

Spacecraft Containers

Pressurized and non-pressurized Transport and Storage Containers for road and air transport and for long term storage of satellites and subsystems.



Based on a large number of available designs, RUAG Space delivers Spacecraft Containers tailored to the specific requirements of customers worldwide. The containers provide a controlled environment for the spacecraft.

Features

- Compatibility with road, sea and aircraft transportation (Airbus Beluga, Antonov 124, Boeing 747)
- Fulfilment of IATA requirements for air transport
- High passive thermal performance and self-powered active thermal control

N2 - pressurisation system with automatic control of internal overpressure, as well as emergency venting and breathing capability. Alternatively various types of free breathing containers have been designed and delivered.

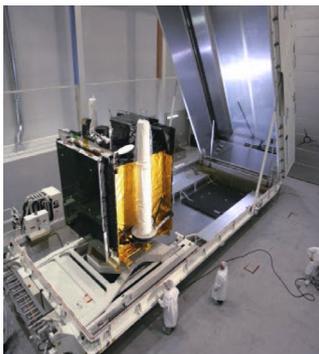
- Support for various configurations (dry/wet) of the spacecraft and for different types of satellites via adequately adaptable, helicable damping systems
- Cleanroom compatibility up to cc100, if so requested
- Remotely controlled hydraulic opening of the lid
- Extendable lid to cope with various spacecraft dimensions and to reduce transportation height for empty transport
- Integrated and/or removable remote-controlled tilting unit for the spacecraft
- Active environmental control of the inner atmosphere
- Electronic shock recording during transport and storage

The typical configuration of a spacecraft transport and storage container is a baseframe, a thermally insulated tub and a removable lid with external thermal insulation. The top is a pressure vessel enclosure or a panel construction to provide the best load capability with minimum dimensions.

The joint between the removable lid and container base is sealed by an inflatable seal. Quick release latches fix the lid to the base. Joints are bonded or welded to minimize sealing problems. For high mass satellites, carbon- and stainless steel is chosen.

In any case the material for the interface to the spacecraft adapter is aluminium alloy.

Aluminium alloy can be used as structural material if lightweight and non magnetic properties are of major importance.



Environmental requirements are maintained by efficient passive thermal insulation, thermal control units with heating/cooling capability and air drying/filtering systems (for pressurized containers self-regulating nitrogen overpressure systems). For container autonomy a diesel generator is part of the environmental package.

A helicable damping system attenuates shock and vibration. Instrumentation fitted comprises a monitoring system for recording of shock, pressure, temperature and humidity. In-facility mobility of the container is assisted by braked, swivel-lock castors, which can be retracted for transport.

The typical qualification process comprises tests for:

- Functional sequence
- Gas tightness
- Dynamic response (drop test, road test)
- Thermal behaviour
- Water spray test
- Electrical bonding test

Programs

Pressurised Containers:

- Cluster (EADS Astrium)
- Envisat (EADS Astrium)
- ERS 1&2 (EADS Astrium)
- Huygens (EADS Astrium)
- Integral (Thales Alenia Space)
- MetOp (EADS Astrium)
- Mipas (EADS Astrium)
- MSG (Thales Alenia Space)
- Seviri (EADS Astrium)
- Silex (EADS Astrium)
- Soho (EADS Astrium)

Non Pressurised Containers:

- Alphasat (EADS Astrium)
- Amos, Eros (IAI MBT)
- Artemis (Thales Alenia Space)
- Ariane (Snecma)
- Ariane Booster (Dutch Space)
- Envisat (Thales Alenia Space)
- Eurostar 3000 (EADS Astrium)
- Gaia (EADS Astrium)
- Herschel/Planck (EADS Astrium)
- Italsat (Thales Alenia Space)
- JAV / JAR (Sabca)
- Satellite Transport Container (Space Systems / Loral, MDA)
- Solar Orbiter (EADS Astrium)