



## Diameter and Sphericity Precision / Roughness - DIN 5401- Edition 08/2002

Grade	Dw		Vdws	Ra	Vdwl	Vdwa	Limiting deviations in µm	preferred gauges			IG / ST in µm
	nominal size in mm		in µm	in µm	in µm **	in µm **		values in µm ***			
	over	up to	max.	max.	max.	max.					
G3	--	12,7	0,08	0,01	0,13	--	± 5,32	- 5 to -0,5	0	+0,5 to +5	0,5
G5	--	12,7	0,13	0,014	0,25	--	± 5,63	- 5 to -1	0	+1 to +5	1
G10	--	25,4	0,25	0,02	0,5	--	± 9,75	-9 to -1	0	+1 to +9	1
G16*	--	25,4	0,4	0,025	0,8	--	± 11,40	-10 to -2	0	+2 to +10	2
G20*	--	38,1	0,5	0,032	1,0	--	± 11,50	-10 to -2	0	+2 to +10	2
G28*	--	50,8	0,7	0,05	1,4	--	± 13,70	-12 to -2	0	+2 to +12	2
G40	--	100	1	0,06	2,0	--	± 19,00	-16 to -4	0	+4 to +16	4
G80	--	100	2	0,1	--	4,0	± 14,00	-12 to -4	0	+4 bis +12	4
G100	--	150	2,5	0,1	5,0	--	± 47,50	-40 to -10	0	+10 bis +40	10
G200	--	150	5	0,15	10,0	--	± 72,50	-60 to -10	0	+10 bis +60	10
G300*	--	25,4	10	0,2	--	20	± 70,00	-60 to -20	0	+20 bis +60	20
G300	25,4	50,8	15	0,2	--	30	± 105,00	-90 to -30	0	+30 bis +90	30
G300	50,8	75	20	0,2	--	40	± 140,00	-120 to -40	0	+40 bis +120	40
G500	--	25,4	25	--	--	50	± 75,00	-50	0	+50	50
G500	25,4	50,8	25	--	--	75	± 112,50	-75	0	+75	75
G500	50,8	75	25	--	--	100	± 150,00	-100	0	+200	100
G500	75	100	32	--	--	125	± 187,50	-125	0	+125	125
G500	100	125	38	--	--	150	± 225,00	-150	0	+150	150
G500	125	150	44	--	--	175	± 262,50	-175	0	+175	175
G600	all		--	--	--	400	± 200,00	--	0	--	--
G700	all		--	--	--	2.000	± 1.000,00	--	0	--	--

\* In some cases and subject to agreement, half the gauge interval values may be used for grades G16, G20, G28 and G300.

\*\* Values relate to the mean diameter for a ball, D<sub>wm</sub>. For smaller ball sizes (not covered in this standard), values are subject to agreement.

\*\*\* Graded in intervals equal to IG.



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ISO 9001:2008  
ISO 14001:2004

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## Definitions

<p><b><u>Dw = Nominal ball diameter</u></b> Diameter value which is used for the general identification of a ball size.</p>
<p><b><u>Vdws = Variation of ball diameter</u></b> Difference between the biggest and the smallest of the single diameter of a ball.</p>
<p><b><u>Ra = Finished Surface roughness</u></b> In terms of norm deviations of a geometrical perfect surface, whereupon form deviations and waviness remain unconsidered. <i>Remark: The fixed limiting values in table 3 refer to the arithmetic mean value of the deviation of the roughness-profile from the average line Ra.</i></p>
<p><b><u>Vdwl = Variation of ball lot diameter</u></b> Difference between the biggest and the smallest mean ball diameter in one lot. <i>Remark: The parameter is only valid for balls of grade G 3 to G200, except for G80.</i></p>
<p><b><u>Vdwa = Variation of ball diameters in one sort</u></b> Difference between the greatest and the smallest ball diameter in one sort. <i>Remark: The parameter is only valid for balls of grade G 3 to G200, also for G80.</i></p>
<p><b><u>IG = Sort interval</u></b> Amount, in which the allowable dimension of ball diameter is evenly spread.</p>
<p><b><u>Dwm = Mean ball diameter</u></b> Arithmetic mean of the biggest and the smallest single diameter of a ball.</p>
<p><b><u>DwmL = Mean diameter of one ball lot</u></b> Arithmetic mean of the mean diameter of the largest and the smallest ball in one ball lot.</p>
<p><b><u>Dws = Single ball diameter</u></b> Distance between two parallel planes tangential to the actual surface of a ball.</p>
<p><b><u>ST= Tolerance of sorts</u></b> Range where DwmL is allowed to vary within a sort. <i>Remark: The tolerance of sorts ST is identical to the amount with the sort-interval IG.</i></p>



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