#### Apparent Density

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| Apparent Density Analysis | * The packout operator performs the apparent (bulk) density (APD) and visual inspection tests on Fine Powder products at intervals specified on the product sample schedule. * Equipment for determination of apparent densities and the lab method (WW-2471) which describes the test are provided in the packout/clean room. Due to its location, a vacuum system has been provided to reduce particle emission to the clean room air. * Equipment used for obtaining samples and determining apparent densities must be kept clean to avoid contamination from dirt and other products. * Samples should be obtained carefully from the packout screen discharge to minimize the product exposure to potential contamination. * The apparent density of Teflon™ is the weight in grams of one liter of polymer. The test precision on a single analysis is +/- 6 grams per liter. A sketch of the equipment is shown in lab method WW-2471.   **APD SAMPLING AND TESTING**  **Sample Gathering**   * Using a clean stainless steel sampling pan, collect only enough polymer from the packout screen discharge to fill, or nearly fill, a 1-pint container. Do not scoop the polymer from the drum, since this will shear the polymer. Be sure "full" stream sampling is used.   **IMPORTANT:**  NOT USING THE FULL STREAM WILL IMPACT THE TEST RESULTS! DO NOT DUMP MATERIAL OUT OF THE CONTAINER IF OVERFILLED OR TAKE A SAMPLE DURING THIN/BARE SPOTS.  IF A RETAINER SAMPLE IS USED FOR APD, A SPLITTER MUST BE USED TO REDUCE THE SAMPLE TO THE APPROPRIATE SIZE.   * Put the entire contents of the pan in a 1 pint container.   **Testing**   * Make sure the stainless steel cup and holder are clean and dry. * Turn on the vacuum system by pressing the "START" button. * Set the Syntron Electric Controller on a setting that will allow the cup to be filled in 20 - 30 seconds for the product type you are testing. * Test the product according to the procedure in lab method WW-2471. * The table used to convert the scale weight to the apparent density is posted by the test equipment. * Record the results in the packout log book and enter all results in LIMS. * Place the sample in a WTI drum when complete. * Make sure the cabinet is closed and the vacuum and Syntron Electric Controller are turned off. |

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#### Apparent Density, Continued

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| Apparent Density Analysis **(Continued)** | * Some of the factors which affect the test and should be checked in case of trouble are as follows: * Distance polymer falls from the screener discharge spout - the top of the cup should be 1-1/2 +/- 1/8 inches from the bottom of the screener discharge. Increased height can cause packing in sample and an inaccurate reading. * Screening rate - time required to fill sample cup should be 20 to 30 seconds. Adjust the controller setting to get the proper fill time. * Scraper position - the bottom of the scraper teeth should just miss the top of the sample cup (the gap should be less than 1/32 inch). If the scraper hits the cup, check for polymer on the inside recess of the cup holder. * A plate is attached to the apparatus to verify the scraper position. If the plate fits in between the scraper and the cup, the scraper is too high. Call FLS immediately and have the lab come and calibrate the apparatus. Operators are not to adjust the apparatus themselves without direction from the ATO. * Time elapsed between filling and leveling the sample cup - if the cup stands for less than 15 seconds between filling and scraping, a lower-than-normal result will be obtained; if longer than 15 seconds, the result will be high. * Vibration of the cup before it is scraped - there should be no discernible vibration of the platform used for the sample cup. Rough handling has about the same effect as vibration. Both will give a high reading. * Scale calibration off. The scale should be level and the calibration can be checked by maintenance. |

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| Visual Inspection | * Inspect the polymer as it falls into the drum for any foreign material or unusual condition such as moisture, discoloration, or sheared particles. * If something is found follow procedures for product disposition. |

End of topic

#### Apparent Density, Continued

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| **Importance and Notes for Using the Splitter** | * The splitter should be used when the amount of powder or retainer is too large for the sample required for analysis * If a retainer sample is used for retesting or breakpoint detection, it must be prepared using the splitter. Using the splitter ensures a more even distribution of powder particle size and increases the accuracy of the APD test by a factor of 10. * When using the splitter, the ENTIRE retainer must be sent through the splitter or else the particle size is not represented accurately * After splitting the sample, only one of the receiving trays is used for the APD analysis. The ENTIRE receiving tray must be used for the analysis or else the particle size is not represented accurately * Retainers can be refrigerated if sticking powder is a problem |
| **Preparing Sample for Analysis Using the Splitter** | 1. Inspect the splitter for contamination or fouling from previous sample preparations. Clean if contamination or excess powder is present 2. Test the lever on the splitter to loosen and break up any sticking powder 3. Have retainer needed for analysis ready 4. Add the powder to the splitter slowly so that the splitter is not overwhelmed    1. Adding too much too quickly can cause the splitter to stick and could cause shearing or compaction to the polymer 5. Once the ENTIRE retainer has been completely run through the splitter, use one side of the receiving trays for analysis. 6. If one side of the receiving trays is still too much powder for sample, run one receiving tray through the splitter again until the correct sample size is achieved. 7. Proceed with the analysis as a standard APD test |
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#### Apparent Density, Continued

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| **Splitter Apparatus** | C:\Users\CB54621\AppData\Local\Microsoft\Windows\INetCache\Content.Word\splitter_9.jpg  Hopper lever  Receiving trays |
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#### Apparent Density, Continued

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| **Splitter Example** | Example of prepping sample:  A 30-40g sample is needed from a 100g retainer.   * Splitting the sample once will give two 50g samples (still out of tolerance). * Splitting the sample twice will give a 25g sample (out of tolerance)   Solution:   * Split the sample once and set aside a complete receiving tray of 50g * Split the other receiving tray (50g) again into two 25g samples * Leave one receiving tray full of the 25g sample * Split the other receiving tray a 3rd time   + This should result in one receiving tray with 12.5g and one with 37.5g (25g + 12.5g) * The sample is now in tolerance for analysis |

End of topic