

Customer Needs:

To better understand the specific needs of the customer, we recorded several questions to be asked to our Sponsor Representative. Since we, at this time, do not have a sponsor representative, we elected a member of our group to act as the sponsor and answer the questions.

Question	Customer Statement	Interpreted Need
What type of samples will be collected? (solid or fluid-like sand/particles?)	Solid, rock samples will be collected for testing and evaluation	The sample manipulator will onboard and reorient solid samples
Will the sample need to be moved more than once? (e.g. onboard, test, move, different test, move to storage, etc.)	The samples will be collected, manipulated, then returned for storage.	The sample manipulator will be able to move the sample from the collection point, to the manipulation point, to the return point.
How/where will the samples be stored?	They'll be stored in a different part of the rover.	Collected samples are stored outside of the specimen testing location
What tests will be done on the samples?	The samples will be tested by a laser, camera, and spectrometer.	The sample manipulator will allow the instruments to be used on the sample.
What are the physical size constraints? (size of samples, size of sample manipulator)	Samples will be within the size range of a golf ball to a tennis ball	The sample manipulator will accommodate specimens of various size
What parts of the samples must be visible to the testing instruments?	Testing instruments must have access to every portion of the collected sample	The testing instruments will have access to every portion of the sample
Are there any limitations on what materials we can use?	No limitations on specific materials but must be light weight.	The sample manipulator will be light weight.
Where does the power to the sample manipulator come from?	Power comes from the rover.	The sample manipulator will be able to interface with the rover power systems.

Based on the customers responses and our team's interpretations, the most important needs to the project are to collect the sample from the surrounding environment, move a sample to and from the manipulator, rotate the sample for different viewing angles, and to function with the preexisting conditions of the rover. Sample orienting will allow 2 DoF for the samples to be tested thoroughly by the laser, camera, and spectrometer. The preexisting conditions on the rover include a power system and require that the sample manipulation system be lightweight.