

# SWX-207HD & 207HD5

## Self-Extinguishing Borated Polyethylene



SWX-207HD Self-Extinguishing Borated Polyethylene is used for neutron shielding applications where flame resistance is necessary or desired for the installation. Its hydrogen content is slightly lower than that of SWX-201 Borated Polyethylene.

Self-extinguishing materials are desirable for use in any location requiring neutron shielding where there is an issue with fire loading and a need to reduce the amount of material contributing to the overall amount of combustible materials. ASTM test D-635 (Flammability of Self-Supporting Plastics) shows SWX-207HD to be self-extinguishing. ASTM Test D-2863 gives a Limiting Oxygen Index of 30.2. In addition to the fire resistance, SWX-207HD produces negligible smoke when exposed to flame.

SWX-207HD contains high hydrogen content to provide good characteristics for the attenuation of fast neutrons and contains 0.9% by weight boron (4.7% for SWX-207HD5). It has relative high density of 1.7 g/cc (106 lbs/cu ft), which improves its gamma shielding characteristics compared to other polyethylene based shields. SWX-207HD has numerous applications in nuclear facilities including shielding hatches, ducts, sumps, stairwells, etc.

SWX-207HD is available in slabs, 1-inch thick, in sizes up to 96" x 48". It is easily shaped and cut using ordinary woodworking and metalworking tools. Shieldwerx can custom machine SWX-207HD to your specifications.



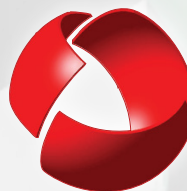
**Self-extinguishing polyethylene shielding**



**SWX-207HD contains ~1% boron and 6% hydrogen**



**SWX-207HD5 contains ~5% boron and 6.6% hydrogen**



# SWX-207HD & 207HD5

## Self-Extinguishing Borated Polyethylene

# Specifications

### Composition Data

	<u>207HD</u>	<u>207HD5</u>
Hydrogen atom density / cm <sup>3</sup> :	6.10 x 10 <sup>22</sup>	6.35 x 10 <sup>22</sup>
Hydrogen weight percent:	6.01 %	6.65 %
Hydrogen natural isotope distribution:	99.98 % <sup>1</sup> H	99.98 % <sup>1</sup> H
Boron atom density / cm <sup>3</sup> :	8.14 x 10 <sup>20</sup>	4.19 x 10 <sup>21</sup>
Boron natural isotope distribution:	19.6 % <sup>10</sup> B & 80.4 % <sup>11</sup> B	19.6 % <sup>10</sup> B & 80.4 % <sup>11</sup> B
Boron weight percent:	0.86 %	4.71 %
Total Density:	1.70 g / cm <sup>3</sup> (106 lbs / ft <sup>3</sup> )	1.60 g / cm <sup>3</sup> (99.8lbs / ft <sup>3</sup> )

### Radiation Properties

Macroscopic thermal neutron cross section:	0.64 (cm <sup>-1</sup> )	3.19 (cm <sup>-1</sup> )
Gamma resistance:	5 x 10 <sup>8</sup> rad	5 x 10 <sup>8</sup> rad
Neutron resistance:	2.5 x 10 <sup>17</sup> n/cm <sup>2</sup>	2.5 x 10 <sup>17</sup> n/cm <sup>2</sup>

### Physical Properties

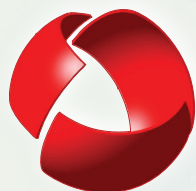
State:	Sheets, bricks	Sheets, bricks
Color:	Grey/Tan	Grey/Black
Odor:	No odor	No odor
Machinability:	Excellent	Excellent

### Thermal Properties

Recommended Temperature Limit:	200 °F (93.3 °C)	200 °F (93.3 °C)
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### Chemical Properties

Chemical Name & Synonyms:	Borated Polyethylene	Borated Polyethylene
Trade Name & Synonyms:	SWX-207HD	SWX-207HD5
Chemical Family:	Polyolefins	Polyolefins
Formula:	Mixture (CH <sup>2</sup> ) <sub>n</sub> , B	Mixture (CH <sup>2</sup> ) <sub>n</sub> , B
Solubility in Water:	Negligible	Negligible



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Data Sheet Revision: Nov 2015