INSTRUCTIONS FOR UNIFORM WASHING OF SUGAR

With the exception of baskets having loading cones, the wash water nozzles and manifold should be set as shown in the accompanying drawing #W-491B.

Wash Water Pressure - For short cycle operations where sugar is washed to high purity, the nozzle pressure for best results should be at least 50 p.s.i., which would call for a water header pressure of 75-80 p.s.i. Refer to chart #W-491A for quantity of wash water delivered per second at various pressures. The advantage of the higher pressure is to give a more finely atomized spray resulting in more uniform washing. Also, with the higher pressure, the washing time is reduced, resulting in a time saving that can be used for increased centrifugal capacity. The same quantity of wash water applied in a shorter time also results in less dissolution of sugar crystals.

Wash Water Temperature - If curb tops do not have sliding covers, the wash water temperature at the centrifugals should be slightly below the boiling point. If the superheated wash water system is used and curb tops have sliding covers, the wash water temperature should be regulated at 225-230°F. (107-110°C. High temperature greatly aids in the atomization of the wash water and promotes more uniform washing.

The wash water lines to the centrifugals should be insulated and a small return line (not over ½ inch) to the supply tank be available to assure the same temperature at each centrifugal.

The temperature of the wash water has considerable to do with the setting and/or adjustment of the spray nozzles. The higher the wash water temperature as well as the higher the centrifugal speed, the greater the downward angle of the two lower nozzles on the manifold should be, particularly the lowest nozzle.

Spray Nozzle Adjustments - Besides setting the nozzle system as shown in drawing #W-491B, there are other adjustments of the individual nozzles.

The top nozzle should have a deflector plate on the top side of the nozzle, and the spray should be adjusted from this nozzle in such a way that the majority of spray strikes just under the outer rim of the basket cap. This assures good washing of the sugar in the extreme top portion of the basket.

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The bottom nozzle is adjusted so that there is a slight undercutting of the sugar wall at the bottom. The undercutting need not be more than ½" deep and about the same in height. This slight undercutting is necessary to get properly washed sugar in the extreme bottom portion of the basket.

With the top and bottom nozzles properly adjusted as stated above, the balance of the nozzles are adjusted so that there is finally a straight uniform wall of washed sugar with the exception of the slight undercutting mentioned above.

Loading Of The Basket - It is essential for uniform washing, and to secure uniform washing with with a minimum quantityof wash water, that the basket be uniformly loaded. If the basket is loaded at too high a speed, a tapered massecuite and sugar wall develops. The bottom of the sugar wall cannot then be properly washed without using a great excess of wash water, and the top portion is then excessively over-washed resulting in a lower centrifugal sugar yield.

Overloading should also be avoided because, besides putting sugar grain and massecuite into the greens (molasses) and raising the purity, the separation of the greens from the wash syrups is adversely affected. Also, off-color sugar may develop since the wash water nozzles are set for normal loads.

Discharging Of The Sugar - The sugar should be discharged as completely as possible each time to avoid leaving sugar at the top and bottom of the basket. Poor washing will result if appreciable amounts of sugar continue to be left at these points. Also, if the plow shoe is not making proper contact with the screens a thin layer of sugar is left on the screen at various points, and this in time develops into scabbing and off-color sugar results.

Flushing Of The Basket - Flushing the basket with 3-4 seconds of wash water (manual operation of push button or lever as the case may be) before every second or third charge is definitely recommended. In addition, after finishing each massecuite strike, the basket and screens should be well washed. This, also, where there are ring-valve separators in the curbs, keeps the separator valves clean. Naturally, in this case, the separator should be in the tripped position when washing-out operations take place.

Size Of Spray Nozzle Orifices - The 5/32 inch orifice is recommended for the washing of all sugars with the exception of final crystallizer sugars, in which case nozzles with 1/16 inch orifice are used.

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Single Washing (5/32" Orifice Nozzle) - When single or only one washing is made the water should not be applied until the centrifugal is at approximately full speed. This permits the use of the minimum quantity of wash water. Also where separation of greens (molasses) and washings is made, better separation is secured.

Intermittent Or Double Washing (5/32" Orifice Nozzle) - This washing system using superheated wash water is recommended for all sugars except final crystallizer or low grade. The first washing in all cases should not be applied until the syrup film on the sugar wall has disappeared.

Refined sugar massecuites and raw sugar affination magmas usually purge rapidly, and application of the first washing at the end of 20 seconds from loading is usually correct. This however should be the minimum time before application of the first wash; there must be sufficient time to build up enough centrifugal force to throw off the first washings rapidly in order to minimize the interval between washings, especially where separation of syrups is made. A first washing time of 5 seconds is recommended.

When washing "A & B" sugars in raw sugar factories, or remelt sugars in refineries, to high purity, the purging rate due to higher viscosity and, in some cases, less grain uniformity requires that the first washing be delayed longer than 20 seconds because of the fact that wash water should not be applied until the syrup film on the sugar wall has been eliminated.

The interval between the first and second washings varies according to the type of sugar and whether separation is made between the greens and washes. Where separation is made, the interval between washings should be such that, when the separator is tripped at the start of the second washing, the purity of the wash syrup produced will be equal to or higher than the massecuite being purged. The interval between washings will vary with the speed of the centrifugal and the grain characteristics of the massecuite.

Washing Low Grade Sugars (1/16" Orifice Nozzle) - Where low grade sugars are washed, the wash water should not be applied until all traces of molasses film have disappeared from the surface of the sugar wall. If molasses film remains on the sugar wall, it is useless to try washing the sugar. Uniform washing is impossible, and breaks in the molasses film resulting from uneven washing would throw the basket out of balance. Retention of molasses film on the sugar wall proves that the massecuite contains badly mixed grain.

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Where low grade sugars are washed and separation of molasses and washings is made, the wash water should not be applied until practically all the molasses has been eliminated from the charge. This is essential if worthwhile separation is to be secured, that is, if a minimum quantity of washings of high enough purity are to be returned to process to make separation a profitable procedure.

Supporting references attached:

Drawing #W-491B
Chart #W-491A

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