

ESSEN
STEEL

WIRE & STRAND

PC STRAND





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**COMMITTED TO QUALITY
WITH GREEN TECHNOLOGY**



ESSEN STEEL INDUSTRY LLC

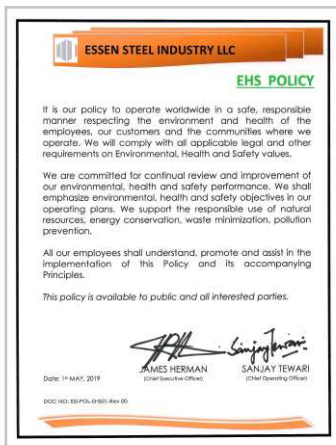
We are one of the leading producers of high & low carbon steel wires & strands in GCC. We are manufacturing a wide variety of steel wires ranging from high carbon wires to low carbon wires conforming to various International standards: bright and Galvanized Wire (Hot Dip), Spring Steel Wire (all grades), Mild steel wire, PC Wire and Strand, Binding Wire, ACSR & ACS wire & strands. Our supplies span the entire market with key segments being Power, Engineering, Agriculture, Automotive, Telecom and Construction.

ESSEN STEEL INDUSTRY LLC is the first GCC company in this field to be accredited with all three certifications i.e. ISO 9001, ISO 14001 and ISO 45001.

The company has certification for ICV with ADNOC. We have invested 35 Million USD to establish the latest state-of-the-art manufacturing facility. The plant, at KIZAD, Abu Dhabi, UAE features total manufacturing capacity of 72,000 MTPA of steel wires and strands. Subsequent expansions are planned to increase capacity to 90,000 MTPA level by 2024. The world class in-house product testing facilities makes us one of the best Wire & Strand producers in the region with all process validation systems in place. SPC is practiced throughout the organization for touching each minor need of improvement and defect elimination. Our team is inspired, by our Directors, who are focused on durable quality product and are always leading the way with their thrust on world class manufacturing practices and customer delight.

EsSEN Steel enjoys a good reputation with buyer confidence based on quality product and timely supply. We are a professionally managed Company backed by a competent qualified Team of Experts, ensuring our products meet and exceed customer expectations, with emphasis on quality backed up by stringent checks at every stage of production process.

Our Technical Team works continuously to keep abreast of latest technological developments and advances while incorporating the same in our operations and practices. Regular and complete interaction with our customers enables us to develop our products to customer requirements.



ESSEN STEEL INDUSTRY LLC contributes to the economic health and infrastructure of the UAE by manufacturing steel wire & strands for use in various segments like Infra-structure, construction, fencing, spring etc. Our process controls/checks are meeting world's most stringent norms and are being evaluated by some of the best technical experts in the world, with guidance at every stage right from steel cleaning & coating process, wire drawing, galvanizing, fine drawing, stranding, all of which makes the product most durable and highest quality, meeting all requirements of customers.

We are testing the steel at all stages with process validation and control plans, design controls and 24x7 process data monitoring through data acquisition system. Further, we emphasis of green culture in production/process thus have spent significantly on facilities to keep minimum or lowest impact on environment.



Our vision is to lead globally in Steel Wire and Steel Wire Products manufacturing by keeping customers as the focus of every strategy and achieve exceptional, sustainable and profitable growth through product development support with latest trends and technology. Our Manufacturing facilities are accredited with ISO 9001 / 14001/45001 by TUV SUD and DCL (Dubai Central Laboratories) (Dubai Municipality) certification for LRPC product to both ASTM and BS standards. Further to strengthen the market presence in exports domain. ESSEN STEEL is accredited with UK CARES product conformity for LRPC strands as per BS 5896 2012. The company aims for TPM Excellence award by 2025. The facility has maximum emphasis on quality product and thus has invested in online data acquisition systems on its manufacturing lines and monitoring of process parameters twice in a shift. All reports are reviewed by shift engineers and are recorded as soft note. The Quality Lab is well equipped with testing machines from Testometric, UK for checking the product quality parameters. All Engineers are well trained on systems and practices by best available industry professionals from world leaders.



For delivering the best and consistent quality to customers, emphasis is given on good rod suppliers and for all premium segment products, the main input i.e. wire rods are procured from only approved sources like TATA STEEL / BRITISH STEEL / SHAGANG / YANGANG and EMIRATES STEEL. 100% incoming inspection makes our system strong and consistent.

We validate our process for each product with excellent world-class laboratory with testing facilities from world best testing machine makers for metallurgical, mechanical (physical) and chemical testing of steel. All products are supported with test certificates in accordance with relevant international codes & standards.

HIGH TENSILE STEEL STRANDS

A steel member is prestressed and embedded in concrete, loses the initially applied stress exponentially with the passage of time. The important factor attributing to this loss is stress relaxation property of steel. By treating the steel through a thermo-mechanical stabilizing process the stress relaxation property is controlled to a great extent, resulting in following advantages:

- Up to 10% reduction in steel requirements
- Reduction in project cost for reduction in number of labor/ducts/sheathings/wedges
- Reduction in concrete requirement due to reduced size of structural members

Applications : Prestressed concrete girders for Road/River & Railway bridges/flyovers, Domes, Building- Slabs & Beam reinforcement, Silos, Aqua-ducts, Viaducts & Railway sleepers, Nuclear Power plant, LNG Tank and Hopper and many more.

Products are made in accordance to the following international standards:

ASTM A416 17a / BS 5896 1980 Amd-1 / BS 5896 2012 / EN 10138 / AS 1311 / AS NZS 4672 / JIS G 3536 / IS 14268

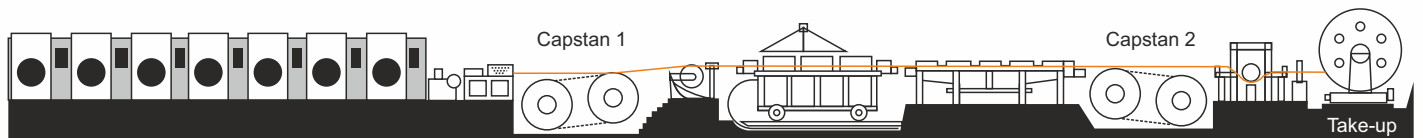
Products are tested for all critical parameters at all stages of manufacturing and records are maintained as per ASTM/ BS / DCL / UKCARES / IMS requirements for traceability and statistical analysis is done for process improvement. Testing is carried out based on inspection and Testing plan for the product, this also covers the specific testing requirements of customers. We follow the control Plan for manufacturing the product, which is a validated document after trials and technical inputs from standards & Process validation trials as per ESSEN OPERATIONAL EXCELLENCE PRACTICES (EOEP) and focused Quality assurance approach. The team is well trained on Process controls and testing by the best technical teams in the field.

To maintain the best quality product, the control starts from the very first stage i.e. wire rod. Wire rod quality plays major roll in product quality and characteristics, the wire rods are procured from approved vendors with proven track records for supplying best quality wire rods globally. The wire rods are purchased with reference to the technical document specially framed for the stringent wire rod quality norms and wire rods are 100% tested for Mechanical/Metallurgical/Chemical properties as an acceptance criterion for incoming RM inspection. All test results are well analyzed and used for continuous improvement of systems and Statistical Process Control (SPC) techniques are utilized for Process monitoring and improvement, results are evaluated for updates in Process validations. Records are maintained for 100% traceability of RM coil/Heat Number reference with reference to the invoice details.

Product testing is done as per Quality testing Plan internally for breaking load and relaxation tests in our world class test laboratory, which houses 500 KN Universal testing Machine along with Relaxation testing machines for regular testing of products. For special tests the product is tested in Approved European Labs with proper accreditations. The following test are carried out with these labs:

- 1. Relaxation test; 1000 hrs at 0.80 F m**
- 2. Stress Corrosion test**
- 3. Endurance test or Fatigue testing for 2M cycles**
- 4. Cryogenic testing at -170°C**
- 5. Pull out test**

All the tests are carried out on special requirements for UK CARES or Specific Customer requirements. These test are carried out on yearly or 5 yearly basis.



The Manufacturing Process : The manufacturing is done on green technology process line with higher SAFETY & ENVIRONMENT friendly approach.

The manufacturing process starts from wire rod preparation for wire drawing, which includes Mechanical descaling / surface cleaning with state-of the art green technology and surface is coated with phosphate with in-line electro-phosphating technology which covers 100% surface (not possible in conventional pickling process) and green technology thus, offers better wire rod surface for drawing. The wire drawers are from best in class with high speed drawing capabilities offering excellent wire quality with proven mechanical properties. Wire is collected in spools and send for next process of thermo-Mechanical stabilization, which induces the Low-Relaxation property in product. All machines/lines are PLC controlled with load/extension monitoring during operation, thus consistent high quality output is guaranteed. The wire rods are handled only single time in order to prevent any mechanical surface damage and the output of 27 MT master spool is layer winded to 3.40 MT coils as final pack. These coils are wrap packed with PE strap with ESSEN logo and VCI shrink wrap as per customer requirement. The packed coils are stacked in eye-to-sky position in FG stock area on FIFO basis.

QUALITY CONTROL / ASSURANCE FUNCTION

We have a fully equipped laboratory to monitor and maintain a well-defined quality assurance system, which tracks and tests steel at every stage right from rod stage tests like physical testing, metallurgical testing and chemical testing, the Lab is well equipped with testing machines & manned by professionally qualified highly experienced technical team comprising of engineering graduates.

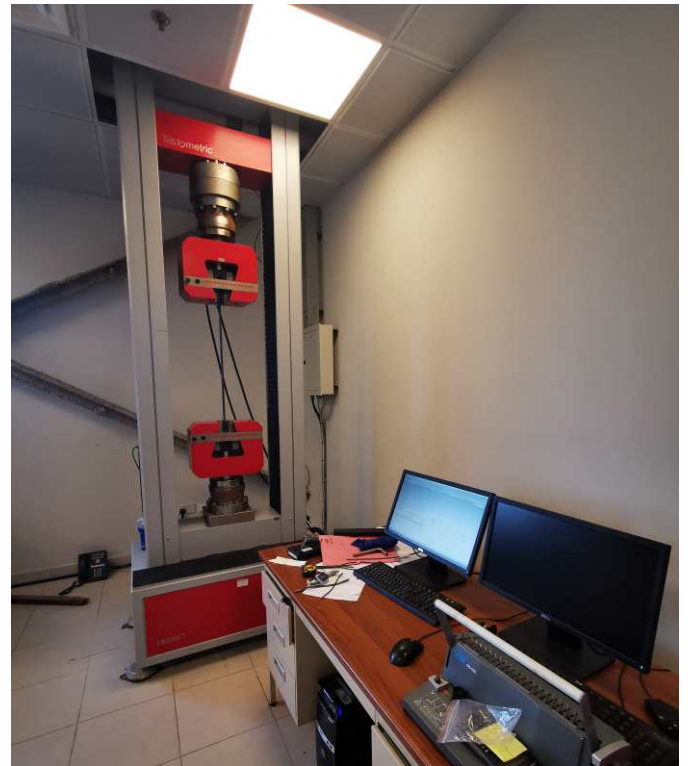
Quality Assurance engineers are always guided by some of the world's best technical experts and developments/process are accordingly validated with all test records. Besides this, equipment is selected from world's best makers like:

1. Tensile testing machines from Testometric, UK
2. Relaxation testing machine, Taiwan
3. Wire bend test machine from in house design

Our product is well designed with design software, experience of best Steel wire & Strands manufacturers technical heads and our own team, which is highly experienced in field of steel wire & Strands. Thus, design parameters are tested with comprehensive testing in quality laboratory, which supports the ultimate performance parameters like breaking force, relaxation, MOE etc. This makes our PC Strands world class product with guaranteed performance. Thus, by using ESSEN STEEL Products, you are assured of excellent Quality and commitment for service!!! We foresee a great relation with you and are committed to serve you better !! first time and every time.

ESSEN STEEL has recently commissioned world class facility at KIZAD, Abu Dhabi, United Arab Emirates catering to quality product needs of the region and global market. The 35 million USD investment is made as a commitment to deliver high quality product and service to the construction industry. The present range of products include

- Bright Low Relaxation (LRPC)
- Galvanized LRPC strands
- Plain, Indented & ribbed high tensile steel wire for prestressed concrete



PRODUCTS ARE OFFERED AS THE FOLLOWING 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	%		
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) XD
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)
	15.20	+/- 0.4	143.00	1,125	25,484	150.00	21,662	212.50	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 ³	Inch ³	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

INDIAN SPECIFICATION : IS-14268/1992

CLASS	NOMINAL DIAMETER OF STRAND	TOLERANCE	NOMINAL AREA OF STRAND	MINIMUM BREAKING STRENGTH OF STRAND		0.2 PROOF LOAD (90%) OF BREAKING STRENGTH		MINIMUM % ELONGATION GL=600mm	NOMINAL WEIGHT OF STRAND (APPROX)	RELAXATION LOSS	CHEMICAL COMPOSITION
				kN	kg	kN	kg				
	mm	± mm	mm ²	kN	kg	kN	kg		kg/kM	%	%
11	9.5	+0.66 -0.15	54.8	102.3	10434	92.1	9394	3.5	432	2.5 Max. at 70% of specified min breaking load after 1000 hours OR 1.8 max. at 70% of specified min. breaking load after 100 hours	S = .04 max. P = .04 max.
	11.1	+0.66 -0.15	74.2	137.9	14065	124.1	12658		582		
	12.7	+0.66 -0.15	98.7	183.7	18737	165.3	16860		775		
	15.2	+0.66 -0.15	140.0	260.7	26592	234.6	23929		1102		

BS 5896:1980 Amd 1

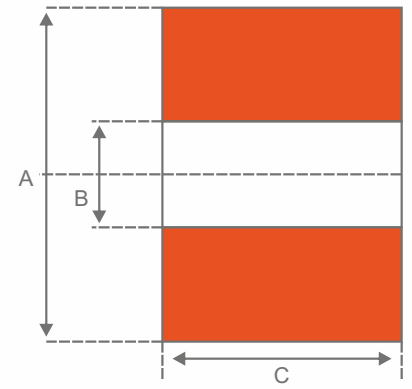
TYPE OF STRAND	NOMINAL DIAMETER	TOLERANCE		NOMINAL AREA OF STRAND	NOMINAL TENSILE STRENGTH	SPECIFIED CHARACTERISTIC BREAKING STRENGTH	LOAD AT 1% ELONGATION	RELAXATION			Minimum Elongation at max load	Nominal Mass
		DIA	Cross sectional areas and Mass					INITIAL LOAD (% OF ACTUAL BREAKING LOAD)	Maximum after 1000hrs			
		±mm							Class 1	Class 2		
7-wire Standard	9.3	+0,30	+4%	52	1860	97	85	For all strands	For all strands	For all strands	For all strands	408
	11			-0.15	71	1770	125					110
	12.5	+0,40	-2%	93	1860	173	152	60%	4.50%	1%	730	
	15.2			-0,20	139	1860	259	228	70%	8.00%	2.50%	1090
7-Wire Super	9.6	+0,30	+4%	55	1860	102	90	80%	12%	4.50%	3.50%	432
	11.3			-0.15	75	1860	139					122
	12.9	+0,40	-2%	100	1860	186	163	785				
	15.7			-0,20	150	1860	279	246	1180			

Dimensions of Reeless Coil (Product Packing)

Essen Steel Low Relaxation PC strand can be supplied in dry or oiled condition as per customer's requirement. Oil used can be easily washed with plain water at site before stressing and grouting operations.

PC strands are supplied in cheese coil from 2.5 MT to 3.5 MT as per customer's requirement. These coils are suitable strapped for compactness and depending on customer's requirement are packed or palletized.

The starting end of the strand is separately identified and can be easily located in the coil.



Position of Coil as per customer specification



Nominal Diameter of Strand	kg / mtr	Outside Diameter (mm)	Inside Diameter (mm)	Width/Height (mm)	Approximate Length per pack (mtr) (Correspond to coil weight of 2.5 to 3.5 MT)
9.30	0.406	1300 to 1500	B=750	C=800	7750
9.53	0.432				7500
12.7	0.775				4250
15.2	1.10				3000
15.7	1.17				2850



CAUTION

PC Strand Wire is coiled under high tension. Ensure adequate safety measures while uncoiling

COIL STORAGE AND HANDLING AT SITE

It is important to mention that handling of strands/coils at site must be done with proper care else it may result in under performance and severe repercussions at later stages.

Essen steel offers both dry and oiled strands based on customer needs:

Oiled Strands: Water soluble oil is applied on surface during stabilization process to protect the strand during storage at site, this oil can be easily washed with water during application.

Dry Strands: The dry strands are supplied with VCI paper/polyethylene packings, which protects the strands during storage at site. This is critical and if strand is supposed to be stored for longer durations, then some other external protections must be applied/used to avoid any rust formation.

1. Strands should be unloaded and kept in shed to protect the surface.
2. If strands are to be kept outside for short duration, each coil should be covered properly with waterproof sheet.
3. Condensation inside the packing/covers shall be avoided.
4. If strands are to be kept in open/outside for long duration, the covers should be provided with moisture/vapor absorbing media.
5. Flame cutters are strictly prohibited for cutting of strands as it will result in change of steel properties which is detrimental for the desired usage of steel strands. Thus, strands shall be cut with abrasive cutters or other mechanical devices.
6. The pull direction: The strand shall be placed in strand cage in such a way that arrow pull direction faces the opening. The coil shall be properly fit in the cage, so that no gap is available for strand to move.

For SAFE working with LRPC strands/Wire, we insist the users to follow the safety instructions on site handling & Usage as mentioned on our packing. This is for safety of the workers at site and as per our policy we are committed to ensure the safety

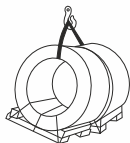
CAUTION

PLEASE PAY ATTENTION TO THESE INSTRUCTIONS AS THEY ARE IMPORTANT FOR PRODUCT'S CONDITION BEFORE STRESSING. ABRASION OR SCRATCH FROM IMPROPER HANDLING MAY CAUSE FAILURES, DAMAGES AND SERIOUS INJURIES WHEN STRESSING.

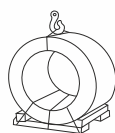
LIFT AND STORAGE



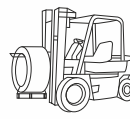
SLING COIL HORIZONTALLY. C-HOOK STEEL IS RECOMMENDED TO HELP BALANCE THE COIL.



SLING ONLY ONE COIL AT A TIME



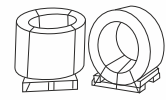
SLING TO THE COIL, NOT STRAP



INSERT FORKLIFT'S TYNES THROUGH THE EYE OF COIL WHEN LIFTING FOR EYE - HORIZONTAL COIL



INSERT FORKLIFT'S TYNES THROUGH PALLET WHEN LIFTING FOR EYE - SKYWARD COIL

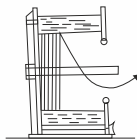


ALWAYS PUT COIL ON THE PALLET DURING STORAGE. KEEP COIL INDOORS AWAY FROM MOISTURE.

STRAP REMOVAL

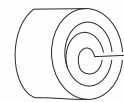


USE ONLY PROPER STEEL SCISSORS. OXYACETYLENE FLAME AND DISC CUTTERS CAUSE SPARK HARMING COIL TO BE ABRADED.

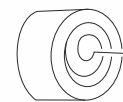


MAXIMUM 5.0 mm SPACE BETWEEN INNER CAGE WIDTH AND INNER COIL WIDTH BEFORE CUTTING STRAPS. PIPE OR CONE AT CAGE CENTER PREVENTS LOPPING. TIE OUTER STRAND END TO THE CAGE. CAGE ON REAL FLAT SURFACE.

STRAND UNWINDING



LEFT HAND LAY LOOP TRAVELS COUNTER - CLOCKWISE ROUND THE EYE OF COIL



RIGHT HAND LAY LOOP TRAVELS CLOCKWISE ROUND THE EYE OF COIL. ROTATE THE COIL AND PULL STRAND THROUGH THE EYE OF COIL IF NECESSARY



INVESTING IN THE FUTURE

To maintain competitiveness and quality, we routinely re-invest in our manufacturing facilities and equipment. We also invest in the future of our industry by regularly working with researchers in academia and private industry to develop new and innovative products and techniques. Essen Steel intends to be a member of the Precast / Prestressed Concrete Institute and the Post-Tensioning Institute.

ESSEN STEEL is now investing in value added products/solutions and shall be the first in gcc to provide the following products in 2020:

- 1. Epoxy coated lrpc strands:** essen steel will offer epoxy coated strands as per astm a882 for all size range of uncoated strand. Three different type of finish will be offered for strand to concrete bond requirements i.e. No grit, fine grit and coarse grit. Epoxy will cover strand inside voids as well as overall outside surface of strand.
- 2. Galvanized lrpc strands** (200 gsm to 400 gsm) for extra protection in extreme corrosive environment. The corrosion fatigue is reduced by hot-dip galvanized protection coating.
- 3. Polymer coated bright/galvanized lrpc strands:** these strands are applied with extruded thermoplastic coating, which provides as seal against the corrosive chemicals/water etc during construction stage. Thus, protects the steel and enhances the life of structure. Essen steel has team with adequate experience on extrusion and sheathing technology, thus product quality is guaranteed. Essen will be offering different types of polymer, coating thickness and colour with uv stabilized polymers.
- 4. Grease filled un-bonded lrpc strand for post tensioning:** this strand will be offered in both bright/galvanized coated with corrosion resistant high temperature grease/wax tofill the voids between the wires, then the final sheathing is done with uv stabilized polymerwith min thickness of 0,50 mm to 3,00 mm or more as per customer requirement)
- 5. Compacted strands:** essen steel will offer high strength compacted strands in both bright and galvanized steel for extra corrosive protection. Compacted strands offer 5% to 8% extra breaking force for same diameter of uncompacted strands.



-  Zinc Coating
-  Anticorrosion High Temperature Grease
-  UV Stabilized Polymer

Project Approvals

Project Approvals	Category	Key Members		Location
SEVEN HOTEL & APARTMENT @ THE PALM JUMEIRA	BUILDING - POST TENSIONING	CONTRACTOR	AIRLINK BUILDING CONTRACTING LLC	DUBAI, UAE
		DEVELOPER	SEVEN TIDES INTERNATIONAL	
		CONSULTANT	CONIN	
DEIRA MALL	BUILDING - POST TENSIONING	CONTRACTOR	UNITED ENGINEERING CONSTRUCTION COMPANY LLC	DUBAI, UAE
		DEVELOPER	NAKHEEL	
		CONSULTANT	TED JACOB ENGINEERING GROUP	
STELLA MARIS DUBAI MARINA RESIDENTIAL BUILDING	BUILDING - POST TENSIONING	CONTRACTOR	GENERAL CONSTRUCTION COMPANY LLC	DUBAI, UAE
		DEVELOPER	SCOPE INVESTMENT LLC	
		CONSULTANT	LACASA ARCHITECTS & ENGINEERING CONSULTANTS	
FIRE & SAFETY STRUCTURE	BUILDING - PRECAST	CONTRACTOR	AL NASR CONTRACTING COMPANY LLC	ABU DHABI, UAE
		DEVELOPER	MUBADALA	
		CONSULTANT	OBERMEYER MIDDLE EAST GmBH	
CHERRYWOOD TOWNHOUSE	BUILDING - PRECAST	CONTRACTOR	AL MOOSA AND SONS CONTRACTING	DUBAI, UAE
		DEVELOPER	MERAAS	
		CONSULTANT	BEST CONSULTING ENGINEERS	
AL MINA RESIDENCE AT BARR	BUILDING - PRECAST	CONTRACTOR	ABU HATIM CO. LLC	OMAN
		DEVELOPER	BARR AL JISSAH RESORT CO, S.A.O.C	
		CONSULTANT	QUAD DESIGN	
MBR-DUBAI HILLS VILLAS	BUILDING - POST TENSIONING	CONTRACTOR	GINCO GENERAL CONTRACTING LLC	DUBAI, UAE
		DEVELOPER	DUBAI HILLS ESTATE	
		CONSULTANT	BHNS ENGINEERING CONSULTANTS	
SUNRISE ENGLISH PRIVATE SCHOOL	BUILDING - PRECAST	CONTRACTOR	INTERNATIONAL CONSTRUCTION CONT COMPANY	DUBAI, UAE
		DEVELOPER	DEPARTMENT OF EDUCATION AND KNOWLEDGE	
		CONSULTANT	FIRAS ENGINEERING CONSULTANTS	
DRAGON CITY COMPLEX	BUILDING - PRECAST	CONTRACTOR	AL MOOSA AND SONS CONTRACTING	DUBAI, UAE
		DEVELOPER	INTERNATIONAL CITY	
		CONSULTANT	DAR-AL-HANDASAH CONSULTANT	
DEWA HQ AL SHERA	BUILDING - POST TENSIONING	CONTRACTOR	GHANTOOT GROUP	ABU DHABI, UAE
		DEVELOPER	DUBAI ELECTRICITY & WATER AUTHORITY (DEWA)	
		CONSULTANT	ATKINS	
GC TERMINAL-1 INFRASTRUCTURE WORKS	INFRA STRUCTURE	CONTRACTOR	SAIF BIN DARWISH CO LLC	ABU DHABI, UAE
		DEVELOPER	ABU DHABI PORTS AUTHORITY	
		CONSULTANT	SAIF BIN DARWISH CO LLC	
RIYADH CITY SOUTH PHASE-1 INFRASTRUCTURE WORK(IN3)	INFRA STRUCTURE	CONTRACTOR	NAEL & BIN HARMAL HYDROEXPORT LLC (NBHH)	ABU DHABI, UAE
		DEVELOPER	ABU DHABI HOUSING AUTHORITY/ALDAR PROP PJSC	
		CONSULTANT	MOTT MAC DONALD LTD	
	RAILWAY - PRECAST	CONTRACTOR	AL MERAIKHI	ABU DHABI, UAE
		DEVELOPER	ETIHAD RAILWAYS	
		CONSULTANT	JACOBS	
	BUILDING - POST TENSIONING	CONTRACTOR	CHINA STATE CONSTRUCTION ENGINEERING	DUBAI, UAE
		DEVELOPER	EMAAR	
		CONSULTANT	ARCH GROUP	
	BUILDING - POST TENSIONING	CONTRACTOR	SHAPOORJI PALANJI MIDEAST / FREYSSINET	DUBAI, UAE
		DEVELOPER	EMAAR	
		CONSULTANT	WSP, CANADA	
	BUILDING - PRECAST	CONTRACTOR	AL BASTI MUKTHA LLC	DUBAI, UAE
		DEVELOPER	DUBAI CREEK HARBOUR/ EMAAR	
		CONSULTANT	ATK ENGINEERINGCONSULTANTS	
	INFRA STRUCTURE	CONTRACTOR	WADE ADAMS	DUBAI, UAE
		DEVELOPER	ROADS AND TRANSPORT AUTHORITY (RTA)	
		CONSULTANT	CDM SMITH Inc	
	INFRA STRUCTURE	CONTRACTOR	GULF CONTRACTORS COMPANY LLC	ABU DHABI, UAE
		DEVELOPER	AL JUBAIL ISLAND INVESTMENT	
		CONSULTANT	PARSONS INTERNATIONAL LIMITED	
	INFRA STRUCTURE	CONTRACTOR	WADE ADAMS	DUBAI, UAE
		DEVELOPER	ROADS AND TRANSPORT AUTHORITY (RTA)	
		CONSULTANT	CDM SMITH Inc	

The Team

"Coming together is a beginning, staying together is progress, and working together is success."



GLOBAL PRESENCE OF ESSEN STEEL





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STEEL

WIRE & STRAND

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MADE IN ABU DHABI



دائرة التنمية الاقتصادية
DEPARTMENT OF ECONOMIC DEVELOPMENT