

# Macalloy 1030 Stainless and Carbon Post Tensioning Systems

## Technical Data

TABLE 1

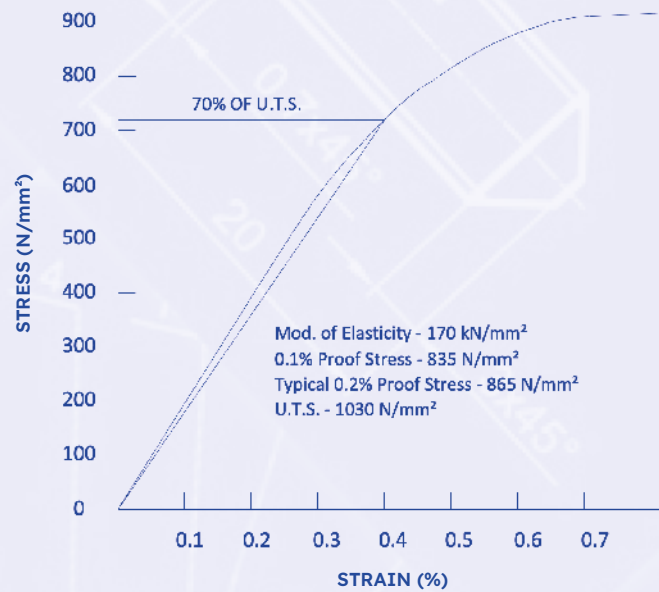
| Grade                            | Nominal<br>0.1% Proof<br>Stress | Nominal<br>Ultimate Tensile<br>Strength | Minimum<br>Elongation | Approximate<br>Modulus of<br>Elasticity |
|----------------------------------|---------------------------------|-----------------------------------------|-----------------------|-----------------------------------------|
|                                  | N/mm <sup>2</sup>               | N/mm <sup>2</sup>                       | %                     | kN/mm <sup>2</sup>                      |
| Macalloy 1030 25-40 (Carbon)     | 835                             | 1030                                    | 6                     | 170*                                    |
| Macalloy 1030 50-75 (Carbon)     | 835                             | 1030                                    | 6                     | 205                                     |
| Macalloy S1030 20-75 (Stainless) | 835                             | 1030                                    | 10                    | 185                                     |

\*Secant Modulus of Elasticity in range 5 – 70% UTS

TABLE 2

| Nominal<br>Diameter | Nominal<br>Prestress<br>at 70% | Nominal<br>0.1% Proof<br>Load | Nominal<br>Failing<br>Load | Major<br>Thread<br>Diameter | Unthreaded<br>Section<br>Diameter | Cross<br>Sectional<br>Area | Mass  |
|---------------------|--------------------------------|-------------------------------|----------------------------|-----------------------------|-----------------------------------|----------------------------|-------|
| mm                  | kN                             | kN                            | kN                         | mm                          | mm                                | mm <sup>2</sup>            | Kg/m  |
| 20*                 | 226                            | 262                           | 323                        | 22                          | 20.3                              | 322                        | 2.57  |
| 25                  | 354                            | 410                           | 506                        | 28.9                        | 26                                | 530                        | 4.2   |
| 26.5'               | 398                            | 460                           | 569                        | 30.4                        | 27.5                              | 572                        | 4.49  |
| 32                  | 580                            | 670                           | 828                        | 36.2                        | 33.1                              | 847                        | 6.65  |
| 36                  | 734                            | 850                           | 1049                       | 40.2                        | 37.1                              | 1075                       | 8.44  |
| 40                  | 907                            | 1050                          | 1295                       | 45.3                        | 41.2                              | 1320                       | 10.36 |
| 50                  | 1415                           | 1639                          | 2022                       | 54.8                        | 50.9                              | 1963                       | 15.66 |
| 62                  | 2176                           | 2521                          | 3109                       | 67.4                        | 63.3                              | 3117                       | 24.47 |
| 75                  | 3018                           | 3495                          | 4311                       | 77.2                        | 73.4                              | 4185                       | 32.86 |

\*Available in Stainless only \*Available in Carbon only



**Figure 1:** Typical Stress Strain Graph for Macalloy 1030 bar (25-40mm)

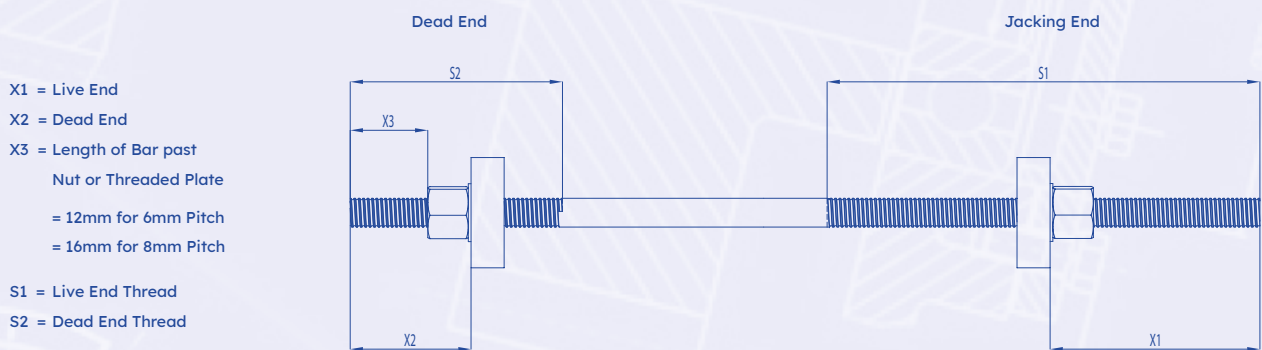
| TABLE 3                                                                                                                                                                                                                       |              |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|
| K Values for Macalloy Coarse Threads                                                                                                                                                                                          |              |     |
| <p>Torque (Nm) = <math>\frac{P \times D}{K}</math></p> <p>Where</p> <p><b>P</b> is desired axial load in kN</p> <p><b>D</b> is the nominal bar diameter in mm</p> <p><b>K</b> is a constant obtained by test measurements</p> | Bar Diameter | K   |
|                                                                                                                                                                                                                               | mm           |     |
|                                                                                                                                                                                                                               | 25           | 4.1 |
|                                                                                                                                                                                                                               | 26.5         | 4.3 |
|                                                                                                                                                                                                                               | 32           | 4.7 |
|                                                                                                                                                                                                                               | 36           | 4.9 |
|                                                                                                                                                                                                                               | 40           | 4.5 |
|                                                                                                                                                                                                                               | 50           | 4.1 |

| TABLE 4   |                                         |      |                      |        |        |        |        |        |        |      |        |
|-----------|-----------------------------------------|------|----------------------|--------|--------|--------|--------|--------|--------|------|--------|
|           | Physical Parameters                     |      |                      |        |        |        |        |        |        |      |        |
|           | Item                                    | Unit | Nominal Bar Diameter |        |        |        |        |        |        |      |        |
|           |                                         |      | 20                   | 25     | 26.5   | 32     | 36     | 40     | 50     | 62   | 75     |
| Flat Nuts | Carbon                                  |      | -                    | FN25   | FN26.5 | FN32   | FN36   | FN40   | FN50   | FN62 | FN75   |
|           | Stainless                               |      | FSSN20               | FSSN25 | -      | FSSN32 | FSSN36 | FSSN40 | FSSN50 | -    | FSSN75 |
| Carbon    | Length                                  | mm   | -                    | 34.5   | 38.5   | 43     | 48     | 53     | 73.5   | 95   | 100    |
|           | Width Across Flats (DIA. For 62 & 75mm) | mm   | -                    | 46     | 50     | 56     | 62     | 72     | 90     | 123  | 135    |
| Stainless | Length                                  | mm   | 25                   | 32     | -      | 40     | 47     | 50     | 70     | -    | 100    |
|           | Width Across Flats (DIA. For 50 & 75mm) | mm   | 41.3                 | 47.3   | -      | 56.4   | 60.3   | 63.5   | 101.6  | -    | 135    |

| TABLE 4 (CONTINUED)                 |                      |    |        |        |         |        |        |        |        |                          |        |
|-------------------------------------|----------------------|----|--------|--------|---------|--------|--------|--------|--------|--------------------------|--------|
| Flat Washers                        | Carbon               |    | -      | FSW25  | FSW26.5 | FSW32  | FSW36  | FSW40  | FSW50  | FSW62                    | FSW75  |
|                                     | Stainless            |    | FSSW20 | FSSW25 | -       | FSSW32 | FSSW36 | FSSW40 | FSSW50 | -                        | FSSW75 |
|                                     | Outside Diameter     | mm | 50     | 60     | 65      | 70     | 75     | 90     | 105    | FLAT WASHER NOT REQUIRED |        |
|                                     | Thickness            | mm | 5      | 5      | 5       | 5      | 5      | 5      | 5      |                          |        |
| Couplers                            | Carbon               |    | -      | FC25   | FC26.5  | FC32   | FC36   | FC40   | FC50   | FC62                     | FC75   |
|                                     | Stainless            |    | FSSC20 | FSSC25 | -       | FSSC32 | FSSC36 | FSSC40 | FSSC50 | -                        | FSSC75 |
|                                     | Outside Diameter     | mm | 35     | 42.5   | 42.5    | 50     | 57.5   | 62.5   | 76     | 95                       | 110    |
|                                     | Length – Carbon      | mm | -      | 85     | 90      | 115    | 130    | 140    | 170    | 210                      | 230    |
|                                     | Length – Stainless   | mm | 65     | 80     | -       | 95     | 105    | 120    | 160    | -                        | 210    |
| End Plates                          | Carbon               |    | -      | FPP25  | FPP26.5 | FPP32  | FPP36  | FPP40  | FPP50  | FPP62                    | FPP75  |
|                                     | Stainless            |    | FSSP20 | FSSP25 | -       | FSSP32 | FSSP36 | FSSP40 | FSSP50 | -                        | FSSP75 |
|                                     | Length               | mm | 100    | 100    | 110     | 125    | 140    | 160    | 200    | 275                      | 300    |
|                                     | Width                | mm | 100    | 100    | 110     | 125    | 140    | 160    | 200    | 275                      | 300    |
|                                     | Thickness – standard | mm | 25     | 40     | 40      | 50     | 50     | 60     | 60     | 75                       | 75     |
|                                     | Hole Diameter        | mm | 24     | 34     | 36      | 41     | 45     | 51     | 61     | 72                       | 82     |
|                                     | Thickness – threaded | mm | -      | 40     | 40      | 50     | 60     | 60     | 70     | 110                      | 110    |
| Ducts*                              | Recommended Duct ID  | mm | 30     | 38     | 40      | 48     | 54     | 60     | 75     | 93                       | 109    |
| Threads                             | Pitch                | mm | 2.5    | 6      | 6       | 6      | 6      | 8      | 8      | 8                        | 8      |
| Standard Thread Length (See Fig. 2) | Length               |    |        |        |         |        |        |        |        |                          |        |
|                                     | S1 Jacking End       | mm | 250    | 250    | 250     | 250    | 250    | 250    | 250    | 360                      | 360    |
|                                     | S1 Dead End          | mm | 100    | 100    | 100     | 100    | 100    | 100    | 100    | 160                      | 160    |
|                                     | Coupler              | mm | 40     | 45     | 50      | 60     | 65     | 75     | 90     | 110                      | 150    |
|                                     | X1 (Min.)            | mm | 75     | 90     | 100     | 120    | 125    | 140    | 175    | 215                      | 240    |
|                                     | X2 (Min.)            | mm | 42     | 49     | 53      | 57     | 62     | 71     | 91     | 110                      | 116    |
|                                     | X3 (Min.)            | mm | 12     | 12     | 12      | 12     | 12     | 16     | 16     | 16                       | 16     |

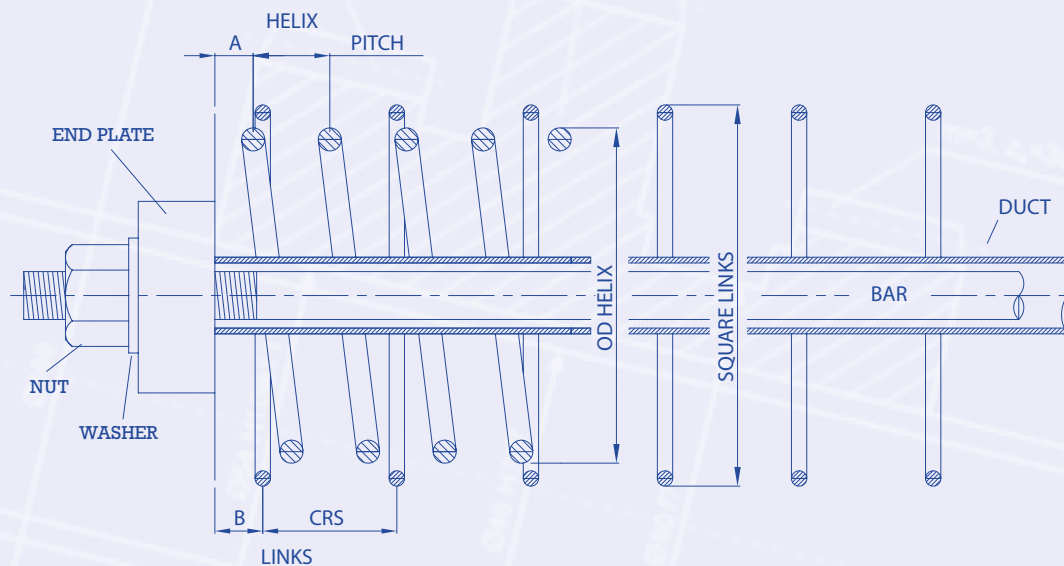
\*Note duct sizes do not accommodate couplers

**Figure 2:** End thread dimensions



| TABLE 5               |       |    |            |     |            |       |    |          |     |        |                      |
|-----------------------|-------|----|------------|-----|------------|-------|----|----------|-----|--------|----------------------|
| REINFORCEMENT DETAILS |       |    |            |     |            |       |    |          |     |        |                      |
| Bar Dia.              | HELIX |    |            |     |            | LINKS |    |          |     |        | Recommended Duct I.D |
|                       | Bar   | A  | Pitch (mm) | OD  | Turns (mm) | Bar   | B  | CRS (mm) | SQU | Number |                      |
| 25                    | 12    | 20 | 40         | 175 | 4          | 8     | 25 | 70       | 199 | 6      | 38                   |
| 26.5                  | 12    | 20 | 40         | 180 | 4          | 8     | 25 | 70       | 205 | 6      | 40                   |
| 32                    | 12    | 20 | 40         | 190 | 5          | 8     | 30 | 70       | 216 | 7      | 48                   |
| 36                    | 12    | 20 | 40         | 210 | 6          | 8     | 30 | 70       | 235 | 7      | 54                   |
| 40                    | 12    | 20 | 40         | 240 | 7          | 10    | 35 | 75       | 265 | 8      | 60                   |
| 50                    | 12    | 20 | 40         | 300 | 8          | 12    | 40 | 80       | 330 | 9      | 75                   |
| 62                    | 12    | 30 | 50         | 400 | 8          | 16    | 50 | 80       | 490 | 10     | 93                   |
| 75                    | 12    | 30 | 50         | 450 | 8          | 16    | 50 | 100      | 490 | 10     | 109                  |

**Figure 3:** Typical end block reinforcement



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