enquiry and we will confirm it against the table before quoting.

How do I request a quotation?

Use the technical drawing on this page to pick the exact configuration, then submit it with the quote form. We respond within one business day.

Related Pages

[View the full Phillips Countersunk Self-Tapping Screw — GB/T 846 / ISO 7050 \(Series 028\) page \(https://engineeringhardware.com/fastener/cad-svg-028-countersunk/\)](https://engineeringhardware.com/fastener/cad-svg-028-countersunk/)

More Phillips Countersunk Self-Tapping Screw — GB/T 846 / ISO 7050 (Series 028) Guides

- **GB/T 846 Phillips Countersunk Self-Tapping Screw — GB/T 846 / ISO 7050 (Series 028)**
(<https://engineeringhardware.com/guide/standard/gb-t-846-cad-svg-028-countersunk/>)