

# BlueDock®

connector

18" TO 42"



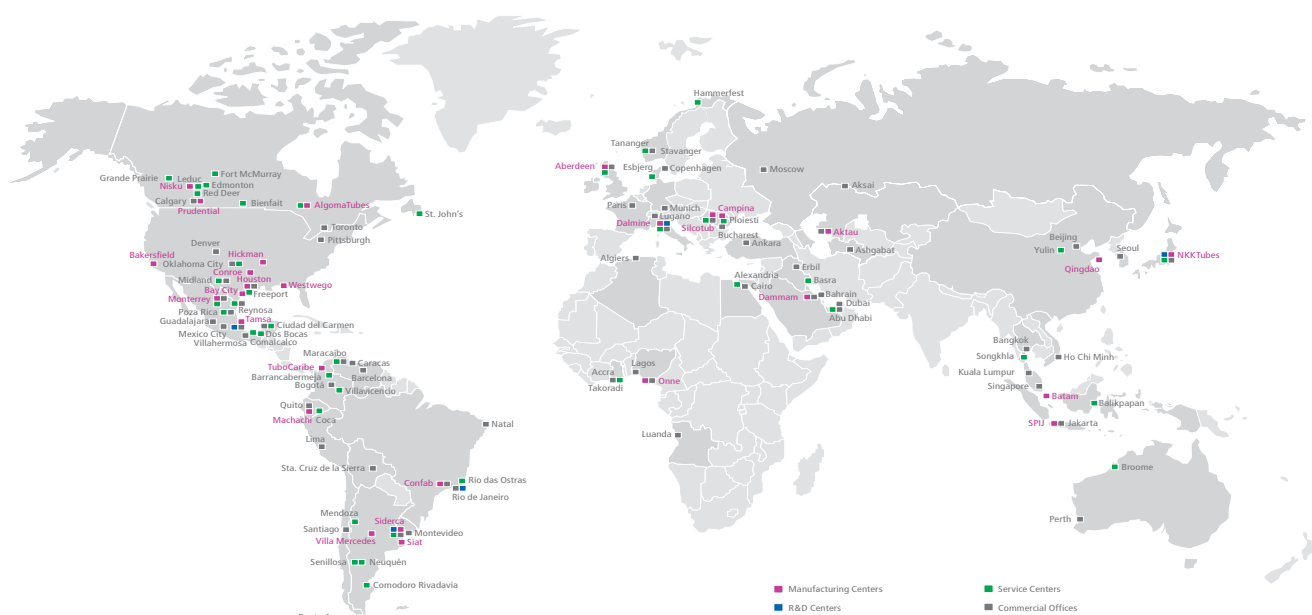


# TenarisHydril

TenarisHydril offers outstanding premium connection design and technology worldwide. With a comprehensive range of high performance products backed by an extensive global field service network and licensed threading shops, we develop solutions to meet the needs of ever more demanding E&P environments.

TenarisHydril premium connections are supplied and supported by Tenaris, the leading manufacturer and supplier of steel tubes and integrated tubular services to the world's energy industry.

For further information please visit our website at [www.tenaris.com](http://www.tenaris.com).



# Premium efficiency Integrated expertise



The TenarisHydril BlueDock® connector incorporates design concepts from the extensively tested TenarisHydril Blue® Series premium connections and provides reliable performance in the most complex ultra-deepwater operations.

This product has undergone sealability tests based on API RP 5C5 standard, and has been successfully used by major oil and gas operators working in extremely demanding environments.

The TenarisHydril BlueDock® connector is an integrated solution based on Tenaris's experience in pipe manufacturing, premium connection design and welding technology. The company manufactures the pipe and the connector under the same quality management system and can supply it as part of a more extensive casing and tubing package for offshore wells.

This complete solution is backed by Tenaris's global service network providing technical assistance, product testing, pipe management and technical support in the field.

# General product description

## FEATURES

- Proprietary hooked thread profile design provides fully reliable structural capacity under extreme loads and extra fatigue resistance.
- The multiple start and low TPI thread design with self-alignment guides allows fast, trouble-free make-up, requiring only 3/4 of a turn to final make-up.
- Double shoulder provides more than 100% compression efficiency, high over-torque capacity and enhanced fatigue response.
- Dope pockets to avoid excess dope pressure.
- Primary seal: metal-to-metal or pre-installed elastomeric seal.
- Optional sea water exclusion seal.
- Up to three anti-rotational keys.
- Box lifting shoulder suitable for conventional elevators.
- Make-up visual indicator.
- Internal or external flush configuration.
- Driving installation capacity verified by full scale testing.
- Full Fatigue option, manufactured with state-of-the-art technologies to optimize fatigue service, supported by extensive full-scale testing.

## APPLICATIONS

- **HP/HT & Deep Wells**
- **Deepwater**
- **Shallow Water**
- **Conductor and surface casing**

## BENEFITS

- Easy and safe stabbing, minimized cross-threading risk.
- High sealability performance – gas and water sealability verified by full-scale testing at 95% pipe body VME according to the forthcoming revision of API RP 5C5 CAL I.
- 100% ratings in tension, compression and bending.
- High fatigue performance under bending and/or tension-compression cycling loads, given by maximized radii and avoidance of stress-risers.
- Minimized risk of dope overpressure.
- Minimized risk of back-off.
- High over-torque capacity.

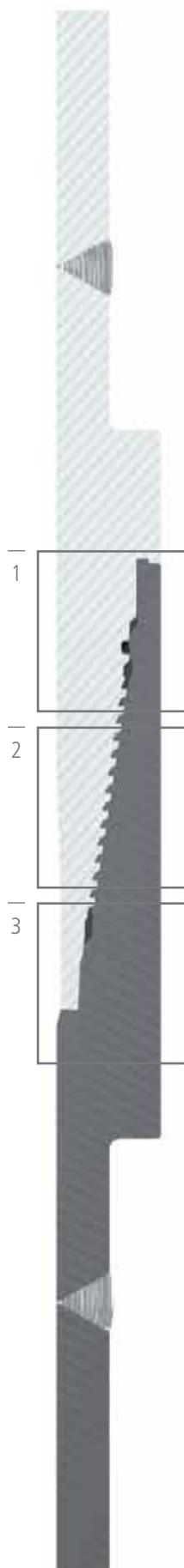
| BLUEDOCK® PRODUCT FAMILY SCOPE |                      |                   |                                         |
|--------------------------------|----------------------|-------------------|-----------------------------------------|
| OUTSIDE DIAMETER               | PRIMARY SEAL*        |                   | OPTIONAL SEA WATER EXCLUSION SEAL (SWS) |
|                                | METAL-TO-METAL (MTM) | ELASTOMERIC (ELS) |                                         |
| 18                             | ●                    | ●                 | ●                                       |
| 20                             | ●                    | ●                 | ●                                       |
| 22                             | ●                    | ●                 | ●                                       |
| 24                             | ●                    | ●                 | ●                                       |
| 26                             |                      | ●                 | ●                                       |
| 28                             |                      | ●                 | ●                                       |
| 30                             |                      | ●                 | ●                                       |
| 32                             |                      | ●                 | ●                                       |
| 36                             |                      | ●                 | ●                                       |
| 38                             |                      | ●                 | ●                                       |
| 42                             |                      | ●                 | ●                                       |

● AVAILABLE

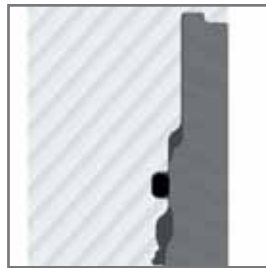
Specific size availability can be found in Technical Data Table on page 16.

\* Primary seal options: either metal-to-metal or elastomeric.

# Key features



1



- Double shoulder provides more than 100% compression efficiency, high over-torque capacity and enhanced fatigue response.
- Optional sea water exclusion seal.

2



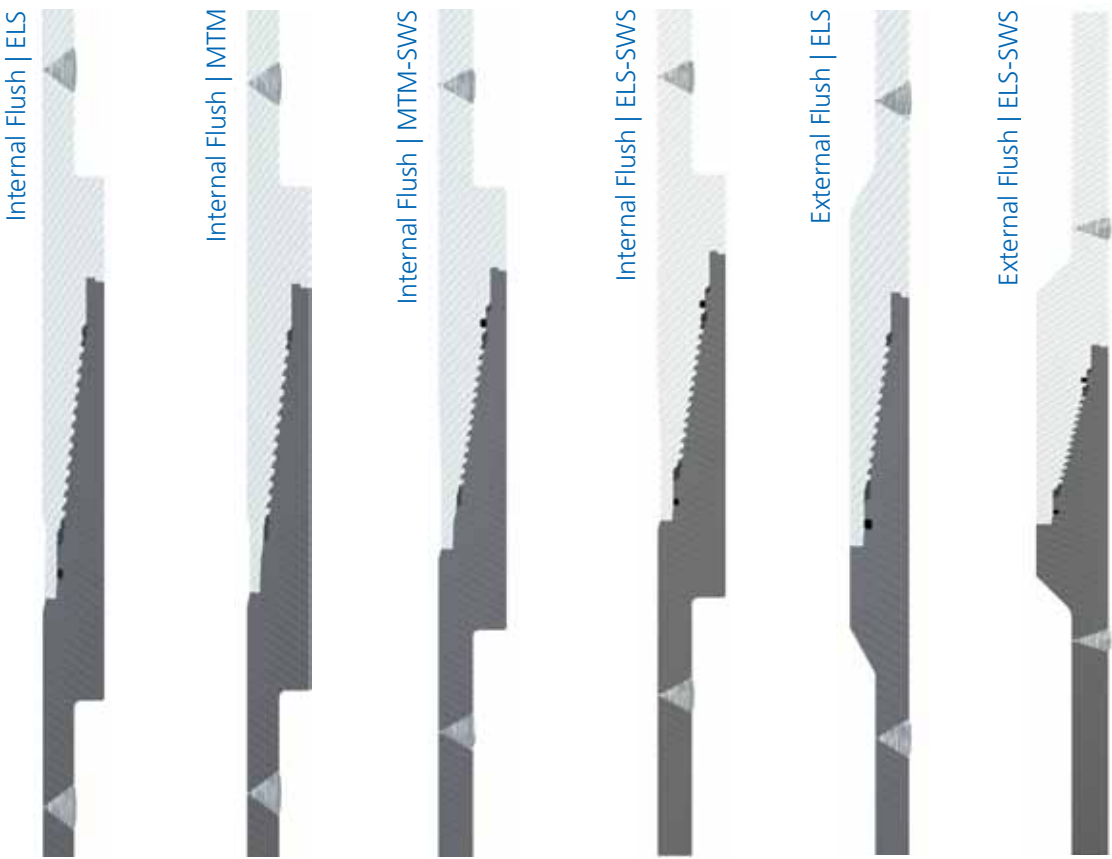
- Proprietary hooked thread profile design provides fully reliable structural capacity under extreme loads and extra fatigue resistance.
- High thread taper makes stabbing deeper and easier.

3

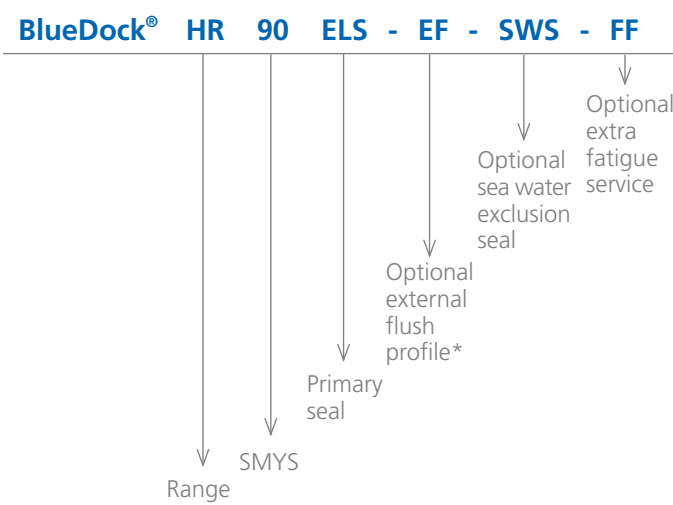


- The multiple start and low TPI thread design with self-alignment guides allows fast, trouble-free make-up, requiring only 3/4 of a turn to final make-up.
- Metal-to-metal seal in sizes up to 24" or pre-installed elastomeric seal in sizes from 18" to 42".

# Typical profile options



## BlueDock® connector nomenclature



Example of BlueDock® connector naming.  
\* Standard design presents an internal flush configuration.  
The external flush option needs to be specified if requested.

| CONCEPT                             | ACRONYM | MEANING                                 |
|-------------------------------------|---------|-----------------------------------------|
| Wall Thickness Range                | HR      | High Range                              |
|                                     | LR      | Low Range                               |
| Connector SMYS                      | 70      | 70 ksi Specified Minimum Yield Strength |
|                                     | 90      | 90 ksi Specified Minimum Yield Strength |
| Primary Seal                        | MTM     | Metal-to-Metal                          |
|                                     | ELS     | Elastomeric                             |
| Geometry (optional)                 | EF      | External Flush                          |
| Sea Water Exclusion Seal (optional) | SWS     | Sea Water Exclusion Seal                |
| Extra Fatigue Service (optional)    | FF      | Full Fatigue                            |

# Qualified for complex operations

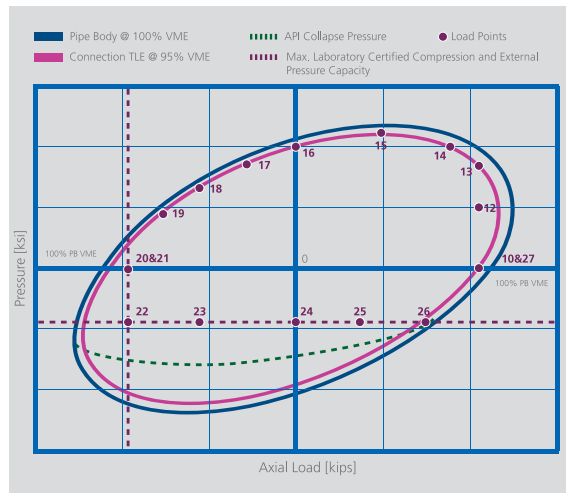
The TenarisHydril BlueDock® connector design is based on state-of-the-art techniques in numerical simulation as well as Tenaris's extensive knowledge in premium connection technology.

Its design relies on the extensively tested TenarisHydril Blue® Series and is fully optimized by finite element analysis (FEA). It is also verified through an extensive full-scale testing program (FST) performed in internal and external laboratories on several sizes of the product family.

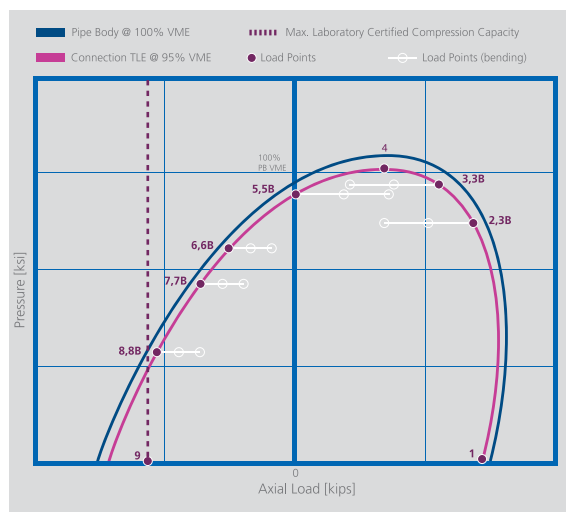
The BlueDock® connector has undergone sealability tests at 95% pipe body VME based on the forthcoming revision of the API RP 5C5 standard. The gas sealability of surface casings is tested according to the forthcoming revision of the API RP 5C5 CAL I protocol. The water sealability and structural capacity of conductor casings are tested according to the Series B of the same standard.

Tenaris assesses carefully the fatigue performance of threaded connectors in order to provide proper data for the design stage of the well. The fatigue resistance of the BlueDock® connector is expressed then, through an S-N curve obtained from full scale resonant fatigue tests at Tenaris own and external labs. The company performs a fatigue testing program for its connectors, in which the product is subjected to different load levels (stress range). Statistical analysis of the obtained data is performed to calculate a stress factor (SF) from the DNV C203 B1 Design curve used as reference. A special option manufactured with state-of-the-art technologies to optimize fatigue service, supported by extensive full-scale testing is also available.

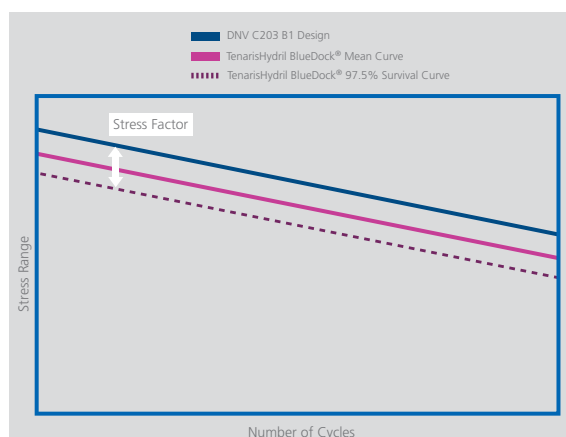
To validate the connector design in the most challenging deepwater environments today, Tenaris also conducted offshore rig tests in partnership with major oil and gas companies. Furthermore, BlueDock® connectors have already been installed offshore by several major oil and gas operators.



EXAMPLE OF  
TLE FOR SERIES  
A TEST ON  
BLUEDOCK®  
HR 90 MTM 22"  
X 1.125" WT  
API 5L X70, AS  
PART OF THE  
API RP 5C5 CAL I  
QUALIFICATION.



EXAMPLE OF  
TLE FOR SERIES  
B TEST ON  
BLUEDOCK®  
LR 70 ELS 30"  
X 1.000" WT  
API 5L X65, IN  
ACCORDANCE  
WITH API RP 5C5  
STANDARD.



EXAMPLE OF  
S-N CURVE FOR  
AN SPECIFIC  
CONNECTOR  
SIZE.

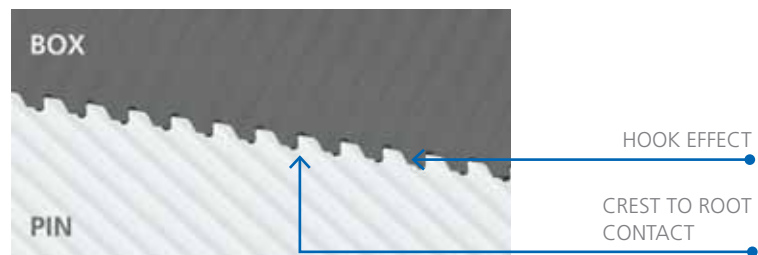
# Robust connection design

## THREAD PROFILE

The BlueDock® connector has a fully reliable structural capacity given by the crest-to-root hooked thread type. Its fast thread taper and high stabbing flank angle ensure deep and easy stabbing, while its multiple thread start provides fast and reliable make-up.

The low TPI design, which offers robust threads, minimizes the cross-threading risk. The final make-up position is achieved with 3/4 of a turn (1/2 to hand-tight + 1/4 power-tight).

The BlueDock® connector offers excellent galling resistance and high fatigue performance, with no stress risers on flank to root transitions.



## DOUBLE SHOULDER

The connector's double shoulder configuration ensures more than 100% pipe body compression efficiency and high over-torque capacity, as well as improved fatigue life performance.

The internal shoulder's negative angle contributes to seal energization. Its stress relaxation groove provides improved fatigue performance.

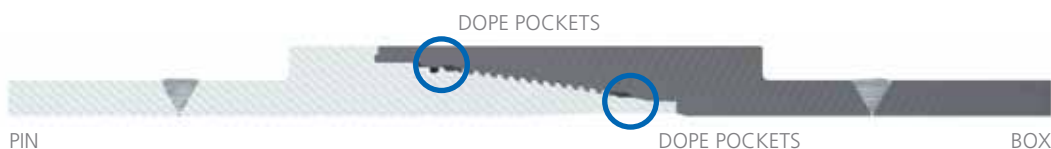
The external shoulder has a visual reference to ensure complete and aligned make-up. It is dimensioned to minimize handling damages.



## DOPE POCKETS

The BlueDock® connector comes with double dope pockets specially designed to allocate the excess of thread compounds while maintaining the connector's efficiency and performance.

The dope pockets profiles, based on TenarisHydril Blue® technology, are designed to provide optimized fatigue life.

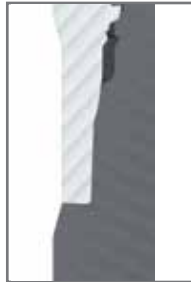


# Advanced sealing options

## PRIMARY METAL-TO-METAL SEAL | 18" TO 24"

The BlueDock® connector has a primary metal-to-metal seal with a sphere-to-cone geometry based on the Blue® Series technology, that provides a smooth seal sliding and a reliable parabolic contact pressure profile.

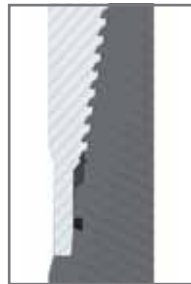
It offers excellent galling resistance and it has an extremely low sensitivity to axial displacement, maintaining the sealability under extreme combined loads.



## PRIMARY ELASTOMERIC SEAL | 18" TO 42"

For applications that do not require MTM sealability, the BlueDock® connector has a primary seal option of elastomeric ring that covers the whole product size range.

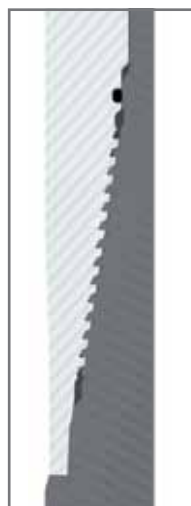
The finite element analysis (FEA) technique was applied to optimize the elastomeric seal groove dimensioning and positioning. The safe O-Ring retention during handling, cleaning and make-and-break operations is ensured by the dovetailed groove profile. The box O-Ring is pre-installed at the mill.



## OPTIONAL SEA WATER EXCLUSION SEAL | 18" TO 42"

Tenaris has developed an elastomeric external seal option for offshore applications. The external seal is a barrier that prevents sea water from entering the thread and affecting the connector's fatigue performance.

As in the primary elastomeric seal, finite element analysis (FEA) was used to optimize the seal design. The pin O-Ring is pre-installed at the mill.



# Secure installation

## SELF-ALIGNMENT GUIDES

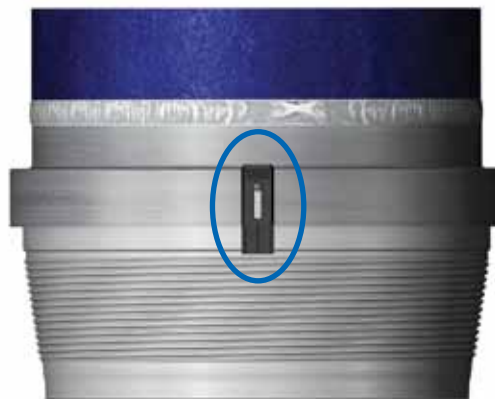
The internal and external guides provide self-alignment of the pin and box members during stabbing, avoiding the possibility of cross-threading.

## ANTI-ROTATIONAL KEYS

Each BlueDock® connector can come with up to three anti-rotational keys. This safe and easy-to-operate device provides extra assurance against accidental back-offs increasing significantly the break-out torque. This increment was verified by ad-hoc testing, reaching approximately a value of 200% of applied make-up torque for surface casing and 300% for conductor casing sizes in the case of two anti-rotational keys installed.

The anti-rotational keys are pre-installed at Tenaris mills and housed, bolted and retained into a groove, to prevent losing parts. This design of anti-rotational keys shows no sensitivity to axial loads or the typical external shoulder opening under high tensile loads.

This device was designed to operate with multiple activations without the need to use special tools.

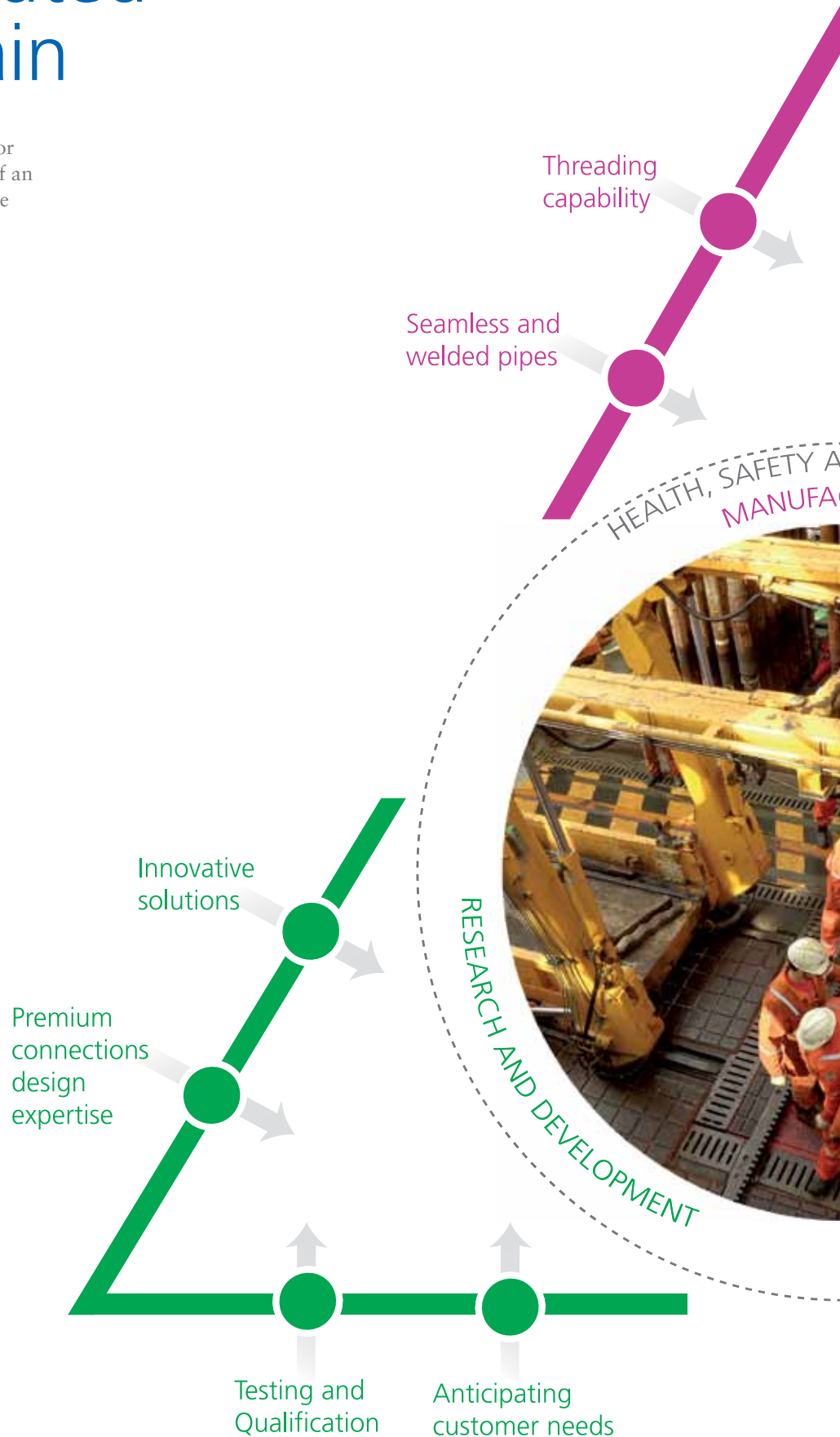


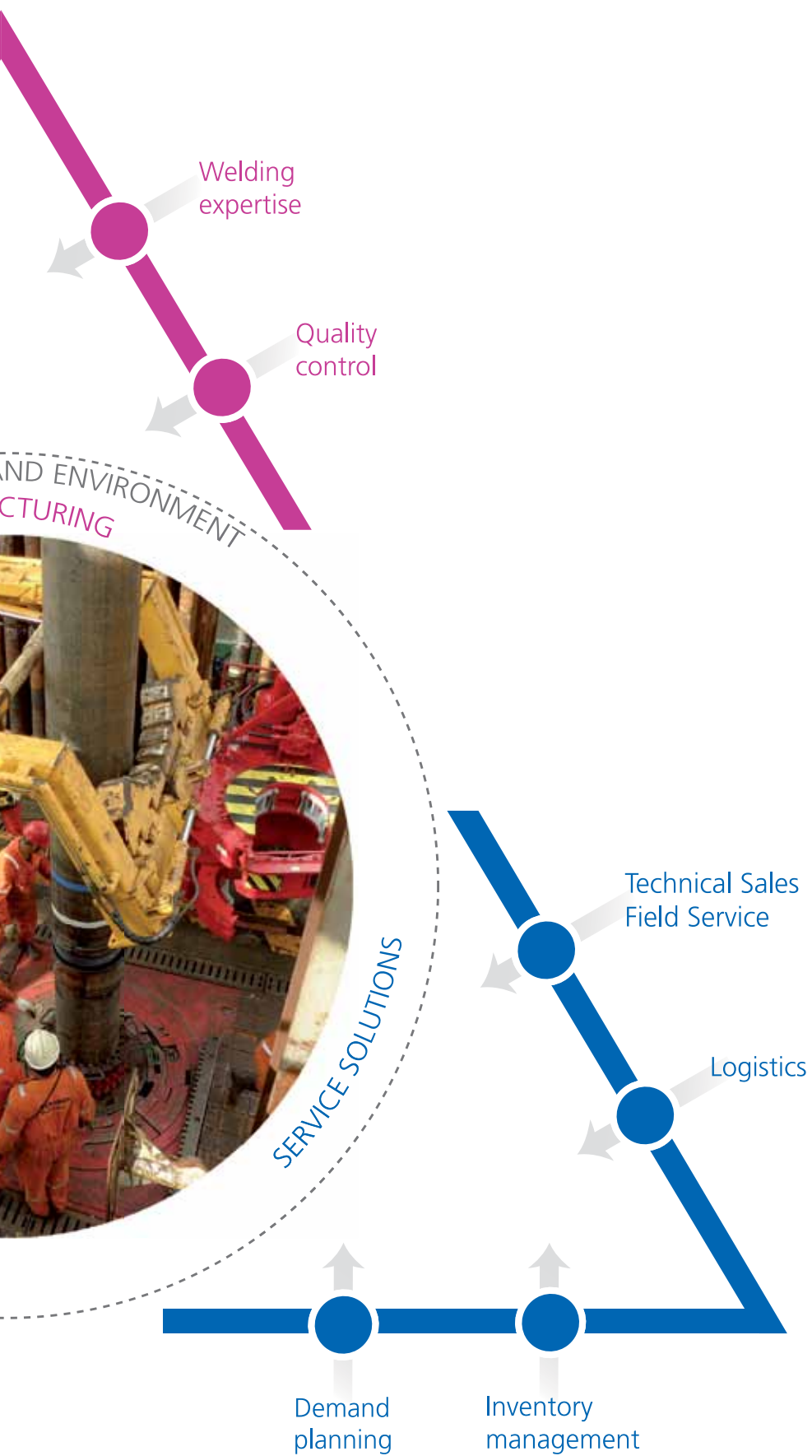
## LIFTING – INTERNAL FLUSH

The connector's integral lifting shoulder on the box side is compatible with side-door and single-joint elevators.

# An efficient and integrated supply chain

The TenarisHydril BlueDock® connector is manufactured and supplied as part of an integrated supply package using a single quality management system.







# Technical Data Table for BlueDock<sup>®</sup> connector

# Technical Data Table | 18" TO 30"

| DESIGNATION |                |                | PIPE BODY Geometry |           |                  | CONNECTOR Geometry |          |              |              |                  |        |
|-------------|----------------|----------------|--------------------|-----------|------------------|--------------------|----------|--------------|--------------|------------------|--------|
| SIZE (OD)   | WALL THICKNESS | CONNECTOR TYPE | Nominal ID         | API Drift | Plain End Weight | Regular OD         | Joint ID | Total Length | Make-up Loss | Threads per inch | Weight |
| [in.]       | [in.]          |                | [in.]              | [in.]     | [ft.lb]          | [in.]              | [in.]    | [in.]        | [in.]        |                  | [lb.]  |
| 18          | 0.500          | LR             | 17.000             | 16.813    | 93.5             | 20.000             | 16.750   | 17.383       | 7.341        | 3                | 370    |
|             | 0.625          | LR             | 16.750             | 16.563    | 116.1            | 20.000             | 16.750   | 17.383       | 7.341        | 3                | 391    |
|             | 0.688          | LR             | 16.624             | 16.437    | 127.3            | 20.000             | 16.624   | 17.383       | 7.341        | 3                | 402    |
|             | 0.750          | LR             | 16.500             | 16.313    | 138.3            | 20.000             | 16.500   | 17.383       | 7.341        | 3                | 412    |
|             | 0.812          | LR             | 16.376             | 16.188    | 149.2            | 20.000             | 16.376   | 17.383       | 7.341        | 3                | 423    |
|             | 0.875          | LR             | 16.250             | 16.063    | 160.2            | 20.000             | 16.250   | 17.383       | 7.341        | 3                | 434    |
| 20          | 0.438          | LR             | 19.124             | 18.937    | 91.6             | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 364    |
|             | 0.468          | LR             | 19.064             | 18.877    | 97.7             | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 366    |
|             | 0.500          | LR             | 19.000             | 18.813    | 104.2            | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 367    |
|             | 0.625          | LR             | 18.750             | 18.563    | 129.4            | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 374    |
|             | 0.688          | LR             | 18.624             | 18.437    | 142.0            | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 377    |
|             | 0.750          | LR             | 18.500             | 18.313    | 154.3            | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 380    |
|             | 0.812          | LR             | 18.376             | 18.189    | 166.6            | 21.618             | 18.376   | 16.682       | 6.625        | 3                | 384    |
|             | 0.750          | HR             | 18.500             | 18.313    | 154.3            | 21.954             | 18.352   | 17.861       | 7.808        | 3                | 483    |
|             | 0.812          | HR             | 18.376             | 18.189    | 166.6            | 21.954             | 18.228   | 17.861       | 7.808        | 3                | 497    |
|             | 1.000          | HR             | 18.000             | 17.813    | 203.1            | 21.954             | 18.000   | 17.861       | 7.808        | 3                | 540    |
|             | 1.125          | HR             | 17.750             | 17.563    | 227.0            | 21.954             | 17.750   | 17.861       | 7.808        | 3                | 568    |
|             | 1.250          | HR             | 17.500             | 17.313    | 250.5            | 21.954             | 17.500   | 17.861       | 7.808        | 3                | 596    |
|             | 1.500          | HR             | 17.000             | 16.813    | 296.6            | 21.954             | 17.000   | 17.861       | 7.808        | 3                | 653    |
| 22          | 0.625          | LR             | 20.750             | 20.563    | 142.8            | 23.824             | 20.602   | 16.767       | 6.540        | 3                | 430    |
|             | 0.688          | LR             | 20.624             | 20.437    | 156.7            | 23.824             | 20.602   | 16.767       | 6.540        | 3                | 449    |
|             | 0.750          | LR             | 20.500             | 20.313    | 170.4            | 23.824             | 20.352   | 16.767       | 6.540        | 3                | 468    |
|             | 0.812          | LR             | 20.376             | 20.189    | 183.9            | 23.824             | 20.228   | 16.767       | 6.540        | 3                | 488    |
|             | 0.812          | HR             | 20.376             | 20.189    | 183.9            | 23.954             | 20.228   | 17.861       | 7.808        | 3                | 552    |
|             | 1.000          | HR             | 20.000             | 19.813    | 224.5            | 23.954             | 20.000   | 17.861       | 7.808        | 3                | 595    |
|             | 1.125          | HR             | 19.750             | 19.563    | 251.0            | 23.954             | 19.750   | 17.861       | 7.808        | 3                | 623    |
|             | 1.250          | HR             | 19.500             | 19.313    | 277.3            | 23.954             | 19.500   | 17.861       | 7.808        | 3                | 651    |
|             | 1.500          | HR             | 19.000             | 18.813    | 328.7            | 23.954             | 19.000   | 17.861       | 7.808        | 3                | 708    |
| 24          | 0.500          | LR             | 23.000             | 22.813    | 125.6            | 25.904             | 22.602   | 17.007       | 7.009        | 3                | 473    |
|             | 0.625          | LR             | 22.750             | 22.563    | 156.2            | 25.904             | 22.602   | 17.007       | 7.009        | 3                | 500    |
|             | 0.688          | LR             | 22.624             | 22.437    | 171.5            | 25.904             | 22.550   | 17.007       | 7.009        | 3                | 514    |
|             | 0.725          | LR             | 22.550             | 22.363    | 180.4            | 25.904             | 22.550   | 17.007       | 7.009        | 3                | 522    |
|             | 0.750          | LR             | 22.500             | 22.313    | 186.4            | 25.904             | 22.500   | 17.007       | 7.009        | 3                | 527    |
|             | 0.812          | LR             | 22.376             | 22.189    | 201.3            | 25.904             | 22.376   | 17.007       | 7.009        | 3                | 540    |
|             | 1.000          | LR             | 22.000             | 21.813    | 245.9            | 25.904             | 22.000   | 17.007       | 7.009        | 3                | 580    |
|             | 1.000          | HR             | 22.000             | 21.813    | 245.9            | 26.118             | 21.869   | 19.050       | 9.060        | 3                | 731    |
|             | 1.125          | HR             | 21.750             | 21.563    | 275.1            | 26.118             | 21.750   | 19.050       | 9.060        | 3                | 765    |
|             | 1.250          | HR             | 21.500             | 21.313    | 304.0            | 26.118             | 21.500   | 19.050       | 9.060        | 3                | 798    |
| 26          | 1.500          | HR             | 21.000             | 20.813    | 360.8            | 26.118             | 21.000   | 19.050       | 9.060        | 3                | 864    |
|             | 0.625          | LR             | 24.750             | 24.563    | 169.5            | 27.490             | 24.102   | 16.762       | 6.781        | 3                | 544    |
|             | 0.688          | LR             | 24.624             | 24.437    | 186.2            | 27.490             | 24.024   | 16.762       | 6.781        | 3                | 559    |
|             | 0.750          | LR             | 24.500             | 24.313    | 202.4            | 27.490             | 23.984   | 16.762       | 6.781        | 3                | 569    |
|             | 0.812          | LR             | 24.376             | 24.189    | 218.6            | 27.490             | 23.945   | 16.762       | 6.781        | 3                | 578    |
| 28          | 1.000          | LR             | 24.000             | 23.813    | 267.3            | 27.490             | 23.787   | 16.762       | 6.781        | 3                | 612    |
|             | 0.625          | LR             | 26.750             | 26.563    | 182.9            | 29.800             | 26.352   | 17.943       | 7.963        | 3                | 663    |
|             | 0.750          | LR             | 26.500             | 26.313    | 218.5            | 29.800             | 26.352   | 17.943       | 7.963        | 3                | 700    |
|             | 0.812          | LR             | 26.376             | 26.189    | 236.0            | 29.800             | 26.228   | 17.943       | 7.963        | 3                | 719    |
|             | 0.875          | LR             | 26.250             | 26.063    | 253.7            | 29.800             | 26.102   | 17.943       | 7.963        | 3                | 738    |
|             | 1.000          | LR             | 26.000             | 25.813    | 288.6            | 29.800             | 25.852   | 17.943       | 7.963        | 3                | 775    |
| 30          | 0.500          | LR             | 29.000             | 28.813    | 157.7            | 32.563             | 28.208   | 18.858       | 9.409        | 2                | 901    |
|             | 0.625          | LR             | 28.750             | 28.563    | 196.3            | 32.563             | 28.208   | 18.858       | 9.409        | 2                | 922    |
|             | 0.750          | LR             | 28.500             | 28.313    | 234.5            | 32.563             | 28.208   | 18.858       | 9.409        | 2                | 942    |
|             | 0.812          | LR             | 28.376             | 28.189    | 253.4            | 32.563             | 28.208   | 18.858       | 9.409        | 2                | 952    |
|             | 1.000          | LR             | 28.000             | 27.813    | 310.0            | 32.563             | 28.000   | 18.858       | 9.409        | 2                | 983    |
|             | 1.125          | HR             | 27.750             | 27.563    | 347.3            | 32.250             | 26.750   | 20.396       | 10.392       | 2                | 1279   |
|             | 1.250          | HR             | 27.500             | 27.313    | 384.2            | 32.250             | 26.750   | 20.396       | 10.392       | 2                | 1296   |
|             | 1.500          | HR             | 27.000             | 26.813    | 457.0            | 32.250             | 26.750   | 20.396       | 10.392       | 2                | 1313   |
|             | 1.750          | HR             | 26.500             | 26.313    | 528.5            | 32.250             | 26.500   | 20.396       | 10.392       | 2                | 1367   |
|             | 2.000          | HR             | 26.000             | 25.813    | 598.6            | 32.250             | 26.000   | 20.396       | 10.392       | 2                | 1614   |

Performance stated in this table is valid for MTM and ELS versions and SWS option.

Interchangeable when bracketed. Small variations in the connection Internal diameter will appear.

Sea Water Exclusion Seal (SWS) is an optional for all the family and some dimensions and weights may vary in some products.

Special products are also available (such as certain external flush OD's) or can be offered upon customer request.

| Tension/<br>Compression<br>Efficiency | Bending<br>Efficiency | External/<br>Internal<br>Pressure<br>Efficiency | Joint Yield Strength |      |       |        |       | Max. Allowable Bending |      |      |        |      |             |
|---------------------------------------|-----------------------|-------------------------------------------------|----------------------|------|-------|--------|-------|------------------------|------|------|--------|------|-------------|
|                                       |                       |                                                 | 70 ksi               |      |       | 90 ksi |       | 70 ksi                 |      |      | 90 ksi |      | → connector |
|                                       |                       |                                                 | X52                  | X56  | X65   | X70    | X80   | X52                    | X56  | X65  | X70    | X80  | → pipe      |
| %                                     | %                     | %                                               | x 1000 lb            |      |       |        |       | kip-ft                 |      |      |        |      |             |
| 100                                   | 100                   | 100                                             | 1435                 | 1556 | 1795  | 1932   | 2213  | 509                    | 552  | 637  | 686    | 785  |             |
| 100                                   | 100                   | 100                                             | 1781                 | 1931 | 2228  | 2398   | 2746  | 623                    | 676  | 779  | 839    | 961  |             |
| 100                                   | 100                   | 100                                             | 1953                 | 2118 | 2443  | 2630   | 3012  | 679                    | 736  | 849  | 914    | 1047 |             |
| 100                                   | 100                   | 100                                             | 2122                 | 2300 | 2654  | 2857   | 3272  | 732                    | 794  | 916  | 986    | 1129 |             |
| 100                                   | 100                   | 100                                             | 2289                 | 2482 | 2863  | 3082   | 3530  | 784                    | 850  | 981  | 1056   | 1210 |             |
| 100                                   | 100                   | 100                                             | 2457                 | 2664 | 3074  | 3309   | 3790  | 836                    | 907  | 1046 | 1126   | 1290 |             |
| 100                                   | 100                   | 100                                             | 1405                 | 1524 | 1758  | 1892   | 2167  | 560                    | 608  | 701  | 755    | 864  |             |
| 100                                   | 100                   | 100                                             | 1499                 | 1625 | 1875  | 2019   | 2312  | 596                    | 646  | 746  | 803    | 919  |             |
| 100                                   | 100                   | 100                                             | 1599                 | 1734 | 2000  | 2153   | 2466  | 634                    | 687  | 793  | 853    | 977  |             |
| 100                                   | 100                   | 100                                             | 1986                 | 2153 | 2484  | 2674   | 3062  | 777                    | 843  | 972  | 1047   | 1199 |             |
| 100                                   | 100                   | 100                                             | 2179                 | 2363 | 2726  | 2934   | 3360  | 848                    | 919  | 1060 | 1141   | 1307 |             |
| 100                                   | 100                   | 100                                             | 2368                 | 2567 | 2962  | 3189   | -     | 915                    | 992  | 1145 | 1233   | -    |             |
| 100                                   | 100                   | 100                                             | 2555                 | 2770 | -     | -      | -     | 982                    | 1064 | -    | -      | -    |             |
| 100                                   | 100                   | 100                                             | -                    | -    | -     | -      | 3651  | -                      | -    | -    | -      | 1412 |             |
| 100                                   | 100                   | 100                                             | -                    | -    | 3196  | 3441   | 3940  | -                      | -    | 1228 | 1322   | 1514 |             |
| 100                                   | 100                   | 100                                             | 3116                 | 3378 | 3898  | 4196   | 4805  | 1175                   | 1274 | 1470 | 1582   | 1812 |             |
| 100                                   | 100                   | 100                                             | 3482                 | 3776 | 4356  | 4690   | 5370  | 1297                   | 1406 | 1622 | 1747   | 2000 |             |
| 100                                   | 100                   | 100                                             | 3844                 | 4168 | 4808  | 5176   | -     | 1414                   | 1533 | 1769 | 1904   | -    |             |
| 100                                   | 100                   | 100                                             | 4551                 | 4934 | -     | -      | -     | 1633                   | 1771 | -    | -      | -    |             |
| 100                                   | 100                   | 100                                             | 2191                 | 2375 | 2741  | 2950   | 3379  | 949                    | 1029 | 1187 | 1278   | 1463 |             |
| 100                                   | 100                   | 100                                             | 2405                 | 2607 | 3008  | 3238   | 3708  | 1035                   | 1123 | 1295 | 1394   | 1597 |             |
| 100                                   | 100                   | 100                                             | 2614                 | 2834 | 3270  | 3520   | 4031  | 1119                   | 1213 | 1400 | 1507   | 1726 |             |
| 100                                   | 100                   | 100                                             | 2821                 | 3059 | 3529  | 3800   | -     | 1201                   | 1302 | 1503 | 1618   | -    |             |
| 100                                   | 100                   | 100                                             | -                    | -    | -     | -      | 4351  | -                      | -    | -    | -      | 1852 |             |
| 100                                   | 100                   | 100                                             | 3444                 | 3734 | 4308  | 4638   | 5311  | 1441                   | 1563 | 1803 | 1941   | 2223 |             |
| 100                                   | 100                   | 100                                             | 3851                 | 4176 | 4818  | 5187   | 5939  | 1594                   | 1728 | 1994 | 2147   | 2458 |             |
| 100                                   | 100                   | 100                                             | 4254                 | 4612 | 5321  | 5728   | 6560  | 1741                   | 1887 | 2177 | 2344   | 2684 |             |
| 100                                   | 100                   | 100                                             | 5043                 | 5468 | 6308  | -      | -     | 2018                   | 2188 | 2524 | -      | -    |             |
| 100                                   | 100                   | 100                                             | 1927                 | 2089 | 2410  | 2595   | 2972  | 924                    | 1002 | 1156 | 1245   | 1425 |             |
| 100                                   | 100                   | 100                                             | 2396                 | 2598 | 2997  | 3227   | 3695  | 1137                   | 1233 | 1423 | 1531   | 1754 |             |
| 100                                   | 100                   | 100                                             | 2630                 | 2852 | 3290  | 3542   | 4056  | 1242                   | 1347 | 1554 | 1672   | 1915 |             |
| 100                                   | 100                   | 100                                             | 2767                 | 3001 | 3462  | 3727   | 4267  | 1303                   | 1412 | 1629 | 1754   | 2009 |             |
| 100                                   | 100                   | 100                                             | 2860                 | 3101 | 3577  | 3851   | 4410  | 1343                   | 1456 | 1680 | 1809   | 2071 |             |
| 100                                   | 100                   | 100                                             | 3088                 | 3348 | 3863  | 4158   | 4762  | 1443                   | 1565 | 1805 | 1943   | 2225 |             |
| 100                                   | 100                   | 100                                             | 3772                 | 4090 | 4718  | 5080   | -     | 1735                   | 1882 | 2171 | 2337   | -    |             |
| 100                                   | 100                   | 100                                             | -                    | -    | -     | -      | 5817  | -                      | -    | -    | -      | 2676 |             |
| 100                                   | 100                   | 100                                             | 4220                 | 4576 | 5279  | 5684   | 6508  | 1922                   | 2084 | 2404 | 2588   | 2963 |             |
| 100                                   | 100                   | 100                                             | 4663                 | 5057 | 5834  | 6281   | 7192  | 2102                   | 2279 | 2629 | 2830   | 3241 |             |
| 100                                   | 100                   | 100                                             | 5535                 | 6001 | 6924  | 7454   | -     | 2443                   | 2649 | 3056 | 3290   | -    |             |
| 100                                   | 100                   | 100                                             | 2601                 | 2820 | 3253  | 3503   | 4011  | 1343                   | 1456 | 1680 | 1808   | 2071 |             |
| 100                                   | 100                   | 100                                             | 2856                 | 3097 | 3573  | 3846   | 4404  | 1467                   | 1591 | 1835 | 1976   | 2263 |             |
| 100                                   | 100                   | 100                                             | 3106                 | 3367 | 3885  | 4182   | 4789  | 1588                   | 1722 | 1986 | 2139   | 2449 |             |
| 100                                   | 100                   | 100                                             | 3354                 | 3637 | 4196  | 4517   | 5172  | 1707                   | 1851 | 2135 | 2299   | 2632 |             |
| 100                                   | 100                   | 100                                             | 4100                 | 4445 | 5129  | 5521   | -     | 2056                   | 2230 | 2573 | 2770   | -    |             |
| 100                                   | 100                   | 100                                             | 2806                 | 3042 | 3510  | 3779   | 4327  | 1565                   | 1697 | 1958 | 2108   | 2414 |             |
| 100                                   | 100                   | 100                                             | 3352                 | 3634 | 4193  | 4514   | 5169  | 1853                   | 2009 | 2318 | 2496   | 2858 |             |
| 100                                   | 100                   | 100                                             | 3620                 | 3926 | 4529  | 4876   | 5583  | 1993                   | 2161 | 2493 | 2684   | 3073 |             |
| 100                                   | 100                   | 100                                             | 3892                 | 4220 | 4869  | 5242   | 6002  | 2133                   | 2313 | 2668 | 2873   | 3289 |             |
| 100                                   | 100                   | 100                                             | 4428                 | 4801 | 5539  | 5963   | -     | 2405                   | 2608 | 3009 | 3239   | -    |             |
| 100                                   | 100                   | 100                                             | 2419                 | 2623 | 3026  | 3258   | 3730  | 1462                   | 1585 | 1829 | 1969   | 2255 |             |
| 100                                   | 100                   | 100                                             | 3011                 | 3265 | 3766  | 4055   | 4643  | 1805                   | 1957 | 2258 | 2431   | 2784 |             |
| 100                                   | 100                   | 100                                             | 3598                 | 3901 | 4500  | 4845   | 5548  | 2139                   | 2319 | 2676 | 2880   | 3298 |             |
| 100                                   | 100                   | 100                                             | 3887                 | 4214 | 4862  | 5234   | 5994  | 2301                   | 2495 | 2879 | 3099   | 3549 |             |
| 100                                   | 100                   | 100                                             | 4756                 | 5157 | 5949  | 6405   | 7334  | 2781                   | 3015 | 3479 | 3745   | 4288 |             |
| 100                                   | 100                   | 100                                             | 5327                 | 5776 | 6664  | 7174   | 8215  | 3089                   | 3350 | 3864 | 4160   | 4764 |             |
| 100                                   | 100                   | 100                                             | 5893                 | 6390 | 7372  | 7937   | 9089  | 3389                   | 3675 | 4240 | 4564   | 5227 |             |
| 100                                   | 100                   | 100                                             | 7011                 | 7602 | 8770  | 9442   | 10811 | 3965                   | 4300 | 4961 | 5340   | 6115 |             |
| 100                                   | 100                   | 100                                             | 8107                 | 8791 | 10142 | -      | -     | 4510                   | 4891 | 5642 | -      | -    |             |
| 100                                   | 100                   | 100                                             | 9148                 | 9852 | 11435 | -      | -     | 5006                   | 5391 | 6258 | -      | -    |             |

# Technical Data Table | 32 " TO 42 "

| DESIGNATION |                |                | PIPE BODY Geometry |           |                  | CONNECTOR Geometry |          |              |              |                  |        |
|-------------|----------------|----------------|--------------------|-----------|------------------|--------------------|----------|--------------|--------------|------------------|--------|
| SIZE (OD)   | WALL THICKNESS | CONNECTOR TYPE | Nominal ID         | API Drift | Plain End Weight | Regular OD         | Joint ID | Total Length | Make-up Loss | Threads per inch | Weight |
| [in.]       | [in.]          |                | [in.]              | [in.]     | [ft.lb]          | [in.]              | [in.]    | [in.]        | [in.]        |                  | [lb.]  |
| 32          | 0.500          | LR             | 31.000             | 30.813    | 168.4            | 34.562             | 30.352   | 18.246       | 8.762        | 2                | 876    |
|             | 0.625          | LR             | 30.750             | 30.563    | 209.6            | 34.562             | 30.352   | 18.246       | 8.762        | 2                | 904    |
|             | 0.750          | LR             | 30.500             | 30.313    | 250.5            | 34.562             | 30.352   | 18.246       | 8.762        | 2                | 932    |
|             | 0.812          | LR             | 30.376             | 30.189    | 270.7            | 34.562             | 30.352   | 18.246       | 8.762        | 2                | 946    |
|             | 0.877          | LR             | 30.246             | 30.059    | 291.8            | 34.562             | 30.246   | 18.246       | 8.762        | 2                | 961    |
|             | 0.983          | LR             | 30.034             | 29.847    | 325.9            | 34.562             | 30.034   | 18.246       | 8.762        | 2                | 985    |
|             | 1.000          | LR             | 30.000             | 29.813    | 331.4            | 34.562             | 30.000   | 18.246       | 8.762        | 2                | 989    |
| 36          | 0.625          | LR             | 34.750             | 34.563    | 236.3            | 37.250             | 32.191   | 20.717       | 9.756        | 2                | 1268   |
|             | 0.812          | LR             | 34.376             | 34.189    | 305.4            | 37.250             | 32.191   | 20.717       | 9.756        | 2                | 1299   |
|             | 1.000          | LR             | 34.000             | 33.813    | 374.2            | 37.250             | 32.191   | 20.717       | 9.756        | 2                | 1331   |
|             | 1.125          | LR             | 33.750             | 33.563    | 419.4            | 37.250             | 32.191   | 20.717       | 9.756        | 2                | 1352   |
|             | 1.250          | LR             | 33.500             | 33.313    | 464.3            | 37.250             | 32.191   | 20.717       | 9.756        | 2                | 1373   |
|             | 1.500          | LR             | 33.000             | 32.813    | 553.2            | 37.250             | 32.191   | 20.717       | 9.756        | 2                | 1414   |
|             | 1.500          | HR             | 33.000             | 32.813    | 553.2            | 37.250             | 30.708   | 24.408       | 13.033       | 2                | 2094   |
|             | 1.750          | HR             | 32.500             | 32.313    | 640.7            | 37.250             | 30.708   | 24.408       | 13.033       | 2                | 2135   |
|             | 2.000          | HR             | 32.000             | 31.813    | 726.9            | 37.250             | 30.708   | 24.408       | 13.033       | 2                | 2177   |
| 38          | 1.500          | HR             | 35.000             | 34.813    | 585.3            | 39.901             | 33.500   | 25.431       | 13.033       | 2                | 2244   |
|             | 1.750          | HR             | 34.500             | 34.313    | 678.1            | 39.901             | 33.500   | 25.431       | 13.033       | 2                | 2278   |
|             | 2.000          | HR             | 34.000             | 33.813    | 769.7            | 39.901             | 33.500   | 25.431       | 13.033       | 2                | 2312   |
| 42          | 0.500          | LR             | 41.000             | 40.813    | 221.8            | 43.630             | 39.500   | 19.482       | 7.447        | 2                | 1191   |
|             | 0.625          | LR             | 40.750             | 40.563    | 276.4            | 43.630             | 39.500   | 19.482       | 7.447        | 2                | 1204   |
|             | 0.812          | LR             | 40.376             | 40.189    | 357.5            | 43.630             | 39.500   | 19.482       | 7.447        | 2                | 1222   |
|             | 1.000          | LR             | 40.000             | 39.813    | 438.3            | 43.630             | 39.500   | 19.482       | 7.447        | 2                | 1241   |
|             | 1.125          | LR             | 39.750             | 39.563    | 491.6            | 43.630             | 39.500   | 19.482       | 7.447        | 2                | 1253   |
|             | 1.250          | LR             | 39.500             | 39.313    | 544.5            | 43.630             | 39.500   | 19.482       | 7.447        | 2                | 1265   |

Performance stated in this table is valid for MTM and ELS versions and SWS option.

Interchangeable when bracketed. Small variations in the connection Internal diameter will appear.

Sea Water Exclusion Seal (SWS) is an optional for all the family and some dimensions and weights may vary in some products.

Special products are also available (such as certain external flush OD's) or can be offered upon customer request.

| Tension/<br>Compression<br>Efficiency | Bending<br>Efficiency | External/<br>Internal<br>Pressure<br>Efficiency | Joint Yield Strength |       |       |        |       | Max. Allowable Bending |      |       |        |       |             |
|---------------------------------------|-----------------------|-------------------------------------------------|----------------------|-------|-------|--------|-------|------------------------|------|-------|--------|-------|-------------|
|                                       |                       |                                                 | 70 ksi               |       |       | 90 ksi |       | 70 ksi                 |      |       | 90 ksi |       | → connector |
|                                       |                       |                                                 | X52                  | X56   | X65   | X70    | X80   | X52                    | X56  | X65   | X70    | X80   | → pipe      |
| %                                     | %                     | %                                               | x 1000 lb            |       |       |        |       | kip-ft                 |      |       |        |       |             |
| 100                                   | 100                   | 100                                             | 2583                 | 2801  | 3231  | 3478   | 3983  | 1669                   | 1810 | 2088  | 2248   | 2574  |             |
| 100                                   | 100                   | 100                                             | 3216                 | 3487  | 4023  | 4331   | 4959  | 2062                   | 2236 | 2579  | 2777   | 3179  |             |
| 100                                   | 100                   | 100                                             | 3844                 | 4168  | 4808  | 5176   | 5927  | 2445                   | 2651 | 3059  | 3293   | 3771  |             |
| 100                                   | 100                   | 100                                             | 4153                 | 4503  | 5195  | 5593   | 6405  | 2632                   | 2854 | 3292  | 3544   | 4059  |             |
| 100                                   | 100                   | 100                                             | 4476                 | 4853  | 5599  | 6028   | 6903  | 2825                   | 3063 | 3534  | 3805   | 4357  |             |
| 100                                   | 100                   | 100                                             | 5000                 | 5422  | 6255  | 6734   | 7711  | 3135                   | 3399 | 3922  | 4222   | 4834  |             |
| 100                                   | 100                   | 100                                             | 5084                 | 5512  | 6360  | 6846   | -     | 3184                   | 3452 | 3983  | 4288   | -     |             |
| 100                                   | 100                   | 100                                             | 3626                 | 3931  | 4536  | 4883   | 5591  | 2627                   | 2848 | 3286  | 3537   | 4050  |             |
| 100                                   | 100                   | 100                                             | 4686                 | 5081  | 5862  | 6310   | 7226  | 3359                   | 3642 | 4202  | 4524   | 5181  |             |
| 100                                   | 100                   | 100                                             | 5740                 | 6223  | 7180  | 7730   | 8851  | 4072                   | 4416 | 5094  | 5484   | 6280  |             |
| 100                                   | 100                   | 100                                             | 6434                 | 6976  | 8049  | 8665   | 9922  | 4533                   | 4916 | 5671  | 6105   | 6991  |             |
| 100                                   | 100                   | 100                                             | 7123                 | 7724  | 8911  | 9593   | 10985 | 4984                   | 5405 | 6235  | 6713   | 7687  |             |
| 100                                   | 100                   | 100                                             | 8487                 | 9202  | -     | 11429  | -     | 5857                   | 6350 | -     | 7887   | -     |             |
| 100                                   | 100                   | 100                                             | -                    | -     | 10616 | -      | 13087 | -                      | -    | 7326  | -      | 9032  |             |
| 100                                   | 100                   | 100                                             | 9829                 | 10658 | 12296 | 13237  | 15158 | 6690                   | 7254 | 8369  | 9010   | 10317 |             |
| 100                                   | 100                   | 100                                             | 11151                | 12091 | 13950 | 15018  | 17197 | 7486                   | 8117 | 9365  | 10082  | 11544 |             |
| 100                                   | 100                   | 100                                             | 8979                 | 9735  | 11232 | 12092  | 13846 | 6569                   | 7123 | 8218  | 8847   | 10130 |             |
| 100                                   | 100                   | 100                                             | 10403                | 11280 | 13014 | 14010  | 16043 | 7512                   | 8145 | 9397  | 10117  | 11585 |             |
| 100                                   | 100                   | 100                                             | 11807                | 12803 | 14771 | 15901  | 18209 | 8415                   | 9125 | 10527 | 11333  | 12978 |             |
| 100                                   | 100                   | 100                                             | 3390                 | 3651  | 4237  | 4563   | 5215  | 2896                   | 3119 | 3620  | 3899   | 4456  |             |
| 100                                   | 100                   | 100                                             | 4224                 | 4549  | 5281  | 5687   | 6499  | 3588                   | 3864 | 4485  | 4830   | 5520  |             |
| 100                                   | 100                   | 100                                             | 5464                 | 5884  | 6830  | 7355   | 8406  | 4599                   | 4953 | 5749  | 6191   | 7076  |             |
| 100                                   | 100                   | 100                                             | 6698                 | 7213  | 8372  | 9016   | -     | 5588                   | 6018 | 6985  | 7523   | -     |             |
| 100                                   | 100                   | 100                                             | 7512                 | 8090  | 9390  | -      | -     | 6230                   | 6710 | 7788  | -      | -     |             |
| 100                                   | 100                   | 100                                             | 8321                 | 8961  | -     | -      | -     | 6861                   | 7388 | -     | -      | -     |             |



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