SMITH PUMPS

# TWO-INJECTOR OPTIONS

All MeaSUREmix models can be supplied with one or two injectors, with the exception of the model R-1, which is always a two-injector option. There are four inherent advantages with two-injector option machines, which comprise the categories to be covered in this bulletin. These are:

(1) Choice of proportion desired
(2) Ability to inject two "incompatible" chemicals simultaneously, which if mixed together prior to injection would result in adverse reactions.
(3) Simultaneous injection of acid and nutrient chemicals without combining them prior to injection.
(4) Having a "built-in" spare injector.

**(1) CHOICE OF PROPORTION DESIRED.** Any one of the following standard proportions is available as shown for each injector (see Manual "CM-2", or "Boletín 195" in Spanish, for a list which also includes most special proportions).

Model R-3 - 1:50, 1:100, 1:150, 1:200
Model R-4 - 1:100, 1:200, 1:300, 1:400
Model R-6 - 1:50, 1:100, 1:200, 1:500
Model R-8 - 1:200, 1:400, 1:500

Different proportions can be obtained with any two-injector MeaSUREmix, placing both dip tubes in the same container, examples of which are in the following table:

1:50 / 1:50 = 1:25
1:50 / 1:100 = 1:33
1:50 / 1:150 = 1:37
1:50 / 1:200 = 1:45

1:100 / 1:100 = 1:50
1:100 / 1:200 = 1:67
1:100 / 1:300 = 1:75
1:100 / 1:400 = 1:80
1:100 / 1:500 = 1:83

1:150 / 1:150 = 1:75
1:150 / 1:100 = 1:60
1:150 / 1:200 = 1:85

1:200 / 1:200 = 1:100
1:200 / 1:300 = 1:119
1:200 / 1:400 = 1:133
1:200 / 1:500 = 1:143

1:300 / 1:300 = 1:150
1:300 / 1:400 = 1:172

1:400 / 1:400 = 1:200
1:400 / 1:500 = 1:222

1:500 / 1:500 = 1:250

NOTE: The formula below was used to determine the proportions to the left. Determination of the proportion value**, "X",** written after the **"1:"** is as follows:

$$\textbf{1: "X" = 1 : } \frac{\textbf{100}}{\textbf{( } I_1 \textbf{ + } I_2 \textbf{ )}}$$

Where:

$I_1$ = the number of gallons injected by the first injector per 100 gallons of water passed through the MeaSUREmix.

$I_2$ = the number of gallons injected by the second injector per 100 gallons of water passed through the MeaSUREmix.

**Number of gallons injected per 100 gallons of water for the following proportions:**

**1:50 = 2**
**1:100 = 1**
**1:150 = 0.67**
**1:200 = 0.50**
**1:300 = 0.33**
**1:400 = 0.25**
**1:500 = 0.20**

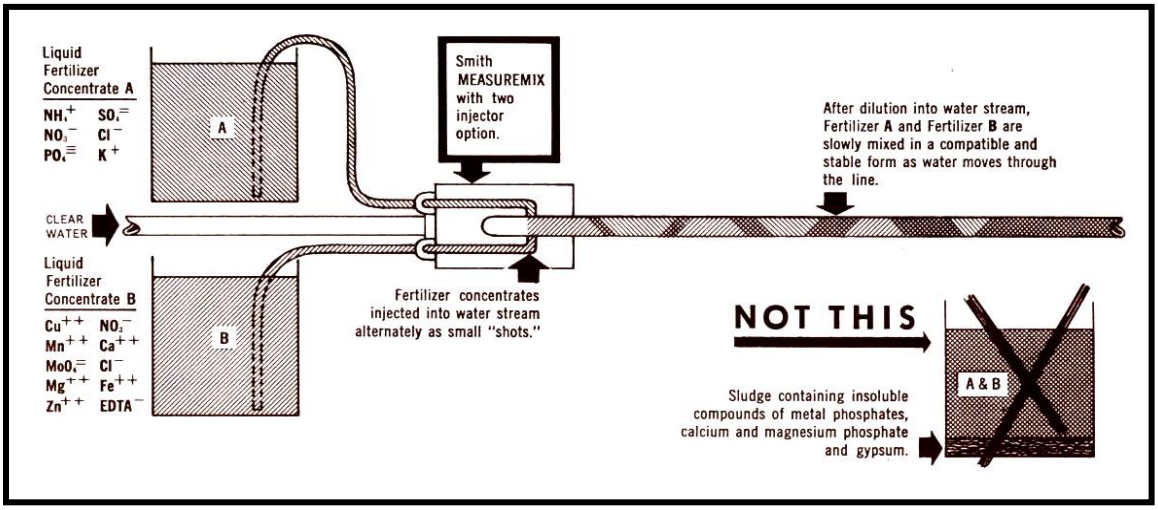
For example, to determine the ratio of injection when both injectors on an R-3, 1:100 / 1:100 proportion are used simultaneously out of the same concentrate tank:

$$\frac{\textbf{100}}{\textbf{1 + 1}} \textbf{ = 50 (a 1:50 ratio)}$$

If more than one machine is used at the same time in a parallel system, the proportions can vary even more, depending upon how many dip tubes are used at the same time.

**(2) ABILITY TO INJECT TWO "INCOMPATIBLE" CHEMICALS SIMULTANEOUSLY, WHICH IF MIXED TOGETHER PRIOR TO INJECTION WOULD RESULT IN ADVERSE REACTIONS.** Sometimes it is desired to inject two chemical solutions which, when mixed together in concentrated form, react with each other and form an insoluble precipitate at the bottom of the container (see illustration), or react with each other and form other chemicals which would then be harmful to the materials of construction used in the standard injection system.

In such cases, it is advisable to utilize a two-injector option and two separate concentrate containers. One of the dip tubes (suction hoses) is placed in the first container, and the other dip tube in the second container. In this way, the incompatible chemicals will not contact each other until they are injected into the treated water stream, highly diluted, so they will no longer react with each other to form precipitates or other harsh chemicals.




**(3) SIMULTANEOUS INJECTION OF ACID AND NUTRIENT CHEMICALS WITHOUT COMBINING THEM PRIOR TO INJECTION.** In most cases it is in the end user's best interests to always use a two-injector option when injecting acids. ALWAYS INJECT ACID BY ITSELF. DO NOT MIX IT WITH OTHER CHEMICALS. THIS IS IMPORTANT!

**(4) HAVING A "BUILT-IN" SPARE INJECTOR.** MeaSUREmix users can greatly benefit from a two-injector option, as it reduces maintenance problems. As long as the water is clear and clean, under proper conditions the parts that wear soonest are in the injection system. One injector can be used until it loses efficiency, and then, the second injector may be placed in service. When both injectors are in good condition, and only one is being used, the non-used injector will last longer if it is allowed to inject plain water either from a container, or from the priming valve slightly open.

Since the water motors of all MeaSUREmix units have sufficient power to drive two injector pumps, there is no loss in accuracy or longevity with double injectors.

Additional information can be found in Manual "CM-2".

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