The proton beams circulate in the accelerator in Ultra High Vacuum to make them interact only with each other when colliding at the interaction point. A special beam pipe "holds" the vacuum where they pass through the LHCb detector; it has to be mechanically very strong to stand the difference in pressure between the vacuum inside it and the air in the cavern but also be as transparent as possible for the particles originating in the proton-proton collisions.

The LHCb beam pipe is made of four conical sections from 2 to 6 m in lengths ending with flanges to mount them together.

Less particles cross the walls of a Beam Pipe in the the shape of a cone rather than a cylinder.

The LHCb beam pipe is made of a first conical section with angular aperture of 25 mrad in the RICH area followed by a series of cones of 10 mrad welded together to the end of the muon system following the inner aperture of the detectors.

The Exit Window connecting to the VELO vacuum vessel.

The Exit Window while checking its dimension and shape.

The first Beryllium section: "25 mrad"

All sections after metrological checks are put through vacuum tests.

All Be sections are built by Kompozit, Moscow. They are the first ever built in Be in a conical shape for use in an High Energy Experiment.

The second Beryllium section

Tubes of beryllium to be machined in cones that will then be welded in a single tube at Kompozit, Moscow.

The second section completed and ready to be shipped to IHEP, Protvino to be vacuum tested.

The beam pipe in its shipping cradle.

The Exit Window.

Special Al bellows have been machined at CERN.

Materials have the mechanical characteristic to be used in a beam pipe. Between these beryllium is the most transparent (the flat line is a beam pipe which walls are made of air).

Beryllium is used for the beam pipe from the VELO to RICH2. Since it is brittle and can be toxic special care has to be taken. In the calorimeter and muon system beryllium shields surrounding the beam pipe is made of Stainless Steel.