



flexibility

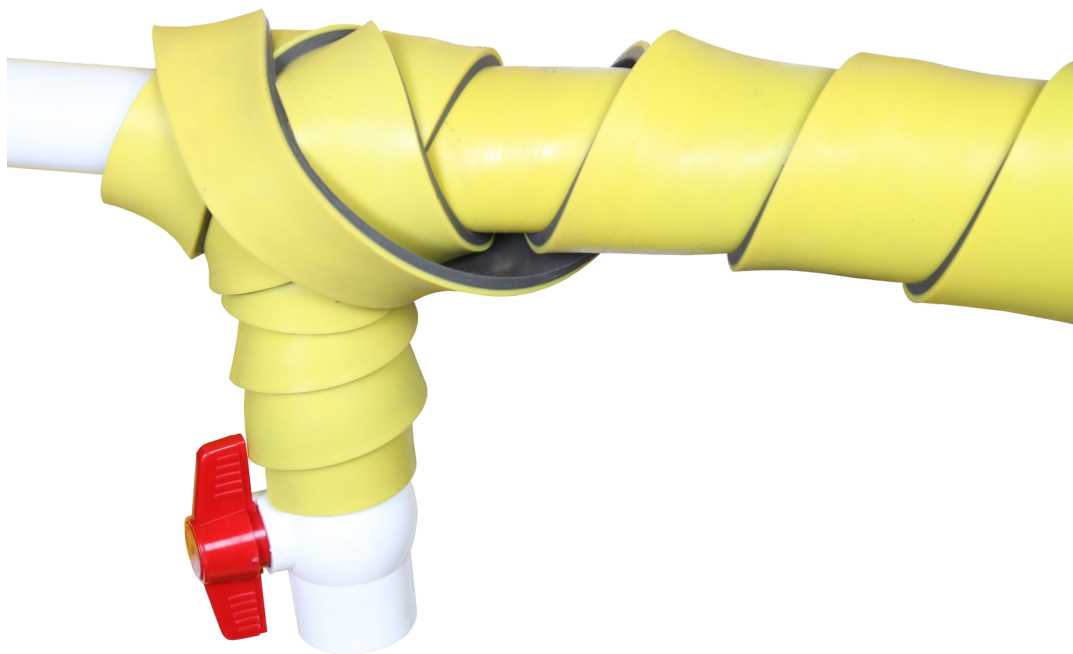
NPO's T-Flex® products maximize shielding effectiveness while keeping the weight to a minimum. Ideal for applications that require custom moldable shapes along with flexibility, such as small bore pipe, elbows and valves. T-Flex® products are available as blankets, ribbon wrap, pipe shields, floor tiles, magnetic tiles, and molded shapes—flexible or rigid. Fasteners/securing methods are available and include magnets, grommets and HRA locking devices. Tungsten, Bismuth, and Iron attenuating materials are available. T-Flex® products are rated for continuous use up to 350° F/176° C.

- More effectively position mass in path of radiation source to achieve lowest weight per unit of shielding.
- Install in seconds by using the “slip-over-the component” feature, integral fasteners and/or magnets.
- Advance ALARA program goals by adding these highly effective shielding materials to shielding tool box.
- Lead alternative - No mixed waste
- Ideal for small bore piping
- Mold to any shape
- Easily cut for in field adjustments
- Efficient placement of shielding closest to source
- Rated for continuous use up to 350°F/176°C

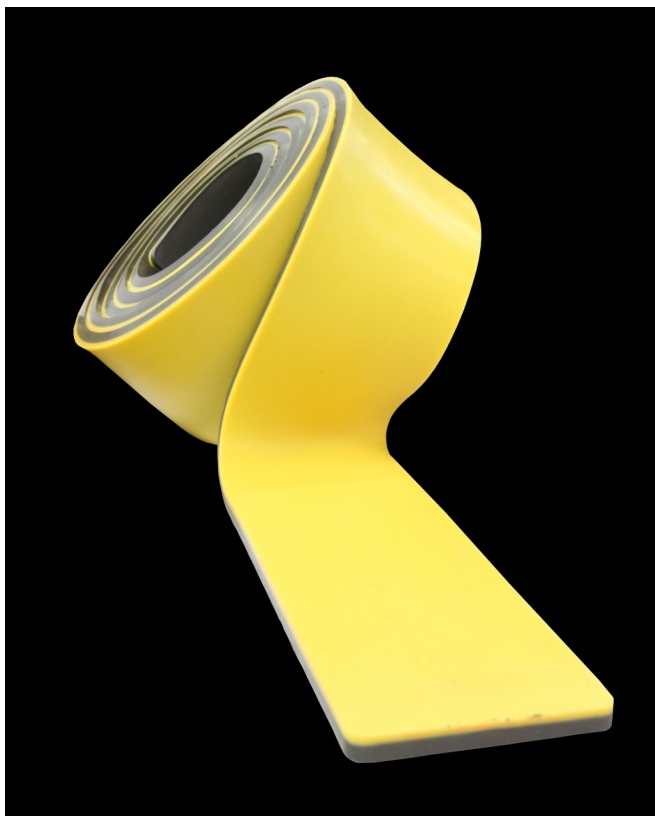
T-Flex® Shielding

Ribbon Wrap

MarShield™
EVERY SOLUTION IN SHIELDING



Highly flexible strips. These ribbons can be spiral wrapped around components for a quick “hot spot” solution. Standard length is 8 feet and material can be easily cut in the field using typical cutting tools.



T-Flex® Shielding

pipe shields



Ideal for small bore pipe applications. Engineered to be within weight limitations while maximizing attenuation. Cinch straps are included for each section of pipe shielding.

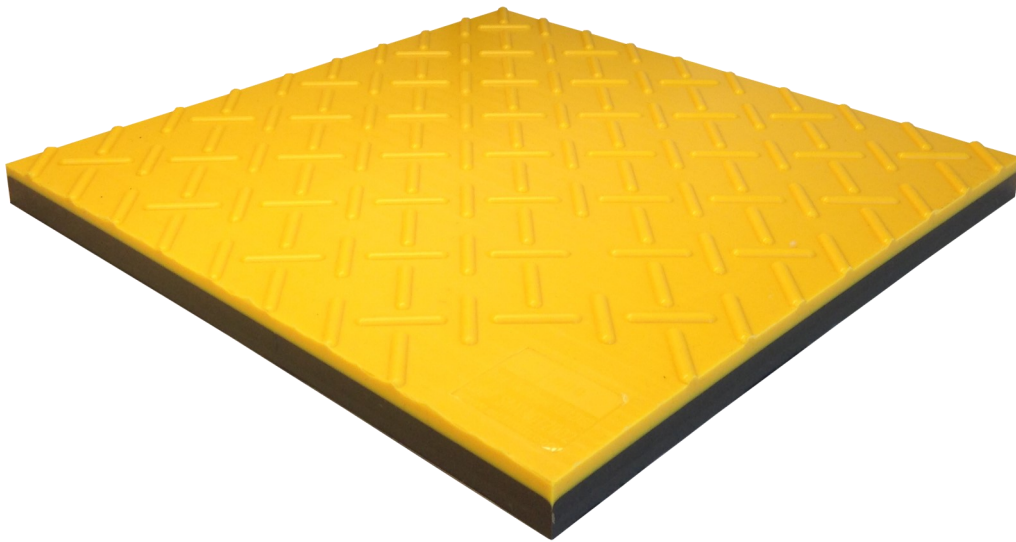


Pipe Size	Material	Attenuation	T-Flex® OD	Lb/ft
1" (1.315")	T-Flex® Tungsten	50%	3.1"	19
1" (1.315")	T-Flex® Bismuth	50%	3.8"	20
1" (1.315")	T-Flex® Tungsten	75%	4.8"	50
1" (1.315")	T-Flex® Bismuth	75%	6.2"	58
2" (2.375")	T-Flex® Tungsten	50%	4.2"	28
2" (2.375")	T-Flex® Bismuth	50%	4.9"	29
2" (2.375")	T-Flex® Tungsten	75%	5.9"	69
2" (2.375")	T-Flex® Bismuth	75%	7.3"	75
3" (3.5")	T-Flex® Tungsten	50%	5.3"	37
3" (3.5")	T-Flex® Bismuth	50%	6.0"	38
3" (3.5")	T-Flex® Tungsten	75%	7.0"	87
3" (3.5")	T-Flex® Bismuth	75%	8.4"	92

T-Flex® Shielding

floor shielding

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Designed to provide economical and ergonomic solutions for shielding sources below. Each tile combines the attenuation properties of T-Flex® with the durability of a work mat. They also can be cut for in field adjustments. The floor shielding features a non-slip diamond tread surface.

- Dry Cask Platforms
- Scorpion Platforms
- Refuel Bridge
- RCP Platform

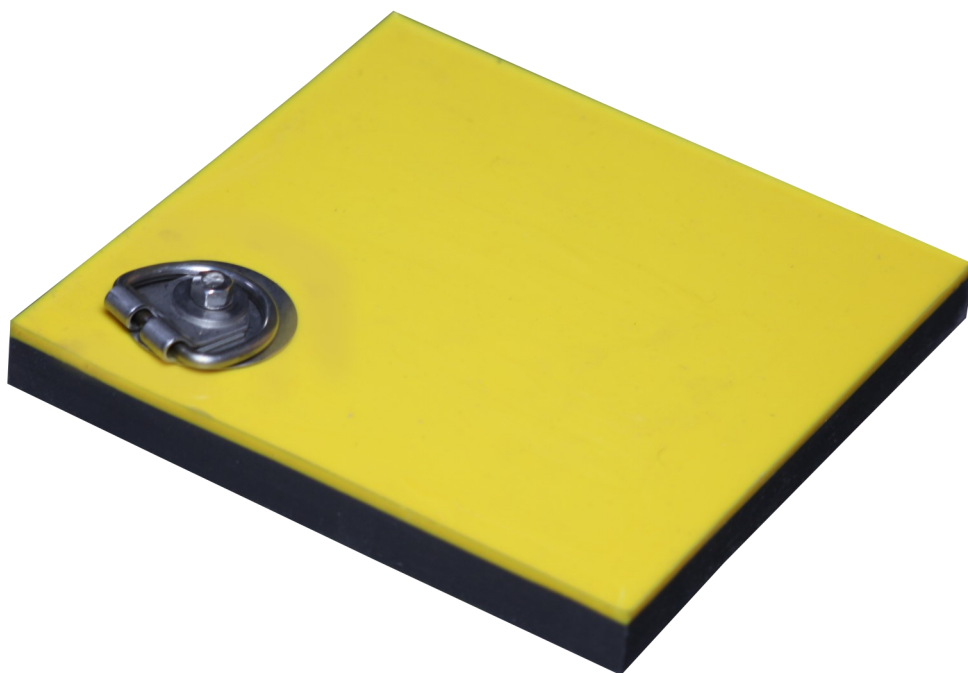


Material	lb/ft ²	Thickness	Attenuation
T-Flex® Tungsten	10	0.375"	25%
T-Flex® Bismuth	10	0.515"	24%
T-Flex® Iron	10	0.765"	18%
T-Flex® Tungsten	15	0.505"	32%
T-Flex® Bismuth	15	0.725"	33%
T-Flex® Iron	15	1.125"	26%
T-Flex® Tungsten	20	0.645"	39%
T-Flex® Bismuth	20	0.945"	41%
T-Flex® Iron	20	1.475"	32%

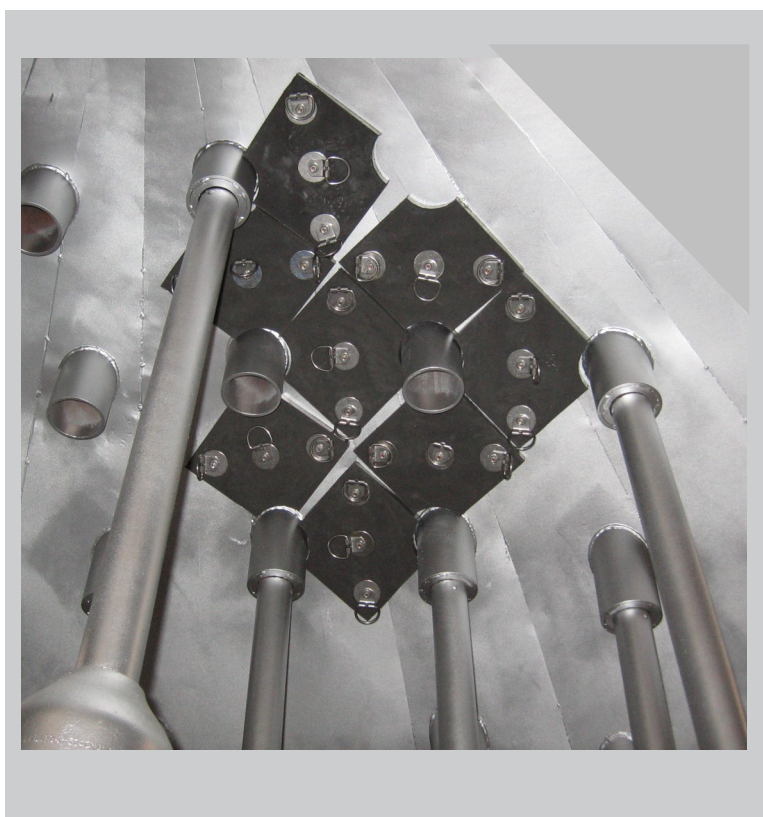
T-Flex® Shielding

magnetic

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Magnetic tiles cling to any carbon steel surface allowing for a variety of applications. Each tile installs easily and quickly and is removed by pulling a D-ring. They are available with magnets strong enough for use under RX head.



T-Flex® Shielding

blankets



An alternative to lead blankets, similar attenuation characteristics without the lead hazard. T-Flex Blankets can be cut in the field using a utility knife, but can stand up to normal wear and tear. Increased flexibility over a standard lead blanket allows for wrapping shielding closer to the source and easier handling characteristics.

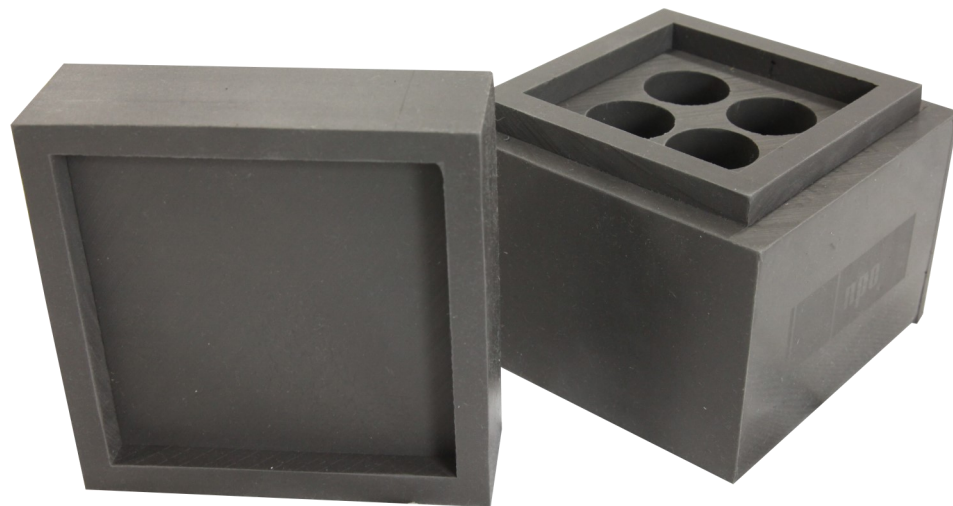


Material	Size	lb/ft ²	Attenuation	Weight
T-Flex® Tungsten	1' x 3'	10	19%	30 lb
T-Flex® Tungsten	1' x 3'	15	27%	45 lb
T-Flex® Tungsten	1' x 4'	10	19%	40 lb
T-Flex® Tungsten	1' x 4'	15	27%	60 lb
T-Flex® Bismuth	1' x 3'	10	20%	30 lb
T-Flex® Bismuth	1' x 3'	15	29%	45 lb
T-Flex® Bismuth	1' x 4'	10	20%	40 lb
T-Flex® Bismuth	1' x 4'	15	29%	60 lb

T-Flex® Shielding

laboratory

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The non-toxic T-Flex® Beaker and Vial Shields provide a convenient method of reducing extremity dose when using radioactive solutions in laboratory environments. Transport and store beakers and vials either on an individual basis or all together in a rolling case.



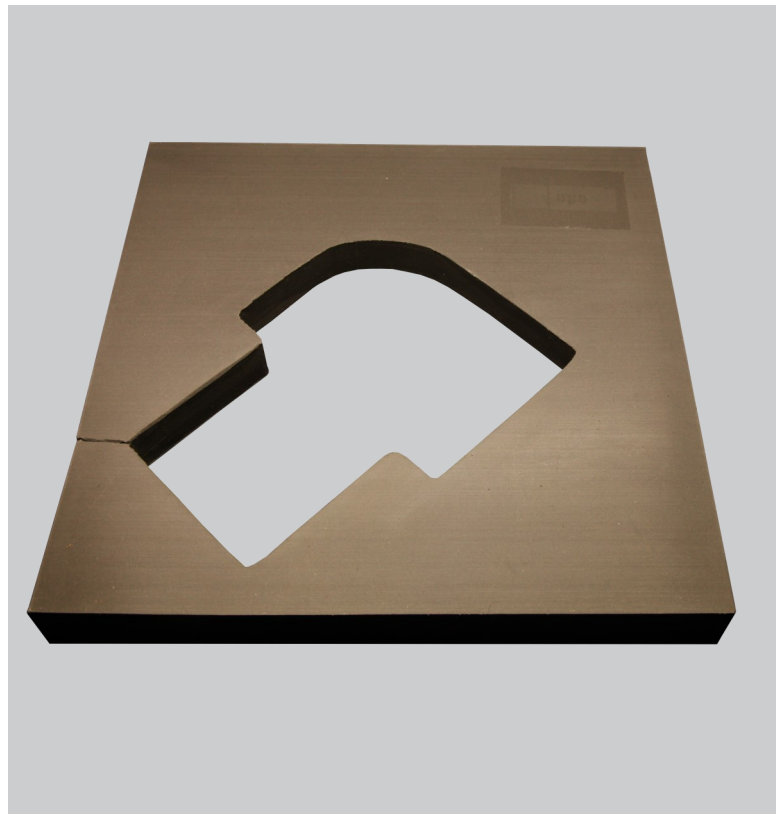
T-Flex® Shielding

custom

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The silicone base for T-Flex allows for complex and custom shapes. Custom molded shapes allows the shielding to get nearest to the source as possible and be more effective at reducing the overall dose.



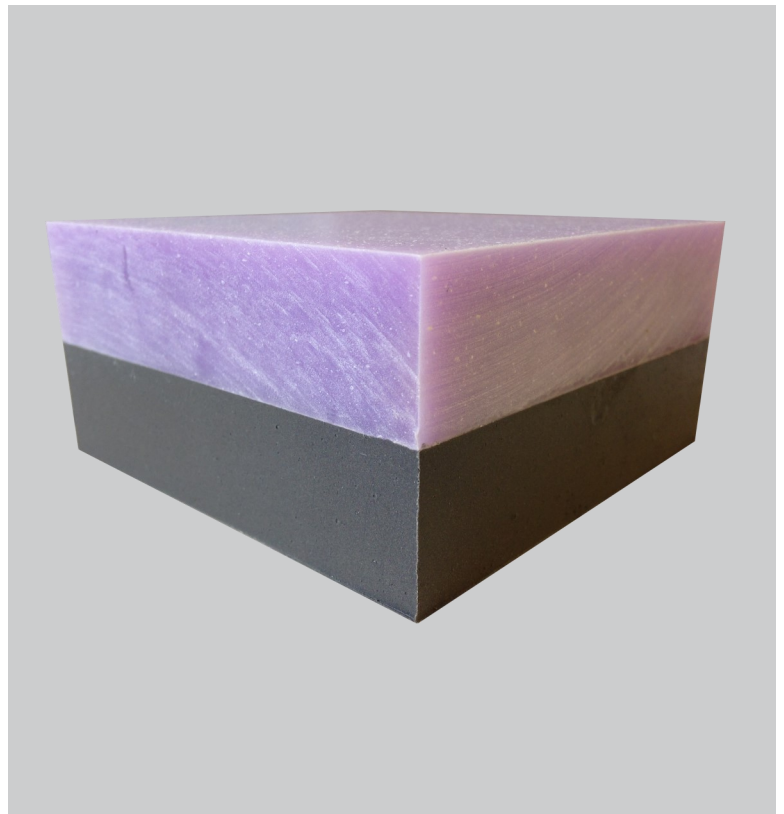
T-Flex® Shielding

dry cask — composite

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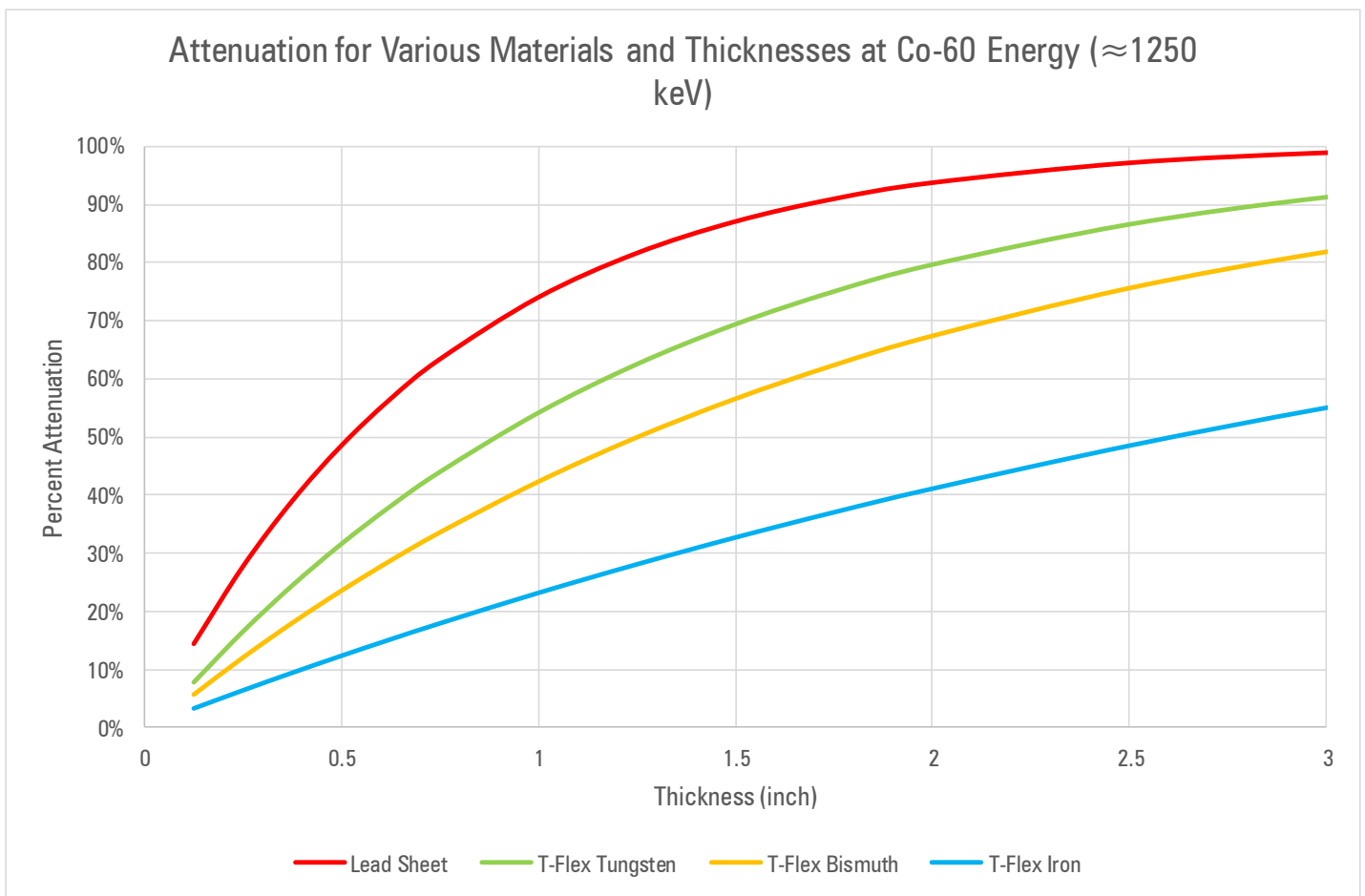
T-Flex® dry cask composite shielding is designed to tackle both neutron and gamma sources associated with dry cask operations. T-Flex is an excellent gamma and neutron attenuator and this shielding is supplemented by an additional neutron attenuator such as a borated polyethylene.



Gamma Attenuation

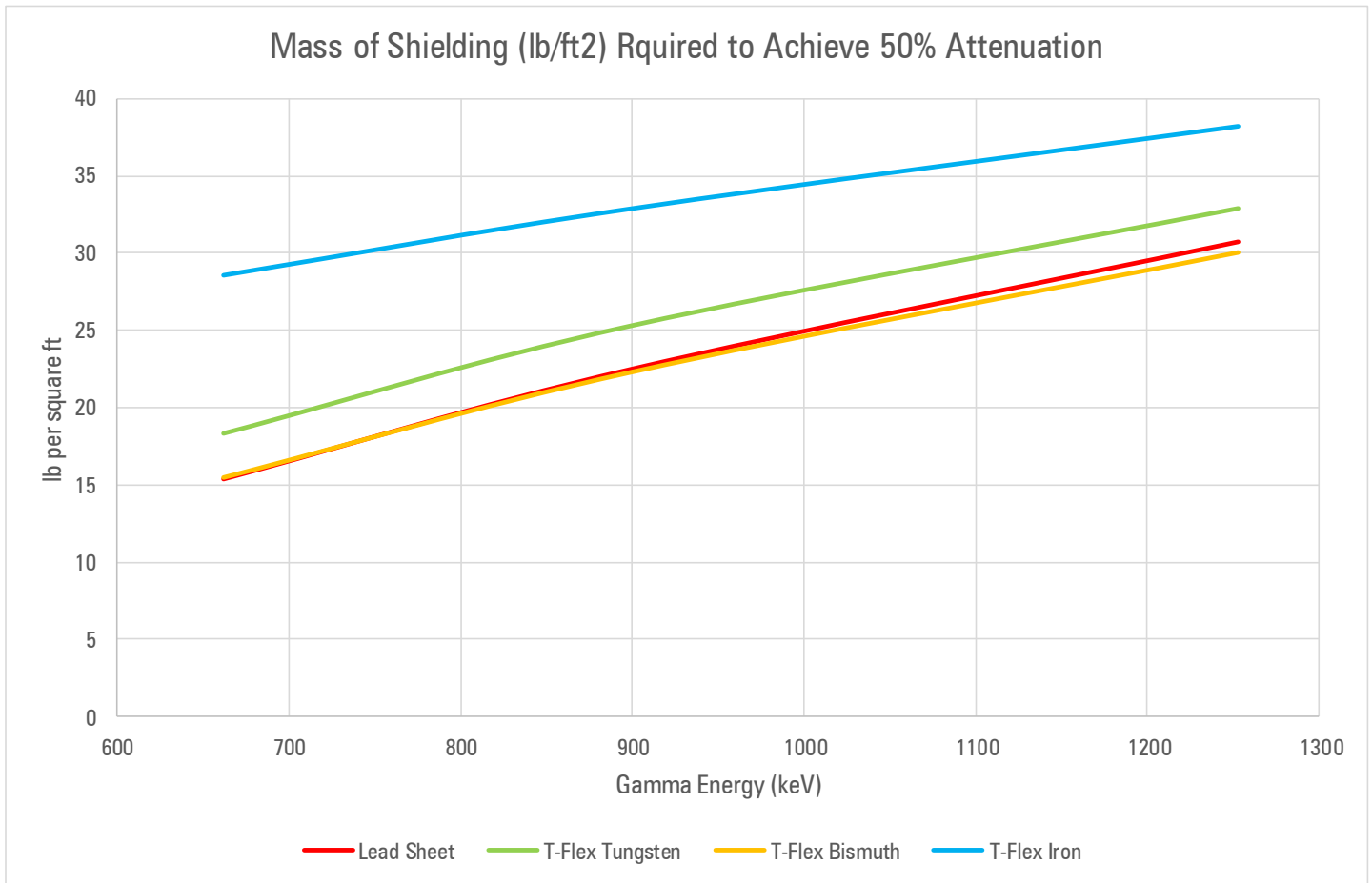
Gamma Attenuation by Type of Material

Attenuation for Various Materials and Thicknesses at Co-60 Energy (≈1250 keV)													
Material	Thickness (inch)												
	0.125	0.25	0.375	0.5	0.625	0.75	1	1.25	1.5	1.75	2	2.5	3
Lead Sheet	14%	28%	39%	48%	57%	63%	74%	82%	87%	91%	94%	97%	99%
T-Flex Tungsten	8%	17%	25%	32%	38%	44%	54%	62%	69%	75%	80%	86%	91%
T-Flex Bismuth	6%	12%	18%	24%	29%	34%	42%	50%	57%	62%	67%	76%	82%
T-Flex Iron	3%	6%	9%	12%	15%	18%	23%	28%	33%	37%	41%	48%	55%



Gamma Attenuation

Gamma Attenuation by Type of Material



The physics of gamma radiation shielding and the attenuating impact of available shielding materials can be distilled down to “mass-in-the-path”. For gamma energies approaching Cobalt-60 (1.25 MeV), achieving 50% attenuation or half-value-layer (hvl) will have very similar weights per unit area. What will vary is the thickness of the material necessary to achieve the desired attenuation.

npo

As a 35+ year veteran company to the shielding industry, employees at NPO attribute a great deal of our success to the partnerships established with our customers. At NPO, we work synergistically with our customers, adapting product designs that conform to their specifications. In fact, over the last three years alone, NPO has customized 199 new product parts to meet the unique ALARA challenges our customers have faced. We would like to extend this partnership to your team as well. Please contact us today to discuss how NPO can support you.

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