

## **NEUTRON BEAM FILTERS**

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The purpose of filters is to transmit neutrons with selected energy, while remove unwanted ones from the incident neutron beam. This reduces the background, and the number of spurious. The types of commonly used now-a-day neutron filters and their properties are discussed in the present work.

There are three major types of neutron filters. The first type is filter of selective thermal neutron. It transmits the main reflected neutrons from a crystal monochrometer, while reject the higher order contaminations accompanying the main one.

Beams coming from the moderator always contain unwanted radiation like fast neutrons and gamma-rays which contribute to experimental background and to the biological hazard potential. Such filter type is called filter of whole thermal neutron spectrum.

The third filter type is it transmits neutrons with energies in the resonance energy range ( $E_n \geq 1$  KeV). The main idea of such neutron filter technique is the use of large quantities of a certain material which have the deep interference minima in its total neutron cross-section. By transmitting reactor neutrons through bulk layer of such material, one can obtain the quasi-monochromatic neutron lines instead of white reactor spectrum.