

www.siw.co.th

©2022 THE SIAM INDUSTRIAL WIRE CO.,LTD.

All rights reserved.



**LET'S CONNECT
TOGETHER**

A GLOBAL LEADER

STEEL WIRE MAKERS



THE SIAM INDUSTRIAL WIRE CO.,LTD.

"To become a global leader in creating masterpieces
that leave truly lasting legacies."

GLOBAL PRODUCT CERTIFICATIONS

ABOUT US

The Siam Industrial Wire is the one of the world's leading steel wire makers. We are relentless in our pursuit for excellence in product quality and innovation. We take pride in being able to anticipate your needs and provide tailored solutions for each of your requirements. We strive to exceed expectations.

For over twenty years, we have continued to manufacture high quality steel wire with annual production capacity of 250,000 metric tonnes making us ASEAN's largest manufacturer.

The Siam Industrial Wire is the vital partner of many construction masterpieces across the globe. Our products are accepted worldwide for the construction of bridges, stadiums, high-rises, airport runways, LNG tanks and many more. Our products and processes conform to global standards and are accredited by countless international institutes.

We provide world-class support, training, and consultations worldwide through our established network of global partners. As a business, we understand the importance of the people working with and within Siam Industrial Wire. Relationships come second to none at The Siam Industrial Wire and that is why we are committed to build a culture where work and life are in harmony. Our employee programs help everyone realize their life goals and develop fulfilling career paths within the company.



SIW is continuously improving on its environmental footprint and it does so transparently by declaring its footprint according to the International Environment Product Declaration (EPD) system

www.environdec.com

SERVICES

1. World Class Quality

SIW, for over 27 years now, has been in the business of serving its global customers around the world to enable them to build their various world-class projects. Conforming to over one hundred national and international standards, SIW's current and prospective customers can be confident that every single Pre-stressed Concrete Wire & Strand is manufactured with the highest level of quality and process efficiency.

2. Fully Customized

All our product variants are customizable for the diameter and specifications to match its end-use application accurately. These products conform to both TIS (Thailand) standards as well as to various other International standards of countries and markets that we serve.

3. Served with Utmost Pre & Post Sales Care

We have an expert team of engineers to give specific advice from the laying out of the structure to giving cost calculations until the completion of the project and we also provide support to specific problems. In other words, we can work with your engineering team in a seamless manner

4. Lightning Response

With a capacity of over 215,000 tons per year, we are able to deliver our customers' desired products in a timely manner to any part of the world. We also work with reputed supply chain partners, including partners to manage overseas shipping. Amongst various value added services, we also provide options of tracking the status of your products on a world-wide basis and in real-time.

5. Ultimate Safety & Privacy

Our Customers' Safety is our topmost priority and we ensure this through the quality of our products and the associated service. We guard all the customer specific information with utmost diligence and also keep all matters of this information absolutely confidential.



OUR PRODUCTS



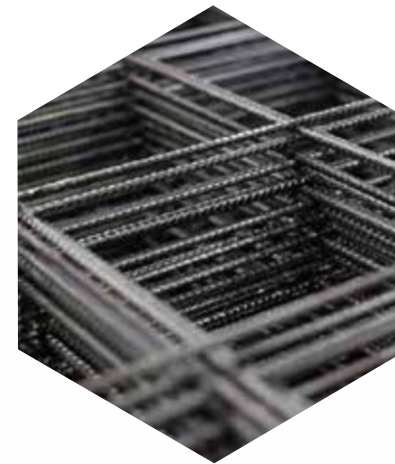
PC Wire

Steel Single Wire (PC wire) is high carbon and low relaxation steel wire that is used for concrete structure : Prestressed Concrete.



PC Strand

7-Wire PC Strand is High carbon and Low relaxation steel wire and twisted by 7 single wires. The 7-Wire PC strand, 7-Wire Indented PC Strand, and 7-Wire Compacted PC Strand are used extensively in pre-stressed and post-tensioned concrete structures.



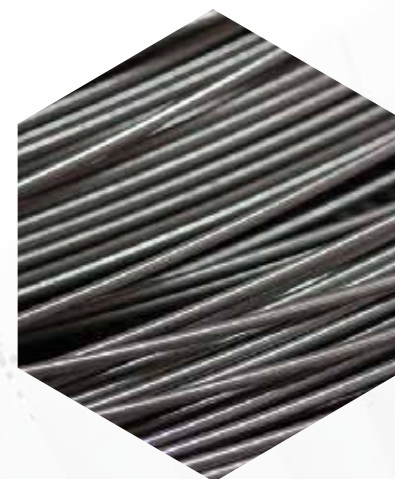
Wire Mesh

Wire Mesh is used largely as a base for ground slabs, pavements, box culverts and bottom mesh or post-tensioned floors. The Thai Industrial Standard (TIS) SIW's wire mesh is made according to this TIS 737 standard for plain type and TIS 926 for deformed/ ribbed types.



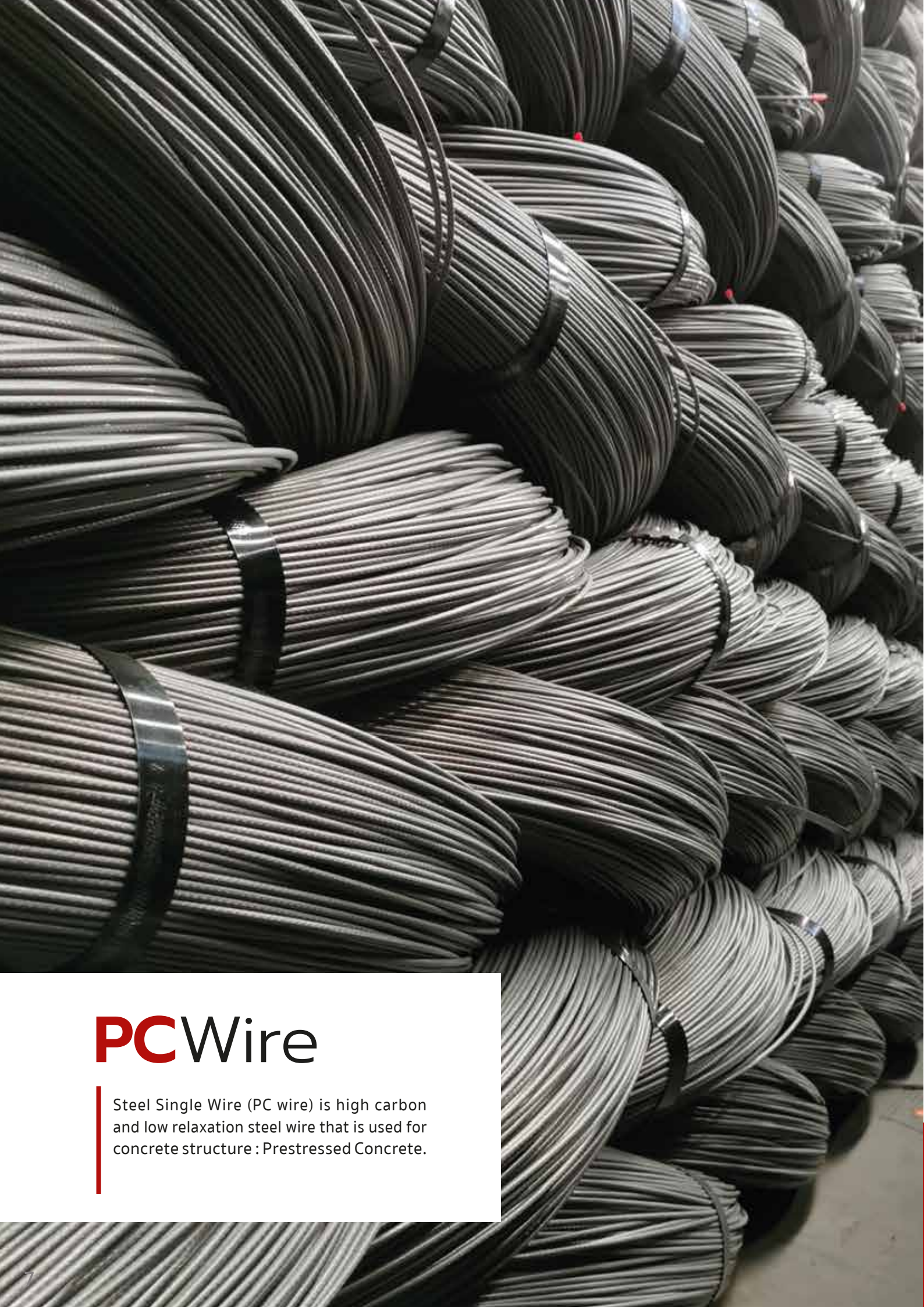
Cold Drawn

Cold Drawn Wire has been granted the Thai Industrial Standard, TIS 747 for plain type and TIS 943 for deformed/ribbed type and is manufactured in accordance with ASTM A82(plain type), ASTM A496 (deformed/ribbed type), BS 4482, AS 1303 and AS/NZS 4671.



Spring Wire

A steel wire material for springs application which is made by a high quality of high carbon steel wire rod. Manufacturing by cold drawing process.

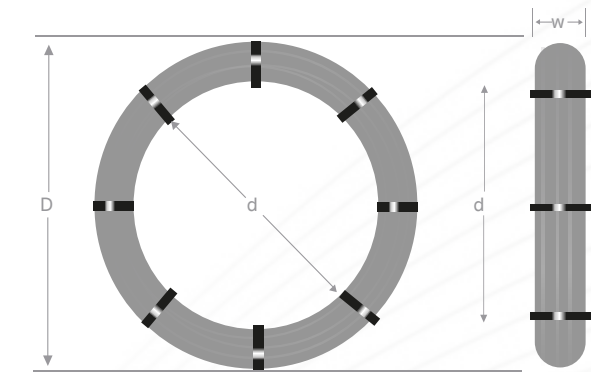


Specification

Indentation

	Plain
	Oval indent-2 Faces
	Oval indent-4 Faces
	Chevron
	Crimp
	Spiral

Coil Dimension



Diameter Size (mm)	Coil Weight (kg)	Inside Dimeter (d) (mm)	Outside Dimeter (D) (mm)	Product
4-5	201-400	140	175	Indentation
	601-900	140	175	All products
	901-1,300	140	185	All products
	901-1,300	150	195	Chevron
	1,500-2,400	150	210	All products
4-5	901-1,300	150	195	Crimped
6-9	601-900	170	200	All products
	901-1,300	170	210	All products
	1,500-2,400	170	220	All products
7-9	900-1,300	185	225	Spiral
	1,500-2,400	185	225	Spiral

Coil Orientation



Application

- Concrete Pile
- Electric Pole
- Flood Wall Fencing
- Ground and Rock Anchor
- Prestressed Concrete Cylinder Pipe
- Precast Structure
- Railway Sleeper
- Spun Pile
- Wind Tower

PCWire

Steel Single Wire (PC wire) is high carbon and low relaxation steel wire that is used for concrete structure : Prestressed Concrete.

Certification Standard



TIS 95 - 2540
ASTM A421 - 2005
ASTM A421 - 2010
ASTM A421 - 2015
ASTM A648 - 2012
ASTM A881 - 2005
ASTM A881 - 2010
ASTM A881 - 2016
BS 5896 - 2012

pr EN 10138 - 2009
pr EN 10138 - 2012
JIS 3536 - 1999
JS JIS 3536 - 2014
LNEC E452 - 2011
LNEC E452 - 2020
XP-A35-045-2
MS 1138 - 2007
SNI 1155 - 2011

NBR 7482 - 2008
GB/T 5223 - 2002
UNE 36094 - 1997
BRL2401 - 2018
GOST 7348-81
UNI 7675 : 2016
NBN I 10-002 : 1987

PCWire APPLICATION



Flood Wall Fencing



Precast Structure



Concrete Pile



Ground and Rock Anchor



Hollow Core Plank



Electric Pole



Spun Pile



Pre- Stressed Concrete Cylinder Pipe



PCStrand

7-Wire PC Strand is High carbon and Low relaxation steel wire and twisted by 7 single wires.
The 7 Wire PC strand , 7-Wire Indented PC Strand, and 7-Wire Compacted PC Strand are used extensively in pre-stressed and post-tensioned concrete structures.

Specification

Indentation



Plain



Indent

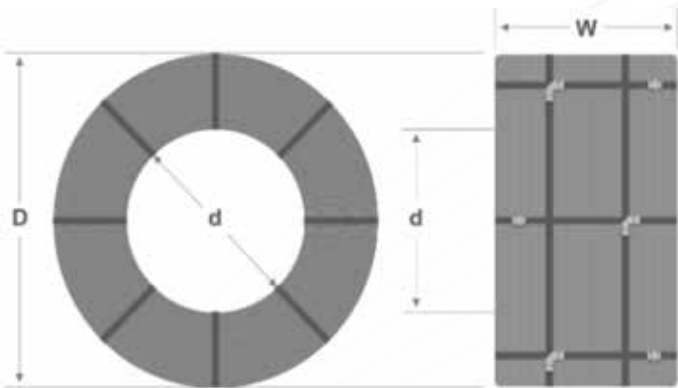


Chevron



Compacted

Coil Dimension



Coil Orientation

- Eye-to-Side
- Eye-to-Sky



Application

- Concrete Pile
- LNG Tank
- Hollow Core Plank Precast Structure
- Cement Silo
- Precast Segmentation Box
- Beam & Column (Precast House)
- Bounded Post Tension (Flooring)
- Bridge Girder
- Prestress Concrete Plank Girder
- Wind Tower

Certification Standard



TIS 420 - 1997,
AS/NZS 4672 - 2007,
ASTM A416 - 2015,
ASTM A886 - 2012,
BS 5896 - 2012,
prEN 10138 - 2012,
JIS G 3536 - 2014,
LNEC E 453 - 2011,
XP A35-045-3,
XP A35-045-3,
MS 1138 - 4 2007,
SNI 1154-2011,
TSE 5680 - 1988,
IS 14268 - 1995

PC Strand APPLICATION



Wind Tower



Concrete Sheet Pile



Ground & Rock Anchor



Beam & Column (Precast Building)



Hollow Core Plank (Precast Structure)



Pre-stressed Concrete Plank Girder



Bonded Post Tension (Flooring)



PE Unbonded Post Tension (Flooring)



Cement Silo



Bridge Girder



LNG Tank



Precast Segmentation Box



WIREMesh

Wire mesh is used largely as a base for ground slabs, pavements, box culverts and post-tensioned floors. SIW wire meshes are made according to this Thai Industrial Standard (TIS) 737-2549

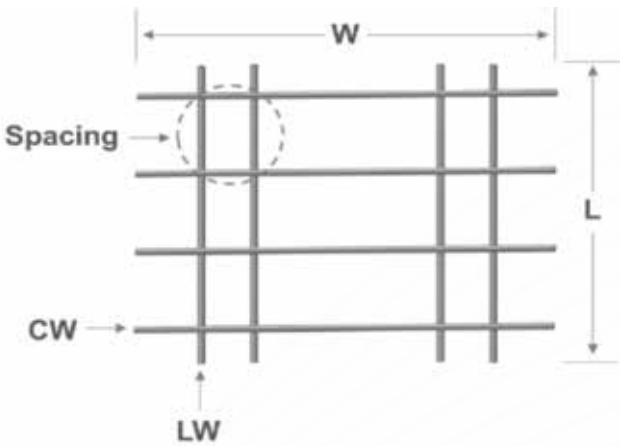
Specification

- Indentation



- Diameter = 4-12 mm
- Minimum Spacing = 100 mm

Product dimension



Orientation



Detail	Min	Max	Unit
Width	90	360	cm
Length	120	1200	cm

Application

- Road pavement
- Slab on ground
- Post-tension mesh
- Flat slab
- Precast concrete
- Box culvert
- Fence

Certification Standard



TIS 743 – 2006
 TIS 747 – 1998
 TIS 194 – 1992
 TIS 943 – 1990
 MIT 23 – 2022

WIREMesh APPLICATION



Box Clvert



Flat Slab



Road Pavement



Slab on ground



Precast Concrete



Flat Slab



COLDDrawn

Cold Drawn Wire has been granted the Thai Industrial Standard, TIS 747 for plain type and TIS 943 for deformed/ribbed type and is manufactured in accordance with ASTM A82(plain type), ASTM A 496 (deformed/ribbed type), BS 4482, AS 1303 and AS/NZS 4671 Hard drawn wire is manufactured in accordance with ASTM A648.

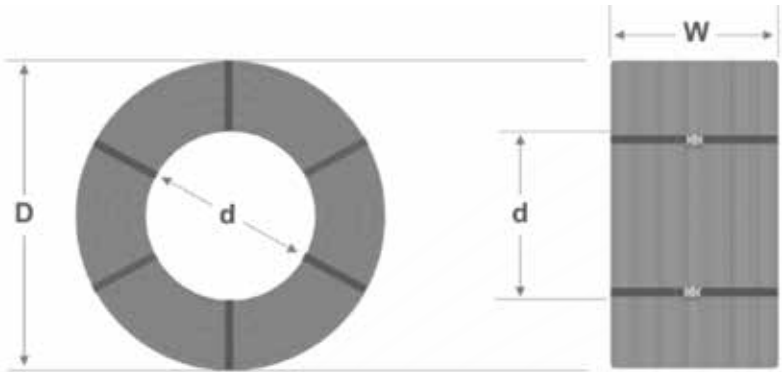
Specification

- Indentation

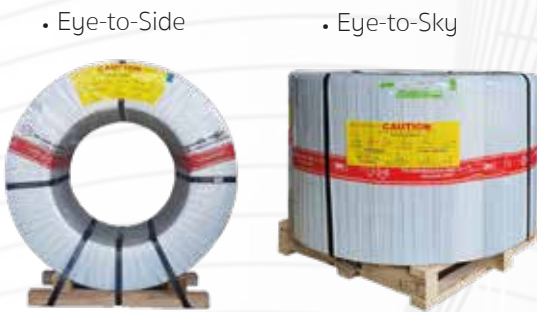


a. Round
b. Deformed
c. Indent

Coil Dimension



Coil Orientation



Coil Weight (kg)	Inside Dimeter (d) (mm)	Outside Dimeter (D) (mm)	Width (W) (mm)	Diameter Size (mm)
250-500	550	650-1000	300	2.5-12
	650	680-1000	800	
500-750	550	650-1000	300	2.5-12
	650	680-1000	800	
750-1500	550	650-1000	300	2.5-12
	650	680-1000	800	
1500-2200	550	650-1000	300	2.5-12
	650	680-1000	800	

Application

- Stirup
- Concrete pipe
- General reinforcement concrete
- Precast concrete

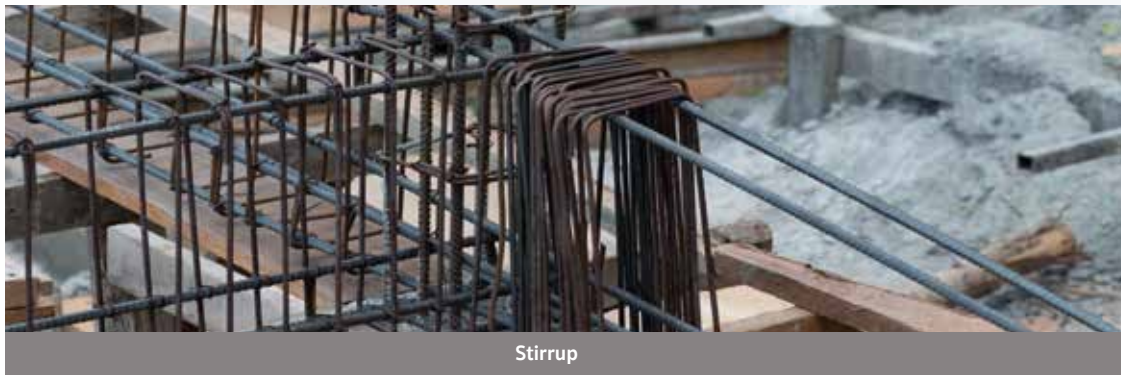
Certification Standard



TIS 747 – 1998,
TIS 194 – 1992,
TIS 943 – 1990,
ASTM A 82 – 2007,
ASTM A 496 – 2007

ASTM A 648 – 2018,
ASTM A 1064 – 2018,
AS/ NZS 4671 – 2001

COLD Drawn APPLICATION



Stirrup



Concrete Pipe



General Reinforcement Concrete



Precast Concrete



SPRINGWire

A steel wire material for springs application which is made by a high quality of high carbon steel wire rod. Manufacturing by cold drawing process.

HARD-DRAWN Wire

Hard-drawn wire is the most basic steel wire. The term “hard-drawn” simple means the steel which has been drawn though the die to the targeted diameter with no additional processing or tempering.

Specification

- Diameter (mm) = 4.00 - 12.00
- Grade = SWA, SWB, SWC
- Coil Weight (kg) = 150-1,000
- Inner Diameter (mm) = 600 - 1,000
- Outer Diameter (mm) = 900-1,200

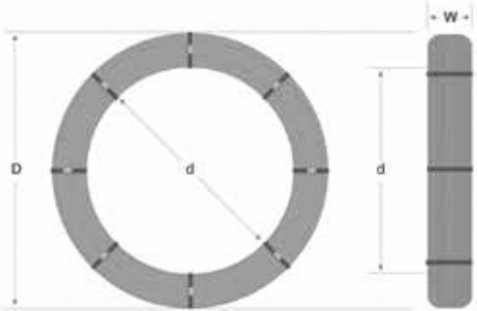
PIANOWire

Piano Wire is a specialized wire product for manufacturing high quality spring. It is made from high carbon wire rod, treating with special drawing process and quality control. Therefore, Piano Wire provides stable strength, superior durability, and high ductility.

Specification

- Diameter (mm) = 4.00 - 7.00
- Grade = SWP-A, SWP-B
- Coil Weight (kg) = 150-1,000
- Inner Diameter (mm) = 600 - 1,000
- Outer Diameter (mm) = 900-1,200

Coil Dimension



Size (mm)	Coil Weight (kg)	Inside Dimeter (d) (mm)	Outside Dimeter (D) (mm)
4-6	500	600	900
6-12	500	900	1400

Coil Orientation



Certification Standard



JIS G 3521-2018
JIS G 3522-2014
JIS G 3532-2011
JIS G3506-2004



Specification

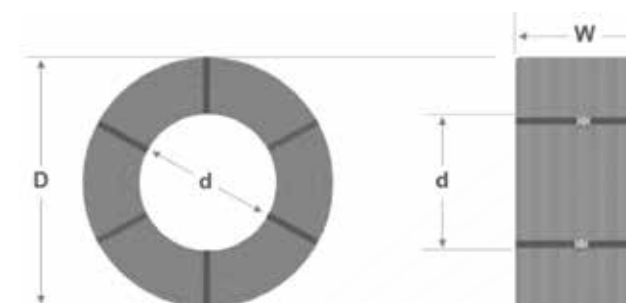
Indentation



Plain

- Coil Weight (kg) = 2,500 - 3,000
- Diameter = 12.7 mm , 15.2 mm and 15.7 mm
- Inside Diameter (mm) = 750
- Grade = 1860 Mpa
(depend on selected international standards)

Coil Dimension



Coil Orientation

• Eye-to-Side



• Eye-to-Sky



Product Weight (kg)	Inside Diameter (d) (mm)	Outside Diameter (D) (mm)	Width (W) (mm)
3,000	750	1,250	760

Application

- Ground Slab
- Unbounded Post Tension (Flooring)

PE Unbonded

The PE unbonded PC strand is the PC strand that each individual tendon is coated with grease and covered by High Density Polyethylene(HDPE) formed in the extrusion process. The envelope helps to protect the wire from corrosive environment and is convenient for removal when using temporary construction as well as to get un-bonded property for post-tensioned work.

Certification Standard



JIS G 3536-2014,
AS/ NZS 4672 - 2007

PROJECT REFERENCES



My Thuan Bridge, Vinh Long Vietnam



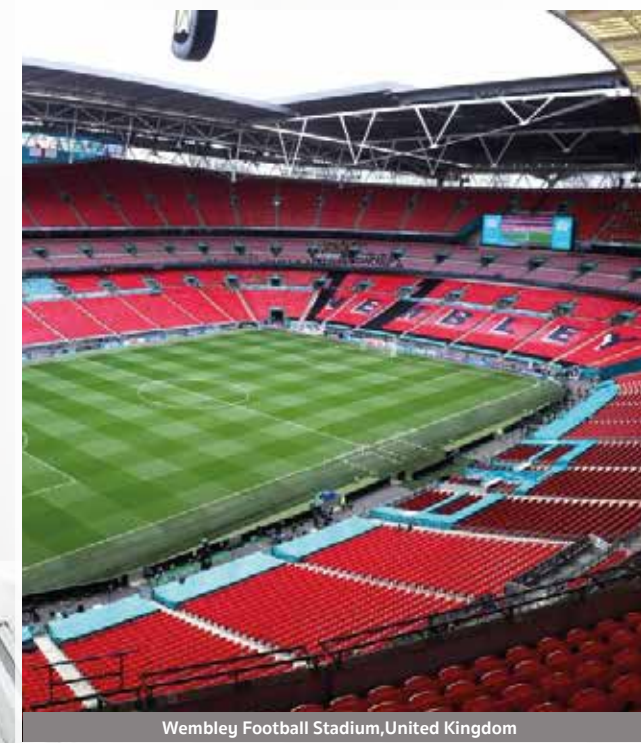
PTT LNG Tank, Thailand



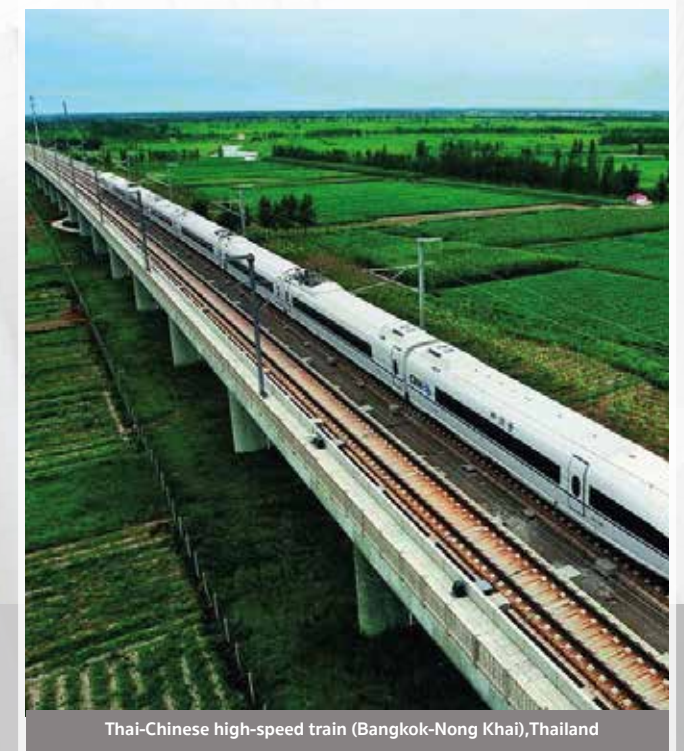
The Opus, United Arab Emirates.



Terminal 5, Heathrow Airport, UK



Wembley Football Stadium, United Kingdom



Thai-Chinese high-speed train (Bangkok-Nong Khai), Thailand

PROJECT REFERENCES

Rama8 Bridge,Thailand



Dywidag Wind Towers



Changi Airport Treminal 3,Singapore



Bang Sue Grand Station



Brisbane Airport Link,Brisbane Australia

SUSTAINABILITY

SIW received Green Industry Level 4 certificate from the Ministry of Industry, Govt. of Thailand (<https://greenindustry.diw.go.th/webgi/about-1/>).

This award recognizes SIW for continuously improving on its environmentally friendly business operations and for demonstrating its strong commitment towards continuous development and improvement of its manufacturing processes and for its pro-active engagement with various stakeholders and partners to build an entire “green supply chain”.

Thailand’s “Green Industry” initiative drives the principle of creating a balance between the economy, society and the environment (the Triple Bottom Line).



The Carbon Footprint
Certification no. TGO CFP FY20-050-290 for PC Strand 1 ton
Certification no. TGO CFP FY20-050-291 for PC Wire 1 ton



SIW LET'S CONNECT
TOGETTER

CONTACT US



HEAD Office

Rasa Tower 1 14th Floor,
555 Phaholyothin Road, Chatuchak,
Bangkok 10900, Thailand

E-mail :Marketing@siw.co.th
Tel. 662-9370060-67,
Fax. 662-9370068-69



FACTORY

160 Moo 11 T. Nonglaloek,
Bankhai, Rayong 21120,
Thailand

E-mail : siw@siw.co.th
Tel. 66-3889-2333,
Fax. 66-3889-2071-72



@siwmkt



www.siw.co.th



siw Channel



สยามวอดิแกล็กอุตสาหกรรม - Sales and Marketing

STANDARD			NOMINAL DIAMETER	DIAMETER TOLERANCE	NOMINAL AREA	UNIT WEIGHT	WEIGHT TOLERANCE	PITCH	MINIMUM BREAKING LOAD	MINIMUM YIELD LOAD			Stress ratio	Reduction of area	MINIMUM ELONGATION	STRAIGHTNESS	1,000-HR. RELAXATION (% MAX.)	MOE
Different Outer& Center	Standard	GRADE Mpa	mm.	mm.	mm2	kg./1000 m.	%	Times diameter	kN	kN.				%	%		Fm = Maximum force of specification Fma = Maximum force of actual	Gpa or kN/mm2
										0.10%	0.20%	at 1.0% extension						
> 2% diff ΦC & ΦO	TIS 420 - 1997	1 720	9.3	-	51.6	405	+4/-2	12-18	88.8	72.8	75.4	-	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 4.5	-
			10.8	-	69.7	546	+4/-2	12-18	120	98.4	102	-	-	-	3.5		4.5	
			12.4	-	92.9	729	+4/-2	12-18	160	131	136	-	-	-	3.5		4.5	
			15.2	-	139	1101	+4/-2	12-18	239	196	203	-	-	-	3.5		4.5	
		1 860	9.5	-	54.8	432	+4/-2	12-18	102	83.6	86.6	-	-	-	3.5		4.5	
			11.1	-	74.2	580	+4/-2	12-18	138	113	117	-	-	-	3.5		4.5	
			12.7	-	98.7	774	+4/-2	12-18	184	151	156	-	-	-	3.5		4.5	
			15.2	-	139	1101	+4/-2	12-18	259	212	220	-	-	-	3.5		4.5	
		1 860	12.70 - C	-	112	890	+4/-2	14-18	209	178	184	-	-	-	3.5		4.5	
		1 820	15.20 - C	-	165	1295	+4/-2	14-18	300	255	264	-	-	-	3.5		4.5	
1 700	18.00 - C	-	223	1750	+4/-2	14-18	380	323	334	-	-	-	3.5	4.5				
> 3% diff ΦC & ΦO	AS/NZS 4672 - 2007	1 720	9.3	-	51.6	405	+4/-2	12-18	88.8	72.8	75.4	-	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	185 - 205
		1 850	9.5	-	55	432	+4/-2	12-18	102	83.6	86.6	-	-	-	3.5		3.5	
		1 870	11.1	-	73.9	580	+4/-2	12-18	138	113	117	-	-	-	3.5		3.5	
		1 720	12.4	-	92.9	729	+4/-2	12-18	160	131	136	-	-	-	3.5		3.5	
		1 860	12.70-C	-	112	890	+4/-2	14-18	209	178	184	-	-	-	3.5		3.5	
		1 870	12.7	-	98.7	774	+4/-2	12-18	184	151	156	-	-	-	3.5		3.5	
		1 840	12.9	-	100	785	+4/-2	12-18	186	158	165	-	-	-	3.5		3.5	
		1 750	15.2	-	143	1122	+4/-2	12-18	250	205	212	-	-	-	3.5		3.5	
		1 820	15.20-C	-	165	1295	+4/-2	14-18	300	255	264	-	-	-	3.5		3.5	
		1 830	15.2	-	143	1122	+4/-2	12-18	261	214	222	-	-	-	3.5		3.5	
		1 700	18.00-C	-	223	1750	+4/-2	14-18	380	323	334	-	-	-	3.5		3.5	
		1 780	18	-	190	1492	+4/-2	12-18	338	277	287	-	-	-	3.5		3.5	
		1 830	18	-	190	1492	+4/-2	12-18	353	289	300	-	-	-	3.5		3.5	
	Approve for BS std.	Y1860S7	15.7	-	150	1,172.00	+2/-2	14-18	279- 321	246	-	-	-	-	3.5		80% Fma 4.5	195
	ASTM A416 - 2006	1 725	9.5	+/-0.4	51.6	405	-	12-16	89	-	-	80.1	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	-
			11.1	+/-0.4	69.7	548	-	12-16	120.1	-	-	108.1	-	-	3.5		3.5	
			12.7	+/-0.4	92.9	730	-	12-16	160.1	-	-	144.1	-	-	3.5		3.5	
			15.2	+/-0.4	139.4	1094	-	12-16	240.2	-	-	216.2	-	-	3.5		3.5	
		1 860	9.53	+0.65/-0.15	54.8	432	-	12-16	102.3	-	-	92.1	-	-	3.5		3.5	
			11.11	+0.65/-0.15	74.2	582	-	12-16	137.9	-	-	124.1	-	-	3.5		3.5	
ASTM A416 - 2010	1 725	9.5	+/-0.4	51.6	405	-	12-16	89	-	-	80.1	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	-	
		7.9	+/-0.4	37	294	-	12-16	64.5	-	-	58.1	-	-	3.5		3.5		
		11.1	+/-0.4	69.7	548	-	12-16	120.1	-	-	108.1	-	-	3.5		3.5		
		12.7	+/-0.4	92.9	730	-	12-16	160.1	-	-	144.1	-	-	3.5		3.5		
		15.2	+/-0.4	139.4	1094	-	12-16	240.2	-	-	216.2	-	-	3.5		3.5		
	1 860	9.53	+0.65/-0.15	54.8	432	-	12-16	102.3	-	-	92.1	-	-	3.5		3.5		
		11.11	+0.65/-0.15	74.2	582	-	12-16	137.9	-	-	124.1	-	-	3.5		3.5		
		12.7	+0.65/-0.15	98.7	775	-	12-16	183.7	-	-	165.3	-	-	3.5		3.5		
		15.24	+0.65/-0.15	140	1102	-	12-16	260.7	-	-	234.6	-	-	3.5		3.5		
		15.75	+0.65/-0.15	149.2	1173	-	12-16	277.4	-	-	249.7	-	-	3.5		3.5		
		17.78	+0.65/-0.15	189.7	1487	-	12-16	353.2	-	-	318	-	-	3.5		3.5		
		17.78	+0.65/-0.15	189.7	1487	-	12-16	353.2	-	-	318	-	-	3.5		3.5		
ASTM A416 - 2012	1 725	9.5	+/-0.4	52	405	-	12-16	89	-	-	80.1	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	-	
		11.1	+/-0.4	69.7	548	-	12-16	120	-	-	108.1	-	-	3.5		3.5		
		12.7	+/-0.4	92.9	730	-	12-16	160	-	-	144.1	-	-	3.5		3.5		
		15.2	+/-0.4	139	1090	-	12-16	240	-	-	216.2	-	-	3.5		3.5		
	1 860	9.53	+0.65/-0.15	55	430	-	12-16	102	-	-	92.1	-	-	3.5		3.5		
		11.1	+0.65/-0.15	74.2	580	-	12-16	138	-	-	124.1	-	-	3.5		3.5		
		12.7	+0.65/-0.15	98.7	780	-	12-16	184	-	-	165.3	-	-	3.5		3.5		
		15.2	+0.65/-0.15	140	1100	-	12-16	261	-	-	234.6	-	-	3.5		3.5		
		15.7	+0.65/-0.15	150	1200	-	12-16	279	-	-	251.4	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
ASTM A416 - 2015	1 725	7.9	+/-0.4	37	294	-	12-16	64.5	-	-	58.1	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	-	
		9.5	+/-0.4	52	405	-	12-16	89	-	-	80.1	-	-	3.5		3.5		
		11.1	+/-0.4	69.7	548	-	12-16	120	-	-	108.1	-	-	3.5		3.5		
		12.7	+/-0.4	92.9	730	-	12-16	160	-	-	144.1	-	-	3.5		3.5		
		15.2	+/-0.4	139	1090	-	12-16	240	-	-	216.2	-	-	3.5		3.5		
	1 860	9.53	+0.65/-0.15	55	430	-	12-16	102	-	-	92.1	-	-	3.5		3.5		
		11.1	+0.65/-0.15	74.2	580	-	12-16	138	-	-	124.1	-	-	3.5		3.5		
		12.7	+0.65/-0.15	98.7	780	-	12-16	184	-	-	165.3	-	-	3.5		3.5		
		15.2	+0.65/-0.15	140	1100	-	12-16	261	-	-	234.6	-	-	3.5		3.5		
		15.7	+0.65/-0.15	150	1200	-	12-16	279	-	-	251.4	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
ASTM A416 - 2016	1 725	7.9	+/-0.4	37	294	-	12-16	64.5	-	-	58.1	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	-	
		9.5	+/-0.4	52	405	-	12-16	89	-	-	80.1	-	-	3.5		3.5		
		11.1	+/-0.4	69.7	548	-	12-16	120	-	-	108.1	-	-	3.5		3.5		
		12.7	+/-0.4	92.9	730	-	12-16	160	-	-	144.1	-	-	3.5		3.5		
		15.2	+/-0.4	139	1090	-	12-16	240	-	-	216.2	-	-	3.5		3.5		
	1 860	9.53	+0.65/-0.15	55	430	-	12-16	102	-	-	92.1	-	-	3.5		3.5		
		11.1	+0.65/-0.15	74.2	580	-	12-16	138	-	-	124.1	-	-	3.5		3.5		
		12.7	+0.65/-0.15	98.7	780	-	12-16	184	-	-	165.3	-	-	3.5		3.5		
		15.2	+0.65/-0.15	140	1100	-	12-16	261	-	-	234.6	-	-	3.5		3.5		
		15.7	+0.65/-0.15	150	1200	-	12-16	279	-	-	251.4	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
		17.8	+0.65/-0.15	190	1500	-	12-16	353	-	-	318	-	-	3.5		3.5		
ASTM A416 - 2017	1725	7.9	+/-0.4	37.00	294.0	-	12-16	64.5	-	-	58.1	-	-	3.5	≤ 25 mm. of 1 m.	80% Fm 3.5	-	
		9.50	+/-0.4	52.00	405.0	-	12-16	89	-	-	80.1	-	-	3.5		3.5		
		11.1	+/-0.4	69.70	548.0	-	12-16	120	-	-	108.1	-	-	3.5		3.5		
		12.7	+															

STANDARD			NOMINAL DIAMETER	DIAMETER TOLERANCE	NOMINAL AREA	UNIT WEIGHT	WEIGHT TOLERANCE	PITCH	MINIMUM BREAKING LOAD	MINIMUM YIELD LOAD			Stress ratio	Reduction of area	MINIMUM ELONGATION	STRAIGHTNESS	1,000-HR. RELAXATION (% MAX.)	MOE			
Different Outer& Center	Standard	GRADE Mpa	mm.	mm.	mm2	kg/1000 m.	%	Times diameter	kN	kN.				%	%		Fm = Maximum force of specification Fma = Maximum force of actual	Gpa or kN/mm2			
										0.10%	0.20%	at 1.0% extension									
> 3% diff ΦC & ΦO	prEN 10138 - 2006	Y1770S7	9.3	-	52	406.1	± 2%	14-18	92.0 - 109	81	-	-	0.85 - 0.95	≥25%, plain ≥20%, indent	3.5	≤ 25 mm. of 1 m.	70% Fma 2.5	195			
			11	-	70	546.7	± 2%	14-18	124 - 143	109	-	-	0.85 - 0.95								
			12.5	-	93	726.3	± 2%	14-18	165 - 195	145	-	-	0.85 - 0.95								
			12.9	-	100	781	± 2%	14-18	177 - 209	156	-	-	0.85 - 0.95								
			15.2	-	139	1,086	± 2%	14-18	246 - 290	216	-	-	0.85 - 0.95								
		15.7	-	150	1,172	± 2%	14-18	266 - 314	234	-	-	0.85 - 0.95									
		Y1860S7	9.3	-	52	406.1	± 2%	14-18	96.7 - 114	85.1	-	-	0.85 - 0.95						3.5		
			9.6	-	55	429.6	± 2%	14-18	102 - 120	89.8	-	-	0.85 - 0.95						3.5		
			11.3	-	75	585.8	± 2%	14-18	140 - 165	123	-	-	0.85 - 0.95						3.5		
			12.5	-	93	726.3	± 2%	14-18	173 - 204	152	-	-	0.85 - 0.95						3.5		
			12.9	-	100	781	± 2%	14-18	186 - 220	164	-	-	0.85 - 0.95		3.5						
		Y1860S7G Y1860S7G Y1820S7G Y1700S7G	15.2	-	139	1,086	± 2%	14-18	259 - 306	228	-	-	0.85 - 0.95		3.5						
			15.7	-	150	1,172	± 2%	14-18	279 - 329	246	-	-	0.85 - 0.95		3.5						
			12.70 - C	-	112	874.7	± 2%	14-18	208 - 245	183	-	-	0.85 - 0.95		3.5						
			15.20 - C	-	165	1,289	± 2%	14-18	307 - 362	270	-	-	0.85 - 0.95		3.5						
			15.20 - C	-	165	1,289	± 2%	14-18	300 - 354	264	-	-	0.85 - 0.95		3.5						
			18.00 - C	-	223	1,742	± 2%	14-18	379 - 447	334	-	-	0.85 - 0.95		3.5						
18.00 - C	-		223	1,742	± 2%	14-18	379 - 447	334	-	-	0.85 - 0.95	3.5									
> 3% diff ΦC & ΦO	FprEN 10138 - 2009	Y1770S7	9.3	-	52	406.1	± 2%	14-18	92.0 - 106	81	-	-	0.85 - 0.95	≥25%, plain ≥20%, indent	3.5	≤ 25 mm. of 1 m.	70% Fma 2.5	195			
			11	-	70	546.7	± 2%	14-18	124 - 143	109	-	-	0.85 - 0.95								
			12.5	-	93	726.3	± 2%	14-18	165 - 190	145	-	-	0.85 - 0.95								
			12.9	-	100	781	± 2%	14-18	177 - 204	156	-	-	0.85 - 0.95								
			15.2	-	139	1,086	± 2%	14-18	246 - 283	216	-	-	0.85 - 0.95								
		15.7	-	150	1,172	± 2%	14-18	266 - 306	234	-	-	0.85 - 0.95									
		Y1860S7	9.3	-	52	406.1	± 2%	14-18	96.7 - 111	85.1	-	-	0.85 - 0.95						3.5		
			9.6	-	55	429.6	± 2%	14-18	102 - 117	89.8	-	-	0.85 - 0.95						3.5		
			11.3	-	75	585.8	± 2%	14-18	140 - 161	123	-	-	0.85 - 0.95						3.5		
			12.5	-	93	726.3	± 2%	14-18	173 - 199	152	-	-	0.85 - 0.95						3.5		
			12.9	-	100	781	± 2%	14-18	186 - 214	164	-	-	0.85 - 0.95		3.5						
		Y1860S7G Y1860S7G Y1820S7G Y1700S7G	15.2	-	139	1,086	± 2%	14-18	259 - 298	228	-	-	0.85 - 0.95		3.5						
			15.7	-	150	1,172	± 2%	14-18	279 - 321	246	-	-	0.85 - 0.95		3.5						
			12.7 - C	-	112	874.7	± 2%	14-18	208 - 239	183	-	-	0.85 - 0.95		3.5						
			15.2 - C	-	165	1,289	± 2%	14-18	307 - 353	270	-	-	0.85 - 0.95		3.5						
			15.2 - C	-	165	1,289	± 2%	14-18	300 - 345	264	-	-	0.85 - 0.95		3.5						
			18.00 - C	-	223	1,742	± 2%	14-18	379 - 436	334	-	-	0.85 - 0.95		3.5						
18.00 - C	-		223	1,742	± 2%	14-18	379 - 436	334	-	-	0.85 - 0.95	3.5									
> 3% diff ΦC & ΦO	prEN 10138 - 2012	Y1770S7	9.3	-	52	406.1	+2/-2	14-18	92.0 - 106.0	81	-	-	1.05-1.18	≥25%, plain ≥20%, indent	3.5	≤ 25 mm. of 1 m.	70% Fma 2.5	195			
			11	-	70	546.7	+2/-2	14-18	124.0-143.0	109	-	-	1.05-1.18								
			12.5	-	93	726.3	+2/-2	14-18	165.0-190.0	145	-	-	1.05-1.18								
			12.9	-	100	781	+2/-2	14-18	177.0 - 204.0	156	-	-	1.05-1.18								
			15.2	-	139	1,086.00	+2/-2	14-18	246.0-283.0	216	-	-	1.05-1.18								
		15.7	-	150	1,172.00	+2/-2	14-18	266.0-306.0	234	-	-	1.05-1.18									
		Y1860S7	9.3	-	52	406.1	+2/-2	14-18	96.7-111.0	85.1	-	-	1.05-1.18						3.5		
			9.6	-	55	429.6	+2/-2	14-18	102.0-117.0	89.8	-	-	1.05-1.18						3.5		
			11.3	-	75	585.8	+2/-2	14-18	140.0-161.0	123	-	-	1.05-1.18						3.5		
			12.5	-	93	726.3	+2/-2	14-18	173.0-199.0	152	-	-	1.05-1.18						3.5		
			12.9	-	100	781	+2/-2	14-18	186.0-214.0	164	-	-	1.05-1.18		3.5						
		Y1860S7G Y1860S7G Y1820S7G Y1700S7G	15.2	-	139	1,086.00	+2/-2	14-18	259.0-298.0	228	-	-	1.05-1.18		3.5						
			15.7	-	150	1,172.00	+2/-2	14-18	279.0-321.0	246	-	-	1.05-1.18		3.5						
			12.70 - C	-	112	874.7	+2/-2	14-18	208.0-239.0	183	-	-	1.05-1.18		-				3.5		
			15.20 - C	-	165	1,289.00	+2/-2	14-18	307.0-353.0	270	-	-	1.05-1.18		-				3.5		
			15.20 - C	-	165	1,289.00	+2/-2	14-18	300.0-345.0	264	-	-	1.05-1.18		-				3.5		
			18.00 - C	-	223	1,742.00	+2/-2	14-18	379.0-436.0	334	-	-	1.05-1.18		-				3.5		
18.00 - C	-		223	1,742.00	+2/-2	14-18	379.0-436.0	334	-	-	1.05-1.18	-	3.5								
> 0.08 diff ΦC & ΦO	JIS G 3536 - 2008	SWPR7AL 1 720	9.3	+0.4/-0.2	51.61	405	-	12-18	88.8	-	75.5	-	-	-	3.5	≤ 25 mm. of 1 m.	70% Fma 2.5	-			
			10.8	+0.4/-0.2	69.68	546	-	12-18	120	-	102	-	-	-	3.5						
			12.4	+0.4/-0.2	92.9	729	-	12-18	160	-	136	-	-	-	3.5						
			15.2	+0.4/-0.2	138.7	1,101.00	-	12-18	240	-	204	-	-	-	3.5						
			15.7	+0.4/-0.2	138.7	1,101.00	-	12-18	261	-	222	-	-	-	3.5						
		SWPR7BL 1 860	9.5	+0.4/-0.2	54.84	432	-	12-18	102	-	86.8	-	-	-	-	3.5			≤ 25 mm. of 1 m.		
			11.1	+0.4/-0.2	74.19	580	-	12-18	138	-	118	-	-	-	3.5						
			12.7	+0.4/-0.2	98.71	774	-	12-18	183	-	156	-	-	-	3.5						
			15.2	+0.4/-0.2	138.7	1,101.00	-	12-18	261	-	222	-	-	-	3.5						
			15.7	+0.4/-0.2	138.7	1,101.00	-	12-18	261	-	222	-	-	-	3.5						
> 0.08 diff ΦC & ΦO	JIS G 3536 - 2014	SWPR7AL 1 720	9.3	+0.4/-0.2	51.61	405	-	12-18	88.8	-	75.5	-	-	-	3.5	≤ 25 mm. of 1 m.	70% Fm 2.5	-			
			10.8	+0.4/-0.2	69.68	546	-	12-18	120	-	102	-	-	-	3.5						
			12.4	+0.4/-0.2	92.9	729	-	12-18	160	-	136	-	-	-	3.5						
			15.2	+0.4/-0.2	138.7	1,101.00	-	12-18	240	-	204	-	-	-	3.5						
			15.7	+0.4/-0.2	138.7	1,101.00	-	12-18	240	-	204	-	-	-	3.5						
> 0.08 diff ΦC & ΦO	LNEC E 453 - 2002	1 860	9.3	-	52	406.1	+2/-2	14-18	96.7 - 111	85.1	-	-	-	-	3.5	≤ 25 mm. of 1 m.	70% Fma 2.5	185 - 205			
			11.3	-	75	585.8	+2/-2	14-18	140 - 160	123	-	-	-	-	3.5						
			12.5	-	93	726.3	+2/-2	14-18	173 - 199	152	-	-	-	-	3.5						
			13	-	102	796.9	+2/-2	14-18	190 - 219	167	-	-	-	-	3.5						
			15.2	-	139	1,086.00	+2/-2	14-18	259 - 298	228	-	-	-	-	3.5						
			15.3	-	140	1,093.00	+2/-2	14-18	260 - 299	229	-	-	-	-	3.5						
			1770	15.7	-	150	1,172.00	+2/-2	14-18	266 - 306	234	-	-	-	-				3.5		
1860	15.7	-	150	1,172.00	+2/-2	14-18	279 - 321	246	-	-	-	-	3.5								
> 0.02-1.05 diff ΦC & ΦO	LNEC E 453 - 2011	1 860	9.3	-	52	406.10	+2/-2	14-18	96.7 - 111	85.1	-	-	-	-	3.5	≤ 25 mm. of 1 m.	70% Fma 2.5	185 - 205			
			11.3	-	75	585.80	+2/-2	14-18	140 - 160	123	-	-	-	-	3.5						
			12.5	-	93	726.30	+2/-2	14-18	173 - 199	152	-	-	-	-	3.5						
			13	-	102	796.90	+2/-2	14-18	190 - 219	167	-	-	-	-	3.5						
			15.2	-	139	1,086.00	+2/-2	14-18	259 - 298	228	-	-	-	-	3.5						
			15.3	-	140	1,093.00	+2/-2	14-18	260 - 299	229	-	-	-	-	3.5						
			1770	15.7	-	150	1,172.00	+2/-2	14-18	266 - 306	234	-	-	-	-				3.5		
1860	15.7	-	150	1,172.00	+2/-2	14-18	279 - 321	246	-	-	-	-	3.5								
-	XP A35 - 045 - 3	1 860	9.3	-	52	406.12	+2/-2	(mm) 130-167	96.7	86.1	-	-	-	≥25%, plain ≥20%, indent	3.5	≤ 25 mm.	80% Fma 4.5	-			
			12.5	-	93	726.33	+2/-2	175-225	173	154	-	-	-	3.5							
			12.9	-	100	781	+2/-2	181-232	186	166	-	-	-	3.5							
			15.2	-	139	1,085.59	+2/-2	213-274	259	231	-	-	-	3.5							
			1860	15.7	-	150	1,171.50	+2/-2	220-283	279	248	-	-	-	3.5						
			1860	15.7	-	150	1,171.50	+2/-2	220-283	279	248	-	-	-	3.5						
0.025 0.038 0.051 0.064 0.076 0.102	SNI 1154-2016	KBjP - P7 R A (LR grade 1725)	6.4	+/- 0.40	23.22	182	-	12-16	40	-	-	36	-	-	3.5	≤ 25 mm. of 1 m.	70% Fm 2.5	-			
			7.9	+/-																	

STANDARD	NOMINAL DIAMETER	DIAMETER TOLERANCE	NOMINAL AREA	UNIT WEIGHT	WEIGHT TOLERANCE	RIB SPACING	TENSILE STRENGTH	YIELD STRENGTH	DEFORM HIGHT	MINIMUM REDUCTION OF AREA	Pin diameter for BEND TEST
	mm.	mm.	mm. ²	kg./1000 m.	%	mm.	Mpa	Mpa (0.5%)	mm.	%	(d=diameter)
ASTM A 82	2.52	+/- 0.08	5	-	-	-	550	485	-	30	
	4.37	+/- 0.08	15	-	-	-	550	485	-	30	
	5.05	+/- 0.08	20	-	-	-	550	485	-	30	
	5.64	+/- 0.08	25	-	-	-	550	485	-	30	
	6.18	+/- 0.08	30	-	-	-	550	485	-	30	
	6.68	+/- 0.10	35	-	-	-	550	485	-	30	
	8.74	+/- 0.10	60	-	-	-	550	485	-	30	
ASTM A 496	4.05	-	12.9	0.152	+/- 6	4.62 - 7.24	585	515	> 0.16	> 25	2D / 900
	4.96	-	19.4	0.202	+/- 6	4.62 - 7.24	585	515	> 0.19	>25	2D / 900
	5.60	-	25	0.1962	+/- 6	4.62 - 7.24	585	515	-	-	
	6.70	-	35	0.2747	+/- 6	4.62 - 7.24	585	515	-	-	
	7.60	-	45	0.3532	+/- 6	4.62 - 7.24	585	515	-	-	
	8.00	-	50	0.3925	+/- 6	4.62 - 7.24	585	515	-	-	
	8.70	-	60	0.4709	+/- 6	4.62 - 7.24	585	515	-	-	
TIS 747 Round Wire	3.00	+/-0.1	7.07	-	-	-	550	485	-	30	
	4.00	+/-0.1	12.57	-	-	-	550	485	-	30	
	5.00	+/-0.1	19.64	-	-	-	550	485	-	30	
	6.00	+/-0.1	28.29	-	-	-	550	485	-	30	
	7.00	+/-0.1	38.5	-	-	-	550	485	-	30	
	8.00	+/-0.1	50.29	-	-	-	550	485	-	30	
TIS 943 Deform Wire	4.00	-	12.57	0.099	+/-6	4.62-7.25	585	515	0.16	-	
	5.00	-	19.64	0.154	+/-6	4.62-7.27	585	515	0.22	-	
	6.00	-	28.28	0.222	+/-6	4.62-7.29	585	515	0.27	-	
	7.00	-	38.49	0.302	+/-6	4.62-7.31	585	515	0.32	-	
	8.00	-	50.27	0.395	+/-6	4.62-7.33	585	515	0.36	-	
	9.00	-	63.63	0.499	+/-6	4.62-7.35	585	515	0.40	-	
TIS 194	2.80	+/-0.08	7.07	0.055	-	-	540-1080	-	-	-	
	3.00	+/-0.08	9.62	0.076	-	-	540-1080	-	-	-	
	4.00	+/-0.10	15.91	0.125	-	-	440-930	-	-	-	
	5.00	+/-0.10	23.76	0.186	-	-	390-830	-	-	-	
	6.00	+/-0.13	28.28	0.222	-	-	390-830	-	-	-	
	7.50	+/-0.15	33.19	0.26	-	-	390-830	-	-	-	
	8.00	+/-0.15	38.49	0.302	-	-	390-830	-	-	-	
AS/ NZS 4671 (500L)	3.70	-	10.75	0.084	+/- 4.5	0.5D - 1.0D	Rm/Re >= 1.03	500 - 750	0.05D - 0.10D	-	
	4.00	-	12.57	0.099	+/- 4.5		Rm/Re >= 1.03	500 - 750		-	
	5.00	-	19.64	0.154	+/- 4.5		Rm/Re >= 1.03	500 - 750		-	
	7.00	-	38.49	0.302	+/- 4.5		Rm/Re >= 1.03	500 - 750		-	
ASTM A 648 (CLASS III)							BREAKNG LOAD				
							(kN)				
	4.88	+/-0.05	18.7	0.147	-	-	32.5 - 36.3	-	-	35	
	6.35	+/-0.05	31.67	0.249	-	-	52.4 - 58.9	-	-	30	
	7.92	+/-0.05	49.27	0.387	-	-	75.2 - 85.4	-	-	30	
	PLAIN										
	2.52	+/-0.08	5	-	-	-	550	485	-	30	1d
	3.57	+/-0.08	10	-	-	-	550	485	-	30	1d
	4.37	+/-0.08	15	-	-	-	550	485	-	30	1d
	5.05	+/-0.08	20	-	-	-	550	485	-	30	1d
	5.64	+/-0.08	25	-	-	-	550	485	-	30	1d
	6.18	+/-0.08	30	-	-	-	550	485	-	30	1d
	6.68	+/-0.10	35	-	-	-	550	485	-	30	1d
	7.14	+/-0.10	40	-	-	-	550	485	-	30	1d
	7.57	+/-0.10	45	-	-	-	550	485	-	30	1d
	7.98	+/-0.10	50	-	-	-	550	485	-	30	2d
	8.37	+/-0.10	55	-	-	-	550	485	-	30	2d
	8.74	+/-0.10	60	-	-	-	550	485	-	30	2d
	9.10	+/-0.10	65	-	-	-	550	485	-	30	2d
	9.44	+/-0.10	70	-	-	-	550	485	-	30	2d
	10.10	+/-0.15	80	-	-	-	550	485	-	30	2d
	10.70	+/-0.15	90	-	-	-	550	485	-	30	2d
	11.30	+/-0.15	100	-	-	-	550	485	-	30	2d
	12.40	+/-0.15	120	-	-	-	550	485	-	30	2d
ASTM A1064 - 14	DEFORM										
	5.64	-	25	0.196	+/-6	3.50 - 5.00	585	515	-	-	2d
	6.18	-	30	0.235	+/-6	3.50 - 5.00	585	515	-	-	2d
	6.68	-	35	0.275	+/-6	3.50 - 5.00	585	515	-	-	2d
	7.14	-	40	0.314	+/-6	3.50 - 5.00	585	515	-	-	4d
	7.57	-	45	0.353	+/-6	3.50 - 5.00	585	515	-	-	4d
	7.98	-	50	0.392	+/-6	3.50 - 5.00	585	515	-	-	4d
	8.37	-	55	0.432	+/-6	3.50 - 5.00	585	515	-	-	4d
	8.74	-	60	0.471	+/-6	3.50 - 5.00	585	515	-	-	4d
	9.10	-	65	0.510	+/-6	3.50 - 5.00	585	515	-	-	4d
	9.44	-	70	0.549	+/-6	3.50 - 5.00	585	515	-	-	4d
	10.10	-	80	0.628	+/-6	3.50 - 5.00	585	515	-	-	4d
	10.70	-	90	0.706	+/-6	3.50 - 5.00	585	515	-	-	4d
	11.30	-	100	0.785	+/-6	3.50 - 5.00	585	515	-	-	4d
	12.40	-	120	0.942	+/-6	3.50 - 5.00	585	515	-	-	4d

STANDARD		NOMINAL DIAMETER	DIAMETER TOLERANCE	NOMINAL AREA	UNIT WEIGHT	WEIGHT TOLERANC E	MINIMUM BREAKING LOAD	MINIMUM YIELD LOAD			FORCE RATIO or YIELD RATIO	INDENT DEPTH	Width	Pitch	MINIMUM ELONGATION	MINIMUM Agt	MINIMUM REVERSE BEND	STRAIGHTNESS (AH)	1,000-HR. RELAXATION (% MAX.)	MOE	Constriction (ROA)	Fatigue	Corrosion solution A	Torsion	Bend	Radius				
STANDARD	GRADE Mpa	mm.	mm.	mm ²	kg./1000 m.		kN	kN.				mm.	mm	mm	%	%	Times			Gpa or kN/mm2	%	N/mm2		round / length 203mm. min	round / die- rolled section					
								0.1%	0.2%	at 1% extension																				
TIS 95 - 2540	1 770	4	-	12.6	98.9	+/-2.0 g/m	22.3	18.5	19.0	-		0.05 - 0.20			3.5	-			80% Fm 4.5	4.5	195 - 215	-	-	-	-					
	Mat.LU.1770	4	-	12.6	97.00 - 98.50		22.3	18.5	19.0	-		0.05 - 0.20			3.5	-														
	1 670	4	-	12.6	98.9	+/-2.0 g/m	21.0	17.5	17.9	-		0.05 - 0.20			3.5	-														
	1 770	5	-	19.6	154	+/-3.1 g/m	34.7	28.8	29.5	-		0.05 - 0.20			3.5	-														
	Mat.LU.1770	5	-	19.6	150.90 - 153.51		34.7	28.8	29.5	-		0.05 - 0.20			3.5	-														
	1 670	5	-	19.6	154	+/-3.1 g/m	32.7	27.2	27.8	-	-	0.05 - 0.20			3.5	-														
	1 770	6	-	28.3	222	+/-3.7 g/m	50.1	41.6	42.6	-		0.10 - 0.20	-	-	3.5	-														
	1 670	6	-	28.3	222	+/-3.7 g/m	47.3	39.3	40.2	-		0.10 - 0.20			3.5	-														
	1 670	7	-	38.5	302	+/-4.3 g/m	64.3	53.4	54.7	-		0.10 - 0.20			3.5	-														
	1 570	7	-	38.5	302	+/-4.3 g/m	60.4	50.1	51.3	-		0.10 - 0.20			3.5	-														
	1 470	9	-	63.6	499	+/-7.2 g/m	93.5	74.8	76.7	-		0.10 - 0.20			3.5	-														
	AS/NZS 4672 - 2007	1 770	4.00	-	12.60	99	+/-2.0 g/m	22.30	18.50	19.00	-		0.08 - 0.16			-	3.5									≥ 4 for plain ≥ 3 for indented and Ribbed	≤ 30 mm. of 1 m.	80% Fm 3.0	195 - 215	-
1 770		5.00	-	19.60	154	+/-3.1 g/m	34.70	28.80	29.50	-		0.08 - 0.16			-	3.5														
1 670		5.00	-	19.60	154	+/-3.1 g/m	32.70	27.20	27.80	-		0.08 - 0.16			-	3.5														
1 700		5.03	-	19.90	156	+/-3.1 g/m	33.80	28.10	28.70	-	-	0.08 - 0.16	-	-	-	3.5														
1 670		7.00	-	38.50	302	+/-4.3 g/m	64.30	53.40	54.70	-		0.11 - 0.19			-	3.5														
1 570		7.00	-	38.50	302	+/-4.3 g/m	60.40	50.10	51.30	-		0.11 - 0.19			-	3.5														
1 470		9.00	-	63.60	499	+/-7.2 g/m	93.50	74.80	76.70	-		0.11 - 0.19			-	3.5														
ASTM A421 - 2005	WA	4.98	+/-0.05	19.47	152.05	-	33.58	-	-	28.52		-			4.0		-	≤ 3 inch of 60 inch	80% Fm 3.5	-	-	-	-	-	-					
		6.35	+/-0.05	31.65	247.21	-	52.39	-	-	44.54		-			4.0															
	BA	4.98	+/-0.05	19.47	152.05	-	32.22	-	-	27.39		-			4.0													3.5		
		6.35	+/-0.05	31.65	247.21	-	52.39	-	-	44.54		-			4.0													3.5		
ASTM A421 - 2010	WA	4.98	+/-0.05	19.47	152.05	-	33.58	-	-	28.52		-			4.0		-	≤ 3 inch of 60 inch	80% Fm 3.5	-	-	-	-	-	-					
		6.35	+/-0.05	31.65	247.21	-	52.39	-	-	44.54		-			4.0															
	BA	4.98	+/-0.05	19.47	152.05	-	32.22	-	-	27.39		-			4.0													3.5		
		6.35	+/-0.05	31.65	247.21	-	52.39	-	-	44.54		-			4.0													3.5		
ASTM A421 - 2015	WA	4.98	+/-0.05	19.47	152.05	-	33.58	-	-	28.52		-			4.0		-	≤ 3 inch of 60 inch	80% Fm 3.5	-	-	-	-	-	-					
		6.35	+/-0.05	31.65	247.21	-	52.39	-	-	44.54		-			4.0															
	BA	4.98	+/-0.05	19.47	152.05	-	32.22	-	-	27.39		-			4.0													3.5		
		6.35	+/-0.05	31.65	247.21	-	52.39	-	-	44.54		-			4.0													3.5		
ASTM A648 - 2012	1530	4.88	+/-0.05	18.69	-	-	28.6 - 32.5	-	-	-		-			-		-	-	70% Fm 7.48	Internal spec 195 - 215	≥ 35% ≥ 35% ≥ 30% ≥ 30% ≥ 30% ≥ 30%	-	≥ 10 ≥ 10 ≥ 8 ≥ 8 ≥ 7 ≥ 7	-						
	1740	4.88	+/-0.05	18.69	-	-	32.5 - 36.3	-	-	-		-			-															
	1450	6.35	+/-0.05	31.65	-	-	46.1 - 52.6	-	-	-		-			-															
	1650	6.35	+/-0.05	31.65	-	-	52.4 - 58.9	-	-	-		-			-															
	1390	7.92	+/-0.05	49.24	-	-	68.4 - 78.6	-	-	-		-			-															
	1520	7.92	+/-0.05	49.24	-	-	75.2 - 85.4	-	-	-		-			-															
ASTM A881 - 2005	1550	5.03	+/-0.08	19.86	155.90	-	30.80	-	-	27.72		0.08 - 0.15			3.0		-	≤ 3 inch of 1.8 m.	80% Fm 3.5	-	-	-	-	-						
	1620	5.03	+/-0.08	19.86	155.90	-	32.20	-	-	28.98		0.08 - 0.15			3.0															
	1720	5.03	+/-0.08	19.86	155.90	-	34.30	-	-	30.87		0.08 - 0.15			3.0															
	1790	5.50	+/-0.08	23.70	187.40	-	42.60	-	-	38.34		0.08 - 0.15			3.0															
ASTM A881 - 2010	1620	5.03	+/-0.08	19.86	155.90	-	32.20	-	-	28.98		0.08 - 0.15			3.0		wire bend 6X	≤ 3 inch of 1.8 m.	80% Fm 3.5	-	-	-	-	-						
	1720	5.03	+/-0.08	19.86	155.90	-	34.30	-	-	30.87		0.08 - 0.15			3.0															
	1760	5.32	+/-0.08	22.23	174.50	-	39.10	-	-	36.83		0.08 - 0.15			3.0															
ASTM A881 - 2016	1620	5.03	+/-0.08	19.86	155.90	-	32.20	-	-	28.98		0.08 - 0.15			3.0		wire bend 6X	≤ 3 inch of 1.8 m.	80% Fm 3.5	-	-	-	-	-						
	1720	5.03	+/-0.08	19.86	155.90	-	34.30	-	-	30.87		0.08 - 0.15			3.0															
	1760	5.32	+/-0.08	22.23	174.50	-	39.10	-	-	36.83		0.08 - 0.15			3.0															
BS 5896 - 2012	Y1670C	4.00	-	12.6	98.40	+/-2.0 %	21.0 - 24.2	18.5	-	-		INDENT CH 0.06 - 0.13(+/-0.03)	3.0 - 4.0	5.2 - 5.8		3.5	≥ 4 for plain ≥ 3 for indented	≤ 25 mm. of 1 m.	80% Fma 4.5	205	≥ 25 % for plain wire ≥ 20 % for indented wire.	80% Fma ≥ 200 MPa for plain ≥180 MPa for indented	Individual min 2hr Med. min 5hr	-	-	-				
	Y1770C	4.00	-	12.6	98.40	+/-2.0 %	22.3 - 25.6	19.6	-	-					3.5														4.5	
	Y1670C	5.00	-	19.6	153.10	+/-2.0 %	32.7 - 37.6	28.8	-	-					3.5														4.5	
	Y1770C	5.00	-	19.6	153.10	+/-2.0 %	34.7 - 39.9	30.50	-	-					3.5														4.5	
	Y1860C	5.00	-	19.6	153.10	+/-2.0 %	36.5 - 42.0	32.5	-	-	1.05-1.17				3.5														4.5	
	Y1670C	6.00	-	28.3	221.00	+/-2.0 %	47.3 - 54.4	41.6	-	-					3.5														4.5	
	Y1770C	6.00	-	28.3	221.00	+/-2.0 %	50.1 - 57.6	44.1	-	-					3.5														4.5	
	Y1570C	7.00	-	38.5	300.70	+/-2.0 %	60.4 - 69.5	53.2	-	-					3.5														4.5	
prEN 10138 - 2009	Y1670C	7.00	-	38.5	300.70	+/-2.0 %	64.3 - 73.9	56.6	-	-		0.09 - 0.16(+/-0.04)			3.5				4.5											
	Y1860C	4.0	-	12.6	98.4	+/-2.0 %	23.4-26.9	20.8	-	-		T1 0.06 - 0.13(+/-0.03)	3.0 - 4.0	5.0 - 6.0	-	3.5	≥ 4 for plain ≥ 3 for indented	≤ 25 mm. of 1 m.	70% Fma 2.5	205	≥ 25 % for plain wire ≥ 20 % for indented wire.	70% Fma ≥ 200 MPa for plain ≥180 MPa for indented	Individual min 1.5hr Med. min 4hr	-	-	-				
	Y1770C	4.0	-	12.6	98.4	+/-2.0 %	22.3-25.6	19.6	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1770C	5.0	-	19.6	153.1	+/-2.0 %	34.7-39.9	30.5	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1670C	5.0	-	19.6	153.1	+/-2.0 %	32.7-37.6	28.8	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1770C	6.0	-	28.3	221.0	+/-2.0 %	50.1-57.6	44.1	-	-	0.85-0.95	T1 0.09 - 0.16(+/-0.04)	4.5 - 5.5	7.5 - 8.5	-	3.5														
	Y1670C	6.0	-	28.3	221.0	+/-2.0 %	47.3-54.4	41.6	-	-		T1 0.09 - 0.16(+/-0.04)			-	3.5														
	Y1670C	7.0	-	38.5	300.7	+/-2.0 %	64.3-73.9	56.6	-	-		T1 0.09 - 0.16(+/-0.04)			-	3.5														
	Y1670C	7.0	-	38.5	300.7	+/-2.0 %	60.4-69.5	53.2	-	-		T1 0.09 - 0.16(+/-0.04)			-	3.5														
	Y1670C	7.5	-	44.2	345.2	+/-2.0 %	73.8-84.9	64.9	-	-		T1 0.09 - 0.16(+/-0.04)	-	3.5																
	Y1670C	8.0	-	50.3	392.8	+/-2.0 %	84.0-96.6	73.9	-	-		T1 0.09 - 0.16(+/-0.04)	-	3.5																
	Y1570C	9.0	-	63.6	496.7	+/-2.0 %	99.9 -115	86.9	-	-		T1 0.10 - 0.20(+/-0.05)	4.5 - 5.5	7.5 - 8.5	-	3.5														
prEN 10138 - 2012	Y1860C	4.0	-	12.6	98.4	+/-2.0 %	23.4-26.9	20.8	-	-		T1 0.06 - 0.13(+/-0.03)	3.0 - 4.0	5.0 - 6.0	-	3.5	≥ 4 for plain ≥ 3 for indented	≤ 25 mm. of 1 m.	70% Fma 2.5	-	≥ 25 % for plain wire ≥ 20 % for indented wire.	70% Fma ≥ 200 MPa for plain ≥180 MPa for indented	Individual min 1.5hr Med. min 4hr	-	-	-				
	Y1770C	4.0	-	12.6	98.4	+/-2.0 %	22.3-25.6	19.6	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1860C	5.0	-	19.6	153.1	+/-2.0 %	36.5-42.0	32.5	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1770C	5.0	-	19.6	153.1	+/-2.0 %	34.7-39.9	30.5	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1670C	5.0	-	19.6	153.1	+/-2.0 %	32.7-37.6	28.8	-	-		T1 0.06 - 0.13(+/-0.03)			-	3.5														
	Y1770C	6.0	-	28.3	221.0	+/-2.0 %	50.1-57.6	44.1	-	-		T1 0.09 - 0.16(+/-0.04)	4.5 - 5.5	7.5 - 8.5	-	3.5														
	Y1770C	6.0	-	28.3	221.0	+/-2.0 %	47.3-54.4	41.6	-	-		T1 0.09 - 0.16(+/-0.04)			-	3.5														

STANDARD		NOMINAL DIAMETER	DIAMETER TOLERANCE	NOMINAL AREA	UNIT WEIGHT	WEIGHT TOLERANCE	MINIMUM BREAKING LOAD	MINIMUM YIELD LOAD			FORCE RATIO or YIELD RATIO	INDENT DEPTH	Width	Pitch	MINIMUM ELONGATION	MINIMUM Agt	MINIMUM REVERSE BEND	STRAIGHTNESS (AH)	1,000-HR. RELAXATION (% MAX.)	MOE	Constriction (ROA)	Fatigue	Corrosion solution A	Torsion	Bend	Radius	
STANDARD	GRADE Mpa	mm.	mm.	mm²	kg./1000 m.		kN	0.1%	0.2%	at 1% extension		mm.	mm	mm	%	%	Times			Gpa or kN/mm2	%	N/mm2		round / length 203mm. min	round / die-rolled section		
JS JIS 3536 - 2014	SWPD1L (indent)	4.00	+/-0.04	12.57	98.70	-	21.10	-	18.60	-		-			3.5				70% Fm	2.5							
		5.00	+/-0.05	19.64	154.00	-	31.90	-	27.90	-		-			4.0				2.5								
		6.00	+/-0.05	28.27	222.00	-	44.10	-	38.70	-		-			4.0				2.5								
	SWPR1AL (plain)	7.00	+/-0.05	38.48	302.00	-	58.30	-	51.00	-	-	-			4.5				2.5								
		8.00	+/-0.06	50.27	395.00	-	74.00	-	64.20	-		-	-		4.5				2.5								
		9.00	+/-0.06	63.62	499.00	-	90.20	-	78.00	-		-	-		4.5				2.5								
	SWPR1BL (plain)	5.00	+/-0.05	19.64	154.00	-	33.80	-	29.90	-		-			4.0				2.5								
		7.00	+/-0.05	38.48	302.00	-	62.30	-	54.90	-		-			4.5				2.5								
		8.00	+/-0.06	50.27	395.00	-	78.90	-	69.10	-		-			4.5				2.5								
LNEC E452 - 2011	1 770	4.00	-	12.60	98.40	+/-2.0 %	22.3 - 25.6	19.60	-	-		0.06 - 0.13 (+/-0.03)	3.0 - 4.0	5.0 - 6.0		3.5			70% Fma	2.5							
	1 860	4.00	-	12.60	98.40	+/-2.0 %	23.4 - 26.9	20.80	-	-		0.06 - 0.13 (+/-0.03)				3.5			2.5								
	1 770	5.00	-	19.60	153.10	+/-2.0 %	34.7 - 39.9	30.50	-	-		0.06 - 0.13 (+/-0.03)				3.5			2.5								
	1 860	5.00	-	19.60	153.10	+/-2.0 %	36.5 - 42.0	32.50	-	-		0.06 - 0.13 (+/-0.03)				3.5			2.5								
	1 770	6.00	-	28.30	221.00	+/-2.0 %	50.1 - 57.6	44.10	-	-		0.09 - 0.16 (+/-0.04)		3.5			2.5										
	1 670	7.00	-	38.50	300.70	+/-2.0 %	64.3 - 73.9	56.60	-	-		0.09 - 0.16 (+/-0.04)		3.5			2.5										
	1 670	8.00	-	50.30	392.80	+/-2.0 %	84.0 - 96.6	73.90	-	-		0.09 - 0.16 (+/-0.04)		3.5			2.5										
	1 570	9.40	-	69.40	542.00	+/-2.0 %	109.0 - 125.0	94.80	-	-		0.10 - 0.20 (+/-0.05)	4.5 - 5.5	7.5 - 8.5		3.5			2.5								
	1 570	9.50	-	70.90	553.70	+/-2.0 %	111.0 -128.0	96.60	-	-		0.10 - 0.20 (+/-0.05)				3.5			2.5								
	1 570	10.00	-	78.50	613.10	+/-2.0 %	123.0 -141.0	107.00	-	-		0.10 - 0.20 (+/-0.05)				3.5			2.5								
1 570	10.50	-	86.60	676.30	+/-2.0 %	136.0 - 156.0	118.00	-	-		0.10 - 0.20 (+/-0.05)				3.5			2.5									
LNEC E452 - 2020	1 770	4.00	-	12.60	98.40	+/-2.0 %	22.3 - 25.6	19.60	-	-		0.06 - 0.13 (+/-0.03)	3.0 - 4.0	5.0 - 6.0		3.5			70% Fma	2.5							
	1 860	4.00	-	12.60	98.40	+/-2.0 %	23.4 - 26.9	20.80	-	-		0.06 - 0.13 (+/-0.03)				3.5			2.5								
	1 770	5.00	-	19.60	153.10	+/-2.0 %	34.7 - 39.9	30.50	-	-		0.06 - 0.13 (+/-0.03)				3.5			2.5								
	1 860	5.00	-	19.60	153.10	+/-2.0 %	36.5 - 42.0	32.50	-	-		0.06 - 0.13 (+/-0.03)				3.5			2.5								
	1 770	6.00	-	28.30	221.00	+/-2.0 %	50.1 - 57.6	44.10	-	-		0.09 - 0.16 (+/-0.04)		3.5			2.5										
	1 670	7.00	-	38.50	300.70	+/-2.0 %	64.3 - 73.9	56.60	-	-	0.85-0.95	0.09 - 0.16 (+/-0.04)		3.5			2.5										
	1 670	8.00	-	50.30	392.80	+/-2.0 %	84.0 - 96.6	73.90	-	-		0.09 - 0.16 (+/-0.04)		3.5			2.5										
	1 570	9.40	-	69.40	542.00	+/-2.0 %	109.0 - 125.0	94.80	-	-		0.10 - 0.20 (+/-0.05)		3.5			2.5										
	1 570	9.50	-	70.90	553.70	+/-2.0 %	111.0 -128.0	96.60	-	-		0.10 - 0.20 (+/-0.05)		3.5			2.5										
	1 570	10.00	-	78.50	613.10	+/-2.0 %	123.0 -141.0	107.00	-	-		0.10 - 0.20 (+/-0.05)		3.5			2.5										
1 570	10.50	-	86.60	676.30	+/-2.0 %	136.0 - 156.0	118.00	-	-		0.10 - 0.20 (+/-0.05)		3.5			2.5											
XP-A35-045-2	1 860	4.0 - CA	-	12.60	98.4	+/-2.0 %	23.40	21.00	-	-	-	0.04 - 0.08	3.0 - 4.0	5.0 - 6.0		3.5		3		≤ 25 mm.	80% Fma	4.5	190 - 215	20% for indented wire25% for Plain wire	Individual min 1.5h		
	1 860	5.0 - CA	-	19.60	153.10	+/-2.0 %	36.50	32.50	-	-		0.05 - 0.09				3.5		3			4.5	Med. min 4h					
	1 860	5.0 - CB	-	19.60	153.10	+/-2.0 %	36.50	32.50	-	-	-	0.07-0.13		3.5		3											
	1 860	5.00	-	19.60	153.10	+/-2.0 %	36.50	32.50	-	-	-	0.05-0.09		3.5		3											
	1 670	8.00	-	50.30	392.80	+/-2.0 %	84.00	75.00	-	-	-	-		3.5		-											
	1 570	9.40	-	69.40	542.00	+/-2.0 %	109.00	97.00	-	-	-	-		3.5		-											
MS 1138 - 2 2007	1 770	4.00	-	12.60	98.90	+/-2.0 g/m	22.30	-	19.00	-		0.07 - 0.17	3.5 min	5.5 min		3.5			80% Fm	4.5							
	1 670	4.00	-	12.60	98.90	+/-2.0 g/m	21.00	-	17.90	-		0.07 - 0.17				3.5			4.5								
	1 770	5.00	-	19.60	154.00	+/-3.1 g/m	34.70	-	29.80	-		0.07 - 0.17				3.5			4.5								
	1 670	5.00	-	19.60	154.00	+/-3.1 g/m	32.70	-	27.80	-		0.07 - 0.17				3.5			4.5								
	1 770	6.00	-	28.30	222.00	+/-3.7 g/m	50.10	-	42.60	-		0.10 - 0.20		3.5			4.5										
	1 670	6.00	-	28.30	222.00	+/-3.7 g/m	47.30	-	40.20	-		0.10 - 0.20		3.5			4.5										
	1 670	7.00	-	38.50	302.00	+/-4.3 g/m	64.30	-	54.70	-		0.10 - 0.20	5.0 min	8.0 min		3.5			4.5								
	1 570	7.00	-	38.50	302.00	+/-4.3 g/m	60.40	-	51.30	-		0.10 - 0.20				3.5			4.5								
	1 670	8.00	-	50.30	395.00	+/-5.9 g/m	84.00	-	71.40	-		0.10 - 0.20				3.5			4.5								
	1 570	8.00	-	50.30	395.00	+/-5.9 g/m	79.00	-	67.10	-		0.10 - 0.20				3.5			4.5								
1 470	9.00	-	63.60	499.00	+/-7.2 g/m	93.50	-	76.70	-		0.10 - 0.20		3.5			4.5											
SNI 1155 - 2011	KBJP-R (1670)	5.00	+/-0.05	-	-	-	31.87	-	27.95	-		-			4.0			-	70% Fma	2.5							
	KBJP-R (1570)	7.00	+/-0.05	-	-	-	58.35	-	50.94	-		-			4.5			-	2.5								
	KBJP-R (1470)	9.00	+/-0.06	-	-	-	90.22	-	77.96	-		-			4.5			-	2.5								
NBR 7482 - 2008	CP 175 RB 4 E	4.00	+/-0.05	12.6	98.70	-	21.00	-	18.9	-		-	3.0 - 4.0		5.0		3		80% Fm	3.0							
	CP 175 RB 5 E	5.00	+/-0.05	19.6	154.00	-	33.00	-	29.7	-		-			5.0		3			3.0							
	CP 175 RB 6 E	6.00	+/-0.05	28.3	222.00	-	47.70	-	43.0	-		-		5.0		3			3.0								
	CP 170 RB 7 E	7.00	+/-0.05	38.5	302.00	-	63.30	-	54.9	-		-	4.5 - 5.5		5.0		3			3.0							
	CP 160 RB 8 E	8.00	+/-0.05	50.3	395.00	-	77.90	-	70.1	-		-			5.0		3			3.0							
	CP 150 RB 9 E	9.00	+/-0.05	63.6	499.00	-	92.60	-	83.3	-		-			6.0		3			3.0							
	GB/T 5223 - 2002	1470	6.00	+/-0.05	28.27	222	-	41.56	-	36.47	-		-			3.5		4		80% Fm	4.5						
1770		7.00	+/-0.05	38.48	302	-	68.11	-	49.64	-		-			3.5		4		4.5								
1470		10.00	+/-0.06	78.54	616	-	115.45	-	101.32	-		-			3.5		4		4.5								
UNE 36094 - 1997	Y 1770 C	3.0	-	7,07 +/-0.14	55.5	-	12.5-14.6	10.4	10.6	-		0.02-0.06	3.5 ± 0.5	5.5 ± 0.5		3.5			80% Fma	4.5							
	Y 1770 C	4.00	-	12.6 +/-0.25	98.6	-	22.3-26.1	18.5	19.0	-		Type1 0.03-0.07				3.5			≥ 4 for plain		4.5						
	Y 1860 C	4.00	-	12.6 +/-0.25	98.6	-	23.4-27.4	19.4	19.9	-		Type2 0.05-0.09				3.5					4.5						
	Y 1770 C	5.00	-	19.6 +/-0.39	154	-	34.7-40.6	28.8	29.5	-		Type1 0.04-0.08				3.5			≥ 3 for indented	≤ 25 mm. of 1 m.	4.5						
	Y 1860 C	5.00	-	19.6 +/-0.39	154	-	36.5-42.7	30.3	31.0	-		Type2 0.06-0.10		3.5					4.5								
	Y 1770 C	6.00	-	28.3 +/- 0.47	222	-	50.1-58.6	41.6	42.6	-		Type1 0.05-0.10		3.5					4.5								