PS-ISO: 16124 :2015

(ICS No.77.140.65)

PAKISTAN STANDARD FOR

Steel wire rod – Dimensions and tolerances

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0. FOREWORD

0.1 This Pakistan Standard was adopted by the Authority of Board of Director for Pakistan Standards and Quality Control Authority after draft prepared by the Technical Committee for "Metal Alloys and Testing (MTC-5) is duly approved and endorsed by the Mechanical National Standard Committee meeting held on 7th May 2015.

02. This Pakistan Standard No. PS-ISO-16124:2015 is based on ISO-16124:2014 which is acknowledged with thanks.

0.3 This Pakistan Standard has been adopted after taking into consideration, the views and the suggestions of the manufacturers, specialists, technologists and utilizing agencies, well in line with the technical barriers to trade agreement (WTO/TBT).

0.4 This Standard is subject to periodical review in order to keep pace with development in technology. Any suggestion for improvement will be recorded and placed before the revising committee in due course.

Steel Wire Rod — Dimensions and Tolerances

1. Scope

This Pakistan Standard specifies dimensions and tolerances to the dimensions applicable to steel wire rod as defined in ISO 6929.

2. Dimensions and tolerances on dimensions

The dimensions and tolerances applicable to the dimensions of hot-rolled steel wire rod shall be as specified in 2.1 to 2.4.

2.1 Round wire rod

The preferred nominal sizes and tolerances on diameters shall be as specified in Table 1 and Table 2, respectively. Four levels of tolerance are standardized: T1, T2, T3 and T4.

The maximum permissible out-of-round for all sizes, measured as the difference between the maximum and the minimum diameter of the same cross-section, shall be 80 % of the total tolerance specified on the diameter (see Table 2).

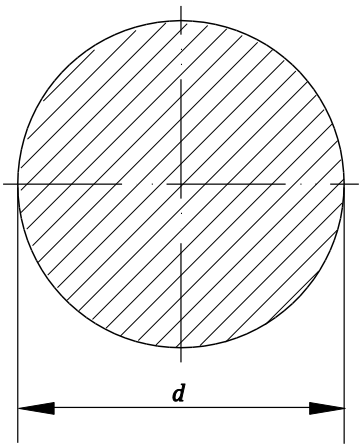


Table 1 — Preferred diameter, nominal section, and nominal mass of round wire rod

Preferred diameter, *d* mm	**Cross-sectional area**[a] mm^2	**Mass per unit length**[a] kg/m
5	19,63	0,154
5,5	23,76	0,187
6	28,27	0,222
6,5	33,18	0,260
7	38,48	0,302

7,5	44,18	0,347
8	50,26	0,395
8,5	56,74	0,445
9	63,62	0,499
9,5	70,88	0,556
10	78,54	0,617
10,5	86,59	0,680
11	95,03	0,746
11,5	103,9	0,816
12	113,1	0,888
12,5	122,7	0,963
13	132,7	1,04
13,5	143,1	1,12
14	153,9	1,21
14,5	165,1	1,30
15	176,7	1,39
15,5	188,7	1,48
16	201,1	1,58
16,5	213,8	1,68
17	227,0	1,78
17,5	240,5	1,89
18	254,5	2,00
18,5	268,8	2,11
19	283,5	2,23
19,5	298,6	2,34
20	314,2	2,47
21	346,4	2,72
22	380,1	2,98
23	415,5	3,26
24	452,4	3,55
25	490,9	3,85
26	530,9	4,17
27	572,6	4,49
28	615,8	4,83
29	660,5	5,18
30	706,9	5,55
31	754,8	5,92
32	804,2	6,31
33	855,3	6,71
34	907,9	7,13
35	962,1	7,55
36	1 018	7,99
37	1 075	8,44
38	1 134	8,90
39	1 195	9,38
40	1 257	9,86
41	1 320	10,4
42	1 385	10,9

43	1 452	11,4
44	1 521	11,9
45	1 590	12,5
46	1 662	13,0
47	1 735	13,6
48	1 810	14,2
49	1 886	14,8
50	1 964	15,4
51	2 043	16,0
52	2 124	16,7
53	2 206	17,3
54	2 290	18,0
55	2 376	18,7
56	2 463	19,3
57	2 552	20,0
58	2 642	20.7
59	2 734	21,5
60	2 827	22,2
[a] For information only.		
NOTE 1 Cross-sectional area: $S = 0{,}7854d^2$		
NOTE 2 Mass/m = 0,00785S.		

Table 2 — Tolerances on diameter of round wire rod and out-of-round of round wire rod

Diameter, d mm	**Tolerance**[b] mm				**Out-of-round** (≤) mm			
	T1[a]	**T2**	**T3**	**T4**	**T1**	**T2**	**T3**	**T4**
$5{,}00 \le d \le 10{,}00$	±0,30	±0,25	±0,20	±0,15	0,48	0,40	0,32	0,24
$10{,}00 < d \le 15{,}00$	±0,40	±0,30	±0,25	±0,20	0,64	0,48	0,40	0,32
$15{,}00 < d \le 25{,}00$	±0,50	±0,35	±0,30	±0,25	0,80	0,56	0,48	0,40
$25{,}00 < d \le 40{,}00$	±0,60	±0,40	±0,35	±0,30	0,96	0,64	0,56	0,48
$40{,}00 < d \le 50{,}00$	±0,80	±0,50	±0,40	-	1,28	0,80	0,64	-
$50{,}00 < d \le 60{,}00$	±1,00	±0,60	-	-	1,60	0,96	-	-
[a] For the size range 5,00 mm < d ≤ 10,00 mm, larger values for the tolerance may be agreed upon between the parties.								
[b] For other strict class tolerances, tolerance may be agreed upon between the parties.								

2.2 Square wire rod

The nominal width and tolerance of the side shall be as specified in Table 3 and Table 4, respectively.

The permissible out-of-square for all sizes, measured as the difference between the maximum and the minimum diameter of the same cross-section, shall be 80 % of the total tolerance specified on the width of side (see Table 4).

The tolerances on corner radius of nominal width of square wire rod shall be as specified in Table 5.

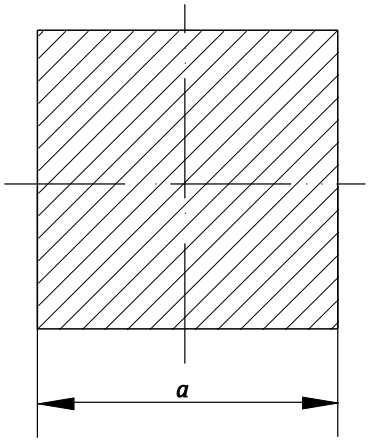


Table 3 — Width of side, nominal section, and nominal mass of square wire rod

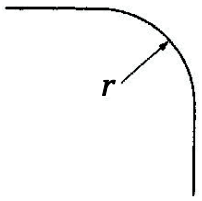
Preferred width, *a* mm	**Cross-sectional area**[a] mm^2	**Mass per unit length**[a] kg/m
8	64,00	0,50
9	81,00	0,64
10	100,0	0,79
11	121,0	0,95
12	144,0	1,13
13	169,0	1,33
14	196,0	1,54
15	225,0	1,77
16	256,0	2,01
17	289,0	2,27
18	324,0	2,54
19	361,0	2,83
20	400,0	3,14
21	441,0	3,46
22	484,0	3,80
23	529,0	4,15
24	576,0	4,52
25	625,0	4,91
26	676,0	5,31
27	729,0	5,72
28	784,0	6,15
29	841,0	6,60
30	900,0	7,06

31	961,0	7,54
32	1 024,0	8,04
[a] For information only.		

Table 4 — Width tolerances and out-of-square of square wire rod

Nominal width, *a* mm		**Width tolerance** mm	**Out-of-square** (≤) mm
Over	**Up to and including**		
8,5	15	±0,4	0,64
15	25	±0,5	0,80
25	32	±0,6	0,96
NOTE Limited corner radii are permissible.			

Table 5 — Tolerances on corner radius of nominal width of square wire rod

Corner radius, *r*	**Nominal width**, mm	*r*, mm
	8 ≤ *a* ≤ 12	*r* ≤ 1
	12 < *a* ≤ 20	*r* ≤ 1,5
	20 < *a* ≤ 30	*r* ≤ 2
	30 < *a* ≤ 32	*r* ≤ 2,5

2.3 Hexagonal wire rod

The nominal thickness, measured as the width across opposite flat faces, and tolerance on thickness shall be as specified in Table 6 and Table 7, respectively.

The permissible out-of-hexagon for all sizes measured as the difference between the maximum and the minimum diameter of the same cross-section, shall be 80 % of the total thickness tolerance (see Table 7).

The tolerances on corner radius of nominal width of hexagon wire rod shall be as specified in Table 8.

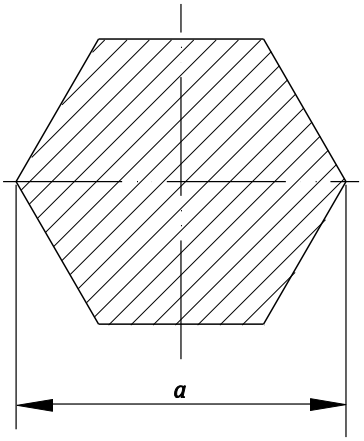


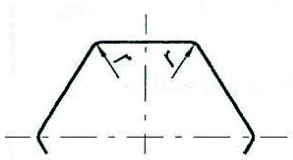
Table 6 — Thickness, nominal section, and nominal mass of hexagonal wire rod

Preferred thickness, *a* mm	**Cross-sectional area**[a] mm^2	**Mass per unit length**[a] kg/m
15	194,9	1,53
16	221,7	1,74
17	250,3	1,96
18	280,6	2,20
19	312,6	2,45
20	346,4	2,72
22	419,2	3,29
23	458,1	3,60
24	498,8	3,92
25	541,3	4,25
26	585,4	4,60
27	631,3	4,96
28	679,0	5,33
29	728,3	6,37
30	779,4	6,81
31	832,2	7,28
32	886,8	7,76
33	943,1	8,25
34	1 000,1	8,76
35	1 060,8	9,28
36	1 122,3	9,82
37	1 185,5	10,37
38	1 250,5	10,94
39	1 317,2	11,52
40	1 385,6	12,12
[a] For information only.		

Table 7 — Thickness tolerances and out-of-hexagon of hexagonal wire rod

Nominal thickness, *a* mm		**Thickness tolerance** mm	**Out-of-hexagon** (≤) mm
Over	**Up to and including**		
8,5	15	±0,4	0,64
15	25	±0,5	0,80
25	40	±0,6	0,96
NOTE Limited corner radii are permissible.			

Table 8 — Tolerances on corner radius of nominal width of hexagon wire rod

Corner radius, *r*	**Nominal width**, mm	*r*, mm
	$a \leq 20{,}0$	$r \leq 1{,}5$
	$20{,}0 < a \leq 28{,}5$	$r \leq 2{,}0$
	$28{,}5 < a \leq 40$	$r \leq 2{,}5$

2.4 Rectangular wire rod

The nominal size, defined as width (w) by thickness (t), and tolerance on size shall be as specified in Table 9, Table 10a, and Table 10b, respectively.

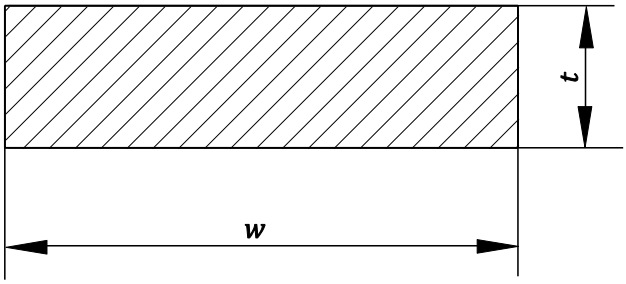


Table 9 — Size, nominal section, and nominal mass of rectangular wire rod

Preferred $w \times t$ mm	**Cross-sectional area**[a] mm^2	**Mass per unit length**[a] kg/m
18 × 10	180,0	1,41
18 × 12	216,0	1,70
20 × 10	200,0	1,57
20 × 12	240,0	1,88
20 × 14	280,0	2,20
22 × 8	176,0	1,38
22 × 10	220,0	1,73
22 × 12	264,0	2,07
22 × 14	308,0	2,42
25 × 8	200,0	1,57
25 × 10	250,0	1,96
25 × 12	300,0	2,36
25 × 14	350,0	2,75
25 × 16	400,0	3,14
28 × 8	224,0	1,76
28 × 10	280,0	2,20
28 × 12	336,0	2,64
28 × 14	392,0	3,08

28 × 16	448,0	3,52
30 × 6	180,0	1,41
30 × 8	240,0	1,88
30 × 10	300,0	2,36
30 × 12	360,0	2,83
30 × 14	420,0	3,30
30 × 16	480,0	3,77
[a] For information only. NOTE By agreement between purchaser and manufacturer, other sizes may be delivered.		

Table 10a — Width tolerances of rectangular wire rod

Nominal width, *w* mm		**Width tolerance** mm
Over	**Up to and including**	
18	22	±0,4
22	28	±0,5
28	30	±0,6
NOTE Limited corner radii are permissible.		

Table 10b — Thickness tolerances of rectangular wire rod

Nominal thickness, *t* mm		**Thickness tolerance** mm
Over	**Up to and including**	
8	12	±0,3
12	16	±0,4
NOTE Limited corner radii are permissible.		

3 Inspection on the cross-sectional dimensions

In cases of dispute, the cross-sectional dimensions shall be measured at a distance from the end of wire rod greater than those included in Table 11.

Table 11 — Measured distance from the end of the coil

Nominal diameter (or dimension), *d* mm	**Distance from the end of the coil** mm
$5 \leq d \leq 7$	5 000
$7 < d \leq 13$	4 000
$13 < d \leq 18$	3 000
$18 < d \leq 23$	2 000
$23 < d \leq 28$	1 500
$28 < d \leq 60$	1 000

4 Mass of coils

Mass and tolerance on mass of individual coils may be agreed upon between the manufacturer and customer.

It is permitted that a maximum of 5 % of the number of coils may be supplied with a mass less than the specified minimum mass.

Bibliography

[1] ISO 6929, *Steel products — Vocabulary*