

Hardware Description

Biorack is a reusable, multiuser facility, developed by the European Space Agency (ESA), designed for studying the effects of microgravity and radiation on cellular functions and developmental processes in plants, tissues, cells, bacteria, and small invertebrates. The facility is equipped with a cooler/freezer, two incubators, and a glovebox. Experiment hardware must fit in one of two types of sealed, anodized aluminum containers. Type I containers are 90 x 58 x 24 mm and Type II containers are 79 x 79 x 99 mm.

The US3 hardware is designed to study the effects of microgravity on cell cultures. US3 hardware used only Type I containers.

Subsystems

Cell Chambers: The chamber is a Lexan polycarbonate with two wells. In each well is a bubble of a gas exchanging material that expands or collapses as medium is added or removed. A silicon rubber gasket and bottom plate hold cells cultured on coverslips. A deflector ring in the bottom of the chamber prevents fluid forces from dislodging or shearing the cells.

Chamber Assemblies: Four culture chambers (eight wells) are inverted and placed onto a tray inserted in a Type I container. The chamber units are held in place by double-sided tape. Medium exchange and fixation are performed by inserting a hypodermic needle through the gasket and onto the cultures.

Specifications

Dimensions: 20 Type I containers (90 x 58 x 24 mm each)

Weight: Unknown

Power: N/A

Data Acquisition

None

Related Ground-Based Hardware

None

Hardware Publications

- Duke, P.J., D. Montufar-Solis, and E. Daane: Chondrogenesis in Cultures of Embryonic Mouse Limb Mesenchyme Exposed to Microgravity. In: *Biorack on Spacelab IML-1*, ESA SP-1162. Noordwijk, the Netherlands: ESA Publications Division, March 1995, pp. 115–127.
- *Life Sciences Laboratory Equipment (LSLE) On-line Catalog*. NASA, 1998. <http://lifesci.arc.nasa.gov:100/lisle/>.

Missions Flown 1991-1995

IML-1/STS-42

