

TITLE:

Fluid Run-Off Quantification for Disposable Baby Diapers

SCOPE:

This method describes the procedure for quantitatively evaluating the surface effect of disposable baby diapers.

SAFETY:

Read the material safety data sheets for all chemicals used in this procedure.

EQUIPMENT AND MATERIALS:

1. 1. Lab balance accurate to the nearest 0.01 g
2. 2. 30° incline table with clip board peg
3. 3. 5 plastic coated clipboards
4. 4. Paper towel or equivalent absorbent material
5. 5. 7 ml/sec separatory funnel and stand
6. 6. Timer or stopwatch
7. 7. Graduated cylinder to measure 25 ml or volumetric dispenser
8. 8. 0.9% NaCl saline prepared with distilled or deionized water
9. 9. Scissors, rotary knife, or equivalent
10. 10. Ruler
11. 11. Masking tape or equivalent
12. 12. Food dye or equivalent

PROCEDURE:

1. 1. Prepare the 0.9% saline by dissolving 45 g of Sodium Chloride into 4955 ml of distilled or deionized water. Blend the saline thoroughly.
2. 2. Add a few drops of food dye (or equivalent) to the saline and blend thoroughly.
Note: Only use enough dye to allow for a visual indication of fluid flow and wicking.

Primary Test

3. 3. Weigh the diaper and record the weight to the nearest 0.01 grams.
4. 4. Cut the diaper in half and save the front half.
5. 5. Secure the end opposite the center with clipboard clamp and tape the cut end to the clipboard surface, creating a seal. Pull firmly to reduce folds and creases on the product surface.
6. 6. Mark the fluid dosing position 10 cm above the top edge of the masking tape.
7. 7. To evaluate more than one product at a time, pre-mount the products onto clipboards before the test begins.
Note: If testing an extra large diaper, it may be helpful to trim the front edge of the diaper so it fits onto the clipboard.
8. 8. Clamp the separatory funnel with the spigot 1 cm above the pre-marked dosing position.
9. 9. Set the timer for 10 minutes.

10. 10. Dispense 25 mls of 0.9% NaCl saline into the separatory funnel.
11. 11. Position the balance at the bottom of the 30° incline table with a folded paper towel on the weighing surface to contain any fluid that runs off (see figure 1).
Note: Be certain that the paper towel is not in contact with the incline table when zeroing the balance.
12. 12. Zero the scale and open the separatory funnel valve. The paper towel will absorb any fluid run-off. If necessary, use the towel to absorb any fluid remaining on the clipboard or tape. Record the run-off weight to the nearest 0.01 gram. This is the primary run-off value.
13. 13. Start the timer.

Secondary Test

14. 14. After 10 minutes have passed repeat steps 10 – 14.
15. 15. Record the run-off weight to the nearest 0.01 gram. This is the secondary run-off value.

Tertiary Test

16. 16. After 10 minutes have passed repeat steps 11 – 13.
17. 17. Record the run-off weight to the nearest 0.01 gram. This is the tertiary run-off value.

Results:

18. 18. Record each reading, and calculate the average and standard deviation of the run-off values obtained in each test.

Note: During this test, make observations about the surface of the diapers. For example, one may notice beading of the saline on the nonwoven surface. This information is useful when evaluating the performance of a hygienic article.

1 Figure

