Belleville Washers (Inch Series)

Belleville Washers (Inch Series) to Trade series (inch Belleville) are catalogued in id 0.26-0.76 mm, with od 0.55-1.56 mm, thick 0.02-0.06 mm. 6 sizes are held in the table below, and the technical drawing redraws to whichever row you select.

Standard

Trade series (inch Belleville)

ID

0.26-0.76 mm

OD

0.55-1.56 mm

Thick

0.02-0.06 mm

Catalogued sizes

6

Dimensions are nominal values from the governing standard. Confirm the tolerance class for your application before ordering.



Product catalog

Related Disc Springs & Belleville Washers products



(https://engineeringhardware.com/product/oem-odm-disc-spring-lock-washer-disc-spring-belleville-washer/)

Disc Spring & Belleville Washers

OEM ODM Disc Spring Lock Washer Disc Spring Belleville Washer (https://engineeringhardware.com/product/oem-odm-disc-spring-lock-washer-disc-spring-belleville-washer/)

Spring Washer · DIN, ASME, BS, JIS, as, En, GB

US$0.0006 – 0.0024MOQ 1 piece



(https://engineeringhardware.com/product/flat-wave-disc-spring-teeth-retaining-square-epdm-washer/)

Disc Spring & Belleville Washers

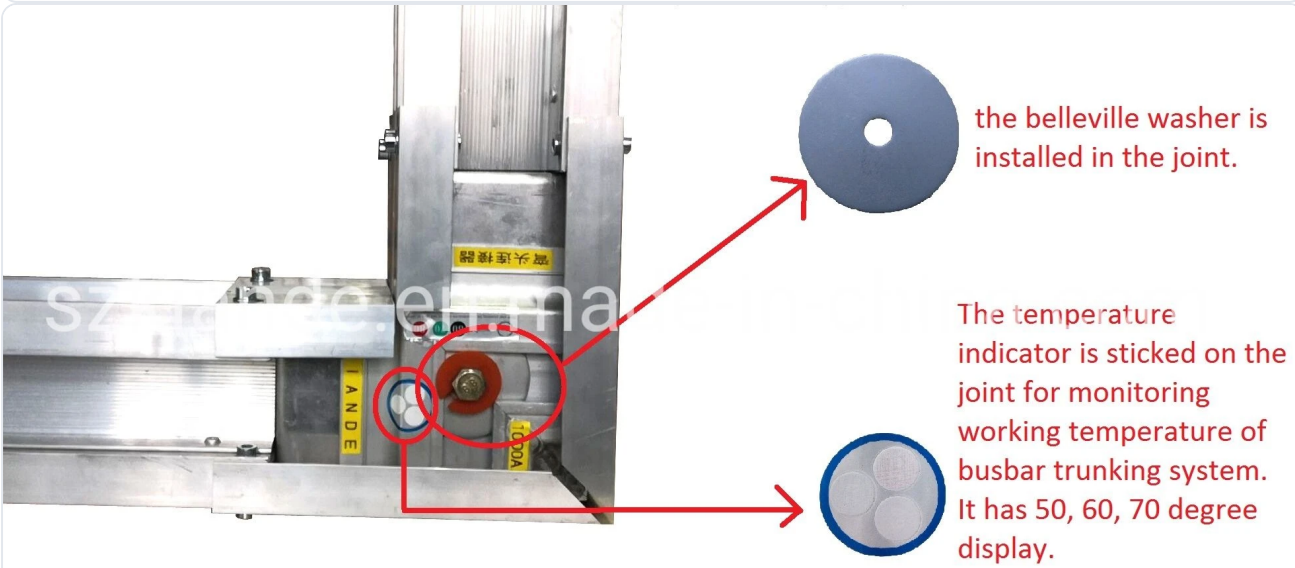
Flat Wave Disc Spring Teeth Retaining Square EPDM Washer

(https://engineeringhardware.com/product/flat-wave-disc-spring-teeth-retaining-

square-epdm-washer/)

Customized · Stainless Steel

US$0.14 – 0.18MOQ 1,000 pieces



(https://engineeringhardware.com/product/belleville-spring-washer-on-busbar-joint-for-busway-system-hexagon-spring-washer/)

Disc Spring & Belleville Washers

Belleville Spring Washer on Busbar Joint for Busway System Hexagon Spring Washer (https://engineeringhardware.com/product/belleville-spring-washer-on-busbar-joint-for-busway-system-hexagon-spring-washer/)

Flat Gasket · Carbon Steel

US$0.96 – 1.32MOQ 1 piece



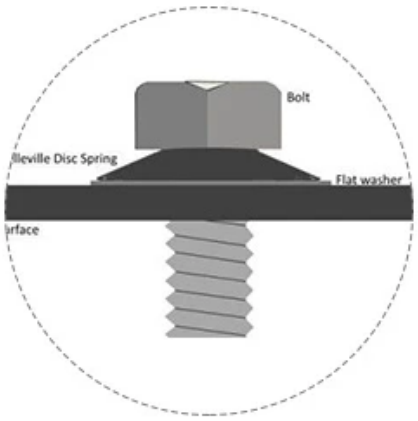
(https://engineeringhardware.com/product/industrial-grade-din9250-carbon-steel-double-fold-self-locking-spring-belleville/)

Disc Spring & Belleville Washers

Industrial Grade DIN9250 Carbon Steel Double Fold Self Locking Spring Belleville Washer Industrial Fastening Component
(https://engineeringhardware.com/product/industrial-grade-din9250-carbon-steel-double-fold-self-locking-spring-belleville/)
(https://engineeringhardware.com/product/industrial-grade-din9250-carbon-steel-double-fold-self-locking-spring-belleville/)

Belleville Washer · DIN,ASTM/ANSI JIS En ISO,as,GB

US$0.036 – 0.36 MOQ 10,000 pieces







(https://engineeringhardware.com/product/stainless-steel-a2-a4-inox-nf-e25-511-belleville-grooved-conical-disc-spring-washers/)

Disc Spring & Belleville Washers

Stainless Steel A2 A4 Inox NF E25-511 Belleville Grooved Conical Disc Spring Washers for Automotive and Engines

(https://engineeringhardware.com/product/stainless-steel-a2-a4-inox-nf-e25-511-belleville-grooved-conical-disc-spring-washers/)
(https://engineeringhardware.com/product/stainless-steel-a2-a4-inox-nf-e25-511-belleville-grooved-conical-disc-spring-washers/)

Spring Washer · NF E25-511

US$0.012 – 0.42 MOQ 5,000 pieces



(https://engineeringhardware.com/product/reliable-spherical-conical-washer-with-stainless-steel-ce-cert-smooth-finish-m3-m24/)

Disc Spring & Belleville Washers

Reliable Spherical & Conical Washer with Stainless Steel CE Cert Smooth Finish M3-M24 (https://engineeringhardware.com/product/reliable-spherical-conical-washer-with-stainless-steel-ce-cert-smooth-finish-m3-m24/)

Belleville Washer · DIN, GB

US$0.18 – 998.40 MOQ 2,000 pieces

View all Disc Spring & Belleville Washers → (https://engineeringhardware.com/fastener-products/washers/disc-spring-belleville-washers/)

Full product catalog (https://engineeringhardware.com/products/)

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 Steel 66

Alloy Steel 41

Bearing Steel 5

Spring Steel 25

Aluminum and Aluminum Alloys 21

Brass 17

Bronze 11

Copper 8

Titanium and Titanium Alloys 18

Nickel and Nickel Alloys 22

Iron-Nickel and High-Temperature Alloys 10

Tool Steel and Specialty Hardened Steel 9

Structural and Construction Steel 9

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
- ML08Al
- 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

Belleville Washers are bought for a small number of well-defined jobs. These are the ones we ship them for. Stocked from 1/4" to 3/4" (screw size).

Industries that specify Belleville Washers

Flanged & gasketed joints Maintaining bolt load as a gasket relaxes.

Electrical connections Bus-bar joints that must stay tight through thermal cycling.

Machine tools Preload packs and clamping systems.

Rotating & vibrating plant Spring, tooth and wedge types that maintain or lock bolt tension.

Steel fabrication Spreading load under a head or nut and protecting the surface finish.

Machine building & OEM Setting bearing area on soft alloy, plastic and oversized holes.

Typical applications

- stacked in series or parallel to tune load and travel
- maintaining bolt load in a joint that settles
- spreading clamp load over a soft or oversized bearing face
- protecting a painted or plated surface under a turned nut
- maintaining bolt tension in a joint that settles

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.

Hardness matters

Under a high-strength bolt a soft washer embeds into the joint and preload is lost — specify a hardened washer for structural bolting.

Full application guide: where Belleville Washers are used, how to specify them, and the cases they are wrong for (https://engineeringhardware.com/applications/belleville-washers-inch/)

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 1/4" Belleville Washers (Inch Series) to Trade series (inch Belleville). Side view and top view, drawn to the dimensions in the table below and redrawn for any size selected.

Sends the selected values to the quote form below.

Request a Quotation for Belleville Washers (Inch Series)

The form below follows the current technical drawing configuration. Change the drawing values above and the request details update automatically.

Dimensions & Specifications (Trade series (inch Belleville))

Every row below is a starting point for the customizer above — pick any size and the drawing will redraw to that row.

For bolt size	Inner diameter (in)	Outer diameter (in)	Thickness (in)	Free height (in
1/4"	0.260	0.550	0.020	0.034
5/16"	0.322	0.688	0.025	0.042
3/8"	0.385	0.812	0.030	0.050
1/2"	0.510	1.062	0.040	0.066
5/8"	0.635	1.312	0.050	0.082
3/4"	0.760	1.562	0.060	0.098

Belleville Washers (Inch Series) are washers manufactured to Trade series (inch Belleville). This page lists the full dimensional range with the key specifications engineers need to select and specify them.

What Are Belleville Washers (Inch Series)?

Belleville Washers (Inch Series) are washers defined by Trade series (inch Belleville). They are selected by screw size and the dimensional characteristics shown below, and are available in a range of materials and finishes to suit the application and environment.

Materials & Finishes

Common materials include carbon steel (typically zinc plated or hot-dip galvanized), hardened or case-hardened steel where wear matters, and stainless steel A2 (304) or A4 (316) for corrosion resistance. Specify the material, hardness where relevant, and the

surface finish appropriate to your application and environment.

Specification Guides

Each size, material and standard of Belleville Washers (Inch Series) has its own reference page with the figures for that one configuration.

Goes With

Hardware commonly specified alongside Belleville Washers (Inch Series).

Pricing

Belleville Washers (Inch Series) are supplied to order. Pricing starts from approximately US$0.090 per piece for standard sizes in carbon steel; final pricing depends on size, material, finish and order quantity (MOQ applies). Submit your exact configuration with the quote form above.

Custom manufacturing · Made to drawing

Need a belleville washers (inch series) outside the standard range?

Bearing area is usually the reason for a special washer: a larger outside diameter to spread load into a softer material, or a thicker section to resist dishing. Made by stamping or punching.

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

Custom washer manufacturing
(https://engineeringhardware.com/custom/washers/)

Send a drawing (https://engineeringhardware.com/custom/washers/#rfq)

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.

Video: Belleville Washers (Inch Series)



(https://www.youtube.com/watch?v=2qCNOBUvPdQ)https://www.youtube.com/watch?v=2qCNOBUvPdQ)

► Watch video: https://www.youtube.com/watch?v=2qGNQBUvPd0 (https://www.youtube.com/watch?v=2qGNQBUvPd0)

Third-party video, selected automatically for this topic. It is not produced by Engineering Hardware and is not a specification source — use the tables on this page for dimensional data.

Frequently Asked Questions

What standard are Belleville Washers (Inch Series) manufactured to?

Belleville Washers (Inch Series) are manufactured to Trade series (inch Belleville). The dimensional values on this page follow that standard.

Which sizes of Belleville Washers (Inch Series) does Engineering Hardware supply?

The table on this page lists 6 sizes for Belleville Washers (Inch Series), ranging from 1/4" to 3/4". Sizes outside the table can be quoted on request.

In which materials are Belleville Washers (Inch Series) supplied?

Belleville Washers (Inch Series) are supplied in carbon steel (zinc plated / HDG) and stainless A2 / A4, with finishes including zinc plating, hot-dip galvanizing and black oxide. Choose material and finish to suit the load and the service environment for Belleville Washers (Inch Series).

How do I request a quotation?

Use the parametric drawing on this page to set the exact configuration (size, material, finish) and click "Request this configuration" — a specialist from Engineering Hardware will respond within one business day.