

 **INSUMEX**<sup>®</sup>  
Insumos y Bienes de México S.A. DE C.V.  
*Tuberías, Válvulas y Conexiones*

# TUBERÍA SIN COSTURA

Esta tubería no tiene un proceso de soldado por lo cual no tiene una costura. Por sus características se considera tener mayor resistencia que la tubería con costura sin embargo esto es sólo en algunas aplicaciones específicas.

La tubería de Acero al Carbón sin costura laminada en caliente tiene diversas aplicaciones industriales estructurales como en maquinaria pesada, cilindros hidráulicos, maquinaria agrícola, la industria minera, la construcción, el uso estructural y aplicaciones mecánicas. En la tubería de conducción, en general sus usos son para fluidos como agua, aire, gases, vapor y usos mecánicos.



La tubería sin costura es una tubería hecha en una sola pieza, sin uniones ni soldaduras, lo que da como resultado tubería diseñada para usos que requieren una calidad y una especificación determinada, como son los usos de conducción de fluidos y gases en la industria química y petroquímica, así como en el área de la construcción.

# TUBERÍA CON COSTURA



La costura se refiere al soldado que recibe la placa al ser rolada para dar forma a la tubería. Es una especie de cicatriz que el tubo tiene debido al proceso de soldado que recibe; usualmente es eléctrico o ERW.

Puede tener aplicaciones estructurales como espacios tubulares, pilotes, puentes, anuncios, estructuras menores, chaquetas, encamisados, torres de alta tensión y anuncios panorámicos. Se utilizan en casi cualquier tipo de industria como la construcción, petroquímica, azucarera, energía, cervecera, química, alimenticia, farmacéutica, tequilera, organismos de agua, minería, entre otras. La costura puede ser recta o longitudinal, helicoidal o espiral y doble arco sumergido.

# TUBERÍA GALVANIZADA

La tubería de Acero Galvanizado es una tubería de acero (estirado o con soldadura), como en el caso anterior, pero que se le ha sometido a un proceso de galvanizado interior y exterior. El galvanizado se aplica después de formado el tubo. Al igual que la de Acero al Carbón, se dobla la placa a los diámetros que se requiera. Existen con costura y sin costura y se utiliza para transportar agua potable, gases o aceites.

En diámetro de 1/2"-6"

En cédulas comerciales: 20, 30, 40, 80.

# TUBERÍA ESTRUCTURAL CÉDULA 30 Y 40

Es una tubería derivada de la lámina comercial. Se fabrica bajo los mismos procesos que la tubería con costura. La diferencia se determina en el grado de Acero y que no cuenta con una prueba hidrostática, por lo cual no se recomienda para el transporte de fluidos. Su uso está enfocado al mercado comercial y convencional para estructuras ligeradas y de uso variado.

En diámetros de 3/4"-6" Ced 30

1/2"-12" Ced 40



# TUBERÍA

## DATOS TÉCNICOS

Diámetros de fabricación: 1/4"-36"  
En cédulas comerciales: 20, 40, 80, STD, XH y XXH.  
Tubería fabricada bajo diferentes Normas: A-53 / A-106 / API 5L.  
Los grados para ASTM-53 y ASTM-106 son: Gr. A / Gr. B / Gr. C.  
Los grados para API 5L son: Gr. B / X-42 / X-46 / X-52 / X-56 / X-60 / X-65 / X-70

Soldadura Longitudinal (ERW), Helicoidal (SSAW) y Doble Arco Sumergido (DSAW).  
Tubería fabricada bajo diferentes Normas: ASTM-53 / API 5L.  
Los grados para ASTM-53 son: Gr. A / Gr. B / Gr. C.  
Los grados para API 5L son: Gr. B / X-42 / X-46 / X-52 / X-56 / X-60 / X-65 / X-70 / X-80.  
Diámetros de fabricación: 1/4" - 80"  
Fabricadas en cédulas comerciales y cualquier espesor deseado.



**SIN COSTURA**



**CON COSTURA**

# PESOS & DIMENSIONES

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |      | ESPESOR DE PARED |       | CÉDULA | PESO  |      |
|------------------|-------------------|------|------------------|-------|--------|-------|------|
|                  | in                | mm   | in               | mm    |        | Lb/ft | Kg/m |
| 1/8              | 0.405             | 10.3 | 0.035            | 0.89  | 5      | 0.14  | 0.21 |
|                  |                   |      | 0.049            | 1.24  | 10     | 0.19  | 0.28 |
|                  |                   |      | 0.068            | 1.73  | 40 STD | 0.24  | 0.36 |
|                  |                   |      | 0.095            | 2.41  | 80 XS  | 0.31  | 0.47 |
|                  |                   |      |                  |       |        |       |      |
| 1/4              | 0.540             | 13.7 | 0.049            | 1.24  | 5      | 0.26  | 0.38 |
|                  |                   |      | 0.065            | 1.65  | 10     | 0.33  | 0.49 |
|                  |                   |      | 0.088            | 2.24  | 40 STD | 0.43  | 0.63 |
|                  |                   |      | 0.119            | 3.02  | 80 XS  | 0.54  | 0.80 |
|                  |                   |      |                  |       |        |       |      |
| 3/8              | 0.675             | 17.1 | 0.049            | 1.24  | 5      | 0.33  | 0.49 |
|                  |                   |      | 0.065            | 1.65  | 10     | 0.42  | 0.63 |
|                  |                   |      | 0.091            | 2.31  | 40 STD | 0.57  | 0.85 |
|                  |                   |      | 0.126            | 3.20  | 80 XS  | 0.74  | 1.10 |
|                  |                   |      |                  |       |        |       |      |
| 1/2              | 0.840             | 21.3 | 0.065            | 1.65  | 5 5S   | 0.54  | 0.80 |
|                  |                   |      | 0.083            | 2.11  | 10 10S | 0.67  | 1.00 |
|                  |                   |      | 0.109            | 2.77  | 40 STD | 0.85  | 1.27 |
|                  |                   |      | 0.147            | 3.73  | 80 XS  | 1.09  | 1.62 |
|                  |                   |      | 0.188            | 4.78  | 160    | 1.31  | 1.95 |
|                  |                   |      | 0.294            | 7.47  | XXS    | 1.72  | 2.55 |
|                  |                   |      |                  |       |        |       |      |
| 3/4              | 1.050             | 26.7 | 0.065            | 1.65  | 5 5S   | 0.68  | 1.02 |
|                  |                   |      | 0.083            | 2.11  | 10 10S | 0.86  | 1.28 |
|                  |                   |      | 0.113            | 2.87  | 40 STD | 1.13  | 1.68 |
|                  |                   |      | 0.154            | 3.91  | 80 XS  | 1.48  | 2.20 |
|                  |                   |      | 0.219            | 5.56  | 160    | 1.95  | 2.90 |
|                  |                   |      | 0.308            | 7.82  | XXS    | 2.44  | 3.64 |
|                  |                   |      |                  |       |        |       |      |
| 1                | 1.315             | 33.4 | 0.065            | 1.65  | 5 5S   | 0.87  | 1.29 |
|                  |                   |      | 0.109            | 2.77  | 10 10S | 1.41  | 2.09 |
|                  |                   |      | 0.133            | 3.38  | 40 STD | 1.68  | 2.50 |
|                  |                   |      | 0.179            | 4.55  | 80 XS  | 2.17  | 3.24 |
|                  |                   |      | 0.250            | 6.35  | 160    | 2.85  | 4.24 |
|                  |                   |      | 0.358            | 9.09  | XXS    | 3.66  | 5.45 |
| 1 1/4            | 1.660             | 42.2 | 0.065            | 1.65  | 5 5S   | 0.87  | 1.29 |
|                  |                   |      | 0.109            | 2.77  | 10 10S | 1.41  | 2.09 |
|                  |                   |      | 0.140            | 3.56  | 40 STD | 2.27  | 3.39 |
|                  |                   |      | 0.191            | 4.85  | 80 XS  | 3.00  | 4.46 |
|                  |                   |      | 0.250            | 6.35  | 160    | 3.77  | 5.61 |
|                  |                   |      | 0.382            | 9.70  | XXS    | 5.22  | 7.77 |
| 1 1/2            | 1.900             | 48.3 | 0.065            | 1.65  | 5 5S   | 1.28  | 1.90 |
|                  |                   |      | 0.109            | 2.77  | 10 10S | 2.09  | 3.11 |
|                  |                   |      | 0.145            | 3.68  | 40 STD | 2.72  | 4.05 |
|                  |                   |      | 0.200            | 5.08  | 80 XS  | 3.63  | 5.41 |
|                  |                   |      | 0.281            | 7.14  | 160    | 4.86  | 7.24 |
|                  |                   |      | 0.400            | 10.16 | XXS    | 6.41  | 9.55 |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |        | ESPESOR DE PARED |       | CÉDULA | PESO  |       |        |      |      |
|------------------|-------------------|--------|------------------|-------|--------|-------|-------|--------|------|------|
|                  | in                | mm     | in               | mm    |        | Lb/ft | Kg/m  |        |      |      |
| 2                | 2.375             | 60.3   | 0.065            | 1.65  | 5 5S   | 1.61  | 2.39  |        |      |      |
|                  |                   |        | 0.109            | 2.77  | 10 10S | 2.64  | 3.93  |        |      |      |
|                  |                   |        | 0.154            | 3.91  | 40 STD | 3.66  | 5.44  |        |      |      |
|                  |                   |        | 0.172            | 4.37  |        | 4.05  | 6.03  |        |      |      |
|                  |                   |        | 0.188            | 4.78  |        | 4.40  | 6.54  |        |      |      |
|                  |                   |        | 0.218            | 5.54  | 80 XS  | 5.03  | 7.48  |        |      |      |
|                  |                   |        | 0.250            | 6.35  |        | 5.68  | 8.45  |        |      |      |
|                  |                   |        | 0.281            | 7.14  |        | 6.29  | 9.36  |        |      |      |
|                  |                   |        | 0.344            | 8.74  | 160    | 7.47  | 11.12 |        |      |      |
|                  |                   |        | 0.436            | 11.07 | XXS    | 9.04  | 13.45 |        |      |      |
|                  |                   |        | 2 1/2            | 2.875 | 73.0   | 0.083 | 2.11  | 5 5S   | 2.48 | 3.69 |
| 0.120            | 3.05              | 10 10S |                  |       |        | 3.53  | 5.26  |        |      |      |
| 0.203            | 5.16              | 40 STD |                  |       |        | 5.80  | 8.63  |        |      |      |
| 0.216            | 5.49              |        |                  |       |        | 6.14  | 9.14  |        |      |      |
| 0.250            | 6.35              |        |                  |       |        | 7.02  | 10.44 |        |      |      |
| 0.276            | 7.01              | 80 XS  |                  |       |        | 7.67  | 11.41 |        |      |      |
| 0.375            | 9.53              | 160    |                  |       |        | 10.02 | 14.92 |        |      |      |
| 0.552            | 14.02             | XXS    |                  |       |        | 13.71 | 20.40 |        |      |      |
| 3                | 3.500             | 88.9   |                  |       |        | 0.083 | 2.11  | 5 5S   | 3.03 | 4.51 |
|                  |                   |        |                  |       |        | 0.120 | 3.05  | 10 10S | 4.34 | 6.45 |
|                  |                   |        |                  |       |        | 0.125 | 3.18  |        | 4.51 | 6.71 |
|                  |                   |        | 0.156            | 3.96  |        | 5.58  | 8.30  |        |      |      |
|                  |                   |        | 0.188            | 4.78  |        | 6.66  | 9.91  |        |      |      |
|                  |                   |        | 0.216            | 5.49  | 40 STD | 7.58  | 11.29 |        |      |      |
|                  |                   |        | 0.250            | 6.35  |        | 8.69  | 12.93 |        |      |      |
|                  |                   |        | 0.281            | 7.14  |        | 9.67  | 14.39 |        |      |      |
|                  |                   |        | 0.300            | 7.62  | 80 XS  | 10.26 | 15.27 |        |      |      |
|                  |                   |        | 0.438            | 11.13 | 160    | 14.34 | 21.34 |        |      |      |
|                  |                   |        | 0.600            | 15.24 | XXS    | 18.60 | 27.68 |        |      |      |
| 3 1/2            | 4.000             | 101.6  | 0.083            | 2.11  | 5 5S   | 3.48  | 5.17  |        |      |      |
|                  |                   |        | 0.120            | 3.05  | 10 10S | 4.98  | 7.41  |        |      |      |
|                  |                   |        | 0.125            | 3.18  |        | 5.18  | 7.71  |        |      |      |
|                  |                   |        | 0.156            | 3.96  |        | 6.41  | 9.54  |        |      |      |
|                  |                   |        | 0.188            | 4.78  |        | 7.66  | 11.40 |        |      |      |
|                  |                   |        | 0.226            | 5.74  | 40 STD | 9.12  | 13.57 |        |      |      |
|                  |                   |        | 0.250            | 6.35  |        | 10.02 | 14.92 |        |      |      |
|                  |                   |        | 0.281            | 7.14  |        | 11.17 | 16.63 |        |      |      |
|                  |                   |        | 0.318            | 8.08  | 80 XS  | 12.52 | 18.63 |        |      |      |
|                  |                   |        | 0.636            | 16.15 | XXS    | 22.87 | 34.04 |        |      |      |
|                  |                   |        | 4                | 4.500 | 114.3  | 0.083 | 2.11  | 5 5S   | 3.92 | 5.83 |
| 0.120            | 3.05              | 10 10S |                  |       |        | 5.62  | 8.36  |        |      |      |
| 0.125            | 3.18              |        |                  |       |        | 5.85  | 8.70  |        |      |      |
| 0.156            | 3.96              |        |                  |       |        | 7.24  | 10.78 |        |      |      |
| 0.188            | 4.78              |        |                  |       |        | 8.67  | 12.90 |        |      |      |
| 0.219            | 5.56              |        |                  |       |        | 10.02 | 14.92 |        |      |      |
| 0.237            | 6.02              | 40 STD |                  |       |        | 10.80 | 16.07 |        |      |      |
| 0.250            | 6.35              |        |                  |       |        | 11.36 | 16.90 |        |      |      |
| 0.281            | 7.14              | 60     |                  |       |        | 12.67 | 18.86 |        |      |      |
| 0.312            | 7.92              |        |                  |       |        | 13.97 | 20.79 |        |      |      |
| 0.337            | 8.56              | 80 XS  |                  |       |        | 15.00 | 22.32 |        |      |      |
| 4 1/2            | 5.000             | 127.0  | 0.438            | 11.13 | 120    | 19.02 | 28.31 |        |      |      |
|                  |                   |        | 0.531            | 13.49 | 160    | 22.53 | 33.53 |        |      |      |
|                  |                   |        | 0.674            | 17.12 | XXS    | 27.57 | 41.03 |        |      |      |
|                  |                   |        | 0.247            | 6.27  | 40 STD | 12.55 | 18.68 |        |      |      |
|                  |                   |        | 0.355            | 9.02  | 80 XS  | 17.63 | 26.23 |        |      |      |
|                  |                   |        | 0.710            | 18.03 | XXS    | 32.56 | 48.46 |        |      |      |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |       | ESPESOR DE PARED |       | CÉDULA | PESO   |       |
|------------------|-------------------|-------|------------------|-------|--------|--------|-------|
|                  | in                | mm    | in               | mm    |        | Lb/ft  | Kg/m  |
| 5                | 5.563             | 141.3 | 0.109            | 2.77  | 5 5S   | 6.36   | 9.46  |
|                  |                   |       | 0.125            | 3.18  |        | 7.27   | 10.81 |
|                  |                   |       | 0.134            | 3.40  |        | 10 10S | 7.78  |
|                  |                   |       | 0.156            | 3.96  | 9.02   |        | 13.42 |
|                  |                   |       | 0.188            | 4.78  | 40 STD | 10.80  | 16.08 |
|                  |                   |       | 0.219            | 5.56  |        | 12.51  | 18.62 |
|                  |                   |       | 0.258            | 6.55  |        | 14.63  | 21.78 |
|                  |                   |       | 0.281            | 7.14  |        | 15.87  | 23.61 |
|                  |                   |       | 0.312            | 7.92  |        | 17.51  | 26.06 |
|                  |                   |       | 0.344            | 8.74  |        | 19.19  | 28.56 |
|                  |                   |       | 0.375            | 9.53  | 80 XS  | 20.80  | 30.95 |
|                  |                   |       | 0.500            | 12.70 |        | 120    | 27.06 |
|                  |                   |       | 0.625            | 15.88 | 160    | 32.99  | 49.10 |
|                  |                   |       | 0.750            | 19.05 | XXS    | 38.59  | 57.43 |
| 6                | 6.625             | 168.3 | 0.109            | 2.77  | 5 5S   | 7.59   | 11.30 |
|                  |                   |       | 0.120            | 3.05  |        | 8.35   | 12.42 |
|                  |                   |       | 0.125            | 3.18  |        | 10 10S | 8.69  |
|                  |                   |       | 0.134            | 3.40  | 9.30   |        | 13.84 |
|                  |                   |       | 0.141            | 3.58  | 40 STD | 9.77   | 14.55 |
|                  |                   |       | 0.149            | 3.78  |        | 10.32  | 15.35 |
|                  |                   |       | 0.156            | 3.96  |        | 10.79  | 16.06 |
|                  |                   |       | 0.172            | 4.37  |        | 11.87  | 17.66 |
|                  |                   |       | 0.188            | 4.78  |        | 12.94  | 19.25 |
|                  |                   |       | 0.203            | 5.16  |        | 13.94  | 20.74 |
|                  |                   |       | 0.219            | 5.56  | 15.00  | 22.32  |       |
|                  |                   |       | 0.237            | 6.02  | 16.19  | 24.09  |       |
|                  |                   |       | 0.250            | 6.35  | 17.04  | 25.36  |       |
|                  |                   |       | 0.280            | 7.11  | 40 STD | 18.99  | 28.27 |
|                  |                   |       | 0.312            | 7.92  |        | 21.06  | 31.34 |
|                  |                   |       | 0.344            | 8.74  | 80 XS  | 23.10  | 34.38 |
|                  |                   |       | 0.375            | 9.53  |        | 25.06  | 37.29 |
|                  |                   |       | 0.432            | 10.97 | 80 XS  | 28.60  | 42.56 |
|                  |                   |       | 0.500            | 12.70 | 120    | 32.74  | 48.72 |
| 0.562            | 14.27             | 120   | 36.43            | 54.21 |        |        |       |
| 0.625            | 15.88             | 160   | 40.09            | 59.66 |        |        |       |
| 0.719            | 18.26             |       | 45.40            | 67.56 |        |        |       |
| 0.750            | 19.05             | 160   | 47.11            | 70.10 |        |        |       |
| 0.864            | 21.95             | XXS   | 53.21            | 79.19 |        |        |       |
| 0.875            | 22.23             | XXS   | 53.79            | 80.05 |        |        |       |
| 7                | 7.625             | 193.7 | 0.301            | 7.65  | STD    | 23.57  | 35.07 |
|                  |                   |       | 0.500            | 12.70 | XS     | 38.09  | 56.68 |
|                  |                   |       | 0.875            | 22.23 | XXS    | 63.14  | 93.97 |
| 8                | 8.625             | 219.1 | 0.105            | 2.67  | 5 5S   | 9.56   | 14.23 |
|                  |                   |       | 0.109            | 2.77  |        | 9.92   | 14.77 |
|                  |                   |       | 0.120            | 3.05  |        | 10.91  | 16.24 |
|                  |                   |       | 0.125            | 3.18  | 10 10S | 11.36  | 16.90 |
|                  |                   |       | 0.134            | 3.40  |        | 12.16  | 18.10 |
|                  |                   |       | 0.141            | 3.58  | 10 10S | 12.79  | 19.03 |
|                  |                   |       | 0.148            | 3.76  |        | 13.41  | 19.96 |
|                  |                   |       | 0.156            | 3.96  |        | 14.12  | 21.02 |
|                  |                   |       | 0.164            | 4.17  |        | 14.83  | 22.08 |
|                  |                   |       | 0.172            | 4.37  |        | 15.54  | 23.13 |
|                  |                   |       | 0.179            | 4.55  |        | 16.16  | 24.05 |
|                  |                   |       | 0.188            | 4.78  | 16.96  | 25.24  |       |
|                  |                   |       | 0.203            | 5.16  | 18.28  | 27.20  |       |
|                  |                   |       | 0.219            | 5.56  | 19.68  | 29.29  |       |



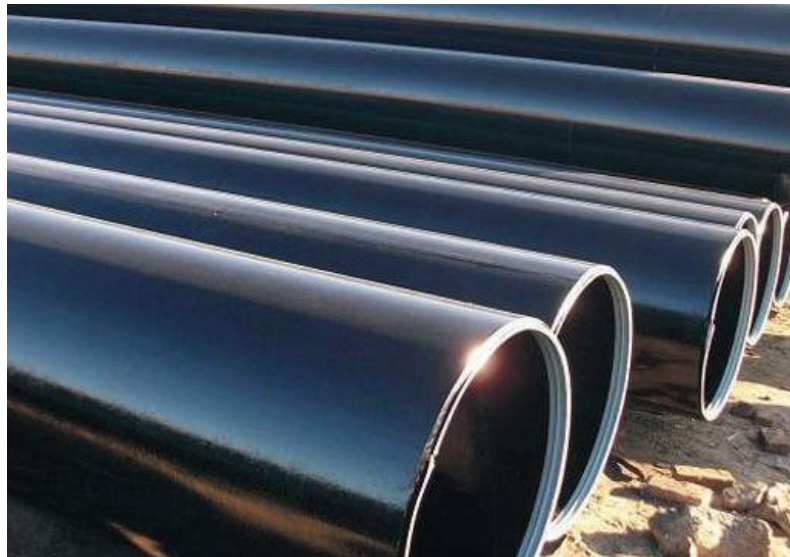
| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |         | ESPESOR DE PARED |        | CÉDULA | PESO  |        |
|------------------|-------------------|---------|------------------|--------|--------|-------|--------|
|                  | in                | mm      | in               | mm     |        | Lb/ft | Kg/m   |
| 8                | 8.625             | 219.1   | 0.237            | 6.02   |        | 21.25 | 31.63  |
|                  |                   |         | 0.250            | 6.35   | 20     | 22.38 | 33.31  |
|                  |                   |         | 0.277            | 7.04   | 30     | 24.72 | 36.79  |
|                  |                   |         | 0.312            | 7.92   |        | 27.73 | 41.26  |
|                  |                   |         | 0.322            | 8.18   | 40 STD | 28.58 | 42.54  |
|                  |                   |         | 0.344            | 8.74   |        | 30.45 | 45.32  |
|                  |                   |         | 0.375            | 9.53   |        | 33.07 | 49.22  |
|                  |                   |         | 0.406            | 10.31  | 60     | 35.67 | 53.09  |
|                  |                   |         | 0.438            | 11.13  |        | 38.34 | 57.05  |
|                  |                   |         | 0.500            | 12.70  | 80 XS  | 43.43 | 64.63  |
|                  |                   |         | 0.562            | 14.27  |        | 48.44 | 72.09  |
|                  |                   |         | 0.594            | 15.09  | 100    | 51.00 | 75.90  |
|                  |                   |         | 0.625            | 15.88  |        | 53.45 | 79.55  |
|                  |                   |         | 0.719            | 18.26  | 120    | 60.77 | 90.44  |
|                  |                   |         | 0.750            | 19.05  |        | 63.14 | 93.97  |
|                  |                   |         | 0.812            | 20.62  | 140    | 67.82 | 100.93 |
|                  |                   |         | 0.875            | 22.23  | XXS    | 72.50 | 107.89 |
| 0.906            | 23.01             | 160     | 74.77            | 111.26 |        |       |        |
| 1.000            | 25.40             |         | 81.52            | 121.31 |        |       |        |
| 9                | 9.625             | 244.5   | 0.342            | 8.69   | STD    | 33.94 | 50.51  |
|                  |                   |         | 0.500            | 12.70  | XS     | 48.78 | 72.59  |
| 10               | 10.750            | 273.1   | 0.134            | 3.40   | 5 5S   | 15.21 | 22.63  |
|                  |                   |         | 0.141            | 3.58   |        | 15.99 | 23.80  |
|                  |                   |         | 0.149            | 3.78   |        | 16.89 | 25.13  |
|                  |                   |         | 0.156            | 3.96   |        | 17.67 | 26.29  |
|                  |                   |         | 0.165            | 4.19   | 10 10S | 18.67 | 27.79  |
|                  |                   |         | 0.179            | 4.55   |        | 20.23 | 30.10  |
|                  |                   |         | 0.188            | 4.78   |        | 21.23 | 31.59  |
|                  |                   |         | 0.203            | 5.16   |        | 22.89 | 34.06  |
|                  |                   |         | 0.219            | 5.56   |        | 24.66 | 36.69  |
|                  |                   |         | 0.250            | 6.35   | 20     | 28.06 | 41.76  |
|                  |                   |         | 0.279            | 7.09   |        | 31.23 | 46.48  |
|                  |                   |         | 0.307            | 7.80   | 30     | 34.27 | 51.01  |
|                  |                   |         | 0.312            | 7.92   |        | 34.82 | 51.81  |
|                  |                   |         | 0.322            | 8.18   |        | 35.90 | 53.42  |
|                  |                   |         | 0.344            | 8.74   |        | 38.27 | 56.95  |
|                  |                   |         | 0.365            | 9.27   | 40 STD | 40.52 | 60.31  |
|                  |                   |         | 0.375            | 9.53   |        | 41.59 | 61.90  |
|                  |                   |         | 0.438            | 11.13  |        | 48.29 | 71.86  |
|                  |                   |         | 0.500            | 12.70  | 60 XS  | 54.79 | 81.54  |
|                  |                   |         | 0.562            | 14.27  |        | 61.21 | 91.09  |
| 0.594            | 15.09             | 80      | 64.49            | 95.98  |        |       |        |
| 0.625            | 15.88             |         | 67.65            | 100.68 |        |       |        |
| 0.719            | 18.26             | 100     | 77.11            | 114.74 |        |       |        |
| 0.812            | 20.62             |         | 86.27            | 128.39 |        |       |        |
| 0.844            | 21.44             | 120     | 89.38            | 133.02 |        |       |        |
| 0.875            | 22.23             |         | 92.38            | 137.47 |        |       |        |
| 0.938            | 23.83             |         | 98.39            | 146.43 |        |       |        |
| 1.000            | 25.40             | 140 XXS | 104.24           | 155.12 |        |       |        |
| 1.125            | 28.58             | 160     | 115.76           | 172.27 |        |       |        |
| 1.250            | 31.75             |         | 126.95           | 188.93 |        |       |        |
| 11               | 11.750            | 298.5   | 0.375            | 9.53   | STD    | 45.60 | 67.86  |
|                  |                   |         | 0.500            | 12.70  | XS     | 60.14 | 89.49  |
| 12               | 12.750            | 323.9   | 0.105            | 2.67   |        | 14.19 | 21.12  |
|                  |                   |         | 0.134            | 3.40   |        | 18.07 | 26.90  |
|                  |                   |         | 0.156            | 3.96   | 5S     | 21.00 | 31.26  |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |         | ESPESOR DE PARED |        | CÉDULA | PESO  |        |
|------------------|-------------------|---------|------------------|--------|--------|-------|--------|
|                  | in                | mm      | in               | mm     |        | Lb/ft | Kg/m   |
| 12               | 12.750            | 323.9   | 0.165            | 4.19   | 5      | 22.20 | 33.04  |
|                  |                   |         | 0.172            | 4.37   |        | 23.13 | 34.42  |
|                  |                   |         | 0.180            | 4.57   | 10 10S | 24.19 | 36.00  |
|                  |                   |         | 0.188            | 4.78   |        | 25.25 | 37.57  |
|                  |                   |         | 0.203            | 5.16   |        | 27.23 | 40.52  |
|                  |                   |         | 0.219            | 5.56   |        | 29.34 | 43.66  |
|                  |                   |         | 0.237            | 6.02   |        | 31.70 | 47.18  |
|                  |                   |         | 0.250            | 6.35   | 20     | 33.41 | 49.72  |
|                  |                   |         | 0.281            | 7.14   |        | 37.46 | 55.74  |
|                  |                   |         | 0.297            | 7.54   |        | 39.54 | 58.84  |
|                  |                   |         | 0.312            | 7.92   |        | 41.49 | 61.74  |
|                  |                   |         | 0.330            | 8.38   | 30     | 43.82 | 65.21  |
|                  |                   |         | 0.344            | 8.74   |        | 45.62 | 67.90  |
|                  |                   |         | 0.375            | 9.53   | STD    | 49.61 | 73.83  |
|                  |                   |         | 0.406            | 10.31  | 40     | 53.58 | 79.73  |
|                  |                   |         | 0.438            | 11.13  |        | 57.65 | 85.80  |
|                  |                   |         | 0.500            | 12.70  | XS     | 65.48 | 97.45  |
|                  |                   |         | 0.562            | 14.27  | 60     | 73.23 | 108.98 |
|                  |                   |         | 0.625            | 15.88  |        | 81.02 | 120.57 |
|                  |                   |         | 0.688            | 17.48  | 80     | 88.72 | 132.03 |
| 0.750            | 19.05             |         | 96.22            | 143.19 |        |       |        |
| 0.812            | 20.62             |         | 103.63           | 154.22 |        |       |        |
| 0.844            | 21.44             | 100     | 107.43           | 159.87 |        |       |        |
| 0.875            | 22.23             |         | 111.08           | 165.31 |        |       |        |
| 0.938            | 23.83             |         | 118.45           | 176.27 |        |       |        |
| 1.000            | 25.40             | 120 XXS | 125.62           | 186.94 |        |       |        |
| 1.062            | 26.97             |         | 132.70           | 197.48 |        |       |        |
| 1.125            | 28.58             | 140     | 139.82           | 208.07 |        |       |        |
| 1.250            | 31.75             |         | 153.68           | 228.70 |        |       |        |
| 1.312            | 33.32             | 160     | 160.43           | 238.75 |        |       |        |
| 14               | 14.000            | 355.6   | 0.105            | 2.67   |        | 15.60 | 23.21  |
|                  |                   |         | 0.134            | 3.40   |        | 19.86 | 29.56  |
|                  |                   |         | 0.156            | 3.96   | 5S     | 23.09 | 34.36  |
|                  |                   |         | 0.164            | 4.17   |        | 24.26 | 36.10  |
|                  |                   |         | 0.179            | 4.55   |        | 26.45 | 39.36  |
|                  |                   |         | 0.188            | 4.78   | 10S    | 27.76 | 41.31  |
|                  |                   |         | 0.203            | 5.16   |        | 29.94 | 44.56  |
|                  |                   |         | 0.210            | 5.33   |        | 30.96 | 46.07  |
|                  |                   |         | 0.219            | 5.56   |        | 32.27 | 48.02  |
|                  |                   |         | 0.250            | 6.35   | 10     | 36.75 | 54.69  |
|                  |                   |         | 0.281            | 7.14   |        | 41.21 | 61.33  |
|                  |                   |         | 0.312            | 7.92   | 20     | 45.66 | 67.94  |
|                  |                   |         | 0.344            | 8.74   |        | 50.22 | 74.74  |
|                  |                   |         | 0.375            | 9.53   | 30 STD | 54.62 | 81.29  |
| 0.406            | 10.31             |         | 59.00            | 87.81  |        |       |        |
| 0.438            | 11.13             | 40      | 63.50            | 94.51  |        |       |        |



| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |       | ESPESOR DE PARED |        | CÉDULA | PESO   |        |
|------------------|-------------------|-------|------------------|--------|--------|--------|--------|
|                  | in                | mm    | in               | mm     |        | Lb/ft  | Kg/m   |
| 14               | 14.000            | 355.6 | 0.469            | 11.91  |        | 67.84  | 100.96 |
|                  |                   |       | 0.500            | 12.70  | XS     | 72.16  | 107.39 |
|                  |                   |       | 0.562            | 14.27  |        | 80.74  | 120.15 |
|                  |                   |       | 0.594            | 15.09  | 60     | 85.13  | 126.69 |
|                  |                   |       | 0.625            | 15.88  |        | 89.37  | 132.99 |
|                  |                   |       | 0.688            | 17.48  |        | 97.91  | 145.71 |
|                  |                   |       | 0.750            | 19.05  | 80     | 106.24 | 158.10 |
|                  |                   |       | 0.812            | 20.62  |        | 114.48 | 170.37 |
|                  |                   |       | 0.875            | 22.23  |        | 122.78 | 182.71 |
|                  |                   |       | 0.938            | 23.83  | 100    | 130.99 | 194.93 |
|                  |                   |       | 1.000            | 25.40  |        | 138.98 | 206.83 |
|                  |                   |       | 1.062            | 26.97  |        | 146.89 | 218.60 |
|                  |                   |       | 1.094            | 27.79  | 120    | 150.94 | 224.63 |
|                  |                   |       | 1.125            | 28.58  |        | 154.85 | 230.44 |
|                  |                   |       | 1.250            | 31.75  | 140    | 170.38 | 253.56 |
|                  |                   |       | 1.406            | 35.71  | 160    | 189.30 | 281.71 |
|                  |                   |       | 2.000            | 50.80  |        | 256.58 | 381.83 |
|                  |                   |       | 2.125            | 53.98  |        | 269.78 | 401.47 |
|                  |                   |       | 2.200            | 55.88  |        | 277.53 | 413.01 |
|                  |                   |       | 2.500            | 63.50  |        | 307.36 | 457.40 |
| 16               | 16.000            | 406.4 | 0.134            | 3.40   |        | 22.73  | 33.82  |
|                  |                   |       | 0.165            | 4.19   | 5S     | 27.93  | 41.57  |
|                  |                   |       | 0.188            | 4.78   | 10S    | 31.78  | 47.29  |
|                  |                   |       | 0.203            | 5.16   |        | 34.28  | 51.02  |
|                  |                   |       | 0.219            | 5.56   |        | 36.95  | 54.98  |
|                  |                   |       | 0.250            | 6.35   | 10     | 42.09  | 62.64  |
|                  |                   |       | 0.281            | 7.14   |        | 47.22  | 70.27  |
|                  |                   |       | 0.312            | 7.92   | 20     | 52.33  | 77.87  |
|                  |                   |       | 0.344            | 8.74   |        | 57.58  | 85.68  |
|                  |                   |       | 0.375            | 9.53   | 30 STD | 62.64  | 93.22  |
|                  |                   |       | 0.406            | 10.31  |        | 67.69  | 100.73 |
|                  |                   |       | 0.438            | 11.13  |        | 72.87  | 108.44 |
|                  |                   |       | 0.469            | 11.91  |        | 77.87  | 115.89 |
|                  |                   |       | 0.500            | 12.70  | 40 XS  | 82.85  | 123.30 |
|                  |                   |       | 0.562            | 14.27  |        | 92.75  | 138.03 |
|                  |                   |       | 0.625            | 15.88  |        | 102.73 | 152.88 |
|                  |                   |       | 0.656            | 16.66  | 60     | 107.61 | 160.14 |
|                  |                   |       | 0.688            | 17.48  |        | 112.62 | 167.60 |
|                  |                   |       | 0.750            | 19.05  |        | 122.28 | 181.97 |
|                  |                   |       | 0.812            | 20.62  |        | 131.85 | 196.21 |
| 0.844            | 21.44             | 80    | 136.75           | 203.51 |        |        |        |
| 0.875            | 22.23             |       | 141.49           | 210.55 |        |        |        |
| 0.938            | 23.83             |       | 151.04           | 224.77 |        |        |        |
| 1.000            | 25.40             |       | 160.36           | 238.64 |        |        |        |
| 1.031            | 26.19             | 100   | 164.99           | 245.53 |        |        |        |
| 1.062            | 26.97             |       | 169.60           | 252.39 |        |        |        |
| 1.125            | 28.58             |       | 178.90           | 266.24 |        |        |        |
| 1.188            | 30.18             |       | 188.12           | 279.96 |        |        |        |
| 1.219            | 30.96             | 120   | 192.63           | 286.66 |        |        |        |
| 1.250            | 31.75             |       | 197.11           | 293.33 |        |        |        |
| 1.438            | 36.53             | 140   | 223.87           | 333.15 |        |        |        |
| 1.594            | 40.49             | 160   | 245.49           | 365.34 |        |        |        |
| 18               | 18.000            | 457.2 | 0.165            | 4.19   | 5S     | 31.46  | 46.82  |
|                  |                   |       | 0.188            | 4.78   | 10S    | 35.80  | 53.28  |
|                  |                   |       | 0.219            | 5.56   |        | 41.63  | 61.95  |
|                  |                   |       | 0.250            | 6.35   | 10     | 47.44  | 70.60  |
|                  |                   |       | 0.281            | 7.14   |        | 53.23  | 79.21  |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |       | ESPESOR DE PARED |        | CÉDULA | PESO   |        |
|------------------|-------------------|-------|------------------|--------|--------|--------|--------|
|                  | in                | mm    | in               | mm     |        | Lb/ft  | Kg/m   |
| 18               | 18.000            | 457.2 | 0.312            | 7.92   | 20     | 59.00  | 87.80  |
|                  |                   |       | 0.344            | 8.74   |        | 64.93  | 96.63  |
|                  |                   |       | 0.375            | 9.53   | STD    | 70.66  | 105.15 |
|                  |                   |       | 0.406            | 10.31  |        | 76.37  | 113.65 |
|                  |                   |       | 0.438            | 11.13  | 30     | 82.24  | 122.38 |
|                  |                   |       | 0.469            | 11.91  |        | 87.90  | 130.81 |
|                  |                   |       | 0.500            | 12.70  | XS     | 93.54  | 139.21 |
|                  |                   |       | 0.562            | 14.27  | 40     | 104.77 | 155.92 |
|                  |                   |       | 0.625            | 15.88  |        | 116.10 | 172.77 |
|                  |                   |       | 0.688            | 17.48  |        | 127.33 | 189.49 |
|                  |                   |       | 0.750            | 19.05  | 60     | 138.31 | 205.83 |
|                  |                   |       | 0.812            | 20.62  |        | 149.21 | 222.05 |
|                  |                   |       | 0.875            | 22.23  |        | 160.19 | 238.40 |
|                  |                   |       | 0.938            | 23.83  | 80     | 171.10 | 254.62 |
|                  |                   |       | 1.000            | 25.40  |        | 181.74 | 270.46 |
|                  |                   |       | 1.062            | 26.97  |        | 192.31 | 286.19 |
|                  |                   |       | 1.125            | 28.58  |        | 202.96 | 302.03 |
|                  |                   |       | 1.156            | 29.36  | 100    | 208.17 | 309.79 |
|                  |                   |       | 1.188            | 30.18  |        | 213.52 | 317.76 |
|                  |                   |       | 1.250            | 31.75  |        | 223.84 | 333.11 |
| 1.375            | 34.93             | 120   | 244.38           | 363.68 |        |        |        |
| 1.562            | 39.67             | 140   | 274.50           | 408.50 |        |        |        |
| 1.781            | 45.24             | 160   | 308.81           | 459.57 |        |        |        |
| 20               | 20.000            | 508.0 | 0.188            | 4.78   | 5S     | 39.82  | 59.26  |
|                  |                   |       | 0.219            | 5.56   | 10S    | 46.31  | 68.92  |
|                  |                   |       | 0.250            | 6.35   | 10     | 52.79  | 78.55  |
|                  |                   |       | 0.281            | 7.14   |        | 59.24  | 88.16  |
|                  |                   |       | 0.312            | 7.92   |        | 65.67  | 97.73  |
|                  |                   |       | 0.344            | 8.74   |        | 72.29  | 107.58 |
|                  |                   |       | 0.375            | 9.53   | 20 STD | 78.68  | 117.09 |
|                  |                   |       | 0.406            | 10.31  |        | 85.05  | 126.56 |
|                  |                   |       | 0.438            | 11.13  |        | 91.60  | 136.32 |
|                  |                   |       | 0.469            | 11.91  |        | 97.93  | 145.73 |
|                  |                   |       | 0.500            | 12.70  | 30 XS  | 104.24 | 155.12 |
|                  |                   |       | 0.562            | 14.27  |        | 116.79 | 173.80 |
|                  |                   |       | 0.594            | 15.09  | 40     | 123.23 | 183.39 |
|                  |                   |       | 0.625            | 15.88  |        | 129.46 | 192.66 |
|                  |                   |       | 0.688            | 17.48  |        | 142.04 | 211.39 |
|                  |                   |       | 0.750            | 19.05  |        | 154.35 | 229.70 |
|                  |                   |       | 0.812            | 20.62  | 60     | 166.57 | 247.88 |
|                  |                   |       | 0.875            | 22.23  |        | 178.90 | 266.24 |
|                  |                   |       | 0.938            | 23.83  |        | 191.15 | 284.47 |
|                  |                   |       | 1.000            | 25.40  |        | 203.12 | 302.28 |
| 1.031            | 26.19             | 80    | 209.08           | 311.15 |        |        |        |
| 1.062            | 26.97             |       | 215.01           | 319.98 |        |        |        |
| 1.125            | 28.58             |       | 227.01           | 337.83 |        |        |        |
| 1.188            | 30.18             |       | 238.92           | 355.56 |        |        |        |
| 1.250            | 31.75             |       | 250.57           | 372.88 |        |        |        |
| 1.281            | 32.54             | 100   | 256.35           | 381.50 |        |        |        |
| 1.312            | 33.32             |       | 262.12           | 390.08 |        |        |        |
| 1.375            | 34.93             |       | 273.78           | 407.44 |        |        |        |
| 1.500            | 38.10             | 120   | 296.67           | 441.49 |        |        |        |
| 1.750            | 44.45             | 140   | 341.44           | 508.11 |        |        |        |
| 1.969            | 50.01             | 160   | 379.56           | 564.84 |        |        |        |
| 22               | 22.000            | 558.8 | 0.250            | 6.35   | 10     | 58.13  | 86.51  |
|                  |                   |       | 0.281            | 7.14   |        | 65.25  | 97.10  |
|                  |                   |       | 0.312            | 7.92   |        | 72.34  | 107.66 |



| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |              | ESPESOR DE PARED |        | CÉDULA | PESO   |        |
|------------------|-------------------|--------------|------------------|--------|--------|--------|--------|
|                  | in                | mm           | in               | mm     |        | Lb/ft  | Kg/m   |
| <b>22</b>        | 22.000            | 558.8        | 0.344            | 8.74   | STD    | 79.64  | 118.52 |
|                  |                   |              | 0.375            | 9.53   | 20     | 86.70  | 129.02 |
|                  |                   |              | 0.406            | 10.31  |        | 93.73  | 139.48 |
|                  |                   |              | 0.438            | 11.13  |        | 100.97 | 150.25 |
|                  |                   |              | 0.469            | 11.91  |        | 107.96 | 160.66 |
|                  |                   |              | 0.500            | 12.70  | 30 XS  | 114.93 | 171.03 |
|                  |                   |              | 0.562            | 14.27  |        | 128.80 | 191.68 |
|                  |                   |              | 0.625            | 15.88  |        | 142.82 | 212.54 |
|                  |                   |              | 0.688            | 17.48  |        | 156.76 | 233.28 |
|                  |                   |              | 0.750            | 19.05  |        | 170.38 | 253.56 |
|                  |                   |              | 0.812            | 20.62  |        | 183.93 | 273.72 |
|                  |                   |              | 0.875            | 22.23  | 60     | 197.61 | 294.08 |
|                  |                   |              | 0.938            | 23.83  |        | 211.21 | 314.31 |
|                  |                   |              | 1.000            | 25.40  |        | 224.51 | 334.10 |
|                  |                   |              | 1.062            | 26.97  |        | 237.72 | 353.77 |
|                  |                   |              | 1.125            | 28.58  | 80     | 251.07 | 373.63 |
|                  |                   |              | 1.188            | 30.18  |        | 264.33 | 393.36 |
|                  |                   |              | 1.250            | 31.75  |        | 277.29 | 412.66 |
|                  |                   |              | 1.312            | 33.32  |        | 290.18 | 431.83 |
|                  |                   |              | 1.375            | 34.93  | 100    | 303.18 | 451.19 |
| 1.438            | 36.53             |              | 316.11           | 470.42 |        |        |        |
| 1.500            | 38.10             |              | 328.74           | 489.22 |        |        |        |
| 1.625            | 41.28             |              | 353.97           | 526.76 |        |        |        |
| 1.875            | 47.63             | 120          | 403.41           | 600.34 |        |        |        |
| 2.125            | 53.98             | 140          | 451.52           | 671.93 |        |        |        |
|                  |                   |              |                  | 160    | 451.52 | 671.93 |        |
|                  |                   |              | 0.218            | 5.54   | 55     | 55.43  | 82.48  |
|                  |                   |              | 0.250            | 6.35   | 10     | 63.48  | 94.46  |
|                  |                   |              | 0.281            | 7.14   |        | 71.25  | 106.04 |
|                  |                   |              | 0.312            | 7.92   |        | 79.01  | 117.58 |
|                  |                   |              | 0.344            | 8.74   |        | 87.00  | 129.47 |
|                  |                   |              | 0.375            | 9.53   | 20 STD | 94.71  | 140.95 |
|                  |                   |              | 0.406            | 10.31  |        | 102.41 | 152.40 |
|                  |                   |              | 0.438            | 11.13  |        | 110.33 | 164.19 |
|                  |                   |              | 0.469            | 11.91  |        | 117.98 | 175.58 |
|                  |                   |              | 0.500            | 12.70  | XS     | 125.62 | 186.94 |
|                  |                   |              | 0.562            | 14.27  | 30     | 140.82 | 209.56 |
|                  |                   |              | 0.625            | 15.88  |        | 156.19 | 232.43 |
|                  |                   |              | 0.688            | 17.48  | 40     | 171.47 | 255.17 |
|                  |                   |              | 0.750            | 19.05  |        | 186.42 | 277.42 |
|                  |                   |              | 0.812            | 20.62  |        | 201.29 | 299.56 |
|                  |                   |              | 0.875            | 22.23  |        | 216.32 | 321.92 |
| <b>24</b>        | <b>24.000</b>     | <b>609.6</b> | 0.938            | 23.83  |        | 231.26 | 344.16 |
|                  |                   |              | 0.969            | 24.61  | 60     | 238.59 | 355.06 |
|                  |                   |              | 1.000            | 25.40  |        | 245.89 | 365.92 |
|                  |                   |              | 1.062            | 26.97  |        | 260.43 | 387.56 |
|                  |                   |              | 1.125            | 28.58  |        | 275.12 | 409.42 |
|                  |                   |              | 1.188            | 30.18  |        | 289.73 | 431.16 |
|                  |                   |              | 1.219            | 30.96  | 80     | 296.88 | 441.81 |
|                  |                   |              | 1.250            | 31.75  |        | 304.02 | 452.43 |
|                  |                   |              | 1.312            | 33.32  |        | 318.23 | 473.58 |
|                  |                   |              | 1.375            | 34.93  |        | 332.58 | 494.94 |
|                  |                   |              | 1.438            | 36.53  |        | 346.85 | 516.18 |
|                  |                   |              | 1.500            | 38.10  |        | 360.81 | 536.95 |
|                  |                   |              | 1.531            | 38.89  | 100    | 367.76 | 547.29 |
|                  |                   |              | 1.562            | 39.67  |        | 374.69 | 557.60 |
|                  |                   |              | 1.812            | 46.02  | 120    | 429.82 | 639.64 |
|                  |                   |              | 2.062            | 52.37  | 140    | 483.61 | 719.69 |
|                  |                   |              | 2.343            | 59.51  | 160    | 542.48 | 807.29 |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |        | ESPESOR DE PARED |       | CÉDULA | PESO   |        |
|------------------|-------------------|--------|------------------|-------|--------|--------|--------|
|                  | in                | mm     | in               | mm    |        | Lb/ft  | Kg/m   |
| 26               | 26.000            | 660.4  | 0.250            | 6.35  | STD    | 68.82  | 102.42 |
|                  |                   |        | 0.281            | 7.14  |        | 77.26  | 114.98 |
|                  |                   |        | 0.312            | 7.92  |        | 85.68  | 127.51 |
|                  |                   |        | 0.344            | 8.74  |        | 94.35  | 140.41 |
|                  |                   |        | 0.375            | 9.53  |        | 102.73 | 152.88 |
|                  |                   |        | 0.406            | 10.31 |        | 111.09 | 165.32 |
|                  |                   |        | 0.438            | 11.13 |        | 119.70 | 178.13 |
|                  |                   |        | 0.469            | 11.91 |        | 128.01 | 190.50 |
|                  |                   |        | 0.500            | 12.70 |        | 136.31 | 202.85 |
|                  |                   |        | 0.562            | 14.27 |        | 152.84 | 227.45 |
|                  |                   |        | 0.625            | 15.88 |        | 169.55 | 252.32 |
|                  |                   |        | 0.688            | 17.48 |        | 186.18 | 277.06 |
|                  |                   |        | 0.750            | 19.05 |        | 202.46 | 301.29 |
|                  |                   |        | 0.812            | 20.62 |        | 218.66 | 325.39 |
| 0.875            | 22.23             | 235.03 | 349.76           |       |        |        |        |
| 0.938            | 23.83             | 251.32 | 374.01           |       |        |        |        |
| 1.000            | 25.40             | 267.27 | 397.74           |       |        |        |        |
| 28               | 28.000            | 711.2  | 0.250            | 6.35  | STD    | 74.17  | 110.37 |
|                  |                   |        | 0.281            | 7.14  |        | 83.27  | 123.92 |
|                  |                   |        | 0.312            | 7.92  |        | 92.35  | 137.44 |
|                  |                   |        | 0.344            | 8.74  |        | 101.71 | 151.36 |
|                  |                   |        | 0.375            | 9.53  |        | 110.75 | 164.81 |
|                  |                   |        | 0.406            | 10.31 |        | 119.77 | 178.24 |
|                  |                   |        | 0.438            | 11.13 |        | 129.06 | 192.06 |
|                  |                   |        | 0.469            | 11.91 |        | 138.04 | 205.43 |
|                  |                   |        | 0.500            | 12.70 |        | 147.00 | 218.76 |
|                  |                   |        | 0.562            | 14.27 |        | 164.85 | 245.33 |
|                  |                   |        | 0.625            | 15.88 |        | 182.91 | 272.20 |
|                  |                   |        | 0.688            | 17.48 |        | 200.89 | 298.95 |
|                  |                   |        | 0.750            | 19.05 |        | 218.49 | 325.15 |
|                  |                   |        | 0.812            | 20.62 |        | 236.02 | 351.23 |
| 0.875            | 22.23             | 253.74 | 377.61           |       |        |        |        |
| 0.938            | 23.83             | 271.38 | 403.85           |       |        |        |        |
| 1.000            | 25.40             | 288.65 | 429.56           |       |        |        |        |
| 30               | 30.000            | 762.0  | 0.250            | 6.35  | STD    | 79.51  | 118.33 |
|                  |                   |        | 0.281            | 7.14  |        | 89.28  | 132.86 |
|                  |                   |        | 0.312            | 7.92  |        | 99.03  | 147.37 |
|                  |                   |        | 0.344            | 8.74  |        | 109.06 | 162.30 |
|                  |                   |        | 0.375            | 9.53  |        | 118.77 | 176.75 |
|                  |                   |        | 0.406            | 10.31 |        | 128.45 | 191.16 |
|                  |                   |        | 0.438            | 11.13 |        | 138.43 | 206.00 |
|                  |                   |        | 0.469            | 11.91 |        | 148.07 | 220.35 |
|                  |                   |        | 0.500            | 12.70 |        | 157.69 | 234.67 |
|                  |                   |        | 0.562            | 14.27 |        | 176.87 | 263.21 |
|                  |                   |        | 0.625            | 15.88 |        | 196.28 | 292.09 |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |        | ESPESOR DE PARED |        | CÉDULA | PESO   |        |      |     |       |        |
|------------------|-------------------|--------|------------------|--------|--------|--------|--------|------|-----|-------|--------|
|                  | in                | mm     | in               | mm     |        | Lb/ft  | Kg/m   |      |     |       |        |
| 30               | 30.000            | 762.0  | 0.688            | 17.48  | STD    | 215.60 | 320.84 |      |     |       |        |
|                  |                   |        | 0.750            | 19.05  |        | 234.53 | 349.02 |      |     |       |        |
|                  |                   |        | 0.812            | 20.62  |        | 253.38 | 377.07 |      |     |       |        |
|                  |                   |        | 0.875            | 22.23  |        | 272.45 | 405.45 |      |     |       |        |
|                  |                   |        | 0.938            | 23.83  |        | 291.43 | 433.70 |      |     |       |        |
|                  |                   |        | 1.000            | 25.40  |        | 310.03 | 461.38 |      |     |       |        |
|                  |                   |        | 1.062            | 26.97  |        | 328.55 | 488.94 |      |     |       |        |
|                  |                   |        | 1.125            | 28.58  |        | 347.28 | 516.81 |      |     |       |        |
|                  |                   |        | 1.188            | 30.18  |        | 365.93 | 544.57 |      |     |       |        |
|                  |                   |        | 1.250            | 31.75  |        | 384.20 | 571.75 |      |     |       |        |
|                  |                   |        | 1.375            | 34.93  |        | 420.78 | 626.19 |      |     |       |        |
|                  |                   |        | 1.500            | 38.10  |        | 457.03 | 680.14 |      |     |       |        |
|                  |                   |        | 32               | 32.000 |        | 812.8  | 0.250  | 6.35 | STD | 84.86 | 126.28 |
|                  |                   |        |                  |        |        |        | 0.281  | 7.14 |     | 95.29 | 141.80 |
| 0.312            | 7.92              | 105.70 |                  |        | 157.29 |        |        |      |     |       |        |
| 0.344            | 8.74              | 116.42 |                  |        | 173.25 |        |        |      |     |       |        |
| 0.375            | 9.53              | 126.79 |                  |        | 188.68 |        |        |      |     |       |        |
| 0.406            | 10.31             | 137.13 |                  |        | 204.08 |        |        |      |     |       |        |
| 0.438            | 11.13             | 147.79 |                  |        | 219.94 |        |        |      |     |       |        |
| 0.500            | 12.70             | 168.38 |                  |        | 250.58 |        |        |      |     |       |        |
| 0.562            | 14.27             | 188.89 |                  |        | 281.09 |        |        |      |     |       |        |
| 0.625            | 15.88             | 209.64 |                  |        | 311.98 |        |        |      |     |       |        |
| 0.688            | 17.48             | 230.31 |                  |        | 342.74 |        |        |      |     |       |        |
| 0.750            | 19.05             | 250.57 |                  |        | 372.88 |        |        |      |     |       |        |
| 0.812            | 20.62             | 270.74 |                  |        | 402.91 |        |        |      |     |       |        |
| 0.875            | 22.23             | 291.16 |                  |        | 433.29 |        |        |      |     |       |        |
| 0.938            | 23.83             | 311.49 | 463.55           |        |        |        |        |      |     |       |        |
| 1.000            | 25.40             | 331.41 | 493.20           |        |        |        |        |      |     |       |        |
| 1.062            | 26.97             | 351.26 | 522.73           |        |        |        |        |      |     |       |        |
| 1.125            | 28.58             | 371.34 | 552.61           |        |        |        |        |      |     |       |        |
| 1.188            | 30.18             | 391.33 | 582.37           |        |        |        |        |      |     |       |        |
| 1.250            | 31.75             | 410.93 | 611.53           |        |        |        |        |      |     |       |        |
| 34               | 34.000            | 863.6  | 0.250            | 6.35   | STD    | 90.20  | 134.24 |      |     |       |        |
|                  |                   |        | 0.281            | 7.14   |        | 101.30 | 150.74 |      |     |       |        |
|                  |                   |        | 0.312            | 7.92   |        | 112.37 | 167.22 |      |     |       |        |
|                  |                   |        | 0.344            | 8.74   |        | 123.77 | 184.20 |      |     |       |        |
|                  |                   |        | 0.375            | 9.53   |        | 134.80 | 200.61 |      |     |       |        |
|                  |                   |        | 0.406            | 10.31  |        | 145.81 | 216.99 |      |     |       |        |
|                  |                   |        | 0.438            | 11.13  |        | 157.16 | 233.87 |      |     |       |        |
|                  |                   |        | 0.469            | 11.91  |        | 168.12 | 250.20 |      |     |       |        |
|                  |                   |        | 0.500            | 12.70  |        | 179.07 | 266.49 |      |     |       |        |
|                  |                   |        | 0.562            | 14.27  |        | 200.90 | 298.98 |      |     |       |        |
|                  |                   |        | 0.625            | 15.88  |        | 223.00 | 331.87 |      |     |       |        |
|                  |                   |        | 0.688            | 17.48  |        | 245.02 | 364.63 |      |     |       |        |
|                  |                   |        | 0.750            | 19.05  |        | 266.60 | 396.75 |      |     |       |        |
|                  |                   |        | 0.812            | 20.62  |        | 288.10 | 428.74 |      |     |       |        |
| 0.875            | 22.23             | 309.87 | 461.13           |        |        |        |        |      |     |       |        |
| 0.938            | 23.83             | 331.54 | 493.39           |        |        |        |        |      |     |       |        |
| 1.000            | 25.40             | 352.80 | 525.02           |        |        |        |        |      |     |       |        |
| 1.062            | 26.97             | 373.97 | 556.52           |        |        |        |        |      |     |       |        |
| 1.125            | 28.58             | 395.39 | 588.41           |        |        |        |        |      |     |       |        |
| 1.188            | 30.18             | 416.73 | 620.17           |        |        |        |        |      |     |       |        |
| 1.250            | 31.75             | 437.65 | 651.30           |        |        |        |        |      |     |       |        |
| 36               | 36.000            | 914.4  | 0.250            | 6.35   | 10     | 95.55  | 142.19 |      |     |       |        |
|                  |                   |        | 0.281            | 7.14   |        | 107.30 | 159.69 |      |     |       |        |
|                  |                   |        | 0.312            | 7.92   |        | 119.04 | 177.15 |      |     |       |        |

| DIÁMETRO NOMINAL | DIÁMETRO EXTERIOR |         | ESPESOR DE PARED |       | CÉDULA | PESO   |        |
|------------------|-------------------|---------|------------------|-------|--------|--------|--------|
|                  | in                | mm      | in               | mm    |        | Lb/ft  | Kg/m   |
| 36               | 36.000            | 914.4   | 0.344            | 8.74  | STD    | 131.13 | 195.14 |
|                  |                   |         | 0.375            | 9.53  |        | 142.82 | 212.54 |
|                  |                   |         | 0.406            | 10.31 |        | 154.49 | 229.91 |
|                  |                   |         | 0.438            | 11.13 |        | 166.52 | 247.81 |
|                  |                   |         | 0.469            | 11.91 |        | 178.15 | 265.12 |
|                  |                   |         | 0.500            | 12.70 |        | 189.76 | 282.40 |
|                  |                   |         | 0.562            | 14.27 |        | 212.92 | 316.86 |
|                  |                   |         | 0.625            | 15.88 |        | 236.37 | 351.75 |
|                  |                   |         | 0.688            | 17.48 |        | 259.73 | 386.52 |
|                  |                   |         | 0.750            | 19.05 |        | 282.64 | 420.61 |
|                  |                   |         | 0.812            | 20.62 |        | 305.46 | 454.58 |
|                  |                   |         | 0.875            | 22.23 |        | 328.57 | 488.97 |
|                  |                   |         | 0.938            | 23.83 |        | 351.60 | 523.24 |
|                  |                   |         | 1.000            | 25.40 |        | 374.18 | 556.84 |
|                  |                   |         | 1.062            | 26.97 |        | 396.67 | 590.31 |
|                  |                   |         | 1.125            | 28.58 |        | 419.45 | 624.21 |
|                  |                   |         | 1.188            | 30.18 |        | 442.14 | 657.97 |
|                  |                   |         | 1.250            | 31.75 |        | 464.38 | 691.08 |
| 1.375            | 34.93             | 508.98  | 757.45           |       |        |        |        |
| 1.500            | 38.10             | 553.25  | 823.32           |       |        |        |        |
| 42               | 42.000            | 1,066.8 | 0.250            | 6.35  | STD    | 111.59 | 166.06 |
|                  |                   |         | 0.344            | 8.74  |        | 153.20 | 227.98 |
|                  |                   |         | 0.375            | 9.53  |        | 166.88 | 248.34 |
|                  |                   |         | 0.406            | 10.31 |        | 180.54 | 268.67 |
|                  |                   |         | 0.438            | 11.13 |        | 194.62 | 289.62 |
|                  |                   |         | 0.469            | 11.91 |        | 208.24 | 309.89 |
|                  |                   |         | 0.500            | 12.70 |        | 221.83 | 330.13 |
|                  |                   |         | 0.562            | 14.27 |        | 248.97 | 370.51 |
|                  |                   |         | 0.625            | 15.88 |        | 276.46 | 411.41 |
|                  |                   |         | 0.688            | 17.48 |        | 303.86 | 452.19 |
|                  |                   |         | 0.750            | 19.05 |        | 330.75 | 492.20 |
|                  |                   |         | 0.812            | 20.62 |        | 357.55 | 532.09 |
|                  |                   |         | 0.875            | 22.23 |        | 384.70 | 572.50 |
|                  |                   |         | 0.938            | 23.83 |        | 411.77 | 612.78 |
|                  |                   |         | 1.000            | 25.40 |        | 438.32 | 652.30 |
|                  |                   |         | 1.062            | 26.97 |        | 464.79 | 691.69 |
|                  |                   |         | 1.125            | 28.58 |        | 491.61 | 731.60 |
|                  |                   |         | 1.188            | 30.18 |        | 518.34 | 771.37 |
| 1.250            | 31.75             | 544.56  | 810.40           |       |        |        |        |
| 1.500            | 38.10             | 649.47  | 966.51           |       |        |        |        |
| 48               | 48.000            | 1,219.2 | 0.344            | 8.74  | STD    | 175.26 | 260.82 |
|                  |                   |         | 0.375            | 9.53  |        | 190.93 | 284.14 |
|                  |                   |         | 0.406            | 10.31 |        | 206.58 | 307.42 |
|                  |                   |         | 0.438            | 11.13 |        | 222.71 | 331.43 |
|                  |                   |         | 0.469            | 11.91 |        | 238.32 | 354.66 |
|                  |                   |         | 0.500            | 12.70 |        | 253.91 | 377.85 |
|                  |                   |         | 0.562            | 14.27 |        | 285.02 | 424.15 |
|                  |                   |         | 0.625            | 15.88 |        | 316.55 | 471.07 |
|                  |                   |         | 0.688            | 17.48 |        | 347.99 | 517.87 |
|                  |                   |         | 0.750            | 19.05 |        | 378.85 | 563.80 |
|                  |                   |         | 0.812            | 20.62 |        | 409.64 | 609.60 |
|                  |                   |         | 0.875            | 22.23 |        | 440.83 | 656.02 |
|                  |                   |         | 0.938            | 23.83 |        | 471.94 | 702.32 |
|                  |                   |         | 1.000            | 25.40 |        | 502.47 | 747.75 |
|                  |                   |         | 1.062            | 26.97 |        | 532.92 | 793.07 |
|                  |                   |         | 1.125            | 28.58 |        | 563.77 | 838.99 |
|                  |                   |         | 1.188            | 30.18 |        | 594.54 | 884.78 |
|                  |                   |         | 1.250            | 31.75 |        | 624.74 | 929.72 |
| 1.500            | 38.10             | 745.68  | 1109.70          |       |        |        |        |
| 2.000            | 50.80             | 983.55  | 1463.69          |       |        |        |        |

| Estándar de Especificación | Aplicación |  | Requerimiento Químico |                                      |                     |                      |            | Requerimiento Físico |                             | Otras Pruebas e Inspecciones   |
|----------------------------|------------|--|-----------------------|--------------------------------------|---------------------|----------------------|------------|----------------------|-----------------------------|--|
|                            |            |  | C                     | Si                                   | Mn                  | P                    | S          | Esfuerzo de Tensión  | Esfuerzo de Cedencia Mínimo |  |
| ASTM A-53                  | Grado A    | Tubería para Uso General               | 0.25 Máx              | —                                    | 0.95 Máx            | 0.05 Máx             | 0.06 Máx   | 48,000 psi           | 30,000 psi                  | En caso de galvanizado se requiere Prueba de recubrimiento de zinc. Prueba hidrostática especificada respectivamente en su diámetro y grado. |
|                            | Grado B    |  | 0.30 Máx              | —                                    | 1.20 Máx            | 0.05 Máx             | 0.06 Máx   | 60,000 psi           | 35,000 psi                  |  |
| ASTM A-53                  | Grado A-25 | Tubería de Línea                       | 0.21 Máx              | —                                    | 0.30 Min / 0.60 Max | 0.045 Máx            | 0.06 Máx   | 45,000 psi           | 25,000 psi                  |  |
|                            |            |  | 0.21 Máx              | —                                    | 0.30 Min / 0.60 Max | 0.045 Min / 0.80 Max | 0.06 Máx   | 65,000 psi           | 25,000 psi                  |  |
|                            | Grado A    |  | 0.21 Máx              | —                                    | 0.90 Máx            | 0.04 Máx             | 0.05 Máx   | 48,000 psi           | 30,000 psi                  |  |
|                            |            |  | Grado B               | 0.2 Máx c/ Cost. / 0.27 Máx s/ Cost. | —                   | 1.15 Máx             | 0.04 Máx   | 0.05 Máx             | 60,000 psi                  |  |
| ASTM A-106                 | Grado A    | Uso Especial para Condiciones Extremas | 0.25 Máx              | 0.10 Min                             | 0.27 Min / 0.93 Máx | 0.048 Máx            | 0.0058 Máx | 48,000 psi           | 30,000 psi                  |  |
|                            | Grado B    |  | 0.30 Máx              | 0.10 Min                             | 0.29 Min / 1.06 Máx | 0.048 Máx            | 0.0058 Máx | 60,000 psi           | 35,000 psi                  |  |
|                            | Grado C    |  | 0.35 Máx              | 0.10 Min                             | 0.29 Min / 1.06 Máx | 0.048 Máx            | 0.0058 Máx | 70,000 psi           | 40,000 psi                  |  |
| ASTM A-252                 | Grado 1    | Tubería para Pilotes y Estructuras     | —                     | —                                    | —                   | 0.050 Máx            | —          | 50,000 psi           | 30,000 psi                  |  |
|                            | Grado 2    |  | —                     | —                                    | —                   | 0.050 Máx            | —          | 60,000 psi           | 35,000 psi                  |  |
|                            | Grado 3    |  | —                     | —                                    | —                   | 0.050 Máx            | —          | 66,000 psi           | 45,000 psi                  |  |