Nuclear Shielding Pads for Combat vehicles

Nuclear explosion give rise to immediate threat of blast, heat and INR (initial nuclear radiation) besides the delayed threat of fallout radiation / contamination. ***Initial Nuclear Radiation*** **(**INR) is the radiation emitted within the first minute of nuclear explosion of nuclear weapon. This consists of high-energy *gamma rays* and *fast neutrons*. The other accompanying radiations *alpha's and beta's* are all absorbed within the near vicinity of explosion. ***Primary gamma rays*** are best shielded with lead or high-density materials. ***Fast neutrons*** are more effectively shielded by hydrogen. Therefore, hydrogen contents are maximized in polymer matrix of composite shielding materials. The fast neutrons are slowed down to thermal energies by collision with hydrogen atoms. The heavy atoms such as lead will also slow down, fast neutrons by inelastic scattering.

Fallout Radiation or residual radiation emitted later than one minute after the explosion of nuclear weapon. Fallout from a *high air burst* practically negligible. It is mainly occurs in the case of ground burst or *low air burst*. ***Secondary gamma rays*** having energy of 2.2 Mev are created as a result of collision of fast neutrons with hydrogen atoms. It can be minimized by adding boron or lithium. Gamma rays resulting from capture of thermal neutrons by boron have energy of only 0.42 Mev which reduces the overall dosage considerably.

Photographs of some Nuclear Shielding Pads