

# Tolerances

(Applicable to DIN 2093 quality – all dimensions in mm)

Outside Diameter		
O/D Range	+	-
3 up to 6	0.00	0.12
over 6 up to 10	0.00	0.15
over 10 up to 18	0.00	0.18
over 18 up to 30	0.00	0.21
over 30 up to 50	0.00	0.25
over 50 up to 80	0.00	0.30
over 80 up to 120	0.00	0.35
over 120 up to 180	0.00	0.40
over 180 up to 250	0.00	0.46
over 250 up to 315	0.00	0.52
over 315 up to 400	0.00	0.57
over 400 up to 500	0.00	0.63
over 500 up to 600	0.00	0.68

Inside Diameter		
I/D Range	+	-
3 up to 6	0.12	0.00
over 6 up to 10	0.15	0.00
over 10 up to 18	0.18	0.00
over 18 up to 30	0.21	0.00
over 30 up to 50	0.25	0.00
over 50 up to 80	0.30	0.00
over 80 up to 120	0.35	0.00
over 120 up to 180	0.40	0.00
over 180 up to 250	0.46	0.00
over 250 up to 315	0.52	0.00
over 315 up to 400	0.57	0.00
over 400 up to 500	0.63	0.00
over 500 up to 600	0.68	0.00

Concentricity of Diameters		
O/D Range	Tolerance	DIN
3 up to 6	0.15	2.IT 11
over 6 up to 10	0.18	
over 10 up to 18	0.22	
over 18 up to 30	0.26	
over 30 up to 50	0.32	
over 50 up to 80	0.60	2.IT 12
over 80 up to 120	0.70	
over 120 up to 180	0.80	
over 180 up to 250	0.92	
over 250 up to 315	1.04	
over 315 up to 400	1.14	
over 400 up to 500	1.26	
over 500 up to 600	1.36	

Thickness			
Group	Thickness Range	+	-
1	0.20 up to 0.60	0.02	0.06
	over 0.60 to under 1.25	0.03	0.09
2	1.25 up to 3.80	0.04	0.12
	over 3.80 up to 6.00	0.05	0.15
3	over 6.00 up to 14.00	0.10	0.10

Overall Height			
Group	Thickness Range	+	-
1	under 1.25	0.10	0.05
2	1.25 up to 2.00	0.15	0.08
	over 2.00 up to 3.00	0.20	0.10
	over 3.00 up to 6.00	0.30	0.15
3	over 6.00 up to 14.00	0.30	0.30

Spring Force Tolerance			
Group	Thickness Range	Group force deviation at test height $l_0 - 0.75h_0$	
		+	-
1	under 1.25	25%	7.5%
2	1.25 up to 3.00	15%	7.5%
	over 3.00 up to 6.00	10%	5%
3	over 6.00 up to 14.00	5%	5%

Guide Clearance	
Outside or Inside Diameter	Total Clearance
up to 16	0.20
over 16 up to 20	0.30
over 20 up to 26	0.40
over 26 up to 31.5	0.50
over 31.5 up to 50	0.60
over 50 up to 80	0.80
over 80 up to 140	1.00
over 140 up to 250	1.60