Engineering Plastics for Neutron Radiation Shielding

Quadrant borated Polyethylenes:
Borotron® UH015 I UH030 I UH050
Borotron® HM015 I HM030 I HM050
Borotron® HD050

TRENDS

Nuclear and medical radiation shielding applications require materials providing safety and protection for environment and people, exhibiting high hydrogen density and low weight at acceptable cost.

Most radiation fields are combinations of different kinds of radiation, such as fast neutrons, thermal neutrons, primary gamma and secondary gamma rays.
Fast neutrons are most effectively shielded by materials with high hydrogen content. They are slowed to thermal energies by collision with hydrogen atoms. Thermal neutrons can be virtually eliminated by the presence of high thermal neutron cross-section materials such as boron. Primary gamma rays are best shielded with lead or other high density materials. Secondary gamma rays are created as the result of the capture of thermal neutrons by hydrogen. These capture-gamma rays can be minimized by adding boron.

QUADRANT'S SOLUTIONS

Borated UHMW-PE, HMW-PE and HD-PE grades
Dimensionally stable plastics with high hydrogen content and added boron

CUSTOMER BENEFITS

Consistent density and homogeneity
Superior dimensional stability over a wide temperature range
Easy to handle and fabricate to a variety of shapes and parts
Low weight
Acceptable cost versus other shielding materials

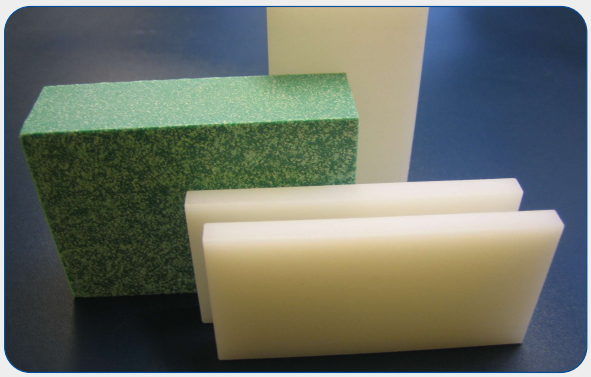
QUADRANT
You inspire ... we materialize®

BOROTRON® BORATED POLYETHYLENE

Borotron - borated PE grades - have been used as a medical and industrial shielding material to attenuate and absorb neutron radiation. This easily fabricated polymer material also offers designers greater durability and function over a wider range of temperatures than traditional materials.
Whereas essentially any type of PE is suitable for shielding against high energy neutron radiation, borated PE combines the effect of moderation of fast neutrons and absorption of lower energy thermal neutrons.

BOROTRON® PRODUCT RANGE

BRAND	BORON %
Borotron UH015 HM015	1,5%
Borotron UH030 HM030	3,0%
Borotron UH050 HM050 HD050	5,0%



UH = Ultra High Molecular Weight Polyethylene
HM = High Molecular Weight Polyethylene
HD = High Density Polyethylene

APPLICATIONS

Medical vaults and doors
Hot cells
Nuclear storage and transport containers
Nuclear waste management
Particle accelerators
Nuclear detection systems

Distributed by:

Learn more online at: www.quadrantplastics.com

QUADRANT