

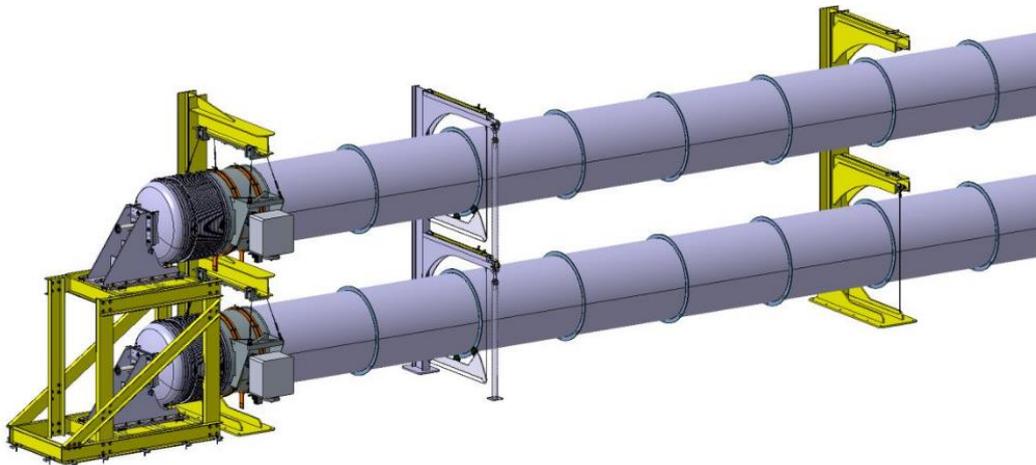
The vacuum arm system of the Einstein Telescope (ET) gravitational wave interferometer will probably be the world's largest ultra-high vacuum (UHV) system for a long time to come (120 km). For a gravitational wave interferometer like ET, the cost is important and proportional to its length. The construction of a vacuum system of this size requires an enormous effort to optimise the choice of materials, manufacturing processes and tube treatments to reduce costs, as it is estimated to account for 1/3 of the total cost of ET.

For the vacuum technology sector, there is an agreement between CERN-INFN-Nikhef-IFAE on beam tubes with the aim of manufacturing, assembling and testing a pilot sector and writing the technical design report including cost estimates. The aim of the structural design phase is to reduce the mass and cost of the structure. Corrugated tubes have been identified as the right solution to reduce the mass and therefore the cost of the structure, as they allow the use of thin sheet of a few millimetres (around 1.3 mm). To meet this challenge, industrial partners must be found to produce UHV-compatible corrugated tubes using technologies scalable to ET. In addition, the 4 mm thick AISI 441 VIRGO geometry beampipe is being prioritised for the construction of the first phase of the pilot sector.

CERN is looking for industrial partners to manufacture the VIRGO-based pilot sector beampipe (50m long) and UHV-compatible corrugated pipes using technologies scalable to ET.

Scope of the supply:

- Manufacture of a 50 m long welded pipe with inner diameter 1 m, made of ferritic stainless steel (AISI 441) with a thickness of approx. 4 mm for use in UHV, fabricated from sheet metal coils.



- Manufacture of a 50m long corrugated welded pipe with inner diameter 1 m, made ferritic stainless steel (AISI 441) with a thickness of approx. 1.5 mm for use in UHV, fabricated from sheet metal coils.



Prerequisites of the companies:

- Experience with manufacturing of large pipes and production of UHV components, welding qualifications for UHV, working with ferritic stainless steel (AISI 441).