

Twelve Facts for a Better Centrifugal Station – Part 2

Editor's note: Part 1 of this article was published in the May 2008 issue of *Sugar Journal*.

6.) Automatic Feed Control

The investment in an automatic feed control will be well worth your money. The proper use of an automatic feeding system will always result in a higher capacity of the continuous centrifugal. The automatic system will hold a motor load set point allowing the control to adjust feed flow to maintain peak performance of the centrifugal. Automatic control will minimize sugar losses into the molasses. The above graph demonstrates that in a manually controlled system the best load you can get is 55% to 80%, with a loss in molasses of 1%. In an automated feed control system the best load you can get is a 65% to 70% with a lost in molasses of 0.55%.

7.) Automatic Centrifugal Shut Down Systems

Automated shut down system help prevent costly and lengthy repairs by efficiently detecting problems within the masscuit and reacting to those problems much faster then manual systems ever could. Three examples of how an automated shut down system help prevent costly repairs are in overloads, vibrations, and lack of oil flow. When an automatic shut down system detects overflows and vibrations it immediately closes the isolation valve allowing the operator the opportunity to clean-up and correct the problem before costly and untimely damages occur to the centrifugal. When the automatic shut down system detects oil flow failure the centrifugal motor will automatically stop allowing a mechanic the opportunity find and correct the problem, protecting the centrifugal and again preventing costly and untimely damages.

8.) Good Massecuite

Good massecuite starts at the vacuum pan. Good massecuite affects the entire function of the centrifugal. In a nutshell, a good centrifugal operator is a good pan boiler. The key to good massecuite is controlling the size of the crystal in the massecuite (mean aperture, and coefficient of variation), length of the crystal, purity of the mother liquor, crystal/syrup ration, viscosity of the molasses, and stickiness of molasses. For every 1% drop in purity there is a 1% increase in viscosity making the massecuit harder to purge. A 1% brix increase raises the viscosity by 50% making the massecuit heavier and harder to purge. Additionally, because the temperature of the massecuite can change as it flows from the vacuum pan to the centrifugal the temperature of the massecuite as it enters the centrifugal can affect the efficiency of the centrifugal. A one degree (centigrade) increase will drop the viscosity about 10% making it easier for the massecuite to purge. Clean massecuite is critical. Finally, an adequate head is need to make the feeding system work, a 2.5 meters head, at a minimum, must be maintained.

9.) Simple Control Panel

A simple control panel makes a system that is easy to understand and easy to use, resulting in a reduction of wasted employee time and in potentially costly operator errors. A simple control panel should have no more then two needle valves and a good flow meter. The simple control panel also uses two ball valves that control the low pressure steam to optimize heating of massecuite in the centrifugal. The optimizer system is very important in both low and high raw massecuite. Remember that low raw (low grade) massecuite is diluted with a very small amount of water and heated by the optimizing system. The sugar should not be washed in a low raw (low grade)

centrifugal as this causes high molasses purity. On the other hand high raw massecuite should not be diluted but washed on the basket above the color line. This washing on the basket with the high centrifugal force will make very low color sugar.

10.) No Back Pressure in the Molasses Housing ("Tea Potting Problem")

To keep the molasses from blowing past the sealing system and getting into the sugar a vacuum system can be used. A small vacuum in the molasses chamber will help hold the sugar on the screen, reduce the sugar color and require less wash water. Or a well vented molasses chamber will work. When using a well vented molasses chamber you will sometimes need to add an additional molasses drain to get that extra venting. The Australians call this the "Tea potting problem."

11.) Good Centrifugal Steaming and Wash System

A washing system will clean the basket, the sugar housing, the feed neck and the molasses chamber, without flooding the sugar scroll or the molasses tank. The continuous centrifugal must be cleaned at least every eight hours; adequately enough to clean out the backing screen, the feeding nozzle and the feed neck, and melt out all hard sugar. If you let this cleaning go it will turn into a big problem, such as, the plugging up of the backing screen and basket.

12.) Safe Centrifugal Station

Today, many professionals advise, for older centrifugals, that a safety guard be added under the inspection door. A safety guard prevents anything from falling into the centrifugal and prevents potentially severe injuries to employees. Usually new centrifugals already have this guard. Once

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while working on a centrifugal a friend accidentally dropped an old heavy stroboscopes into the turning basket. When the stroboscope landed in the basket it began to fly and bounce around in the basket until it finally came flying out of the inspection door. Luckily the stroboscopes flew out the door, right between myself and my friend without

severely injuring or killing anyone. A safety guard would have prevented the stroboscope from falling into the centrifugal.

It is very important to have good lighting around the centrifugal station. Good lighting aids in the cleanliness, safety and ease of washing the centrifugal station. Hot steam pipes should be behind the control panel, out of the normal working area. Finally, if the centrifugal

begins to vibrate, immediately, wash the basket. A hot water wash down hose should be within easy reach of all continuous centrifugals.

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11.) Un Buen Sistema de Vapores y Lavado

Un sistema de lavado va a lavar a la canasta, al compartimiento del azúcar y al cuello de la entrada de alimentación, si que se inunde el gusano sin-fín o el tanque receptor de miel. La centrifugas continuar deben de ser limpiadas, por lo menos cada (8) horas, con al suficiente capacidad para limpiar tan bien la parte de atrás de la malla, el embudo y cuello de alimentación y fundir o derretir todos los terrones duros de azúcar. Si esta limpieza no se hace con esta frecuencia y con los puntos mencionados, se podría desarrollar un problema serio. Como taparse completamente la parte de atrás de la malla y la canasta.

12.) Una Operación de Centrifugas Segura

Hoy en día, muchos profesionales aconsejan en las centrifugas viejas, de tener una sección adicional de seguridad debajo de la puerta de inspección. Esta sección adicional previene que algo caiga dentro de la centrifuga y al mismo protege de accidentes peligrosos a los operadores. Usualmente la centrifugas nuevas tienen esta sección de seguridad. Algo que me sucedió mientras trabajaba en una centrifuga, mi amigo accidentalmente dejo caer dentro de la centrifuga en operación un pesado y viejo estroboscopio. Cuando el estroboscopio pego en la canasta, comenzó a volar y golpear en diferentes puntos de la canasta, hasta que finalmente salio volando hacia fuera por la puerta de inspección. Para suerte nuestra el estroboscopio salio volando por la puerta de inspección, justamente entre mi amigo y yo, sin que hiriera o matara a alguien.

Una sección de seguridad hubiera prevenido que el estroboscopio cayera dentro de la centrifuga.

Es muy importante que exista un buen iluminado al rededor de la centrifugas. Un buen iluminado ayuda en la limpieza, seguridad y facilita el buen lavado en todas las centrifugas. Los tubos de vapor que normalmente están calientes deben de estar localizados atrás del panel de control y fuera del área normal de trabajo. Finalmente, si la centrifuga comienza a vibrar, inmediatamente proceda a lavar la canasta. Una manguera de agua caliente siempre debe de estar en un lugar de fácil alcance de las centrifugas continuas.

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