PETE 203 Driling Engineering	Example Density Control Using Barite	Date: Aapril 25, 2004 Dr. A. Al-Majed

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How many pounds of barite should be added to one sack of cement to obtain a slurry density of 140 lb/cu ft. Water requirement for barite is 0.0264 gal per pound of barite. Specific gravities of barite and cement are 4.23 and 3.14 respectively. Water requirement for cement is 5 gal per sack.

Additive	Weight (lb)	Density (lb/ft^3)	Volume (ft^3)
Cement	94	195.9	0.48
Barite	χ	264	$\frac{\chi}{264}$
Water for cement	41.7	62.4	0.668
Water for barite	$\frac{62.4(\chi .0264)}{7.48}$	62.4	$\frac{\chi .0264}{7.48}$

$$\text{Density} = \frac{total\ \ wt}{total\ \ Vol}$$

$$\text{Density} = 140 = \frac{\frac{62.4(\chi .0264)}{7.48} 41.7 + \chi + 94}{0.48 + \frac{\chi}{264} + 0.668 + \frac{\chi .0264}{7.48}}$$

$$67.2 + 0.53\ \chi + 93.52 + 0.494\ \chi$$

$$= 0.22\ \chi + 41.7 + \chi + 94$$

$$\chi\ (1 + .22 - .53 - .494) = -94 - 41.7 + 67.2 + 93.52$$

$$0.196\ \chi = 25.02$$

$$\chi = 127 \text{ lb per one sack}$$