

PRODUCTS SPECIFICATIONS AND INTERNATIONAL STANDARDS

ASTM A416-17a

Low Relaxation

GRADE	NOMINAL DIAMETER		TOLERANCE ON DIAMETER	STEEL AREA OF STRAND		WEIGHT OF STRAND		TENSILE STRENGTH	MINIMUM BREAKING LOAD	MINIMUM LOAD @1% EXTENSION	MIN. ELONG.	LAY LENGTH
	mm	in	mm	mm ²	in ²	kg/1000m	lb/1000ft	N/mm ²	KN	KN	%	mm
250 (1725)	7,9	5/16	+/-0,40	37	0,058	294	197	1725	64,50	58,10	3,5	(12-16) x d
	9,5	3/8	+/-0,40	52	0,08	405	272	1725	89,00	80,10	3,5	
	11,1	7/16	+/-0,40	69,7	0,108	548	367	1725	120	108,10	3,5	
	12,7	1/2	+/-0,40	92,9	0,144	730	490	1725	160	144,10	3,5	
	15,2	6/10	+/-0,40	139	0,216	1090	737	1725	240	216,20	3,5	
270 (1860)	9,53	3/8	+0,65/-0,15	55	0,085	430	290	1860	102	92,1	3,5	
	11,1	7/16	+0,65/-0,15	74,2	0,115	580	390	1860	138	124,1	3,5	
	12,7	1/2	+0,65/-0,15	98,7	0,153	780	520	1860	184	165,3	3,5	
	15,2	6/10	+0,65/-0,15	140	0,217	1100	740	1860	261	234,60	3,5	
	15,7	0,62	+0,65/-0,15	150	0,231	1200	780	1860	279	251,4	3,5	
	17,8	7/10	+0,65/-0,15	190	0,294	1500	1000	1860	353	318,00	3,5	

Max. relaxation loss after 1000 Hrs < 2,5% when initial load at 70% of specified breaking load.

BS 5896 : 2012

Relaxation Class 2

STEEL NAME	DIAMETER	TENSILE STRENGTH	CROSS SECTIONAL AREA	MASS PER METER	DEVIATION ON MASS PER METER	CHARACTERISTIC VALUE OF MAX. FORCE FM	MAXIMUM VALUE OF MAXIMUM FORCE FM	Fp 0.1%	Rt 0.1%	MIN. ELONG. Lo. = 500 MM	CURVATIVE OF STRAND	LAY LENGTH
	mm	N/mm ²	mm ²	g/m	%	kN	kN	kN	kN	%		mm
Y1670S7	15,20	1670	139	1086	+ 2	232	267	204	NA	3,5	MAX.BOW HEIGHT = 25 MM / 1 METER	(14-18) X D
Y1700S7G*	18,00	1700	223	1742	+ 2	379	436	334	NA	3,5		
Y1770S7	9,30	1770	52	406,1	+ 2	92	106	81	NA	3,5		
Y1770S7	11,00	1770	70	546,7	+ 2	124	143	109	NA	3,5		
Y1170S7	12,50	1770	93	726,3	+ 2	165	190	145	NA	3,5		
Y1770S7	15,70	1770	150	1172	+ 2	266	306	234	NA	3,5		
Y1820S7G*	15,20	1820	165	1289	+ 2	300	345	264	NA	3,5		
Y1860S7	8,00	1860	38	296,8	+ 2	70,7	81,3	62,2	NA	3,5		
Y1860S7	9,30	1860	52	406,1	+ 2	96,7	111	85,1	NA	3,5		
Y1860S7	9,60	1860	55	429,6	+ 2	102	117	89,8	NA	3,5		
Y1860S7	11,30	1860	75	585,8	+ 2	140	161	123,0	NA	3,5		
Y1860S7	12,50	1860	93	726,3	+ 2	173	199	152,0	NA	3,5		
Y1860S7	12,90	1860	100	781	+ 2	186	214	164,0	NA	3,5		
Y1860S7	15,20	1860	139	1086	+ 2	259	298	228,0	NA	3,5		
Y1860S7	15,70	1860	150	1172	+ 2	279	321	246,0	NA	3,5		
Y1860S7G*	12,70	1860	112	874,7	+ 2	208	239	183,0	NA	3,5		

Max. relaxation loss after 1000 Hrs < 2,5% when initial load at 70% of specified breaking load.
The diameter of the central wire shall be at least 3,0% greater than the diameter of the outer helical wires.

* Compacted strand

EN 10138 - 3 : 2011

Uncoated Strand 7 - steel wire for prestressed concrete

STEEL NAME	STEEL NUMBER	DIAMETER	TENSILE STRENGTH	CROSS SECTIONAL AREA	MASS PER METER	DEVIATION ON MASS PER METER	CHARACTERISTIC VALUE OF MAX. FORCE FM	MAXIMUM VALUE OF MAXIMUM FORCE FM	Fp 0.1%	Rt 0.1%	MIN. ELONG. Lo. = 500 MM	CURVATIVE OF STRAND	LAY LENGTH
		mm	N/mm ²	mm ²	g/m	%	kN	kN	kN	kN	%		mm
Y1770S7	1.1365	9,30	1770	52	406,1	+ 2	92	106	81	NA	3,5	MAX.BOW HEIGHT = 25 MM / 1 METER	(14-18) X D
Y1170S7	1.1365	12,50	1170	93	726,3	+ 2	165	190	145	NA	3,5		
Y1860S7	1.1366	9,30	1860	52	406,1	+ 2	96,7	111	85,1	NA	3,5		
Y1860S7	1.1366	12,50	1860	93	726,3	+ 2	173	199	152,0	NA	3,5		
Y1860S7	1.1366	15,20	1860	139	1086	+ 2	259	298	228,0	NA	3,5		
Y1860S7	1.1366	15,70	1860	150	1172	+ 2	279	321	246,0	NA	3,5		
Y1960S7	1.1367	9,30	1960	52	406,1	+ 2	102	117	91	NA	3,5		
Y1960S7	1.1367	12,50	1960	93	726,3	+ 2	182	209	162	NA	3,5		
Y2060S7	1.1368	12,50	2060	93	726,3	+ 2	192	221	171	NA	3,5		
Y2060S7	1.1368	12,90	2060	100	781	+ 2	206	237	183,0	NA	3,5		
Y1860S7G*	1.1372	12,70	1860	112	874,7	+ 2	208	239	183,0	NA	3,5		
Y1860S7G*	1.1372	15,20	1860	165	1289	+ 2	307	353	270	NA	3,5		
Y1700S7G*	1.1370	18,00	1700	223	1742	+ 2	379	436	334	NA	3,5		

Max. relaxation loss after 1000 Hrs < 2,5% when initial load at 70% of specified breaking load.

The diameter of the central wire shall be at least 3,0% greater than the diameter of the outer helical wires.

* Compacted strand

AUSTRALIAN STANDARDS : AS 1311

STANDARD	NOMINAL DIAMETER	DIAMETER TOLERANCE	NOMINAL AREA OF STAND	NOMINAL MASS	MINIMUM BREAKING STRENGTH OF STAND		MINIMUM YIELD STRAND		MINIMUM ELONGATION	INITIAL LOAD	
	mm	Imm	mm ²	kg/1000m	kgf	kN	kgf	kN	%	70%	80%
Regular	9.30	+/- 0.4	52.00	410	9,528	94.00	8,145	79.90	3.5	2.5 (B)	3.5 (B)
	10.90	+/- 0.4	71.00	555	12,742	125.00	10,836	106.30	3.5	2.5 (B)	3.5 (B)
	12.70	+/- 0.4	94.00	740	16,820	165.00	14,297	140.30	3.5	2.5 (B)	3.5 (B)
	15.20	+/- 0.4	139.00	1,090	23,140	227.00	19,669	193.00	3.5	2.5 (B)	3.5 (B)
Super	9.30	+/- 0.4	55.00	430	10,398	102.00	8,838	86.70	3.5	2.5 (B)	3.5 (B)
	10.90	+/- 0.4	75.00	590	14,067	138.00	11,957	117.30	3.5	2.5 (B)	3.5 (B)
	12.70	+/- 0.4	100.00	785	18,756	184.00	15,943	156.40	3.5	2.5 (B)	3.5 (B)
Extra High Tensile	15.20	+/- 0.4	143.00	1,125	26,606	261.00	22,615	221.90	3.5	2.5 (B)	3.5 (B)

JAPANESE STANDARDS : JIS G 3536

Grade	Nominal Diameter		Minimum Yield Strand			Minimum Elongation*	1000 hr Relaxation Loss
	mm	Inch	kgf	lbf	kN	%	
SWPR7AL	9.30	3/8	7633	16973	75.50	3.5	2.5% max with initial load equal to 70% of minimum specified breaking load
	10.80	7/16	10312	22930	102.00		
	12.40	1/2	13750	30573	136.00		
	15.20	6/10	20624	45860	204.00		
SWPR7BL	9.50	3/8	8776	19513	86.80	3.5	
	11.10	7/16	11930	26527	118.00		
	12.70	1/2	15772	35069	156.00		
	15.20	6/10	22444	49906	222.00		

*GL (Gauge Length) = 600mm

JAPANESE SPECIFICATIONS : JIS G 3536

GRADE	NOMINAL DIAMETER		DIAMETER TOLERANCE		NOMINAL AREA		NOMINAL WEIGHT		MIN. BREAKING STRENGTH		
	mm	Inch	± mm	± inch	mm ²	Inch ²	kg/1000m	lb/1000ft	kgf	lbf	kN
SWPR7AL	9.30	3/8			51.61	0.080	405	272	8978	19963	88.80
	10.80	7/16	+0.40	+0.016	69.68	0.108	546	367	12132	26976	120.00
	12.40	1/2	-0.20	-0.008	92.90	0.144	729	490	16176	35968	160.00
	15.20	6/10			138.70	0.215	1101	740	24264	53952	240.00
SWPR7BL	9.50	3/8			54.84	0.085	432	290	10312	22930	102.00
	11.10	7/16	+0.40	+0.016	74.19	0.115	580	390	13952	31023	138.00
	12.70	1/2	-0.20	-0.008	98.71	0.153	774	520	18500	41139	183.00
	15.20	6/10			138.70	0.215	1101	740	26390	58673	261.00



TENSILE TESTING MACHINE



STRESS RELAXATION MACHINE

INDIAN STANDARDS: IS 14268 - 2022

STRAND DESIGNATION	DIAMETER	TENSILE STRENGTH	CROSS-SECTIONAL AREA	MASS PER METRE	TOLERANCE ON NOMINAL MASS PER METRE	MINIMUM BREAKING LOAD	MINIMUM 0.2 PERCENT PROOF LOAD
	mm	Mpa	mm ²	g/m	Percent	kN	kN
15.2-1670-P	15.2	1 670	139	1 086	± 2	232	204
18.0-1670-P	18.0	1 770	223	1 742	± 2	379	334
6.9-1770-P	6.9	1 770	29	226.5	± 2	51.3	45.1
9.0-1770-P	9.0	1 770	50	390.5	± 2	88.5	77.9
9.3-1770-P	9.3	1 770	52	406.1	± 2	92	81
9.6-1770-P	9.6	1 770	55	429.6	± 2	97.4	85.7
11.0-1770-P	11.0	1 770	70	546.7	± 2	124	109
12.5-1770-P	12.5	1 770	93	726.3	± 2	165	145
12.7-1770-P	12.7	1 770	100	781	± 2	177	156
15.2-1770-P	15.2	1 770	139	1 086	± 2	246	216
15.7-1770-P	15.7	1 770	150	1 172	± 2	266	234
18.0-1770-P	18.0	1 770	200	1 562	± 2	354	312
15.2-1860-C	15.2	1 820	165	1 289	± 2	300	264
6.9-1860-P	6.9	1 860	29	226.5	± 2	53.9	47.4
7.0-1860-P	7.0	1 860	30	234.3	± 2	55.8	49.1
8.0-1860-P	8.0	1 860	38	296.8	± 2	70.7	62.2
9.0-1860-P	9.0	1 860	50	390.5	± 2	93	81.8
9.3-1860-P	9.3	1 860	52	406.1	± 2	96.7	85.1
9.6-1860-P	9.6	1 860	55	429.6	± 2	102	89.8
11.0-1860-P	11.0	1 860	70	546.7	± 2	130	114
11.3-1860-P	11.3	1 860	75	585.8	± 2	140	123
12.5-1860-P	12.5	1 860	93	726.3	± 2	173	152
12.9-1860-P	12.9	1 860	100	781	± 2	186	164
13.0-1860-P	13.0	1 860	102	796.6	± 2	190	167
15.2-1860-P	15.2	1 860	139	1 086	± 2	259	228
15.7-1860-P	15.7	1 860	150	1 172	± 2	279	246
12.7-1860-C	12.7	1 860	112	874.7	± 2	208	183
15.2-1860-C	15.2	1 860	165	1 289	± 2	307	270
9.0-1960-P	9.0	1 960	50	390.5	± 2	98	87.2
9.3-1960-P	9.3	1 960	52	406.1	± 2	102	90.8
9.6-1960-P	9.6	1 960	55	429.6	± 2	108	96.1
11.0-1960-P	11.0	1 960	70	546.7	± 2	137	122
11.3-1960-P	11.3	1 960	75	585.8	± 2	147	131
12.5-1960-P	12.5	1 960	93	726.3	± 2	182	162
12.9-1960-P	12.9	1 960	100	781	± 2	196	174
13.0-1960-P	13.0	1 960	102	796.6	± 2	200	178
15.2-1960-P	15.2	1 960	139	1 086	± 2	272	242
15.7-1960-P	15.7	1 960	150	1 172	± 2	294	262
6.4-2060-P	6.4	2 060	25	195.3	± 2	51.5	45.8
6.9-2060-P	6.9	2 060	29	226.5	± 2	58.1	51.7
7.0-2060-P	7.0	2 060	30	234.3	± 2	61.8	55
8.6-2060-P	8.6	2 060	45	351.5	± 2	92.7	82.5
11.3-2060-P	11.3	2 060	75	585.8	± 2	155	138
12.5-2060-P	12.5	2 060	93	726.3	± 2	192	171
12.9-2060-P	12.9	2 060	100	781	± 2	206	183
6.9-2160-P	6.9	2 160	29	226.5	± 2	60.9	54.2