

Leonardo: Positive results as Space Drill put to the test for ExoMars 2020 mission

- **After 4 months of operations in a special chamber simulating the Martian environment, Leonardo's drill passed the space qualification tests**
- **With its diamond bit, the instrument will, for the first time, drill down into the surface of the Red Planet to a depth of 2 metres in search of traces of life**
- **Leonardo has a primary role in ExoMars, a program involving over 130 space companies from ESA State members, led by Thales Alenia Space**

Milan, 8 February 2018 – Space qualification tests of the drill manufactured by Leonardo at its Nerviano (Milan) plant for the ExoMars 2020 mission have now been completed with success.

The announcement comes at the presentation of the exhibition “Mars - Close encounters with the Red Planet,” beginning this week and extending through June 3 at the National Museum of Science and Technology in Milan.

The tests of the instrument, which lasted four months, took place at the University of Padova's Interdepartmental Centre for Space Studies and Activities “CISAS – G. Colombo”. The drill operated in a special testing chamber simulating the Martian environment and included rocky soil, temperatures ranging from -100°C to +35°C and an atmosphere thick with carbon dioxide at a pressure of 5-10 millibars.

These operations demonstrated the drill will be capable of completing its mission on Mars, where it will look for traces of present or past life, digging down as far as 2 metres into the surface of the Red Planet. At this depth, in fact, biological activities are not destroyed by cosmic radiations, and it is therefore possible to find evidence of their existence.

The ExoMars drill is a true technological marvel. With a power of just 80 watt (one-fifth of the power in a household drill), it will drill through the soil with a polycrystalline diamond bit, making a hole 25 millimetres across. It will collect samples of material which will then be distributed to the ExoMars Rover's analytical laboratory for detailed examination.

A full-size model of the drill, with the details of its robotic and fully automated interior, will be on display at the exhibition “Mars - Close encounters with the Red Planet.” The initiative is sponsored by the Italian Space Agency (ASI), the Italian Ministry of Cultural Heritage and Activities and Tourism and the National Museum of Science and Technology Leonardo da Vinci, in collaboration with the European Space Agency, INAF, Leonardo, Thales Alenia Space and National Geographic.

Notes to the editor: ExoMars and the contributions of Leonardo

ExoMars programme is a collaboration between the European Space Agency (ESA) and Russia's Roscosmos, with the fundamental contribution of the Italian Space Agency (ASI) and the NASA.

It is divided into two missions: the first took the Trace Gas Orbiter (TGO) module into orbit around Mars to study its atmosphere, while the second will be launched in 2020. The latter aims to land an automatic Rover on Mars capable of collecting soil samples at a depth of two metres with the Leonardo's drill and of analysing their chemical, physical and biological properties.

Leonardo has a primary role in ExoMars, a program involving over 130 space companies from ESA State members. Thales Alenia Space (Thales 67%, Leonardo 33%), has the leadership of both missions. Lots of high-tech instruments used in the programme are manufactured by Leonardo, which is also responsible for the development of several key systems of the Exomars Ground segment through Telespazio (Leonardo 67%, Thales 33%).