Radiation Shielding

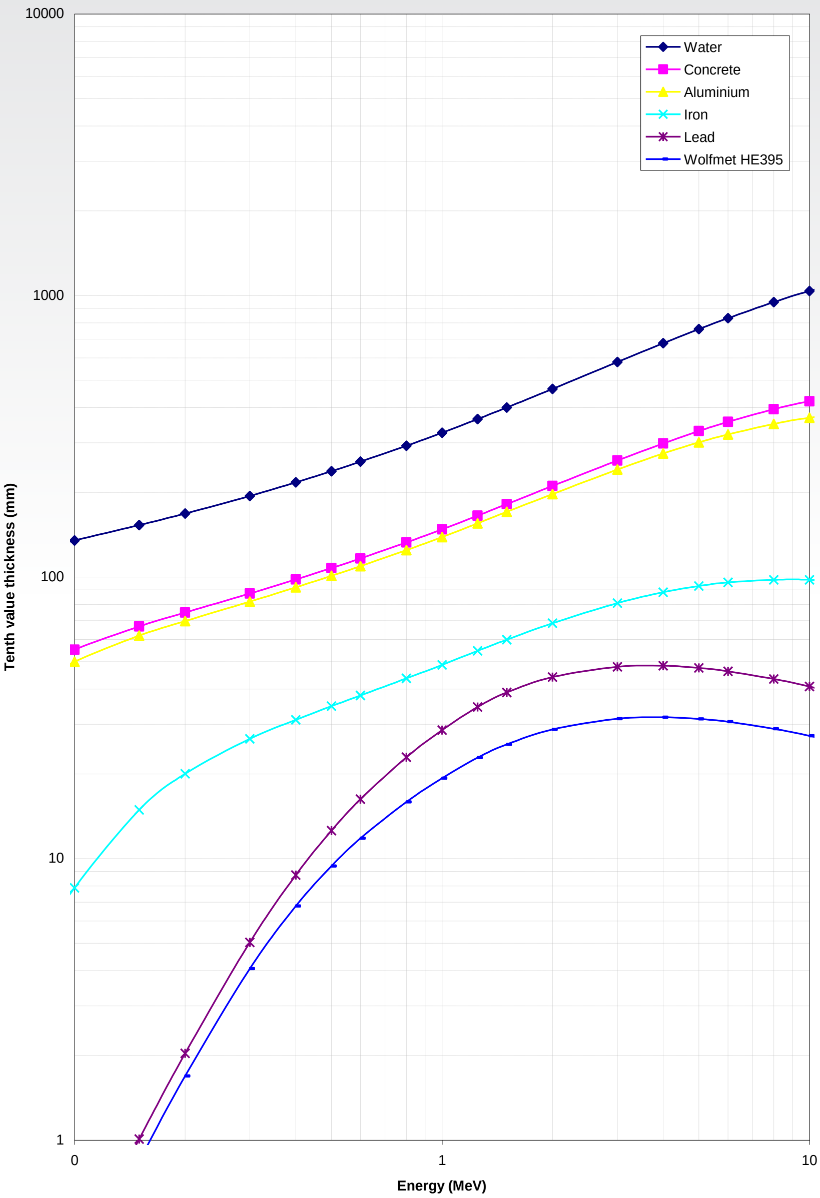
Introduction

Wolfmet Tungsten Alloys are not only very dense, but they are also very good at attenuating ionising radiation. This makes them ideal for shielding applications such as in nuclear medicine or in the nuclear industry.

The ability to attenuate radiation is often expressed in "tenth layer thickness" - the thickness of a plate required to reduce the transmitted radiation to one tenth of the intensity of the incident radiation; the lower the figure, the better the shielding. The attenuation properties also vary with the incident energy of the radiation.

Graph 1 demonstrates gamma-ray absorption characteristics of Wolfmet HE 395 and other shielding materials showing tenth-layer thickness (narrow beam/ radiation) as a function of incident beam energy. Data supplied by the National Physical Laboratory.

Graph 1 - Comparative Absorption Data as a Function of Energy



WOLFMET
EXCELLENCE IN TUNGSTEN

Radiation Shielding

Comparative Absorption Data

Within the Wolfmet Tungsten Alloy range, the tungsten content varies from 90% to 97% by weight. More tungsten improves the radiation attenuation and so reduces the tenth layer thickness. This is illustrated in Table 1 at a fixed incident γ-ray energy (Co^{60}), where the absorption data for two of the Wolfmet products and lead are compared. Also shown are the corresponding half thicknesses of shielding needed to halve the radiation intensity.

Table 1 - Comparative Absorption Data

	HA 190	HE 395	Lead
% Tungsten	90.0	95.0	0
Narrow beam Radiation tenth layer thickness, mm	24.8	24.3	38.3
Half thickness, mm	7.5	7.0	11.7