

Lunar habitat Chairs Questions and answers

Correction:

In some discussion I may have suggested that the chair should be able to be used as either a work chair or a lounge chair. I think a work chair and lounge chair are too dissimilar and this would be too complicated. Instead the chair should be able to be used either as a work chair or as a dining room chair. When dining it is important that a chair have a back so people can relax more while eating; however, when working there may be value to not having a back—kind of like using a work stool.

Camping chairs are built to be more rugged to be able to be transported in the car and collapsed and set up again and again. This ruggedness make them heavier than what these chairs may need to be. The chairs you are designing don't need to leave the habitat and probably won't be collapsed and set up over and over. You may be able to make the chair light weight and fit in a small space for transportation to the moon and be assembled in a short time with one or two tools. I'm sure the chairs will move around in the habitat but they probably won't need to be collapsed. If you want to make it so the back comes off or folds down or make it have arms that can be used, that is great!

What kind of look, color or style would you want on the moon?

I am working on the lunar habitat chair HUNCH design project and I have some questions. First, the most recent correction raised some questions about what we are supposed to design. The original specifications seem pretty clear that the chair is supposed to be both a work chair and a dining chair, but the correction seemed like it was saying we are only building one or the other. My question is: are we making a chair to be used as both? and if not does it need to be height adjustable?

It should have some kind of easy adjustment if possible. Our chairs need to have some dual use and capability. The cost per pound to get things to the moon is prohibitive to send single function chairs and the space in the habitat will also be precious. Think about office chairs that can adjust. This doesn't mean they are pneumatic and spring loaded but there are many options.



This idea could work. (arms not required) It would be nice if it could be fewer legs to adjust but this would work.

Also just to clarify the chair needs to hold 130 lbs of force not the equivalent of 130 pounds on the moon?

Obviously I don't expect NASA to send astronauts that weigh over 700lbs on earth. So the 130lbs requirement is so someone on your team is able to sit in the chair and at least demonstrate that you can build a chair and you can talk about function and maybe about comfort. The weight of the chair can be expensive but you are also trying to be functional.

Comfort here may not have be the same on the moon. Here you may have 125lb body and the volume of an adolescent. When you get to the moon, you still have the volume of an adolescent but you now have the weight of a toddler. Your weight distribution in the chair will be very different and comfort may mean something different to your new situation.

What kind of flooring should we expect in the Lunar Habitat?

Since this is an inflatable habitat, the flooring will have to be flexible, minimizes static electricity and fairly easy to clean. This means the flooring will be similar to the multi colored, ½" foam pads that you might have had as kids (probably just one color for the astronauts). This also means that you may want to think about how you spread the person's weight onto the floor

3 legs, 4 legs or more

wide feet or spread on rail/skids?

Does this matter in 1/6th gravity on the moon?

I have done days of research in an attempt to find a replacement material for polyethylene for use in my group's inflatable chair, with little success. Thus, I would like to ask a few questions regarding materials:

What is the maximum temperature the chair is expected to experience during transport to the moon? (I found an approximation of about 185 degrees F, but I wish to make sure.)

That is a decent range. I would not expect it to get higher than that.

Would some form of silicone be suitable as a material? What kind? (Yes, I am well aware that I should have considered silicone much earlier.)

RTV is a type of silicone rubber and is the material used both inside and outside the ISS. Silicone rubber is the only class of space flight-qualified elastomeric seal material that functions across the expected temperature range in the vacuum of space.

3. If silicone is not suitable, do you have any suggestions for a substitute?

The space suits use a urethane coated nylon cloth as the pressure bladder. You don't have to use that for your prototype but you can suggest it as a flight material.

Is RTV and silicone the same?



RTV silicone and normal silicone are two major types of silicone. The key difference between RTV and silicone is that **RTV is a general term for room temperature vulcanizing silicone, whereas silicone is a sulfur-containing polymer material.**Jun 19, 2019