

|       |          |                       |      |       | MINIMUM YIELD STRENGTH, KSI   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|----------|-----------------------|------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |          |                       |      |       | 55                            | 65    | 75    | 80    | 80    | 85    | 90    | 95    | 100   | 105   | 110   | 110   | 120   | 125   | 130   | 135   |
|       |          |                       |      |       | MINIMUM TENSILE STRENGTH, KSI |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |          |                       |      |       | 75                            | 85    | 95    | 95    | 100   | 100   | 100   | 105   | 110   | 120   | 120   | 125   | 130   | 135   | 140   | 145   |
| DIA   | WEIGHT   |                       |      | WALL  | GRADE                         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | WNU      | WN                    | WPE  |       | J-55                          | M-65  | 75    | L-80  | N-80  | 85    | C-90  | T-95  | 100   | 105   | C-110 | P-110 | 120   | Q-125 | 130   | 135   |
| 1.050 | 1.20     | 1.14                  | 1.13 | 0.113 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.333 A  | COLLAPSE PRESSURE     |      |       | 10560                         | 12480 | 14410 | 15370 | 15370 | 16330 | 17290 | 18250 | 19210 | 20170 | 21130 | 21130 | 23050 | 24010 | 24970 | 25930 |
|       | 0.824 ID | BODY YIELD STRENGTH   |      |       | 18                            | 22    | 25    | 27    | 27    | 28    | 30    | 32    | 33    | 35    | 37    | 37    | 40    | 42    | 43    | 45    |
|       | 0.730 DD | API INTERNAL PRESSURE |      |       | 10360                         | 12240 | 14130 | 15070 | 15070 | 16010 | 16950 | 17890 | 18830 | 19780 | 20720 | 20720 | 22600 | 23540 | 24480 | 25430 |
|       | SD       | TEST PRESS 80%        |      |       | 9500                          | 11200 | 12900 | 13890 | 13890 | 14800 | 15500 | 16400 | 17200 | 18100 | 18900 | 18900 | 20700 | 21500 | 22400 | 23200 |
| 1.050 | 1.50     | 1.48                  | 1.45 | 0.154 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.433 A  | COLLAPSE PRESSURE     |      |       | 13770                         | 16270 | 18770 | 20020 | 20020 | 21280 | 22530 | 23780 | 25030 | 26280 | 27530 | 27530 | 30040 | 31290 | 32540 | 33790 |
|       | 0.742 ID | BODY YIELD STRENGTH   |      |       | 24                            | 28    | 32    | 35    | 35    | 37    | 39    | 41    | 43    | 45    | 48    | 48    | 52    | 54    | 56    | 58    |
|       | 0.648 DD | API INTERNAL PRESSURE |      |       | 14120                         | 16680 | 19250 | 20530 | 20530 | 21820 | 23100 | 24380 | 25670 | 26950 | 28230 | 28230 | 30800 | 32080 | 33370 | 34650 |
|       | SD       | TEST PRESS 80%        |      |       | 12900                         | 15300 | 17600 | 18900 | 18900 | 19900 | 21100 | 22300 | 23500 | 24600 | 25800 | 25800 | 28200 | 29300 | 30500 | 31700 |
| 1.315 | 1.80     | 1.70                  | 1.68 | 0.133 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.494 A  | COLLAPSE PRESSURE     |      |       | 10000                         | 11820 | 13640 | 14550 | 14550 | 15450 | 16360 | 17270 | 18180 | 19090 | 20000 | 20000 | 21820 | 22730 | 23640 | 24550 |
|       | 1.049 ID | BODY YIELD STRENGTH   |      |       | 27                            | 32    | 37    | 40    | 40    | 42    | 44    | 47    | 49    | 52    | 54    | 54    | 59    | 62    | 64    | 67    |
|       | 0.955 DD | API INTERNAL PRESSURE |      |       | 9730                          | 11500 | 13270 | 14160 | 14160 | 15040 | 15930 | 16810 | 17700 | 18580 | 19470 | 19470 | 21240 | 22120 | 23010 | 23890 |
|       | SD       | TEST PRESS 80%        |      |       | 8900                          | 10500 | 12100 | 12900 | 12900 | 13800 | 14600 | 15400 | 16200 | 17000 | 17800 | 17800 | 19400 | 20200 | 21000 | 21800 |
| 1.315 | 2.25     | 2.19                  | 2.17 | 0.179 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.639 A  | COLLAPSE PRESSURE     |      |       | 12940                         | 15290 | 17640 | 18810 | 18810 | 19990 | 21170 | 22340 | 23520 | 24690 | 25870 | 25870 | 28220 | 29400 | 30570 | 31750 |
|       | 0.957 ID | BODY YIELD STRENGTH   |      |       | 35                            | 42    | 48    | 51    | 51    | 54    | 58    | 61    | 64    | 67    | 70    | 70    | 77    | 80    | 83    | 86    |
|       | 0.863 DD | API INTERNAL PRESSURE |      |       | 13100                         | 15480 | 17870 | 19080 | 19080 | 20250 | 21440 | 22630 | 23820 | 25010 | 26200 | 26200 | 28590 | 29780 | 30970 | 32160 |
|       | SD       | TEST PRESS 80%        |      |       | 12000                         | 14200 | 16300 | 17400 | 17400 | 18500 | 19600 | 20700 | 21800 | 22900 | 24000 | 24000 | 26100 | 27200 | 28300 | 29400 |
| 1.660 | 2.40     | 2.30                  | 2.27 | 0.140 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.669 A  | COLLAPSE PRESSURE     |      |       | 8490                          | 10040 | 11580 | 12360 | 12360 | 13130 | 13900 | 14670 | 15440 | 16220 | 16990 | 16990 | 18530 | 19310 | 20080 | 20850 |
|       | 1.380 ID | BODY YIELD STRENGTH   |      |       | 37                            | 43    | 50    | 54    | 54    | 57    | 60    | 64    | 67    | 70    | 74    | 74    | 80    | 84    | 87    | 90    |
|       | 1.286 DD | API INTERNAL PRESSURE |      |       | 8120                          | 9590  | 11070 | 11810 | 11810 | 12550 | 13280 | 14020 | 14760 | 15500 | 16230 | 16230 | 17710 | 18450 | 19190 | 19920 |
|       | SD       | TEST PRESS 80%        |      |       | 7400                          | 8600  | 10100 | 10990 | 10990 | 11500 | 12100 | 12800 | 13500 | 14200 | 14800 | 14800 | 16200 | 16900 | 17500 | 18200 |
| 1.660 | 3.02     | 3.03                  | 3.00 | 0.191 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.881 A  | COLLAPSE PRESSURE     |      |       | 11200                         | 13240 | 15270 | 16290 | 16290 | 17310 | 18330 | 19350 | 20360 | 21380 | 22400 | 22400 | 24440 | 25460 | 26470 | 27490 |
|       | 1.278 ID | BODY YIELD STRENGTH   |      |       | 48                            | 57    | 66    | 70    | 70    | 75    | 79    | 84    | 88    | 93    | 97    | 97    | 106   | 110   | 115   | 119   |
|       | 1.184 DD | API INTERNAL PRESSURE |      |       | 11070                         | 13090 | 15100 | 16110 | 16110 | 17120 | 18120 | 19130 | 20140 | 21140 | 22150 | 22150 | 24160 | 25170 | 26180 | 27180 |
|       | SD       | TEST PRESS 80%        |      |       | 10100                         | 12000 | 13800 | 14700 | 14700 | 15600 | 16600 | 17500 | 18400 | 19300 | 20300 | 20300 | 22100 | 23000 | 23900 | 24900 |
| 1.660 | 3.24     | 3.00                  | 3.09 | 0.198 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.909 A  | COLLAPSE PRESSURE     |      |       | 11560                         | 13660 | 15760 | 16810 | 16810 | 17860 | 18910 | 19960 | 21010 | 22060 | 23110 | 23110 | 25210 | 26260 | 27310 | 28360 |
|       | 1.264 ID | BODY YIELD STRENGTH   |      |       | 50                            | 59    | 68    | 73    | 73    | 77    | 82    | 86    | 91    | 95    | 100   | 100   | 109   | 114   | 118   | 123   |
|       | 1.170 DD | API INTERNAL PRESSURE |      |       | 11480                         | 13570 | 15660 | 16700 | 16700 | 17740 | 18790 | 19830 | 20870 | 21920 | 22960 | 22960 | 25050 | 26090 | 27140 | 28180 |
|       | SD       | TEST PRESS 80%        |      |       | 10500                         | 12400 | 14300 | 15300 | 15300 | 16200 | 17200 | 18100 | 19100 | 20000 | 21000 | 21000 | 22900 | 23900 | 24800 | 25800 |
| 1.900 | 2.90     | 2.75                  | 2.72 | 0.145 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.799 A  | COLLAPSE PRESSURE     |      |       | 7750                          | 9160  | 10570 | 11280 | 11280 | 11980 | 12620 | 13190 | 13750 | 14300 | 14840 | 14840 | 15890 | 16410 | 16910 | 17400 |
|       | 1.610 ID | BODY YIELD STRENGTH   |      |       | 44                            | 52    | 60    | 64    | 64    | 68    | 72    | 76    | 80    | 84    | 88    | 88    | 96    | 100   | 104   | 108   |
|       | 1.516 DD | API INTERNAL PRESSURE |      |       | 7350                          | 8680  | 10020 | 10680 | 10680 | 11350 | 12020 | 12690 | 13360 | 14020 | 14690 | 14690 | 16030 | 16690 | 17360 | 18030 |
|       | SD       | TEST PRESS 80%        |      |       | 6700                          | 7900  | 9200  | 9900  | 9900  | 10400 | 11000 | 11600 | 12200 | 12800 | 13400 | 13400 | 14700 | 15300 | 15900 | 16500 |
| 1.900 | 3.64     | 3.65                  | 3.63 | 0.200 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.058 A  | COLLAPSE PRESSURE     |      |       | 10360                         | 12240 | 14130 | 15070 | 15070 | 16010 | 16950 | 17890 | 18840 | 19780 | 20720 | 20720 | 22600 | 23550 | 24480 | 25430 |
|       | 1.500 ID | BODY YIELD STRENGTH   |      |       | 59                            | 69    | 80    | 85    | 85    | 91    | 96    | 101   | 107   | 112   | 117   | 117   | 128   | 134   | 139   | 144   |
|       | 1.406 DD | API INTERNAL PRESSURE |      |       | 10130                         | 11970 | 13820 | 14740 | 14740 | 15680 | 16580 | 17500 | 18420 | 19340 | 20260 | 20260 | 22110 | 23030 | 23950 | 24870 |
|       | SD       | TEST PRESS 80%        |      |       | 9300                          | 10900 | 12600 | 13500 | 13500 | 14300 | 15200 | 16000 | 16800 | 17700 | 18500 | 18500 | 20200 | 21100 | 21900 | 22700 |
| 1.900 | 4.19     | 4.00                  | 3.94 | 0.219 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.157 A  | COLLAPSE PRESSURE     |      |       | 11220                         | 13260 | 15300 | 16320 | 16320 | 17340 | 18360 | 19380 | 20400 | 21420 | 22440 | 22440 | 24470 | 25490 | 26510 | 27530 |
|       | 1.462 ID | BODY YIELD STRENGTH   |      |       | 64                            | 75    | 87    | 93    | 93    | 98    | 104   | 110   | 116   | 121   | 127   | 127   | 139   | 145   | 150   | 156   |
|       | 1.368 DD | API INTERNAL PRESSURE |      |       | 11090                         | 13110 | 15130 | 16140 | 16140 | 17150 | 18150 | 19160 | 20170 | 21180 | 22190 | 22190 | 24210 | 25210 | 26220 | 27230 |
|       | SD       | TEST PRESS 80%        |      |       | 10100                         | 12000 | 13800 | 14800 | 14800 | 15700 | 16600 | 17500 | 18400 | 19400 | 20300 | 20300 | 22100 | 23100 | 24000 | 24900 |
| 1.900 | 0.00     | 4.42                  | 4.41 | 0.250 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.296 A  | COLLAPSE PRESSURE     |      |       | 12570                         | 14850 | 17140 | 18280 | 18280 | 19430 | 20570 | 21710 | 22850 | 24000 | 25140 | 25140 | 27420 | 28570 | 29710 | 30850 |
|       | 1.400 ID | BODY YIELD STRENGTH   |      |       | 71                            | 84    | 97    | 104   | 104   | 110   | 117   | 123   | 130   | 136   | 143   | 143   | 156   | 162   | 168   | 175   |
|       | 1.306 DD | API INTERNAL PRESSURE |      |       | 12660                         | 14970 | 17270 | 18420 | 18420 | 19570 | 20720 | 21880 | 23030 | 24180 | 25330 | 25330 | 27630 | 28780 | 29930 | 31080 |
|       | SD       | TEST PRESS 80%        |      |       | 11600                         | 13700 | 15800 | 16900 | 16900 | 17900 | 18900 | 20000 | 21100 | 22100 | 23200 | 23200 | 25300 | 26300 | 27400 | 28400 |

|       |          |                       |      |       | MINIMUM YIELD STRENGTH, KSI   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|----------|-----------------------|------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |          |                       |      |       | 55                            | 65    | 75    | 80    | 80    | 85    | 90    | 95    | 100   | 105   | 110   | 110   | 120   | 125   | 130   | 135   |       |       |       |       |
|       |          |                       |      |       | MINIMUM TENSILE STRENGTH, KSI |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |          |                       |      |       | 75                            | 85    | 95    | 95    | 100   | 100   | 100   | 105   | 110   | 120   | 120   | 125   | 130   | 135   | 140   | 145   |       |       |       |       |
| DIA   | WEIGHT   |                       |      | WALL  | GRADE                         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | WNU      | WN                    | WPE  |       | J-55                          | M-65  | 75    | L-80  | N-80  | 85    | C-90  | T-95  | 100   | 105   | C-110 | P-110 | 120   | Q-125 | 130   | 135   |       |       |       |       |
| 2.063 | 3.25     | 0.00                  | 3.18 | 0.156 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 0.935 A  | COLLAPSE PRESSURE     |      |       |                               | 7690  | 9090  | 10480 | 11180 | 11180 | 11850 | 12420 | 12980 | 13530 | 14070 | 14600 | 14600 | 15620 | 16130 | 16620 | 17090 |       |       |       |
|       | 1.751 ID | BODY YIELD STRENGTH   |      |       |                               | 51    | 61    | 70    | 75    | 75    | 79    | 84    | 89    | 94    | 98    | 103   | 103   | 112   | 117   | 122   | 126   |       |       |       |
|       | 1.657 DD | API INTERNAL PRESSURE |      |       |                               | 7280  | 8600  | 9920  | 10590 | 10590 | 11250 | 11910 | 12570 | 13230 | 13890 | 14560 | 14560 | 15880 | 16540 | 17200 | 17860 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 6700  | 7900  | 9100  | 9700  | 9700  | 10300 | 10900 | 11500 | 12100 | 12700 | 13300 | 13300 | 14500 | 15100 | 15700 | 16300 |
| 2.063 | 4.50     | 0.00                  | 4.42 | 0.225 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.299 A  | COLLAPSE PRESSURE     |      |       |                               | 10690 | 12630 | 14580 | 15550 | 15550 | 16520 | 17490 | 18460 | 19430 | 20410 | 21380 | 21380 | 23320 | 24290 | 25260 | 26240 |       |       |       |
|       | 1.613 ID | BODY YIELD STRENGTH   |      |       |                               | 71    | 84    | 97    | 104   | 104   | 110   | 117   | 123   | 130   | 136   | 143   | 143   | 156   | 162   | 169   | 175   |       |       |       |
|       | 1.519 DD | API INTERNAL PRESSURE |      |       |                               | 10500 | 12410 | 14310 | 15270 | 15270 | 16220 | 17180 | 18130 | 19090 | 20040 | 20990 | 20990 | 22900 | 23860 | 24810 | 25770 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 9600  | 11300 | 13100 | 14090 | 14090 | 14800 | 15700 | 16600 | 17500 | 18300 | 19200 | 19200 | 20900 | 21800 | 22700 | 23600 |
| 2.375 | 4.70     | 4.60                  | 4.44 | 0.190 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.304 A  | COLLAPSE PRESSURE     |      |       |                               | 8100  | 9570  | 11040 | 11780 | 11780 | 12510 | 13250 | 13980 | 14720 | 15460 | 16130 | 16130 | 17310 | 17900 | 18470 | 19030 |       |       |       |
|       | 1.995 ID | BODY YIELD STRENGTH   |      |       |                               | 72    | 85    | 98    | 104   | 104   | 111   | 117   | 124   | 130   | 137   | 143   | 143   | 156   | 163   | 170   | 176   |       |       |       |
|       | 1.901 DD | API INTERNAL PRESSURE |      |       |                               | 7700  | 9100  | 10500 | 11200 | 11200 | 11900 | 12600 | 13300 | 14000 | 14700 | 15400 | 15400 | 16800 | 17500 | 18200 | 18900 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 7000  | 8300  | 9600  | 10200 | 10200 | 10900 | 11500 | 12200 | 12800 | 13400 | 14100 | 14100 | 15400 | 16000 | 16600 | 17300 |
| 2.375 | 5.30     | 5.10                  | 5.03 | 0.218 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.477 A  | COLLAPSE PRESSURE     |      |       |                               | 9170  | 10840 | 12500 | 13340 | 13340 | 14170 | 15010 | 15840 | 16670 | 17510 | 18340 | 18340 | 20010 | 20840 | 21670 | 22510 |       |       |       |
|       | 1.939 ID | BODY YIELD STRENGTH   |      |       |                               | 81    | 96    | 111   | 118   | 118   | 126   | 133   | 140   | 148   | 155   | 162   | 162   | 177   | 185   | 192   | 199   |       |       |       |
|       | 1.845 DD | API INTERNAL PRESSURE |      |       |                               | 8830  | 10440 | 12050 | 12850 | 12850 | 13650 | 14460 | 15260 | 16060 | 16870 | 17670 | 17670 | 19280 | 20080 | 20880 | 21680 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 8100  | 9500  | 11000 | 11700 | 11700 | 12500 | 13200 | 14000 | 14700 | 15400 | 16200 | 16200 | 17600 | 18400 | 19100 | 19800 |
| 2.375 | 5.95     | 5.80                  | 5.76 | 0.254 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.692 A  | COLLAPSE PRESSURE     |      |       |                               | 10510 | 12420 | 14330 | 15280 | 15280 | 16240 | 17190 | 18150 | 19100 | 20060 | 21010 | 21010 | 22920 | 23880 | 24830 | 25790 |       |       |       |
|       | 1.867 ID | BODY YIELD STRENGTH   |      |       |                               | 93    | 110   | 127   | 135   | 135   | 144   | 152   | 161   | 169   | 178   | 186   | 186   | 203   | 212   | 220   | 228   |       |       |       |
|       | 1.773 DD | API INTERNAL PRESSURE |      |       |                               | 10290 | 12170 | 14040 | 14970 | 14970 | 15910 | 16840 | 17780 | 18720 | 19650 | 20590 | 20590 | 22460 | 23390 | 24330 | 25270 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 9400  | 11100 | 12800 | 13790 | 13790 | 14500 | 15400 | 16300 | 17100 | 18000 | 18800 | 18800 | 20500 | 21400 | 22200 | 23100 |
| 2.375 | 6.20     | 6.00                  | 5.90 | 0.261 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.733 A  | COLLAPSE PRESSURE     |      |       |                               | 10760 | 12720 | 14670 | 15650 | 15650 | 16630 | 17610 | 18590 | 19560 | 20540 | 21520 | 21520 | 23480 | 24450 | 25430 | 26410 |       |       |       |
|       | 1.853 ID | BODY YIELD STRENGTH   |      |       |                               | 95    | 113   | 130   | 139   | 139   | 147   | 156   | 165   | 173   | 182   | 191   | 191   | 208   | 217   | 225   | 234   |       |       |       |
|       | 1.759 DD | API INTERNAL PRESSURE |      |       |                               | 10580 | 12500 | 14420 | 15390 | 15390 | 16350 | 17310 | 18270 | 19230 | 20190 | 21150 | 21150 | 23080 | 24040 | 25000 | 25960 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 9700  | 11400 | 13200 | 14100 | 14100 | 14900 | 15800 | 16700 | 17600 | 18500 | 19300 | 19300 | 21100 | 22000 | 22900 | 23700 |
| 2.375 | 6.60     | 6.60                  | 6.56 | 0.295 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.928 A  | COLLAPSE PRESSURE     |      |       |                               | 11970 | 14140 | 16320 | 17410 | 17410 | 18490 | 19580 | 20670 | 21760 | 22840 | 23930 | 23930 | 26110 | 27200 | 28280 | 29370 |       |       |       |
|       | 1.785 ID | BODY YIELD STRENGTH   |      |       |                               | 106   | 125   | 145   | 154   | 154   | 164   | 174   | 183   | 193   | 202   | 212   | 212   | 231   | 241   | 251   | 260   |       |       |       |
|       | 1.691 DD | API INTERNAL PRESSURE |      |       |                               | 11960 | 14130 | 16300 | 17390 | 17390 | 18480 | 19560 | 20650 | 21740 | 22820 | 23910 | 23910 | 26080 | 27170 | 28260 | 29340 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 10900 | 12900 | 14900 | 15900 | 15900 | 16900 | 17900 | 18900 | 19900 | 20900 | 21900 | 21900 | 23800 | 24800 | 25800 | 26800 |
| 2.375 | 7.45     | 7.35                  | 7.32 | 0.336 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.152 A  | COLLAPSE PRESSURE     |      |       |                               | 13360 | 15790 | 18220 | 19430 | 19430 | 20650 | 21860 | 23080 | 24290 | 25510 | 26720 | 26720 | 29150 | 30360 | 31580 | 32790 |       |       |       |
|       | 1.703 ID | BODY YIELD STRENGTH   |      |       |                               | 118   | 140   | 161   | 172   | 172   | 183   | 194   | 204   | 215   | 226   | 237   | 237   | 258   | 269   | 280   | 291   |       |       |       |
|       | 1.609 DD | API INTERNAL PRESSURE |      |       |                               | 13620 | 16090 | 18570 | 19810 | 19810 | 21040 | 22280 | 23520 | 24760 | 26000 | 27230 | 27230 | 29710 | 30950 | 32190 | 33420 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 12400 | 14700 | 17000 | 18190 | 18190 | 19200 | 20400 | 21500 | 22600 | 23800 | 24900 | 24900 | 27200 | 28300 | 29400 | 30600 |
| 2.875 | 6.50     | 6.40                  | 6.17 | 0.217 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 1.812 A  | COLLAPSE PRESSURE     |      |       |                               | 7680  | 9070  | 10470 | 11170 | 11170 | 11820 | 12380 | 12940 | 13490 | 14020 | 14550 | 14550 | 15560 | 16070 | 16560 | 17030 |       |       |       |
|       | 2.441 ID | BODY YIELD STRENGTH   |      |       |                               | 100   | 118   | 136   | 145   | 145   | 154   | 163   | 172   | 181   | 190   | 199   | 199   | 217   | 227   | 236   | 245   |       |       |       |
|       | 2.347 DD | API INTERNAL PRESSURE |      |       |                               | 7280  | 8590  | 9910  | 10570 | 10570 | 11230 | 11890 | 12550 | 13210 | 13870 | 14530 | 14530 | 15850 | 16510 | 17170 | 17830 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 6600  | 7800  | 9100  | 9700  | 9700  | 10300 | 10900 | 11500 | 12100 | 12700 | 13300 | 13300 | 14500 | 15100 | 15700 | 16300 |
| 2.875 | 7.90     | 7.80                  | 7.67 | 0.276 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.254 A  | COLLAPSE PRESSURE     |      |       |                               | 9550  | 11280 | 13020 | 13890 | 13890 | 14750 | 15620 | 16490 | 17360 | 18220 | 19090 | 19090 | 20830 | 21700 | 22560 | 23430 |       |       |       |
|       | 2.323 ID | BODY YIELD STRENGTH   |      |       |                               | 124   | 147   | 169   | 180   | 180   | 192   | 203   | 214   | 225   | 237   | 248   | 248   | 270   | 282   | 293   | 304   |       |       |       |
|       | 2.229 DD | API INTERNAL PRESSURE |      |       |                               | 9240  | 10920 | 12600 | 13440 | 13440 | 14280 | 15120 | 15960 | 16800 | 17640 | 18480 | 18480 | 20160 | 21000 | 21840 | 22680 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 8400  | 10000 | 11500 | 12360 | 12360 | 13100 | 13800 | 14600 | 15400 | 16100 | 16900 | 16900 | 18400 | 19200 | 20000 | 20700 |
| 2.875 | 8.70     | 8.60                  | 8.45 | 0.308 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.484 A  | COLLAPSE PRESSURE     |      |       |                               | 10520 | 12430 | 14350 | 15300 | 15300 | 16260 | 17220 | 18170 | 19130 | 20090 | 21040 | 21040 | 22960 | 23910 | 24870 | 25830 |       |       |       |
|       | 2.259 ID | BODY YIELD STRENGTH   |      |       |                               | 137   | 161   | 186   | 199   | 199   | 211   | 224   | 236   | 248   | 261   | 273   | 273   | 298   | 311   | 323   | 335   |       |       |       |
|       | 2.165 DD | API INTERNAL PRESSURE |      |       |                               | 10310 | 12190 | 14060 | 15000 | 15000 | 15940 | 16870 | 17810 | 18750 | 19690 | 20620 | 20620 | 22500 | 23430 | 24370 | 25310 |       |       |       |
|       |          |                       |      | SD    | TEST PRESS 80%                |       |       |       | 9400  | 11100 | 12900 | 13700 | 13700 | 14600 | 15400 | 16300 | 17100 | 18000 | 18900 | 18900 | 20600 | 21400 | 22300 | 23100 |



|       |          |                       |       |       | MINIMUM YIELD STRENGTH, KSI   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|----------|-----------------------|-------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |          |                       |       |       | 55                            | 65    | 75    | 80    | 80    | 85    | 90    | 95    | 100   | 105   | 110   | 110   | 120   | 125   | 130   | 135   |       |
|       |          |                       |       |       | MINIMUM TENSILE STRENGTH, KSI |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |          |                       |       |       | 75                            | 85    | 95    | 95    | 100   | 100   | 100   | 105   | 110   | 120   | 120   | 125   | 130   | 135   | 140   | 145   |       |
| DIA   | WEIGHT   |                       |       | WALL  | GRADE                         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | WNU      | WN                    | WPE   |       | J-55                          | M-65  | 75    | L-80  | N-80  | 85    | C-90  | T-95  | 100   | 105   | C-110 | P-110 | 120   | Q-125 | 130   | 135   |       |
| 2.875 | 9.50     | 9.35                  | 9.21  | 0.340 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.708 A  | COLLAPSE PRESSURE     |       |       |                               | 11470 | 13560 | 15640 | 16680 | 16680 | 17730 | 18770 | 19810 | 20860 | 21900 | 22940 | 22940 | 25030 | 26070 | 27110 | 28150 |
|       | 2.195 ID | BODY YIELD STRENGTH   |       |       |                               | 149   | 176   | 203   | 217   | 217   | 230   | 244   | 257   | 271   | 284   | 298   | 298   | 325   | 339   | 352   | 366   |
|       | 2.101 DO | API INTERNAL PRESSURE |       |       |                               | 11380 | 13450 | 15520 | 16560 | 16560 | 17590 | 18630 | 19660 | 20700 | 21730 | 22770 | 22770 | 24830 | 25870 | 26900 | 27940 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 10400 | 12300 | 14200 | 15100 | 15100 | 16100 | 17000 | 18000 | 18900 | 19900 | 20800 | 20800 | 22700 | 23700 | 24600 | 25500 |
| 2.875 | 10.70    | 10.50                 | 10.40 | 0.392 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.058 A  | COLLAPSE PRESSURE     |       |       |                               | 12950 | 15310 | 17660 | 18840 | 18840 | 20020 | 21200 | 22370 | 23550 | 24730 | 25910 | 25910 | 28260 | 29440 | 30620 | 31790 |
|       | 2.091 ID | BODY YIELD STRENGTH   |       |       |                               | 168   | 199   | 229   | 245   | 245   | 260   | 275   | 291   | 306   | 321   | 336   | 336   | 367   | 382   | 398   | 413   |
|       | 1.997 DO | API INTERNAL PRESSURE |       |       |                               | 13120 | 15510 | 17900 | 19090 | 19090 | 20280 | 21470 | 22670 | 23860 | 25050 | 26250 | 26250 | 28630 | 29830 | 31020 | 32210 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 12000 | 14200 | 16400 | 17500 | 17500 | 18500 | 19600 | 20700 | 21800 | 22900 | 24000 | 24000 | 26200 | 27300 | 28400 | 29500 |
| 2.875 | 11.00    | 11.00                 | 10.89 | 0.405 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.143 A  | COLLAPSE PRESSURE     |       |       |                               | 13310 | 15730 | 18150 | 19360 | 19360 | 20570 | 21780 | 22990 | 24210 | 25420 | 26630 | 26630 | 29050 | 30260 | 31470 | 32680 |
|       | 2.065 ID | BODY YIELD STRENGTH   |       |       |                               | 173   | 204   | 236   | 251   | 251   | 267   | 283   | 299   | 314   | 330   | 346   | 346   | 377   | 393   | 409   | 424   |
|       | 1.971 DO | API INTERNAL PRESSURE |       |       |                               | 13560 | 16020 | 18490 | 19720 | 19720 | 20950 | 22190 | 23420 | 24650 | 25880 | 27120 | 27120 | 29580 | 30820 | 32050 | 33280 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 12400 | 14700 | 16900 | 18000 | 18000 | 19200 | 20300 | 21400 | 22500 | 23700 | 24800 | 24800 | 27000 | 28200 | 29300 | 30400 |
| 2.875 | 11.65    | 11.50                 | 11.45 | 0.440 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.366 A  | COLLAPSE PRESSURE     |       |       |                               | 14260 | 16850 | 19440 | 20740 | 20740 | 22040 | 23330 | 24630 | 25920 | 27220 | 28520 | 28520 | 31110 | 32410 | 33700 | 35000 |
|       | 1.995 ID | BODY YIELD STRENGTH   |       |       |                               | 185   | 219   | 252   | 269   | 269   | 286   | 303   | 320   | 337   | 353   | 370   | 370   | 404   | 421   | 438   | 454   |
|       | 1.901 DO | API INTERNAL PRESSURE |       |       |                               | 14730 | 17410 | 20090 | 21430 | 21430 | 22770 | 24100 | 25440 | 26780 | 28120 | 29460 | 29460 | 32140 | 33480 | 34820 | 36160 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 13500 | 15900 | 18400 | 19600 | 19600 | 20800 | 22000 | 23300 | 24500 | 25700 | 26900 | 26900 | 29400 | 30600 | 31800 | 33100 |
| 3.500 | 0.00     | 7.70                  | 7.58  | 0.216 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.228 A  | COLLAPSE PRESSURE     |       |       |                               | 5970  | 6770  | 7510  | 7870  | 7870  | 8200  | 8540  | 8880  | 9160  | 9450  | 9730  | 9730  | 10250 | 10500 | 10730 | 10940 |
|       | 3.068 ID | BODY YIELD STRENGTH   |       |       |                               | 123   | 145   | 167   | 178   | 178   | 189   | 201   | 212   | 223   | 234   | 245   | 245   | 267   | 279   | 290   | 301   |
|       | 2.943 DO | API INTERNAL PRESSURE |       |       |                               | 5940  | 7020  | 8100  | 8640  | 8640  | 9180  | 9720  | 10260 | 10800 | 11340 | 11880 | 11880 | 12960 | 13500 | 14040 | 14580 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 5400  | 6400  | 7400  | 7900  | 7900  | 8400  | 8900  | 9400  | 9900  | 10400 | 10900 | 10900 | 11800 | 12300 | 12800 | 13300 |
| 3.500 | 9.30     | 9.20                  | 8.81  | 0.254 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.590 A  | COLLAPSE PRESSURE     |       |       |                               | 7400  | 8750  | 10000 | 10540 | 10540 | 11050 | 11570 | 12080 | 12580 | 13060 | 13530 | 13530 | 14440 | 14890 | 15330 | 15740 |
|       | 2.992 ID | BODY YIELD STRENGTH   |       |       |                               | 142   | 168   | 194   | 207   | 207   | 220   | 233   | 246   | 259   | 272   | 285   | 285   | 311   | 324   | 337   | 350   |
|       | 2.867 DO | API INTERNAL PRESSURE |       |       |                               | 6990  | 8260  | 9530  | 10160 | 10160 | 10600 | 11430 | 12070 | 12700 | 13340 | 13970 | 13970 | 15240 | 15880 | 16510 | 17150 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 6400  | 7500  | 8700  | 9300  | 9300  | 9900  | 10500 | 11000 | 11600 | 12200 | 12800 | 12800 | 13900 | 14500 | 15100 | 15700 |
| 3.500 | 10.30    | 10.20                 | 9.92  | 0.289 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.915 A  | COLLAPSE PRESSURE     |       |       |                               | 8330  | 9850  | 11360 | 12120 | 12120 | 12880 | 13640 | 14390 | 15150 | 15910 | 16670 | 16670 | 18180 | 18940 | 19660 | 20170 |
|       | 2.922 ID | BODY YIELD STRENGTH   |       |       |                               | 160   | 189   | 219   | 233   | 233   | 248   | 262   | 277   | 292   | 306   | 321   | 321   | 350   | 364   | 379   | 394   |
|       | 2.797 DO | API INTERNAL PRESSURE |       |       |                               | 7960  | 9390  | 10840 | 11560 | 11560 | 12280 | 13010 | 13730 | 14450 | 15170 | 15900 | 15900 | 17340 | 18060 | 18790 | 19510 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 7300  | 8600  | 9900  | 10600 | 10600 | 11200 | 11900 | 12600 | 13200 | 13900 | 14500 | 14500 | 15900 | 16500 | 17200 | 17800 |
| 3.500 | 12.95    | 12.70                 | 12.53 | 0.375 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.682 A  | COLLAPSE PRESSURE     |       |       |                               | 10520 | 12440 | 14350 | 15310 | 15310 | 16260 | 17220 | 18180 | 19130 | 20090 | 21050 | 21050 | 22960 | 23920 | 24870 | 25830 |
|       | 2.750 ID | BODY YIELD STRENGTH   |       |       |                               | 203   | 239   | 276   | 295   | 295   | 313   | 331   | 350   | 368   | 387   | 405   | 405   | 442   | 460   | 479   | 497   |
|       | 2.625 DO | API INTERNAL PRESSURE |       |       |                               | 10310 | 12190 | 14060 | 15000 | 15000 | 15940 | 16880 | 17810 | 18750 | 19690 | 20630 | 20630 | 22500 | 23440 | 24380 | 25310 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 9400  | 11100 | 12900 | 13700 | 13700 | 14600 | 15400 | 16300 | 17100 | 18000 | 18900 | 18900 | 20600 | 21400 | 22300 | 23100 |
| 3.500 | 14.30    | 14.30                 | 14.11 | 0.430 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.147 A  | COLLAPSE PRESSURE     |       |       |                               | 11850 | 14010 | 16160 | 17240 | 17240 | 18320 | 19400 | 20480 | 21550 | 22630 | 23710 | 23710 | 25860 | 26940 | 28020 | 29100 |
|       | 2.640 ID | BODY YIELD STRENGTH   |       |       |                               | 228   | 270   | 311   | 332   | 332   | 352   | 373   | 394   | 415   | 435   | 456   | 456   | 498   | 518   | 539   | 560   |
|       | 2.515 DO | API INTERNAL PRESSURE |       |       |                               | 11830 | 13980 | 16130 | 17200 | 17200 | 18280 | 19350 | 20430 | 21500 | 22580 | 23650 | 23650 | 25800 | 26880 | 27950 | 29030 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 10800 | 12800 | 14700 | 15700 | 15700 | 16700 | 17700 | 18700 | 19700 | 20600 | 21600 | 21600 | 23600 | 24600 | 25600 | 26500 |
| 3.500 | 15.80    | 15.50                 | 15.39 | 0.476 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.522 A  | COLLAPSE PRESSURE     |       |       |                               | 12930 | 15280 | 17630 | 18800 | 18800 | 19960 | 21150 | 22330 | 23500 | 24680 | 25850 | 25850 | 28200 | 29380 | 30550 | 31730 |
|       | 2.548 ID | BODY YIELD STRENGTH   |       |       |                               | 249   | 294   | 339   | 362   | 362   | 384   | 407   | 430   | 452   | 475   | 497   | 497   | 543   | 565   | 588   | 610   |
|       | 2.423 DO | API INTERNAL PRESSURE |       |       |                               | 13090 | 15470 | 17850 | 19040 | 19040 | 20230 | 21420 | 22610 | 23800 | 24990 | 26180 | 26180 | 28580 | 29750 | 30940 | 32130 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 12000 | 14100 | 16300 | 17400 | 17400 | 18500 | 19600 | 20700 | 21800 | 22900 | 23900 | 23900 | 26100 | 27200 | 28300 | 29400 |
| 3.500 | 16.70    | 16.70                 | 16.30 | 0.510 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.791 A  | COLLAPSE PRESSURE     |       |       |                               | 13690 | 16180 | 18670 | 19920 | 19920 | 21160 | 22410 | 23650 | 24900 | 26140 | 27390 | 27390 | 29880 | 31120 | 32370 | 33610 |
|       | 2.480 ID | BODY YIELD STRENGTH   |       |       |                               | 264   | 311   | 359   | 383   | 383   | 407   | 431   | 455   | 479   | 503   | 527   | 527   | 575   | 599   | 623   | 647   |
|       | 2.355 DO | API INTERNAL PRESSURE |       |       |                               | 14030 | 16580 | 19130 | 20400 | 20400 | 21680 | 22950 | 24230 | 25500 | 26780 | 28050 | 28050 | 30600 | 31880 | 33150 | 34430 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 12800 | 15200 | 17500 | 18700 | 18700 | 19800 | 21000 | 22100 | 23300 | 24500 | 25600 | 25600 | 28000 | 29100 | 30300 | 31500 |

|       |          |                       |       |       | MINIMUM YIELD STRENGTH, KSI   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|----------|-----------------------|-------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |          |                       |       |       | 55                            | 65    | 75    | 80    | 80    | 85    | 90    | 95    | 100   | 105   | 110   | 110   | 120   | 125   | 130   | 135   |       |
|       |          |                       |       |       | MINIMUM TENSILE STRENGTH, KSI |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |          |                       |       |       | 75                            | 85    | 95    | 95    | 100   | 100   | 100   | 105   | 110   | 120   | 120   | 125   | 130   | 135   | 140   | 145   |       |
|       |          |                       |       |       | GRADE                         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| DIA   | WNU      | WN                    | WPE   | WALL  | J-55                          | M-65  | 75    | L-80  | N-80  | 85    | C-80  | T-85  | 100   | 105   | C-110 | P-110 | 120   | Q-125 | 130   | 135   |       |
| 3.500 | 17.05    | 17.00                 | 16.83 | 0.530 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.945 A  | COLLAPSE PRESSURE     |       |       |                               | 14130 | 16700 | 19270 | 20560 | 20560 | 21840 | 23130 | 24410 | 25700 | 26980 | 28270 | 28270 | 30840 | 32120 | 33410 | 34690 |
|       | 2.440 ID | BODY YIELD STRENGTH   |       |       |                               | 272   | 321   | 371   | 396   | 396   | 420   | 445   | 470   | 495   | 519   | 544   | 544   | 593   | 618   | 643   | 668   |
|       | 2.315 DD | API INTERNAL PRESSURE |       |       |                               | 14580 | 17230 | 19880 | 21200 | 21200 | 22530 | 23850 | 25180 | 26500 | 27830 | 29150 | 29150 | 31800 | 33130 | 34450 | 35780 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 13300 | 15700 | 18200 | 19400 | 19400 | 20600 | 21800 | 23000 | 24200 | 25400 | 26700 | 26700 | 29100 | 30300 | 31500 | 32700 |
| 4.000 | 0.00     | 9.50                  | 9.12  | 0.226 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 2.680 A  | COLLAPSE PRESSURE     |       |       |                               | 5110  | 5750  | 6320  | 6590  | 6590  | 6830  | 7080  | 7310  | 7520  | 7720  | 7910  | 7910  | 8230  | 8390  | 8520  | 8630  |
|       | 3.548 ID | BODY YIELD STRENGTH   |       |       |                               | 147   | 174   | 201   | 214   | 214   | 228   | 241   | 255   | 268   | 281   | 295   | 295   | 322   | 335   | 348   | 362   |
|       | 3.423 DD | API INTERNAL PRESSURE |       |       |                               | 5440  | 6430  | 7420  | 7910  | 7910  | 8400  | 8900  | 9390  | 9890  | 10380 | 10880 | 10880 | 11870 | 12360 | 12850 | 13350 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 5000  | 5900  | 6800  | 7200  | 7200  | 7700  | 8100  | 8600  | 9000  | 9500  | 9900  | 9900  | 10800 | 11300 | 11800 | 12200 |
| 4.000 | 11.00    | 11.00                 | 10.47 | 0.262 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.077 A  | COLLAPSE PRESSURE     |       |       |                               | 6590  | 7510  | 8380  | 8900  | 8900  | 9200  | 9590  | 9980  | 10350 | 10710 | 11060 | 11060 | 11710 | 12030 | 12330 | 12610 |
|       | 3.476 ID | BODY YIELD STRENGTH   |       |       |                               | 169   | 200   | 231   | 246   | 246   | 262   | 277   | 292   | 308   | 323   | 338   | 338   | 369   | 385   | 400   | 415   |
|       | 3.351 DD | API INTERNAL PRESSURE |       |       |                               | 6300  | 7450  | 8600  | 9170  | 9170  | 9740  | 10320 | 10890 | 11460 | 12040 | 12610 | 12610 | 13760 | 14330 | 14900 | 15470 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 5900  | 6800  | 7900  | 8400  | 8400  | 8900  | 9400  | 10000 | 10500 | 11000 | 11500 | 11500 | 12600 | 13100 | 13600 | 14100 |
| 4.000 | 11.60    | 11.60                 | 11.35 | 0.286 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.337 A  | COLLAPSE PRESSURE     |       |       |                               | 7300  | 8630  | 9760  | 10280 | 10280 | 10770 | 11270 | 11760 | 12240 | 12700 | 13160 | 13160 | 14030 | 14460 | 14870 | 15270 |
|       | 3.428 ID | BODY YIELD STRENGTH   |       |       |                               | 184   | 217   | 250   | 267   | 267   | 284   | 300   | 317   | 334   | 350   | 367   | 367   | 400   | 417   | 434   | 450   |
|       | 3.303 DD | API INTERNAL PRESSURE |       |       |                               | 6880  | 8130  | 9380  | 10010 | 10010 | 10640 | 11260 | 11890 | 12510 | 13140 | 13760 | 13760 | 15020 | 15640 | 16270 | 16890 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 6300  | 7400  | 8600  | 9200  | 9200  | 9700  | 10300 | 10900 | 11400 | 12000 | 12600 | 12600 | 13700 | 14300 | 14900 | 15400 |
| 4.000 | 13.40    | 13.20                 | 12.95 | 0.330 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.805 A  | COLLAPSE PRESSURE     |       |       |                               | 8330  | 9840  | 11350 | 12110 | 12110 | 12870 | 13620 | 14380 | 15140 | 15900 | 16650 | 16650 | 18170 | 18910 | 19530 | 20140 |
|       | 3.340 ID | BODY YIELD STRENGTH   |       |       |                               | 209   | 247   | 285   | 304   | 304   | 323   | 342   | 361   | 381   | 400   | 419   | 419   | 457   | 476   | 495   | 514   |
|       | 3.215 DD | API INTERNAL PRESSURE |       |       |                               | 7940  | 9380  | 10830 | 11550 | 11550 | 12270 | 12990 | 13720 | 14440 | 15160 | 15880 | 15880 | 17330 | 18050 | 18770 | 19490 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 7300  | 8600  | 9900  | 10600 | 10600 | 11200 | 11900 | 12590 | 13200 | 13900 | 14500 | 14500 | 15800 | 16500 | 17200 | 17800 |
| 4.000 | 14.80    | 14.80                 | 14.71 | 0.380 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.322 A  | COLLAPSE PRESSURE     |       |       |                               | 9460  | 11180 | 12900 | 13760 | 13760 | 14620 | 15480 | 16340 | 17200 | 18050 | 18910 | 18910 | 20630 | 21490 | 22350 | 23210 |
|       | 3.240 ID | BODY YIELD STRENGTH   |       |       |                               | 238   | 281   | 324   | 346   | 346   | 367   | 389   | 411   | 432   | 454   | 475   | 475   | 519   | 540   | 562   | 583   |
|       | 3.115 DD | API INTERNAL PRESSURE |       |       |                               | 9140  | 10810 | 12470 | 13300 | 13300 | 14130 | 14960 | 15790 | 16630 | 17460 | 18290 | 18290 | 19950 | 20780 | 21610 | 22440 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 8400  | 9900  | 11400 | 12200 | 12200 | 12900 | 13700 | 14400 | 15200 | 16000 | 16700 | 16700 | 18200 | 19000 | 19800 | 20500 |
| 4.000 | 16.10    | 16.10                 | 15.90 | 0.415 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.674 A  | COLLAPSE PRESSURE     |       |       |                               | 10230 | 12090 | 13950 | 14880 | 14880 | 15810 | 16740 | 17670 | 18600 | 19530 | 20460 | 20460 | 22320 | 23250 | 24180 | 25110 |
|       | 3.170 ID | BODY YIELD STRENGTH   |       |       |                               | 257   | 304   | 351   | 374   | 374   | 397   | 421   | 444   | 467   | 491   | 514   | 514   | 561   | 584   | 608   | 631   |
|       | 3.045 DD | API INTERNAL PRESSURE |       |       |                               | 9990  | 11800 | 13620 | 14530 | 14530 | 15430 | 16340 | 17250 | 18160 | 19060 | 19970 | 19970 | 21790 | 22700 | 23600 | 24510 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 9100  | 10800 | 12500 | 13300 | 13300 | 14100 | 14900 | 15800 | 16600 | 17400 | 18300 | 18300 | 19900 | 20800 | 21600 | 22400 |
| 4.000 | 19.00    | 18.90                 | 18.71 | 0.500 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 5.498 A  | COLLAPSE PRESSURE     |       |       |                               | 12030 | 14220 | 16410 | 17590 | 17590 | 18590 | 19690 | 20780 | 21880 | 22970 | 24060 | 24060 | 26250 | 27340 | 28440 | 29530 |
|       | 3.000 ID | BODY YIELD STRENGTH   |       |       |                               | 302   | 357   | 412   | 440   | 440   | 467   | 495   | 522   | 550   | 577   | 605   | 605   | 660   | 687   | 715   | 742   |
|       | 2.875 DD | API INTERNAL PRESSURE |       |       |                               | 12030 | 14220 | 16410 | 17590 | 17590 | 18590 | 19690 | 20780 | 21880 | 22970 | 24060 | 24060 | 26250 | 27340 | 28440 | 29530 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 11000 | 13000 | 15000 | 16000 | 16000 | 17000 | 18000 | 19000 | 20000 | 21000 | 22000 | 22000 | 24000 | 25000 | 26000 | 27000 |
| 4.000 | 21.10    | 21.10                 | 20.65 | 0.562 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 6.070 A  | COLLAPSE PRESSURE     |       |       |                               | 13280 | 15700 | 18110 | 19320 | 19320 | 20530 | 21740 | 22940 | 24150 | 25360 | 26570 | 26570 | 28980 | 30190 | 31400 | 32610 |
|       | 2.876 ID | BODY YIELD STRENGTH   |       |       |                               | 334   | 395   | 455   | 486   | 486   | 516   | 546   | 577   | 607   | 637   | 668   | 668   | 728   | 759   | 789   | 819   |
|       | 2.751 DD | API INTERNAL PRESSURE |       |       |                               | 13520 | 15980 | 18440 | 19670 | 19670 | 20900 | 22130 | 23360 | 24590 | 25820 | 27050 | 27050 | 29510 | 30730 | 31960 | 33190 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 12400 | 14600 | 16900 | 18000 | 18000 | 19100 | 20200 | 21400 | 22500 | 23600 | 24700 | 24700 | 27000 | 28100 | 29200 | 30300 |
| 4.000 | 22.50    | 22.20                 | 22.11 | 0.610 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 6.496 A  | COLLAPSE PRESSURE     |       |       |                               | 14220 | 16800 | 19390 | 20680 | 20680 | 21970 | 23260 | 24560 | 25850 | 27140 | 28430 | 28430 | 31020 | 32310 | 33600 | 34900 |
|       | 2.780 ID | BODY YIELD STRENGTH   |       |       |                               | 357   | 422   | 487   | 520   | 520   | 552   | 585   | 617   | 650   | 682   | 715   | 715   | 780   | 812   | 844   | 877   |
|       | 2.655 DD | API INTERNAL PRESSURE |       |       |                               | 14680 | 17350 | 20020 | 21350 | 21350 | 22680 | 24020 | 25350 | 26690 | 28020 | 29360 | 29360 | 32030 | 33360 | 34690 | 36030 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 13400 | 15900 | 18300 | 19500 | 19500 | 20700 | 22000 | 23200 | 24400 | 25600 | 26800 | 26800 | 29300 | 30500 | 31700 | 32900 |
| 4.500 | 0.00     | 10.50                 | 10.24 | 0.224 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.009 A  | COLLAPSE PRESSURE     |       |       |                               | 4010  | 4430  | 4780  | 4940  | 4940  | 5070  | 5200  | 5310  | 5410  | 5490  | 5560  | 5560  | 5720  | 5830  | 5930  | 6030  |
|       | 4.052 ID | BODY YIELD STRENGTH   |       |       |                               | 165   | 196   | 226   | 241   | 241   | 256   | 271   | 286   | 301   | 316   | 331   | 331   | 361   | 376   | 391   | 406   |
|       | 3.927 DD | API INTERNAL PRESSURE |       |       |                               | 4790  | 5660  | 6530  | 6970  | 6970  | 7400  | 7840  | 8280  | 8710  | 9150  | 9580  | 9580  | 10450 | 10890 | 11320 | 11760 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 4400  | 5200  | 6000  | 6400  | 6400  | 6800  | 7200  | 7600  | 8000  | 8400  | 8800  | 8800  | 9600  | 10000 | 10400 | 10800 |

|       |          |                       |       |       | MINIMUM YIELD STRENGTH, KSI   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|----------|-----------------------|-------|-------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |          |                       |       |       | 55                            | 65    | 75    | 80    | 80    | 85    | 90    | 95    | 100   | 105   | 110   | 110   | 120   | 125   | 130   | 135   |       |
|       |          |                       |       |       | MINIMUM TENSILE STRENGTH, KSI |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       |          |                       |       |       | 75                            | 85    | 95    | 95    | 100   | 100   | 100   | 105   | 110   | 120   | 120   | 125   | 130   | 135   | 140   | 145   |       |
| DIA   | WEIGHT   |                       |       |       | GRADE                         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | WNU      | WN                    | WPE   | WALL  | J-55                          | M-65  | 75    | L-80  | N-80  | 85    | C-90  | T-95  | 100   | 105   | C-110 | P-110 | 120   | Q-125 | 130   | 135   |       |
| 4.500 | 0.00     | 11.00                 | 10.80 | 0.237 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.174 A  | COLLAPSE PRESSURE     |       |       |                               | 4480  | 4990  | 5440  | 5650  | 5650  | 5830  | 6010  | 6170  | 6320  | 6450  | 6570  | 6570  | 6750  | 6830  | 6900  | 6900  |
|       | 4.026 ID | BODY YIELD STRENGTH   |       |       |                               | 175   | 206   | 238   | 254   | 254   | 270   | 286   | 302   | 317   | 333   | 349   | 349   | 381   | 397   | 413   | 428   |
|       | 3.901 DO | API INTERNAL PRESSURE |       |       |                               | 5070  | 5990  | 6910  | 7370  | 7370  | 7830  | 8300  | 8760  | 9220  | 9680  | 10140 | 10140 | 11060 | 11520 | 11980 | 12440 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 4600  | 5500  | 6300  | 6700  | 6700  | 7200  | 7600  | 8000  | 8400  | 8800  | 9300  | 9300  | 10100 | 10500 | 11000 | 11400 |
| 4.500 | 11.60    | 11.60                 | 11.36 | 0.250 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.338 A  | COLLAPSE PRESSURE     |       |       |                               | 4960  | 5560  | 6100  | 6360  | 6360  | 6590  | 6810  | 7030  | 7230  | 7410  | 7580  | 7580  | 7870  | 8000  | 8120  | 8210  |
|       | 4.000 ID | BODY YIELD STRENGTH   |       |       |                               | 184   | 217   | 250   | 267   | 267   | 284   | 300   | 317   | 334   | 350   | 367   | 367   | 401   | 417   | 434   | 451   |
|       | 3.875 DO | API INTERNAL PRESSURE |       |       |                               | 5350  | 6320  | 7290  | 7780  | 7780  | 8260  | 8750  | 9240  | 9720  | 10210 | 10690 | 10690 | 11670 | 12150 | 12640 | 13130 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 4900  | 5800  | 6700  | 7100  | 7100  | 7600  | 8000  | 8400  | 8900  | 9300  | 9800  | 9800  | 10700 | 11100 | 11600 | 12000 |
| 4.500 | 12.75    | 12.60                 | 12.25 | 0.271 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.600 A  | COLLAPSE PRESSURE     |       |       |                               | 5730  | 6480  | 7170  | 7500  | 7500  | 7810  | 8120  | 8410  | 8690  | 8960  | 9210  | 9210  | 9670  | 9890  | 10100 | 10280 |
|       | 3.958 ID | BODY YIELD STRENGTH   |       |       |                               | 198   | 234   | 270   | 288   | 288   | 306   | 324   | 342   | 360   | 378   | 396   | 396   | 432   | 450   | 468   | 486   |
|       | 3.833 DO | API INTERNAL PRESSURE |       |       |                               | 5800  | 6850  | 7900  | 8430  | 8430  | 8960  | 9490  | 10010 | 10540 | 11070 | 11590 | 11590 | 12650 | 13170 | 13700 | 14230 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 5300  | 6300  | 7200  | 7700  | 7700  | 8200  | 8700  | 9200  | 9600  | 10100 | 10600 | 10600 | 11600 | 12000 | 12500 | 13000 |
| 4.500 | 13.50    | 13.50                 | 13.05 | 0.290 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 3.836 A  | COLLAPSE PRESSURE     |       |       |                               | 6420  | 7310  | 8140  | 8540  | 8540  | 8920  | 9300  | 9660  | 10020 | 10360 | 10690 | 10690 | 11300 | 11600 | 11880 | 12150 |
|       | 3.920 ID | BODY YIELD STRENGTH   |       |       |                               | 211   | 249   | 288   | 307   | 307   | 326   | 345   | 364   | 384   | 403   | 422   | 422   | 460   | 480   | 499   | 518   |
|       | 3.795 DO | API INTERNAL PRESSURE |       |       |                               | 6200  | 7330  | 8460  | 9020  | 9020  | 9590  | 10150 | 10710 | 11280 | 11840 | 12410 | 12410 | 13530 | 14100 | 14660 | 15230 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 5700  | 6700  | 7700  | 8200  | 8200  | 8800  | 9300  | 9800  | 10300 | 10800 | 11300 | 11300 | 12400 | 12900 | 13400 | 13900 |
| 4.500 | 15.50    | 15.20                 | 15.00 | 0.337 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.407 A  | COLLAPSE PRESSURE     |       |       |                               | 7620  | 9010  | 10390 | 11080 | 11080 | 11660 | 12220 | 12760 | 13300 | 13820 | 14340 | 14340 | 15340 | 15830 | 16310 | 16770 |
|       | 3.826 ID | BODY YIELD STRENGTH   |       |       |                               | 242   | 286   | 331   | 353   | 353   | 375   | 397   | 419   | 441   | 463   | 485   | 485   | 529   | 551   | 573   | 595   |
|       | 3.701 DO | API INTERNAL PRESSURE |       |       |                               | 7210  | 8520  | 9830  | 10480 | 10480 | 11140 | 11800 | 12450 | 13110 | 13760 | 14420 | 14420 | 15730 | 16380 | 17040 | 17690 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 6600  | 7800  | 9000  | 9600  | 9600  | 10200 | 10800 | 11400 | 12000 | 12600 | 13200 | 13200 | 14400 | 15000 | 15600 | 16200 |
| 4.500 | 17.00    | 17.00                 | 16.74 | 0.380 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 4.918 A  | COLLAPSE PRESSURE     |       |       |                               | 8500  | 10060 | 11600 | 12370 | 12370 | 13140 | 13920 | 14690 | 15460 | 16240 | 17010 | 17010 | 18560 | 19330 | 20100 | 20870 |
|       | 3.740 ID | BODY YIELD STRENGTH   |       |       |                               | 270   | 320   | 369   | 393   | 393   | 418   | 443   | 467   | 492   | 516   | 541   | 541   | 590   | 615   | 639   | 664   |
|       | 3.615 DO | API INTERNAL PRESSURE |       |       |                               | 8130  | 9610  | 11080 | 11820 | 11820 | 12560 | 13300 | 14040 | 14780 | 15520 | 16260 | 16260 | 17730 | 18470 | 19210 | 19950 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 7400  | 8800  | 10100 | 10800 | 10800 | 11500 | 12200 | 12900 | 13600 | 14300 | 14900 | 14900 | 16200 | 16900 | 17600 | 18200 |
| 4.500 | 19.20    | 18.90                 | 18.71 | 0.430 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 5.498 A  | COLLAPSE PRESSURE     |       |       |                               | 9510  | 11240 | 12960 | 13830 | 13830 | 14690 | 15560 | 16420 | 17280 | 18150 | 19010 | 19010 | 20740 | 21610 | 22470 | 23330 |
|       | 3.640 ID | BODY YIELD STRENGTH   |       |       |                               | 302   | 357   | 412   | 440   | 440   | 467   | 495   | 522   | 550   | 577   | 605   | 605   | 660   | 687   | 715   | 742   |
|       | 3.515 DO | API INTERNAL PRESSURE |       |       |                               | 9200  | 10870 | 12540 | 13380 | 13380 | 14210 | 15050 | 15890 | 16720 | 17560 | 18390 | 18390 | 20070 | 20900 | 21740 | 22580 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 8400  | 9900  | 11500 | 12200 | 12200 | 13000 | 13800 | 14600 | 15300 | 16100 | 16800 | 16800 | 18300 | 19100 | 19900 | 20600 |
| 4.500 | 21.60    | 21.50                 | 21.38 | 0.500 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 6.283 A  | COLLAPSE PRESSURE     |       |       |                               | 10860 | 12840 | 14810 | 15800 | 15800 | 16790 | 17780 | 18770 | 19750 | 20740 | 21730 | 21730 | 23700 | 24690 | 25680 | 26670 |
|       | 3.500 ID | BODY YIELD STRENGTH   |       |       |                               | 346   | 408   | 471   | 503   | 503   | 534   | 565   | 597   | 628   | 660   | 691   | 691   | 754   | 785   | 817   | 848   |
|       | 3.375 DO | API INTERNAL PRESSURE |       |       |                               | 10690 | 12640 | 14580 | 15560 | 15560 | 16530 | 17500 | 18470 | 19440 | 20420 | 21390 | 21390 | 23330 | 24310 | 25280 | 26250 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 9800  | 11600 | 13300 | 14200 | 14200 | 15100 | 16000 | 16900 | 17800 | 18700 | 19600 | 19600 | 21300 | 22200 | 23100 | 24000 |
| 4.500 | 24.60    | 23.70                 | 23.59 | 0.560 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 6.932 A  | COLLAPSE PRESSURE     |       |       |                               | 11990 | 14160 | 16340 | 17430 | 17430 | 18520 | 19610 | 20700 | 21790 | 22880 | 23970 | 23970 | 26150 | 27240 | 28330 | 29420 |
|       | 3.380 ID | BODY YIELD STRENGTH   |       |       |                               | 381   | 451   | 520   | 555   | 555   | 589   | 624   | 659   | 693   | 728   | 763   | 763   | 832   | 867   | 901   | 936   |
|       | 3.255 DO | API INTERNAL PRESSURE |       |       |                               | 11980 | 14160 | 16330 | 17420 | 17420 | 18510 | 19600 | 20690 | 21780 | 22870 | 23960 | 23960 | 26130 | 27220 | 28310 | 29400 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 11000 | 12900 | 14900 | 15900 | 15900 | 16900 | 17900 | 18900 | 19900 | 20900 | 21900 | 21900 | 23900 | 24900 | 25900 | 26900 |
| 4.500 | 26.50    | 26.10                 | 26.06 | 0.630 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|       | 7.660 A  | COLLAPSE PRESSURE     |       |       |                               | 13240 | 15650 | 18060 | 19260 | 19260 | 20470 | 21670 | 22880 | 24080 | 25280 | 26490 | 26490 | 28900 | 30100 | 31300 | 32510 |
|       | 3.240 ID | BODY YIELD STRENGTH   |       |       |                               | 421   | 498   | 575   | 613   | 613   | 651   | 689   | 728   | 766   | 804   | 843   | 843   | 919   | 958   | 996   | 1034  |
|       | 3.115 DO | API INTERNAL PRESSURE |       |       |                               | 13480 | 15930 | 18380 | 19600 | 19600 | 20830 | 22050 | 23280 | 24500 | 25730 | 26950 | 26950 | 29400 | 30630 | 31850 | 33080 |
|       | SD       | TEST PRESS 80%        |       |       |                               | 12300 | 14600 | 16800 | 17900 | 17900 | 19000 | 20200 | 21300 | 22400 | 23500 | 24600 | 24600 | 26900 | 28000 | 29100 | 30200 |