

## Flexible Form Factor

**Question to be answered:** Is it possible to design a flexible container that can carry experiments in space for a variety of vehicles that meets flight requirements?

A form factor is simply the packaging an experiment will be placed into for launch. Experiments taken to space need to be contained within the launch vehicle. Traditionally we have used very rigid containers. With the development of commercial vehicles there is a need for flexible form factors. These containers can be used to carry experiments with solids, liquids or gels.



Form factors on space station

### Background:

As we move from flying experiments in NASA's space shuttle to containing them on the space station there is a need for flexible form factors for the new vehicles being developed. What form factor do we need to fly experiments on Virgin Galactic's SpaceShipTwo, or Sierra Nevada's Dream Chaser?

The primary design goal behind the *form factor* is reducing *space usage* and cost. Flexible packages possess an outstanding ability to control transmission of light, oxygen, moisture, flavor, outgassing, microbes and other elements. Form factors can be tailored to meet the unique requirements of a wide variety of experiments and vehicles. Current needs involve being able to carry liquids or gels for experiments and experiments that require power and data collection.

### Experiment Information:

Design a flexible, durable, very strong container with a strap or some other device that will attach the container to the rocket or spacecraft. This experiment holder has to protect the experiment inside the bag and keep any liquids or gels from leaking onto other experiments. It must be completely fireproof, not conduct electricity, and be easy to open. Any electrical connections going into or coming out of the form factor will have to be universal to allow standard plugs and electrical connections.

### Questions to be answered by the experiments include:

- Can a flexible container be designed to carry liquids/gels without leakage?
- Is the container easy to open?
- Is the composition of the contents affected by space travel (color, smell, microscopically, chemically)?

For additional information:

Material used by NASA for payload bags:

[http://www.amazon.com/Meta-Aramid-Felt-Long-Thick-Wide/dp/B002YXZ1B4/ref=sr\\_1\\_fkmr0\\_3?s=industrial&ie=UTF8&qid=1327443438&sr=1-3-fkmr0](http://www.amazon.com/Meta-Aramid-Felt-Long-Thick-Wide/dp/B002YXZ1B4/ref=sr_1_fkmr0_3?s=industrial&ie=UTF8&qid=1327443438&sr=1-3-fkmr0)

Information about Virgin Galactic payload racks:

<http://www.virgingalactic.com/news/item/conducting-research-on-spaceshiptwo-and-whiteknighttwo/>

Space X Dragon Capsule information:

<http://www.spacex.com/updates.php>