

Silly Putty[®]

Introduction

Demonstrate and discuss Silly Putty's[®] unique properties.



Concepts

- Polymer
- Silicone

Materials

- | | |
|--------------------------|----------------------------------------|
| Silly Putty [®] | Newspaper |
| Hammer | Wood board, approximately 15 cm square |
| Magazine | |

Safety Precautions

There are no hazards from normal handling of Silly Putty. Do not ingest and use only in the manner for which it is intended. Wash hands thoroughly after handling.

Procedure

1. Roll the Silly Putty into a ball. Drop it on a smooth, hard floor (not on a carpet). What happens?
2. Pull the Silly Putty slowly. What happens?
3. Pull the Silly Putty quickly. What happens?
4. Roll a small piece of Silly Putty into a ball. Place it on a wood board.
 - a. Hit it with your hand. What happens? Does it flatten?
 - b. Hit the Silly Putty with a hammer. What happens? (*Caution:* The hammer may rebound with a fair amount of force.)
5. Flatten a piece of Silly Putty.
 - a. Press it on a picture in the newspaper. Lift the Silly Putty off the newspaper. What happens?
 - b. Repeat this procedure using a picture from a page in a magazine. What happens?
 - c. Rub your finger across the newspaper print. Repeat using the magazine. Describe what happens.

Discussion

Silly Putty is a silicone polymer originally made in 1941 in an unsuccessful attempt to manufacture a silicon-based synthetic rubber. Although it had no industrial value, a salesman who frequented the laboratory would give out samples of this unusual material to his clients. Eventually, Silly Putty was marketed as a toy. It is usually packaged in small egg-shaped containers and is most commonly pink in color.

Silly Putty is a non-Newtonian fluid that has dilatant properties; that is, it tends to dilate or expand under stress rather than be compressed as a rubber ball. For this reason, it has some unique properties.

- a. Under low stress, such as slowly pulling the Silly Putty apart, the putty flows forming thin strands.
- b. Under high stress, such as a sharp pull, the putty breaks.
- c. If rolled into a ball and dropped, the putty will bounce.
- d. If the ball of putty is placed on a table top and hit with the hand, the ball will hardly be deformed. If hit with a hammer, the putty will shatter. Yet, if it is squeezed gently, the ball will flatten.
- e. If the putty is stuffed through a tube, it will swell as it emerges from the open end. This is known as die-swell. (This

works well with freshly-prepared putty as the putty tends to harden with age.)

The Silly Putty will pick up the pictures from the newspaper, but not from the magazine. This is due to the type of inks used. Newspaper ink is made from mineral oil and finely-powdered carbon (called carbon black); it never dries completely. This is observed if you rub your finger over the print. The ink used in magazines is dry; it will not transfer. The colored inks used in the Sunday comic sections of the newspaper may be a type that dry, like magazine inks, or may be the type similar to black newspaper ink, so some will be picked up by the Silly Putty and some may not.

Acknowledgment

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***Silly Putty* is available from Flinn Scientific, Inc.**

Catalog No.	Description
AP1962	Silly Putty®

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.