

# INVESTIGATING OF AN HOURGLASS

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## 1-Introduction

Our question is that whether or not the weight of a running hourglass differs from the weight of the hour glass at rest.

When the sand starts pouring, part of it is freely falling and it may reduce the weight of the hourglass. In the other hand, when the grains arrive at the bottom, they apply an impulse.

Some examiners would simply calculate that these two affairs sum up to zero and they will ignore them but we want to show that these two affairs have their own effect on the weight of the hourglass and they are measurable.

## 2- Experiments

The hourglass was made with two rods, a glass container, a funnel and the gate for controlling the time when we want the grains to pour. The upper container was filled with salt and it was put on the scale. Then the variation of weight was just measured. When the sand starts pouring, the weight had fluctuation. It increased and then went up and down but it was actually upper than zero (the weight of the hourglass at rest).

A sudden increase in weight after 43 seconds was seen when the upper container was becoming empty and the last sands was pouring in the lower container.

## 3-Results

The weight of a pouring hourglass is equal to the weight of the hourglass at rest. The matter is that the impulse in at the end of the fall effects on the weight of an hourglass and in those seconds we can perfectly see the increase of weight. We should also consider the weight at the beginning of the fall that should decrease because of the free falling of sands. The effect is tiny and hardly measurable using standard laboratory equipment.

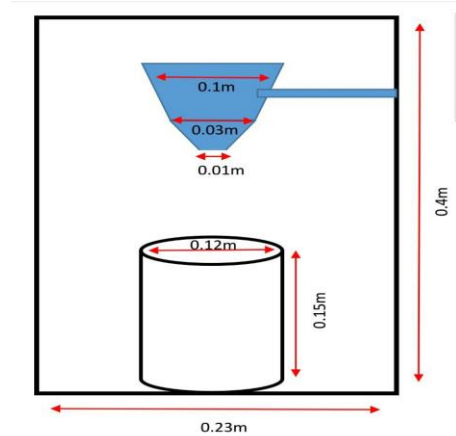


Figure 1- Experimental shape of Hourglass

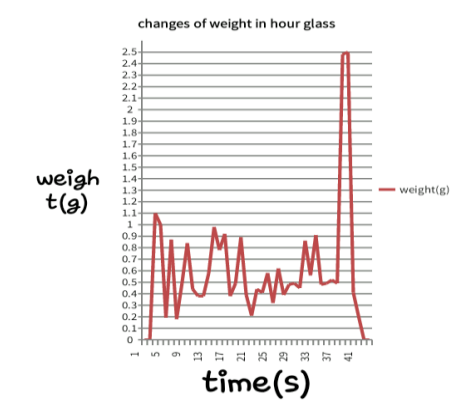


Figure 2- Changes of weight in hourglass

## References

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