



**mecesa**<sup>®</sup>

FUNDADA EN 1952

# TUBOS

(Inoxidable - Cobre - Plástico)



# TUBING

(Stainless steel - Copper - Plastic)



Tubos de acero inoxidable austenítico ASTM A 269 resistente a la corrosión, sin soldadura y para uso en general.

Austenitic stainless steel tubing ASTM A 269 corrosion resistant, without welding and for general use.

Tubos de acero inoxidable austenítico ASTM A 213 sin soldadura para calderas, sobrecalentadores e intercambiadores de calor.

Austenitic stainless steel pipes ASTM A 213 seamless for boiler, superheater and heat exchangers

| Especificación / Specification | Tipo / Type   |               |        |
|--------------------------------|---------------|---------------|--------|
| ASTM A213 / A269               | TP 304/304L   | TP 316/316L   | TP 321 |
| EN Número / Number             | 1.4301/1.4401 | 1.4306/1.4404 | 1.4541 |

1.- Composición química (Tabla 1. ASTM A269)

1.- Chemical composition (Table 1. ASTM A269)

| Tipo / Type | Composición % / Composition % |         |        |        |      |       |       |     |
|-------------|-------------------------------|---------|--------|--------|------|-------|-------|-----|
|             | C máx.                        | Mn máx. | P máx. | S máx. | Si   | Ni    | Cr    | Mo  |
| TP 304/304L | 0.035                         | 2       | 0.04   | 0.03   | 0.75 | 8-13  | 18-20 |     |
| TP 316/316L | 0.035                         | 2       | 0.04   | 0.03   | 0.75 | 10-15 | 16-18 | 2-3 |
| TP 321      | 0.08                          | 2       | 0.04   | 0.03   | 0.75 | 9-13  | 17-20 |     |

2.- Tabla de dimensiones y presiones de servicio máximas a temperatura ambiente.

2.- Table of dimensions and maximum operating pressure at ambient temperature.

Grupo A / Group A = TP 304/304L - 316/316L      Grupo B / Group B = TP 321

| Tubo O.D.<br>Tube O.D.<br>m.m. | Espesores nominal de pared / Nominal wall thickness |               |                     |                |               |                     |               |               |                     |               |               |                     |
|--------------------------------|---|---------------|---------------------|----------------|---------------|---------------------|---------------|---------------|---------------------|---------------|---------------|---------------------|
|                                | 1 mm  |               | Peso Weight<br>Kg/m | 1.5 mm         |               | Peso Weight<br>Kg/m | 2 mm          |               | Peso Weight<br>Kg/m | 2.5 mm        |               | Peso Weight<br>Kg/m |
|                                | A   | B             |                     | A              | B             |                     | A             | B             |                     | A             | B             |                     |
| 6                              | 368<br>(5337)                                       | 441<br>(6396) | 0.125               | → BAR<br>→ PSI |               |                     |               |               |                     |               |               |                     |
| 8                              | 267<br>(3872)                                       | 320<br>(4641) | 0.175               |                |               |                     |               |               |                     |               |               |                     |
| 10                             | 210<br>(3045)                                       | 251<br>(3640) | 0.225               | 327<br>(4742)  | 391<br>(5670) | 0.319               | 453<br>(6570) | 543<br>(7875) | 0.400               |               |               |                     |
| 12                             | 173<br>(2509)                                       | 207<br>(3002) | 0.275               | 267<br>(3772)  | 320<br>(4641) | 0.394               | 368<br>(5337) | 441<br>(6396) | 0.500               |               |               |                     |
| 14                             | 156<br>(2262)                                       | 187<br>(2712) | 0.325               | 240<br>(3480)  | 288<br>(4177) | 0.469               | 330<br>(4786) | 395<br>(5728) | 0.600               |               |               |                     |
| 16                             | 138<br>(2001)                                       | 162<br>(2349) | 0.375               | 208<br>(3016)  | 249<br>(3611) | 0.544               | 284<br>(4119) | 341<br>(4945) | 0.701               |               |               |                     |
| 18                             |   |               |                     | 183<br>(2654)  | 220<br>(3190) | 0.619               | 250<br>(3625) | 300<br>(4351) | 0.801               | 320<br>(4641) | 383<br>(5554) | 0.970               |
| 22                             |   |               |                     | 148<br>(2146)  | 178<br>(2581) | 0.769               | 201<br>(2915) | 241<br>(3495) | 1.000               | 256<br>(3712) | 307<br>(4452) | 1.228               |
| 25                             |   |               |                     | 130<br>(1885)  | 155<br>(2248) | 0.882               | 176<br>(2552) | 210<br>(3045) | 1.150               | 223<br>(3234) | 267<br>(3872) | 1.410               |

| Tubo O.D.<br>Tube O.D.<br>in. | Espesores nominal de pared BWG in (m.m) / Nominal wall thickness BWG in (m.m) |                |                     |               |                |                     |                |                 |                     |                |               |                     |               |               |                     |               |               |                     |
|-------------------------------|---|----------------|---------------------|---------------|----------------|---------------------|----------------|-----------------|---------------------|----------------|---------------|---------------------|---------------|---------------|---------------------|---------------|---------------|---------------------|
|                               | 0.032 (0.812)   |                | Peso Weight<br>Kg/m | 0.035 (0.899) |                | Peso Weight<br>Kg/m | 0.042 (1.066)  |                 | Peso Weight<br>Kg/m | 0.049 (1.244)  |               | Peso Weight<br>Kg/m | 0.065 (1.651) |               | Peso Weight<br>Kg/m | 0.072 (1.828) |               | Peso Weight<br>Kg/m |
|                               | A   | B              |                     | A             | B              |                     | A              | B               |                     | A              | B             |                     | A             | B             |                     | A             | B             |                     |
| 1/8" (3.75)                   | 606<br>(8789)   | 726<br>(10529) | 0.060               | 686<br>(9949) | 822<br>(11921) | 0.064               | 852<br>(12357) | 1020<br>(14793) | 0.072               | → BAR<br>→ PSI |               |                     |               |               |                     |               |               |                     |
| 1/4" (6.35)                   |   |                |                     | 306<br>(4438) | 367<br>(5322)  | 0.122               | 371<br>(5380)  | 444<br>(6439)   | 0.142               | 442<br>(6410)  | 530<br>(7686) | 0.160               |               |               |                     |               |               |                     |
| 3/8" (9.52)                   |   |                |                     | 197<br>(2857) | 236<br>(3422)  | 0.195               | 237<br>(3437)  | 284<br>(4119)   | 0.227               | 280<br>(4061)  | 336<br>(4873) | 0.259               | 384<br>(5569) | 460<br>(6671) | 0.327               |               |               |                     |
| 1/2" (12.7)                   |   |                |                     | 144<br>(2088) | 174<br>(2523)  | 0.267               | 174<br>(2526)  | 208<br>(3016)   | 0.312               | 205<br>(2973)  | 246<br>(3567) | 0.359               | 279<br>(4046) | 334<br>(4844) | 0.459               |               |               |                     |
| 5/8" (15.87)                  |   |                |                     | 122<br>(1769) | 146<br>(2117)  | 0.339               | 146<br>(2117)  | 175<br>(2538)   | 0.397               | 172<br>(2494)  | 206<br>(2987) | 0.458               | 233<br>(3379) | 279<br>(4046) | 0.591               | 260<br>(3770) | 311<br>(4510) | 0.646               |
| 3/4" (19.05)                  |   |                |                     | 101<br>(1464) | 121<br>(1755)  | 0.411               | 120<br>(1740)  | 144<br>(2088)   | 0.483               | 142<br>(2059)  | 170<br>(2465) | 0.558               | 191<br>(2770) | 229<br>(3321) | 0.723               | 213<br>(3089) | 256<br>(3712) | 0.793               |
| 1" (25.4)                     |   |                |                     | 75<br>(1087)  | 90<br>(1305)   | 0.554               | 89<br>(1290)   | 107<br>(1551)   | 0.653               | 105<br>(1522)  | 126<br>(1827) | 0.757               | 141<br>(2045) | 169<br>(2451) | 0.987               | 157<br>(2277) | 188<br>(2726) | 1.085               |



El cálculo de presiones han sido realizados a partir de la norma ASME B31.3 de acuerdo con las tolerancias de las normas ASTM A213/A269.  
 Temperatura de cálculo de -20°F a 100°F (-29°C a 38°C).

The pressure calculation have been made according to ASME B31.3 the tolerances are in accordance with ASTM A213/A269.

The calculation have been made at -20 ° F to 100 ° F (-29 ° C to 38 ° C).

3.- Presión de servicio máxima a alta temperatura:  
 Para determinar la presión de servicio a una temperatura superior al ambiente, multiplicar la presión indicada en tabla (Punto 2) por el coeficiente que se indica en la siguiente tabla, según la temperatura de servicio deseada.

3. - Maximum operating pressure at high temperature:  
 To determine the operating pressure at a higher temperature, multiply the pressure of the item 2 table by the factor indicated in the following table, at the desired temperature.

| Coeficiente / Coefficient |      |      |      |      |      |      |      |      |      |      |      |     |      |      |      |       |      |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|-----|------|------|------|-------|------|
| °F                        | 200  | 300  | 400  | 500  | 600  | 650  | 700  | 750  | 800  | 850  | 900  | 950 | 1000 | 1050 | 1100 | 1150  | 1200 |
| °C                        | 93   | 150  | 204  | 260  | 316  | 343  | 371  | 400  | 427  | 454  | 482  | 510 | 538  | 566  | 593  | 621   | 650  |
| TP 304/304L               | 0.85 | 0.76 | 0.70 | 0.65 | 0.62 | 0.61 | 0.59 | 0.58 | 0.57 | -    | -    | -   | -    | -    | -    | -     | -    |
| TP 316/316L               | 0.85 | 0.76 | 0.70 | 0.65 | 0.62 | 0.61 | 0.59 | 0.58 | 0.57 | 0.56 | -    | -   | -    | -    | -    | -     | -    |
| TP 321                    | 0.9  | 0.82 | 0.76 | 0.71 | 0.67 | 0.66 | 0.65 | 0.64 | 0.63 | 0.62 | 0.61 | 0.6 | 0.6  | 0.48 | 0.35 | 0.256 | 0.18 |

4.- Ensayos certificados.  
 Pruebas de abocardado.  
 Dureza en la superficie Rockwell < B90.  
 Prueba de aplastamiento.  
 Prueba hidrostática.

4. - Test certificates.  
 Flare testing.  
 Rockwell hardness surface <B90.  
 Crushing test.  
 Hydrostatic testing.



5.- Para referenciar el tubo ver página 9

5. - For tubing references see page 9

Tubos de cobre recocido :  
ASTM B 68 / ASTM B 75  
ASTM B 88 (Tipo K / Tipo L)

Tubos de cobre recubierto en PVC color negro:  
ASTM B 68 / ASTM B 75

1.- Características químicas (Tabla 1. ASTM B 68,  
ASTM B 75 y ASTM B 88).

Cobre UNS N° C12200  
Cobre mínimo % 99.9  
Fósforo % 0.015 a 0.040

2.- Dimensiones y presiones máximas de servicio para  
tubería de cobre ASTM B68 y ASTM B75.

Annealed copper tubes:  
ASTM B 68 / ASTM B 75  
ASTM B 88 (K / L type)

Copper tubes coated in black PVC:  
ASTM B 68 / ASTM B 75

1.- Chemical composition (Table 1 ASTM B 68,  
ASTM B 75 and ASTM B 88).

Copper UNS No. C12200  
Minimum 99.9% Copper  
Phosphorus% 0015-0040

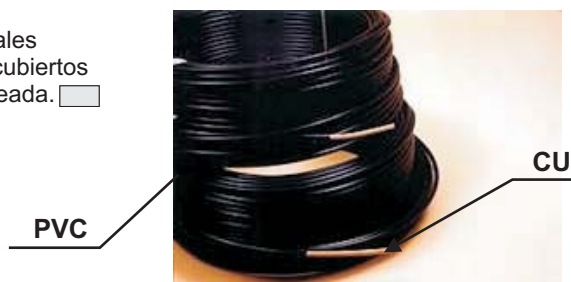
2.- Sizes and maximum working pressures for copper  
tubing ASTM B68 and ASTM B75.

| Tubo O.D.<br>Tube O.D.<br>m.m. | Espesores nominal de pared<br>Nominal wall thickness |                        |               |                        |
|--------------------------------|--|------------------------|---------------|------------------------|
|                                | 0.8 m.m.   | Peso<br>Weight<br>Kg/m | 1 m.m.        | Peso<br>Weight<br>Kg/m |
| 4                              | 180<br>(2610)  | 0.072                  | 235<br>(3408) | 0.084                  |
| 6                              | 114<br>(1653)  | 0.117                  | 145<br>(2103) | 0.140                  |
| 8                              |  |                        | 105<br>(1522) | 0.197                  |
| 10                             |  |                        | 83<br>(1203)  | 0.253                  |
| 12                             |  |                        | 68<br>(986)   | 0.309                  |
| 14                             |  |                        | 58<br>(841)   | 0.365                  |
| 16                             |  |                        | 50<br>(725)   | 0.422                  |
| 18                             |  |                        | 44<br>(638)   | 0.478                  |

→ BAR  
→ PSI

| Tubo O.D.<br>Tube O.D.<br>in. | Espesores nominal de pared BWG IN (m.m)<br>Nominal wall thickness BWG IN (m.m) |                        |                  |                        |                  |                        |                  |                        |                  |                        |
|-------------------------------|--|------------------------|------------------|------------------------|------------------|------------------------|------------------|------------------------|------------------|------------------------|
|                               | 0.028<br>(0.711)   | Peso<br>Weight<br>Kg/m | 0.032<br>(0.812) | Peso<br>Weight<br>Kg/m | 0.035<br>(0.889) | Peso<br>Weight<br>Kg/m | 0.042<br>(1.066) | Peso<br>Weight<br>Kg/m | 0.049<br>(1.244) | Peso<br>Weight<br>Kg/m |
| 1/8" (3.75)                   |  |                        |                  |                        | 217<br>(3147)    | 0.057                  | → BAR<br>→ PSI   |                        |                  |                        |
| 1/4" (6.35)                   | 90<br>(1288)   | 0.112                  | 108<br>(1566)    | 0.126                  | 118<br>(1711)    | 0.136                  | 147<br>(2132)    | 0.158                  |                  |                        |
| 3/8" (9.52)                   |  |                        | 69<br>(1000)     | 0.199                  | 76<br>(1102)     | 0.216                  | 94<br>(1363)     | 0.253                  | 113<br>(1638)    | 0.289                  |
| 1/2" (12.7)                   |  |                        | 52<br>(754)      | 0.270                  | 56<br>(812)      | 0.295                  | 69<br>(1000)     | 0.349                  | 82<br>(1189)     | 0.400                  |
| 3/4" (19.05)                  |  |                        | 34<br>(493)      | 0.416                  | 36<br>(522)      | 0.454                  | 44<br>(638)      | 0.539                  | 53<br>(768)      | 0.623                  |

Tubos disponibles los cuales  
pueden suministrarse recubiertos  
en PVC, ver zona sombreada.



PVC coated tubing available for sizes  
indicated by shaded area.



Dimensiones y presiones máximas de servicio para tubería de cobre ASTM B 88 (Tipo K - Tipo L).

Sizes and maximum working pressures for copper tubing ASTM B 88 (Type K - Type L).

| Tubo O.D.<br>Tube O.D. | Ø Exterior<br>Outside Ø |        | Espesores nominal de pared<br>Nominal wall thickness |        |                     |               |       |                     | Presión máxima de servicio<br>Maximum working pressure |     |               |     |
|------------------------|-------------------------|--------|--|--------|---------------------|---------------|-------|---------------------|--|-----|---------------|-----|
|                        |                         |        | Tipo / Type K  |        |                     | Tipo / Type L |       |                     | Tipo / Type K  |     | Tipo / Type L |     |
|                        | IN.                     | M.M.   | IN.  | M.M.   | Peso Weight<br>Kg/m | IN.           | M.M.  | Peso Weight<br>Kg/m | BAR  | PSI | BAR           | PSI |
| 1/2"                   | 0.625                   | 15.875 | 0.049  | 1.2446 | 0.512               | 0.040         | 1.016 | 0.424               | 61   | 885 | 50            | 725 |
| 3/4"                   | 0.875                   | 22.225 | 0.065  | 1.6510 | 0.956               | 0.045         | 1.143 | 0.678               | 59   | 856 | 40            | 580 |
| 1"                     | 1.125                   | 28.575 | 0.065  | 1.6510 | 1.251               | 0.050         | 1.270 | 0.976               | 45   | 652 | 34            | 493 |
| 1 1/4"                 | 1.375                   | 34.925 | 0.065  | 1.6510 | 1.546               | 0.055         | 1.397 | 1.318               | 37   | 536 | 30            | 435 |
| 1 1/2"                 | 1.625                   | 41.275 | 0.072  | 1.8288 | 2.030               | 0.060         | 1.524 | 1.705               | 34   | 493 | 28            | 406 |
| 2"                     | 2.125                   | 53.975 | 0.083  | 2.1082 | 3.077               | 0.070         | 1.778 | 2.612               | 30   | 435 | 25            | 362 |
| 2 1/2"                 | 2.625                   | 66.675 | 0.095  | 2.4130 | 4.364               | 0.080         | 2.032 | 3.697               | 28   | 406 | 23            | 333 |
| 3"                     | 3.125                   | 79.375 | 0.109  | 2.7686 | 5.970               | 0.090         | 2.286 | 4.960               | 27   | 391 | 22            | 319 |

Cálculos realizados a partir de las especificaciones de la norma ASME B31.3 basada en una tensión mínima del cobre de 30 Ksi a una temperatura entre -20°F a 100°F (-29°C a 38°C) de acuerdo con las tolerancias en diámetros y espesores de pared correspondiente a cada norma.

Calculations according to ASME B31.3 standard based on a minimum stress value of 30 Ksi copper at a temperature between -20°F to 100°F (-29°C to 38°C) according to the tolerances in diameter and wall thickness for each standard.

### 3.- Presión de servicio a alta temperatura:

Para determinar la presión de servicio a una temperatura superior al ambiente, multiplicar la presión indicada en tabla (Punto 2) por el coeficiente que se indica en la siguiente tabla, según la temperatura de servicio deseada.

### 3.- Maximum operating pressure at high temperature:

To determine the operating pressure at a higher temperature, multiply the pressure of the item 2 table by the factor indicated in the following table, at the desired temperature.

| Coeficiente / Coefficient |      |       |     |       |       |     |
|---------------------------|------|-------|-----|-------|-------|-----|
| °F                        | 150  | 200   | 250 | 300   | 350   | 400 |
| °C                        | 66   | 93    | 121 | 150   | 177   | 204 |
| <b>B 68</b>               | 0.85 | 0.816 | 0.8 | 0.783 | 0.66  | 0.5 |
| <b>B 75</b>               | 0.85 | 0.816 | 0.8 | 0.783 | 0.666 | 0.5 |
| <b>B 88</b>               | 0.85 | 0.816 | 0.8 | 0.783 | 0.666 | 0.5 |



4.- Para referenciar el tubo ver página 9

4.- For tubing references see page 9