

# Mechanical design of the Water Cherenkov Test Experiment (WCTE) at CERN

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The Water Cherenkov Test Experiment (WCTE) is a test experiment proposed at CERN to measure the response of a Water Cherenkov Detector for charged particles such as  $\pi^\pm$ ,  $p^+$ ,  $e^\pm$ , etc. The data obtained from WCTE will be used in future neutrino experiments.

WCTE consists of a sealed cylindrical tank filled with ultrapure water. 128 multi-PhotoMultiplier Tubes (mPMTs) are mounted on a cylindrical support structure facing inwards to map out the Cherenkov radiation with high granularity.

This work presents the mechanical design and analysis of the support structure for WCTE. It is designed to sustain the load of 128 mPMTs, arrangement of Photogrammetry system Cameras & lights and Calibration arm without significant change in the position / geometry of the structure. SS304 is identified as a suitable material to ensure the compatibility with the ultrapure water and Gd-treated water. The structure is robust against stresses during handling and subsequent transport with and without water.

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