

DOWEL PINS AND EXTRACTABLE DOWELS

Dowels are solid pins, usually precision ground to narrow limits to permit accurate fitting, they are traditionally used to hold parts together in a fixed alignment, relying on the tightness of fit to stay in place.

Some applications for solid pins require clearance or transition fits on at least one of the components to be fastened. There are three factors that determine the size of hole needed:

- **The tolerance on the dowel**
- **The tightness of fit needed**
- **The hardness of the components into which the dowel is to be fitted**



TOLERANCES AND FITS

Our range standardises on m6 tolerance, which corresponds to the ISO and DIN standards*. The m6 tolerance is a 'plus tolerance' range and is normally used for interference fits. Also available are the minus tolerance ranges, h7 and h8.

HOLE TOLERANCE GUIDE

Hole material	Hardened steel	Mild steel	Aluminium / zinc / brass
Interference fit	Pin Ø less 5 microns	Pin Ø less 25 microns	Pin Ø less 35 microns
Transition fit	Pin Ø less 2 microns	Pin Ø less 5 microns	Pin Ø less 5 microns
Clearance fit	Pin Ø plus 25–60 microns	Pin Ø plus 25–60 microns	Pin Ø plus 25–60 microns

FITTING DOWELS INTO BLIND HOLES

When a dowel is interference-fitted into a blind hole, it increases the pressure of the air trapped in the hole. It is recommended that the dowel should have an air release flat ground along its full length to prevent the dowel being ejected under the pressure of compressed air, or bursting the component into which it is driven.

MATERIALS**

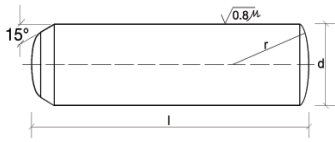
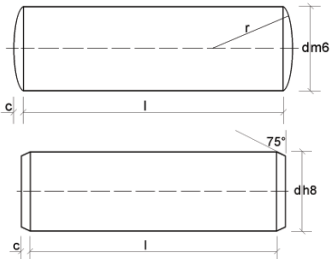
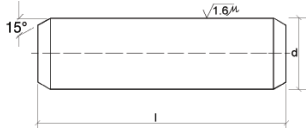
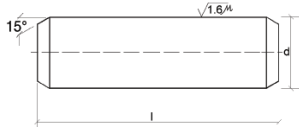
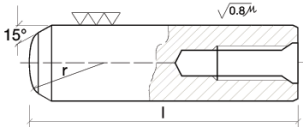
Through hardened steel	100Cr6, WS 1.3505 hardened and tempered to HV 550-650
Mild steel, unhardened	WS 1.0718 (9SMnPb28)
Stainless a2	WS 1.4305 or 303S31
Stainless a4	WS 1.4571 or 316S11

*See page 37 for full details.

**Other materials are listed under 'special pins'. See page 38 for material compositions.

STANDARDS

Dowel pins are made to several national or international standards, each with slight differences in chamfer forms, length tolerances and available materials.

STANDARD	STOCKED	MADE TO ORDER
DIN 6325 	Diameters 1–20mm in steel, through-hardened and ground to m6	Other tolerances Stainless steel Diameters not shown overleaf
DIN 7 <i>Note; overall length is greater than nominal length. See dimension C and refer to table on next page</i> 	Diameters 1–30mm in mild steel ground to m6 Diameters 0.8–25mm in stainless A2 Diameters 1–12mm in stainless A4	Other tolerances Diameters not shown overleaf Dowels 14-25mm in stainless A4
ISO 2338 (1998) 	Diameters 1–25mm in mild steel ground to m6 Diameters 1–25mm in stainless A2	Other tolerances Stainless A4 Diameters not shown overleaf
ISO 8734 (1998) 		Diameters 1–20mm Through-hardened steel ground to m6 (8734A) Case-hardened steel ground to m6 (8734B) Through hardened martensitic stainless (8734C)
DIN 7979D 	Diameters 4–20mm in steel, through-hardened and ground to m6 Diameters 4–20mm in stainless A2	

ADDITIONAL STANDARDS

BS 1804 PART 1	Solid dowels in inch sizes in low carbon steel, case-hardened for diameters 1/8"-1
BS 1804 PART 2	Solid dowels in metric sizes in low or high carbon steel, hardened for diameters of 4mm and above
BS 1804 PART 3	Extractable dowels and taper pins
BS 7055	Equivalent to ISO 8734
ISO 8733	Equivalent to DIN 7979A (unhardened)
ISO 8735	Equivalent to DIN 7979D (hardened)

SIZE RANGES

SIZE RANGE – DOWEL PINS TO DIN 6325 m6 TOLERANCE

Nominal Diameter, DIN 6325	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	20
Available Materials	Steel, Through Hardened and Ground to m6 tolerance													
Double Shear Strengths tested to ISO 8749, kN	1.5	3.4	5.5	8	13	22	31	53	88	132	210	260	350	485
Lengths in mm														
4														
5														
6														
8														
10														
12														
14														
16														
18														
20														
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70														
80														
90														
100														
110														
120														
Length Tolerances	to js 14													

SIZE RANGE – DOWEL PINS TO DIN 7 m6 AND h8 TOLERANCE

Nominal Diameter, DIN 7	0.8	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	20	25	30
Dimension C	0.12	0.15	0.23	0.3	0.4	0.45	0.6	0.75	0.9	1.2	1.5	1.8	2	2.5	3	4	4.5
Available Materials	Mild Steel ground to m6 or h8 tolerance A2 Stainless, Grade 1.4305 ground to m6 or h8, up to 25 mm Ø A4 Stainless, Grade 1.4571 ground to m6, from 1 to 25mm Ø																
Double Shear Strengths tested to ISO 8749, kN																	
Mild Steel	0.4	0.7	1.6	2.85	4.25	6.15	10.6	16.5	22.8	40.5	63.2	91	124	156	220	300	390
Stainless Steel A2	0.4	0.7	1.7	2.9	4.4	6.6	11.7	18.1	26.0	47.0	64.1	92					
Lengths in mm																	
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90																	
100																	
110																	
120																	
Length Tolerances	3 – 10 mm long + 0.3,-0					12 – 50 mm long + 0.5,-0					Over 50 mm long + 0.8,-0						

A selection kit is also available. Also stocked in inch sizes in equivalent standard.

SIZE RANGES

SIZE RANGE – DOWEL PINS TO ISO 2338 (1998)

Nominal Diameter, ISO 2338 (1998)	0.8	1	1.5	2	2.5	3	4	5	6	8	10	12	16	20	25	30	
Available Materials	Mild Steel ground to m6 or h8 tolerance A2 Stainless, Grade 1.4305 ground to m6 or h8, $\varnothing 5$ to \varnothing																
Double Shear Strengths tested to ISO 8749, kN																	
Mild Steel	0.4	0.7	1.6	2.85	4.25	6.15	10.6	16.5	22.8	40.5	63.2	91	156	220	300	390	
Stainless Steel A2	0.4	0.7	1.7	2.9	4.4	6.6	11.7	18.1	26.0	47.0	64.1	92	160				
Lengths in mm																	
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Length Tolerances	3 – 10 mm long ± 0.25					12 – 50 mm long ± 0.5					Over 50 mm long ± 0.75						

A selection kit is also available. Longer lengths available in diameters 5 – 20mm.

SIZE RANGE – EXTRACTABLE DOWELS TO DIN 7979D WITH AIR RELEASE FLAT

Nominal Diameter, DIN 7979D with Air Release	4	5	6	8	10	12	14	16	20
Available Materials	Through Hardened Steel Grade WS 1.3505, ground to m6 tolerance A2 Stainless Steel Grade 1.4305, ground to m6								
Thread Size	M2.5	M3	M4	M5	M6	M6	M8	M8	M10
Lengths in mm									
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70									
80									
90									
100									
120									
Length Tolerances	to js 15								