# FP Finishing Cleaning Activities & Procedures

**In this Chapter**

[Transition Matrices 2](#_Toc36018313)

[Step 1. Reading the Transition Matrix 2](#_Toc36018314)

[Step 2. Mid-Campaign Cleaning Requirement 3](#_Toc36018315)

[Cleaning Type Requirements 4](#_Toc36018316)

[Drop Line High Pressure Water Cleaning Lock Tag & Try 7](#_Toc36018317)

[Drop Line High Pressure Water Cleaning Lock Tag & Try, Continued 8](#_Toc36018318)

[Co-Coagulated Setup, Operation and Clean Up 9](#_Toc36018319)

[Hot Water Rinsing of Lines 11](#_Toc36018320)

[Line 1 Flush: 5, 6 & 7 Blend Tanks ‘A+’, ‘A’ and ‘B’ Transitions 11](#_Toc36018321)

[Line 2 Flush: 1&2 Blend Tanks, ‘B’ Transition 12](#_Toc36018322)

[Line 3 Flush: 3&4 Blend Tanks, ‘A+’, ‘A’ and ‘B’ Transitions 13](#_Toc36018323)

[Autoclave and Decanter Water Rinse Tasks 15](#_Toc36018324)

[Blend Tank and Finishing Water Rinse Tasks 16](#_Toc36018325)

[DCS Flush Software 16](#_Toc36018326)

[Cleaning of Finishing System 17](#_Toc36018327)

[Metal Belt Cleaning (DCS BELT CLEAN) 22](#_Toc36018328)

[Metal Belt Cleaning (High Pressure Cleaning Contractor) 23](#_Toc36018329)

[Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns) 25](#_Toc36018330)

[Using #1 Dryer Clean-In-Place Spray System 32](#_Toc36018334)

[Refloating Sinkers in the Float Tank 33](#_Toc36018335)

[Cleaning the Oscillating Feeder 35](#_Toc36018336)

[FP Finishing Housekeeping 36](#_Toc36018337)

#### Transition Matrices

|  |  |
| --- | --- |
| Purpose | This procedure provides instructions on how to prepare the system for product changes or for mid-campaign cleanings. The purpose is to prevent mixing products and maintain a clean system according to the demands of each product.  This OD is in the Finishing manual (33F), but there are tasks and definitions that pertain to the **Polymerization** and **Packout** personnel. |

|  |  |
| --- | --- |
| Step 1. Reading the Transition Matrix | There are two Transition Matrices:  **1) Matrix for Transitioning into Specialty Products**    **Appendix I - 33F2 03.27.20**  **2) Matrix for Transitioning into Other Products**    **Appendix II - 33F2 03.27.20**  Reading a Transition Matrix  Product “transitioning from” is the left column. The product “transitioning into” is across the top row.  The identified transition cell provides the cleaning type by a capital letter. There may be additional directions after the cleaning, e.g., how many batches or drums of a prerequisite product to produce prior to starting the intended product.  Some cells (cells with the same product in the column and row heading) in the RMS/Specialty matrix are split into 2 sections:  Top section – describes the cleaning and additional directions when conducting a mid-campaign “minor” cleaning.  Bottom section – describes the cleaning and additional directions when conducting a major cleaning, e.g. starting over at 60-70 batches.  See the Mid-Campaign Cleaning Frequency Table below for determining when the “minor” and “major” cleanings are to be conducted |

Continued on next page

# Transition Matrices, Continued

|  |  |
| --- | --- |
| Step 2. Mid-Campaign Cleaning Requirement | The table below details the frequency and type of cleaning requirements, even if there is no product transition. |

|  |  |  |  |
| --- | --- | --- | --- |
| Type | Cleaning Frequency and Cleaning Type | Products | Product Description |
| 1 | * Starts with an A+ * At 30-35 batches, conduct “A” cleaning (on Line 7-3 Blend Tanks must be empty). * At 60-70 batches, start over with “A+” cleaning. | 601X, RMS137S, RMS512S, RMS516S | These products have a high molecular weight shell and therefore are more likely to foul lines, shear and create coconut. |
| 2 | * Starts with a B * At 35-40 batches conduct a “W” cleaning * At 70-80 batches, start over with “B” cleaning | All other products | These products are relatively stable and are least likely to foul lines. |
| 3 | * After a 14 day or greater outage perform system water flushes per this procedure and clean all process tanks | 601X, RMS137S, RMS512S, RMS516S | These product applications are sensitive to contamination that can collect during outages. |

End of topic

#### Cleaning Type Requirements

|  |  |
| --- | --- |
| Purpose | When a recipe changes or after a period of operation there is a transition involved to maintain product quality. The transition may be a simple label change or extensive high-pressure water cleaning of the entire wet system.  A short description of the cleaning types is provided in the table below. Detailed descriptions of the cleaning types are provided in the following pages. The detailed descriptions describe the cleaning in more detail, but not necessarily in the order that the tasks occur. |

|  |  |
| --- | --- |
| Type | Short Description |
| A, A+ | Type “A” cleaning involves high pressure water service; schedule this service in advance. |
| A+ | This is a full system cleaning.   * All tanks are emptied, cleaned and rinsed. * All piping is cleaned using high pressure water service. * All tanks and piping are given a system flush.   Startup Requirements are below.   * Batches are second quality until AC batches are within SPC limits (see 33P6F). * 2 cuts (1 side and 1 bottom) from each Blend Tank to be packed out as 2nd quality. |
| A | This involves a decanter cleaning and high-pressure water cleaning from the downstream of the block valves on the exit of the Blend Tanks.   * The Blend Tanks do not have to be emptied on 8-1 system for this cleaning type. * The lines are flushed with 2 cuts (1 side and 1 bottom) from each Blend Tank that are packed out as 2nd quality. * The Dryer heat zones are not cleaned. |
| B | This is a full system cleaning.   * All tanks and pipes are emptied, cleaned and rinsed. * The Dryer is cleaned. * High pressure water cleaning is not prescribed in this type of cleaning. |
| C | Cleaning code for going into co-coagulation products. Use ODs 33P4C27 and this OD section: Co-Coagulated Setup, Operation and Clean Up to prepare systems. To summarize, the following must be done:  Co-coagulation  transition  types   * Thoroughly flush the transfer line from #6 decanter to #5 Blend Tank * Clean #5 Blend Tank * Clean coagulator filters and housing * Clean float tank and clean and change packout screen |
| L | This is simply a label change in the packout room. |
| W | Wax decanter cleaning, only |
| NA | Not applicable. Either this is not a transition, or this transition cannot occur. |

Continued on next page

# Cleaning Type Requirements, Continued

The following check list is form P-026. This form is filled out when completing a transition on the Dryer lines.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **DECANTER** | **A+** | **A** | **B** | **C** | **W** |
| Have IVS run the lines from the Decanter to the Blend Tanks and back from the Blend Tanks to the Decanter. | **O** |  |  |  |  |
| Flush lines from Decanter to Blend Tanks and Blend Tanks to Decanter | **O** |  | **O** |  |  |
| Use the camera to inspect for cleanliness and valve alignment | **O** |  |  |  |  |
| Flush the transfer line from #6 Decanter to #5 Blend Tank before and after each campaign. |  |  |  | **O** |  |
| **BLEND TANKS** |  |  |  |  |  |
| Clean the Blend Tanks (drain and hose out Blend Tanks, hose off the agitator and baffles) and make sure the drain valve sealing surface is clean) | **O** |  | **O** | **O** |  |
| Drain the Coagulator filters, remove the filters and clean the housing. Clean the filter baskets. | **O** | **O** | **O** | **O** |  |
| Flush line from the Blend Tanks to the Coagulators | **O** |  | **O** |  |  |
| Have IVS run the lines from the Blend Tanks to the coagulator filters and back from the coagulator filters to the Blend Tanks | **O** |  |  |  |  |
| Have IVS run the lines from the coagulator filters to the Automatic valve at the Blend Tanks. |  | **O** |  |  |  |
| Use the camera to inspect for cleanliness and valve alignment. | **O** |  |  |  |  |
| Flush lines from #5 Blend Tank to the Coagulator. |  |  |  | **O** |  |
| **COAGULATOR** |  |  |  |  |  |
| Have IVS clean lines from filters to the Coagulator and back from the Coagulator to the filters. | **O** | **O** |  |  |  |
| Have IVS clean line from Coagulator to the Float Tank. | **O** | **O** |  |  |  |
| Use camera to inspect for cleanliness and valve alignment. | **O** |  |  |  |  |
| Flush coagulator drop line to float tank | **O** | **O** | **O** | **O** |  |
| Rinse and pickle the coagulator. | **O** | **O** | **O** | **O** |  |
| Check for proper impeller spacing and change if needed.  RECORD WHAT SPACING IS CHANGED TO \_\_\_\_\_\_\_\_\_\_\_\_ | **O** | **O** | **O** | **O** |  |
| **FLOAT TANKS** |  |  |  |  |  |
| Refloat sinkers and run as second quality (notify packout). | **O** | **O** | **O** | **O** |  |
| Have IVS clean line from the Float Tank to the Separation Tank. | **O** |  |  |  |  |
| Drain and rinse the float tank. | **O** | **O** | **O** | **O** |  |
| Collect resin in scrap drums. | **O** | **O** | **O** | **O** |  |
| Clean trough, paddle chains and chain tracks. | **O** | **O** | **O** | **O** |  |
| Clean Float Tank filter screens with hot water and brass or plastic bristle brush | **O** | **O** | **O** | **O** |  |
| **SEPARATION TANK** | **A+** | **A** | **B** | **C** | **W** |
| Clean separation filter and filter basket. Replace filter if needed. | **O** | **O** | **O** |  |  |
| Dip powder into scrap drums. | **O** | **O** | **O** |  |  |
| Clean screens. | **O** | **O** | **O** |  |  |

*Continued on next page*

# Cleaning Type Requirements, Continued

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **DEWATERING SCREENER** |  |  |  |  |  |
| Disassemble the Sweco screener | **O** | **O** | **O** | **O** |  |
| Clean screens and housing. | **O** | **O** | **O** | **O** |  |
| Reassemble Sweco screener. | **O** | **O** | **O** | **O** |  |
| **DRYERS** |  |  |  |  |  |
| Remove oscillating feeder screen and flush with hot water. | **O** | **O** | **O** | **O** |  |
| Clean the oscillating feeder deck, bed leveler, and front section of dryer after purge but prior to cleaning the dryer belt. | **O** | **O** | **O** | **O** |  |
| Make sure to clean the powder from under the oscillating feeder. This will enable us to track hydraulic leaks better. | **O** | **O** | **O** |  |  |
| Clean packout conveyor, dryer troughs, feed and exit idler, and guide rolls. | **O** | **O** | **O** | **O** |  |
| Shovel loose resin into drums. | **O** | **O** | **O** | **O** |  |
| **Contact Packout operators to proceed with cleaning their side.** | **O** | **O** | **O** | **O** |  |
| **If running 516, clean transfer pump and hose** | **O** |  |  |  |  |
| Inspect steam coils for leaks or damage. | **O** |  | **O** | **O** |  |
| Clean recirculating fans, filter screens, distributor plates and compartments (lumps of polymer on the recirculating fans cause vibration from fan imbalance). Inspect dryer fan belts for broken or damaged belts. Replace as necessary. | **O** | **O** | **O** | **O** |  |
| Clean dryer curtains, doors and walls. | **O** |  | **O** | **O** |  |
| Clean the area under the belt. | **O** |  | **O** | **O** |  |
| Clean dryer belts. | **O** |  | **O** | **O** |  |
| Inspect Dryer cloth belt for tears or holes by rolling through entire length | **O** |  | **O** | **O** |  |
| Check metal belt and fishscales for damage, cracks and cleanliness. | **O** | **O** | **O** | **O** |  |
| Inspect all dairy tubing piping, caps, and joints. Insure all caps and joints are seated, piping is connected properly during and after each transition. | **O** |  | **O** | **O** |  |
| Make sure to have IVS clean Zone 1 distribution plate when they clean the metal belt every 4 months. Make sure they don’t use high pressure to clean this. |  |  |  |  |  |
| Run a break (barespot) in the Dryer | **O** | **O** | **O** | **O** |  |
| **PACKOUT** |  |  |  |  |  |
| Clean and change PO screen, store properly. | **O** | **O** | **O** | **O** |  |
| Clean packout conveyor, scrape chute. | **O** | **O** | **O** | **O** |  |
| **Follow Hot Water Flushing of Lines in 33F2 for final rinse of system** | **O** |  |  |  |  |
| **Startup! As long as the 1st Autoclave batch is 1st quality, only the first cut off the side and bottom of each Blend Tank are 2nd quality.** Use these cuts to flush all possible lines by taking cuts from side BT draw and straight through. Switch between filters to flush the lines of residue and water.  Circle BT after 2nd quality cut has been taken 1 2 3 4 5 6 7 | **O** |  |  |  |  |

*End of topic*

#### Drop Line High Pressure Water Cleaning Lock Tag & Try

|  |  |
| --- | --- |
| Lock, Tag & Try | Lock Tag & Try exception 15-04 documents the lock, tag and try requirements for high pressure water cleaning of Teflon® PTFE drop lines.  Key points include:   * Automatic valves need to be **pinned open where ever possible**. * Lock out with three-way air valves is **acceptable only under certain conditions**. * Valves must be evaluated by technical to determine if air lock out will completely de-energize the valve, i.e. not an acceptable lock out for fail-closed valves with springs. A list of valves that have been evaluated is shown below. * Three-way air supply valves set up as follows must be provided on the process valve.      * This type of lock out is acceptable for drop line cleaning purposes ONLY, not for maintenance work, e.g. hands in the valve, isolation against of full vessel (as in an A transition, e.g. bottom of the Blend Tank). * **We must complete a ‘try’ step** on automatic valves. Air supply vent lines have become plugged with polymer and/or wax occasionally in the past. These vents should not have mufflers and should be directed away from polymer/wax sources. Operators should **listen for expulsion of air** when the valve’s air supply is vented. **OPERATOR NEEDS TO THEN TRY TO CLOSE THE VALVE.** Most valves are smart valves and actual **valve position can be seen from the DCS screen**. * Manual valves will not be locked open for drop line cleanings. The area needs to be barricaded to limit access to the equipment to minimize access to manual valves and to protect against potential for exposure to hot water.   **A Transitions:**   * A transtions on the 7-3 System require Blend Tanks #3 & #4 to be empty as we do not have manual valves or automatic valves which can be pinned on this system. (Blend Tank side draws can be pinned, but straight-thru valves cannot & no manual valves are on these lines) * Manual valves must be closed and locked into and out of the Blend Tanks on the 8-1 system for an A transition. |
|  |  |

Continued on next page

#### Drop Line High Pressure Water Cleaning Lock Tag & Try, Continued

**Fine Powder Valves where Air Lock-Out is Acceptable for High Pressure Cleaning ONLY**

**8-1 System**

**Autoclave Operator Valves**

|  |  |
| --- | --- |
| **Loop #** | **Description** |
| 8609HS | #8 AC to #8 WXDC Valve |
| 8613HS | #8 AC to #9 WXDC Crossover Valve |
| 10021HS | #6 Decanter to BT5 3-way |
| 10001HS | #8 Decanter to BT5 3-way |
| 10029HS | #8 Decanter to BT6 3-way |
| 10054HS | #8 Decantor to BT7 3-way |

**Dryer Operator Valves**

|  |  |
| --- | --- |
| **Loop #** | **Description** |
| 10004HS | #5 Blend Tank Straight Thru |
| 10030HS | #6 Blend Tank Straight Thru |
| 10055HS | #7 Blend Tank Straight Thru |
| 10055HS | #1 N/S Coag Filter Selector |

**7-3 System**

**Autoclave Operator Valves**

|  |  |
| --- | --- |
| **Loop #** | **Description** |
| 4706HS | #7 Decanter to BT3 3-way |
| 4728HS | #7 Decanter to BT4 3-way |
| 4212HS | BT3 Inlet Valve |
| 4736HS | BT4 Inlet Valve |

**Dryer Operator Valves**

|  |  |
| --- | --- |
| **Loop #** | **Description** |
| 4714HS | #3 Blend Tank Straight Thru Valve |
| 4710HS | #3 Blend Tank 3-way BT/DMW/Coag |
| 4740HS | #4 Blend Tank Straight Thru Valve |
| 4731HS | #4 Blend Tank 3-way BT/DMW/Coag |
| 4737HS | #2 N/S Coag Filter Selector |
| 4745HS | #2 North Filter to Coag 3-way Valve |
| 4738HS | #2 South Filter to Coag 3-way Valve |

End of topic

#### Co-Coagulated Setup, Operation and Clean Up

|  |  |
| --- | --- |
| Introduction | This procedure provides instructions on how to:   * prepare the system for a co-coagulation campaign * start and run the campaign * clean up after the campaign.   This OD is in the Finishing manual (33F). Additional product information can be found in 33P4 C27. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| General Information | Co-coagulated blends are produced on #1 Dryer. CFP6000X and 601X or RMS137S are added and coagulated together in #1 Coagulator.   |  |  |  | | --- | --- | --- | | **Component** | **Autoclave** | **Blend Tank** | | CFP6000X | 6 | 5 | | 601X or RMS137S | 8 | 6 and 7 |   These 2 components can be combined in varying ratios in the coagulator to produce different products. However, only 1 product is produced today.   |  |  |  | | --- | --- | --- | |  | % 601X or RMS137S | % CFP6000X | | RMS512S | 50 | 50 | |

|  |  |
| --- | --- |
| Initial Setup by Dryer Operators | At the start of the co-coagulation campaign, Dryer Operators:   * Clean transfer line from #6 decanter to #5 BT. Use procedure “COCOAG\_CLN\_PR”. See **33F SECTION 3.B.1** for Line 1 Blend Tank 1 procedure * Empty and clean #5 BT prior to filling with CFP6000X. * Clean the Decanter. |

|  |  |
| --- | --- |
| Check Specifications | Autoclave and Dryer operators check that base products are in specification.   * CFP6000X on 6-2 line.   + Extrusion pressure (also called rheometer) and SSG must be in specification.   + When drum 1, 12 and 60 are in specification, begin transferring CFP6000X to Blend Tank 5. * 601X or RMS137S produced on 8-1 line   + If using 601X, then it should be tested for Gore Extrusion Pressure and Break strength to confirm quality.   + When in specification for Gore extrusion pressure and break strength, material can be used for co-coagulation. |

Continued on next page

Co-Coagulated Setup, Operation and Clean Up, Continued

|  |  |
| --- | --- |
| CFP6000X Transfer from Decanter 6 to Blend Tank 5 | To transfer material from the #6 decanter to the #5 BT, Autoclave Operators use the #6 Wax Decanter screen. |

|  |  |
| --- | --- |
| Campaign Conclusion | * The last coagulation cut must be sent to 2nd quality if the proper additions of CFP6000X + 601X/RMS137S are not added.   The last material can be processed in three different ways. Option 1 is preferred.  **Preferred Option 1:** Excess CFP6000X in BT5.  Conclude production of co-coagulation products with excess CFP6000X in #5 BT, and no PSR in #6 or #7 BTs. This will allow the excess CFP6000X to be run out as micropowder feed (second quality CFP6000X).  **Option 2:** Excess 601X/RMS137S.  Conclude production of co-coagulation products with excess 601X/RMS137S. Run out as FPD3923. Process the heel in #5 Blend Tank as second quality CFP6000X. Perform transition per transition matrix to next product. |

|  |  |
| --- | --- |
| End of Campaign Cleaning | At the end of the co-coagulation campaign, Dryer Operators:   1. Clean Transfer Line from 6 Decanter to Blend Tank 5  * Clean transfer line from #6 decanter to #5 BT. Use procedure “COCOAG\_CLN\_PR”. See **33F SECTION 3.B.1** for Line 1 Blend Tank 1 procedure. * Close the manual valves at both ends of the header to protect against cross mixing of products.  1. Clean Blend Tank 5 and South Filter Coagulator feed line  * Clean #5 BT thoroughly. If #6 and/or #7 BT are to continue PSR, closing the manual drop valve from each blend tank will allow cleaning from #5 BT through #1 coagulator without backing dispersion or flush water into #6BT or #7 BT. A full “A” cleaning of the finishing end is required after a co-coagulation campaign. * Flush the transfer line from #5 Blend Tank to the South Filter and from the South Filter to the Coagulator. |

*End of topic*

#### Hot Water Rinsing of Lines

|  |  |
| --- | --- |
| Reference Job Scopes | Additional Details around Contractor High Pressure Cleaning of #1 System can be found in Job Scope FPD-H01.  Additional Details around Contractor High Pressure Cleaning of #2 System can be found in Job Scope FPD-H02.  Additional Details around Contractor High Pressure Cleaning of #3 System can be found in Job Scope FPD-H11. |

|  |  |
| --- | --- |
| Purpose | These procedures are used to flush the lines after the High Pressure Contractors have cleaned the system with their equipment.  They can also be used to backflush the lines to eliminate coconut found in the product.  Run these steps as close to production startup as reasonable. |

|  |  |
| --- | --- |
| Line 1 Flush: 5, 6 & 7 Blend Tanks ‘A+’, ‘A’ and ‘B’ Transitions | **Start with:**   * + Clean coagulator filter baskets   + Close Coagulator dispersion fill valve   + Close side draw and straight thru valves from BT   + MAKE SURE COAGULATOR LID IS LATCHED CLOSED   **Complete these steps:**   * Turn on Manual hot water valve behind North and Center * Turn on ¾” small manual to NORTH filter * (2nd cycle, use hot water valve to CENTER filter) * When water stops flowing (listen) * open valve to coagulator and let it fill briefly, cycle valve closed to re-pressure * repeat the pressuring cycle 3-4 times * When coagulator is full, open the supernate drain lines on the coagulator filters to let dirty water drain to SUPERNATE. Open lids of filters to make draining faster. * Switch between North & Center supernate drain lines to flush both line * Repeat this cycle of flushing with hot water through the Center filter * Repeat until the water in the coagulator is clear (no dispersion!) * Flush through North, Repeat North till Clear * Flush through Center, Repeat Center till Clear   **Complete by:**  Fill coagulator with hot water, Cycle the Coagulator Drop valve 3-4 times while dropping hot water to float tank to clean drop line and valve  Pickle coagulator to help cool coagulator. Drop when ready to take a cut. |

*Continued on next page*

# Hot Water Rinsing of Lines, Continued

|  |  |
| --- | --- |
| Line 2 Flush: 1&2 Blend Tanks, ‘B’ Transition | **Start with:**   * + Clean coagulator filter baskets   + Close Coagulator dispersion fill valve   + Close side draw and straight thru valves from BT   + MAKE SURE COAG LID IS LATCHED CLOSED   **Complete these steps:**   * Switch filters on DCS to run through East filter * Turn on Manual orange handle hot water valve in between 1& 2 BTs * Open manual valve in dispersion fill line in front of #2 BT ONLY HALF WAY or Coag Filter housing O-ring will BLOW OUT spraying the area with hot water * When water stops flowing (listen) * open valve to coagulator and let it fill briefly, cycle valve closed to re-pressure * repeat the pressuring cycle 3-4 times * When coagulator is full, open the Coagulator Drain Line to Supernate system (coagulator fill valve must be closed) * Repeat this cycle of flushing with hot water through the West filter * Repeat until the water in the coagulator is clear (no dispersion!) * Flush through East, Repeat East till Clear * Flush through West, Repeat West till Clear   **Complete by:**  Fill coagulator with hot water, Cycle the Coagulator Drop valve 3-4 times while dropping hot water to float tank to clean drop line and valve  Turn OFF Manual orange handle hot water valve in between 1&2 BTs, or BT will overflow with hot water  Pickle coagulator to help cool coagulator. Drop when ready to take a cut. |

*Continued on next page*

# Hot Water Rinsing of Lines, Continued

|  |  |
| --- | --- |
| Line 3 Flush: 3&4 Blend Tanks, ‘A+’, ‘A’ and ‘B’ Transitions | **Start with:**   * + Clean coagulator filter baskets   + Close Coagulator disp fill valve   + Close side draw and straight thru valves from BT   + MAKE SURE COAGULATOR LID IS LATCHED CLOSED   **Complete these steps:**   * Line up to run through North filter on DCS * Turn on Manual hot water valve in behind, above coagulator filters to North filter * When water stops flowing (listen) * open valve to coagulator and let it fill briefly, cycle valve closed to re-pressure * repeat the pressuring cycle 3-4 times * When coagulator is full, open the Coagulator Drain Line to Supernate system (coagulator fill valve must be closed) * Repeat this cycle of flushing with hot water through the South filter * Repeat until the water in the coagulator is clear (no dispersion!) * Flush through North, Repeat North till Clear * Flush through South, Repeat South till Clear   **Complete by:**  Fill coagulator with hot water, Cycle the Coagulator Drop valve 3-4 times while dropping hot water to float tank to clean drop line and valve  Pickle coagulator to help cool coagulator. Drop when ready to take a cut. |

|  |  |
| --- | --- |
| **Purpose** | This procedure provides instructions to conduct a top-to-bottom hot water flush (from autoclave drop line to the separation tank under the float tank).  The reason for the flush is to:   * remove contamination left behind due to maintenance or high pressure water cleaning on the system. Following high pressure water cleaning (or any maintenance) of the dispersion drop lines, residual dirt/contamination can be left in the lines from the high pressure water hoses, tools, etc.   A DCS automated line flush sequences are available for the 7-3 and 8-1 systems. These sequences flush from the wax decanter to the Coagulator filters as well as to flush the wax decanter and blend tanks themselves. See the second section of this procedure “DCS Flush Software”. |

*Continued on next page*

# Hot Water Rinsing of Lines, Continued

|  |  |
| --- | --- |
| **Safety** | * Refer to the PPE Matrix for the Proper PPE to protect from hot water when draining the Decanter or other steps where splashing will occur. * Barricade Coagulator and Float Tank. During Dryer flush steps since there is a potential to overfill the Coagulator and Float Tank with hot water. * Do not exceed 60% level in the Decanter or Blend Tanks. They can overflow at ~70-75% level. Level transmitters on the Wax Decanter and Blend Tanks are calibrated using the specific gravity of Dispersion. Level readings on these tanks filled with water will read lower than actual level. |

|  |  |
| --- | --- |
| HP Line Cleaning Complete | The high pressure cleaning of the Autoclave drop line and transfer line from the Decanter to the Blend Tank **must be complete before proceeding**. These four lines must be clean before the Autoclave Operator can proceed with the flush. |

End of topic

#### Autoclave and Decanter Water Rinse Tasks

|  |  |
| --- | --- |
| Decanter Flush (Autoclave Operator) | **Preparation Steps**   * The Autoclave Operator can start the boilouts, etc. before or during the flush procedure.   **Decanter and Drop Line Flush**   1. Fill Decanter with    * 1. Boilout water OR      2. Dedicated Aqueous Charge water through the AC drop line.  * Confirm water temperature is over 90 C. * Add 400 gallons of water to the Decanter (Decanter level should be ~25-35%, depending on system)  1. Hot water flush into the decanter from each of the Blend Tanks for 30 seconds. This can be done using the automatic flush program in the DCS (preferred method) or manually.    1. AUTOMATIC – on the Blend Tank screen (34BT-VLVS for the 7AC system, or 567BT-VLVS for the 8 AC system) select the #-DEC option (located in the “Tank Cleaning:” icon)    2. MANUAL - Using each of the hot water flushes in the drop line from the Decanter to the Blend Tanks; use all flush lines to fill the Decanter to 25-35%. |



|  |  |
| --- | --- |
|  | 1. Drain the Decanter to the Supernate sump. Leave drain open. 2. Repeat Hot water flush into the decanter from each of the Blend Tanks for 30 seconds. 3. Repeat Hot water flush into the decanter from each of the Blend Tanks for 30 seconds. 4. Hose out the Decanter. 5. Close Decanter drain. Decanter is now ready to receive a batch. |



End of topic

#### Blend Tank and Finishing Water Rinse Tasks

|  |  |
| --- | --- |
| HP Line Cleaning Complete | **High Pressure Water Cleaning Status**  The high pressure cleaning of the Coagulator fill lines, drop line and Float Tank drop line **must be complete**. These lines must be clean before the Finishing Operator can proceed with the flush. |

End of topic

#### DCS Flush Software

|  |  |
| --- | --- |
| **Automated DCS Line Flush Sequences** | Automated line flush procedures are available on the DCS for all Blend Tanks and Blend Tank headers to the Coagulator filters. See ODs 33FB1, 33FB2, 33FB3 for a description under START-UP FOLLOWING SHUTDOWN OR TRANSITION. |

End of topic

#### Cleaning of Finishing System

|  |  |
| --- | --- |
| **Purpose** | The Fine Powder finishing systems must be kept clean to ensure quality resin production. Cleanings are usually conducted during product transitions; however, cleaning may be needed based on any findings during troubleshooting the finishing system:   * 33F.8.C -Dry Finishing Troubleshooting, * 33F.8.D - Contamination Troubleshooting * 33F.8.E - Moisture Troubleshooting   This document is intended to provide a step-by-step procedure for cleaning the finishing system (Blend Tanks to Packout), which is often during product transitions. |

|  |  |
| --- | --- |
| **Safety** | There are several hazards in the Dryer and Finishing area: thermal (hot water and steam), moving equipment (belts, feeders, etc.), chemical, etc.   * Please refer the PTFE PPE Matrix for the Proper PPE to be used for this procedure. Please note when the PPE Requirements for the use of a Hot Water Hose also. * Post Tripping hazard signs, as needed. * The dryer produces very high temperatures. Operations need to be always watchful for burn points and hazards associated with hot process piping. * When using ladders, follow all site procedures. * Follow lock, tag and try procedures per S&OH 508. * When inspecting steam coils, use appropriate PPE. * Call FP/FLS if any problem, safety or otherwise, occurs during individual shift.   **Remember:** IF YOUR WORKING CONDITIONS CHANGE, STOP THE WORK AND RE-PLAN SAFETY OR QUALITY ISSUES ASSOCIATED WITH THE JOB YOU ARE DOING!!! |

|  |  |
| --- | --- |
| Preparation | Follow Fine Powder Finishing System cleaning checklist, Form P-28, is available in ETQ.   * The packout operator should be notified that the end of the first quality material is coming through the dryer, in order to obtain the end of campaign samples and co-ordinate the cleaning of the exit packout conveyor. * Prior to cleaning the dryer system, as much of the “sinker” resin in the flotation tank should be refloated and run through the dryer as second quality (explained in more detail in Refloating Sinkers section of this OD) * The dewatering and finishing system should be Locked, Tagged and Tried. Lock out sheets for the systems can be found in the Finishing Area Control Room. * The steps listed below are in order from start to finish, whether there is one operator or two available for cleaning. When transition times are being monitored, that process is outlined below. |

Continued on next page

# Cleaning of Finishing System, Continued

|  |  |  |
| --- | --- | --- |
| **Step** |  | **Transition Time Definitions** |
| **1** | Upstairs work | Begins at start of cleaning of second BT. Ends at completion of flushing lines and coag. |
| **2** | Last Good Cut | Time at end of last good powder put on belt. Take reading from dryer trend. |
| **3** | Prepare for Belt Clean | Starts with refloating sinkers and end time is when done checking steam coils. |
| **4** | Belt Clean | Actual start and stop time. |
| **5** | Purge | Actual start and stop time. |
| **6** | First Cut on Belt | Actual time powder is put on belt. |
|  | Total Time | Add elapsed column time. |
|  | Powder to Powder | Time from last good cut to first good cut. Step six completed time minus step 2 time. |
|  |  |  |
|  | \*Note | Record start and end times, calculate elapsed time, and record any issues or delays. |
|  | \*Note | At the end of the transition record elapsed times and powder-to-powder times in log. |

|  |  |
| --- | --- |
| Procedure | * 1. Prior to transitioning the System, operator to prepare LTT (Lock Tag and try sheets) and Danger tags for entire lockout   2. Once BT (Blend tank) has gone empty, open drain valve on BT to be cleaned.   3. Clean BT. Make sure guards are in place on top of tank openings before cleaning.   \*NOTE – LTT is not required if High Pressure water cleaning crew is NOT called in. Operator to shut off field disconnect to agitator at BT. While hosing out BT, only the hand to the elbow is permitted inside the tank. If the agitator is to be ‘bumped’ or ‘rotated’, verify water hose is not lying on or near BT opening when turning on/off Field and Hand switch. Operator cleaning the tank is the only personnel permitted to bump agitator motor during transition cleaning.   1. Clean BT dike. 2. Close drain valve on BT. 3. Communicate to Autoclave operator that BT is ready to receive material. 4. Verify red scrap drums are available, labeled and ready for usage. 5. Open straight through on the ‘on-line’ BT at 0-10% level, and empty BT. 6. Once other BT empties, follow procedure steps b-e above until all BTs are done. 7. Operators to flush line from BT to filters, and clean filters. 8. Operator to check to see if last cut is out of FT (Float Tank). If out then refloat sinkers. 9. Turn flush on to Coagulators and flush line from filters to Coagulators. Clean Coagulator and agitator. Close Coagulator drop valve when cleaning is complete |

Continued on next page

# Cleaning of Finishing System, Continued

|  |  |
| --- | --- |
| **Procedure**  **(Continued)** | \*NOTE - Make sure guards are in place on top of tank openings before cleaning. LTT is not required if High-Pressure water cleaning crew is NOT called in. Operator to shut off field disconnect to agitator at Coagulators. While hosing out Coagulators, only the hand to the elbow is permitted inside the tank. If the agitator is to be ‘bumped’ or ‘rotated’, ensure water hose is not lying on or near Coagulator. Operator cleaning the tank is the only personnel permitted to bump agitator motor. If maintenance is changing impeller spacing, Coagulator needs to be locked out per normal Operating Procedures for ‘Changing out impeller spacing’.  m) Put dryer in the ‘purge’ step (belt speed = 4.5) for 1 hour  n) Remove and clean feeder and feeder screen. Clean bed leveler.  o) Empty powder from belt.  p) Cool down/shutdown dryer.  q) During the LTT of the dryer, check bed leveler depth and adjust if incorrect.  • To check proper bed leveler height, use bed leveler tool provided.  • Assure the dryer is in shutdown state.  • Assure one of the bed leveler paddles/blades is perpendicular to the belt,  • Apply proper LTT to the bed leveler and dryer, before placing the bed leveler tool between the bed leveler and belt.  • Check the distance between the two, by placing bed leveler tool between the bed leveler paddle/blade and belt. Check the markings on the bed leveler tool used.  • Assure the distance is no more than 5/16, and no less than ¼.  • Contact Supervision/Maintenance if adjustment is needed. |

|  |  |
| --- | --- |
|  |  |

|  |  |
| --- | --- |
|  | r) Lockout dryer using P-134 for #1 Dryer, P-059 for #2 Dryer, and P-060 for #3 Dryer.  MAKE SURE DRYER EXHAUST IS LINED UP TO ATOMSPHERE TO PREVENT EXTRA AIR FLOW TO THE SCRUBBER. EXCESSIVE FLOW TO THE SCRUBBER WILL CAUSE THE OTHER DRYERS TO SHUTDOWN.  \*Note - The steam supply manual to the steam coils in Zones 1, 2, 3, and 4 do not have to be isolated. Caution is still needed when opening doors. If a steam leak is observed, follow Procedure 508 to lock out dryer. Along with this change, when cleaning dryer, hand switches to the recirculation fans are to be in the off position and hand switch cover to be locked out. When spraying water around the recirculation fans, operator is to maintain a distance of 2 feet from recirculation fans and operator’s hand to the elbow is the only part of the body allowed to break the plane of the dryer door. |

*Continued on next page*

# Cleaning of Finishing System, Continued

|  |  |
| --- | --- |
| **Procedure**  **(Continued)** | s) Lockout Feeder end of dryer (feeder, float tank, dynascreener)  t) Disassemble and scrape exit end of dryer clean idler rolls, 2 on feed end and 2 on exit end. Notify packout when complete so they can clean packout chute and screen.  u) Notify packout operator to shut down Packout and Exit Conveyors. Remove lids from packout conveyor to permit cleaning of all parts of conveyor. Remove drain plugs to the packout conveyor inside the exit end of dryer that allow water to drain out. Clean exit chute with copper gauze (DO NOT use stainless steel gauze as it will scratch the conveyor pan) and brass (DO NOT use S/S) scraper. PO and Dryer personnel to scrape chute and exit pan. Restart conveyor to clean out loose polymer. Shut off conveyor and shovel out exit end of Dryer  v) Operator to note steam temperature control valves to the dryer zones and monitor temperature readout on IP21. If temperature starts dropping, and continues, proceed to next step. If temperature increases or maintains temperature, steam manual needs to be isolated and locked out as this could be an indication of leak through of the steam supply automatic temperature control valves. Operations use extreme caution when working around Zones 1-2-3-4, as dryers will still be hot.  w) The Sweco dewatering screener should be disassembled and the interior and screen sprayed clean. Be careful to save and replace the plastic cleaning rings that go under the screen. Inspect screen for tears. Inspect coil springs for damage. Replace torn boots.  x) Open doors and pull drain caps. It is helpful to open the dryer doors to the dryer cool down before cleaning begins.  y) Operator to get ladders and all necessary PPE for cleaning dryer.  z) Remove fan compartment drains, clean and handle the recirc screens carefully to avoid damaging the fine mesh. Hose/clean entire dryer from top to bottom (cleaning all zones, screens, blowers, curtains, doors, walls, etc.).  aa) Check steam coils for leaks (if steam was valved out, steam must be valved in to do coil leak check).  • Verify all steam automatics are closed (zones 1, 2, 3, & 4)  • Open all zone doors, if not already open.  • Barricade area around coils (limited access)  • Open steam automatics (one at a time) and inspect zone for steam/condensate leaks. If there are any leaks notify supervision.  • Close automatics to zones 1, 2, 3, and 4.  • Close and secure doors and prep for belt cleaning  • Place automatics in “Supervisory” position in DCS |

*Continued on next page*

# Cleaning of Finishing System, Continued

|  |  |
| --- | --- |
| **Procedure**  **(Continued)** | bb) Prepare dryer for startup  • Close internal dryer overhead filter/distribution screen drain caps,  • Inspect all dairy tubing piping, caps, and joints. Insure all caps and joints are seated, piping is connected properly during and after each transition, and free from cracks.  • Close dryer doors.  cc) Close internal dryer overhead filter/distribution screen drain caps, close dryer doors.  dd) Unlock dryer.  ee) Align dryer back to scrubber from CCR (Central Control Room) on DCS controls.  ff) Close doors, unlock recirc fans, and go to the “Metal Belt Cleaning” procedure. |
|  | gg) Clean Float Tank (FT) and Separation Tank.  • Drain and rinse the Float Tank with water. Avoid flushing powder to the sump - collect as much resin as possible in scrap drums.  • Clean Float Tank screens.  • Flush accumulated resin from the paddle chains and chain tracks on #2 and #3 float tanks. This should be done only when the dryer is down for product type change.  • Inspect screens at back end of float tank for holes that might let powder out to the sump during coagulator drops.  hh) Unlock Float Tank/Coagulator if maintenance is complete.  ii) Put dryer in Purge step for an hour.  jj) Close flapper drain valves of each dryer zone.  kk) Dry and Wipe out exit end, and then reassemble.  ll) Make first (1st) cut while dryer is in the purge step.  mm) Notify packout operator that there is powder on the belt. Packout operator to follow procedures listed below when powder is at the end of the belt. |

*End of topic*

#### Metal Belt Cleaning (DCS BELT CLEAN)

|  |  |
| --- | --- |
| Introduction | The metal cleaning function is to provide final cleaning prior to running product through the dryer. Schematic is provided in Figure 1.  Metal Belt Clean with DCS BELT CLEAN is to be conducted at the following times:   * After every dryer product transition cleaning * After maintenance is conducted in/on the dryer that could result in contamination in the dryer (consult supervision) * If the dryer has been down for an extended period of time (>18 hours), and if the dryer will be taking material in the next 4-8 hours * After replacing the air handling filters |

|  |  |
| --- | --- |
| Procedure | * In BELT CLEAN the cleaning system is ON and the vibrating exit rolls are running. The airflow from the recirculation fans is used to hold the PEEK belt to the metal belt, guiding it through the dryer. Belt speed should be set at 4.5 fpm. * Begin metal belt spray cleaning. Belt cleaning pump and water will need to be unlocked when in use, and locked and tagged when idle. Check the CAT metal belt cleaning pump oil crankcase oil level. The three oilers should have oil in them and the top leveler in a vertical position. Check the pump pressure regulating needle valve; pressure should be maintained at 900-1000 psi. For a schematic of this system refer diagram following this procedure. * Open manual valve to the dryer to be cleaned. * CAUTION: MAKE SURE THE SUPPLY VALVE TO THE CORRECT DRYER IS OPEN AND THE VALVE TO THE OTHER DRYERS ARE CLOSED BEFORE OPENING THE SUPPLY VALVE TO THE CAT METAL BELT CLEANING PUMP. * Open the manual valve to the metal belt cleaner spray oscillator. On No. 1, the motive water can come from the LP demin water pump or demin water header. * Open the manual supply valve to the CAT metal belt-cleaning pump. * Turn on the CAT metal belt-cleaning pump. Field switch at #3 dryer will need to be unlocked. The CAT metal belt cleaning pump then can be started at either the pump or the dryer switch after they are both unlocked. * The feeder doors can be left open during the metal belt cleaning to prevent water mist or fog from causing the belt edge tracking photo eyes not to work. * Run for at least 1 ½ hour. It will take about 1 ½ hr to make two full metal belt revolutions at 4.5 fpm belt speed. * Visually inspect the belt for cleanliness. Repeat BELT CLEAN if necessary. * Clean the area under the belt in the airlock, heating zones, ambient cooler, and chilled cooler by flushing polymer to the drains in each zone. This cleaning can be done before the belt is cleaned but then must be "touched up" after the belt is cleaned. * Touch-up cleaning with the area water hose may be needed for the metal belt. Pay close attention again to resin in the wheels and fish scales. If the belt is clean then proceed, otherwise continue in BELT CLEAN. If BELT CLEAN is not effective, work with the FLS to schedule the High Pressure Cleaning contractor to clean the belt. * Reverse section b). |

*End of topic*

#### Metal Belt Cleaning (High Pressure Cleaning Contractor)

If High Pressure Cleaning Contractor is to clean metal belt & fish scales

See Job Scope FPD-H07.

* + PROTECT the PEEK belt by taking tension off of the fabric belt
    - Slide the cloth PEEK to one side of the dryer to allow access to part of the metal belt.
    - Tie the belt gently out of the way of the cleaning crew.
    - Interlocks for belt drive must be cleared to enable a suitable belt speed for IVS to clean the metal belt.
    - To clear interlocks, the hydraulic pump and belt drive pump must be running in manual on the hand switch.
    - Hydraulic lines to the oscillating feeder must be locked closed to prevent movement of the other feeder.
    - Lockout the oscillating feeder vibrating motor.
    - The metal belt should be set to run at 4.5 to allow timely cleaning by IVS.
    - The belt drive hand switch should be tagged allowing the contract cleaning crew (IVS) to turn the hand switch off and on as needed to concentrate on tougher areas of the metal belt.
    - Special care should be taken after cleaning to inspect the metal belt. Look for remaining polymer in the metal belt seams between sections of the belt. Also, look for polymer on/between fish scales and chain rollers.
    - Need to have Zone 1 distribution plate cleaned by IVS at this time during the metal belt cleaning.
    - Need to have powder cleaned from under the oscillating feeder at this time also.
    - Float Tank chain (on #2 &/or #3 Float Tank) should be cleaned as well when the corresponding dryer belt is cleaned. Follow LTT.
    - Following IVS metal belt cleaning the dryer should be ran in purge for at least 1 (one) hour to dry out the metal and peek belts.
  + DO NOT use high pressure water greater than 1000 psi
  + DO NOT spray with tip closer than 6” to the belt as it may damage the metal belt.
  + USE a 60 deg tip.

\*\*NOTE: DO NOT spray the fabric belt with the **Hotsie or other contractor’s** high pressure spray. The spray will damage the fabric. **The PEEK fabric belt can be sprayed carefully with the area’s black water hoses if spot cleaning is needed.**

*Continued on next page*

# Metal Belt Cleaning (High Pressure Cleaning Contractor), Continued

##### Figure 1 – Diagram of High Pressure Cleaning pump supply to Dryers.



*End of topic*

#### Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns)

|  |
| --- |
| All areas of the dryer shall be cleaned and free of any residual polymer before and after shutdowns. The procedure is the same as a routine transition system cleaning. However, additional cleaning of the dryer roofs, float tank roofs and supply/exhaust air ducts will be required.  Close attention should be made to clean areas where maintenance was performed.  When possible, work with FLS, planners and maintenance to PM all equipment and change air filters when periods of downtime are planned.  **Dryer Entry:**   * Check the dryers thoroughly for cardboard and plywood that was used by Maintenance/ Construction and left in the dryer. * **Note that cardboard is to always be used on top of metal belt before plywood is laid in dryer to protect metal belt from damage.**    + **PEEK belt should be either removed from the dryer or pulled to one side. It should NEVER be subjected to weight of personnel in the dryer especially when it is pulled to one side.**   + **If the PEEK belt is stepped or kneeled on when it is pulled to one side or even when flat in the dryer the LIFE OF THE BELT could be SIGNIFICANTLY REDUCED by creasing of folds or localized pressing of the PEEK belt into the perforated metal belt.** |

*Continued on next page*

# Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns), Continued

|  |  |
| --- | --- |
| Replacing Red Caulking | Replacing red caulking is a high risk quality maintenance activity because the old caulk being removed and new caulk that does not adhere to the dryer has the potential to contaminate finished product. Caulking can also become brittle and deteriorate faster if not applied correctly. Brittle caulking can allow for air bypass as well as break free from the dryer surface and contaminate finished product. Follow all guidance below to minimize potential contamination from red caulking replacement procedure. The operations FLS and maintenance FLS are to ensure each task is completed by a member of either the operations or maintenance team.   * Before red caulking is replaced in the dryer:   + The dryer must be cleaned using an A+ transition cleaning method.     - If the dryer is not clean, new caulking will have less adhesive strength to the dryer surface     - Reference P-026 and P-212 for A+ transition activities   + Follow protocol outlined above in “Dryer Entry” for metal belt and PEEK belt protection.   + Plastic sheeting must be used to catch any red caulking that is removed as part of the preparation for new caulk.     - Plastic sheeting must be durable enough to withstand maintenance work in dryer without tearing.     - Do not use perforated plastic sheeting or sheeting that is not wide enough to cover the entire dryer.     - An example of proper plastic sheeting is 6-mil 20-ft x 100-ft clear plastic sheeting or something equivalent.   + Use painters tape to anchor plastic sheeting in place. Maintenance activities in the past have led to ruffled sheeting and bypass when sheeting is not anchored with tape. * Remove the old caulk from the dryer   + BE THOROUGH AND GIVE GREAT ATTENTION TO DETAIL   + DO NOT RUSH. This is, historically, a large source of contamination when rushed   + Using a razor scraper (requires cut resistant gloves), remove the old caulk from the dryer noting which areas received caulk and which did not     - Document areas that received caulking with pictures if necessary   + Collect as much of the old caulk on plastic sheeting as possible   + Vacuum hose areas with old caulk to ensure loose particles are removed * Apply new caulking to areas where old caulking was removed   + BE THOROUGH AND GIVE GREAT ATTENTION TO DETAIL   + DO NOT RUSH. This is, historically, a large source of contamination when rushed   + NEVER wipe excess caulking on the dryer or belt   + Caulking lines should be uniform thick beads   + Avoid “whisps” or “trails” from the main caulking bead   + Avoid excess caulking that results in globs or “hanger” formations   **Refer to pictures included in this OD for details on defects and proper application** |

*Continued on next page*

# Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns), Continued

|  |  |
| --- | --- |
| **Defects During Application**  Old caulking contamination to metal belt! Avoid at all costs, lay thick plastic and tape to contain! | Example 1: metal belt contamination  C:\Users\CB54621\AppData\Local\Microsoft\Windows\INetCache\Content.Word\pre start up caulking job_11.jpg |

*Continued on next page*

# Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns), Continued

|  |  |
| --- | --- |
| Defects During Application (Continued) | Example 2: poor application  C:\Users\CB54621\AppData\Local\Microsoft\Windows\INetCache\Content.Word\pre start up caulking job_2.jpg  Stringers or leftover caulk that has been wiped from main bead  Dryer not cleaned before application  Globs separate from main bead |

*Continued on next page*

# Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns), Continued

|  |  |
| --- | --- |
| Defects During Application | Example 3: poor application  C:\Users\CB54621\AppData\Local\Microsoft\Windows\INetCache\Content.Word\pre start up caulking job_17.jpg  Old caulking contamination not contained in plastic  Seam with old caulking that did not receive new caulking  Smudged bead / non-uniform application  Stringers or leftover caulk that has been wiped from main bead |

*Continued on next page*

# Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns), Continued

|  |  |
| --- | --- |
| **Post Application Cleaning**  **Post-Cleaning Monitoring** | Post -application cleaning  Cleaning the dryers after a caulking job is just as critical as the application. This is a list of tasks to help after caulking applications. However, if an atypical condition exists, pay special attention to the area in need of cleaning (Ex: areas where old caulking was removed but no new caulking was applied).   * New caulking must set for at least 24 hrs. It is better to allow 36 hrs if time permits   + New caulking must cure before IVS belt clean, the dryer is put in purge or metal belt clean. * Pull all plastic from the dryer making sure to enclose any removed caulking or excess applied caulking * Have the metal belt cleaned for at least an 8 hr period (typically IVS).   + Run at a reduced rate to ensure adequate cleaning for each section.   + Ensure multiple full rotations.   + Clean all parts of metal belt including the fish scales, sprockets, chain, and panels * Clean above the distribution plates and vacuum excess water from above the dryer * Clean above the metal belt paying special attention to plates above fish scales, baffles between zones, and any small areas that could have caulking residue. * Have the dryer undergo a series of belt washes and purges to knock loose any contaminant that may be stuck in the dryer   + 2 hr belt clean   + 1 hr purge   + 2 hr belt clean * Final inspection to be completed together by representatives from operations, maintenance, and technical     Post-cleaning monitoring  The following procedure is to be used by the packout room and dryers for disposition of material following a caulking application.  Packout   * WTI first 10 drums   + Check all drums for red caulking during fill   + Check oversize for red caulking as well * Run drums 11-14 as second quality * Take dry screen samples from drums 1, 10, 20, 30, 40, 50, and 60.   + Perform dry screen tests on this frequency for the first 2 lots. * If no red caulking is found, release as standard * Continue to monitor every 4 drum fills for the first 48 hrs after start up using the contamination logs (P-163). |

*Continued on next page*

# Special Dryer Cleanings (After Maintenance Work, TAR, or Extended Shutdowns), Continued

|  |  |
| --- | --- |
| **Post-Cleaning Monitoring (Continued)** | Dryer Operators   * Dryer operators are to check the exit pan every 2 hrs for the first 24 hrs * Perform dry screen tests prepared by packout operators using standard method.   Disposition  **If no red caulking is found, all material (except first 14 drums dispositioned as WTI or second quality) can be made standard. If red caulking is found anytime during the increased monitoring, shut down immediately and place all material from the last five lots on hold. Operations will meet with technical and maintenance to decide disposition of material still on hold.** |

*End of topic*

#### Using #1 Dryer Clean-In-Place Spray System

#1 dryer is equipped with internal demin water headers and spray nozzles that can be used to clean the dryer. The spray nozzles are located at three different locations. These “Clean in Place”, or C.I.P., headers are controlled from a bank of manual valves along the west wall of #1 dryer bay. For most effective cleaning, valve in a single zone at a time to maintain highest water pressures.

Spray locations are:

Each zone above the distribution screens

Each zone above the recirculation screens

Each zone along the dryer bay sloped floor

1. Unlock the demin water manual valve upstream of 10324HV. Note this manual valve should always remain locked whenever the dryer is in operation to prevent water leaks onto product.
2. Open 10342HV from the control room; 10329HV should close.
3. Open the fan compartment drains (3" pipe cap located under the recirculating screens) to prevent polymer from being trapped in the fan compartment during cleaning.
4. Clean the recirculating fan compartments and fans in each zone, then use the C.I.P. manual valves to clean one zone at a time above the distribution screens. Inspect distribution screens for cleanliness and touch up dirty spots with additional C.I.P. spray or by hand with demin water hose.
5. Spray down the recirculation screens with C.I.P. water one zone at a time. Then pull out the recirc screens. Do additional touch up cleaning if required. Look for holes in the screens, which might permit bypassing of unfiltered air.
6. Spray down through the steam coils to remove built up resin.
7. Use the floor C.I.P. sprays to wash down the dryer floor to the east side trench. Then close 10342HV and lock the upstream manual valve. 10329HV should open and drain the C.I.P. manifold. It is a good practice to open each of the (11) C.I.P. manual valves after 10329HV opens to drain empty the C.I.P. headers, then close the (11) C.I.P. manual valves.

NOTE:

The #1 dryer motive water for metal belt cleaning can come from the #1 low pressure (LP) demin water pump or demin water header.

*End of topic*

#### 

#### Refloating Sinkers in the Float Tank

|  |  |
| --- | --- |
| **Purpose** | During the course of a campaign and during product transitions, removing sinkers from the Float Tank is required to prevent fouling the system and product cross-contamination.  During normal operation of the Drying system, sinkers will accumulate on the sides, bottom and throat end of the float tank, Visual checks of the float tank should be made occasionally during each shift for buildup of sinkers. Excessive buildup of sinkers will affect the function of the Float Tank. When floating sinkers:   * Close communication with Fine Powder Packout operator is essential to prevent 2nd quality material from being packed out as 1st quality material. * Only use Cold Demin water to clean Sinkers out of the float tank during transitions. Hot water will make the powder gummy which can plug the Sweco screener during normal operation. * To minimize downtime, refloating the sinkers should be done when the system will be going down for a transition, low material, maintenance or any other scheduled down time or in conjunction with the cleaning of the Oscillating feeder screen. * Refloating sinkers will be unique in amount and location of where they accumulate (very little, a lot, sides only, throat end only or all over). * While refloating sinkers the float tank paddles may be moving for cleaning. This is part of the BTO Do Not Touch Exceptions. Please take all proper precautions while equipment is moving. |

|  |  |
| --- | --- |
| **Procedure** | 1. Once it has been determined that sinkers need to be refloated, operator action is required to close blend tank to ensure another cut is not taken in the coagulator. 2. Drop the cut and run as much product out of the Float tank as possible. 3. Use Cold Demin water to hose up as much product as possible before dropping the water level to refloat sinkers. 4. Notify Packout operator of barespot and then sinkers to be packed out as second quality resin. 5. After 1st quality material has run out of the float tank, select “SINKERS” on the “Float Sinkers” menu on the coagulator screen. 6. Deagglomerate “sinkers” by hosing with Cold Demin water.  * Start hosing sinkers while the water level is being lowered. This will allow the sinkers to move towards the back of the float tank, giving more room in the throat area for the remaining sinkers to be refloated. * While the water level is lowered, use the Cold Demin water to clean any powder that is built up on the screens. |

*Continued on next page*

# Refloating Sinkers in the Float Tank, Continued

|  |  |
| --- | --- |
| Procedure (Continued) | 1. Acknowledge coagulator message “When manual interaction is ready/done select continue” by selecting “CONTINUE” to raise float tank level to original level.  * Large quantities of water will enter the tank when the fill is initiated. Continue breaking agglomerates while the coagulator empties. * If the set point for draining the tank was manually chosen as a value above 10% then it is recommended to repeat steps e thru g * If there is a large amount of material left in the bottom of the float tank then repeat steps e thru g.  1. After float tank has been filled  * Set coagulator to “repeat”, select blend tank and start taking another cut. * (NOTE- After coagulator starts taking a cut, place selector switch back to “single”).  1. While new cut is being agitated in the coagulator, the oscillating feeder screen and bed leveler is to be cleaned with Hot Demin water and replaced.  * While cleaning the bed leveler use minimal amount of water. Excessive water can make it through the dryer and cause the powder to clump and stick in the vibrating pan. It could also cause issues with moisture.  1. Notify packout operators that after sinkers, standard material is resuming.   **Option to remove sinkers from Float Tank through bottom clean out drop valve**   1. Shut Blend Tank automatic valves 2. Have coagulator pickled 3. Lockout Skimmer 4. Setpoint of Float Tank to Zero 5. Once tank is empty of most water, Make sure there’s a filter in the separation tank basket 6. Open Float Tank manual drop valve to Separation tank 7. Hose sinkers out bottom into the filter basket with cold water 8. Dump baskets of powder into red scrap drums 9. Close manual valve, 10. Refill FT with cold water and pickle water from coagulator 11. Unlock and return system to normal operation 12. Don’t drop a coagulator cut of powder until float tank is full of water |

*End of topic*

#### Cleaning the Oscillating Feeder

|  |  |
| --- | --- |
| **Purpose** | During normal operation of the Drying system, a skin of product will form on the face of the feeder screen, which, contributes to wet material. Too much build up can produce coconut with some products.   * To minimize downtime, clean the screen when the system will be going down anyway for some other reason. * While cleaning the screen, check the bed leveler blades for excessive build up and/or stringers. Clean as needed, minimizing the strength and amount of water sprayed into the dryer. |

|  |  |
| --- | --- |
| Procedure | * 1. Put the Coagulator cycle selector to “Single” and run as much good product out of the Float tank as possible.   2. Notify packout operator of bare spot.   3. Put the Dryer in PURGE   4. Lockout oscillating feeder hand-switch to vibrating motor and oscillating feeder hydraulic pump block valve.   5. Turn the air switch for the screen hold down clamps to off. Dryer #1 and #2 switch are located inside the Oscillating Feeder Housing. Dryer #3 switch is located on the Sweco screener support brackets.   6. Carefully remove screen and place on floor. Spray as much product from screen as possible. Check the Oscillating feeder tray for buildup and if needed, spray down the channel to the south end of dryer.   7. **\*NOTE\* Ensure there is no contamination on screen before re-installing**   8. Replace screen and turn air switch for the hold down clamps back on, ensuring they have fully engaged.   9. Clean bed leveler as needed.   10. Unlock oscillating feeder hand-switch to vibrating motor and oscillating feeder hydraulic pump block valve.   11. If bed leveler is cleaned, check the Exit Conveyor or PO Conveyor troughs on exit end after fifteen to twenty minutes for water. Wipe out if needed.   12. Notify packout operator that 2nd quality material is to be processed through the dryer. Leave a bare spot. (Approximately 5 minutes should be sufficient).   13. Return the dryer phase selector to “Drying”.   14. Return Coagulator cycle selector to “Repeat”. |

End of topic

#### FP Finishing Housekeeping

|  |  |
| --- | --- |
| Introduction | * Good housekeeping in process areas helps prevent contamination issues with products being produced. * It is also integral to a good Industrial Hygiene program to limit worker exposure to workplace chemicals. * Proper housekeeping helps point out process problems by ensuring that an area is always expected to be clean and free of drips and product. This helps identify leaks more quickly so they can be resolved in a timely manner.   To help support the readiness of the processing equipment and ensure housekeeping standards are kept up to date, a routine audit of the FP Finishing area will be conducted with Operations, Technology, and Leadership. The key points to be addressed on audits can be found in P-202, the Dryer Patrol Sheet. |

|  |  |
| --- | --- |
| Area Floors | * All storage must be neat and kept to a minimum. Permanent storage areas should be identified with yellow lines. * Aisles will be kept free of materials and equipment.   Floor areas must be kept clean. Spills must be immediately cleaned up. Where a vacuum is available, it should be the primary method of keeping the floor clean. If only brooms are available, the floors must be swept clean and the residue disposed of in scrap drums. Floors should be "hosed down" with water where available. All water must be squeegeed off the floor after hosing. |

|  |  |
| --- | --- |
| Area Walls | * All wall tool storage must be neat. * Wall surfaces must be washed or wiped down when evidence of dust or dirt starts to show. * Painted walls must be repainted whenever discoloration or deterioration becomes evident. |

|  |  |
| --- | --- |
| Desks and Storage Cabinets | * The tops must be kept neat and clean. * Inside storage should be neat - avoiding collecting and storing non-used items in desks and cabinets. * Painted surfaces should be kept in good condition and repainted as needed. * No food or drinks allowed in process work areas due to good Industrial Hygiene practices, and contamination potential. |

*Continued on next page*

# FP Finishing Housekeeping, Continued

|  |  |
| --- | --- |
| Equipment | * Must be routinely dusted to avoid dust accumulation - use vacuum for this cleaning job where available. * Product or process leaks must be repaired as soon as practical to avoid a continuing problem. * Cleaning tools including hoses must be neatly stored when not in use to prevent tripping hazards. |

|  |  |
| --- | --- |
| Roof Areas | * Must be free of miscellaneous scrap * Roof areas must not be used for prolonged storage of excess materials and equipment. |

*End of topic*