

### Pipe METRIC

|             |              |       |             |       |                                             | NEW           | API PREMIUM |
|-------------|--------------|-------|-------------|-------|---------------------------------------------|---------------|-------------|
| Pipe size   | <i>in</i>    | 4.500 | <i>mm</i>   | 114.3 | OD <i>mm</i>                                | <b>114.3</b>  | 109.9       |
| Pipe weight | <i>lb/ft</i> | 20.00 | <i>kg/m</i> | 29.76 | Thickness <i>mm</i>                         | <b>10.9</b>   | 8.7         |
| Upset Type  |              | IEU   |             |       | X-Sec Area <i>cm<sup>2</sup></i>            | <b>35.5</b>   | 27.8        |
| Tube grade  |              | S135  |             |       | Section Modulus <i>cm<sup>3</sup></i>       | <b>83.8</b>   | 65.2        |
| Range       |              | 2     |             |       | Polar Section Modulus <i>cm<sup>3</sup></i> | <b>167.7</b>  | 130.3       |
| Tube Yield  | <i>MPa</i>   | 931   |             |       | Tensile Yield <i>kdaN</i>                   | <b>330</b>    | 258         |
| ID          | <i>mm</i>    | 92.5  |             |       | Torsional Yield <i>N-m</i>                  | <b>90,000</b> | 70,000      |
|             |              |       |             |       | 80% Torsional Yield <i>N-m</i>              | <b>72,000</b> | 56,000      |
|             |              |       |             |       | Internal Pressure Yield <i>MPa</i>          | <b>155.8</b>  | 142.0       |
|             |              |       |             |       | Collapse Yield <i>MPa</i>                   | <b>160.6</b>  | 129.6       |
|             |              |       |             |       | D/t                                         | <b>10.47</b>  | 12.58       |
|             |              |       |             |       | Connection/Tube Torsional Ratio             | <b>0.533</b>  |             |

### Tool Joint METRIC

|                         |     |      |                        |                           | NEW   | REC MIN OD |        |
|-------------------------|-----|------|------------------------|---------------------------|-------|------------|--------|
| Connection Type         |     | DS40 | OD                     | mm                        | 133.4 | 123.8      |        |
| Material Yield Strength | MPa | 896  | Tensile Yield Strength | kdaN                      | 374   | 374        |        |
|                         | OD  | mm   | 133.4                  | Torsional Yield Strength  | N-m   | 48,000     | 35,500 |
|                         | ID  | mm   | 68.3                   | Recommended Makeup Torque | N-m   | 28,700     | 21,300 |
| Pin Shoulder Angle      |     | deg  | 18                     |                           |       |            |        |
| Pin Tool Joint Length   |     | mm   | 356                    |                           |       |            |        |
| Box Tool Joint Length   |     | mm   | 356                    |                           |       |            |        |

### Drill Pipe Assembly METRIC

|                          |             |       |
|--------------------------|-------------|-------|
| Shoulder-Shoulder Length | <i>m</i>    | 9.60  |
| Adjusted Weight          | <i>kg/m</i> | 32.89 |
| Closed End Displacement  | <i>L/m</i>  | 10.57 |
| Open End Displacement    | <i>L/m</i>  | 4.19  |
| Fluid Capacity           | <i>L/m</i>  | 6.37  |
| Drift Size               | <i>mm</i>   | 65.1  |

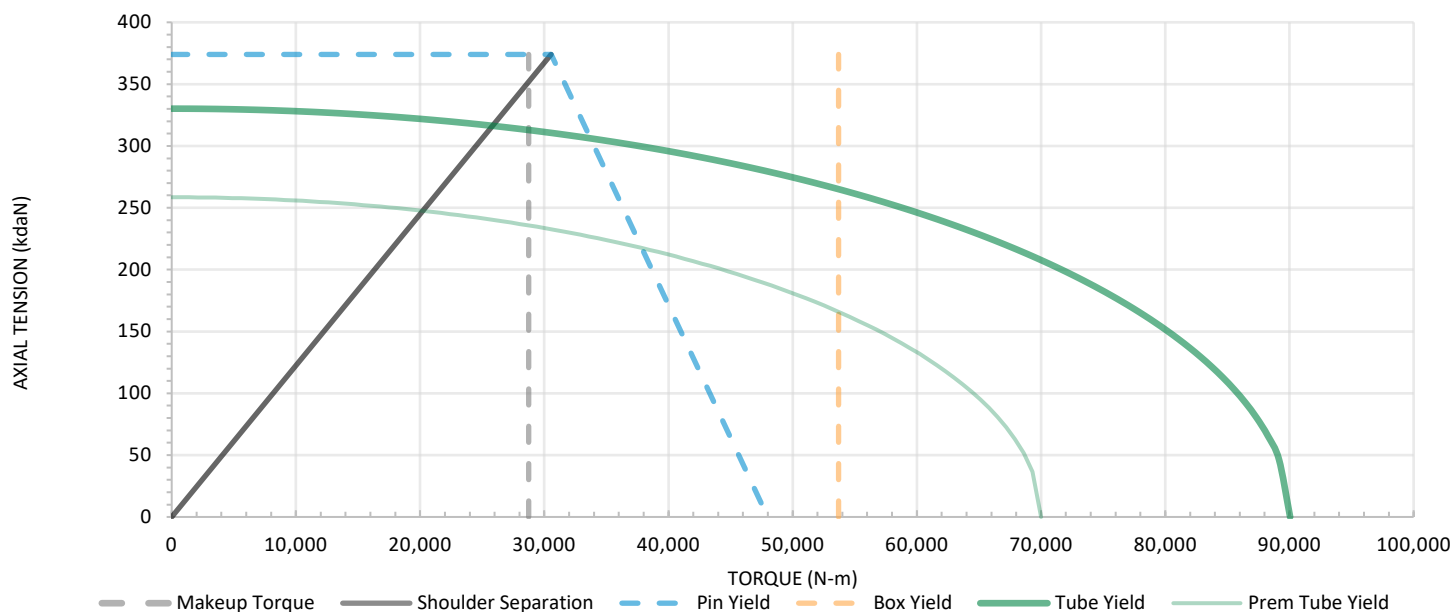
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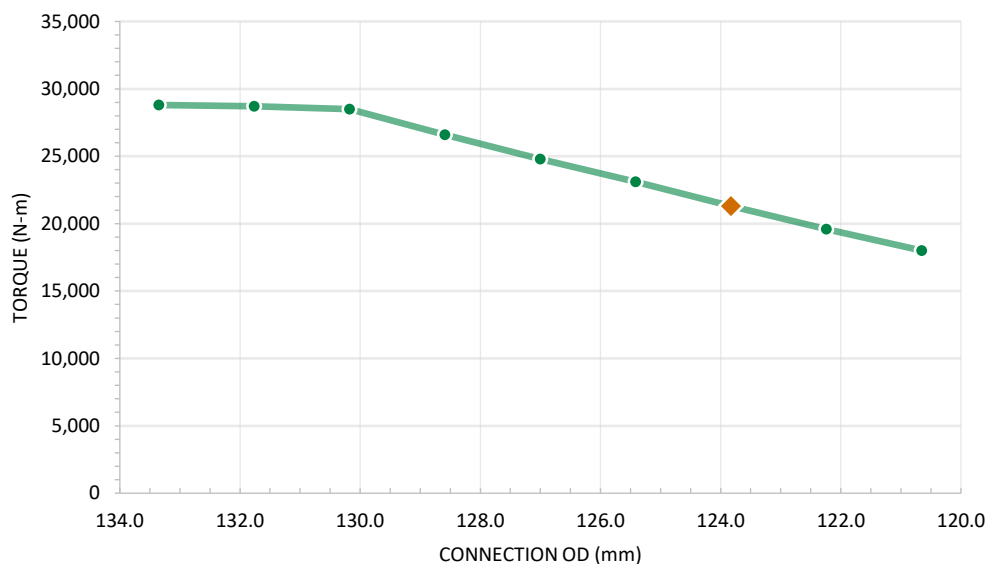
### Makeup Torque Then Tension Chart

METRIC



### Connection Wear Chart

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| CONNECTION OD (mm) | MAKEUP TORQUE (N-m) |
|--------------------|---------------------|
| 133.4              | 28,800              |
| 131.8              | 28,700              |
| 130.2              | 28,500              |
| 128.6              | 26,600              |
| 127.0              | 24,800              |
| 125.4              | 23,100              |
| 123.8              | 21,300              |
| 122.2              | 19,600              |
| 120.7              | 18,000              |
| MIN REC OD (mm)    |                     |
| 123.8              | 21,300              |

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