



# PROFESSIONAL FINISHING SYSTEMS, INC.

12341 Gladstone Ave. ■ Sylmar, CA 91342 ■ (818) 365-8888 ■ FAX (818) 365-8803

## “MASS FINISHING” FLOW-THROUGH SOLUTION SYSTEM

### PURPOSE:

The flow-thru solution system automatically meters liquid compound and water into a vibratory finishing machine. This system provides excellent economy of material and minimum operator attention.

Vibratory machine using steel media are more critical of compound solution than others because of the potential corrosion of the media. Problems of this type are easily avoided by controlling concentration of compound both during start-up and while running the machine during the day.

### DESCRIPTION:

The compound pump intake line has a suction fitting containing a screen and check valve. This is put into the container of concentrate liquid compound. Concentrate is metered through the pump, into the injection fitting and the water line. Pump output is adjusted by turning the speed and stroke knobs. The color of liquid concentrate permits visual observation.

Plant water is connected at the inlet marked “Water In”. A switch at the control panel operates an electric solenoid to shut off water and the compound pump. Water flows through a meter with adjustable needle valve so that the water flow rate can be adjusted. Water passes through the compound injection fitting tee, where the liquid compound concentrate is mixed into the water stream. The solution then flows into the vibratory finishing machine.

### ADJUSTMENT OF THE SOLUTION SYSTEM:

1. Concentration. Concentration represents the amount of compound in a given amount of water. It is normally measured in fluid ounces per gallon of water or percent by volume.

Compounds are designed to do several things. These include prevention of corrosion, cleaning, lubrication, soil suspension, controlling foam, compensating for water hardness etc. Normally, higher concentrations of compound in water are used when more severe cleaning is required. Modern vibratory finishing compounds are normally used in the 1 to 2 ounces per gallon range. Heavy duty cleaning applications may require up to 2 or 4 ounces per gallon, because of the large or more quantities of oily soil which must be emulsified by the compound.

2. Water Flow Rate Control. A meter with adjusting knob is provided to control the flow rate of water into the vibratory machine. These are calibrated directly in gallons per hour or gallons per minute depending on the capacity

Some vibratory equipment should be equipped with a water pressure regulator and gauge to improve water flow rate control. This device is required when significant fluctuations occur in plant water pressure. Set the regulator to about 10 – 20 PSI or as low as required to eliminate pressure surges.

Normal applications use water flow rates between 1 and 2 gallons per cubic foot of machine capacity per hour of operation. In other words, using between 10 and 20 gallons of water per hour in a 10 cubic foot machine is normal. Lower flows are used when the process is essentially clean or when very small media is used. High volumes are used when large amounts of soil must be washed out of the finishing machine, and sometimes at start-up in the morning.

3. Compound Pump. A speed control knob and a stroke control knob are provided. These are each calibrated from 0 to 100 and indicate a percent of full scale. When one knob is set at 50 percent and the other at 100 the pump would deliver 50 percent of its full capacity. When both are set at 50 percent, it would deliver 25 percent of full capacity (50 percent of 50 percent).

### START-UP VERSUS RUNNING:

During a normal vibratory process, the compound concentration is normally in the 1 to 2 ounces per gallon range for most deburring and burnishing applications. It is important for critical applications that these concentrations be maintained through out the day.

At start-up, in order to speed up getting the vibratory machine into a productive state, it is often desirable to use a much higher than normal flow rate of compound and water. It is important during this period that the concentration of compound in water be held as a constant.

For example, a 10 cubic foot working capacity vibratory finishing machine might process with a solution flow rate of 15 gallons per hour and a concentration of 1 ounce per gallon. During the run we would have the speed set at 30 and the stroke set at 40 to give us 15 ounces of compound per hour or a 1 ounce per gallon solution concentrate.

If we are putting only 15 gallons of solution into that machine it is obvious that it's going to take 20 to 40 minutes to develop enough liquid in order to start production. For this reason, we will start-up at a higher flow rate of both compound and water. We set the water flow at 40 gallons of water per hour and need 40 ounces per hour of compound to maintain the one ounce per gallon concentrate. When sufficient liquid has been introduced into the machine, cut back to the normal flow rate.

Under these conditions, the machine is ready for parts quicker. We have improved the efficiency of this equipment.

### NOTES:

1. High viscosity compounds will not meter accurately.
2. For systems not equipped with direct reading flow meters, water flow rate is readily determined by the following:

Gallons per hour equals fluid ounces per 28 seconds, or  
Gallons per hour equals 10 milliliters per 9.5 seconds.

For example, if a total of 40 fluid ounces are collected in 28 seconds from each spray header, the flow rate is 40 gallons per hour. Or, if a total of 400 milliliters are collected in 9.5 seconds from each spray header, the flow rate is 40 gallons per hour.

3. Water flow rate can vary due to changes in plant water pressure. Adjust your water pressure regulator to eliminate this variation.



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## COMPOUND FLOW-THRU SOLUTION SYSTEM

