

ESS Site September 2019



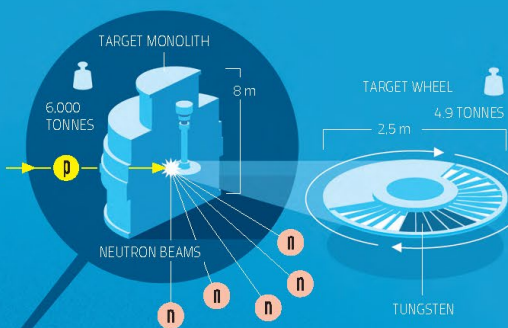
European Spallation Source

The European Spallation Source (ESS) is a multi-disciplinary research centre based on the world's most powerful neutron source, ESS will give scientists new possibilities in a broad range of research, from life science to engineering materials, from heritage conservation to energy and magnetism. ESS is a pan-European project, with Sweden and Denmark serving as host countries. The main research facility is being built in Lund, Sweden, and the Data Management and Software Centre (DMSC) is located in Copenhagen, Denmark.



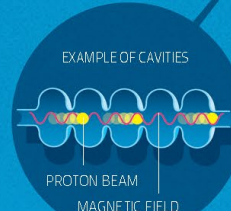
THE TARGET IS THE NEUTRON SOURCE

When the accelerated protons hit the rotating tungsten target wheel, spallation occurs and neutrons are scattered from the tungsten nucleus. The more neutrons produced and collected in the target, the "brighter" the neutron source. The neutrons are directed through moderators and neutron guides to the scientific instruments where they are used for experiments. The Target monolith consists of the Target wheel, moderators, a cooling system and shielding, and weighs approximately 6,000 tonnes.



PROTONS GENERATED IN AN ION SOURCE

In the ion source protons are generated and guided into the linear accelerator, the linac. The first part of the linac is used to focus the proton beam while it accelerates.



EXAMPLE OF CAVITIES

PROTON BEAM
MAGNETIC FIELD

CAVITIES ACCELERATE THE PROTONS

Electromagnetic fields are used to accelerate the protons to approximately 96% of the speed of light. The second part of the accelerator consists of superconducting cavities which are cooled to -271 °C using liquid helium. After traveling 602.5 m the protons hit the target wheel.

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