

Enclosure Block Artifacts

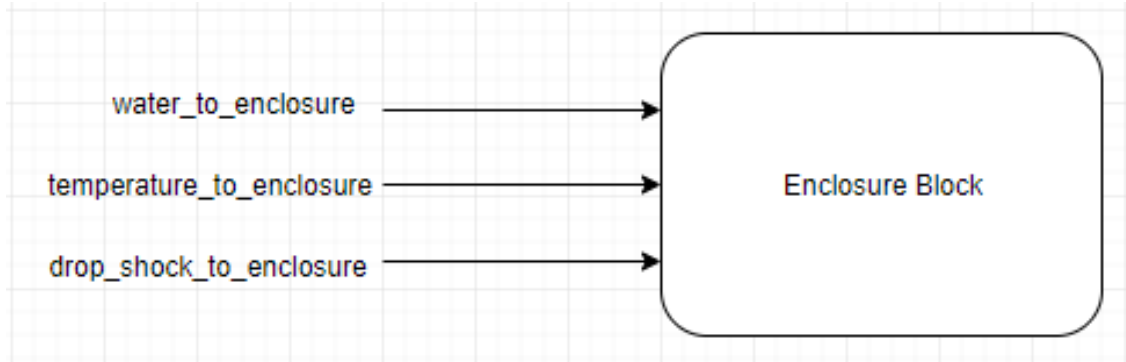


Figure 1. Enclosure Block Diagram

Interface	Properties
water_to_enclosure	The enclosure shall keep water out from the inside when being fully submerged (1 cm depth) into water for one second.
temperature_to_enclosure	The enclosure function as designed from temperature ranging from -10°C to 85+ °C but not more than 200 °C, because the physical melting point of PLA is 220°C, test for at least ten minutes for both extremes. (-12 °C for cold extreme, and ~100°C for hot extreme)
drop_shock_to_enclosure	The enclosure shall not break after being drop at least 5 times on concrete from a height of 3 feet.
Enclosure Dimensions	Height = 30 mm Width = 65 mm Length = 228 mm
Lid Dimensions	Outer Lid length = 168 mm Outer Lid Width = 65 mm Inner Lid Length = 159 mm Inner Lid Width = 59 mm

Table 1. Enclosure Block Interfaces and Properties

Testing Steps

The following three testing procedures should be followed to verify the enclosure for whether it is able keep water out from the inside while being fully submerged 1 cm deep into water, whether the enclosure will protect the contents from temperatures ranging from -10°C to 85+ °C but not more than 200 °C, because the physical melting point of PLA is 220°C, and last procedure will verify that the enclosure will not break after sustaining 5 or more drops from a height of 3 feet in the air.

A. Testing the Water Blocking Ability of the Enclosure

1. First fill a sink with water at least 4 inches in depth.
2. Next, take a paper towel and line the inside enclosure with it; so that if water escapes into the enclosure it will be evident.
3. Then, take the paper towel lined enclosure and place it in the water so that it is fully submerged to at least 1 cm of depth, holding down the enclosure if necessary.
4. Then, count to 1+ seconds and lift the enclosure out of water container.
5. Pat the container dry to make sure not false positives are made on the inside of the paper towel lining.
6. Lastly, lift the enclosure lid and the inspect for water stains on the paper towel lining.

B. Temperature Operation Range of the Enclosure

1. **Checking if the enclosure can operate and -10°C or Lower (Cold Extreme)**
 - i. First place the Enclosure into a freezer around -12 degrees.
 - ii. Next, start a timer for 10 minutes and check back on the enclosure when the time is up.
 - iii. After taking out the enclosure immediately check to see if the enclosure shows any signs of being brittle or structural weakness.
 - iv. If there aren't signs of structural weakness present, then the block passes the cold extreme verification test.
 - v. It is also important to note this test will be video record and shown during block checkoffs.
2. **Checking if the enclosure can operate and 85°C or Higher (Heat Extreme)**
 - i. First preheat the oven to 100 °C, and place aluminum foil on the rack.
 - ii. Then carefully place the enclosure onto the rack.
 - iii. Set a timer for 10 minutes and check the enclosure when times up.
 - iv. Immediately check for to see if the block breaks under stress, if there are breaks major structural bends then the enclosure passed the heat extreme verification test.
 - v. It is also important to note this test will be video record and shown during block checkoffs.

C. Enclosure Dimensions

1. Get a ruler and then measure the:
 - i. Height should be around 30 mm \pm .3mm
 - ii. Width should be around 65 mm \pm .3mm
 - iii. Length should be around 228 \pm .3 mm
2. If all measurements are satisfactory then the blocks passes dimensions checking.

D. Dimensions Testing

1. Get a ruler and then measure the:
 - i. Outer Lid length should be around 168 mm \pm .3 mm
 - ii. Outer Lid Width should be around 65 mm \pm .3 mm
 - iii. Inner Lid Length should be around 159 mm \pm .3 mm
 - iv. Inner Lid Width should be around 59 mm \pm .3 mm
2. If all measurements are satisfactory then the block passes dimension checking.

E. Drop Shock Robustness

1. First measure out what is to be 3 feet high in the air using a meter stick outside on concrete floor.
2. Hold the enclosure on its side and drop it from the measured 3 feet from the previous step.
3. Then inspect the enclosure for any signs of structural weakness, if the enclosure is intact then continue (if there are dents then that is to be expected since this is a plastic enclosure).
4. Repeat steps 2-3 for 4 more times, if the enclosure is still intact then the enclosure passed the robustness test for drop shock robustness.