



SUBJECT PREPARATION OF SILICATE SOLUTION
Process Specifications

PART I - DILUTING & PURIFYING
**(Lancaster Process)

A. EQUIPMENT

1. Wash sink provided with hot and cold tap water and distilled or deionized water.
2. Timer.
3. Measuring spoon, approximately 1 gm.
4. Mechanical system of five essential parts in series an identical system in parallel, interconnected with stainless steel fittings and rubber hose.
 - a. 2-48 liter stainless steel drums with top head removed, and equipped with motor-driven agitators. A water line permits filling from above, and a supply line supplies potassium silicate solution (P29).
 - b. 2-48 liter stainless steel lower drums, equipped with air vents and compressed air lines, designed to receive liquid from upper drums by gravity flow, and by closing vent and admitting compressed air to blow liquid into a third storage drum.
 - c. 2 stainless steel filter presses, Alsop 7", no. 90 pads in the lines following the lower drums, for removing precipitates from the solution.
 - d. 2 porous stainless steel filters, 35 micron pores, for removing lint from the filter press.
 - e. 2-48 liter stainless steel drums, equipped with air vents and compressed air lines, to store the purified solutions from the lower drums and deliver it by means of compressed air to the dispensers.
5. A compressed air line fitted with a pressure reducing valve, pressure gauge and pipe line filter.

B. MATERIALS

1. P29 Potassium Silicate, Kasil No. 1.
2. Z19 Zinc Sulfide Powder.
3. W7K Distilled, W7J Distilled, or W60B Deionized Water.

C. PROCEDURE

1. Prepare upper drum for mixing by closing drum outlet valve.
2. Fill upper drum with 24 liters distilled or deionized water. This quantity is indicated by a mark on the inside of the drum.
3. Add to the upper drum 16 liters of potassium silicate solution (P29) from the overhead line. This quantity is indicated by a mark on the inside of the drum.
4. Start the agitator motor.
5. Add 5 gms. (5 measures) of zinc sulfide powder (Z19).
6. Agitate for 20 minutes.
7. Empty mixing drum.
 - a. Turn off agitator motor.
 - b. Close outlet valve on lower drum to be used and close inlet valve on second drum.
 - c. Shut off air and open vent on lower drum.
 - d. Open inlet valve on lower drum.
 - e. Open outlet valve on upper drum, permitting contents to drain into lower drum.

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C. PROCEDURE (Cont.)

- 8. Blow contents of lower drum, when full, into storage drum.
 - a. Close outlet valve and shut off compressed air on storage drum to be used.
 - b. Open vent and inlet valve on storage drum.
 - c. Close inlet valve and vent on lower drum.
 - d. Turn on compressed air on lower drum and then open outlet valve, blowing contents into storage drum.
- 9. Deliver solution from storage drum, when full, to settling room.
 - a. Close inlet valve and vent on storage drum.
 - b. Turn on compressed air and open outlet valve.
 - c. Air pressure on system 10 to 13 lbs./sq.in.

This completes an entire cycle of purification.

- 10. Take sample for copper determination and specific gravity check according to Part II, Par. C below.

PART II - SAMPLING & TESTING

** (Lancaster Process)

A. PURPOSE

Quantitative determination of metals which cause purple and green spots and/or other defects on finished screens. Test for copper by reduced phenolphthalein method shall be considered indicative of purity of original material for copper, or of the effectiveness of the purification method for removal of copper.

Specific gravity check shall determine acceptability of incoming potassium silicate solution.

B. EQUIPMENT

- 1. Pyrex test tubes, 25 cc. capacity with 10 cc. level indicated.
- 2. Test tube rack.
- 3. 250 cc. graduate.
- 4. Thermometer, 0-100° F.
- 5. Specific gravity hydrometer, 1.200-1.420.

C. SAMPLING PROCEDURE

- 1. Immediately after use, all equipment shall be washed with hot tap water.
- 2. Wash test tubes with 10% nitric acid solution.
- 3. Rinse test tubes twice with distilled or deionized water.
- 4. Rinse test tubes twice with 20 cc. of filtered, purified potassium silicate (P29) from tap between filter and storage drum.
- 5. Take a sample for copper test.
- 6. Place test tubes in rack preparatory to testing.
- 7. Take a sample of 220 cc. of undiluted potassium silicate solution (P29) from overhead supply line in graduate.
Use this sample for specific gravity determination.

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D. NORMAL SAMPLING FREQUENCY

1. Three times daily
 - a. First shift - between 7:00 and 8:00 hours.
 - b. Second shift - between 15:00 and 16:00 hours.
 - c. Third shift - between 23:00 and 24:00 hours.
2. Whenever purifying conditions, or materials, change sufficiently to possibly effect the final product.

E. TESTING OF SAMPLES

Test as soon as possible after sampling according to S.N. 34-37-61 and S.N. 33-P-19.

** PART III - PREPARING SOLUTION
(Marion Process)

A. EQUIPMENT

1. Supply of hot and cold soft tap water and demineralized water.
2. Electric clock.
3. Calibrated scale to measure volume in mix tank.
4. Mechanical system for mixing and storage of solution.
 - a. One 500-gallon stainless steel mix tank equipped with a "Lightning" 2 H.P. agitator.
 - b. Two Triclover centrifugal stainless steel pumps, Model S-142-S (one to pump solution from mixing to storage - one to pump from storage through settling room loop line.)
 - c. Two 1000-gallon stainless steel tanks for storage of solution - high and low level indicators.
 - d. One Alsop filter with #90 pads in line from mix tank to storage tanks to remove solids. Filter Model SD12-WR20.
 - e. Three stainless steel micrometallic filters (35 micron pores). One in line from mix tank to storage tanks, two in parallel in feed line to settling room.
5. Check valves in loop returns and line from mix tank to storage tanks.

B. MATERIALS

1. P29 Potassium Silicate Solution, Kasil No. 1
2. W60C Demineralized Water.

C. PROCEDURE

1. Preparation of Fresh Charge (starting with mix tank empty).
 - a. Prepare tank for mixing by closing valves to drain and to mix tank pump (mix pump #1).
 - b. Fill tank to 9" mark (260.5 gal.) with demineralized water 15.5-32.2°C. (60-90°F.).
 - c. Add 9" of potassium silicate (175.5 gal.).
 - d. Agitate for 5 minutes.

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C. PROCEDURE (Cont.)

1. Preparation of Fresh Charge (starting with mix tank empty). (Cont.)

e. Pump to storage tanks.

(1) Open valve to mix pump #1.

(2) Start pump from control panel switch.

(3) Open valves to proper storage tank.

(4) Turn off pump and close valves when mix tank level has reached level of outlet pipe.

2. Recharging Tank (mix tank level at outlet pipe).

a. Prepare tank for mixing by closing valve to mix pump #1.

b. Fill tank with demineralized water to 12" mark. (234.0 gal.).

c. Add 8" of potassium silicate (156 gal.).

d. Agitate for 5 minutes.

e. Pump to storage.

(1) Open valve to mix pump #1.

(2) Start pump from control panel switch.

(3) Open valves to proper storage tank.

(4) Turn off pump and close valves when mix tank level has reached outlet pipe.

PART IV - SAMPLING & TESTING

(Marion Process)

A. PURPOSE

Quantitative determination of metals which cause purple and green spots and/or other defects on finished screens.

B. SAMPLING PROCEDURE

1. One 500cc. sample bottle will be thoroughly rinsed with demineralized water.

2. The sample bottle will be rinsed with two 500cc. portions of solution to be sampled.

3. The bottle will be filled with solution and submitted immediately to the C & P Lab. for analysis.

4. The sample will be taken from the recirculating line to the mixing tank after 2 - 3 minutes of operation of the pump.

C. SAMPLING FREQUENCY

One sample will be taken from each batch mixed immediately after mixing.

D. TESTING OF SAMPLE

Test as soon as possible after sampling for the following:

1. Copper - Test as per S.N. 34-37-61.

2. Iron - Report results in ppm; iron content not to exceed 25 ppm.

E. REPORTING OF RESULTS

1. In case of a rejectable batch results are to be returned to the Mixing Room Foreman or Engineer immediately. This should not be more than four hours after sampling to prevent use of improper settling solutions.

2. Routine results are to be returned to the Mixing Room Foreman by company mail.

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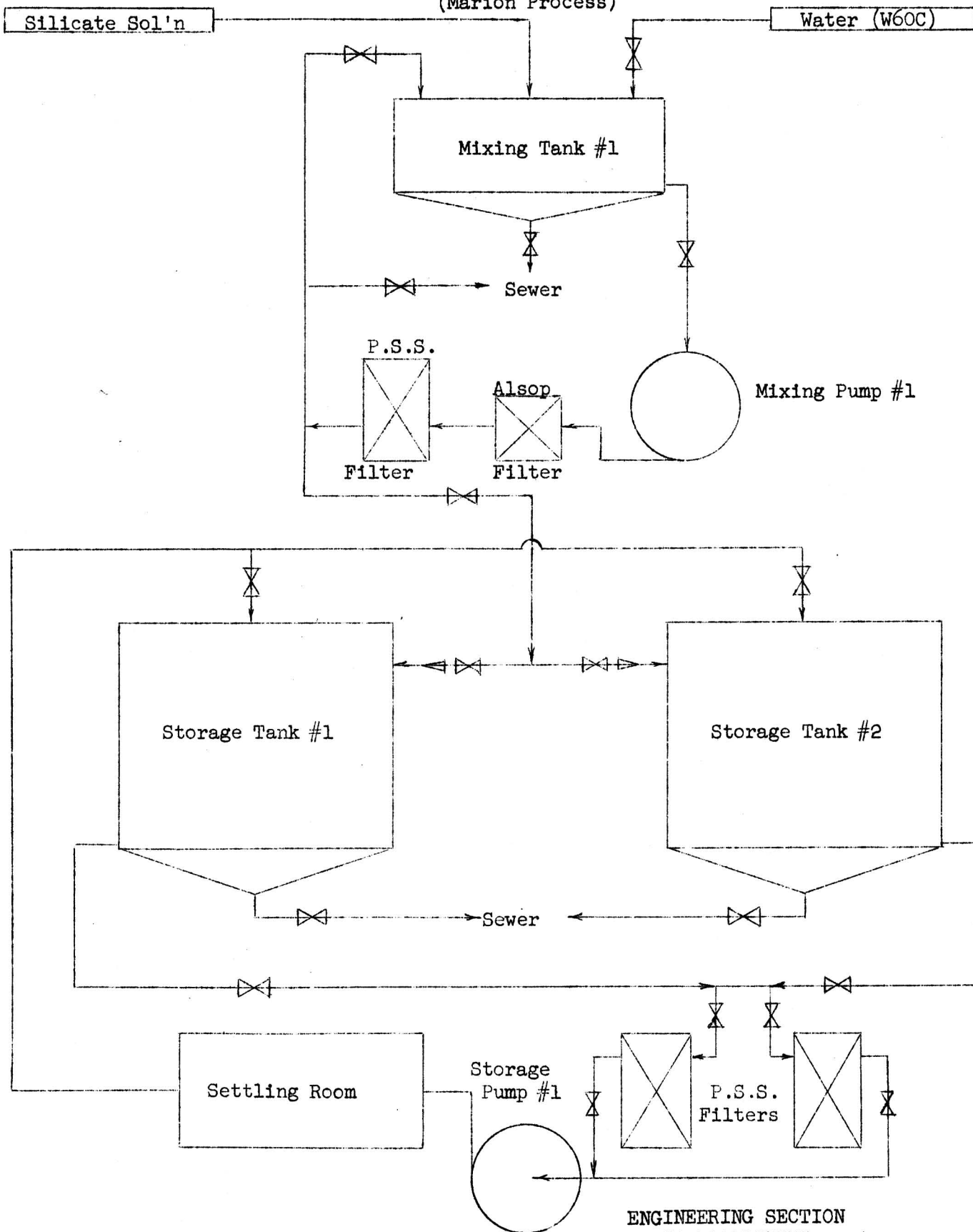


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DIAGRAM OF SILICATE MIXING SYSTEM

(Marion Process)



ENGINEERING SECTION
 STANDARDIZING

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