



CUMING CORPORATION

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TECHNICAL NOTE 100-7

Estimating Riser Buoyancy Module Diameters

The following charts are to aid in estimating the diameters of C-FLOAT syntactic foam riser buoyancy modules. The charts are for three popular riser pipe sizes: 18-5/8", 21", and 24" diameters. Each chart is divided into two "styles" depending on the number of C&K and auxiliary lines. The charts are further divided into three depth ratings of 2,000', 3,000', and 5,000'. Module diameter "D" in inches is given on the vertical axis of each chart, buoyancy "B2" in lbs. per foot of coverage is given on the horizontal axis. Directly below the buoyancy numbers are the corresponding weights "W3" of syntactic foam per foot of coverage. Any values not shown can be simply interpolated from the charts.

IMPORTANT NOTE

These charts are *approximations* only! All estimated buoyancies, weights, and diameters should be checked by calculation and confirmed by Cuming Corporation engineers.

AN EXAMPLE OF HOW TO USE THE CHARTS

Say you want to add buoyancy to a 21" x 50' riser with three lines (C&K lines plus one auxiliary) weighing 11,750 lbs. per joint. Maximum water depth is 3,000 feet.

1. Calculate the riser weight in sea water "W2" by multiplying its weight in air "W1" by 0.87. Then multiply "W2" by a percentage (usually 90%-100%, with 95% most common) to arrive at buoyancy per joint "B1":

$$\text{Weight in sea water} = W2 = 0.87 W1 = 0.87 \times 11,750; = 10,222 \text{ lbs. per joint.}$$

$$\text{Desired buoyancy} = B1 = 0.95 W2 = 0.95 \times 10,222 = 9,711 \text{ lbs. per joint}$$

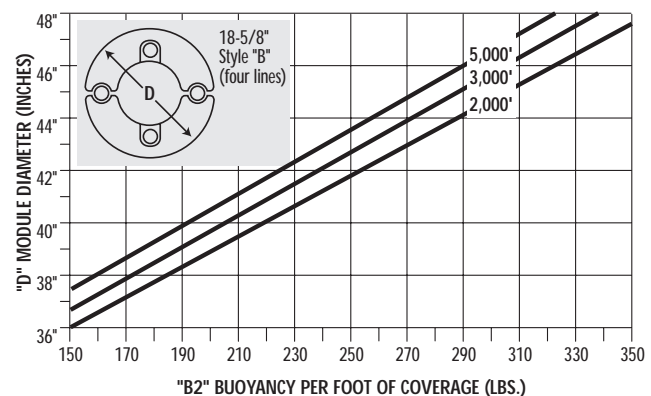
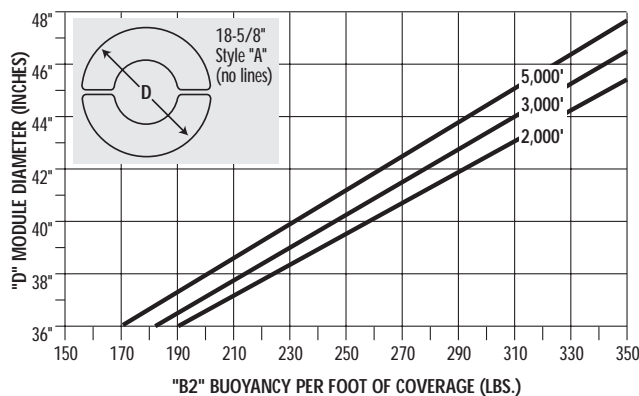
2. Subtract five feet from riser length "L1" to provide room for spider dogs and makeup tools. Divide resulting length "L2" into buoyancy "B1" to arrive at "B2", buoyancy per foot of coverage:

$$\text{Coverage} = L2 = L1 - 5 = 50 - 5 = 45 \text{ feet}$$

$$\text{Buoyancy/Feet} = B2 = B1 / L2 = 9,711 / 45 = 216 \text{ lbs./ft.}$$

3. Go to the 21" riser charts on reverse side. Select the style "B" four-line chart as being more similar to your three-line riser. (For two-line risers, average the diameters of style "A" and "B" charts.) Read up from the "B2" value of 216 lbs./ft. to the "3,000 ft." depth line and across to module diameter "D" of 42.00". Underneath "B2" can be interpolated the "W3" weight of syntactic foam: 158 lbs./ft. of coverage. The fully suited riser joint will therefore weigh $[11,750 + (45 \times 158)] = 18,860$ lbs.

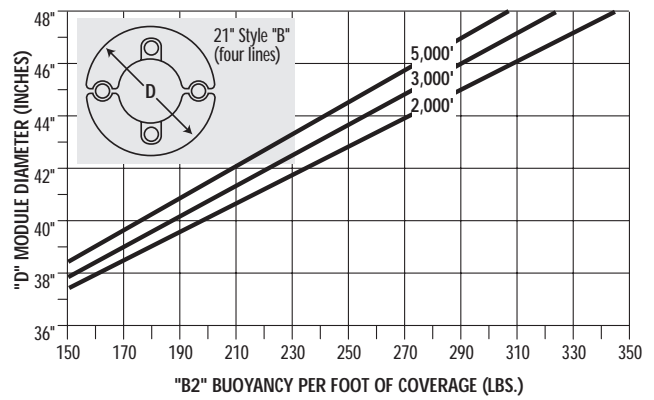
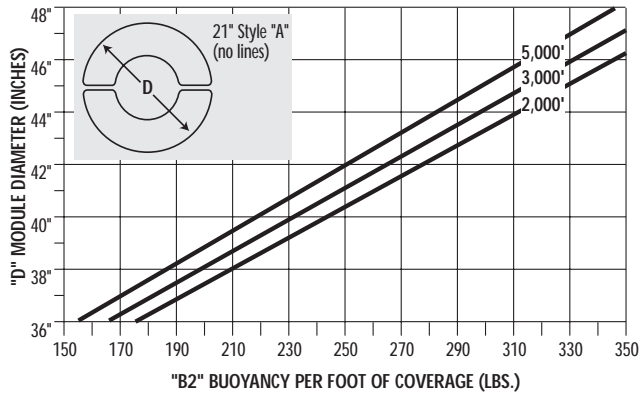
18-5/8" RISER



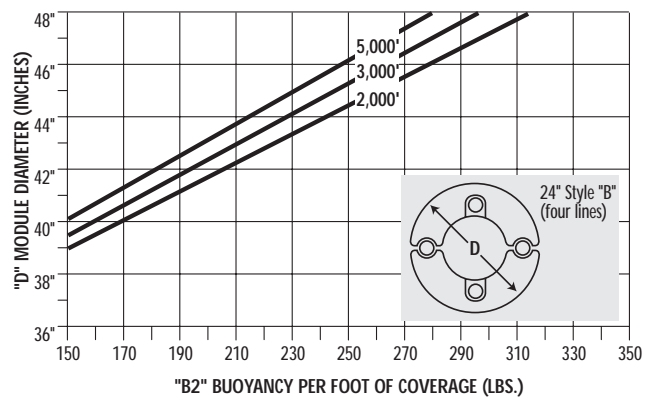
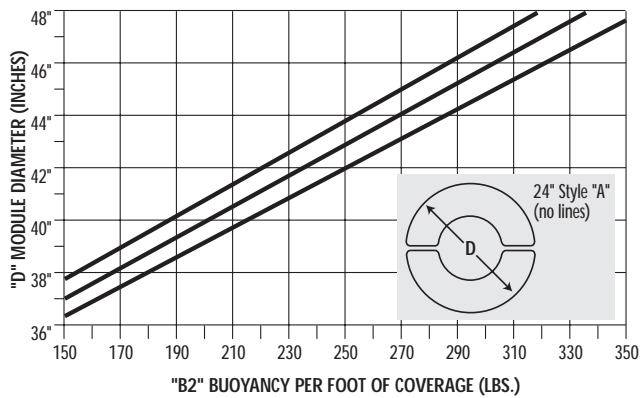
"W3" WEIGHT PER FOOT OF COVERAGE

5,000'	124	141	157	174	191	207	224	240	257	273	290
3,000'	109	124	139	153	168	182	197	212	226	241	255
2,000'	96	109	122	135	147	160	173	186	199	212	224

21" RISER



24" RISER



"W3" WEIGHT PER FOOT OF COVERAGE

5,000'	124	141	157	174	191	207	224	240	257	273	290
3,000'	109	124	139	153	168	182	197	212	226	241	255
2,000'	96	109	122	135	147	160	173	186	199	212	224