

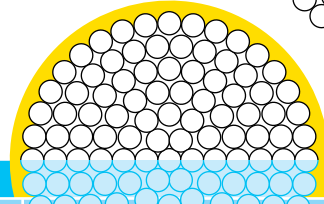
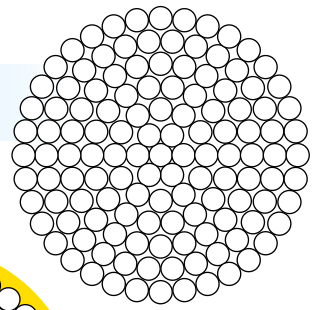
# *Special wire ropes*

*Off shore selection*



# 30 YEARS LIFE PERMANENT MOORING

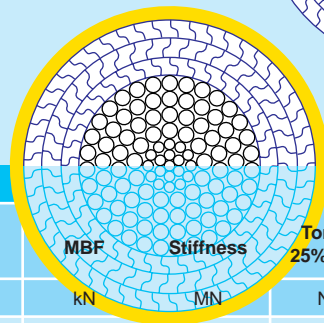
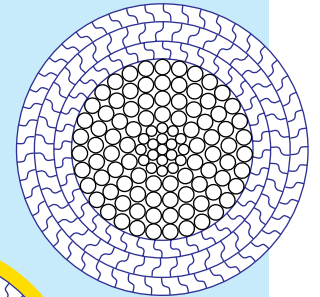
- Construction: spiral strand
- Designed to improve service life
- Surface finish: hot dip galvanized
- Sheathing: HDPE yellow color with longitudinal dark stripe
- Tensile grades of wire optimized to improve wire ductility
- Rope size, mass and MBF may be customized according to project design requirements
- Supply includes: Quality plan - Fatigue design calculations  
Wear design calculation - Corrosion design calculation



## SPIRAL ROPES

| Wire rope diameter |          | Mass (unsheathed) |           | Mass (sheathed) |           | Metallic Area   | MBF   | Stiffness | Torque 25% MBF | Turns 25% MBF |
|--------------------|----------|-------------------|-----------|-----------------|-----------|-----------------|-------|-----------|----------------|---------------|
| Uncoated           | Sheathed | Air               | Sea water | Air             | Sea water |                 |       |           |                |               |
| mm                 | mm       | kg/m              | kg/m      | kg/m            | kg/m      | mm <sup>2</sup> | kN    | MN        | Nm             | deg/m         |
| 77                 | 91       | 29                | 25        | 32              | 25        | 3440            | 5480  | 525       | 750            | 0.5           |
| 83                 | 99       | 34                | 29        | 37              | 29        | 4000            | 6370  | 610       | 950            | 0.5           |
| 89                 | 105      | 39                | 33        | 42              | 33        | 4600            | 7330  | 700       | 1200           | 0.4           |
| 96                 | 114      | 46                | 38        | 49              | 38        | 5350            | 8530  | 820       | 1500           | 0.4           |
| 102                | 122      | 51                | 43        | 55              | 43        | 6040            | 9360  | 925       | 1750           | 0.4           |
| 108                | 128      | 58                | 49        | 61              | 48        | 6770            | 10490 | 1035      | 2100           | 0.4           |
| 115                | 137      | 65                | 55        | 69              | 54        | 7680            | 11760 | 1175      | 2500           | 0.3           |
| 121                | 145      | 72                | 61        | 76              | 60        | 8500            | 12720 | 1300      | 2850           | 0.3           |
| 127                | 151      | 80                | 67        | 84              | 66        | 9370            | 13930 | 1435      | 3300           | 0.3           |
| 134                | 160      | 89                | 75        | 93              | 73        | 10430           | 15510 | 1595      | 3850           | 0.3           |
| 140                | 168      | 97                | 82        | 101             | 79        | 11390           | 16930 | 1740      | 4400           | 0.3           |
| 147                | 175      | 107               | 90        | 112             | 88        | 12550           | 18660 | 1920      | 5100           | 0.3           |

- Construction: lock coil spiral strand
- Designed to: reduce overall size, improve breaking force, wear and corrosion resistance
- Surface finish: hot dip galvanized
- Sheathing: HDPE yellow color with longitudinal dark stripe
- Tensile grades of wire optimized to improve wire ductility
- Rope size, mass and MBF may be customized according to project design requirements
- Supply includes: Quality plan - Fatigue design calculations  
Wear design calculation - Corrosion design calculation

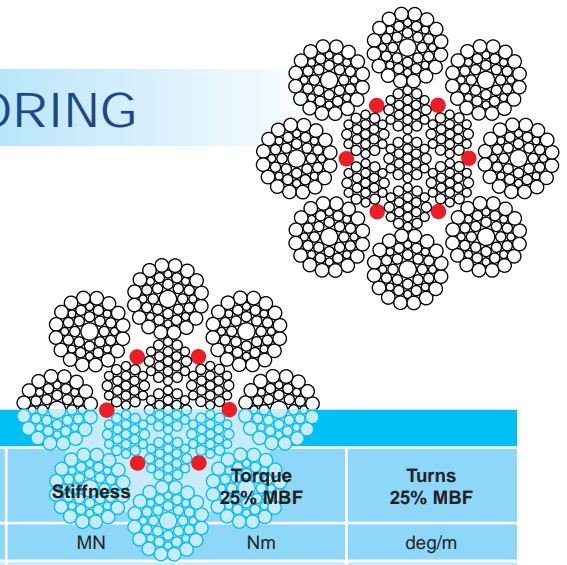


## LOCKED COIL ROPES

| Wire rope diameter |          | Mass (unsheathed) |           | Mass (sheathed) |           | Metallic Area   | MBF   | Stiffness | Torque 25% MBF | Turns 25% MBF |
|--------------------|----------|-------------------|-----------|-----------------|-----------|-----------------|-------|-----------|----------------|---------------|
| Uncoated           | Sheathed | Air               | Sea water | Air             | Sea water |                 |       |           |                |               |
| mm                 | mm       | kg/m              | kg/m      | kg/m            | kg/m      | mm <sup>2</sup> | kN    | MN        | Nm             | deg/m         |
| 77                 | 91       | 30                | 25        | 32              | 26        | 3580            | 5670  | 555       | 800            | 0.4           |
| 83                 | 99       | 37                | 31        | 40              | 32        | 4450            | 7000  | 685       | 1050           | 0.4           |
| 89                 | 105      | 43                | 36        | 46              | 37        | 5150            | 8050  | 795       | 1300           | 0.3           |
| 96                 | 114      | 48                | 41        | 52              | 41        | 5850            | 9140  | 905       | 1600           | 0.3           |
| 102                | 122      | 54                | 45        | 57              | 46        | 6500            | 9930  | 1005      | 1900           | 0.3           |
| 108                | 128      | 62                | 52        | 66              | 53        | 7500            | 11390 | 1160      | 2300           | 0.3           |
| 115                | 137      | 70                | 59        | 74              | 59        | 8450            | 12760 | 1305      | 2750           | 0.3           |
| 121                | 145      | 79                | 66        | 83              | 66        | 9500            | 14100 | 1470      | 3200           | 0.2           |
| 127                | 151      | 86                | 73        | 90              | 72        | 10400           | 15440 | 1610      | 3650           | 0.2           |
| 134                | 160      | 95                | 80        | 99              | 79        | 11430           | 16790 | 1770      | 4200           | 0.2           |
| 140                | 168      | 106               | 89        | 110             | 88        | 12750           | 18510 | 1975      | 4850           | 0.2           |
| 147                | 175      | 116               | 98        | 121             | 97        | 14000           | 20320 | 2170      | 5600           | 0.2           |

# 10 YEARS LIFE PERMANENT MOORING

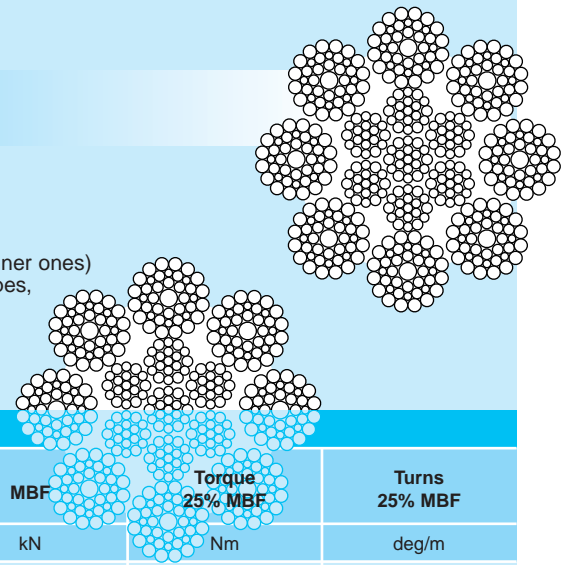
- Construction: 8x41WS-IWRC (6x19W-1x19W) + zinc anodes
- Surface finish: hot dip galvanized
- Designed to improve service life in comparison with 6-strands ropes
- Improved flexibility
- Reduced external wear
- Rope size, mass and MBF may be customized according to project design requirements
- Supply includes: Quality plan - Fatigue design calculations  
Wear design calculation - Corrosion design calculation



| Wire rope diameter | Mass |           | Metallic Area   | MBF   | Stiffness | Torque 25% MBF | Turns 25% MBF |
|--------------------|------|-----------|-----------------|-------|-----------|----------------|---------------|
|                    | Air  | Sea water |                 |       |           |                |               |
| mm                 | kg/m | kg/m      | mm <sup>2</sup> | kN    | MN        | Nm             | deg/m         |
| 77                 | 27   | 22        | 3040            | 4000  | 335       | 6650           | 17            |
| 83                 | 31   | 26        | 3540            | 4640  | 390       | 8350           | 16            |
| 89                 | 35   | 30        | 4070            | 5340  | 450       | 10300          | 14            |
| 96                 | 41   | 35        | 4730            | 6220  | 525       | 12900          | 13            |
| 102                | 47   | 39        | 5340            | 7020  | 595       | 15500          | 13            |
| 108                | 52   | 44        | 5990            | 7870  | 665       | 18400          | 12            |
| 115                | 59   | 50        | 6790            | 8920  | 755       | 22200          | 11            |
| 121                | 66   | 55        | 7520            | 9880  | 835       | 25850          | 11            |
| 127                | 72   | 61        | 8290            | 10880 | 920       | 29900          | 10            |

# WORK BARGE ANCHOR WIRES

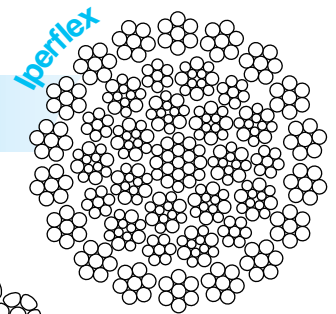
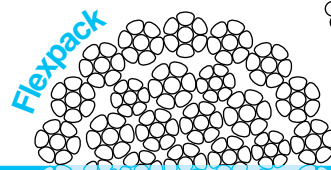
- Construction: 8x41WS-IWRC (6x19W-1x19W)
- Surface finish: bright
- Relative flexibility index: 1.55 times that of 6x36WS-IWRC construction
- Wire tensile: optimize to improve wire ductility (ext. wires of lower tensile grade than inner ones)
- Designed to improve service life in comparison with standard 6-strands high grade ropes, increasing flexibility and reducing external pressure
- Rope size, mass and MBF may be customized according to project design requirements



| Wire rope diameter | Mass |           | Metallic Area   | MBF  | Torque 25% MBF | Turns 25% MBF |
|--------------------|------|-----------|-----------------|------|----------------|---------------|
|                    | Air  | Sea water |                 |      |                |               |
| mm                 | kg/m | kg/m      | mm <sup>2</sup> | kN   | Nm             | deg/m         |
| 51                 | 12   | 10        | 1330            | 1880 | 2050           | 25            |
| 58                 | 15   | 13        | 1720            | 2420 | 3000           | 22            |
| 64                 | 18   | 15        | 2100            | 2930 | 4050           | 20            |
| 70                 | 22   | 18        | 2510            | 3490 | 5250           | 18            |
| 77                 | 26   | 22        | 3040            | 4200 | 7000           | 17            |
| 83                 | 31   | 26        | 3540            | 4870 | 8750           | 16            |
| 89                 | 35   | 30        | 4070            | 5600 | 10750          | 14            |
| 96                 | 41   | 35        | 4730            | 6480 | 13450          | 13            |
| 102                | 46   | 39        | 5340            | 7240 | 15950          | 13            |
| 108                | 52   | 44        | 5990            | 7960 | 18600          | 12            |
| 115                | 59   | 50        | 6790            | 8980 | 22350          | 11            |
| 121                | 65   | 55        | 7520            | 9880 | 25900          | 11            |

# NON ROTATING WIRE ROPES

- Construction: non rotating
- Use: winch riser wires, towing wires, off-shore deploy winch wires
- Designed to improve breaking force and minimise torque and rotation
- Tensile grades of wires optimized to improve wire ductility
- Rope size, mass and MBF may be customized according to project design requirements



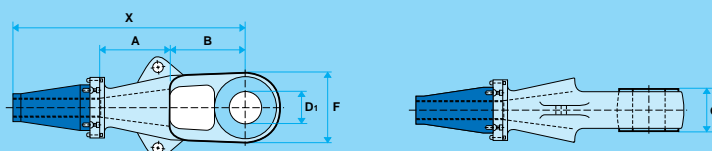
| Wire rope diameter | FLEXPACK |           |                 |      |                |               | IPERFLEX |           |                 |      |                |               |
|--------------------|----------|-----------|-----------------|------|----------------|---------------|----------|-----------|-----------------|------|----------------|---------------|
|                    | Mass     |           | Metallic Area   | MBF  | Torque 25% MBF | Turns 25% MBF | Mass     |           | Metallic Area   | MBF  | Torque 25% MBF | Turns 25% MBF |
|                    | Air      | Sea water |                 |      |                |               | Air      | Sea water |                 |      |                |               |
| mm                 | kg/m     | kg/m      | mm <sup>2</sup> | kN   | Nm             | deg/m         | kg/m     | kg/m      | mm <sup>2</sup> | kN   | Nm             | deg/m         |
| 51                 | 13       | 11        | 1460            | 2270 | 430            | 2.0           | 11       | 10        | 1260            | 1580 | 300            | 1.6           |
| 58                 | 16       | 14        | 1890            | 2930 | 630            | 1.7           | 15       | 12        | 1630            | 2040 | 440            | 1.4           |
| 64                 | 20       | 17        | 2300            | 3570 | 850            | 1.6           | 18       | 15        | 1990            | 2490 | 590            | 1.3           |
| 70                 | 24       | 20        | 2760            | 4280 | 1120           | 1.4           | 22       | 18        | 2380            | 2970 | 780            | 1.1           |
| 77                 | 29       | 24        | 3340            | 5170 | 1490           | 1.3           | 26       | 22        | 2880            | 3600 | 1040           | 1.0           |
| 83                 | 34       | 28        | 3880            | 6010 | 1870           | 1.2           | 30       | 26        | 3350            | 4180 | 1300           | 1.0           |
| 89                 | 39       | 33        | 4460            | 6920 | 2300           | 1.1           | 35       | 29        | 3850            | 4810 | 1600           | 0.9           |
| 96                 |          |           |                 |      |                |               | 41       | 34        | 4480            | 5600 | 2010           | 0.8           |
| 102                |          |           |                 |      |                |               | 46       | 39        | 5060            | 6320 | 2410           | 0.8           |
| 108                |          |           |                 |      |                |               | 51       | 43        | 5670            | 7090 | 2870           | 0.7           |
| 115                |          |           |                 |      |                |               | 58       | 49        | 6430            | 8040 | 3460           | 0.7           |

# CLOSED SPELTER SOCKETS

- Material: cast steel
- Surface: galvanized
- Use: permanent mooring systems
- Final design can be made after FEM-calculations for fatigue lifetime and other requirements.
- An anode for cathodic protection can be intergrated
- Isolators between the socket and the connection are available
- Bending stiffener to avoid rope sharp bending during reeling and deployment



| NR  | MBF  |       | A   | B   | D <sub>1</sub> | F   | G   | X    |
|-----|------|-------|-----|-----|----------------|-----|-----|------|
|     | tons | kN    |     |     |                |     |     |      |
| 428 | 650  | 6400  | 360 | 375 | 150            | 350 | 150 | 1110 |
| 430 | 820  | 8000  | 400 | 410 | 175            | 380 | 170 | 1250 |
| 431 | 1000 | 9800  | 425 | 450 | 205            | 400 | 200 | 1400 |
| 433 | 1200 | 11800 | 500 | 500 | 230            | 500 | 210 | 1570 |
| 440 | 1500 | 14700 | 580 | 570 | 260            | 600 | 225 | 1800 |
| 445 | 1700 | 16700 | 625 | 630 | 300            | 680 | 240 | 1940 |
| 450 | 1900 | 18600 | 700 | 700 | 325            | 725 | 275 | 2150 |



Technical data by DE HAAN

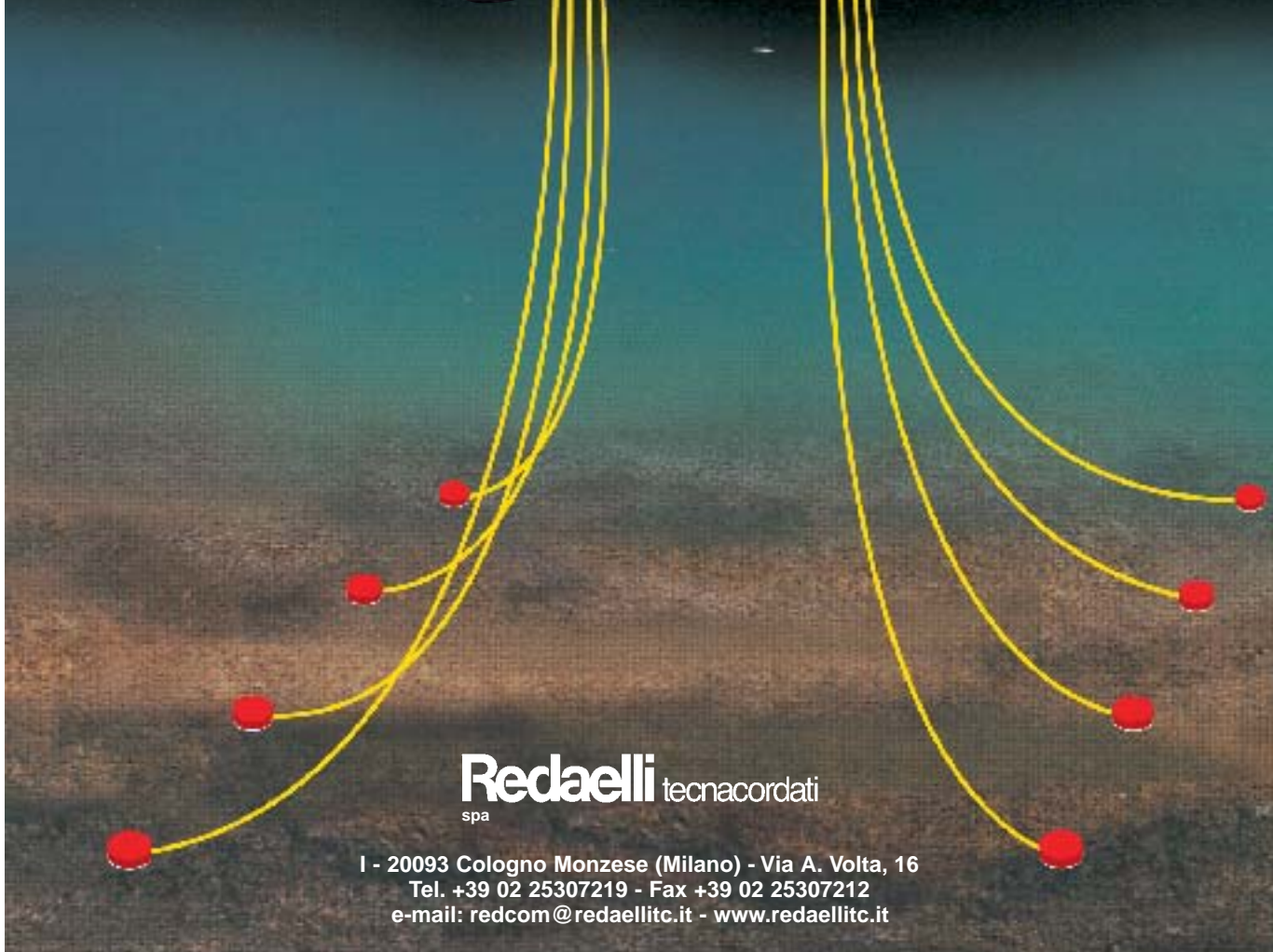
**S**ince the second half of the 19<sup>th</sup> Century Redaelli has promoted wire rope development and its application.

With this background, our continued investment in upgrading production facilities and processes alongside total commitment to technical development, we are now recognised as a market leader in the production of specialised wire ropes to meet the increasing demands of off-shore operations.

The wire rope systems for high service life mooring lines, represent the very pinnacle of our production and applied technology.

They are designed (mainly to DNV 2.5) to maximise resistance to breaking, wear and corrosion and customized in terms of stiffness and mass to grant the optimum dynamic performance of the complete mooring system.





**Redaelli** tecnacordati  
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