Environmental Test Document

1064
UCASAL

Overview

Performed tests:

- Drop test
- Thermal test
- Vibration test
- Vacuum test

Drop Test Configuration

Drop test Requirements:

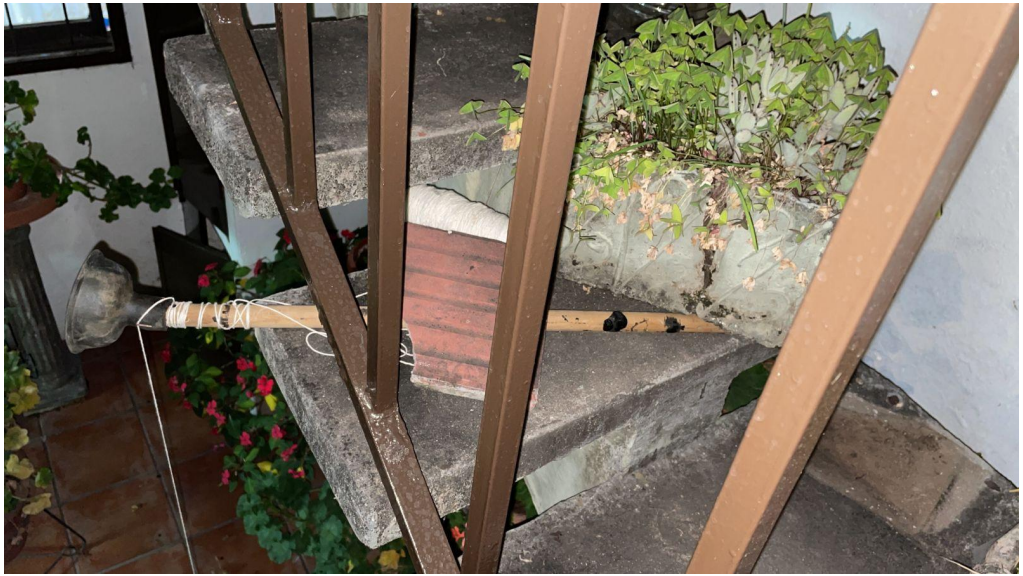
- This test requires a 61 cm non-stretching cord.
- CANSAT, and free space so the cansat does not hit the ground.
- The structure must not flex during the drop test.

Drop Test Configuration

We put a thick wooden stick in a ladder secured by a weight to avoid movement, then we attached with the rope the cansat tied to the parachute cord with a length of 61 cm

Materials used:

- Wooden stick and rigid rope



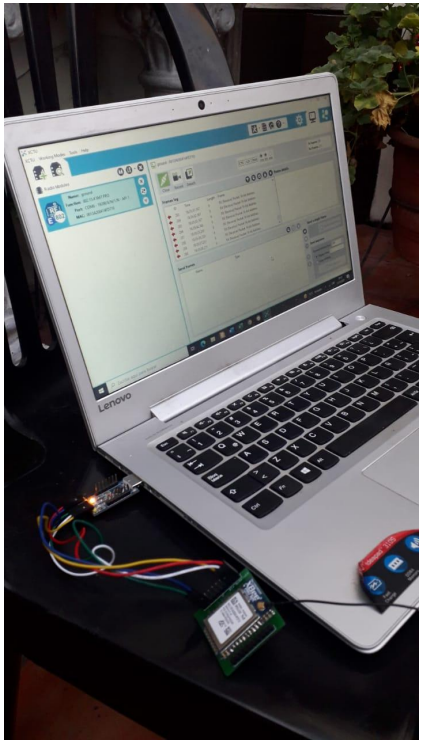
Drop Test Procedures

Drop Test Procedure

1. Power on CanSat.
2. Verify telemetry is being received.
3. Raise CanSat by the attached cord, so that the attachment points of the cord, on the eye bolt and the parachute, are at the same height.
4. Release the CanSat.
5. Verify the CanSat did not lose power.
6. Inspect for any damage, or detached parts.
7. Verify telemetry is still being received.

Drop Test Results

Pictures before the test

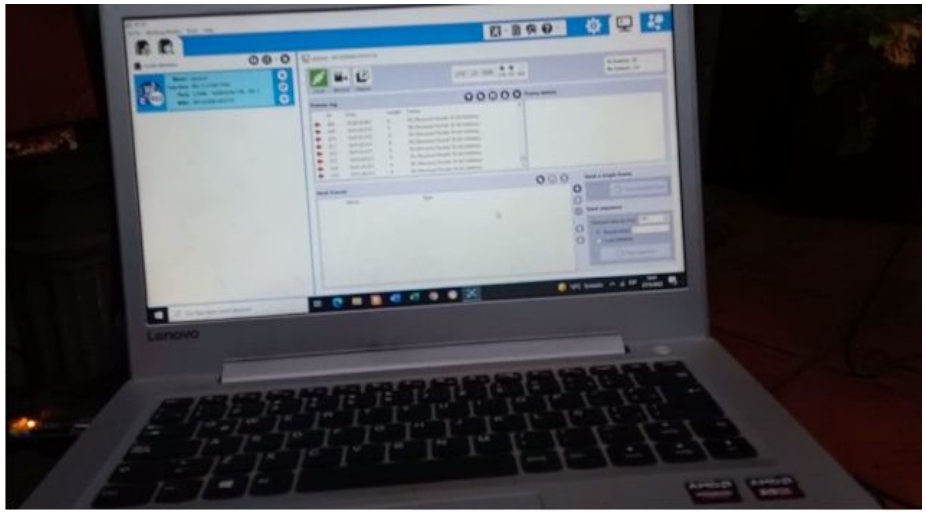


Drop Test Results

How CanSat was secured during the test

Drop Test Results

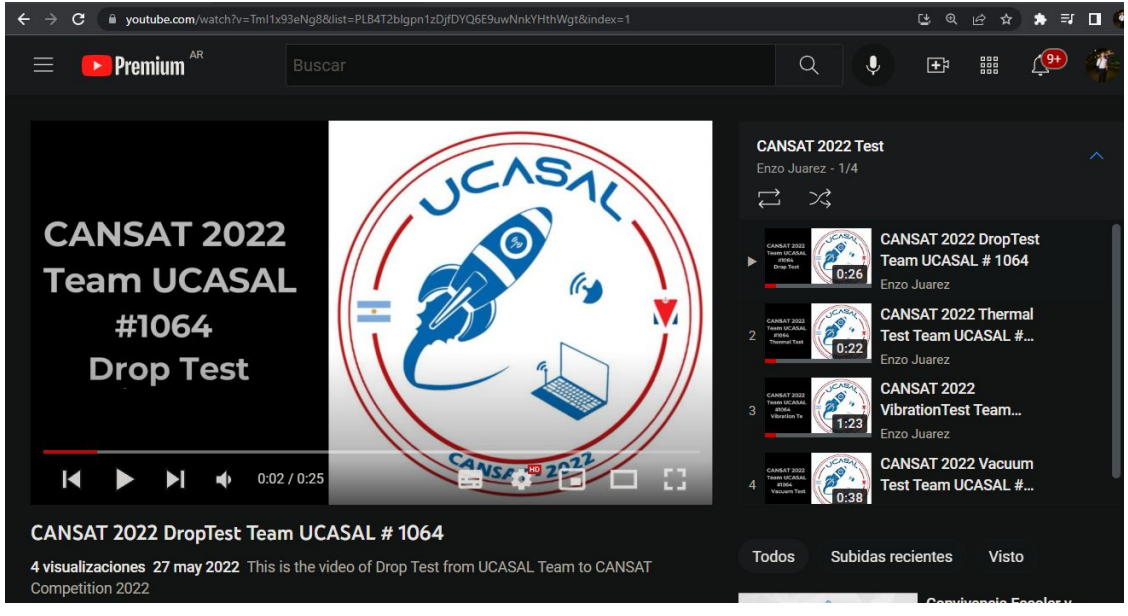
After the drop test we conclude that our cansat pass it successfully.



Drop Test Results

Drop test video link:

- https://www.youtube.com/watch?v=TmI1x93eNg8&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=1



Thermal Test Configuration

Thermal test requirements:

- This test requires a method to heat the CanSat to 60C for a period of 2 hours.
- With the heated gun we could achieve a constant temperature because it has temperature regulation

Thermal Test Configuration

Thermal test setup: A insulated foam box was builded with ductape and foam sheet cut to size, then a heat gun with temperature regulation.

Materials used:

- Insulated foam box
- Heat gun
- Digital thermometer

Thermal Test Procedures

Thermal Test Procedure

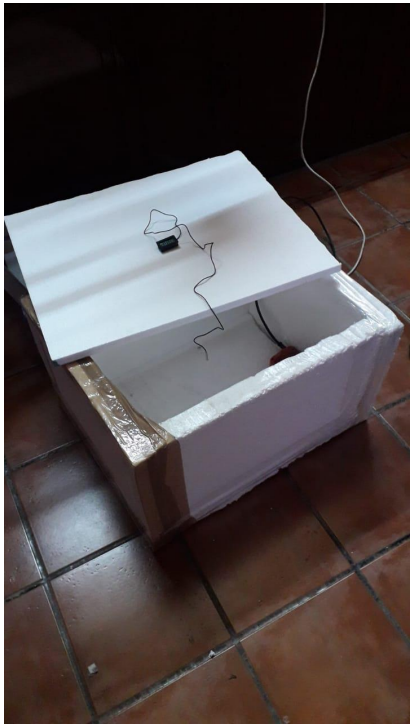
1. Place CanSat into a thermal chamber.
2. Turn on the CanSat.
3. Close and seal the thermal chamber.
4. Turn on the heat source.
5. Monitor the temperature and turn off the heat source when the internal temperature reaches 60C and turn on the heat source when the temperature drops to 55C.

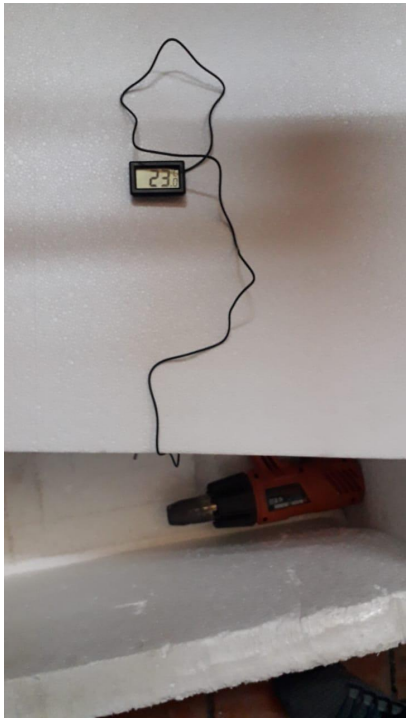
Thermal Test Procedures

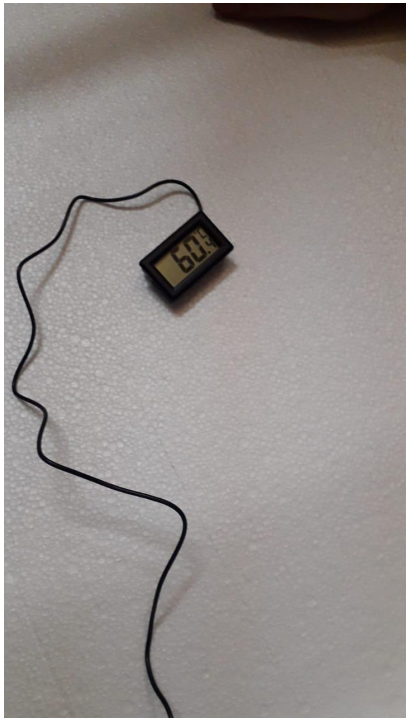
6. Maintain the test conditions for two hours.
7. Turn off the heat source and perform visual inspection and any functional tests to verify the CanSat survived the thermal exposure and can operate as expected.
8. With the CanSat still hot, test any mechanisms and structures to make sure the integrity has not been compromised. Take precautions to avoid injury.
9. Verify epoxy joints and composite materials still maintain their strengths.

Thermal Test Results

Pictures after and during the test



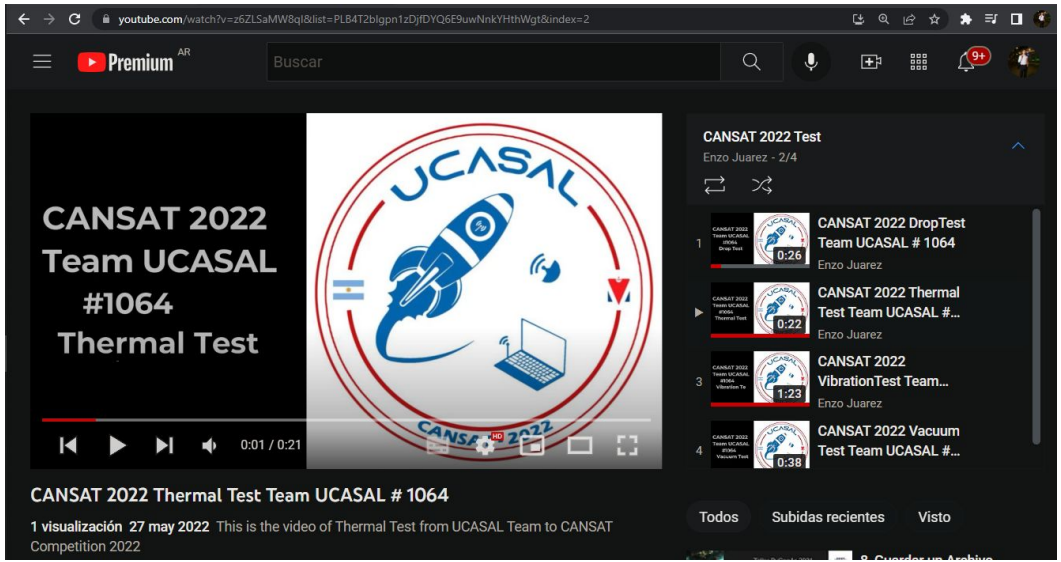




Thermal Test Results

Thermal test video link:

- https://www.youtube.com/watch?v=z6ZLSaMW8qI&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=2



Vibration Test Configuration

We use a sander secured to a vise, then the cansat was secured with duct tape and the vibration test was made power on and off in short cycles and checking that telemetry was correct.

Materials used:

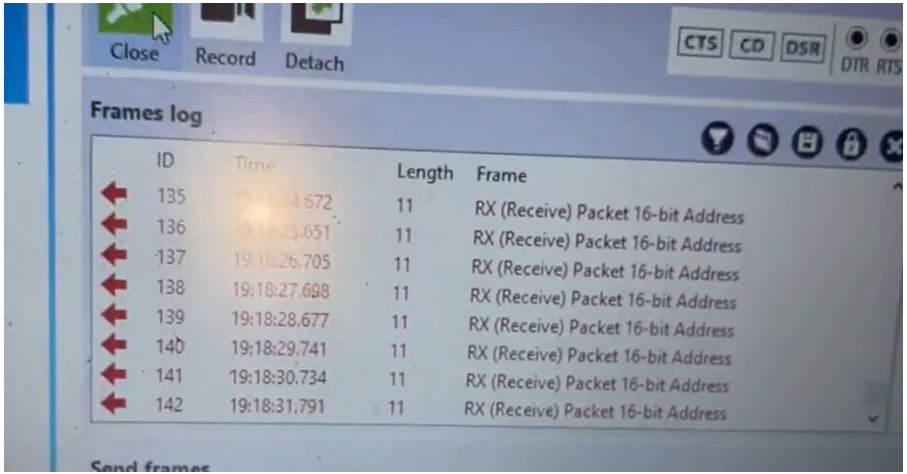
- Power sander

Vibration Test Procedures

Vibration Test Procedures

1. Power on the CanSat.
2. Verify accelerometer data is being collected.
3. Power up the sander.
4. Once the sander is up to full speed, wait 5 seconds.
5. Power down the sander to a full stop.
6. Repeat steps iii to v four more times.
7. Inspect the CanSat for damage and functionality.
8. Verify accelerometer data is still being collected.
9. Power down CanSat.

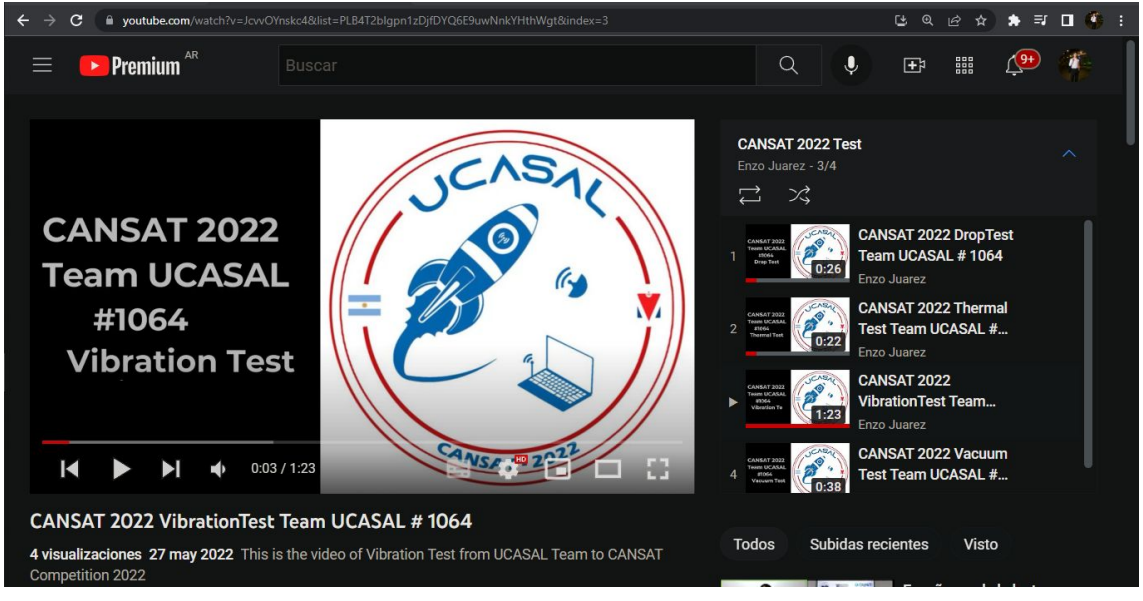
Vibration Test Results



Vibration Test Results

Vibration test video link:

- https://www.youtube.com/watch?v=JcvvOYnskc4&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=3



Vacuum Test Configuration

- List materials used

  A bucket 18 litres

  A vacuum cleaner (was broken before the test)

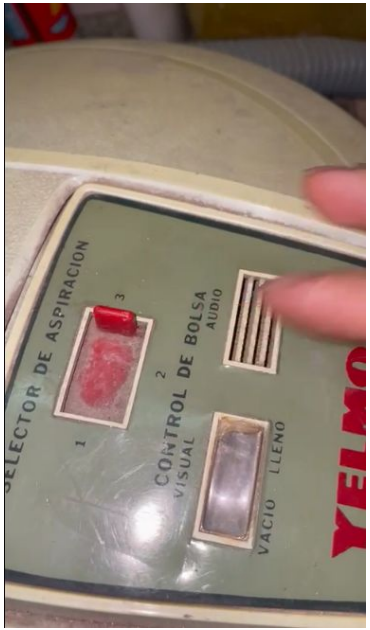
- This test could not be performed because the vacuum cleaner broke before it.

Vacuum Test Procedures

- This test could not be performed because the vacuum cleaner broke before it.

Vacuum Test Results

- Show picture of just before vacuum test



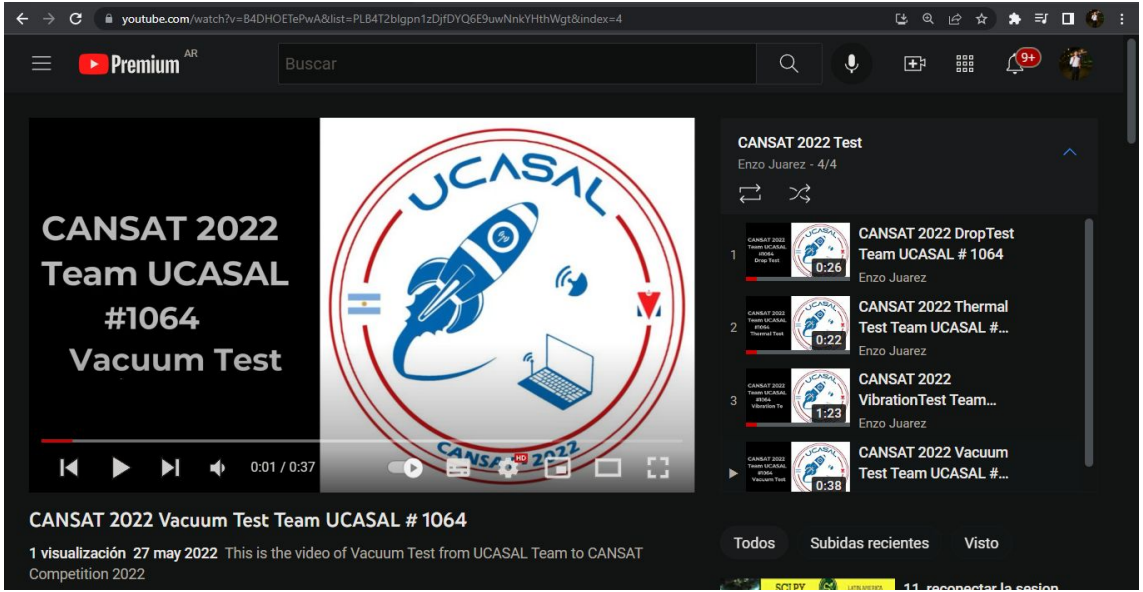
Vacuum Test Results

- The 1064 agrees to get a new vacuum cleaner, to be able to carry out this test correctly, and send the result.

Vacuum Test Results

Vacuum test video link:

- https://www.youtube.com/watch?v=B4DHOETePwA&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=4



Summary

- Drop test worked correctly.
- Thermal test worked correctly.
- Vibration test worked correctly.
- Vacuum test didn’t work correctly, because the vacuum cleaner was broken before the test.