SPECCO® DATA

VOLUMETRIC ADMIXTURE CALIBRATION GUIDELINES

Admixtures are introduced through the High and Low Flow Admix Systems. These systems are governed through adjustable valves with visual flow indicators. The accuracy of these flow meters is guaranteed by their manufacturer for liquids with a viscosity (consistency) equivalent to water. It is not necessary to perform complicated calibrations for these substances if a few simple basics are understood.

Admixtures are usually introduced in ratios per weight of cement 94# bag, or hundredweight (CWT). Obviously, those introduced in very small quantities would be fed from the Low Flow System. Conversely, those with high volume demands utilize the High Flow. Most air-entraining agents and low range water reducers are placed in the Low Flow tank. Most accelerators and high range water reducers are placed in the High Flow tank.

Not all admix pumps are consistent in the extremes of their ranges. Thus, it may be necessary to dilute the raw admixes for two reasons. They may be initially too viscous (gooey) and require diluting to flow at all, or they may be concentrated to the point of requiring introduction below the minimum rates of the flow meters. All liquids, including mix water are introduced in units of volume per unit of time. Recommended dosage rates usually appear on the admixture container label. If dilution is necessary, it should be done in such a way as to provide a logical and convenient volume of solution per unit of time as designated on the flow meter.

- For example, most chemicals being introduced through the **LOW FLOW** system will be in the range of **± 1oz.** per bag (94#), or hundredweight (CWT) of cement. Be sure to consult the admixture label or data sheet for actual amounts. These are examples.

- The flow meter reads in **G**allons **P**er **H**our.

- The easiest thing to do is calculate how many **bags (or CWT) per hour** the machine discharges. Then, how many **gallons per hour** of admix are needed through the flow meter.

- From the time calculation of the cement calibration for series #100 Mobile Concrete Dispensers, we know that about **200 Lbs.** of cement are discharged per **minute.** Multiply that x 60 for the **amount per hour. 200 x 60 = 12,000 Lbs. per hour. 12,000 ÷ 94 = 127.66 bags. At a** rate of 1 oz / bag, that's **1 x 127.66 = 127.66 oz, or almost exactly 1 gallon per hour!**

- There are 128 oz. per gallon. To determine the **gallons per hour**, divide **127.66** by 128. **In my math book, that's 1.**

- The problem here is that this setting is so low on the flow meter scale that it is virtually unattainable. The ball float in the sight glass of the flow meter must be read at its center **-O- .**

- To get the ball into a manageable range, in this case, the chemical must be diluted with potable water by at least two times its volume in the low flow tank. This tank is **12 gallons** in size. With the truck on level ground, fill the admix tank to the **4 gal** mark with clear water. Add **4 gal** of chemical. Then add a final **4gal** of water. The tank will be full. This concentration will allow for a little flexibility of dosage. The admix flow can be varied up or down, if necessary.

- The volume of the admix itself has now been increased by two additional "volumes." This is actually **THREE TIMES** the original volume required. There were four gallons, now there are twelve. Thus to set the flow meter, **3 x** the specified amount is needed. **3 x 1 GPH = 3 gallons per hour on the Low Flow meter.** When this value has been established, it's a very good idea to take a graduated measuring container and check the flow accuracy. Convert back to ounces per minute. 3 gallons x

128 ounces per gallon = 384 ounces per hour. 384 ÷ 60 minutes = 6.4 ounces in one minute. Less than one cup.

- Pull the Low Flow hose free of the mixer throat or water line and place its end in the measuring container. With the truck engine at operating RPM, flip the Low Flow Admix switch on the control panel "on." Set the flow meter to the proper level and discharge enough fluid to be sure the pump and line are primed. Flip the switch "off" and return the solution to the admix tank. Follow the same procedure timed for one minute. Was the proper amount of solution discharged?

- If there is a significant difference in what the flow meter reads and what has been discharged, check to see if the solution is about the consistency of water. If it appears much thicker, further dilution may be necessary. If the ball "flutters" or "bounces," perhaps there is some foreign matter blocking the flow. Follow instructions located in the *maintenance* section of your manual to check and clear the pump and/or its filter screen.

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- The **HIGH FLOW** system will be calibrated nearly the same as above, but using much higher volumes of liquids. For example, most chemicals being introduced through the **HIGH FLOW** system will be in the range of **16 oz.** (one pint) per hundredweight (CWT) of cement. **[**Remember that a hundredweight (100 Lbs.) of cement is only six more pounds than a bag, or sack, and is easier to use for quick calculations. Many specifications are written in hundredweights (CWT) of cement**.]** Be sure to consult the admixture label or data sheet for actual amounts. These are examples.

- This flow meter also reads in **Gallons Per Hour,** but with a much higher scale. Some Mobile Concrete Dispensers have flow meters reading in gallons per minute. If this is the case, try the following method per minute instead of per hour.

- The easiest thing to do is determine from the cement calibration how many **CWT** are discharged per minute by the machine. Then, how many **gallons per minute** of admix are needed through the flow meter.

- From the cement / time calibration, about **200 Lbs.** of cement are discharged per **minute.** Divide that by 100 for the **CWT per minute. 200 ÷ 100 = 2 CWT per minute.** At this rate, **2 x 16 oz.** or **32 oz.** of admix are required **per minute**. There are 128 oz. per gallon. To determine the **gallons per minute**, divide **32** by 128. **32 ÷128 = .25 GPM (1 quart),** or .25 x 60 minutes = 15 gallons per hour.

- The problem here is that this setting is very low on the flow meter scale. The ball float in the sight glass of the flow meter must be read at its center -**O-** . This setting would be in the bottom third of the glass of this particular meter and might not hold a steady flow. The fluid is also very viscous (thick) and difficult to pump and it's unlikely the ball indicator would be visible.

- To get the viscosity and flow rate into a manageable range, in this case, the chemical must be diluted with potable water by at least one times its volume in the high flow tank. This tank is **35 gallons** in size. With the truck on level ground, fill the admix tank with **15 gal** of clear water. Then add **15 gal** of chemical. If there is some doubt as to how readily the water and admix will combine, alternate 5-gallon buckets of water and chemical. At three of each, the tank will be nearly full. This concentration will allow for a little flexibility of dosage. The admix flow can now be varied up or down to suit.

- **The volume of the admix solution has doubled, so now the dosage rate must double to .5 gpm.**

- When this value has been established, it's a very good idea to take a graduated measuring container and check the flow accuracy. In this case, 30 seconds ought to yield half the per minute dosage rate – **.**5 gal ÷ 2 = **.25 gal** x 128 oz. = **32 oz**, **or 1 quart**.

- Pull the High Flow hose free of the water supply or mixer throat and place its end in the measuring container. With the truck engine at operating RPM, flip the High Flow Admix switch on the control panel "on." Set the flow meter to the proper level and discharge enough fluid to be sure the pump and line are primed. Flip the switch "off" and return the solution to the admix tank. Follow the same procedure timed for thirty seconds. Was the proper amount of solution discharged?

- If there is a large difference in what the flow meter reads and what has been discharged (30% difference between actual and indicated is not unusual), check to see if the solution is about the consistency of water. If it appears much thicker, further dilution may be necessary. If the ball "flutters" or "bounces," perhaps there is some foreign matter blocking the flow. Follow instructions located in the *maintenance* section of your manual to check and clear the pump and/or its filter screen.

These rates of flow on admixtures are typical for a wide range of conditions. However, specific admixes and their required rates of flow may vary according to the job and ambient weather conditions. Even when using the original "Old Reliable" combinations, be particularly attentive in conditions **below 60°F and above 80°F.** Also, the rate of flow for given conditions **does not change,** even if the mix design does – **admixtures are always introduced in proportion to the cement!** The cement discharge rate for a Mobile Concrete Dispenser is always the same. Even if you have different gear ratios on your cement feed, once the lever has been shifted to the new rate, it will not change. However, the precise rates for each gear must be established through calibration.

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