FNRS 1 BALLOON

Balloon

External diameter : 30 metres
Payload : 1000 kg
Materials : cotton and rubber
Fuel : hydrogen
Construction : Riedinger Ballon Fabrik (A), in 1931

The balloon was inflated with hydrogen, since the production of helium was too expensive in 1930. The diameter of the inflated balloon was 30 metres, its volume 14,130 m3. The balloon's payload was 1000 kg and it was therefore clearly oversized in relation to the load to be carried. Its capacity theoretically enabled it to lift a locomotive!
The balloon's envelope consisted of two layers of cotton bonded by an intermediate layer of rubber. The fabric was dyed yellow (chloramine). This colour absorbs part of the sun's blue, violet and ultraviolet rays. On take-off the balloon took the shape of a pear. It was only at altitude, when the pressure fell, that the balloon became spherical.

Gondola

External diameter : 2.10 metres
Empty weight : 136 kg
Crew : 2 men
Endurance : 24 hours
Thickness : 3.5 mm
Materials : aluminium
Portholes : glass
Average on board temperature : -2 to + 40°C!
Manufacturer of gondola : Georges L'Hoir, Liège (B)
Interior equipment : Jacques Destappes, mechanic, Brussels (B)

In structural terms, the sphere offers the highest volume for the smallest surface area, and therefore the lowest weight. The 2.10 metre diameter meanwhile, according to Auguste Piccard, is "(…) the smallest dimension in which two observers and a great deal of instrumentation can be accommodated". The first gondola was painted in two colours. It was thus able to present a light or a dark side to the sun. This was Piccard's idea to avoid extreme variations of temperature inside the gondola. The latter was entered through an airlock which, once closed, rendered it totally airtight. To be able to breathe, Piccard followed the example of German submariners. Pure oxygen was injected into the gondola and the air inside the gondola was filtered and put back into circulation.

Pilots

Auguste Piccard and Paul Kipfer in 1931
Auguste Piccard and Max Cosyns in 1932

Records established:

World's first ascent into the stratosphere
First space vessel and first manned spaceflights (NASA)

Ascents completed :

1Altitude 15,780 metres (51,771 feet) : on 27 May 1931, Auguste Piccard and Swiss physicist Paul Kipfer took off from Augsbourg in Bavaria (Germany) and landed on the Gurgl glacier in the Tyrol (Austria) on 28 May, flight duration 17 hours.
Altitude 16,201 metres (53,152 feet) : on 18 August 1932, Auguste Piccard and Belgian physicist Max Cosyns departed from Dübendorf (Switzerland) and landed on the shore of Lake Garda (Italy), flight duration 12 hours.
Altitude 15,500 metres (50,853 feet) : on 18 August 1934, Max Cosyns and student Nérée Van der Elst, in the last flight with the gondola, travelled from Hour (Belgian Ardennes) as far as Slovenia (Zenavlie), establishing a record flight of 1,800 km.

Actual location of balloon : converted to a hot-air balloon, in a gust of wind the envelope flipped over, caught fire, and disappeared in a few seconds in 1934.

Actual location of gondola : the gondola of the first flight, after remaining on the Gurgl glacier for more than a year, was eventually taken to the Aviation section of the Royal Armed Forces Museum. The second gondola is conserved by the Science Museum in London.

