

Transmittance/ Absorbance

Transmittance	Absorbance (AU)
100%	0
99%	0.004
98%	0.009
97%	0.013
96%	0.018
95%	0.022
90%	0.046
85%	0.071
80%	0.097
75%	0.125
70%	0.155
65%	0.187
60%	0.222
55%	0.260
50%	0.301
45%	0.347
40%	0.398
35%	0.456
30%	0.523
25%	0.602
20%	0.699
15%	0.824
10%	1
5%	1.301
1%	2

Symbols Key

- M= molarity – mol/L
- N=normality – Eq/L
- m= molality – mol/kg
- Eq= number of equivalents
- n= number of moles
- MW= $\frac{\text{molecular weight}}{\text{weight}}$
- V= volume – L
- m= mass g
- C= concentration

Conversion Factors

Length	1 meter (m) = 39.37 inches (in.)
	1 inch (in.) = 2.54 centimeters (cm)
	1 Ångstrom (Å) = 10 ⁻¹⁰ m
Mass	1 kilogram (kg) = 2.205 pounds (lb.)
	1 pound (lb.) = 453.5 grams (g)
	1 atomic mass unit (amu) = 1.661 x 10 ⁻²⁴ grams (g)
Energy	1 calorie (cal) = 4.18 joules (j)
Temperature	°F = 1.8°C + 32
	°C = $\frac{°F - 32}{1.8}$
	K = °C + 273.15

Pressure

From/To	kPa	bar	atm	torr	psi	mmHg
kPa	1	0.01	0.00987	7.500	0.16	7.500
bar	100	1	0.987	750.06	14.504	750.06
atm	101.325	1.013	1	760	14.696	760
torr	0.133	0.00133	0.00132	1	0.0193	1
psi	6.895	0.0690	0.068	51.715	1	51.715
mmHg	0.133	.00130	.00130	1	.0193	1

Volume

From/To	L	cm ³	m ³	in ³	ft ³	yd ³	gal
L	1	1000	0.001	61	0.03532	0.00131	0.2642
cm³	0.001	1	1 x 10 ⁻⁶	0.06102	3.53 x 10 ⁻⁵	1.31 x 10 ⁻⁶	2.64 x 10 ⁻⁴
m³	1000	1 x 10 ⁶	1	6.10 x 10 ⁴	35.31	1.308	264.2
in³	0.01639	16.39	1.64 x 10 ⁻⁵	1	5.79 x 10 ⁻⁴	2.14 x 10 ⁻⁵	0.00433
ft³	28.32	2.83 x 10 ⁴	0.02832	1728	1	0.03704	7.481
yd³	764.5	7.65 x 10 ⁵	0.7646	4.76 x 10 ⁴	27	1	202.0
gal	3.786	3785	0.00379	231	0.1337	0.00495	1

To convert from the volume unit in the far-left column, multiply by the factor listed in the column of the new unit.

Unit of Concentration

Percent	PPM (parts per million)	PPB (parts per billion)	PPT (parts per trillion)
0.001%	10	-	-
0.0001%	1	1000	1,000,000
0.00001%	0.1	100	100,000
0.000001%	0.01	10	10,000

Dilution Equations

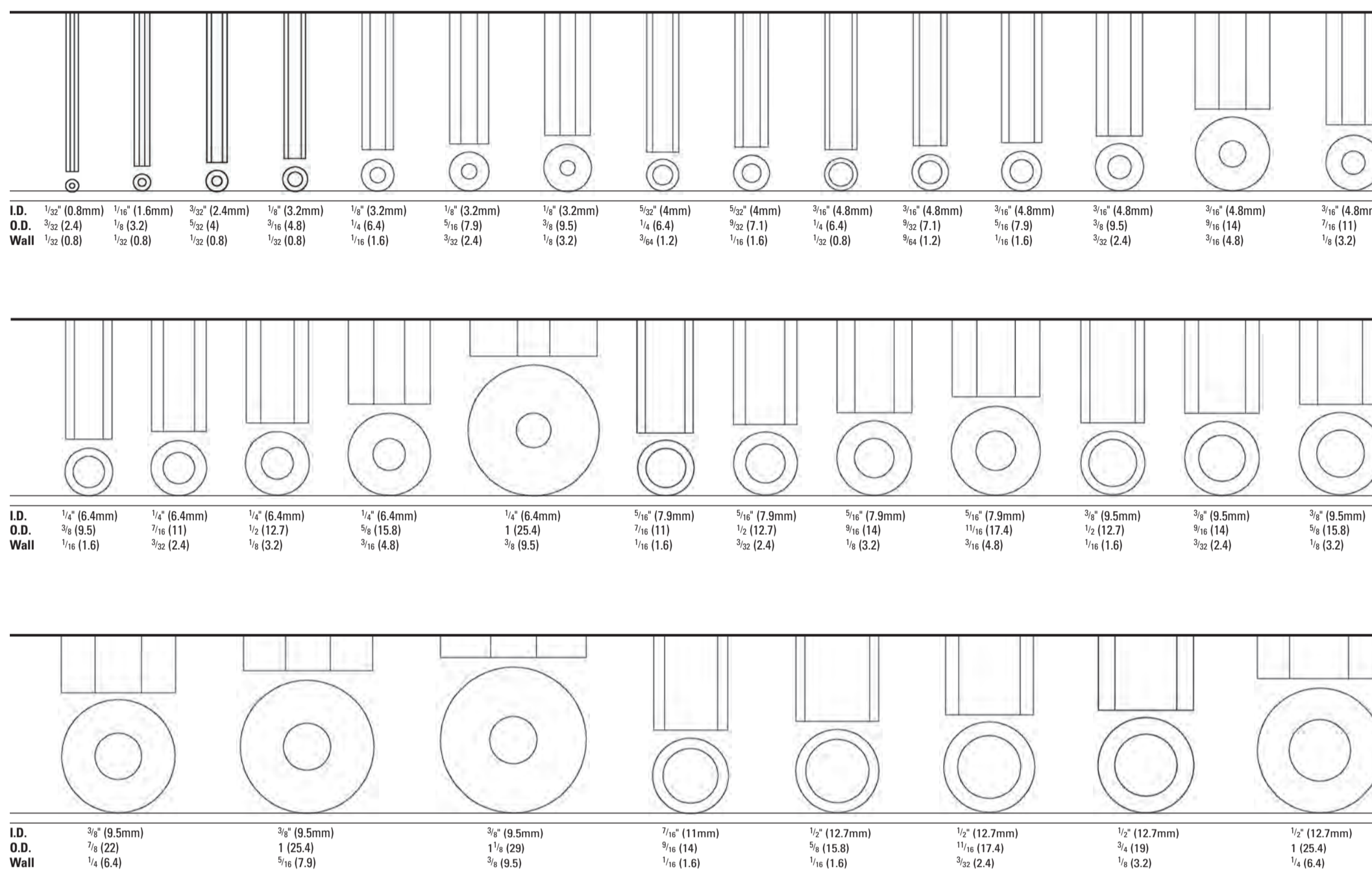
$$M_1 V_1 + M_2 V_2 + \dots = M_F V_F \quad \text{F for final}$$

Normality Calculations

$$N = \frac{\text{Eq}_{\text{substance}}}{V_{\text{solution}}}$$

Tubing Sizer

Hold a piece of your current tubing on top of the sizing chart to determine the best size for your needs. This guide includes many of the most popular tubing sizes. For those tubing sizes not listed here, a "Tubing Sizer" guide is available for download at www.fishersci.com.



Molar Fraction

$$X = \frac{n_{\text{substance}}}{\sum n_i} \quad \text{sum all substances present in solution}$$

% w/w

$$C_{\%w/w} = \frac{m_{\text{substance}}}{m_{\text{solution}}} \times 100\%$$

or

$$C_{\%w/w} = \frac{m_{\text{substance}}}{m_{\text{substance}} + m_{\text{solvent}}} \times 100\%$$

Other Equations

$$n_{\text{substance}} = \frac{m_{\text{substance}}}{M_{\text{substance}}}$$

$$m_{\text{solution}} = m_{\text{solvent}} + m_{\text{substance}}$$

$$d = \frac{m_{\text{solution}}}{(1000 V)} \quad V \text{ in L}$$

Molality

$$m = \frac{n_{\text{substance}}}{m_{\text{solvent}}}$$

Molarity

$$M = \frac{n_{\text{substance}}}{V_{\text{solution}}}$$

or

$$M = \frac{m_{\text{substance}}}{MW_{\text{substance}} V_{\text{solution}}}$$

ChemAlert Storage Codes

ChemAlert® STORAGE red	RED (R): Flammable. Store in an area segregated for flammable reagents.
ChemAlert® STORAGE blue	BLUE (B): Health hazard. Toxic if inhaled, ingested, or absorbed through skin. Store in secure area.
ChemAlert® STORAGE yellow	YELLOW (Y): Reactive and oxidizing reagents. May react violently with air, water, or other substances. Store away from flammable and combustible materials.
ChemAlert® STORAGE white	WHITE (W): Corrosive. May harm skin, eyes, mucous membranes. Store away from red-, yellow-, and blue-coded reagents.
ChemAlert® STORAGE gray	GRAY (G): Presents no more than moderate hazard in any of the categories above. For general chemical storage.