Vacuum and hydraulic testing of the ITER DOME [[1]](#footnote-1)\*)

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The report provides an overview of the problems arising from vacuum and hydraulic testing of the ITER Dome prototype and presents the results of these tests.

The main difficulty was to carry out vacuum tests according to the specific requirements of the ITER International Organization (IO). First of all, these requirements include the achievement of an acceptable value of the background level of helium in the vacuum vessel during testing, which makes it possible to provide the required sensitivity of the leak detector, when the Dome is heated to 250°C. Tests at a temperature of 250°C are necessary, since all in-vessel components of the reactor will be at this temperature, for example, during baking. To achieve the required value of the helium background level, the Dome was baked for 75 hours. During baking, the temperature of the plasma face units reached 400°C, and the temperature of the steel support structure reached 370°C. Besides, getters based on the Ti-Zr-Al alloy were used during the helium tests making it possible to reduce the background level of the helium flow in the vacuum vessel from 10-10 to 10-11 Pa·m3·s-1 in air equivalent. As a result, the hydraulic and vacuum tests of the Dome prototype were successfully carried out in accordance with all requirements of the ITER IO.

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/E/ru/II-Kiselev.docx) [↑](#footnote-ref-1)