

BREAKOUT SESSION 12.

MATERIALS MANUFACTURING

Concern: Additive manufacturing production, where do you see that happening (Lunar, LEO, etc.)?

Response: Request for information is on FedBizOps. Space station tech is what we're looking for right now. ISS will be retired in about 2020, we would like to move towards deep space exploration. Going towards lunar orbiting in the late 2020s. Trying to move LEO technology to help with lunar exploration.

Concern: Ground based additive manufacturing. Is that work focused at any particular center? Nonstructural manufacturing groups?

Response: MSFC is deep into that and looking to leverage that capability. Yes that's a big thing to do and GRC is also heavily involved in additive manufacturing.

Discussion: We use 3d printed tools, and often you make a tool out of a material and you've later got some debris on a shovel you made. Observe that it's important to have a contamination Printing 3d structures that might be useful to have something removable.

Concern: Hybrid manufacturing, to understand your high resolution sensing ability, how interested are you in developing the sensor side of the manufacturing? Developing reduce sensor space observation, reducing that sensor to get really close. Website for state-of-the-art?

Response: Very important as we need to be able to test items on the ground. Could take place in parallel with testing. Currently can really only take visual inspection of this. Not sure if there is public information available. It's under technology area 12 under STMD. Can look at that by googling NASA TA 12. You can also see the timeline of when we need these items.

Concern: Is the explosive nature of the metal a concern?

Response: It's both but a lot of those are carcinogens so not great for a closed crew environment. Material systems are advancing rapidly. Good composite behavior that is rapidly changing.

Concern: 3d printers in space, good for accelerating these kinds of technologies. Good to know that clients can apply to these SBIR topics. What they need help with is getting help working with NASA.

Response: There is an ISS office that funded MIS

Concern: What is the primary metal property you're looking for that you can't seem to get? Is it well above 200C that has to be metal or can current polymers address that? How commercializable would high heat polymers be?

Response: As we improve the process for high heat polymers we can certainly make those requirements. We want to use the right system for the right application.

Concern: Can you use solar power to power additive manufacturing? Is that preferred?

Response: NASA invests in power systems for generation and storage. We're really energy starved at the moment even though we are looking to do deep space travel soon.

Concern: In process method of launching, is there a road map for materials you're looking into? In SBIR is it more feasible to prioritize plastics? Materials, plastics, electronics?

Response: It's specifically for metals in propulsion. It's not really in space manufacturing but it's more to detect temperature.

Concern: Is there any use of corrosion magnesium components for NASA applications?

Response: Not aware.

Concern: Is there a materials and property list?

Response: No official list. We do publish the requirements for a high temperature environment. If your materials system can meet those requirements it helps.

Concern: Make a photo phosphate glass, in order to become space qualified, do you have to redo all the tests or does SBIR take care of that?

Response: There are requirements for materials. Written down in the NASA Standards Requirements. Shows materials and process standards.

Concern: Consumer additive manufacturing work, sometimes it happens in the IP. Is NASA interested in purchasing the IP as well?

Response: NASA has use of any SBIR technology that they funded. The company owns the IP.

Concern: 3d printing the challenges in space, micro gravity, power load, are there other known problems with these technologies and what are you looking to improve on?

Response: Any process you're looking at in additive manufacturing, you have to demonstrate that it works and how you manage that in microgravity. Tipping point solicitations also go into space manufacturing. Need to be able to build stuff in space in case there are problems. On surface systems, for building structures on the moon, you have low gravity so you need to be able to build and manufacture.

Concern: Are we not looking at a sort of factory in space that provides a gravity simulation?

Response: There was a workshop that looked at gravity in space vehicles. Looking at long term health of the crew and we've simulated microgravity where health goes down. When we get to deep space and have microgravity effects and radiation, we still don't understand that.

Concern: MIS, would hybrid approaches for doing fabrication and components be of interest?

Response: Yes. Depends on the mission and we're always looking for creative solutions.

Concern: The norm is transitioning earth capabilities to space, but what about the other way around?

Response: Yes.

Concern: What building size are you looking for?

Response: Not really specified, but in the space lab, the desire is 6x6x6.