

Acoustic Velocities for Common Liquids and Solids  
&  
Common Pipe Sizes

*Revised 12/10/2010*

**Acoustic Velocities for Pipe Solids at 25 deg. C (Shear velocity)**

| <b><i>Material</i></b>       | <b><i>ft/sec</i></b> | <b><i>m/sec</i></b> |
|------------------------------|----------------------|---------------------|
| Acrylic*                     | 8954                 | 2730                |
| Aluminum                     | 10102                | 3080                |
| Aluminum (rolled)            | 9971                 | 3040                |
| Aluminum (2024)              | 10365                | 3160                |
| Asbestos Cement              | 7216                 | 2200                |
| Brass (Naval)                | 6724                 | 2050                |
| Carbon Steel                 | 10516                | 3206                |
| Cast Iron                    | 10594                | 3230                |
| Copper                       | 7413                 | 2260                |
| Copper (annealed)            | 7626                 | 2325                |
| Copper (rolled)              | 7446                 | 2270                |
| Copper-Nickel (70-30)        | 8331                 | 2540                |
| Copper-Nickel (90-10)        | 6757                 | 2060                |
| Ductile Iron                 | 9840                 | 3000                |
| FRP                          | 8216                 | 2505                |
| Glass, Crown                 | 9315                 | 2840                |
| Glass, Pyrex                 | 10758                | 3280                |
| Glass, Quartz                | 11546                | 3520                |
| Gold                         | 3936                 | 1200                |
| Inconel                      | 9906                 | 3020                |
| Iron                         | 10611                | 3235                |
| Iron, Ductile                | 9840                 | 3000                |
| Lead                         | 7118                 | 2170                |
| Lucite                       | 4133                 | 1260                |
| Mild Steel                   | 10611                | 3235                |
| Monel                        | 8922                 | 2720                |
| Mortar                       | 8200                 | 2500                |
| Nickel                       | 9709                 | 2960                |
| Nylon                        | 7872                 | 2400                |
| Nylon, 6-6                   | 3510                 | 1070                |
| Polyethylene (LD)*           | 6363                 | 1940                |
| Polyethylene (HD)*           | 7577                 | 2310                |
| PVC, CPVC*                   | 7872                 | 2400                |
| Steel, 1% carbon             | 10562                | 3220                |
| Steel, galvanized - standard | 10590                | 3223                |
| Steel, hardened 1% carbon    | 10332                | 3150                |
| Stainless Steel - 302        | 10234                | 3120                |
| Stainless Steel - 303        | 10234                | 3120                |
| Stainless Steel - 304        | 10516                | 3206                |
| Stainless Steel - 316        | 10414                | 3175                |
| Stainless Steel - 347        | 10168                | 3100                |
| Stainless Steel - 410        | 9807                 | 2990                |
| Stainless Steel - 430        | 11021                | 3360                |
| Tar epoxy                    | 6560                 | 2000                |
| Tin, rolled                  | 5478                 | 1670                |
| Titanium                     | 10250                | 3125                |
| Tungsten, annealed           | 9479                 | 2890                |
| Tungsten, drawn              | 8659                 | 2640                |
| Tungsten, carbide            | 13054                | 3980                |
| Zinc, rolled                 | 8003                 | 2440                |

\*Longitudinal velocity used when friction coefficients is low

**Longitudinal Acoustic Velocities for Common Liquids at 25 deg C or other temperature indicates**

| <u>Substance</u>              | <u>Specific Gravity</u> | <u>Ft/ Sec.</u> | <u>M./Sec.</u> |
|-------------------------------|-------------------------|-----------------|----------------|
| Acetate, Ethyl                | 0.901                   | 3560            | 1085           |
| Acetate, Methyl               | 0.934                   | 3973            | 1211           |
| Acetic Anhydride (22)         | 1.082                   | 3871            | 1180           |
| Acetic Acid, Nitrile          | 0.783                   | 4232            | 1290           |
| Acetic Acid, Ethyl Ester (33) | 0.901                   | 3560            | 1085           |
| Acetic Acid, Methyl Ester     | 0.934                   | 3973            | 1211           |
| Acetone                       | 0.791                   | 3852            | 1174           |
| Acetonitrile                  | 0.783                   | 4232            | 1290           |
| Acetylacetone                 | 0.729                   | 4590            | 1399           |
| Acetylen Dichloride           | 1.26                    | 3330            | 1015           |
| Acetylene Tetrabromide (47)   | 2.966                   | 3369            | 1027           |
| Acetylene Tetrachloride (47)  | 1.595                   | 3763            | 1147           |
| Alcohol                       | 0.789                   | 3960            | 1207           |
| Alcohol - Ethyl               | 0.83                    | 3960            | 1207           |
| Alcohol - Isopropyl           |                         | 3839            | 1170           |
| Alkazene-13                   | 0.86                    | 4321            | 1317           |
| Alkazene-25                   | 1.2                     | 4288            | 1307           |
| 2-Amino-Ethanol               | 1.018                   | 5656            | 1724           |
| Aminobenzene                  | 1.022                   | 5376            | 1639           |
| 2-Aminotolidine (46)          | 0.999                   | 5308            | 1618           |
| 4-Aminotolidine (46)          | 0.966                   | 4856            | 1480           |
| Ammonia (35)                  | 0.771                   | 5672            | 1729           |
| Amorphous Polyolefin          | 0.98                    | 3158            | 963            |
| n-Amyl Alcohol                |                         | 4015            | 1224           |
| t-Amyl Alcohol                | 0.81                    | 3950            | 1204           |
| Aniline                       | 10.2                    | 5377            | 1639           |
| Argon (45)                    | 1.4                     | 2799            | 853            |
| Azine                         | 0.982                   | 4642            | 1415           |
| Benzene                       | 0.879                   | 4285            | 1306           |
| Benzol (29,40,41)             | 0.879                   | 4285            | 1306           |
| Bromine (21)                  | 2.928                   | 2917            | 889            |
| Bromo-Benzene (46)            | 1.522                   | 3839            | 1170           |
| 1-Bromo Butane (46)           | 1.276                   | 3343            | 1.019          |
| Bromo-Ethane (46)             | 1.46                    | 2953            | 900            |
| Bromoform (46,47)             | 2.89                    | 3012            | 918            |
| n-Butane (-5)                 | 0.601                   | 3560            | 1085           |
| Sec-Butylalcohol              | 0.81                    | 4068            | 1240           |
| n-Butyl Bromide (46)          | 1.276                   | 3343            | 1019           |
| n-Butyl Chloride (22,46)      | 0.887                   | 3740            | 1140           |
| tert Butyl Chloride           | 0.84                    | 3228            | 984            |
| Butyl oleate                  | 1.019                   | 4869            | 1484           |
| 2,3,Butylene glycol           | 1.019                   | 4869            | 1484           |
|                               |                         |                 |                |

**Longitudinal Acoustic Velocities for Common Liquids at 25 deg C or other temperature indicates**

| <u>Substance</u>                        | <u>Specific Gravity</u> | <u>Ft/ Sec.</u> | <u>M./Sec.</u> |
|---|-------------------------|-----------------|----------------|
| Cadmium (7)                             |                         | 7342            | 2238           |
| Carbinol (40,41)                        | 0.791                   | 3530            | 1076           |
| Carbitol                                | 0.988                   | 4784            | 1458           |
| Carbon Dioxide                          | 1.101                   | 2757            | 839            |
| Carbon Disulphide                       | 1.261                   | 3770            | 1149           |
| Carbon Tetrachloride                    | 1.595                   | 3038            | 926            |
| Carbon Tetraflouride (-150)             | 1.75                    | 2872            | 875            |
| Cetane (23)                             | 0.773                   | 4390            | 1338           |
| Chloro-benezene                         | 0.887                   | 3740            | 1140           |
| Chloroform (20)                         |                         | 3054            | 931            |
| 1-Chloro-propane (47)                   | 0.892                   | 3471            | 1058           |
| Chloro-diFluoromethane (3)              | 1.491                   | 2933            | 894            |
| Cinnamaldehyde                          | 1.112                   | 5098            | 1554           |
| Colamine                                | 1.018                   | 5656            | 1724           |
| o-Cresol (46)                           | 1.047                   | 5056            | 1541           |
| m-Cresol (46)                           | 1.034                   | 4921            | 1500           |
| Cyanomethane                            | 0.783                   | 4232            | 1290           |
| Cyclohexane (15)                        | 0.779                   | 4095            | 1284           |
| Cyclohexanol                            | 0.962                   | 4770            | 1454           |
| Cyclohexanone                           | 0.948                   | 4669            | 1423           |
| Decane (46)                             | 0.73                    | 4108            | 1252           |
| 1-Decene (27)                           | 0.746                   | 4052            | 1235           |
| Diacetyl                                | 0.99                    | 4055            | 1236           |
| Diamylamine                             |                         | 4121            | 1256           |
| 1,2 Dibromo-ethane (47)                 | 2.18                    | 3264            | 995            |
| trans-1,2-Dibromoethene (47)            | 2.231                   | 3068            | 935            |
| Dibutyl phthalate                       |                         | 4619            | 1408           |
| Dichloro-t-butyl alcohol                |                         | 4278            | 1304           |
| 2,3,Dichlorodioxane                     |                         | 4564            | 1391           |
| Dichlorodifluoromethane(3)Freon(12)     | 1.516                   | 2540            | 774            |
| 1,2 Dichloro ethane (47)                | 1.253                   | 3914            | 1193           |
| cis 1,2-Dichloro-ethene (3, 47)         | 1.284                   | 3481            | 1061           |
| trans1,2-Dichloro-ethene (3,47)         | 1.257                   | 3314            | 1010           |
| 1-2-Dichlorohexafluorocyclobutane (47)  | 1.65                    | 2195            | 669            |
| 1-3-Dichloro-isobutane                  | 1.14                    | 4003            | 1220           |
| Dichloro methane (3)                    | 1.327                   | 3511            | 1070           |
| 1,1-Dichloro-1,2,2,2,tetra fluoroethane | 1.455                   | 21853           | 665            |
| Diesel fuel                             |                         | 4100            | 1250           |
| Diethyl ether                           | 0.713                   | 3232            | 985            |
| Diethylene glycol                       | 1.116                   | 5203            | 1586           |
| Diethylene glycol, monoethyl ether      | 0.988                   | 4784            | 1458           |
| Diethylenimide oxide                    | 1                       | 4731            | 1442           |
| 1,2-bis (DiFluoramino) butane (43)      | 1.216                   | 3281            | 1000           |
| 1,2-bis(diFluoramino) 2-methylpropane   | 1.213                   | 2953            | 900            |

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|------------------------------------|-------------------------|-----------------|----------------|
| 1,2-bis(diFlouramino) propane (43) | 1.265                   | 3150            | 960            |
| 2,2-Dihydroxydiethyl ether         | 1.116                   | 5203            | 1586           |
| Dihydroxyethane                    | 1.113                   | 5440            | 1658           |
| 1,3-Dimethyl-benzene (46)          | 0.868                   | 4406            | 1343           |
| 1,4-Dimehyl-benzene (46)           |                         | 4377            | 1334           |
| 2,2-Dimethyl-butane (29,33)        | 0.649                   | 3540            | 1079           |
| Dimethyl Ketone                    | 0.0791                  | 3852            | 1174           |
| Dimethyl pentane (47)              | 0.674                   | 3488            | 1063           |
| Dimethyl phthalate                 | 1.2                     | 4800            | 1463           |
| Diiodo-methane                     | 3.24                    | 3215            | 980            |
| Dimethyl Silocan (Dow Corning 200) |                         | 2991            | 912            |
| Dioxane                            | 1.033                   | 4514            | 1376           |
| Dodecane (23)                      | 0.749                   | 4196            | 1279           |
| 1,2-Ethanediol                     | 1.113                   | 5440            | 1658           |
| Ethanenitrile                      | 0.783                   | 4232            | 1290           |
| Ethanoic anhydride (22)            | 1.082                   | 3871            | 1180           |
| Ethanol                            | 0.789                   | 3960            | 1207           |
| Ethanol amide                      | 1.018                   | 5656            | 1724           |
| Ethoxyethane                       | 0.713                   | 3232            | 985            |
| Ethyl acetate (33)                 | 901                     | 3560            | 1085           |
| Ethyl alcohol                      | 0.789                   | 3960            | 1207           |
| Ethyl benzene (46)                 | 0.867                   | 4390            | 1338           |
| Ethyl Bromide (46)                 | 1.461                   | 2953            | 900            |
| Ethyl iodide (460)                 | 1.95                    | 2874            | 876            |
| Ether                              | 0.713                   | 3232            | 985            |
| Ethyl ether                        | 0.713                   | 3232            | 985            |
| Ethylene bromide                   | 2.18                    | 3264            | 995            |
| Ethylene Chloride                  | 1.253                   | 3914            | 1193           |
| Ethyle glycol                      | 1113                    | 5440            | 1658           |
| d-2-Fenechanone                    | 0.947                   | 4331            | 1320           |
| Fluorine                           | 0.0545                  | 1322            | 403            |
| Fluoro-benzene (46)                | 1.024                   | 3901            | 1189           |
| Formaldehyde, methyl ester         | 0.974                   | 3698            | 1127           |
| Formamide                          | 1.134                   | 5322            | 1622           |
| Freon R12                          |                         | 2540            | 774            |
| Furfural                           | 1.157                   | 4738            | 1444           |
| Furfuryl alcohol                   | 1.135                   | 4757            | 1450           |
| Fural                              | 1.157                   | 4738            | 1444           |
| 2-Furancarboxaldehyde              | 1.157                   | 4738            | 1444           |
| 2-Furyl-Methanol                   | 1.135                   | 4757            | 1450           |
| Gallium                            | 6.095                   | 9416            | 2870           |
| Glycerin                           | 1.26                    | 6247            | 1904           |
| Glycol                             | 1.113                   | 5440            | 1658           |

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|---------------------------------|-------------------------|-----------------|----------------|
| Heptane (22, 23)                | 0.684                   | 3711            | 1131           |
| n-Heptane (29,33)               | 0.684                   | 3871            | 1180           |
| Hexachloro-Cyclopentadiene (47) | 1.718                   | 3773            | 1150           |
| Hexadecane (23)                 | 0.773                   | 4390            | 1338           |
| Hexalin                         | 0.962                   | 4770            | 1454           |
| Hexane (16,22,23)               | 0.659                   | 3540            | 1079           |
| n-Hexane (29,33)                | 0.649                   | 3540            | 1079           |
| 2,5-Hexanedione                 | 0.729                   | 4590            | 1399           |
| n-Hexanol                       | 0.819                   | 4265            | 1300           |
| Hexahydrobenzene (15)           | 0.779                   | 4095            | 1248           |
| Hexahydrophenol                 | 0.962                   | 4770            | 1454           |
| Hydrogen (45)                   | 0.071                   | 3894            | 1187           |
| 2-Hydroxy-toluene (46)          | 1.047                   | 5056            | 1541           |
| 3-Hydroxy-toluene (46)          | 1.034                   | 4921            | 1500           |
| Iodo-benzene (46)               | 1.823                   | 3655            | 1114           |
| Iodo-ethane (46)                | 1.95                    | 2874            | 876            |
| Iodo-methane                    | 2.28                    | 3209            | 978            |
| Isobutyl acetate (22)           |                         | 3871            | 1180           |
| Isobutanol                      | 0.81                    | 3976            | 1212           |
| Iso-Butane                      |                         | 4002            | 1220           |
| Isopentane (36)                 | 0.62                    | 3215            | 980            |
| Isopropanol (46)                | 0.785                   | 3839            | 1170           |
| Isopropyl alcohol (46)          | 0.785                   | 3839            | 1170           |
| Kerosene                        | 0.81                    | 4343            | 1324           |
| Ketohexamethylene               | 0.948                   | 4669            | 1423           |
| Lithium fluoride (42)           |                         | 8153            | 2485           |
| Mercury (45)                    | 13.6                    | 4754            | 1449           |
| Mesityloxide                    | 0.85                    | 4298            | 1310           |
| Methane (25,28,38,39)           | 0.162                   | 1329            | 405            |
| Methanol (40,41)                | 0.791                   | 3530            | 1076           |
| Methyl acetate                  | 0.934                   | 3973            | 1211           |
| o-Methylaniline (46)            | 0.999                   | 5308            | 1618           |
| 4-Methylaniline (46)            | 0.966                   | 4856            | 1480           |
| Methyl alcohol (40,44)          | 0.791                   | 3530            | 1076           |
| Methyl benzene (16,52)          | 0.867                   | 4357            | 1328           |
| 2-Methyl-butane (36)            | 0.62                    | 3215            | 980            |
| Methyl carbinol                 | 0.789                   | 3960            | 1207           |
| Methyl-chloroform (47)          | 1.33                    | 3232            | 985            |
| Methyl-cyanide                  | 0.783                   | 4232            | 1290           |
| 3-Methyl cyclohexanol           | 0.92                    | 4593            | 1400           |
| Methylene chloride (3)          | 1.327                   | 3511            | 1070           |

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|-------------------------------|-------------------------|-----------------|----------------|
| Methylene iodide              | 3.235                   | 3215            | 980            |
| Methyl formate (22)           | 0.974                   | 3698            | 1127           |
| Methyl iodide                 | 2.28                    | 3209            | 978            |
| a-Methyl naphthalene          | 1.09                    | 4954            | 1510           |
| 2-Methylphenol (46)           | 1.047                   | 5056            | 1541           |
| 3-Methylphenol (46)           | 1.034                   | 4921            | 1500           |
| Milk, homogenized             |                         | 1548            | 5080           |
| Morpholine                    | 1                       | 4731            | 1442           |
| Naphtha                       | 0.76                    | 4019            | 1225           |
| Natural Gas (37)              | 0.316                   | 2471            | 753            |
| Neon (45)                     | 1.207                   | 1952            | 595            |
| Nitrobenzene (46)             | 1.204                   | 4642            | 1415           |
| Nitrogen (45)                 | 0.808                   | 3156            | 962            |
| Nitromethane (43)             | 1.135                   | 4265            | 1300           |
| Nonane (23)                   | 0.718                   | 3960            | 1207           |
| 1-Nonene (27)                 | 0.736                   | 3960            | 1207           |
| Octane                        | 0.703                   | 3845            | 1172           |
| n-Octane                      | 0.704                   | 3978            | 1213           |
| l-Octene                      | 0.723                   | 3857            | 1176           |
| Oil, Auto crankcase - SAE 20  |                         | 2854            | 870            |
| Oil of Camphor Sassafrassy    |                         | 4560            | 1390           |
| Oil, Car (SAE 20a.30)         | 1.74                    | 2854            | 870            |
| Oil, Castor                   | 0.969                   | 4849            | 1477           |
| Oil, Fuel AA gravity          | 0.99                    | 4872            | 1485           |
| Oil, Diesel                   | 0.8                     | 4101            | 1250           |
| Oil, Lube - X200              |                         | 5020            | 1530           |
| Oil (Olive)                   | 0.912                   | 4695            | 1431           |
| Oil (Peanut)                  | 0.936                   | 4784            | 1458           |
| Oil (Sperm)                   | 0.88                    | 4724            | 1440           |
| Oil, 6                        |                         | 4951            | 1509           |
| 2,2-Oxydiethanol              | 1.116                   | 5203            | 1586           |
| Oxygen (45)                   | 1.155                   | 3123            | 952            |
| Pentachloro-ethane (47)       | 1.687                   | 3550            | 1082           |
| Pentalin (47)                 | 1.687                   | 3550            | 1082           |
| Pentane (36)                  | 0.626                   | 3347            | 1020           |
| n-Pentane (47)                | 0.557                   | 3301            | 1006           |
| Perchlorocyclopentadiene (47) | 1.718                   | 3773            | 1150           |
| Perchloro-ethylene (47)       | 1.632                   | 3399            | 1036           |
| Perfluoro-1-Hepten (47)       | 1.67                    | 1913            | 583            |
| Perfluoro-n-Hexane (47)       | 1.672                   | 1667            | 508            |
| Phene (29,40,41)              | 0.879                   | 4285            | 1306           |
| b-Phenyl acrolein             | 1.112                   | 5098            | 1554           |
| Phenylamine (41)              | 1.022                   | 5377            | 1639           |

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|--------------------------|-------------------------|-----------------|----------------|
| Phenyl bromide (46)      | 1.522                   | 3839            | 1170           |
| Phenyl chloride          | 1.106                   | 4177            | 1273           |
| Phenyl iodide (46)       | 1.823                   | 3655            | 1114           |
| Phenyl methane (16,52)   | 0.867                   | 4357            | 1328           |
| 3-Phenyl propenal        | 1.112                   | 5098            | 1554           |
| Phthalardione            |                         | 3691            | 1125           |
| Phthalic acid, anhydride |                         | 3691            | 1125           |
| Pimelic ketone           | 0.948                   | 4669            | 1423           |
| Polyterpene Resin        | 0.77                    | 3608            | 1100           |
| Potassium bromide (42)   |                         | 3835            | 1169           |
| Potassium fluoride (42)  |                         | 5879            | 1792           |
| Potassium iodide (42)    |                         | 3232            | 985            |
| Potassium nitrate (48)   | 1.859                   | 5709            | 1740           |
| Propane (2,13)           | 0.585                   | 3291            | 1003           |
| 1,2,3-Propanetriol       | 1.26                    | 6247            | 1904           |
| 1-Propanol (46)          | 0.78                    | 4009            | 1222           |
| 2-Propanol (46)          | 0.78                    | 3839            | 1170           |
| 2-Propanone              | 0.791                   | 3852            | 1174           |
| Propene (17,18, 35)      | 0.563                   | 3159            | 963            |
| n-Propyl acetate (22)    |                         | 4199            | 1280           |
| n-Propyl-alcohol         | 0.78                    | 4009            | 1222           |
| Propylchloride (47)      | 0.892                   | 3471            | 1058           |
| Propylene (17,18, 35)    | 0.563                   | -3159           | 963            |
| Pyridine                 | 0.982                   | 4642            | 1415           |
| Refrigerant 11           | 1.49                    | 2718            | 828            |
| Refrigerant 12 (-40)     | 1.52                    | 2540            | 774            |
| Refrigerant 14 (-150)    | 1.75                    | 2872            | 875            |
| Refrigerant 21           | 1.43                    | 2923            | 891            |
| Refrigerant 22           | 1.49                    | 2933            | 894            |
| Refrigerant 113          | 1.56                    | 2571            | 784            |
| Refrigerant 114          | 1.46                    | 2183            | 665            |
| Refrigerant 115          |                         | 2153            | 656            |
| Refrigerant C318         | 1.62                    | 1883            | 574            |
| Selenium (8)             |                         | 3717            | 1072           |
| Silicone (30 cp)         | 0.993                   | 3248            | 990            |
| Sodium fluoride (42)     | 0.877                   | 6831            | 2082           |
| Sodium nitrate (48)      | 1.884                   | 5785            | 1763           |
| Sodium nitrite (48)      | 1.805                   | 6158            | 1877           |
| Solvesso #3              | 0.877                   | 4495            | 1370           |
| Spirit of wine           | 0.789                   | 3960            | 1207           |
| Sulfur                   |                         | 3862            | 1177           |
| Sufuric Acid             | 1.841                   | 4126            | 1258           |
| Tellurium                |                         | 3251            | 991            |



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|---|-------------------------|-----------------|----------------|
| 1,1,2,2-Tetrabromo-ethane (47)          | 2.966                   | 3369            | 1027           |
| Tetrachloroethane (46)                  | 1.553                   | 3839            | 1170           |
| Tetrachloro-ethene (47)                 | 1.632                   | 3399            | 1036           |
| Tetrachloro-Methane (33, 47)            | 1.595                   | 3038            | 926            |
| Tetradecane (46)                        | 0.763                   | 4367            | 1331           |
| Tetraethylene glycol                    | 1.123                   | 5203            | 1586           |
| Tetrafluoro-methane (14) (Freon 14)     | 1.75                    | 2872            | 875            |
| Tetrahydro-1,4-isoxazine                | 1                       | 4731            | 1442           |
| Toluene (16,52)                         | 0.867                   | 4357            | 1328           |
| o-Toluidine (46)                        | 0.999                   | 5308            | 1618           |
| p-Toluidine (46)                        | 0.966                   | 4856            | 1480           |
| Toluol                                  | 866                     | 4291            | 1308           |
| Tribromo-methane                        | 2.89                    | 3019            | 918            |
| Trichloro-ethene                        | 1.33                    | 3232            | 985            |
| Trifluorotrichlorethene - Freon 113     | 1.464                   | 3373            | 1028           |
| Trichloro-fluoromethane (3) (Freon 11)  | 1.49                    | 2718            | 828            |
| Trichloro-methane (47)                  | 1.489                   | 3212            | 979            |
| 1,1,2-Trichloro-Trifluoro-Etham         | 1.563                   | 2571            | 784            |
| Triethyl-amine (33)                     | 0.726                   | 3684            | 1123           |
| Triethylene glycol                      | 1.123                   | 5276            | 1608           |
| 1,1,1-Trifluoro-2-Chloro-2-Bromo-Ethane | 1.869                   | 2274            | 693            |
| d-1,3,3-Trimethylnorcamphor             | 0.947                   | 4331            | 1320           |
| Trinitrotoluene                         | 1.64                    | 5282            | 1610           |
| Unisis 800                              | 0.87                    | 4416            | 1346           |
| Water, distilled                        | 0.996                   | 4915            | 1498           |
| Water, heavy                            |                         | 4593            | 1400           |
| Water, sea                              | 1.025                   | 5023            | 1531           |
| Wood Alcohol                            | 0.791                   | 3530            | 1076           |
| Xenon                                   |                         | 2067            | 630            |
| m-Xylene                                | 0.868                   | 4406            | 1343           |
| o-Xylene                                | 0.897                   | 4368            | 1332           |
| p-Xylene                                |                         | 4377            | 1334           |
| Xylene hexafluoride                     | 1.37                    | 2884            | 879            |
| Zinc                                    |                         | 10820           | 3298           |

Revised 7/29/09

**Sound Speeds in Water at Selected Temperatures**

| Temperature |       | Sound Speed in Water |       |
|-------------|-------|----------------------|-------|
| °C          | °F    | m/s                  | ft/s  |
| 0           | 32.0  | 1,402                | 4,600 |
| 1           | 33.8  | 1,407                | 4,616 |
| 2           | 35.6  | 1,412                | 4,633 |
| 3           | 37.4  | 1,417                | 4,649 |
| 4           | 39.2  | 1,421                | 4,662 |
| 5           | 41.0  | 1,426                | 4,679 |
| 6           | 42.8  | 1,430                | 4,692 |
| 7           | 44.6  | 1,434                | 4,705 |
| 8           | 46.4  | 1,439                | 4,721 |
| 9           | 48.2  | 1,443                | 4,734 |
| 10          | 50.0  | 1,447                | 4,748 |
| 11          | 51.8  | 1,451                | 4,761 |
| 12          | 53.6  | 1,455                | 4,774 |
| 13          | 55.4  | 1,458                | 4,784 |
| 14          | 57.2  | 1,462                | 4,797 |
| 15          | 59.0  | 1,465                | 4,807 |
| 16          | 60.8  | 1,469                | 4,820 |
| 17          | 62.6  | 1,472                | 4,830 |
| 18          | 64.4  | 1,476                | 4,843 |
| 19          | 66.2  | 1,479                | 4,853 |
| 20          | 68.0  | 1,482                | 4,862 |
| 21          | 69.8  | 1,485                | 4,872 |
| 22          | 71.6  | 1,488                | 4,882 |
| 23          | 73.4  | 1,491                | 4,892 |
| 24          | 75.2  | 1,493                | 4,899 |
| 25          | 77.0  | 1,496                | 4,908 |
| 26          | 78.8  | 1,499                | 4,918 |
| 27          | 80.6  | 1,501                | 4,925 |
| 28          | 82.4  | 1,504                | 4,935 |
| 29          | 84.2  | 1,506                | 4,941 |
| 30          | 86.0  | 1,509                | 4,951 |
| 31          | 87.8  | 1,511                | 4,958 |
| 32          | 89.6  | 1,513                | 4,964 |
| 33          | 91.4  | 1,515                | 4,971 |
| 34          | 93.2  | 1,517                | 4,977 |
| 35          | 95.0  | 1,519                | 4,984 |
| 36          | 96.8  | 1,521                | 4,990 |
| 37          | 98.6  | 1,523                | 4,997 |
| 38          | 100.4 | 1,525                | 5,004 |
| 39          | 102.2 | 1,527                | 5,010 |
| 40          | 104.0 | 1,528                | 5,013 |
| 41          | 105.8 | 1,530                | 5,020 |
| 42          | 107.6 | 1,532                | 5,026 |
| 43          | 109.4 | 1,534                | 5,033 |
| 44          | 111.2 | 1,535                | 5,036 |
| 45          | 113.0 | 1,536                | 5,040 |
| 46          | 114.8 | 1,538                | 5,046 |
| 47          | 116.6 | 1,539                | 5,049 |

| Temperature |       | Sound Speed in Water |       |
|-------------|-------|----------------------|-------|
| °C          | °F    | m/s                  | ft/s  |
| 48          | 118.4 | 1,540                | 5,053 |
| 49          | 120.2 | 1,541                | 5,056 |
| 50          | 122.0 | 1,543                | 5,063 |
| 51          | 123.8 | 1,543                | 5,063 |
| 52          | 125.6 | 1,544                | 5,066 |
| 53          | 127.4 | 1,545                | 5,069 |
| 54          | 129.2 | 1,546                | 5,072 |
| 55          | 131.0 | 1,547                | 5,076 |
| 56          | 132.8 | 1,548                | 5,079 |
| 57          | 134.6 | 1,548                | 5,079 |
| 58          | 136.4 | 1,549                | 5,082 |
| 59          | 138.2 | 1,550                | 5,086 |
| 60          | 140.0 | 1,550                | 5,086 |
| 61          | 141.8 | 1,551                | 5,089 |
| 62          | 143.6 | 1,552                | 5,092 |
| 63          | 145.4 | 1,552                | 5,092 |
| 64          | 147.2 | 1,553                | 5,095 |
| 65          | 149.0 | 1,553                | 5,095 |
| 66          | 150.8 | 1,553                | 5,095 |
| 67          | 152.6 | 1,554                | 5,099 |
| 68          | 154.4 | 1,554                | 5,099 |
| 69          | 156.2 | 1,554                | 5,099 |
| 70          | 158.0 | 1,554                | 5,099 |
| 71          | 159.8 | 1,554                | 5,099 |
| 72          | 161.6 | 1,555                | 5,102 |
| 73          | 163.4 | 1,555                | 5,102 |
| 74          | 165.2 | 1,555                | 5,102 |
| 75          | 167.0 | 1,555                | 5,102 |
| 76          | 168.8 | 1,555                | 5,102 |
| 77          | 170.6 | 1,554                | 5,099 |
| 78          | 172.4 | 1,554                | 5,099 |
| 79          | 174.2 | 1,554                | 5,099 |
| 80          | 176.0 | 1,554                | 5,099 |
| 81          | 177.8 | 1,554                | 5,099 |
| 82          | 179.6 | 1,553                | 5,095 |
| 83          | 181.4 | 1,553                | 5,095 |
| 84          | 183.2 | 1,553                | 5,095 |
| 85          | 185.0 | 1,552                | 5,092 |
| 86          | 186.8 | 1,552                | 5,092 |
| 87          | 188.6 | 1,552                | 5,092 |
| 88          | 190.4 | 1,551                | 5,089 |
| 89          | 192.2 | 1,551                | 5,089 |
| 90          | 194.0 | 1,550                | 5,086 |
| 91          | 195.8 | 1,549                | 5,082 |
| 92          | 197.6 | 1,549                | 5,082 |
| 93          | 199.4 | 1,548                | 5,079 |
| 94          | 201.2 | 1,547                | 5,076 |
| 95          | 203.0 | 1,547                | 5,076 |

| Temperature |       | Sound Speed in Water |       |
|-------------|-------|----------------------|-------|
| °C          | °F    | m/s                  | ft/s  |
| 96          | 204.8 | 1,546                | 5,072 |
| 97          | 206.6 | 1,545                | 5,069 |
| 98          | 208.4 | 1,544                | 5,066 |
| 99          | 210.2 | 1,543                | 5,063 |
| 100         | 212.0 | 1,543                | 5,063 |
| 104         | 220.0 | 1,538                | 5,046 |
| 110         | 230.0 | 1,532                | 5,026 |
| 116         | 140.0 | 1,524                | 5,000 |
| 121         | 250.0 | 1,526                | 5,007 |
| 127         | 260.0 | 1,507                | 4,944 |
| 132         | 270.0 | 1,497                | 4,912 |
| 138         | 280.0 | 1,487                | 4,879 |
| 143         | 290.0 | 1,479                | 4,843 |
| 149         | 300.0 | 1,465                | 4,807 |
| 154         | 310.0 | 1,453                | 4,767 |
| 160         | 320.0 | 1,440                | 4,725 |
| 166         | 330.0 | 1,426                | 4,679 |
| 171         | 340.0 | 1,412                | 4,633 |
| 177         | 350.0 | 1,398                | 4,587 |
| 182         | 360.0 | 1,383                | 4,538 |
| 188         | 370.0 | 1,368                | 4,488 |
| 193         | 380.0 | 1,353                | 4,439 |
| 199         | 390.0 | 1,337                | 4,387 |
| 204         | 400.0 | 1,320                | 4,331 |
| 210         | 410.0 | 1,320                | 4,272 |
| 216         | 420.0 | 1,283                | 4,210 |
| 221         | 430.0 | 1,264                | 4,147 |
| 227         | 440.0 | 1,244                | 4,082 |
| 232         | 450.0 | 1,220                | 4,003 |
| 238         | 460.0 | 1,200                | 3,937 |
| 243         | 470.0 | 1,180                | 3,872 |
| 249         | 480.0 | 1,160                | 3,806 |
| 254         | 490.0 | 1,140                | 3,740 |
| 260         | 500.0 | 1,110                | 3,642 |

**FPS TO GPM CROSS - REFERENCE (Schedule 40)**

| <b>Nominal<br/>Pipe<br/>(Inches)</b> | <b>I.D.<br/>INCH</b> | <b>1</b> | <b>1.5</b> | <b>2</b> | <b>2.5</b> | <b>3</b> | <b>3.5</b> | <b>4</b> | <b>4.5</b> | <b>5</b> | <b>5.5</b> | <b>6</b>  | <b>6.5</b> | <b>7</b>  | <b>7.5</b> | <b>8</b>  | <b>8.5</b> | <b>9</b>  |
|--------------------------------------|----------------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|
| 1                                    | 1.05                 | 2.70     | 4.05       | 5.40     | 6.75       | 8.10     | 9.44       | 10.79    | 12.14      | 13.49    | 14.84      | 16.19     | 17.54      | 18.89     | 20.24      | 21.59     | 22.94      | 24.29     |
| 1.25                                 | 1.38                 | 4.66     | 6.99       | 9.32     | 11.65      | 13.98    | 16.31      | 18.65    | 20.98      | 23.31    | 25.64      | 27.97     | 30.30      | 32.63     | 34.96      | 37.29     | 39.62      | 41.95     |
| 1.5                                  | 1.61                 | 6.34     | 9.52       | 12.69    | 15.86      | 19.03    | 22.21      | 25.38    | 28.55      | 31.72    | 34.89      | 38.07     | 41.24      | 44.41     | 47.58      | 50.76     | 53.93      | 57.10     |
| 2                                    | 2.07                 | 10.49    | 15.73      | 20.98    | 26.22      | 31.46    | 36.71      | 41.95    | 47.20      | 52.44    | 57.68      | 62.93     | 68.17      | 73.42     | 78.66      | 83.90     | 89.15      | 94.39     |
| 2.5                                  | 2.47                 | 14.93    | 22.40      | 29.87    | 37.33      | 44.80    | 52.26      | 59.73    | 67.20      | 74.66    | 82.13      | 89.60     | 97.06      | 104.53    | 112.00     | 119.46    | 126.93     | 134.40    |
| 3                                    | 3.07                 | 23.07    | 34.60      | 46.14    | 57.67      | 69.21    | 80.74      | 92.28    | 103.81     | 115.34   | 126.88     | 138.41    | 149.95     | 161.48    | 173.02     | 184.55    | 196.08     | 207.62    |
| 3.5                                  | 3.55                 | 30.85    | 46.27      | 61.69    | 77.12      | 92.54    | 107.96     | 123.39   | 138.81     | 154.23   | 169.66     | 185.08    | 200.50     | 215.92    | 231.35     | 246.77    | 262.19     | 277.62    |
| 4                                    | 4.03                 | 39.75    | 59.63      | 79.50    | 99.38      | 119.26   | 139.13     | 159.01   | 178.88     | 198.76   | 218.64     | 238.51    | 258.39     | 278.26    | 298.14     | 318.02    | 337.89     | 357.77    |
| 5                                    | 5.05                 | 62.42    | 93.63      | 124.84   | 156.05     | 187.26   | 218.47     | 249.68   | 280.89     | 312.10   | 343.32     | 374.53    | 405.74     | 436.95    | 468.16     | 499.37    | 530.58     | 561.79    |
| 6                                    | 6.06                 | 89.89    | 134.83     | 179.77   | 224.72     | 269.66   | 314.60     | 359.54   | 404.49     | 449.43   | 494.37     | 539.32    | 584.26     | 629.20    | 674.15     | 719.09    | 764.03     | 808.98    |
| 8                                    | 7.98                 | 155.87   | 233.80     | 311.73   | 389.67     | 467.60   | 545.53     | 623.47   | 701.40     | 779.33   | 857.27     | 935.20    | 1013.13    | 1091.07   | 1169.00    | 1246.93   | 1324.87    | 1402.80   |
| 10                                   | 10.02                | 245.74   | 368.62     | 491.49   | 614.36     | 737.23   | 860.10     | 982.98   | 1105.85    | 1228.72  | 1351.59    | 1474.46   | 1597.34    | 1720.21   | 1843.08    | 1965.95   | 2088.82    | 2211.70   |
| 12                                   | 11.94                | 348.94   | 523.42     | 697.89   | 872.36     | 1046.83  | 1221.31    | 1395.78  | 1570.25    | 1744.72  | 1919.19    | 2093.67   | 2268.14    | 2442.61   | 2617.08    | 2791.55   | 2966.03    | 3140.50   |
| 14                                   | 13.13                | 421.97   | 632.95     | 843.93   | 1054.91    | 1265.90  | 1476.88    | 1687.86  | 1898.84    | 2109.83  | 2320.81    | 2531.79   | 2742.78    | 2953.76   | 3164.74    | 3375.72   | 3586.71    | 3797.69   |
| 16                                   | 15.00                | 550.72   | 826.08     | 1101.44  | 1376.80    | 1652.16  | 1927.52    | 2202.88  | 2478.24    | 2753.60  | 3028.95    | 3304.31   | 3579.67    | 3855.03   | 4130.39    | 4405.75   | 4681.11    | 4956.47   |
| 18                                   | 16.88                | 697.42   | 1046.13    | 1394.83  | 1743.54    | 2092.25  | 2440.96    | 2789.67  | 3138.38    | 3487.08  | 3835.79    | 4184.50   | 4533.21    | 4881.92   | 5230.63    | 5579.33   | 5928.04    | 6276.75   |
| 20                                   | 18.81                | 866.01   | 1299.02    | 1732.03  | 2165.04    | 2598.04  | 3031.05    | 3464.06  | 3897.06    | 4330.07  | 4763.08    | 5196.09   | 5629.09    | 6062.10   | 6495.11    | 6928.12   | 7361.12    | 7794.13   |
| 24                                   | 22.63                | 1253.48  | 1880.22    | 2506.96  | 3133.69    | 3760.43  | 4387.17    | 5013.91  | 5640.65    | 6267.39  | 6894.13    | 7520.87   | 8147.61    | 8774.34   | 9401.08    | 10027.82  | 10654.56   | 11281.30  |
| 26                                   | 25.25                | 1560.52  | 2340.79    | 3121.05  | 3901.31    | 4681.57  | 5461.83    | 6242.09  | 7022.36    | 7802.62  | 8582.88    | 9363.14   | 10143.40   | 10923.66  | 11703.93   | 12484.19  | 13264.45   | 14044.71  |
| 28                                   | 27.25                | 1817.53  | 2726.29    | 3635.05  | 4543.81    | 5452.58  | 6361.34    | 7270.10  | 8178.87    | 9087.63  | 9996.39    | 10905.15  | 11813.92   | 12722.68  | 13631.44   | 14540.21  | 15448.97   | 16357.73  |
| 30                                   | 29.25                | 2094.11  | 3141.16    | 4188.22  | 5235.27    | 6282.33  | 7329.38    | 8376.44  | 9423.49    | 10470.54 | 11517.60   | 12564.65  | 13611.71   | 14658.76  | 15705.82   | 16752.87  | 17799.93   | 18846.98  |
| 32                                   | 31.25                | 2390.27  | 3585.41    | 4780.55  | 5975.68    | 7170.82  | 8365.96    | 9561.09  | 10756.23   | 11951.37 | 13146.50   | 14341.64  | 15536.78   | 16731.91  | 17927.05   | 19122.19  | 20317.32   | 21512.46  |
| 34                                   | 33.25                | 2706.02  | 4059.03    | 5412.04  | 6765.05    | 8118.06  | 9471.07    | 10824.08 | 12177.09   | 13530.09 | 14883.10   | 16236.11  | 17589.12   | 18942.13  | 20295.14   | 21648.15  | 23001.16   | 24354.17  |
| 36                                   | 35.25                | 3041.35  | 4562.02    | 6082.69  | 7603.36    | 9124.04  | 10644.71   | 12165.38 | 13686.06   | 15206.73 | 16727.40   | 18248.07  | 19768.75   | 21289.42  | 22810.09   | 24330.77  | 25851.44   | 27372.11  |
| 42                                   | 41.25                | 4164.81  | 6247.22    | 8329.62  | 10412.03   | 12494.44 | 14576.84   | 16659.25 | 18741.66   | 20824.06 | 22906.47   | 24988.87  | 27071.28   | 29153.69  | 31236.09   | 33318.50  | 35400.91   | 37483.31  |
| 48                                   | 47.99                | 5637.01  | 8455.52    | 11274.03 | 14092.53   | 16911.04 | 19729.55   | 22548.05 | 25366.56   | 28185.07 | 31003.57   | 33822.08  | 36640.58   | 39459.09  | 42277.60   | 45096.10  | 47914.61   | 50733.12  |
| 54                                   | 53.98                | 7132.03  | 10698.05   | 14264.06 | 17830.08   | 21396.10 | 24962.11   | 28528.13 | 32094.15   | 35660.16 | 39226.18   | 42792.19  | 46358.21   | 49924.23  | 53490.24   | 57056.26  | 60622.27   | 64188.29  |
| 60                                   | 60.09                | 8837.96  | 13256.94   | 17675.92 | 22094.90   | 26513.88 | 30932.85   | 35351.83 | 39770.81   | 44189.79 | 48608.77   | 53027.75  | 57446.73   | 61865.71  | 66284.69   | 70703.67  | 75122.65   | 79541.63  |
| 72                                   | 72.1                 | 12723.84 | 19085.75   | 25447.67 | 31809.59   | 38171.51 | 44533.43   | 50895.35 | 57257.26   | 63619.18 | 69981.10   | 76343.02  | 82704.94   | 89066.85  | 95428.77   | 101790.69 | 108152.61  | 114514.53 |
| 84                                   | 84.1                 | 17311.69 | 25967.54   | 34623.39 | 43279.23   | 51935.08 | 60590.92   | 69246.77 | 77902.62   | 86558.46 | 95214.31   | 103870.16 | 112526.00  | 121181.85 | 129837.70  | 138493.54 | 147149.39  | 155805.23 |



**Common Pipe Sizes for Welded Steel, Aluminum, and Copper (continued)**

| Nominal Diameter | ALUMINUM | COPPER TUBING |        |        |                     | WELDED STEEL |         |         |         |        |        |        |        |        |        |        |        |        |  |        |
|------------------|----------|---------------|--------|--------|---------------------|--------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--------|
|                  |          | Type K        | Type L | Type M | Copper & Brass Pipe | 16 Gage      | 14 Gage | 12 Gage | 10 Gage | 7 Gage | 3 Gage | 1/4    | 5/16   | 3/8    | 7/16   | 1/2    |        |        |  |        |
| 10"              | O.D.     | 10.000        |        |        |                     |              |         | 10.000  | 10.000  | 10.000 | 10.000 | 10.000 | 10.000 |        |        |        |        |        |  |        |
|                  | Wall     | 0.094         |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 2.000  |        |        |        |        |        |        |  |        |
|                  | I.D.     | 9.812         |        |        |                     |              |         | 9.851   | 9.791   | 9.731  | 9.641  | 9.522  |        |        |        |        |        |        |  |        |
| 10-3/4"          | O.D.     |               |        |        |                     |              |         | 10.750  | 10.750  | 10.750 | 10.750 | 10.750 |        |        |        |        |        |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  |        |        |        |        |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 10.601  | 10.541  | 10.481 | 10.391 | 10.272 |        |        |        |        |        |        |  |        |
| 12"              | O.D.     |               |        |        |                     |              |         | 12.000  | 12.000  | 12.000 | 12.000 | 12.000 |        |        |        |        |        |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  |        |        |        |        |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 11.851  | 11.791  | 11.731 | 11.641 | 11.522 |        |        |        |        |        |        |  |        |
| 12-3/4"          | O.D.     |               |        |        |                     |              |         | 12.750  | 12.750  | 12.750 | 12.750 | 12.750 |        |        |        |        |        |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  |        |        |        |        |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 12.601  | 12.541  | 12.481 | 12.391 | 12.272 |        |        |        |        |        |        |  |        |
| 14"              | O.D.     |               |        |        |                     |              |         | 14.000  | 14.000  | 14.000 | 14.000 | 14.000 |        |        |        |        |        |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  |        |        |        |        |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 13.851  | 13.791  | 13.731 | 13.641 | 13.522 |        |        |        |        |        |        |  |        |
| 16"              | O.D.     |               |        |        |                     |              |         | 16.000  | 16.000  | 16.000 | 16.000 | 16.000 | 16.000 | 16.000 | 16.000 | 16.000 |        |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  |        |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 15.851  | 15.791  | 15.731 | 15.641 | 15.522 | 15.500 | 15.370 | 15.250 |        |        |        |  |        |
| 18"              | O.D.     |               |        |        |                     |              |         | 18.000  | 18.000  | 18.000 | 18.000 | 18.000 | 18.000 | 18.000 | 18.000 | 18.000 |        |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  |        |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 17.851  | 17.791  | 17.731 | 17.641 | 17.522 | 17.500 | 17.370 | 17.250 |        |        |        |  |        |
| 20"              | O.D.     |               |        |        |                     |              |         | 20.000  | 20.000  | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 19.851  | 19.791  | 19.731 | 19.641 | 19.522 | 19.500 | 19.370 | 19.250 | 19.124 |        |        |  |        |
| 22"              | O.D.     |               |        |        |                     |              |         | 22.000  | 22.000  | 22.000 | 22.000 | 22.000 | 22.000 | 22.000 | 22.000 | 22.000 | 22.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |        |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 21.851  | 21.791  | 21.731 | 21.641 | 21.522 | 21.500 | 21.370 | 21.250 | 21.124 |        |        |  |        |
| 24"              | O.D.     |               |        |        |                     |              |         | 24.000  | 24.000  | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 |  | 24.000 |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 23.851  | 23.791  | 23.731 | 23.641 | 23.522 | 23.500 | 23.370 | 23.250 | 23.124 | 23.000 |        |  |        |
| 30"              | O.D.     |               |        |        |                     |              |         | 30.000  | 30.000  | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 |  | 30.000 |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 29.851  | 29.791  | 29.731 | 29.641 | 29.522 | 29.500 | 29.370 | 29.250 | 29.124 | 29.000 |        |  |        |
| 36"              | O.D.     |               |        |        |                     |              |         | 36.000  | 36.000  | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 |  | 36.000 |
|                  | Wall     |               |        |        |                     |              |         | 0.075   | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         | 35.851  | 35.791  | 35.731 | 35.641 | 35.522 | 35.500 | 35.370 | 35.250 | 35.124 | 35.000 |        |  |        |
| 42"              | O.D.     |               |        |        |                     |              |         |         | 42.000  | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 |  | 42.000 |
|                  | Wall     |               |        |        |                     |              |         |         | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         |         | 41.791  | 41.731 | 41.641 | 41.522 | 41.500 | 41.370 | 41.250 | 41.124 | 41.000 |        |  |        |
| 48"              | O.D.     |               |        |        |                     |              |         |         | 48.000  | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         |         | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         |         | 47.791  | 47.731 | 47.641 | 47.522 | 47.500 | 47.370 | 47.250 | 47.124 | 47.000 |        |  |        |
| 54"              | O.D.     |               |        |        |                     |              |         |         | 54.000  | 54.000 | 54.000 | 54.000 | 54.000 | 54.000 | 54.000 | 54.000 | 54.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         |         | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         |         | 53.791  | 53.731 | 53.641 | 53.522 | 53.500 | 53.370 | 53.250 | 53.124 | 53.000 |        |  |        |
| 60"              | O.D.     |               |        |        |                     |              |         |         | 60.000  | 60.000 | 60.000 | 60.000 | 60.000 | 60.000 | 60.000 | 60.000 | 60.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         |         | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         |         | 59.791  | 59.731 | 59.641 | 59.522 | 59.500 | 59.370 | 59.250 | 59.124 | 59.000 |        |  |        |
| 66"              | O.D.     |               |        |        |                     |              |         |         | 66.000  | 66.000 | 66.000 | 66.000 | 66.000 | 66.000 | 66.000 | 66.000 | 66.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         |         | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         |         | 65.791  | 65.731 | 65.641 | 65.522 | 65.500 | 65.370 | 65.250 | 65.124 | 65.000 |        |  |        |
| 72"              | O.D.     |               |        |        |                     |              |         |         | 72.000  | 72.000 | 72.000 | 72.000 | 72.000 | 72.000 | 72.000 | 72.000 | 72.000 |        |  |        |
|                  | Wall     |               |        |        |                     |              |         |         | 0.105   | 0.135  | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  | 0.500  |        |  |        |
|                  | I.D.     |               |        |        |                     |              |         |         | 71.791  | 71.731 | 71.641 | 71.522 | 71.500 | 71.370 | 71.250 | 71.124 | 71.000 |        |  |        |

**CARBON STEEL**

**STAINLESS STEEL**

| Nominal Diameter |      | Schedule 10 | Schedule 20 | Schedule 30 | Schedule 40 | Schedule 60 | Schedule 80 | Schedule 100 | Schedule 120 | Schedule 140 | Schedule 160 | Standard Weight | Extra Strong | Double Extra Strong | Schedule 5 | Schedule 10 | Schedule 40 | Schedule 80 |
|------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|-----------------|--------------|---------------------|------------|-------------|-------------|-------------|
| 1/2"             | O.D. |             |             |             | 0.840       |             | 0.840       |              |              |              | 0.840        | 0.840           | 0.840        | 0.840               |            |             |             |             |
|                  | Wall |             |             |             | 0.109       |             | 0.147       |              |              |              | 0.187        | 0.109           | 0.147        | 0.294               |            |             |             |             |
|                  | I.D. |             |             |             | 0.612       |             | 0.546       |              |              |              | 0.466        | 0.612           | 0.546        | 0.252               |            |             |             |             |
| 3/4"             | O.D. |             |             |             | 1.050       |             | 1.050       |              |              |              | 1.050        | 1.050           | 1.050        | 1.050               |            |             |             |             |
|                  | Wall |             |             |             | 0.113       |             | 0.154       |              |              |              | 0.218        | 0.113           | 0.154        | 0.308               |            |             |             |             |
|                  | I.D. |             |             |             | 0.824       |             | 0.742       |              |              |              | 0.614        | 0.824           | 0.742        | 0.434               |            |             |             |             |
| 1"               | O.D. |             |             |             | 1.315       |             | 1.315       |              |              |              | 1.315        | 1.315           | 1.315        | 1.315               | 1.315      | 1.315       | 1.315       | 1.315       |
|                  | Wall |             |             |             | 0.133       |             | 0.179       |              |              |              | 0.250        | 0.133           | 0.179        | 0.358               | 0.065      | 0.109       | 0.133       | 0.179       |
|                  | I.D. |             |             |             | 1.049       |             | 0.957       |              |              |              | 0.815        | 1.049           | 0.957        | 0.559               | 1.185      | 1.097       | 1.049       | 0.957       |
| 1-1/4"           | O.D. |             |             |             | 1.660       |             | 1.660       |              |              |              | 1.660        | 1.660           | 1.660        | 1.660               | 1.660      | 1.660       | 1.660       | 1.660       |
|                  | Wall |             |             |             | 0.140       |             | 0.191       |              |              |              | 0.250        | 0.140           | 0.191        | 0.382               | 0.065      | 0.109       | 0.140       | 0.191       |
|                  | I.D. |             |             |             | 1.380       |             | 1.278       |              |              |              | 1.160        | 1.380           | 1.278        | 0.896               | 1.530      | 1.442       | 1.380       | 1.278       |
| 1-1/2"           | O.D. |             |             |             | 1.900       |             | 1.900       |              |              |              | 1.900        | 1.900           | 1.900        | 1.900               | 1.900      | 1.900       | 1.900       | 1.900       |
|                  | Wall |             |             |             | 0.145       |             | 0.200       |              |              |              | 0.281        | 0.145           | 0.200        | 0.400               | 0.065      | 0.109       | 0.145       | 0.200       |
|                  | I.D. |             |             |             | 1.610       |             | 1.500       |              |              |              | 1.338        | 1.610           | 1.500        | 1.100               | 1.770      | 1.682       | 1.610       | 1.500       |
| 2"               | O.D. |             |             |             | 2.375       |             | 2.375       |              |              |              | 2.375        | 2.375           | 2.375        | 2.375               | 2.375      | 2.375       | 2.375       | 2.375       |
|                  | Wall |             |             |             | 0.154       |             | 0.218       |              |              |              | 0.343        | 0.154           | 0.218        | 0.436               | 0.065      | 0.109       | 0.154       | 0.218       |
|                  | I.D. |             |             |             | 2.067       |             | 1.939       |              |              |              | 1.689        | 2.067           | 1.939        | 1.503               | 2.245      | 2.157       | 2.067       | 1.939       |
| 2-1/2"           | O.D. |             |             |             | 2.875       |             | 2.875       |              |              |              | 2.875        | 2.875           | 2.875        | 2.875               | 2.875      | 2.875       | 2.875       | 2.875       |
|                  | Wall |             |             |             | 0.203       |             | 0.276       |              |              |              | 0.375        | 0.203           | 0.276        | 0.552               | 0.083      | 0.120       | 0.203       | 0.276       |
|                  | I.D. |             |             |             | 2.469       |             | 2.323       |              |              |              | 2.125        | 2.469           | 2.323        | 1.771               | 2.709      | 2.635       | 2.469       | 2.323       |
| 3"               | O.D. |             |             |             | 3.500       |             | 3.500       |              |              |              | 3.500        | 3.500           | 3.500        | 3.500               | 3.500      | 3.500       | 3.500       | 3.500       |
|                  | Wall |             |             |             | 0.216       |             | 0.300       |              |              |              | 0.438        | 0.216           | 0.300        | 0.600               | 0.083      | 0.120       | 0.216       | 0.300       |
|                  | I.D. |             |             |             | 3.067       |             | 2.900       |              |              |              | 2.624        | 3.068           | 2.900        | 2.300               | 3.334      | 3.260       | 3.068       | 2.900       |
| 3-1/2"           | O.D. |             |             |             | 4.000       |             | 4.000       |              |              |              | 4.000        | 4.000           | 4.000        | 4.000               | 4.000      | 4.000       | 4.000       | 4.000       |
|                  | Wall |             |             |             | 0.226       |             | 0.318       |              |              |              | 0.226        | 0.318           | 0.636        | 0.083               | 0.120      | 0.226       | 0.318       |             |
|                  | I.D. |             |             |             | 3.548       |             | 3.364       |              |              |              | 3.548        | 3.364           | 2.728        | 3.834               | 3.760      | 3.548       | 3.364       |             |
| 4"               | O.D. |             |             |             | 4.500       |             | 4.500       | 4.500        |              |              | 4.500        | 4.500           | 4.500        | 4.500               | 4.500      | 4.500       | 4.500       | 4.500       |
|                  | Wall |             |             |             | 0.237       |             | 0.337       | 0.438        |              |              | 0.531        | 0.237           | 0.337        | 0.674               | 0.083      | 0.120       | 0.237       | 0.337       |
|                  | I.D. |             |             |             | 4.026       |             | 3.826       | 3.626        |              |              | 3.438        | 4.026           | 3.826        | 3.152               | 4.334      | 4.260       | 4.026       | 3.826       |
| 5"               | O.D. |             |             |             | 5.563       |             | 5.563       | 5.563        |              |              | 5.563        | 5.563           | 5.563        | 5.563               | 5.563      | 5.563       | 5.563       | 5.563       |
|                  | Wall |             |             |             | 0.258       |             | 0.375       | 0.500        |              |              | 0.625        | 0.258           | 0.375        | 0.750               | 0.083      | 0.134       | 0.258       | 0.375       |
|                  | I.D. |             |             |             | 5.047       |             | 4.813       | 4.563        |              |              | 4.313        | 5.047           | 4.813        | 4.063               | 5.397      | 5.295       | 5.047       | 4.813       |
| 6"               | O.D. |             |             |             | 6.625       |             | 6.625       | 6.625        |              |              | 6.625        | 6.625           | 6.625        | 6.625               | 6.625      | 6.625       | 6.625       | 6.625       |
|                  | Wall |             |             |             | 0.280       |             | 0.432       | 0.562        |              |              | 0.718        | 0.280           | 0.432        | 0.897               | 0.109      | 0.134       | 0.280       | 0.432       |
|                  | I.D. |             |             |             | 6.065       |             | 5.761       | 5.501        |              |              | 5.189        | 6.065           | 5.761        | 4.897               | 6.407      | 6.357       | 6.065       | 5.761       |
| 8"               | O.D. |             | 8.625       | 8.625       | 8.625       | 8.625       | 8.625       | 8.625        | 8.625        | 8.625        | 8.625        | 8.625           | 8.625        | 8.625               | 8.625      | 8.625       | 8.625       | 8.625       |
|                  | Wall |             | 0.250       | 0.277       | 0.322       | 0.406       | 0.500       | 0.593        | 0.718        | 0.812        | 0.906        | 0.322           | 0.500        | 0.875               | 0.109      | 0.148       | 0.322       | 0.500       |
|                  | I.D. |             | 8.125       | 8.071       | 7.981       | 7.813       | 7.625       | 7.439        | 7.189        | 7.001        | 6.813        | 7.981           | 7.625        | 6.875               | 8.407      | 8.329       | 7.981       | 7.625       |
| 10"              | O.D. |             | 10.750      | 10.750      | 10.750      | 10.750      | 10.750      | 10.750       | 10.750       | 10.750       | 10.750       | 10.750          | 10.750       | 10.750              | 10.750     | 10.750      | 10.750      | 10.750      |
|                  | Wall |             | 0.250       | 0.307       | 0.365       | 0.500       | 0.593       | 0.718        | 0.843        | 1.000        | 1.125        | 0.365           | 0.500        | 1.000               | 0.134      | 0.165       | 0.365       | 0.500       |
|                  | I.D. |             | 10.250      | 10.136      | 10.020      | 9.750       | 9.564       | 9.314        | 9.064        | 8.750        | 8.500        | 10.020          | 9.750        | 8.750               | 10.482     | 10.420      | 10.020      | 9.750       |
| 12"              | O.D. |             | 12.750      | 12.750      | 12.750      | 12.750      | 12.750      | 12.750       | 12.750       | 12.750       | 12.750       | 12.750          | 12.750       | 12.750              | 12.750     | 12.750      | 12.750      | 12.750      |
|                  | Wall |             | 0.250       | 0.330       | 0.406       | 0.562       | 0.687       | 0.843        | 1.000        | 1.125        | 1.312        | 0.375           | 0.500        | 1.000               | 0.156      | 0.180       | 0.375       | 0.500       |
|                  | I.D. |             | 12.250      | 12.090      | 11.938      | 11.626      | 11.376      | 11.064       | 10.750       | 10.500       | 10.126       | 12.000          | 11.750       | 10.750              | 12.438     | 12.390      | 12.000      | 11.750      |

**CARBON STEEL**

**STAINLESS STEEL**

| Nominal Diameter |      | Schedule 10 | Schedule 20 | Schedule 30 | Schedule 40 | Schedule 60 | Schedule 80 | Schedule 100 | Schedule 120 | Schedule 140 | Schedule 160 | Standard Weight | Extra Strong | Double Extra Strong | Schedule 5 | Schedule 10 | Schedule 40 | Schedule 80 |
|------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|-----------------|--------------|---------------------|------------|-------------|-------------|-------------|
| 14"              | O.D. | 14.000      | 14.000      | 14.000      | 14.000      | 14.000      | 14.000      | 14.000       | 14.000       | 14.000       | 14.000       | 14.000          | 14.000       |                     | 14.000     | 14.000      |             |             |
|                  | Wall | 0.250       | 0.312       | 0.375       | 0.438       | 0.593       | 0.750       | 0.937        | 1.093        | 1.250        | 1.406        | 0.375           | 0.500        |                     | 0.156      | 0.188       |             |             |
|                  | I.D. | 13.500      | 13.375      | 13.250      | 13.124      | 12.814      | 12.500      | 12.126       | 11.814       | 11.500       | 11.188       | 13.250          | 13.000       |                     | 13.688     | 13.624      |             |             |
| 16"              | O.D. | 16.000      | 16.000      | 16.000      | 16.000      | 16.000      | 16.000      | 16.000       | 16.000       | 16.000       | 16.000       | 16.000          | 16.000       |                     | 16.000     | 16.000      |             |             |
|                  | Wall | 0.250       | 0.312       | 0.375       | 0.500       | 0.656       | 0.843       | 1.031        | 1.218        | 1.438        | 1.593        | 0.375           | 0.500        |                     | 0.165      | 0.188       |             |             |
|                  | I.D. | 15.500      | 15.375      | 15.250      | 15.000      | 14.688      | 14.314      | 13.938       | 13.564       | 13.124       | 12.814       | 15.250          | 15.000       |                     | 15.670     | 15.624      |             |             |
| 18"              | O.D. | 18.000      | 18.000      | 18.000      | 18.000      | 18.000      | 18.000      | 18.000       | 18.000       | 18.000       | 18.000       | 18.000          | 18.000       |                     | 18.000     | 18.000      |             |             |
|                  | Wall | 0.250       | 0.312       | 0.438       | 0.562       | 0.750       | 0.937       | 1.156        | 1.375        | 1.562        | 1.781        | 0.375           | 0.500        |                     | 0.165      | 0.188       |             |             |
|                  | I.D. | 17.500      | 17.375      | 17.124      | 16.876      | 16.500      | 16.126      | 15.688       | 15.250       | 14.876       | 14.438       | 17.250          | 17.000       |                     | 17.670     | 17.624      |             |             |
| 20"              | O.D. | 20.000      | 20.000      | 20.000      | 20.000      | 20.000      | 20.000      | 20.000       | 20.000       | 20.000       | 20.000       | 20.000          | 20.000       |                     | 20.000     | 20.000      |             |             |
|                  | Wall | 0.250       | 0.375       | 0.500       | 0.593       | 0.812       | 1.031       | 1.281        | 1.500        | 1.750        | 1.968        | 0.375           | 0.500        |                     | 0.188      | 0.218       |             |             |
|                  | I.D. | 19.500      | 19.250      | 19.000      | 18.814      | 18.376      | 17.938      | 17.438       | 17.000       | 16.500       | 16.064       | 19.250          | 19.000       |                     | 19.624     | 19.564      |             |             |
| 22"              | O.D. | 22.000      | 22.000      | 22.000      | 22.000      | 22.000      | 22.000      | 22.000       | 22.000       | 22.000       | 22.000       | 22.000          | 22.000       |                     | 22.000     | 22.000      |             |             |
|                  | Wall | 0.250       | 0.375       | 0.500       | 0.594       | 0.812       | 1.031       | 1.281        | 1.500        | 1.750        | 1.969        | 0.375           | 0.500        |                     | 0.188      | 0.218       |             |             |
|                  | I.D. | 21.500      | 21.250      | 21.000      | 20.812      | 20.376      | 19.938      | 19.438       | 19.000       | 18.500       | 18.062       | 21.250          | 21.000       |                     | 21.624     | 21.564      |             |             |
| 24"              | O.D. | 24.000      | 24.000      | 24.000      | 24.000      | 24.000      | 24.000      | 24.000       | 24.000       | 24.000       | 24.000       | 24.000          | 24.000       |                     | 24.000     | 24.000      |             |             |
|                  | Wall | 0.250       | 0.375       | 0.562       | 0.687       | 0.968       | 1.218       | 1.531        | 1.812        | 2.062        | 2.343        | 0.375           | 0.500        |                     | 0.218      | 0.250       |             |             |
|                  | I.D. | 23.500      | 23.250      | 22.875      | 22.626      | 22.064      | 21.564      | 20.938       | 20.376       | 19.876       | 19.314       | 23.250          | 23.000       |                     | 23.564     | 23.500      |             |             |
| 26"              | O.D. | 26.000      | 26.000      |             |             |             |             |              |              |              |              | 26.000          | 26.000       |                     |            |             |             |             |
|                  | Wall | 0.312       | 0.500       |             |             |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. | 25.376      | 25.000      |             |             |             |             |              |              |              |              | 25.250          | 25.000       |                     |            |             |             |             |
| 28"              | O.D. | 28.000      | 28.000      | 28.000      |             |             |             |              |              |              |              | 28.000          | 28.000       |                     |            |             |             |             |
|                  | Wall | 0.312       | 0.500       | 0.625       |             |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. | 27.376      | 27.000      | 26.750      |             |             |             |              |              |              |              | 27.250          | 27.000       |                     |            |             |             |             |
| 30"              | O.D. | 30.000      | 30.000      | 30.000      | 30.000      |             |             |              |              |              |              | 30.000          | 30.000       |                     | 30.000     | 30.000      |             |             |
|                  | Wall | 0.312       | 0.500       | 0.625       | 0.750       |             |             |              |              |              |              | 0.375           | 0.500        |                     | 0.250      | 0.312       |             |             |
|                  | I.D. | 29.376      | 29.000      | 28.750      | 28.500      |             |             |              |              |              |              | 29.250          | 29.000       |                     | 29.500     | 29.376      |             |             |
| 32"              | O.D. | 32.000      | 32.000      | 32.000      | 32.000      |             |             |              |              |              |              | 32.000          | 32.000       |                     |            |             |             |             |
|                  | Wall | 0.312       | 0.500       | 0.625       | 0.688       |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. | 31.376      | 31.000      | 30.750      | 30.624      |             |             |              |              |              |              | 31.250          | 31.000       |                     |            |             |             |             |
| 34"              | O.D. | 34.000      | 34.000      | 34.000      | 34.000      |             |             |              |              |              |              | 34.000          | 34.000       |                     |            |             |             |             |
|                  | Wall | 0.344       | 0.500       | 0.625       | 0.688       |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. | 33.312      | 33.000      | 32.750      | 32.624      |             |             |              |              |              |              | 33.250          | 33.000       |                     |            |             |             |             |
| 36"              | O.D. | 36.000      | 36.000      | 36.000      | 36.000      |             |             |              |              |              |              | 36.000          | 36.000       |                     |            |             |             |             |
|                  | Wall | 0.312       | 0.500       | 0.625       | 0.750       |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. | 35.312      | 35.000      | 34.750      | 34.500      |             |             |              |              |              |              | 35.250          | 35.000       |                     |            |             |             |             |
| 42"              | O.D. |             | 42.000      | 42.000      | 42.000      |             |             |              |              |              |              | 42.000          | 42.000       |                     |            |             |             |             |
|                  | Wall |             | 0.500       | 0.625       | 0.750       |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. |             | 41.000      | 40.750      | 40.500      |             |             |              |              |              |              | 41.250          | 41.000       |                     |            |             |             |             |
| 48"              | O.D. |             |             |             |             |             |             |              |              |              |              | 48.000          | 48.000       |                     |            |             |             |             |
|                  | Wall |             |             |             |             |             |             |              |              |              |              | 0.375           | 0.500        |                     |            |             |             |             |
|                  | I.D. |             |             |             |             |             |             |              |              |              |              | 47.250          | 47.000       |                     |            |             |             |             |

**Common Pipe Sizes for Welded Steel, Aluminum, and Copper (all dimensions in inches)**

| Nominal Diameter |      | ALUMINUM | COPPER TUBING |        |        | Copper & Brass Pipe | WELDED STEEL |         |         |         |        |        |     |      |     |      |  |
|------------------|------|----------|---------------|--------|--------|---------------------|--------------|---------|---------|---------|--------|--------|-----|------|-----|------|--|
|                  |      |          | Type K        | Type L | Type M |                     | 16 Gage      | 14 Gage | 12 Gage | 10 Gage | 7 Gage | 3 Gage | 1/4 | 5/16 | 3/8 | 7/16 |  |
| 1/2"             | O.D. |          | 0.625         | 0.625  | 0.625  | 0.840               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.049         | 0.040  | 0.028  | 0.108               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 0.527         | 0.545  | 0.569  | 0.625               |              |         |         |         |        |        |     |      |     |      |  |
| 5/8"             | O.D. |          | 0.750         | 0.750  | 0.750  |                     |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.049         | 0.042  | 0.030  |                     |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 0.652         | 0.666  | 0.690  |                     |              |         |         |         |        |        |     |      |     |      |  |
| 3/4"             | O.D. |          | 0.875         | 0.875  | 0.875  | 1.050               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.065         | 0.045  | 0.032  | 0.114               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 0.745         | 0.785  | 0.811  | 0.822               |              |         |         |         |        |        |     |      |     |      |  |
| 1"               | O.D. |          | 1.125         | 1.125  | 1.125  | 1.315               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.065         | 0.050  | 0.035  | 0.127               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 0.995         | 1.025  | 1.055  | 1.062               |              |         |         |         |        |        |     |      |     |      |  |
| 1-1/4"           | O.D. |          | 1.375         | 1.375  | 1.375  | 1.660               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.065         | 0.055  | 0.042  | 0.146               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 1.245         | 1.265  | 1.291  | 1.368               |              |         |         |         |        |        |     |      |     |      |  |
| 1-1/2"           | O.D. |          | 1.625         | 1.625  | 1.625  | 1.900               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.072         | 0.060  | 0.027  | 0.150               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 1.481         | 1.505  | 1.571  | 1.600               |              |         |         |         |        |        |     |      |     |      |  |
| 2"               | O.D. |          | 2.125         | 2.125  | 2.125  | 2.375               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.083         | 0.070  | 0.058  | 0.157               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 1.959         | 1.985  | 2.009  | 2.062               |              |         |         |         |        |        |     |      |     |      |  |
| 2-1/2"           | O.D. | 2.500    | 2.625         | 2.625  | 2.625  | 2.875               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall | 0.050    | 0.095         | 0.080  | 0.065  | 0.188               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. | 2.400    | 2.435         | 2.465  | 2.495  | 2.500               |              |         |         |         |        |        |     |      |     |      |  |
| 3"               | O.D. | 3.000    | 3.125         | 3.125  | 3.125  | 3.500               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall | 0.050    | 0.109         | 0.090  | 0.072  | 0.219               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. | 2.900    | 2.907         | 2.945  | 2.981  | 3.062               |              |         |         |         |        |        |     |      |     |      |  |
| 3-1/2"           | O.D. |          | 3.625         | 3.625  | 3.625  | 4.000               |              |         |         |         |        |        |     |      |     |      |  |
|                  | Wall |          | 0.120         | 0.100  | 0.083  | 0.250               |              |         |         |         |        |        |     |      |     |      |  |
|                  | I.D. |          | 3.385         | 3.425  | 3.459  | 3.500               |              |         |         |         |        |        |     |      |     |      |  |
| 4"               | O.D. | 4.000    | 4.125         | 4.125  | 4.125  | 4.500               | 4.000        | 4.000   | 4.000   | 4.000   |        |        |     |      |     |      |  |
|                  | Wall | 0.063    | 0.134         | 0.110  | 0.095  | 0.250               | 0.060        | 0.075   | 0.105   | 0.135   |        |        |     |      |     |      |  |
|                  | I.D. | 3.874    | 3.857         | 3.905  | 3.935  | 4.000               | 3.880        | 3.851   | 3.791   | 3.731   |        |        |     |      |     |      |  |
| 4-1/2"           | O.D. |          |               |        |        | 5.000               | 4.500        | 4.500   | 4.500   | 4.500   |        |        |     |      |     |      |  |
|                  | Wall |          |               |        |        | 0.250               | 0.060        | 0.075   | 0.105   | 0.135   |        |        |     |      |     |      |  |
|                  | I.D. |          |               |        |        | 4.500               | 4.380        | 4.351   | 4.291   | 4.231   |        |        |     |      |     |      |  |
| 5"               | O.D. | 5.000    | 5.125         | 5.125  | 5.125  | 5.563               | 5.000        | 5.000   | 5.000   | 5.000   | 5.000  |        |     |      |     |      |  |
|                  | Wall | 0.063    | 0.160         | 0.125  | 0.109  | 0.250               | 0.060        | 0.075   | 0.105   | 0.135   | 0.179  |        |     |      |     |      |  |
|                  | I.D. | 4.875    | 4.805         | 4.875  | 4.907  | 5.063               | 4.880        | 4.851   | 4.791   | 4.731   | 4.641  |        |     |      |     |      |  |
| 6"               | O.D. | 6.000    | 6.125         | 6.125  | 6.125  | 6.625               | 6.000        | 6.000   | 6.000   | 6.000   | 6.000  |        |     |      |     |      |  |
|                  | Wall | 0.063    | 0.192         | 0.140  | 0.122  | 0.250               | 0.060        | 0.075   | 0.105   | 0.135   | 0.179  |        |     |      |     |      |  |
|                  | I.D. | 5.874    | 5.741         | 5.845  | 5.881  | 6.125               | 5.880        | 5.851   | 5.791   | 5.731   | 5.641  |        |     |      |     |      |  |
| 6-5/8"           | O.D. |          |               |        |        | 6.625               | 6.625        | 6.625   | 6.625   | 6.625   |        |        |     |      |     |      |  |
|                  | Wall |          |               |        |        | 0.060               | 0.075        | 0.105   | 0.135   | 0.179   |        |        |     |      |     |      |  |
|                  | I.D. |          |               |        |        | 6.505               | 6.476        | 6.416   | 6.356   | 6.266   |        |        |     |      |     |      |  |
| 7"               | O.D. | 7.000    |               |        |        | 7.625               | 7.000        | 7.000   | 7.000   | 7.000   | 7.000  | 7.000  |     |      |     |      |  |
|                  | Wall | 0.078    |               |        |        | 0.282               | 0.060        | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |     |      |     |      |  |
|                  | I.D. | 6.844    |               |        |        | 7.062               | 6.880        | 6.851   | 6.791   | 6.731   | 6.641  | 6.522  |     |      |     |      |  |
| 8"               | O.D. | 8.000    | 8.125         | 8.125  | 8.125  | 8.625               | 8.000        | 8.000   | 8.000   | 8.000   | 8.000  | 8.000  |     |      |     |      |  |
|                  | Wall | 0.094    | 0.271         | 0.200  | 0.170  | 0.313               | 0.060        | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |     |      |     |      |  |
|                  | I.D. | 7.812    | 7.583         | 7.725  | 7.785  | 8.000               | 7.880        | 7.851   | 7.791   | 7.731   | 7.641  | 7.522  |     |      |     |      |  |



**Common Pipe Sizes for Welded Steel, Aluminum, and Copper**(all dimensions in inches) (continued)

| Nominal Diameter |      | ALUMINUM | COPPER TUBING |        |        | Copper & Brass Pipe | WELDED STEEL |         |         |         |        |        |        |        |        |        |
|------------------|------|----------|---------------|--------|--------|---------------------|--------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|
|                  |      |          | Type K        | Type L | Type M |                     | 16 Gage      | 14 Gage | 12 Gage | 10 Gage | 7 Gage | 3 Gage | 1/4    | 5/16   | 3/8    | 7/16   |
| 8-5/8"           | O.D. |          |               |        |        |                     | 8.625        | 8.625   | 8.625   | 8.625   | 8.625  | 8.625  |        |        |        |        |
|                  | Wall |          |               |        |        |                     | 0.060        | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |        |        |        |        |
|                  | I.D. |          |               |        |        |                     | 8.505        | 8.476   | 8.416   | 8.356   | 8.266  | 8.147  |        |        |        |        |
| 10"              | O.D. | 10.000   |               |        |        |                     |              | 10.000  | 10.000  | 10.000  | 10.000 | 10.000 |        |        |        |        |
|                  | Wall | 0.094    |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |        |        |        |        |
|                  | I.D. | 9.812    |               |        |        |                     |              | 9.851   | 9.791   | 9.731   | 9.641  | 9.522  |        |        |        |        |
| 10-3/4"          | O.D. |          |               |        |        |                     |              | 10.750  | 10.750  | 10.750  | 10.750 | 10.750 |        |        |        |        |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |        |        |        |        |
|                  | I.D. |          |               |        |        |                     |              | 10.601  | 10.541  | 10.481  | 10.391 | 10.272 |        |        |        |        |
| 12"              | O.D. |          |               |        |        |                     |              | 12.000  | 12.000  | 12.000  | 12.000 | 12.000 |        |        |        |        |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |        |        |        |        |
|                  | I.D. |          |               |        |        |                     |              | 11.851  | 11.791  | 11.731  | 11.641 | 11.522 |        |        |        |        |
| 12-3/4"          | O.D. |          |               |        |        |                     |              | 12.750  | 12.750  | 12.750  | 12.750 | 12.750 |        |        |        |        |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |        |        |        |        |
|                  | I.D. |          |               |        |        |                     |              | 12.601  | 12.541  | 12.481  | 12.391 | 12.272 |        |        |        |        |
| 14"              | O.D. |          |               |        |        |                     |              | 14.000  | 14.000  | 14.000  | 14.000 | 14.000 |        |        |        |        |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  |        |        |        |        |
|                  | I.D. |          |               |        |        |                     |              | 13.851  | 13.791  | 13.731  | 13.641 | 13.522 |        |        |        |        |
| 16"              | O.D. |          |               |        |        |                     |              | 16.000  | 16.000  | 16.000  | 16.000 | 16.000 | 16.000 | 16.000 | 16.000 |        |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  |        |
|                  | I.D. |          |               |        |        |                     |              | 15.851  | 15.791  | 15.731  | 15.641 | 15.522 | 15.500 | 15.370 | 15.250 |        |
| 18"              | O.D. |          |               |        |        |                     |              | 18.000  | 18.000  | 18.000  | 18.000 | 18.000 | 18.000 | 18.000 | 18.000 |        |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  |        |
|                  | I.D. |          |               |        |        |                     |              | 17.851  | 17.791  | 17.731  | 17.641 | 17.522 | 17.500 | 17.370 | 17.250 |        |
| 20"              | O.D. |          |               |        |        |                     |              | 20.000  | 20.000  | 20.000  | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 | 20.000 |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              | 19.851  | 19.791  | 19.731  | 19.641 | 19.522 | 19.500 | 19.370 | 19.250 | 19.124 |
| 22"              | O.D. |          |               |        |        |                     |              | 22.000  | 22.000  | 22.000  | 22.000 | 22.000 | 22.000 | 22.000 | 22.000 | 22.000 |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              | 21.851  | 21.791  | 21.731  | 21.641 | 21.522 | 21.500 | 21.370 | 21.250 | 21.124 |
| 24"              | O.D. |          |               |        |        |                     |              | 24.000  | 24.000  | 24.000  | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 | 24.000 |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              | 23.851  | 23.791  | 23.731  | 23.641 | 23.522 | 23.500 | 23.370 | 23.250 | 23.124 |
| 30"              | O.D. |          |               |        |        |                     |              | 30.000  | 30.000  | 30.000  | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 | 30.000 |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              | 29.851  | 29.791  | 29.731  | 29.641 | 29.522 | 29.500 | 29.370 | 29.250 | 29.124 |
| 36"              | O.D. |          |               |        |        |                     |              | 36.000  | 36.000  | 36.000  | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 | 36.000 |
|                  | Wall |          |               |        |        |                     |              | 0.075   | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              | 35.851  | 35.791  | 35.731  | 35.641 | 35.522 | 35.500 | 35.370 | 35.250 | 35.124 |
| 42"              | O.D. |          |               |        |        |                     |              |         | 42.000  | 42.000  | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 |
|                  | Wall |          |               |        |        |                     |              |         | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              |         | 41.791  | 41.731  | 41.641 | 41.522 | 41.500 | 41.370 | 41.250 | 41.124 |
| 48"              | O.D. |          |               |        |        |                     |              |         | 48.000  | 48.000  | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 | 48.000 |
|                  | Wall |          |               |        |        |                     |              |         | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              |         | 47.791  | 47.731  | 47.641 | 47.522 | 47.500 | 47.370 | 47.250 | 47.124 |
| 54"              | O.D. |          |               |        |        |                     |              |         | 54.000  | 54.000  | 54.000 | 54.000 | 54.000 | 54.000 | 54.000 | 54.000 |
|                  | Wall |          |               |        |        |                     |              |         | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              |         | 53.791  | 53.731  | 53.641 | 53.522 | 53.500 | 53.370 | 53.250 | 53.124 |
| 60"              | O.D. |          |               |        |        |                     |              |         | 60.000  | 60.000  | 60.000 | 60.000 | 60.000 | 60.000 | 60.000 | 60.000 |
|                  | Wall |          |               |        |        |                     |              |         | 0.105   | 0.135   | 0.179  | 0.239  | 0.250  | 0.315  | 0.375  | 0.438  |
|                  | I.D. |          |               |        |        |                     |              |         | 59.791  | 59.731  | 59.641 | 59.522 | 59.500 | 59.370 | 59.250 | 59.124 |

**Common Pipe Sizes for PVC (all dimensions in inches)**

| Nominal Diameter |      | PVC IPS CLASS |          |        |        |          | SCHEDULE |         | PVC Cast Iron O.D. |         |         |         |         |         |         |         | PVC   | PVC PIP CLASS |        |        |        |          |       |  |
|------------------|------|---------------|----------|--------|--------|----------|----------|---------|--------------------|---------|---------|---------|---------|---------|---------|---------|-------|---------------|--------|--------|--------|----------|-------|--|
|                  |      | 100           | 125      | 160    | 200    | 315      | PVC      |         | 100 psi            | 125 psi | 100 psi | 165 psi | 200 psi | 150 psi | 235 psi | 200 psi | Sewer | 100 Foot      | 63     | 80     | 100    | 125      |       |  |
|                  |      | SDR-41        | SDR-32.5 | SDR-26 | SDR-21 | SDR-13.5 | Sch. 40  | Sch. 80 | DR-41              | DR-32.5 | DR-25   | DR-25   | DR-21   | DR-18   | DR-18   | DR-14   | DR-35 | Head          | SDR-64 | SDR-51 | SDR-41 | SDR-32.5 |       |  |
| 1/2"             | O.D. |               |          |        | 0.840  | 0.840    | 0.840    | 0.840   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               |          |        | 0.062  | 0.062    | 0.109    | 0.147   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               |          |        | 0.716  | 0.716    | 0.612    | 0.546   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 3/4"             | O.D. |               |          |        | 1.050  | 1.050    | 1.050    | 1.050   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               |          |        | 0.060  | 0.078    | 0.113    | 0.154   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               |          |        | 0.930  | 0.894    | 0.824    | 0.742   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 1"               | O.D. |               | 1.315    | 1.315  | 1.315  | 1.315    | 1.315    | 1.315   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               | 0.052    | 0.060  | 0.063  | 0.097    | 0.133    | 0.179   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               | 1.211    | 1.195  | 1.189  | 1.121    | 1.049    | 0.957   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 1-1/4"           | O.D. |               | 1.660    | 1.660  | 1.660  | 1.660    | 1.660    | 1.660   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               | 0.060    | 0.064  | 0.079  | 0.123    | 0.140    | 0.191   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               | 1.540    | 1.532  | 1.502  | 1.414    | 1.380    | 1.278   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 1-1/2"           | O.D. |               | 1.900    | 1.900  | 1.900  | 1.900    | 1.900    | 1.900   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               | 0.060    | 0.073  | 0.090  | 0.141    | 0.145    | 0.200   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               | 1.780    | 1.754  | 1.720  | 1.618    | 1.610    | 1.500   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 2"               | O.D. |               | 2.375    | 2.375  | 2.375  | 2.375    | 2.375    | 2.375   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               | 0.073    | 0.091  | 0.113  | 0.176    | 0.154    | 0.218   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               | 2.229    | 2.193  | 2.149  | 2.023    | 2.067    | 1.939   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 2-1/2"           | O.D. |               | 2.875    | 2.875  | 2.875  | 2.875    | 2.875    | 2.875   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall |               | 0.088    | 0.110  | 0.137  | 0.213    | 0.203    | 0.276   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. |               | 2.699    | 2.655  | 2.601  | 2.449    | 2.469    | 2.323   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 3"               | O.D. | 3.500         | 3.500    | 3.500  | 3.500  | 3.500    | 3.500    | 3.500   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall | 0.085         | 0.108    | 0.135  | 0.167  | 0.259    | 0.216    | 0.300   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. | 3.330         | 3.284    | 3.230  | 3.166  | 2.982    | 3.068    | 2.900   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 3-1/2"           | O.D. | 4.000         | 4.000    | 4.000  | 4.000  |          | 4.000    | 4.000   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall | 0.098         | 0.123    | 0.154  | 0.190  |          | 0.226    | 0.318   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. | 3.804         | 3.754    | 3.692  | 3.620  |          | 3.548    | 3.364   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 4"               | O.D. | 4.500         | 4.500    | 4.500  | 4.500  | 4.500    | 4.500    | 4.500   |                    |         | 4.800   |         |         | 4.800   |         | 4.800   | 4.125 |               |        |        | 4.130  | 4.130    | 4.130 |  |
|                  | Wall | 0.110         | 0.138    | 0.173  | 0.214  | 0.333    | 0.237    | 0.337   |                    |         | 0.192   |         |         | 0.267   |         | 0.343   | 0.125 |               |        |        | 0.081  | 0.101    | 0.127 |  |
|                  | I.D. | 4.280         | 4.224    | 4.154  | 4.072  | 3.384    | 4.026    | 3.826   |                    |         | 4.416   |         |         | 4.266   |         | 4.114   | 3.875 |               |        |        | 3.968  | 3.928    | 3.876 |  |
| 5"               | O.D. | 5.563         | 5.563    | 5.563  | 5.563  |          | 5.563    | 5.563   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | Wall | 0.136         | 0.171    | 0.214  | 0.265  |          | 0.258    | 0.375   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
|                  | I.D. | 5.291         | 5.221    | 5.135  | 5.033  |          | 5.047    | 4.813   |                    |         |         |         |         |         |         |         |       |               |        |        |        |          |       |  |
| 6"               | O.D. | 6.625         | 6.625    | 6.625  | 6.625  |          | 6.625    | 6.625   |                    |         | 6.900   |         |         | 6.900   |         | 6.900   | 6.275 | 6.140         |        |        | 6.140  | 6.140    | 6.140 |  |
|                  | Wall | 0.162         | 0.205    | 0.255  | 0.316  |          | 0.280    | 0.432   |                    |         | 0.276   |         |         | 0.383   |         | 0.493   | 0.180 | 0.120         |        |        | 0.120  | 0.150    | 0.189 |  |
|                  | I.D. | 6.301         | 6.215    | 6.115  | 5.993  |          | 6.065    | 5.761   |                    |         | 6.348   |         |         | 6.134   |         | 5.914   | 5.915 | 5.900         |        |        | 5.900  | 5.840    | 5.762 |  |
| 8"               | O.D. | 8.625         | 8.625    | 8.625  | 8.625  |          | 8.625    | 8.625   |                    |         | 9.050   |         |         | 9.050   |         | 9.050   | 8.400 | 8.160         |        |        | 8.160  | 8.160    | 8.160 |  |
|                  | Wall | 0.210         | 0.265    | 0.332  | 0.411  |          | 0.322    | 0.500   |                    |         | 0.362   |         |         | 0.503   |         | 0.646   | 0.240 | 0.087         |        |        | 0.160  | 0.199    | 0.251 |  |
|                  | I.D. | 8.205         | 8.095    | 7.961  | 7.803  |          | 7.981    | 7.625   |                    |         | 8.326   |         |         | 8.044   |         | 7.758   | 7.920 | 7.986         |        |        | 7.840  | 7.762    | 7.658 |  |



**Common Pipe Sizes for Ductile Iron and Cast Iron (all dimensions in inches)**

| Nominal Diameter |      | DUCTILE IRON |          |          |          |          |          |          | CAST IRON |         |         |         |         |         |         |         |
|------------------|------|--------------|----------|----------|----------|----------|----------|----------|-----------|---------|---------|---------|---------|---------|---------|---------|
|                  |      | CLASS 50     | CLASS 51 | CLASS 52 | CLASS 53 | CLASS 54 | CLASS 55 | CLASS 56 | Class A   | Class B | Class C | Class D | Class E | Class F | Class G | Class H |
| 3"               | O.D. |              | 3.960    | 3.960    | 3.960    | 3.960    | 3.960    | 3.960    | 3.800     | 3.960   | 3.960   | 3.960   |         |         |         |         |
|                  | Wall |              | 0.250    | 0.280    | 0.310    | 0.340    | 0.370    | 0.400    | 0.390     | 0.420   | 0.450   | 0.480   |         |         |         |         |
|                  | I.D. |              | 3.460    | 3.400    | 3.340    | 3.280    | 3.220    | 3.160    | 3.020     | 3.120   | 3.060   | 3.000   |         |         |         |         |
| 4"               | O.D. |              | 4.800    | 4.800    | 4.800    | 4.800    | 4.800    | 4.800    | 4.800     | 5.000   | 5.000   | 5.000   |         |         |         |         |
|                  | Wall |              | 0.260    | 0.290    | 0.320    | 0.350    | 0.380    | 0.410    | 0.420     | 0.450   | 0.480   | 0.520   |         |         |         |         |
|                  | I.D. |              | 4.280    | 4.220    | 4.160    | 4.100    | 4.040    | 3.980    | 3.960     | 4.100   | 4.040   | 3.960   |         |         |         |         |
| 6"               | O.D. | 6.900        | 6.900    | 6.900    | 6.900    | 6.900    | 6.900    | 6.900    | 6.900     | 7.100   | 7.100   | 7.100   | 7.220   | 7.220   | 7.380   | 7.380   |
|                  | Wall | 0.250        | 0.280    | 0.310    | 0.340    | 0.370    | 0.400    | 0.430    | 0.440     | 0.480   | 0.510   | 0.550   | 0.580   | 0.610   | 0.650   | 0.690   |
|                  | I.D. | 6.400        | 6.340    | 6.280    | 6.220    | 6.160    | 6.100    | 6.040    | 6.020     | 6.140   | 6.080   | 6.000   | 6.060   | 6.000   | 6.080   | 6.000   |
| 8"               | O.D. | 9.050        | 9.050    | 9.050    | 9.050    | 9.050    | 9.050    | 9.050    | 9.050     | 9.050   | 9.300   | 9.300   | 9.420   | 9.420   | 9.600   | 9.600   |
|                  | Wall | 0.270        | 0.300    | 0.330    | 0.360    | 0.390    | 0.420    | 0.450    | 0.460     | 0.510   | 0.560   | 0.600   | 0.660   | 0.660   | 0.750   | 0.800   |
|                  | I.D. | 8.510        | 8.450    | 8.390    | 8.330    | 8.270    | 8.210    | 8.150    | 8.130     | 8.030   | 8.180   | 8.100   | 8.100   | 8.100   | 8.100   | 8.000   |
| 10"              | O.D. | 11.100       | 11.100   | 11.100   | 11.100   | 11.100   | 11.100   | 11.100   | 11.100    | 11.100  | 11.400  | 11.400  | 11.600  | 11.600  | 11.840  | 11.840  |
|                  | Wall | 0.290        | 0.320    | 0.350    | 0.380    | 0.410    | 0.440    | 0.470    | 0.500     | 0.570   | 0.620   | 0.680   | 0.740   | 0.800   | 0.860   | 0.920   |
|                  | I.D. | 10.520       | 10.460   | 10.400   | 10.340   | 10.280   | 10.220   | 10.160   | 10.100    | 9.960   | 10.100  | 10.400  | 10.120  | 10.000  | 10.120  | 10.000  |
| 12"              | O.D. | 13.200       | 13.200   | 13.200   | 13.200   | 13.200   | 13.200   | 13.200   | 13.200    | 13.200  | 13.500  | 13.500  | 13.780  | 13.780  | 14.080  | 14.080  |
|                  | Wall | 0.310        | 0.340    | 0.370    | 0.400    | 0.430    | 0.460    | 0.490    | 0.540     | 0.620   | 0.680   | 0.750   | 0.820   | 0.890   | 0.970   | 1.040   |
|                  | I.D. | 12.580       | 12.520   | 12.460   | 12.400   | 12.340   | 12.280   | 12.220   | 12.120    | 11.960  | 12.140  | 12.000  | 12.140  | 12.000  | 12.140  | 12.000  |
| 14"              | O.D. | 15.300       | 15.300   | 15.300   | 15.300   | 15.300   | 15.300   | 15.300   | 15.300    | 15.300  | 15.650  | 15.650  | 15.980  | 15.980  | 16.320  | 16.320  |
|                  | Wall | 0.330        | 0.360    | 0.390    | 0.420    | 0.450    | 0.480    | 0.510    | 0.570     | 0.660   | 0.740   | 0.820   | 0.900   | 0.990   | 1.070   | 1.160   |
|                  | I.D. | 14.640       | 14.580   | 14.520   | 14.460   | 14.400   | 14.340   | 14.280   | 14.160    | 13.980  | 14.170  | 14.010  | 14.180  | 14.000  | 14.180  | 14.000  |
| 16"              | O.D. | 17.400       | 17.400   | 17.400   | 17.400   | 17.400   | 17.400   | 17.400   | 17.400    | 17.400  | 17.800  | 17.800  | 18.160  | 18.160  | 18.540  | 18.540  |
|                  | Wall | 0.340        | 0.370    | 0.400    | 0.430    | 0.460    | 0.490    | 0.520    | 0.600     | 0.700   | 0.800   | 0.890   | 0.980   | 1.050   | 1.180   | 1.270   |
|                  | I.D. | 16.720       | 16.660   | 16.600   | 16.540   | 16.480   | 16.420   | 16.360   | 16.200    | 16.000  | 16.200  | 16.020  | 16.200  | 16.000  | 16.180  | 16.000  |
| 18"              | O.D. | 19.500       | 19.500   | 19.500   | 19.500   | 19.500   | 19.500   | 19.500   | 19.500    | 19.500  | 19.920  | 19.920  | 20.340  | 20.340  | 20.780  | 20.780  |
|                  | Wall | 0.350        | 0.380    | 0.410    | 0.440    | 0.470    | 0.500    | 0.530    | 0.640     | 0.750   | 0.870   | 0.960   | 1.070   | 1.170   | 1.280   | 1.390   |
|                  | I.D. | 18.800       | 18.740   | 18.680   | 18.620   | 18.560   | 18.500   | 18.440   | 18.220    | 18.000  | 18.180  | 18.000  | 18.200  | 18.000  | 18.220  | 18.000  |
| 20"              | O.D. | 21.600       | 21.600   | 21.600   | 21.600   | 21.600   | 21.600   | 21.600   | 21.600    | 21.600  | 22.060  | 22.060  | 22.540  | 22.540  | 23.020  | 23.020  |
|                  | Wall | 0.360        | 0.390    | 0.420    | 0.450    | 0.480    | 0.510    | 0.540    | 0.670     | 0.800   | 0.920   | 1.030   | 1.150   | 1.270   | 1.390   | 1.510   |
|                  | I.D. | 20.880       | 20.820   | 20.760   | 20.700   | 20.640   | 20.580   | 20.520   | 20.260    | 20.000  | 20.220  | 20.000  | 20.240  | 20.000  | 20.240  | 20.000  |
| 24"              | O.D. | 25.800       | 25.800   | 25.800   | 25.800   | 25.800   | 25.800   | 25.800   | 25.800    | 25.800  | 26.320  | 26.320  | 26.900  | 26.900  | 27.760  | 27.760  |
|                  | Wall | 0.380        | 0.410    | 0.440    | 0.470    | 0.500    | 0.530    | 0.560    | 0.760     | 0.890   | 1.050   | 1.160   | 1.310   | 1.450   | 1.750   | 1.880   |
|                  | I.D. | 25.040       | 24.980   | 24.920   | 24.860   | 24.800   | 24.740   | 24.680   | 24.280    | 24.020  | 24.220  | 24.000  | 24.280  | 24.000  | 24.260  | 24.000  |

**Common Pipe Sizes for Ductile Iron and Cast Iron (all dimensions in inches) [continued]**

| Nominal Diameter |             | DUCTILE IRON  |               |               |               |               |               |               | CAST IRON     |               |               |               |               |               |         |         |
|------------------|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------|---------|
|                  |             | CLASS 50      | CLASS 51      | CLASS 52      | CLASS 53      | CLASS 54      | CLASS 55      | CLASS 56      | Class A       | Class B       | Class C       | Class D       | Class E       | Class F       | Class G | Class H |
| <b>30"</b>       | <b>O.D.</b> | <b>32.000</b> | <b>32.000</b> | <b>32.000</b> | <b>32.000</b> | <b>32.000</b> | <b>32.000</b> | <b>32.000</b> | <b>31.740</b> | <b>32.000</b> | <b>32.400</b> | <b>32.740</b> | <b>33.100</b> | <b>33.460</b> |         |         |
|                  | Wall        | 0.390         | 0.430         | 0.470         | 0.510         | 0.550         | 0.590         | 0.630         | 0.880         | 1.030         | 1.200         | 1.370         | 1.550         | 1.730         |         |         |
|                  | I.D.        | 31.220        | 31.140        | 31.060        | 30.980        | 30.900        | 30.820        | 30.740        | 29.980        | 29.940        | 30.000        | 30.000        | 30.000        | 30.000        |         |         |
| <b>36"</b>       | <b>O.D.</b> | <b>38.300</b> | <b>38.300</b> | <b>38.300</b> | <b>38.300</b> | <b>38.300</b> | <b>38.300</b> | <b>38.300</b> | <b>37.960</b> | <b>38.300</b> | <b>38.700</b> | <b>39.160</b> | <b>39.600</b> | <b>40.040</b> |         |         |
|                  | Wall        | 0.430         | 0.480         | 0.530         | 0.580         | 0.630         | 0.680         | 0.730         | 0.990         | 1.150         | 1.360         | 1.580         | 1.800         | 2.020         |         |         |
|                  | I.D.        | 37.440        | 37.340        | 37.240        | 37.140        | 37.040        | 36.940        | 36.840        | 35.980        | 36.000        | 35.980        | 36.000        | 36.000        | 36.000        |         |         |
| <b>42"</b>       | <b>O.D.</b> | <b>44.500</b> | <b>44.500</b> | <b>44.500</b> | <b>44.500</b> | <b>44.500</b> | <b>44.500</b> | <b>44.500</b> | <b>44.200</b> | <b>44.500</b> | <b>45.100</b> | <b>45.580</b> |               |               |         |         |
|                  | Wall        | 0.470         | 0.530         | 0.590         | 0.650         | 0.710         | 0.770         | 0.830         | 1.100         | 1.280         | 1.540         | 1.780         |               |               |         |         |
|                  | I.D.        | 43.560        | 43.440        | 43.320        | 43.200        | 43.080        | 42.960        | 42.840        | 42.000        | 41.940        | 42.020        | 42.020        |               |               |         |         |
| <b>48"</b>       | <b>O.D.</b> | <b>50.800</b> | <b>50.800</b> | <b>50.800</b> | <b>50.800</b> | <b>50.800</b> | <b>50.800</b> | <b>50.800</b> | <b>50.500</b> | <b>50.800</b> | <b>51.400</b> | <b>51.980</b> |               |               |         |         |
|                  | Wall        | 0.510         | 0.580         | 0.650         | 0.720         | 0.790         | 0.860         | 0.930         | 1.260         | 1.420         | 1.710         | 1.990         |               |               |         |         |
|                  | I.D.        | 49.780        | 49.640        | 49.500        | 49.360        | 49.220        | 49.080        | 48.940        | 47.980        | 47.960        | 47.980        | 48.000        |               |               |         |         |
| <b>54"</b>       | <b>O.D.</b> | <b>57.100</b> | <b>57.100</b> | <b>57.100</b> | <b>57.100</b> | <b>57.100</b> | <b>57.100</b> | <b>57.100</b> | <b>56.660</b> | <b>57.100</b> | <b>57.800</b> | <b>58.400</b> |               |               |         |         |
|                  | Wall        | 0.570         | 0.650         | 0.730         | 0.810         | 0.890         | 0.970         | 1.050         | 1.350         | 1.550         | 1.900         | 2.230         |               |               |         |         |
|                  | I.D.        | 55.960        | 55.800        | 55.640        | 55.480        | 55.320        | 55.160        | 55.000        | 53.960        | 54.000        | 54.000        | 53.940        |               |               |         |         |
| <b>60"</b>       | <b>O.D.</b> |               |               |               |               |               |               |               | <b>62.800</b> | <b>63.400</b> | <b>64.200</b> | <b>64.820</b> |               |               |         |         |
|                  | Wall        |               |               |               |               |               |               |               | 1.390         | 1.670         | 2.000         | 2.380         |               |               |         |         |
|                  | I.D.        |               |               |               |               |               |               |               | 60.020        | 60.060        | 60.200        | 60.060        |               |               |         |         |
| <b>72"</b>       | <b>O.D.</b> |               |               |               |               |               |               |               | <b>75.340</b> | <b>76.000</b> | <b>76.880</b> |               |               |               |         |         |
|                  | Wall        |               |               |               |               |               |               |               | 1.620         | 1.950         | 2.390         |               |               |               |         |         |
|                  | I.D.        |               |               |               |               |               |               |               | 72.100        | 72.100        | 72.100        |               |               |               |         |         |

**Common Pipe Sizes for Galvanized Steel Tubing and Pipe (all dimensions in inches)**

| Nominal Diameter          |             | Sch 5         | Sch 10        | Sch 20 | Sch 30 | Sch 40        | Std. | Sch 60        | Sch 80        | E.H. | Sch 100 | Sch 120       | Sch 140 | Sch 160       | Double E.H.   |
|---------------------------|-------------|---------------|---------------|--------|--------|---------------|------|---------------|---------------|------|---------|---------------|---------|---------------|---------------|
| <b>0.375<br/>(3/8")</b>   | <b>O.D.</b> | <b>0.6750</b> | <b>0.6750</b> |        |        | <b>0.6750</b> |      |               | <b>0.6750</b> |      |         |               |         |               |               |
|                           | Wall        | 0.0490        | 0.0650        |        |        | 0.0910        |      |               | 0.1260        |      |         |               |         |               |               |
|                           | I.D.        | 0.5770        | 0.5450        |        |        | 0.4930        |      |               | 0.4230        |      |         |               |         |               |               |
| <b>0.500<br/>(1/2")</b>   | <b>O.D.</b> | <b>0.8400</b> | <b>0.8400</b> |        |        | <b>0.8400</b> |      |               | <b>0.8400</b> |      |         |               |         |               |               |
|                           | Wall        | 0.0490        | 0.0650        |        |        | 0.0880        |      |               | 0.1190        |      |         |               |         |               |               |
|                           | I.D.        | 0.7420        | 0.7100        |        |        | 0.6640        |      |               | 0.6020        |      |         |               |         |               |               |
| <b>0.750<br/>(3/4")</b>   | <b>O.D.</b> | <b>1.0500</b> | <b>1.0500</b> |        |        | <b>1.0500</b> |      |               | <b>1.0500</b> |      |         |               |         |               |               |
|                           | Wall        | 0.0650        | 0.0830        |        |        | 0.1130        |      |               | 0.1540        |      |         |               |         |               |               |
|                           | I.D.        | 0.9200        | 0.8840        |        |        | 0.8240        |      |               | 0.7420        |      |         |               |         |               |               |
| <b>1.000</b>              | <b>O.D.</b> | <b>1.3150</b> | <b>1.3150</b> |        |        | <b>1.3150</b> |      |               | <b>1.3150</b> |      |         |               |         | <b>1.3150</b> | <b>1.3150</b> |
|                           | Wall        | 0.0650        | 0.0830        |        |        | 0.1090        |      |               | 0.1790        |      |         |               |         | 0.2500        | 0.4000        |
|                           | I.D.        | 1.1850        | 1.1490        |        |        | 1.0970        |      |               | 0.9570        |      |         |               |         | 0.8150        | 0.5150        |
| <b>1.250<br/>(1 1/4")</b> | <b>O.D.</b> | <b>1.6600</b> | <b>1.6600</b> |        |        | <b>1.6600</b> |      |               | <b>1.6600</b> |      |         |               |         | <b>1.6600</b> | <b>1.6600</b> |
|                           | Wall        | 0.0650        | 0.1090        |        |        | 0.1400        |      |               | 0.1910        |      |         |               |         | 0.2500        | 0.3820        |
|                           | I.D.        | 1.5300        | 1.4420        |        |        | 1.3800        |      |               | 1.2780        |      |         |               |         | 1.1600        | 0.8960        |
| <b>1.500<br/>(1 1/2")</b> | <b>O.D.</b> | <b>1.9000</b> | <b>1.9000</b> |        |        | <b>1.9000</b> |      |               | <b>1.9000</b> |      |         |               |         | <b>1.9000</b> | <b>1.9000</b> |
|                           | Wall        | 0.0650        | 0.1090        |        |        | 0.1450        |      |               | 0.2000        |      |         |               |         | 0.2810        | 0.4000        |
|                           | I.D.        | 1.7700        | 1.6820        |        |        | 1.6100        |      |               | 1.5000        |      |         |               |         | 1.3380        | 1.1000        |
| <b>2.000</b>              | <b>O.D.</b> | <b>2.3750</b> | <b>2.3750</b> |        |        | <b>2.3750</b> |      |               | <b>2.3750</b> |      |         |               |         | <b>2.3750</b> | <b>2.3750</b> |
|                           | Wall        | 0.0650        | 0.1090        |        |        | 0.1540        |      |               | 0.2180        |      |         |               |         | 0.3430        | 0.4360        |
|                           | I.D.        | 2.2450        | 2.1570        |        |        | 2.0670        |      |               | 1.9390        |      |         |               |         | 1.6890        | 1.5030        |
| <b>2.500<br/>(2 1/2")</b> | <b>O.D.</b> | <b>2.8750</b> | <b>2.8750</b> |        |        | <b>2.8750</b> |      |               | <b>2.8750</b> |      |         |               |         | <b>2.8750</b> | <b>2.8750</b> |
|                           | Wall        | 0.0830        | 0.1200        |        |        | 0.2030        |      |               | 0.2760        |      |         |               |         | 0.3750        | 0.5520        |
|                           | I.D.        | 2.7090        | 2.6350        |        |        | 2.4690        |      |               | 2.3230        |      |         |               |         | 2.1250        | 1.7710        |
| <b>3.000</b>              | <b>O.D.</b> | <b>3.5000</b> | <b>3.5000</b> |        |        | <b>3.5000</b> |      |               | <b>3.5000</b> |      |         |               |         | <b>3.5000</b> | <b>3.5000</b> |
|                           | Wall        | 0.0830        | 0.1200        |        |        | 0.2160        |      |               | 0.3000        |      |         |               |         | 0.4370        | 0.6000        |
|                           | I.D.        | 3.3340        | 3.2600        |        |        | 3.0680        |      |               | 2.9000        |      |         |               |         | 2.6260        | 2.3000        |
| <b>3.500<br/>(3 1/2")</b> | <b>O.D.</b> | <b>4.0000</b> | <b>4.0000</b> |        |        | <b>4.0000</b> |      |               | <b>4.0000</b> |      |         |               |         |               | <b>4.0000</b> |
|                           | Wall        | 0.0830        | 0.1200        |        |        | 0.2260        |      |               | 0.3180        |      |         |               |         |               | 0.6360        |
|                           | I.D.        | 3.8340        | 3.7600        |        |        | 3.5480        |      |               | 3.3640        |      |         |               |         |               | 2.7280        |
| <b>4.000</b>              | <b>O.D.</b> | <b>4.5000</b> | <b>4.5000</b> |        |        | <b>4.5000</b> |      | <b>4.5000</b> | <b>4.5000</b> |      |         | <b>4.5000</b> |         | <b>4.5000</b> | <b>4.5000</b> |
|                           | Wall        | 0.0830        | 0.1200        |        |        | 0.2370        |      | 0.2810        | 0.3370        |      |         | 0.4370        |         | 0.5310        | 0.6740        |
|                           | I.D.        | 4.3340        | 4.2600        |        |        | 4.0260        |      | 3.9380        | 3.8260        |      |         | 3.6260        |         | 3.4380        | 3.1520        |

**Common Pipe Sizes for Galvanized Steel Tubing and Pipe** (all dimensions in inches)

| Nominal Diameter  |      | Sch 5   | Sch 10  | Sch 20  | Sch 30  | Sch 40  | Std.    | Sch 60  | Sch 80  | E.H.    | Sch 100 | Sch 120 | Sch 140 | Sch 160 | Double E.H. |
|-------------------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------------|
| 4.500<br>(4 1/2") | O.D. |         |         |         |         |         | 5.0000  |         |         | 5.0000  |         |         |         |         | 5.0000      |
|                   | Wall |         |         |         |         |         | 0.2470  |         |         | 0.3550  |         |         |         |         | 0.7100      |
|                   | I.D. |         |         |         |         |         | 4.5060  |         |         | 4.2900  |         |         |         |         | 3.5800      |
| 5.000             | O.D. | 5.5630  | 5.5630  |         |         | 5.5630  |         |         | 5.5630  |         |         | 5.5630  |         | 5.5630  | 5.5630      |
|                   | Wall | 0.1090  | 0.1340  |         |         | 0.2580  |         |         | 0.3750  |         |         | 0.5000  |         | 0.6250  | 0.7500      |
|                   | I.D. | 5.3450  | 5.2950  |         |         | 5.0470  |         |         | 4.8130  |         |         | 4.5630  |         | 4.3130  | 4.0630      |
| 6.000             | O.D. | 6.6250  | 6.6250  |         |         | 6.6250  |         |         | 6.6250  |         |         | 6.6250  |         | 6.6250  | 6.6250      |
|                   | Wall | 0.1090  | 0.1340  |         |         | 0.2800  |         |         | 0.4320  |         |         | 0.5620  |         | 0.7180  | 0.8640      |
|                   | I.D. | 6.4070  | 6.3570  |         |         | 6.0650  |         |         | 5.7610  |         |         | 5.5010  |         | 5.1890  | 4.8970      |
| 7.000             | O.D. |         |         |         |         |         | 7.6250  |         |         | 7.6250  |         |         |         |         | 7.6250      |
|                   | Wall |         |         |         |         |         | 0.3010  |         |         | 0.5000  |         |         |         |         | 0.8750      |
|                   | I.D. |         |         |         |         |         | 7.0230  |         |         | 6.6250  |         |         |         |         | 5.8750      |
| 8.000             | O.D. | 8.6250  | 8.6250  | 8.6250  | 8.6250  | 8.6250  |         | 8.6250  | 8.6250  |         | 8.6250  | 8.6250  | 8.6250  | 8.6250  | 8.6250      |
|                   | Wall | 0.1090  | 0.1480  | 0.2500  | 0.2770  | 0.3220  |         | 0.4060  | 0.5000  |         | 0.5930  | 0.7180  | 0.8120  | 0.9060  | 0.8750      |
|                   | I.D. | 8.4070  | 8.3290  | 8.1250  | 8.0710  | 7.9810  |         | 7.8130  | 7.6250  |         | 7.4390  | 7.1890  | 7.0010  | 6.8130  | 6.8750      |
| 9.000             | O.D. |         |         |         |         |         | 9.6250  |         |         | 9.6250  |         |         |         |         |             |
|                   | Wall |         |         |         |         |         | 0.3420  |         |         | 0.5000  |         |         |         |         |             |
|                   | I.D. |         |         |         |         |         | 8.9410  |         |         | 8.6250  |         |         |         |         |             |
| 10.000            | O.D. | 10.7500 | 10.7500 | 10.7500 | 10.7500 | 10.7500 |         | 10.7500 | 10.7500 | 10.7500 | 10.7500 | 10.7500 | 10.7500 | 10.7500 |             |
|                   | Wall | 0.1340  | 0.1650  | 0.2500  | 0.3070  | 0.3650  |         | 0.5000  | 0.5930  | 0.5000  | 0.7180  | 0.8430  | 1.0000  | 1.1250  |             |
|                   | I.D. | 10.4820 | 10.4200 | 10.2500 | 10.1360 | 10.0200 |         | 9.7500  | 9.5640  | 9.7500  | 9.3140  | 9.0640  | 8.7500  | 8.5000  |             |
| 11.000            | O.D. |         |         |         |         |         | 11.7500 |         |         | 11.7500 |         |         |         |         |             |
|                   | Wall |         |         |         |         |         | 0.3750  |         |         | 0.5000  |         |         |         |         |             |
|                   | I.D. |         |         |         |         |         | 11.0000 |         |         | 10.7500 |         |         |         |         |             |
| 12.000            | O.D. | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 | 12.7500 |             |
|                   | Wall | 0.1650  | 0.1800  | 0.2500  | 0.3300  | 0.4060  | 0.3750  | 0.5620  | 0.6870  | 0.5000  | 0.8430  | 1.0000  | 1.1250  | 1.3120  |             |
|                   | I.D. | 12.4200 | 12.3900 | 12.2500 | 12.0900 | 11.9380 | 12.0000 | 11.6260 | 11.3760 | 11.7500 | 11.0640 | 10.7500 | 10.5000 | 10.1260 |             |
| 14.000            | O.D. |         | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 | 14.0000 |             |
|                   | Wall |         | 0.2500  | 0.3120  | 0.3750  | 0.4370  | 0.3750  | 0.5930  | 0.7500  | 0.5000  | 0.9370  | 1.0930  | 1.2500  | 1.4060  |             |
|                   | I.D. |         | 13.5000 | 13.3760 | 13.2500 | 13.1260 | 13.2500 | 12.8140 | 12.5000 | 13.0000 | 12.1260 | 11.8140 | 11.5000 | 11.1880 |             |
| 16.000            | O.D. |         | 16.0000 | 16.0000 | 16.0000 | 16.0000 | 16.0000 | 16.0000 | 16.0000 | 16.0000 |         |         |         |         |             |
|                   | Wall |         | 0.2500  | 0.3120  | 0.3750  | 0.5000  | 0.3750  | 0.6560  | 0.8430  | 0.5000  |         |         |         |         |             |
|                   | I.D. |         | 15.5000 | 15.3760 | 15.2500 | 15.0000 | 15.2500 | 14.6880 | 14.3140 | 15.0000 |         |         |         |         |             |

# HDPE PIPE High Density Polyethylene Pipe

| SIZE      |         | DR 26 CLASS 65 |           | DR 21 CLASS 80 |           | DR 17 CLASS 100 |           | DR 13.5 CLASS 128 |           | DR 11 CLASS 160 |           | DR 9 CLASS 200 |           | DR 7 CLASS 267 |           |
|-----------|---------|----------------|-----------|----------------|-----------|-----------------|-----------|-------------------|-----------|-----------------|-----------|----------------|-----------|----------------|-----------|
| Pipe Size | OD (in) | ID (in)        | Wall (in) | ID (in)        | Wall (in) | ID (in)         | Wall (in) | ID (in)           | Wall (in) | ID (in)         | Wall (in) | ID (in)        | Wall (in) | ID (in)        | Wall (in) |
| 2"        | 2.375   |                |           |                |           | 2.078           | 0.140     | 2.002             | 0.176     | 1.917           | 0.216     | 1.815          | 0.264     | 1.656          | 0.339     |
| 3"        | 3.500   |                |           |                |           | 3.063           | 0.206     | 2.951             | 0.259     | 2.826           | 0.318     | 2.675          | 0.389     | 2.440          | 0.500     |
| 4"        | 4.500   |                |           | 4.046          | 0.214     | 3.938           | 0.265     | 3.794             | 0.333     | 3.633           | 0.409     | 3.440          | 0.500     | 3.137          | 0.643     |
| 5"        | 5.563   | 5.109          | 0.214     | 5.001          | 0.265     | 4.870           | 0.327     | 4.690             | 0.412     | 4.490           | 0.506     | 4.253          | 0.618     | 3.877          | 0.795     |
| 6"        | 6.625   | 6.084          | 0.255     | 5.957          | 0.315     | 5.798           | 0.390     | 5.584             | 0.491     | 5.349           | 0.602     | 5.065          | 0.736     | 4.619          | 0.946     |
| 8"        | 8.625   | 7.921          | 0.332     | 7.754          | 0.411     | 7.550           | 0.507     | 7.270             | 0.639     | 6.963           | 0.784     | 6.594          | 0.958     | 6.013          | 1.232     |
| 10"       | 10.750  | 9.874          | 0.413     | 9.665          | 0.512     | 9.410           | 0.632     | 9.062             | 0.796     | 8.679           | 0.977     | 8.219          | 1.194     | 7.494          | 1.536     |
| 12"       | 12.750  | 11.711         | 0.490     | 11.463         | 0.607     | 11.160          | 0.750     | 10.749            | 0.994     | 10.293          | 1.159     | 9.746          | 1.417     | 8.889          | 1.821     |
| 14"       | 14.000  | 12.859         | 0.538     | 12.586         | 0.667     | 12.253          | 0.824     | 11.802            | 1.037     | 11.301          | 1.273     | 10.701         | 1.556     | 9.760          | 2.000     |
| 16"       | 16.000  | 14.696         | 0.615     | 14.385         | 0.762     | 14.005          | 0.941     | 13.488            | 1.185     | 12.915          | 1.455     | 12.231         | 1.778     | 11.154         | 2.286     |
| 18"       | 18.000  | 16.533         | 0.692     | 16.183         | 0.857     | 15.755          | 1.059     | 15.174            | 1.333     | 14.532          | 1.636     | 13.760         | 2.000     | 12.549         | 2.571     |
| 20"       | 20.000  | 18.370         | 0.769     | 17.982         | 0.952     | 17.507          | 1.176     | 16.860            | 1.481     | 16.146          | 1.818     | 15.289         | 2.222     | 13.943         | 2.857     |
| 22"       | 22.000  | 20.206         | 0.846     | 19.778         | 1.048     | 19.257          | 1.294     | 18.544            | 1.630     | 17.760          | 2.000     | 16.819         | 2.444     | 15.337         | 3.143     |
| 24"       | 24.000  | 22.043         | 0.923     | 21.577         | 1.143     | 21.007          | 1.412     | 20.231            | 1.778     | 19.374          | 2.182     | 18.346         | 2.667     | 16.731         | 3.429     |



### C900 (BLUE PVC)

| Nominal Pipe Size (inches) | DR | Average Pipe OD (inches) | Approx Pipe ID (inches) | Min Wall Thickness (t) (inches) |
|----------------------------|----|--------------------------|-------------------------|---------------------------------|
| 4                          | 25 | 4.80                     | 4.42                    | 0.192                           |
| 4                          | 18 | 4.80                     | 4.27                    | 0.267                           |
| 4                          | 14 | 4.80                     | 4.11                    | 0.343                           |
| 6                          | 25 | 6.90                     | 6.35                    | 0.276                           |
| 6                          | 18 | 6.90                     | 6.13                    | 0.383                           |
| 6                          | 14 | 6.90                     | 5.91                    | 0.493                           |
| 8                          | 25 | 9.05                     | 8.33                    | 0.362                           |
| 8                          | 18 | 9.05                     | 8.04                    | 0.503                           |
| 8                          | 14 | 9.05                     | 7.76                    | 0.646                           |
| 10                         | 25 | 11.10                    | 10.21                   | 0.444                           |
| 10                         | 18 | 11.10                    | 9.87                    | 0.617                           |
| 10                         | 14 | 11.10                    | 9.51                    | 0.793                           |
| 12                         | 25 | 13.20                    | 12.14                   | 0.528                           |
| 12                         | 18 | 13.20                    | 11.73                   | 0.733                           |
| 12                         | 14 | 13.20                    | 11.31                   | 0.943                           |
| 14                         | 25 | 15.30                    | 14.08                   | 0.612                           |
| 14                         | 18 | 15.30                    | 13.6                    | 0.850                           |
| 16                         | 25 | 17.40                    | 16.01                   | 0.696                           |
| 16                         | 18 | 17.40                    | 15.47                   | 0.967                           |
| 18                         | 25 | 19.50                    | 17.83                   | 0.780                           |
| 18                         | 18 | 19.50                    | 17.18                   | 1.083                           |
| 20                         | 25 | 21.60                    | 19.75                   | 0.864                           |
| 20                         | 18 | 21.60                    | 19.03                   | 1.200                           |
| 24                         | 25 | 25.80                    | 23.59                   | 1.032                           |

304 / 316 Stainless Steel Tube Wall Thickness I.D. and Weights

| Tube O.D | Wall Thickness | I.D.   |
|----------|----------------|--------|
| 0.188    | 0.035          | 0.118  |
| 0.250    | 0.020          | 0.210  |
|          | 0.028          | 0.194  |
|          | 0.035          | 0.180  |
|          | 0.049          | 0.152  |
|          | 0.065          | 0.120  |
| 0.313    | 0.035          | 0.243  |
|          | 0.049          | 0.215  |
| 0.375    | 0.028          | 0.319  |
|          | 0.035          | 0.305  |
|          | 0.049          | 0.277  |
|          | 0.065          | 0.245  |
| 0.500    | 0.035          | 0.430  |
|          | 0.490          | -0.480 |
|          | 0.065          | 0.370  |
| 0.625    | 0.035          | 0.555  |
|          | 0.049          | 0.527  |
|          | 0.065          | 0.495  |
| 0.750    | 0.035          | 0.680  |
|          | 0.049          | 0.652  |
|          | 0.065          | 0.620  |
|          | 0.120          | 0.510  |
| 0.875    | 0.035          | 0.805  |
|          | 0.490          | -0.105 |
|          | 0.065          | 0.745  |
|          | 0.120          | 0.635  |
| 1.000    | 0.035          | 0.930  |
|          | 0.049          | 0.902  |
|          | 0.065          | 0.870  |
|          | 0.083          | 0.834  |
|          | 0.095          | 0.810  |
|          | 0.120          | 0.760  |
| 1.125    | 0.065          | 0.995  |
| 1.250    | 0.065          | 1.120  |
|          | 0.083          | 1.084  |
|          | 0.120          | 1.010  |
| 1.375    | 0.035          | 1.305  |

| Tube O.D | Wall Thickness | I.D.  |
|----------|----------------|-------|
| 1.500    | 0.049          | 1.402 |
|          | 0.065          | 1.370 |
|          | 0.083          | 1.334 |
|          | 0.120          | 1.260 |
| 1.750    | 0.035          | 1.680 |
|          | 0.065          | 1.620 |
|          | 0.083          | 1.584 |
| 1.875    | 0.065          | 1.870 |
| 2.000    | 0.049          | 1.902 |
|          | 0.065          | 1.870 |
|          | 0.083          | 1.834 |
|          | 0.120          | 1.760 |
| 2.125    | 0.065          | 1.995 |
| 2.250    | 0.065          | 2.120 |
|          | 0.083          | 2.084 |
|          | 0.120          | 2.010 |
| 2.500    | 0.065          | 2.370 |
|          | 0.083          | 2.334 |
|          | 0.120          | 2.260 |
| 2.750    | 0.065          | 2.620 |
| 3.000    | 0.049          | 2.902 |
|          | 0.065          | 2.870 |
|          | 0.083          | 2.834 |
|          | 0.120          | 2.760 |
| 3.250    | 0.065          | 3.120 |
|          | 0.120          | 3.010 |
| 3.500    | 0.065          | 3.370 |
| 4.000    | 0.065          | 3.870 |
|          | 0.083          | 3.834 |
| 4.250    | 0.120          | 4.010 |
| 4.500    | 0.065          | 4.370 |
| 5.000    | 0.065          | 4.870 |
|          | 0.083          | 4.834 |
|          | 0.120          | 4.760 |
| 6.000    | 0.188          | 4.624 |
|          | 0.065          | 5.870 |
|          | 0.083          | 5.834 |
| 8.000    | 0.120          | 5.760 |
|          | 0.120          | 7.760 |

revised 12/10/2010

