

## Flowability (Dry Flow)

1. Weigh a clean, empty 100 cubic centimeter (100ml) cup. (Tare weight).
2. Place the cup approximately 4 centimeters (1.5”) below the bottom of the test funnel.
3. With the bottom of the funnel closed off, place 100 grams of the material into the funnel.
4. Open the funnel permitting the material to flow from the funnel to the top.
5. Determine the length of time it takes for the 100 grams of material to empty the funnel.
6. The results are usually expressed in seconds per 100 grams. (sec/100grams).

Less than 35 seconds per 100 grams is generally accepted as acceptable flowability. To express this in grams per second, divide 100 grams by the length of time it takes to flow.

- I.e. 100 grams flows through the funnel in 35 seconds.  $100 \text{ grams} / 35 \text{ seconds} = 2.85 \text{ grams/ one second.}$

## Bulk (Apparent) Density Procedure

1. After the cup has been filled from the above test, scrape off the excess material above the top of the cup.
2. Weigh the full cup. (Gross weight, cup and material).
3. Subtract the tare weight from the gross weight. The result is the net weight of the material in the cup. (weight per 100 cc).
  - Often times apparent density is expressed in grams/100cc therefore no more mathematics necessary. Some people however express this in grams/1cc. To arrive at this number, divide the net weight in the above step by 100.

### Example:

- Empty weight of cup = 39.9 grams
- Full weight of cup = 76.7 grams

$76.7 \text{ grams (full weight)} - 39.9 \text{ grams (empty weight)} = 36.8 \text{ grams net weight}$

36.8 grams occupied 100 cc, therefore this should be expressed as 36.8 grams/100cc.

If you want to express this as grams per one cc, then this becomes .368 grams/100cc.

If you want to express this in pounds/cubic foot, multiply grams/100cc by .6243. In the above example of 36.8 grams/100cc, this would equal 22.97 pounds/cubic foot.

**Flowability:** It is generally accepted that flowability times of less than 35/seconds/100 grams is accepted. Longer flowability times may result in moldability problems depending on the complexity of the cavity. I would begin to be concerned if the flowability times exceed 35 seconds. Anything less than that equates to better material.

**Apparent Density:** It is generally accepted that the apparent density should be 34grams/100cc or more. However, I have seen that molders successfully mold material as low as 32 grams/100cc. I would begin to be concerned once you get below the 34 grams/100cc mark.