

Prototype Testing:

Engineering Metric Being Tested: Percent of Liquid Spilled from Urine Jug When Emptying per 10 Uses

Purpose:

The intention of this test protocol is to outline a proof of the cleaning process users will experience upon interacting with the product in question. Specifically, the focus will be identifying any risk of unwanted spilling of urine jug contents in enacting the cleaning protocols of grabbing and emptying its contents for replacement. It will also help test the effectiveness of the cookie cutter piece placed inside the toilet which serves as a guide for where the urine jug is placed, ensuring it does not disrupt in the cleaning procedures.

Goals:

The ideal state for the results of this line of experimentation will be to have minimal spill of any liquid contents from the urine jug in its extraction from the toilet housing. The cookie cutter piece would ideally also serve only as a guide without disrupting or posing a barrier to the smooth extraction and replacement of the inner contents of the toilet. This is critical for sanitation and product satisfaction purposes. The marginal acceptable outcome of this test would be less than or approximately 0.125 kg of liquid spilling in the course of the interaction.

Conclusions:

The results of this test unanimously present that 0% of the liquid in the urine jug spills when extracting from the base of the toilet to empty, per the ten trials run by an experienced participant.

Materials:

- Complete toilet prototype with waste containers
- Clorox wipes
- Paper towels
- Gloves
- Scale
- Gender-neutral restroom facilities fully stocked with toilet paper
- Working faucet and hand drying equipment
- Cookie cutter in toilet assembly for testing

Procedure:

The procedures for this test must be strictly upheld. They are as follows:

1. Pre-experimental setup:
 - a. Fill urine jug to brim (just before where the diverter nozzle) with water
 - b. Measure the weight of the paper towel (record)
 - c. Place in appropriate position within the toilet assembly

- d. Close toilet seat (be careful to make sure the urine diverter nozzle aligns with the opening of the urine jug)
2. Experimental procedure:
 - a. Subject will access the urine jug
 - b. Subject will then attempt to extract the urine jug *gracefully* from the toilet
3. Data collection:
 - a. Measure the weight of the small towel after each trial (record)
 - b. Calculate difference. That will amount to how much liquid, if any, has spilled in the user's toilet cleaning interaction.
4. Repeat steps 1-3 to retrieve up to 10 data points for analysis.

Results:

Trial	Paper Towel Weight [Before]	Paper Towel Weight [After]	Difference
1	2.5 g	2.5 g	0 g
2	2.5 g	2.5 g	0 g
3	2.5 g	2.5 g	0 g
4	2.5 g	2.5 g	0 g
5	2.5 g	2.5 g	0 g
6	2.5 g	2.5 g	0 g
7	2.5 g	2.5 g	0 g
8	2.5 g	2.5 g	0 g
9	2.5 g	2.5 g	0 g
10	2.5 g	2.5 g	0 g

Analysis:

Please note that, due to the construction of the cookie cutter not being complete, the implications of what is learned by running this test are restricted to only the bare-bones model of the toilet assembly without the cookie cutter component. That being said, there was absolutely no spillage noted in running this test. Each and every time the participant ran the trial and lifted the urine jug from the base of the toilet, there was no extraneous contact made with the inner workings of the toilet that caused the jug to jostle and spill any bit of its contents.