Flight Hardware

Primary: Forged/Machined Aluminium dome welded to skirt.
Window Assembly, (6 side and 1 top), glass panes and window heaters and thermistors.
Passive Common Berthing Mechanism bolted to the skirt.
Micro-meteoroid and orbital Debris Protection.
System Aluminium bumper on the cylindrical portion.
2 Flight Releasable Grapple Fixture interface plates.

Secondary: Internal closure panels equipment & harness support brackets.
Crew System Kit; seat tracks, handrails, handholds, tethers.
Manually operated shutters for each window (also serves as MDPS).
2 Window Change Out Covers to support on orbit window assembly replacement.

Thermal Control System; water supplied from Node. High Temperature loop.
Passive thermal control utilizes Multi-Layer Insulation and thermo optical properties.
Environmental Control and Life Support air from Node. Inter Module Ventilation.
MIL-1553 Bus, Discrete I/O, Audio, Video.

Utilisation Relevant Data

Launch configuration
Launch vehicle: Space Shuttle. Launched inside the Orbiter cargo bay, mounted on a Spacelab pallet via a Manual Berthing Mechanism.
Launch site: Kennedy Space Center, Cape Canaveral Florida
Launch date: January 2009 (Flight 14.A)

On orbit configuration
Transferred from Orbiter cargo bay to the Node location by the Shuttle Remote Manipulator System and Station Remote Manipulator System interfacing with the Cupola.
Initially berthed to Node 1 Port-port, later relocated to Node 3 Forward-port, the nominal location. (Node 3 Aft-port for contingency)

Outfitting on-orbit
Permanently: 1 Audio Terminal Unit and 2 Utility Outlet Panels.
Periodically: Robotic Work Station, Portable Computer System, Portable Light System, Foot restraint device to support crew operations.

Cupola Observation module
Cupola provides a pressurised observation and work area for the Space Station crew giving visibility to support the control of the space station remote manipulator system and general external viewing of the Earth, celestial objects and visiting vehicles.
Specifications

Dimensions

Overall height: 1,500 mm

Maximum diameter: 2955 mm (including Micrometeoroid and orbital Debris Protection System (MDPS) with shutters closed and including Flight Releasable Grapple Fixture)

Mass budget

Launch mass: 1,805 kg
On-orbit mass: 1,880 kg

Communications and data infrastructure

Via Audio Terminal Unit that is connected to Node 3 and the rest of the station
1553B buses via Utility Outlet Panel
Dedicated discrete lines for Robotic Work Station

Environmental control

Environmental Control and Life Support air from Node Inter-Module-Ventilation with manual temperature adjustment

Electrical power

Window heaters powered directly from the Node 120 V interface, Robotic Workstation, Portable Computer System and Portable Light System powered via the Utility Outlet Panel, 120 V interface.

Construction material

Dome: Forged Al 2219-T851
Skirt: Al 2219-T851
Thermal control: Aluminium Kapton Multi-layer Insulation
Windows: Fused silica and borosilicate glass
MDPS blankets and shutters: Al-6061-T6, AL 7075-T7352 and Kevlar/Nextel sheets

Ownership and development authority

The Cupola is provided by ESA to NASA in exchange for the transport of 5 external payloads.

Prime contractor

Alenia Spazio (Turin, Italy) leading a consortium of European sub-contractors.