SEVEN WIRE PRESTRESSED STRAND
REFERENCES

- PCS 12.7mm 1860 N/mm² supplied for Marina Mosque in Dubai Marina
- PCS 15.7mm 1860 N/mm² supplied for Belval University (Luxembourg)
- PCS 12.7mm 1860N/mm² supplied for The opus (Dubai)
- PCS 15.7mm 1860 N/mm² supplied for La Marina des Portes Océanes, Casablanca, Maroc
- PCS 12.7mm 1860 N/mm² supplied for Marita Mosque in Dubai Marina
- PCS 12.7mm 1860 N/mm² supplied for Leaf Tower in Abu Dhabi

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COMPANY PROFILE

Maklada is part of a Stunas Group, leader in steel industries in mediterranean area. Stunas Group includes a total of 13 companies, manufacturing 200.000 Mt of steel from sandwich panels, structures, modular buildings, wires, ropes, strands,... up to consulting services and real state. Maklada produces more than 100.000 Mt of drawn steel wires and has a worldwide customer portfolio among 35 countries.

Since its creation in 1984, with the Cooperation and Technical Assistance of Suzuki Metal Industry Japan, Maklada has reinforced its technical skills through benchmarkings with leading steel companies Arcelor Mittal, Lucchinni, Tatasteel,... and equipped our plants with the highest end technology and first class supplies for our Production Lines and Laboratories.

Our philosophy is to develop products according to our customers expectations and facilities, and to look after Excellence in Product Performance through our collaborations with Universities, Quality Organizations, Specialists, ....

Backed by 30 years of experience and his know-how, Maklada is specialized in the manufacturing of High Carbon Steel Wires and Strands according to international standards and / or client’s specifications. Today, we continue investing in Technology, in R and D for new products, in environment protection and in customer service.

MODERN TECHNOLOGIES

Our plants are equipped with modern machinery and we are still heavily investing in new equipements and technologies in collaboration with worldwide leading companies and consultants. Our aim is to maintain high quality standard at all levels.
SEVEN WIRE PRESTRESSED STRAND

OUR GEOGRAPHIC LOCATION

Our ideal geographic location, on the Mediterranean Sea, offers us the possibility to reach most of destination at competitive transport costs.

We've supplied PC Strands to USA, Europe, Middle East, .... Worldwide reputed firms as Freyssinet, CCL, Consolis, Suncoast,.... have relied on us for their Projects.

Our new offices in Europe, Morocco and UAE allow us to be closer to our customers improving the level of service and reaction capability. Moreover, Maklada is offering just in time deliveries worldwide through specialized local partners to secure our customers satisfaction.

MAKLADA GOES GREEN

Maklada engages in environmental protection and energy management. Our new production site generates its own energy, with a full tri-generation plant, and is reducing also chemicals emissions by adding a mechanical shot blasting system for raw material cleaning.

A REPUTATION FOR QUALITY SINCE 1984

Maklada has a performing quality system allowing to control all its manufacturing process. The company is ISO 9001 : 2008 certified by TÜV and obtained the award of the presidential quality in 2010. The company is ISO9001 : 2008 certified by TÜV and by UK CARES.

Our range of steel strands (7 wires) for the prestressed concrete is certified in compliance with the standards BS 5896 and ASTM A416. The technical characteristics were checked and verified by the Dubai Central Laboratory (DCL). The technical characteristics were checked by DCL and by UK CARES.

The prestressed armatures of our steel strands are certified in compliance with the technical specifications of ASQPE.

Our factories are equipped with PC Strand machines, chemical and mechanical cleaning installations, stress relieving lines to get all kind of relaxation (normal, low and very low), conditioning and wrapping shop, and a complete laboratory equipped with the most updated technology for mechanical and chemical tests (including relaxation test).

The properties of the strands are controlled during all stages of manufacturing according to a detailed quality control plan.
# References

<table>
<thead>
<tr>
<th>Project</th>
<th>Company</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marina Mosque, Dubai</td>
<td>FREYSSINET</td>
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<tr>
<td>Contractor: Modern Executive Systems Contracting LLC</td>
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<td>Consultant: Access Engineering Consultant</td>
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<td>Pi Staff Accommodation, Abu Dhabi</td>
<td>FREYSSINET</td>
<td>UAE</td>
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<tr>
<td>Constructor: SK Contracting</td>
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<tr>
<td>Consultant: Engineering Consultant Groupe (ECG)</td>
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<td>New York University - B Blocks Works, Abu Dhabi</td>
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<td>Constructor: Al Futtaim Carillion</td>
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<td>Belval University - Luxembourg</td>
<td>FREYSSINET</td>
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<td>Various Prestasters, through MEGASTEEL</td>
<td>UK</td>
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<td>Various Housing Projects</td>
<td>Suncoast, Builders Postension, Ready Cables, through WESTCO</td>
<td>USA</td>
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<td>Various Housing Projects</td>
<td>CCL</td>
<td>USA</td>
</tr>
<tr>
<td>La Marina des Portes Océanes</td>
<td>CCL</td>
<td>Maroc</td>
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</table>

PCS 12.7mm & 9.3mm 1860 N/mm² supplied for various projects in Abu Dhabi, Dubai, USA, UK.

PCS 12.7mm & 1860 N/mm² supplied for New York University, Abu Dhabi.

PCS 12.7mm & 1860 N/mm² supplied for CULTURAL VILLAGE, Culture Village.

PCS 12.7mm & 1860 N/mm² supplied for SPORT CITY (DUBAI).
SEVEN WIRE PRESTRESSED STRAND

Application: 7 wires Prestressed Concrete Strand is used in pre-tensioned and post-tensioned prestressed concrete construction such as Bridges, Ground Anchors, Buildings, Water Tanks, Hollow Cores, Railway Sleepers,…

Standards: These steel strands are produced in conformity with more reputed standards:
- ASTMA416, BS5896 certified by Dubai Central Laboratory (DCL),
- EN 10138-3,
- ASTMA779,
- ISO 6934,
- UNE 36094,
- Clients’s specifications.

Relaxation: Low relaxation strand with maximum relaxations losses of 2.5% after 1000 hours under initial load 70% of actual breaking load.

MANUFACTURING PROCESS

1- Wire Rod Cleaning & Pre-coating:
All wire rod (raw material) must be de-scaled to remove the mill scale (iron oxides) present on the steel surface. This descaling process can be done chemically or mechanically using shotblasting line. After the mill scale has been removed, the wire rod is then coated with a textured carrier coating that promotes lubricant adherence during the subsequent wire drawing process. The most commonly used carrier coating is Zinc Phosphate but other coatings are sometimes used (borax, lime, etc…).

2- Drawing:
The wire rod is drawn through a series of normally 9 dies to achieve the desired mechanical properties. This is a cold-working process; therefore the wire drawing practices are tightly controlled to prevent premature die wear or damage to the steel wire. After the wire drawing process, the wire tensile strength increases in 50% due to work hardening.

3- Stranding:
Once seven (7) spools of wire are produced, six (6) outer wires and one (1) center wire, they are loaded into the stranding machine. The stranding machine pulls the wire off of the spools while maintaining a specified rate of stranding. This rate controls the lay of the strand to comply with standards.

4- Stabilization:
After the wires have been wound into strand, the strand is subjected to a thermo-mechanical process in which the strand is continuously heated to ~380°C +/- 25°C while under tension at ~40-50% of the minimum ultimate tensile strength of the strand. This process acts to relieve the residual wire drawing stresses, permanently elongate the strand, increase the yield strength and reduce relaxation losses. This combination of factors gives the strand a very consistent modulus of elasticity up to and exceeding 80% of the strand’s ultimate strength.

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SEVEN WIRE PRESTRESSED STRAND

**TECHNICAL DATA AND PRODUCTION RANGE**

**ASTM A416M : 2012**

Low relaxation

<table>
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<tr>
<th>GRADE</th>
<th>250 (1720)</th>
<th>370 (1800)</th>
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<tr>
<td></td>
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<tr>
<td>Normal Diameter</td>
<td>7.90</td>
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**BS5896 : 2012**

Relaxation Class 2

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</table>

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

<table>
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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

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Diameter: 7.90 ± 0.40
Nominal Diameter: 7.74
Tensile Strength per mm²: 112
Minimum Breaking Load: 874,7 ± 2
Cross-sectional Area: 294
Elong.: 112
Charact. value of maximum force: 183,0
CURVATIVE STRAND:
Max. bow height = 25mm / 1meter

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Steel number: Y1770S7
Diameter: 15.00
Tensile Strength: 1860
Cross-sectional Area: 180
Minimum Breaking Load: 1086 ± 2
Cross-sectional Area: 259
Elong.: 239
Charact. value of maximum force: 228,0
CURVATIVE STRAND:
Max. bow height = 25mm / 1meter
Each coil is secured with 8 steel straps and wrapped with propylene sheets and outer shrink plastic. It’s marked with 2 water resistant tags having following information: Work Order, Diameter, Standard, Grade, Weight.

Other wrappings are also possible. Strands can be supplied oiled under request.

In Option:
- on pallet skyward
- on pallet eye horizontal

Sizes:

<table>
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<tr>
<th>Width w</th>
<th>750 mm</th>
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<tbody>
<tr>
<td>Inner diameter d</td>
<td>800 mm</td>
</tr>
<tr>
<td>Outer diameter D</td>
<td>1500 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>4000 Kgs Max.</td>
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</table>