



Linear Shafts

Load & Deflections

Solid | Chrome | Hollow

Contact us

Email: help@ooznest.co.uk | **Website:** www.ooznest.co.uk

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The subsequent tables illustrate the maximum loads and deflections for our Linear Shafts.

To calculate the beam deflections, the formulas provided in this resource have been used:
<https://mechanicalc.com/reference/beam-deflection-tables>

For additional assistance, a helpful beam deflection calculator is available at:
<https://deflection.app/?language=en>

To calculate the maximum column load, the formulas provided in this resource have been used: <https://tribby3d.com/blog/column-buckling/> (A value of 1.3 has been used for K)

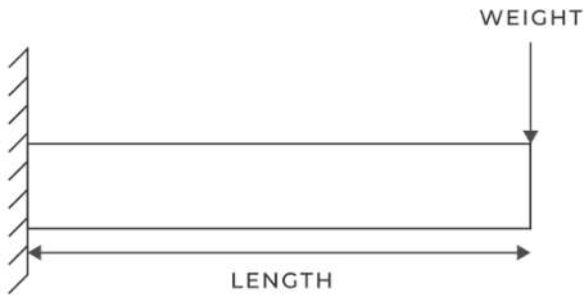
Please be aware that the figures provided are indicative only. They primarily consider beam/column deflection under load. However, real-world performance of a beam/column can also be influenced by factors such as shear stress, bending stress, torsion, buckling, fatigue, resonance, and the specific material properties of the beam/column. Therefore, it is strongly advised to conduct personal design calculations and consider these additional factors to ensure the chosen profile is suitable for the specific application.

We recommend applying appropriate safety factors for your industry to these calculated values. Common safety factors range between 2 and 3 for non-critical applications, providing an additional margin of safety against unforeseen circumstances or inaccuracies in the calculations.

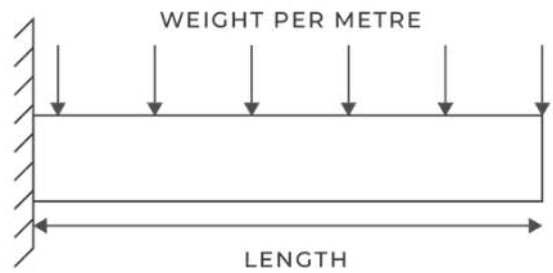
Beams & Loads

Cantilever Beams

Cantilever Beams are only supported at a single end.



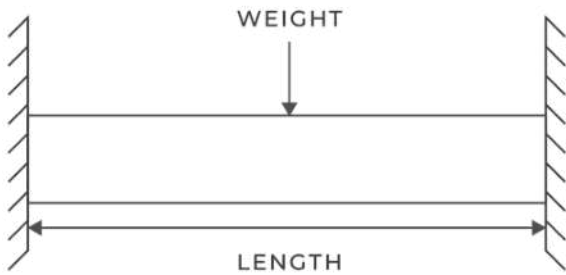
FIXED CANTILEVER
END POINT LOAD



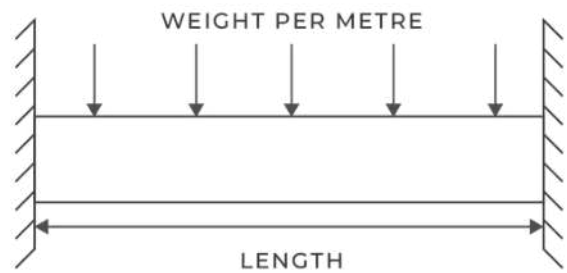
FIXED CANTILEVER
EVENLY DISTRIBUTED LOAD

Fixed Beams

Fixed Beams are supported at both ends.



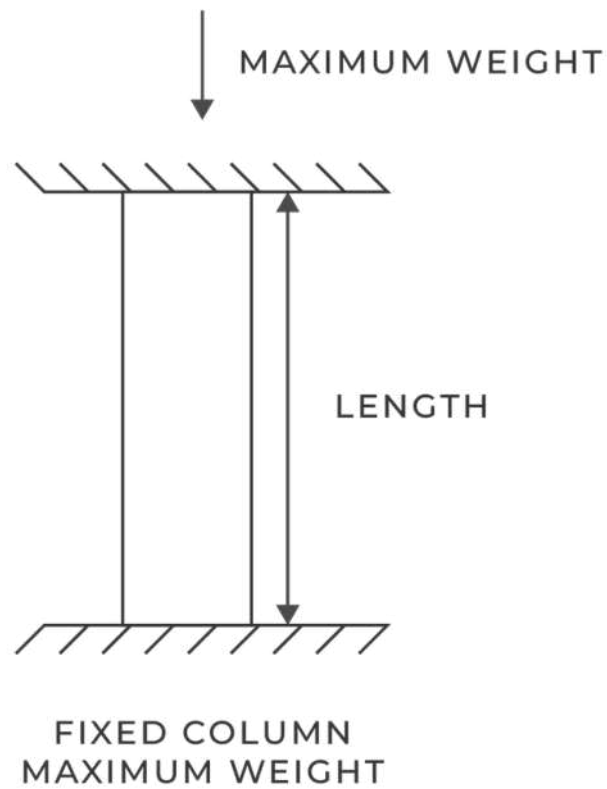
FIXED BEAM
CENTRE POINT LOAD



FIXED BEAM
EVENLY DISTRIBUTED LOAD

Fixed Columns

Fixed Columns are vertical, with the ends fixed at both ends.



Solid - 5mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (p)	Area m ² (a)	Ixx	Iyy
5mm	2E+11	7850	0.0000196350	3.06700E-11	3.06700E-11

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.8	1.9	30.8
0.05	0.0	0.3	1.0	2.5	5.3	57.5
0.10	0.1	0.5	1.7	4.2	8.6	84.1
0.25	0.1	1.1	3.8	9.3	18.6	164.1
0.50	0.3	2.2	7.4	17.8	35.2	297.4
0.75	0.4	3.2	11.0	26.4	51.9	430.6
1.00	0.5	4.3	14.6	34.9	68.6	563.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.8	1.9	30.8
0.05	0.0	0.1	0.3	1.0	2.6	40.8
0.10	0.0	0.1	0.4	1.3	3.2	50.8
0.25	0.0	0.1	0.7	2.1	5.0	80.8
0.50	0.0	0.2	1.1	3.3	8.2	130.8
0.75	0.0	0.3	1.5	4.6	11.3	180.7
1.00	0.0	0.4	1.9	5.9	14.4	230.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.6
0.10	0.0	0.0	0.0	0.1	0.1	1.5
0.25	0.0	0.0	0.1	0.1	0.3	2.7
0.50	0.0	0.0	0.1	0.3	0.6	4.8
1.00	0.0	0.1	0.2	0.5	1.1	9.0
2.00	0.0	0.1	0.5	1.1	2.1	17.3
3.00	0.0	0.2	0.7	1.6	3.2	25.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.6
0.10	0.0	0.0	0.0	0.0	0.1	1.1
0.25	0.0	0.0	0.0	0.0	0.1	1.7
0.50	0.0	0.0	0.0	0.1	0.2	2.7
1.00	0.0	0.0	0.0	0.1	0.3	4.8
2.00	0.0	0.0	0.1	0.2	0.6	9.0
3.00	0.0	0.0	0.1	0.3	0.8	13.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	15	4	2	1	1	0

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (p)	Area m ² (a)	I _{xx}	I _{yy}
6mm	2E+11	7850	0.0000282743	6.36200E-11	6.36200E-11

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.5	1.3	21.4
0.05	0.0	0.1	0.5	1.4	2.9	34.2
0.10	0.0	0.2	0.9	2.2	4.5	47.1
0.25	0.1	0.5	1.9	4.7	9.4	85.6
0.50	0.1	1.1	3.6	8.8	17.4	149.9
0.75	0.2	1.6	5.4	12.9	25.4	214.1
1.00	0.3	2.1	7.1	17.0	33.5	278.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.5	1.3	21.4
0.05	0.0	0.0	0.2	0.7	1.6	26.2
0.10	0.0	0.0	0.3	0.8	1.9	31.0
0.25	0.0	0.1	0.4	1.2	2.8	45.5
0.50	0.0	0.1	0.6	1.8	4.3	69.6
0.75	0.0	0.1	0.8	2.4	5.9	93.7
1.00	0.0	0.2	1.0	3.0	7.4	117.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.4
0.10	0.0	0.0	0.0	0.0	0.1	0.8
0.25	0.0	0.0	0.0	0.1	0.2	1.4
0.50	0.0	0.0	0.1	0.1	0.3	2.5
1.00	0.0	0.0	0.1	0.3	0.5	4.5
2.00	0.0	0.1	0.2	0.5	1.0	8.5
3.00	0.0	0.1	0.3	0.8	1.5	12.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.4
0.10	0.0	0.0	0.0	0.0	0.0	0.6
0.25	0.0	0.0	0.0	0.0	0.1	0.9
0.50	0.0	0.0	0.0	0.0	0.1	1.4
1.00	0.0	0.0	0.0	0.1	0.2	2.5
2.00	0.0	0.0	0.0	0.1	0.3	4.5
3.00	0.0	0.0	0.1	0.2	0.4	6.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	30	8	3	2	1	1

Solid - 8mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
8mm	2E+11	7850	0.0000502655	2.01060E-10	2.01060E-10

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.8	12.0
0.25	0.0	0.2	0.6	1.6	3.3	32.4
0.50	0.0	0.3	1.2	2.9	5.8	52.7
1.00	0.1	0.7	2.3	5.5	10.9	93.4
2.00	0.2	1.3	4.5	10.7	21.1	174.7
3.00	0.2	2.0	6.7	15.9	31.2	256.0
5.00	0.4	3.3	11.1	26.3	51.6	418.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.8	12.0
0.25	0.0	0.0	0.2	0.5	1.2	19.7
0.50	0.0	0.0	0.2	0.7	1.7	27.3
1.00	0.0	0.1	0.3	1.1	2.7	42.5
2.00	0.0	0.1	0.6	1.9	4.6	73.0
3.00	0.0	0.2	0.8	2.7	6.5	103.5
5.00	0.0	0.3	1.3	4.2	10.3	164.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.3	0.6	1.3
0.50	0.0	0.1	0.3	0.9	1.9	3.4
1.00	0.0	0.2	0.6	1.5	3.1	5.6
2.00	0.0	0.3	1.2	2.8	5.6	9.8
3.00	0.1	0.5	1.7	4.1	8.1	14.1
5.00	0.1	0.8	2.8	6.6	13.0	22.7
10.00	0.2	1.6	5.4	13.0	25.4	44.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.3	0.6	1.3
0.50	0.0	0.0	0.2	0.6	1.4	2.9
1.00	0.0	0.1	0.3	0.9	2.2	4.5
2.00	0.0	0.1	0.5	1.5	3.7	7.7
3.00	0.0	0.1	0.7	2.2	5.3	10.9
5.00	0.0	0.2	1.1	3.4	8.4	17.4
10.00	0.0	0.4	2.1	6.6	16.1	33.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	96	24	11	6	4	3

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
10mm	2E+11	7850	0.0000785398	4.90870E-10	4.90870E-10

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.5	7.7
0.25	0.0	0.1	0.3	0.7	1.5	16.0
0.50	0.0	0.1	0.5	1.3	2.6	24.4
1.00	0.0	0.3	1.0	2.3	4.6	41.0
2.00	0.1	0.5	1.9	4.5	8.8	74.3
3.00	0.1	0.8	2.8	6.6	13.0	107.6
5.00	0.2	1.3	4.6	10.9	21.3	174.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.5	7.7
0.25	0.0	0.0	0.1	0.3	0.7	10.8
0.50	0.0	0.0	0.1	0.4	0.9	13.9
1.00	0.0	0.0	0.2	0.5	1.3	20.2
2.00	0.0	0.1	0.3	0.8	2.0	32.7
3.00	0.0	0.1	0.4	1.2	2.8	45.2
5.00	0.0	0.1	0.6	1.8	4.4	70.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.2	0.4	0.8
0.50	0.0	0.0	0.2	0.4	0.9	1.7
1.00	0.0	0.1	0.3	0.7	1.4	2.6
2.00	0.0	0.1	0.5	1.2	2.4	4.3
3.00	0.0	0.2	0.7	1.7	3.4	6.1
5.00	0.0	0.3	1.1	2.8	5.5	9.6
10.00	0.1	0.7	2.2	5.4	10.6	18.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.2	0.4	0.8
0.50	0.0	0.0	0.1	0.3	0.7	1.5
1.00	0.0	0.0	0.1	0.4	1.0	2.1
2.00	0.0	0.0	0.2	0.7	1.7	3.4
3.00	0.0	0.1	0.3	0.9	2.3	4.8
5.00	0.0	0.1	0.5	1.5	3.6	7.4
10.00	0.0	0.2	0.9	2.8	6.7	14.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	234	58	26	15	9	6

Solid - 12mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
12mm	2E+11	7850	0.0001130973	1.01788E-09	1.01788E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	5.3
0.25	0.0	0.0	0.2	0.4	0.8	9.4
0.50	0.0	0.1	0.3	0.7	1.3	13.4
1.00	0.0	0.1	0.5	1.2	2.3	21.4
2.00	0.0	0.3	0.9	2.2	4.3	37.5
3.00	0.0	0.4	1.3	3.2	6.4	53.5
5.00	0.1	0.7	2.2	5.3	10.4	85.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	5.3
0.25	0.0	0.0	0.1	0.2	0.4	6.9
0.50	0.0	0.0	0.1	0.2	0.5	8.4
1.00	0.0	0.0	0.1	0.3	0.7	11.4
2.00	0.0	0.0	0.1	0.4	1.1	17.4
3.00	0.0	0.0	0.2	0.6	1.5	23.4
5.00	0.0	0.1	0.3	0.9	2.2	35.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	0.6
0.50	0.0	0.0	0.1	0.2	0.5	1.0
1.00	0.0	0.0	0.1	0.4	0.8	1.4
2.00	0.0	0.1	0.2	0.6	1.3	2.3
3.00	0.0	0.1	0.4	0.9	1.7	3.1
5.00	0.0	0.2	0.6	1.4	2.7	4.8
10.00	0.0	0.3	1.1	2.6	5.2	9.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	0.6
0.50	0.0	0.0	0.1	0.2	0.4	0.9
1.00	0.0	0.0	0.1	0.2	0.6	1.2
2.00	0.0	0.0	0.1	0.4	0.9	1.8
3.00	0.0	0.0	0.2	0.5	1.2	2.5
5.00	0.0	0.0	0.2	0.7	1.8	3.7
10.00	0.0	0.1	0.4	1.4	3.3	6.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	485	121	54	30	19	13

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (p)	Area m ² (a)	Ixx	Iyy
16mm	2E+11	7850	0.0002010619	3.21699E-09	3.21699E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	3.0
0.50	0.0	0.0	0.1	0.2	0.5	5.5
1.00	0.0	0.0	0.2	0.4	0.8	8.1
2.00	0.0	0.1	0.3	0.7	1.5	13.2
3.00	0.0	0.1	0.4	1.1	2.1	18.3
5.00	0.0	0.2	0.7	1.7	3.4	28.4
10.00	0.1	0.4	1.4	3.3	6.5	53.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	3.0
0.50	0.0	0.0	0.0	0.1	0.2	4.0
1.00	0.0	0.0	0.0	0.1	0.3	4.9
2.00	0.0	0.0	0.1	0.2	0.4	6.8
3.00	0.0	0.0	0.1	0.2	0.5	8.7
5.00	0.0	0.0	0.1	0.3	0.8	12.5
10.00	0.0	0.0	0.2	0.6	1.4	22.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.3	1.0
1.00	0.0	0.1	0.1	0.3	0.6	1.6
2.00	0.0	0.1	0.2	0.5	0.9	2.3
3.00	0.0	0.1	0.3	0.6	1.1	2.9
5.00	0.1	0.2	0.5	0.9	1.7	4.2
10.00	0.1	0.4	0.9	1.7	3.0	7.4
20.00	0.2	0.7	1.7	3.3	5.7	13.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.3	1.0
1.00	0.0	0.0	0.1	0.2	0.5	1.6
2.00	0.0	0.0	0.1	0.3	0.7	2.3
3.00	0.0	0.1	0.2	0.4	0.9	2.9
5.00	0.0	0.1	0.3	0.6	1.3	4.2
10.00	0.0	0.1	0.5	1.1	2.3	7.4
20.00	0.1	0.3	0.9	2.1	4.3	13.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	1532	383	170	96	61	43

Solid - 20mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
20mm	2E+11	7850	0.0003141593	7.85398E-09	7.85398E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.9
0.50	0.0	0.0	0.0	0.1	0.3	3.0
1.00	0.0	0.0	0.1	0.2	0.4	4.0
2.00	0.0	0.0	0.1	0.3	0.6	6.1
3.00	0.0	0.1	0.2	0.4	0.9	8.2
5.00	0.0	0.1	0.3	0.7	1.4	12.3
10.00	0.0	0.2	0.6	1.4	2.7	22.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.9
0.50	0.0	0.0	0.0	0.1	0.1	2.3
1.00	0.0	0.0	0.0	0.1	0.2	2.7
2.00	0.0	0.0	0.0	0.1	0.2	3.5
3.00	0.0	0.0	0.0	0.1	0.3	4.3
5.00	0.0	0.0	0.0	0.1	0.4	5.8
10.00	0.0	0.0	0.1	0.2	0.6	9.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	0.6
1.00	0.0	0.0	0.1	0.2	0.3	0.9
2.00	0.0	0.0	0.1	0.2	0.4	1.2
3.00	0.0	0.1	0.1	0.3	0.5	1.4
5.00	0.0	0.1	0.2	0.4	0.8	1.9
10.00	0.0	0.1	0.4	0.7	1.3	3.2
20.00	0.1	0.3	0.7	1.4	2.4	5.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	0.6
1.00	0.0	0.0	0.1	0.1	0.3	0.9
2.00	0.0	0.0	0.1	0.2	0.4	1.2
3.00	0.0	0.0	0.1	0.2	0.5	1.4
5.00	0.0	0.0	0.1	0.3	0.6	1.9
10.00	0.0	0.1	0.2	0.5	1.0	3.2
20.00	0.0	0.1	0.4	0.9	1.8	5.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	3740	935	416	234	150	104

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
25mm	2E+11	7850	0.0004908739	1.91748E-08	1.91748E-08

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.2
1.00	0.0	0.0	0.0	0.1	0.2	2.1
2.00	0.0	0.0	0.1	0.1	0.3	2.9
3.00	0.0	0.0	0.1	0.2	0.4	3.8
5.00	0.0	0.0	0.1	0.3	0.6	5.5
10.00	0.0	0.1	0.2	0.6	1.1	9.8
20.00	0.0	0.1	0.5	1.1	2.2	18.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.2
1.00	0.0	0.0	0.0	0.0	0.1	1.6
2.00	0.0	0.0	0.0	0.0	0.1	1.9
3.00	0.0	0.0	0.0	0.1	0.1	2.2
5.00	0.0	0.0	0.0	0.1	0.2	2.8
10.00	0.0	0.0	0.0	0.1	0.3	4.4
20.00	0.0	0.0	0.1	0.2	0.5	7.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.4	1.0	2.1
1.00	0.0	0.0	0.2	0.5	1.2	2.4
3.00	0.0	0.1	0.3	0.7	1.6	3.2
5.00	0.0	0.1	0.4	0.9	2.0	3.9
10.00	0.0	0.2	0.6	1.5	3.1	5.7
20.00	0.0	0.3	1.0	2.5	5.2	9.3
40.00	0.1	0.6	1.9	4.7	9.3	16.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.4	1.0	2.1
1.00	0.0	0.0	0.2	0.5	1.3	2.6
3.00	0.0	0.0	0.2	0.7	1.8	3.7
5.00	0.0	0.1	0.3	0.9	2.3	4.8
10.00	0.0	0.1	0.5	1.5	3.6	7.5
20.00	0.0	0.2	0.8	2.5	6.2	12.9
40.00	0.0	0.3	1.5	4.7	11.4	23.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	9132	2283	1015	571	365	254

Solid - 30mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
30mm	2E+11	7850	0.0007068583	3.97608E-08	3.97608E-08

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	0.9
1.00	0.0	0.0	0.0	0.0	0.1	1.3
2.00	0.0	0.0	0.0	0.1	0.2	1.7
3.00	0.0	0.0	0.0	0.1	0.2	2.1
5.00	0.0	0.0	0.1	0.2	0.3	2.9
10.00	0.0	0.0	0.1	0.3	0.6	5.0
20.00	0.0	0.1	0.2	0.5	1.1	9.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	0.9
1.00	0.0	0.0	0.0	0.0	0.1	1.0
2.00	0.0	0.0	0.0	0.0	0.1	1.2
3.00	0.0	0.0	0.0	0.0	0.1	1.3
5.00	0.0	0.0	0.0	0.0	0.1	1.6
10.00	0.0	0.0	0.0	0.1	0.1	2.4
20.00	0.0	0.0	0.0	0.1	0.2	3.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.7	1.4
1.00	0.0	0.0	0.1	0.3	0.8	1.6
3.00	0.0	0.0	0.2	0.4	1.0	2.0
5.00	0.0	0.0	0.2	0.5	1.2	2.3
10.00	0.0	0.1	0.3	0.8	1.7	3.2
20.00	0.0	0.1	0.5	1.3	2.7	4.9
40.00	0.0	0.3	1.0	2.3	4.7	8.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.7	1.4
1.00	0.0	0.0	0.1	0.3	0.8	1.7
3.00	0.0	0.0	0.1	0.4	1.1	2.2
5.00	0.0	0.0	0.2	0.5	1.3	2.7
10.00	0.0	0.0	0.3	0.8	2.0	4.0
20.00	0.0	0.1	0.4	1.3	3.2	6.6
40.00	0.0	0.1	0.7	2.3	5.7	11.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	18936	4734	2104	1184	757	526

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
5mm	2E+11	7850	0.0000196350	3.06700E-11	3.06700E-11

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.8	1.9	30.8
0.05	0.0	0.3	1.0	2.5	5.3	57.5
0.10	0.1	0.5	1.7	4.2	8.6	84.1
0.25	0.1	1.1	3.8	9.3	18.6	164.1
0.50	0.3	2.2	7.4	17.8	35.2	297.4
0.75	0.4	3.2	11.0	26.4	51.9	430.6
1.00	0.5	4.3	14.6	34.9	68.6	563.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.8	1.9	30.8
0.05	0.0	0.1	0.3	1.0	2.6	40.8
0.10	0.0	0.1	0.4	1.3	3.2	50.8
0.25	0.0	0.1	0.7	2.1	5.0	80.8
0.50	0.0	0.2	1.1	3.3	8.2	130.8
0.75	0.0	0.3	1.5	4.6	11.3	180.7
1.00	0.0	0.4	1.9	5.9	14.4	230.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.6
0.10	0.0	0.0	0.0	0.1	0.1	1.5
0.25	0.0	0.0	0.1	0.1	0.3	2.7
0.50	0.0	0.0	0.1	0.3	0.6	4.8
1.00	0.0	0.1	0.2	0.5	1.1	9.0
2.00	0.0	0.1	0.5	1.1	2.1	17.3
3.00	0.0	0.2	0.7	1.6	3.2	25.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.6
0.10	0.0	0.0	0.0	0.0	0.1	1.1
0.25	0.0	0.0	0.0	0.0	0.1	1.7
0.50	0.0	0.0	0.0	0.1	0.2	2.7
1.00	0.0	0.0	0.0	0.1	0.3	4.8
2.00	0.0	0.0	0.1	0.2	0.6	9.0
3.00	0.0	0.0	0.1	0.3	0.8	13.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	15	4	2	1	1	0

Chrome - 6mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
6mm	2E+11	7850	0.0000282743	6.36200E-11	6.36200E-11

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.5	1.3	21.4
0.05	0.0	0.1	0.5	1.4	2.9	34.2
0.10	0.0	0.2	0.9	2.2	4.5	47.1
0.25	0.1	0.5	1.9	4.7	9.4	85.6
0.50	0.1	1.1	3.6	8.8	17.4	149.9
0.75	0.2	1.6	5.4	12.9	25.4	214.1
1.00	0.3	2.1	7.1	17.0	33.5	278.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.2	0.5	1.3	21.4
0.05	0.0	0.0	0.2	0.7	1.6	26.2
0.10	0.0	0.0	0.3	0.8	1.9	31.0
0.25	0.0	0.1	0.4	1.2	2.8	45.5
0.50	0.0	0.1	0.6	1.8	4.3	69.6
0.75	0.0	0.1	0.8	2.4	5.9	93.7
1.00	0.0	0.2	1.0	3.0	7.4	117.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.4
0.10	0.0	0.0	0.0	0.0	0.1	0.8
0.25	0.0	0.0	0.0	0.1	0.2	1.4
0.50	0.0	0.0	0.1	0.1	0.3	2.5
1.00	0.0	0.0	0.1	0.3	0.5	4.5
2.00	0.0	0.1	0.2	0.5	1.0	8.5
3.00	0.0	0.1	0.3	0.8	1.5	12.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.4
0.10	0.0	0.0	0.0	0.0	0.0	0.6
0.25	0.0	0.0	0.0	0.0	0.1	0.9
0.50	0.0	0.0	0.0	0.0	0.1	1.4
1.00	0.0	0.0	0.0	0.1	0.2	2.5
2.00	0.0	0.0	0.0	0.1	0.3	4.5
3.00	0.0	0.0	0.1	0.2	0.4	6.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	30	8	3	2	1	1

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (p)	Area m ² (a)	I _{xx}	I _{yy}
8mm	2E+11	7850	0.0000502655	2.01060E-10	2.01060E-10

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.8	12.0
0.25	0.0	0.2	0.6	1.6	3.3	32.4
0.50	0.0	0.3	1.2	2.9	5.8	52.7
1.00	0.1	0.7	2.3	5.5	10.9	93.4
2.00	0.2	1.3	4.5	10.7	21.1	174.7
3.00	0.2	2.0	6.7	15.9	31.2	256.0
5.00	0.4	3.3	11.1	26.3	51.6	418.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.8	12.0
0.25	0.0	0.0	0.2	0.5	1.2	19.7
0.50	0.0	0.0	0.2	0.7	1.7	27.3
1.00	0.0	0.1	0.3	1.1	2.7	42.5
2.00	0.0	0.1	0.6	1.9	4.6	73.0
3.00	0.0	0.2	0.8	2.7	6.5	103.5
5.00	0.0	0.3	1.3	4.2	10.3	164.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.3	0.6	1.3
0.50	0.0	0.1	0.3	0.9	1.9	3.4
1.00	0.0	0.2	0.6	1.5	3.1	5.6
2.00	0.0	0.3	1.2	2.8	5.6	9.8
3.00	0.1	0.5	1.7	4.1	8.1	14.1
5.00	0.1	0.8	2.8	6.6	13.0	22.7
10.00	0.2	1.6	5.4	13.0	25.4	44.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.3	0.6	1.3
0.50	0.0	0.0	0.2	0.6	1.4	2.9
1.00	0.0	0.1	0.3	0.9	2.2	4.5
2.00	0.0	0.1	0.5	1.5	3.7	7.7
3.00	0.0	0.1	0.7	2.2	5.3	10.9
5.00	0.0	0.2	1.1	3.4	8.4	17.4
10.00	0.0	0.4	2.1	6.6	16.1	33.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	96	24	11	6	4	3

Chrome - 10mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (p)	Area m ² (a)	Ixx	Iyy
10mm	2E+11	7850	0.0000785398	4.90870E-10	4.90870E-10

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.5	7.7
0.25	0.0	0.1	0.3	0.7	1.5	16.0
0.50	0.0	0.1	0.5	1.3	2.6	24.4
1.00	0.0	0.3	1.0	2.3	4.6	41.0
2.00	0.1	0.5	1.9	4.5	8.8	74.3
3.00	0.1	0.8	2.8	6.6	13.0	107.6
5.00	0.2	1.3	4.6	10.9	21.3	174.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.5	7.7
0.25	0.0	0.0	0.1	0.3	0.7	10.8
0.50	0.0	0.0	0.1	0.4	0.9	13.9
1.00	0.0	0.0	0.2	0.5	1.3	20.2
2.00	0.0	0.1	0.3	0.8	2.0	32.7
3.00	0.0	0.1	0.4	1.2	2.8	45.2
5.00	0.0	0.1	0.6	1.8	4.4	70.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.2	0.4	0.8
0.50	0.0	0.0	0.2	0.4	0.9	1.7
1.00	0.0	0.1	0.3	0.7	1.4	2.6
2.00	0.0	0.1	0.5	1.2	2.4	4.3
3.00	0.0	0.2	0.7	1.7	3.4	6.1
5.00	0.0	0.3	1.1	2.8	5.5	9.6
10.00	0.1	0.7	2.2	5.4	10.6	18.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.1	0.2	0.4	0.8
0.50	0.0	0.0	0.1	0.3	0.7	1.5
1.00	0.0	0.0	0.1	0.4	1.0	2.1
2.00	0.0	0.0	0.2	0.7	1.7	3.4
3.00	0.0	0.1	0.3	0.9	2.3	4.8
5.00	0.0	0.1	0.5	1.5	3.6	7.4
10.00	0.0	0.2	0.9	2.8	6.7	14.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	234	58	26	15	9	6

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (p)	Area m ² (a)	Ixx	Iyy
12mm	2E+11	7850	0.0001130973	1.01788E-09	1.01788E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	5.3
0.25	0.0	0.0	0.2	0.4	0.8	9.4
0.50	0.0	0.1	0.3	0.7	1.3	13.4
1.00	0.0	0.1	0.5	1.2	2.3	21.4
2.00	0.0	0.3	0.9	2.2	4.3	37.5
3.00	0.0	0.4	1.3	3.2	6.4	53.5
5.00	0.1	0.7	2.2	5.3	10.4	85.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	5.3
0.25	0.0	0.0	0.1	0.2	0.4	6.9
0.50	0.0	0.0	0.1	0.2	0.5	8.4
1.00	0.0	0.0	0.1	0.3	0.7	11.4
2.00	0.0	0.0	0.1	0.4	1.1	17.4
3.00	0.0	0.0	0.2	0.6	1.5	23.4
5.00	0.0	0.1	0.3	0.9	2.2	35.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	0.6
0.50	0.0	0.0	0.1	0.2	0.5	1.0
1.00	0.0	0.0	0.1	0.4	0.8	1.4
2.00	0.0	0.1	0.2	0.6	1.3	2.3
3.00	0.0	0.1	0.4	0.9	1.7	3.1
5.00	0.0	0.2	0.6	1.4	2.7	4.8
10.00	0.0	0.3	1.1	2.6	5.2	9.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	0.6
0.50	0.0	0.0	0.1	0.2	0.4	0.9
1.00	0.0	0.0	0.1	0.2	0.6	1.2
2.00	0.0	0.0	0.1	0.4	0.9	1.8
3.00	0.0	0.0	0.2	0.5	1.2	2.5
5.00	0.0	0.0	0.2	0.7	1.8	3.7
10.00	0.0	0.1	0.4	1.4	3.3	6.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	485	121	54	30	19	13

Chrome - 16mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
16mm	2E+11	7850	0.0002010619	3.21699E-09	3.21699E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	3.0
0.50	0.0	0.0	0.1	0.2	0.5	5.5
1.00	0.0	0.0	0.2	0.4	0.8	8.1
2.00	0.0	0.1	0.3	0.7	1.5	13.2
3.00	0.0	0.1	0.4	1.1	2.1	18.3
5.00	0.0	0.2	0.7	1.7	3.4	28.4
10.00	0.1	0.4	1.4	3.3	6.5	53.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	3.0
0.50	0.0	0.0	0.0	0.1	0.2	4.0
1.00	0.0	0.0	0.0	0.1	0.3	4.9
2.00	0.0	0.0	0.1	0.2	0.4	6.8
3.00	0.0	0.0	0.1	0.2	0.5	8.7
5.00	0.0	0.0	0.1	0.3	0.8	12.5
10.00	0.0	0.0	0.2	0.6	1.4	22.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.3	1.0
1.00	0.0	0.1	0.1	0.3	0.6	1.6
2.00	0.0	0.1	0.2	0.5	0.9	2.3
3.00	0.0	0.1	0.3	0.6	1.1	2.9
5.00	0.1	0.2	0.5	0.9	1.7	4.2
10.00	0.1	0.4	0.9	1.7	3.0	7.4
20.00	0.2	0.7	1.7	3.3	5.7	13.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.3	1.0
1.00	0.0	0.0	0.1	0.2	0.5	1.6
2.00	0.0	0.0	0.1	0.3	0.7	2.3
3.00	0.0	0.1	0.2	0.4	0.9	2.9
5.00	0.0	0.1	0.3	0.6	1.3	4.2
10.00	0.0	0.1	0.5	1.1	2.3	7.4
20.00	0.1	0.3	0.9	2.1	4.3	13.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	1532	383	170	96	61	43

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
20mm	2E+11	7850	0.0003141593	7.85398E-09	7.85398E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.9
0.50	0.0	0.0	0.0	0.1	0.3	3.0
1.00	0.0	0.0	0.1	0.2	0.4	4.0
2.00	0.0	0.0	0.1	0.3	0.6	6.1
3.00	0.0	0.1	0.2	0.4	0.9	8.2
5.00	0.0	0.1	0.3	0.7	1.4	12.3
10.00	0.0	0.2	0.6	1.4	2.7	22.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.9
0.50	0.0	0.0	0.0	0.1	0.1	2.3
1.00	0.0	0.0	0.0	0.1	0.2	2.7
2.00	0.0	0.0	0.0	0.1	0.2	3.5
3.00	0.0	0.0	0.0	0.1	0.3	4.3
5.00	0.0	0.0	0.0	0.1	0.4	5.8
10.00	0.0	0.0	0.1	0.2	0.6	9.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	0.6
1.00	0.0	0.0	0.1	0.2	0.3	0.9
2.00	0.0	0.0	0.1	0.2	0.4	1.2
3.00	0.0	0.1	0.1	0.3	0.5	1.4
5.00	0.0	0.1	0.2	0.4	0.8	1.9
10.00	0.0	0.1	0.4	0.7	1.3	3.2
20.00	0.1	0.3	0.7	1.4	2.4	5.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	0.6
1.00	0.0	0.0	0.1	0.1	0.3	0.9
2.00	0.0	0.0	0.1	0.2	0.4	1.2
3.00	0.0	0.0	0.1	0.2	0.5	1.4
5.00	0.0	0.0	0.1	0.3	0.6	1.9
10.00	0.0	0.1	0.2	0.5	1.0	3.2
20.00	0.0	0.1	0.4	0.9	1.8	5.8
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	3740	935	416	234	150	104

Chrome - 25mm

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
25mm	2E+11	7850	0.0004908739	1.91748E-08	1.91748E-08

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.2
1.00	0.0	0.0	0.0	0.1	0.2	2.1
2.00	0.0	0.0	0.1	0.1	0.3	2.9
3.00	0.0	0.0	0.1	0.2	0.4	3.8
5.00	0.0	0.0	0.1	0.3	0.6	5.5
10.00	0.0	0.1	0.2	0.6	1.1	9.8
20.00	0.0	0.1	0.5	1.1	2.2	18.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.2
1.00	0.0	0.0	0.0	0.0	0.1	1.6
2.00	0.0	0.0	0.0	0.0	0.1	1.9
3.00	0.0	0.0	0.0	0.1	0.1	2.2
5.00	0.0	0.0	0.0	0.1	0.2	2.8
10.00	0.0	0.0	0.0	0.1	0.3	4.4
20.00	0.0	0.0	0.1	0.2	0.5	7.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.4	1.0	2.1
1.00	0.0	0.0	0.2	0.5	1.2	2.4
3.00	0.0	0.1	0.3	0.7	1.6	3.2
5.00	0.0	0.1	0.4	0.9	2.0	3.9
10.00	0.0	0.2	0.6	1.5	3.1	5.7
20.00	0.0	0.3	1.0	2.5	5.2	9.3
40.00	0.1	0.6	1.9	4.7	9.3	16.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.4	1.0	2.1
1.00	0.0	0.0	0.2	0.5	1.3	2.6
3.00	0.0	0.0	0.2	0.7	1.8	3.7
5.00	0.0	0.1	0.3	0.9	2.3	4.8
10.00	0.0	0.1	0.5	1.5	3.6	7.5
20.00	0.0	0.2	0.8	2.5	6.2	12.9
40.00	0.0	0.3	1.5	4.7	11.4	23.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	9132	2283	1015	571	365	254

Linear Shaft Specification

Outside Diameter	Elastic Modulus (E)	Density kg/m ³ (ρ)	Area m ² (a)	I _{xx}	I _{yy}
30mm	2E+11	7850	0.0007068583	3.97608E-08	3.97608E-08

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	0.9
1.00	0.0	0.0	0.0	0.0	0.1	1.3
2.00	0.0	0.0	0.0	0.1	0.2	1.7
3.00	0.0	0.0	0.0	0.1	0.2	2.1
5.00	0.0	0.0	0.1	0.2	0.3	2.9
10.00	0.0	0.0	0.1	0.3	0.6	5.0
20.00	0.0	0.1	0.2	0.5	1.1	9.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	0.9
1.00	0.0	0.0	0.0	0.0	0.1	1.0
2.00	0.0	0.0	0.0	0.0	0.1	1.2
3.00	0.0	0.0	0.0	0.0	0.1	1.3
5.00	0.0	0.0	0.0	0.0	0.1	1.6
10.00	0.0	0.0	0.0	0.1	0.1	2.4
20.00	0.0	0.0	0.0	0.1	0.2	3.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.7	1.4
1.00	0.0	0.0	0.1	0.3	0.8	1.6
3.00	0.0	0.0	0.2	0.4	1.0	2.0
5.00	0.0	0.0	0.2	0.5	1.2	2.3
10.00	0.0	0.1	0.3	0.8	1.7	3.2
20.00	0.0	0.1	0.5	1.3	2.7	4.9
40.00	0.0	0.3	1.0	2.3	4.7	8.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.7	1.4
1.00	0.0	0.0	0.1	0.3	0.8	1.7
3.00	0.0	0.0	0.1	0.4	1.1	2.2
5.00	0.0	0.0	0.2	0.5	1.3	2.7
10.00	0.0	0.0	0.3	0.8	2.0	4.0
20.00	0.0	0.1	0.4	1.3	3.2	6.6
40.00	0.0	0.1	0.7	2.3	5.7	11.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	18936	4734	2104	1184	757	526

Hollow - 12mm

Linear Shaft Specification

Outside Diameter	Inside Diameter	Elastic Modulus (E)	Density kg/m ³	Area m ² (a)	I _{xx}	I _{yy}
12mm	4mm	2E+11	7850	0.0001005310	1.00531E-09	1.00531E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	4.8
0.25	0.0	0.0	0.1	0.4	0.8	8.9
0.50	0.0	0.1	0.3	0.6	1.3	12.9
1.00	0.0	0.1	0.5	1.2	2.3	21.1
2.00	0.0	0.3	0.9	2.2	4.4	37.3
3.00	0.0	0.4	1.4	3.2	6.4	53.6
5.00	0.1	0.7	2.2	5.3	10.5	86.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.3	4.8
0.25	0.0	0.0	0.1	0.2	0.4	6.3
0.50	0.0	0.0	0.1	0.2	0.5	7.9
1.00	0.0	0.0	0.1	0.3	0.7	10.9
2.00	0.0	0.0	0.1	0.4	1.1	17.0
3.00	0.0	0.0	0.2	0.6	1.4	23.1
5.00	0.0	0.1	0.3	0.9	2.2	35.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	0.5
0.50	0.0	0.0	0.1	0.2	0.5	0.9
1.00	0.0	0.0	0.1	0.4	0.7	1.4
2.00	0.0	0.1	0.2	0.6	1.2	2.2
3.00	0.0	0.1	0.4	0.9	1.7	3.1
5.00	0.0	0.2	0.6	1.4	2.7	4.8
10.00	0.0	0.3	1.1	2.6	5.2	9.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.25	0.50	0.75	1.00	1.25	1.50
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	0.5
0.50	0.0	0.0	0.1	0.2	0.4	0.8
1.00	0.0	0.0	0.1	0.2	0.6	1.2
2.00	0.0	0.0	0.1	0.4	0.9	1.8
3.00	0.0	0.0	0.2	0.5	1.2	2.4
5.00	0.0	0.0	0.2	0.7	1.8	3.7
10.00	0.0	0.1	0.4	1.4	3.3	6.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	479	120	53	30	19	13

Linear Shaft Specification

Outside Diameter	Inside Diameter	Elastic Modulus (E)	Density kg/m ³	Area m ² (a)	I _{xx}	I _{yy}
16mm	7mm	2E+11	7850	0.0001625774	3.09913E-09	3.09913E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	2.5
0.50	0.0	0.0	0.1	0.2	0.5	5.2
1.00	0.0	0.0	0.2	0.4	0.8	7.8
2.00	0.0	0.1	0.3	0.7	1.5	13.1
3.00	0.0	0.1	0.4	1.1	2.1	18.4
5.00	0.0	0.2	0.7	1.8	3.5	28.9
10.00	0.1	0.4	1.4	3.4	6.8	55.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.2	2.5
0.50	0.0	0.0	0.0	0.1	0.2	3.5
1.00	0.0	0.0	0.0	0.1	0.3	4.5
2.00	0.0	0.0	0.1	0.2	0.4	6.5
3.00	0.0	0.0	0.1	0.2	0.5	8.5
5.00	0.0	0.0	0.1	0.3	0.8	12.4
10.00	0.0	0.0	0.2	0.6	1.4	22.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.1	0.1	0.3	0.8
1.00	0.0	0.1	0.1	0.3	0.5	1.5
2.00	0.0	0.1	0.2	0.5	0.8	2.2
3.00	0.0	0.1	0.3	0.6	1.1	2.8
5.00	0.1	0.2	0.5	0.9	1.7	4.1
10.00	0.1	0.4	0.9	1.7	3.0	7.4
20.00	0.2	0.7	1.7	3.3	5.8	14.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.1	0.1	0.3	0.8
1.00	0.0	0.0	0.1	0.2	0.5	1.5
2.00	0.0	0.0	0.1	0.3	0.7	2.2
3.00	0.0	0.1	0.2	0.4	0.9	2.8
5.00	0.0	0.1	0.3	0.6	1.3	4.1
10.00	0.0	0.1	0.5	1.1	2.4	7.4
20.00	0.1	0.3	0.9	2.1	4.4	14.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	1476	369	164	92	59	41

Hollow - 20mm

Linear Shaft Specification

Outside Diameter	Inside Diameter	Elastic Modulus (E)	Density kg/m ³	Area m ² (a)	I _{xx}	I _{yy}
20mm	14mm	2E+11	7850	0.0001602212	5.96824E-09	5.96824E-09

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.3
0.50	0.0	0.0	0.0	0.1	0.3	2.7
1.00	0.0	0.0	0.1	0.2	0.4	4.0
2.00	0.0	0.0	0.2	0.4	0.8	6.8
3.00	0.0	0.1	0.2	0.6	1.1	9.5
5.00	0.0	0.1	0.4	0.9	1.8	15.0
10.00	0.0	0.2	0.8	1.8	3.5	28.7
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	1.3
0.50	0.0	0.0	0.0	0.0	0.1	1.8
1.00	0.0	0.0	0.0	0.1	0.1	2.3
2.00	0.0	0.0	0.0	0.1	0.2	3.3
3.00	0.0	0.0	0.0	0.1	0.3	4.4
5.00	0.0	0.0	0.1	0.2	0.4	6.4
10.00	0.0	0.0	0.1	0.3	0.7	11.6
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.1	0.4
1.00	0.0	0.0	0.1	0.1	0.3	0.8
2.00	0.0	0.0	0.1	0.2	0.4	1.1
3.00	0.0	0.1	0.2	0.3	0.6	1.5
5.00	0.0	0.1	0.2	0.5	0.9	2.1
10.00	0.1	0.2	0.5	0.9	1.6	3.9
20.00	0.1	0.4	0.9	1.7	3.0	7.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	0.75	1.00	1.25	1.50	2.00
0 (Self weight)	0.0	0.0	0.0	0.1	0.1	0.4
1.00	0.0	0.0	0.0	0.1	0.2	0.8
2.00	0.0	0.0	0.1	0.2	0.4	1.1
3.00	0.0	0.0	0.1	0.2	0.5	1.5
5.00	0.0	0.0	0.1	0.3	0.7	2.1
10.00	0.0	0.1	0.2	0.6	1.2	3.9
20.00	0.0	0.1	0.5	1.1	2.3	7.3
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	2842	711	316	178	114	79

Linear Shaft Specification

Outside Diameter	Inside Diameter	Elastic Modulus (E)	Density kg/m ³	Area m ² (a)	I _{xx}	I _{yy}
25mm	15.6mm	2E+11	7850	0.0002997394	1.62676E-08	1.62676E-08

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	0.9
1.00	0.0	0.0	0.0	0.1	0.2	1.9
2.00	0.0	0.0	0.1	0.2	0.3	2.9
3.00	0.0	0.0	0.1	0.2	0.4	3.9
5.00	0.0	0.0	0.1	0.3	0.7	5.9
10.00	0.0	0.1	0.3	0.7	1.3	10.9
20.00	0.0	0.2	0.5	1.3	2.6	21.0
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.1	0.9
1.00	0.0	0.0	0.0	0.0	0.1	1.3
2.00	0.0	0.0	0.0	0.0	0.1	1.6
3.00	0.0	0.0	0.0	0.1	0.1	2.0
5.00	0.0	0.0	0.0	0.1	0.2	2.8
10.00	0.0	0.0	0.0	0.1	0.3	4.7
20.00	0.0	0.0	0.1	0.2	0.5	8.4
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.7	1.5
1.00	0.0	0.0	0.1	0.4	1.0	1.9
3.00	0.0	0.1	0.3	0.7	1.5	2.8
5.00	0.0	0.1	0.4	0.9	1.9	3.6
10.00	0.0	0.2	0.6	1.6	3.2	5.7
20.00	0.0	0.3	1.2	2.8	5.6	10.0
40.00	0.1	0.6	2.2	5.3	10.5	18.5
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.3	0.7	1.5
1.00	0.0	0.0	0.1	0.4	1.0	2.1
3.00	0.0	0.0	0.2	0.7	1.6	3.4
5.00	0.0	0.1	0.3	0.9	2.3	4.7
10.00	0.0	0.1	0.5	1.6	3.8	7.9
20.00	0.0	0.2	0.9	2.8	6.9	14.2
40.00	0.0	0.3	1.7	5.3	13.0	26.9
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	7747	1937	861	484	310	215

Hollow - 30mm

Linear Shaft Specification

Outside Diameter	Inside Diameter	Elastic Modulus (E)	Density kg/m ³	Area m ² (a)	I _{xx}	I _{yy}
30mm	18.3mm	2E+11	7850	0.0004438364	3.42556E-08	3.42556E-08

Fixed Cantilever - End Point Load

Weight (kg)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.6
1.00	0.0	0.0	0.0	0.0	0.1	1.1
2.00	0.0	0.0	0.0	0.1	0.2	1.6
3.00	0.0	0.0	0.0	0.1	0.2	2.1
5.00	0.0	0.0	0.1	0.2	0.3	3.0
10.00	0.0	0.0	0.1	0.3	0.6	5.4
20.00	0.0	0.1	0.3	0.6	1.2	10.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Cantilever - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.10	0.20	0.30	0.40	0.50	1.00
0 (Self weight)	0.0	0.0	0.0	0.0	0.0	0.6
1.00	0.0	0.0	0.0	0.0	0.1	0.8
2.00	0.0	0.0	0.0	0.0	0.1	1.0
3.00	0.0	0.0	0.0	0.0	0.1	1.2
5.00	0.0	0.0	0.0	0.0	0.1	1.5
10.00	0.0	0.0	0.0	0.1	0.2	2.4
20.00	0.0	0.0	0.0	0.1	0.3	4.2
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Centre Point Load

Weight (kg)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.5	1.1
1.00	0.0	0.0	0.1	0.3	0.6	1.3
3.00	0.0	0.0	0.1	0.4	0.9	1.7
5.00	0.0	0.1	0.2	0.5	1.1	2.1
10.00	0.0	0.1	0.3	0.8	1.7	3.1
20.00	0.0	0.2	0.6	1.4	2.8	5.1
40.00	0.0	0.3	1.1	2.6	5.2	9.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Fixed Beam - Normally Distributed Load

Weight (kg/m)	Length (m)					
	0.50	1.00	1.50	2.00	2.50	3.00
0 (Self weight)	0.0	0.0	0.1	0.2	0.5	1.1
1.00	0.0	0.0	0.1	0.3	0.7	1.4
3.00	0.0	0.0	0.1	0.4	0.9	2.0
5.00	0.0	0.0	0.2	0.5	1.2	2.6
10.00	0.0	0.1	0.3	0.8	2.0	4.1
20.00	0.0	0.1	0.4	1.4	3.4	7.1
40.00	0.0	0.2	0.8	2.6	6.3	13.1
Maximum Recommended Deflection	0.3	0.3	0.3	0.3	0.3	0.3

Column Buckling - Fixed Both Ends

Column Length	0.50	1.00	1.50	2.00	2.50	3.00
Maximum Load	16314	4079	1813	1020	653	453

