Radiation Shielding

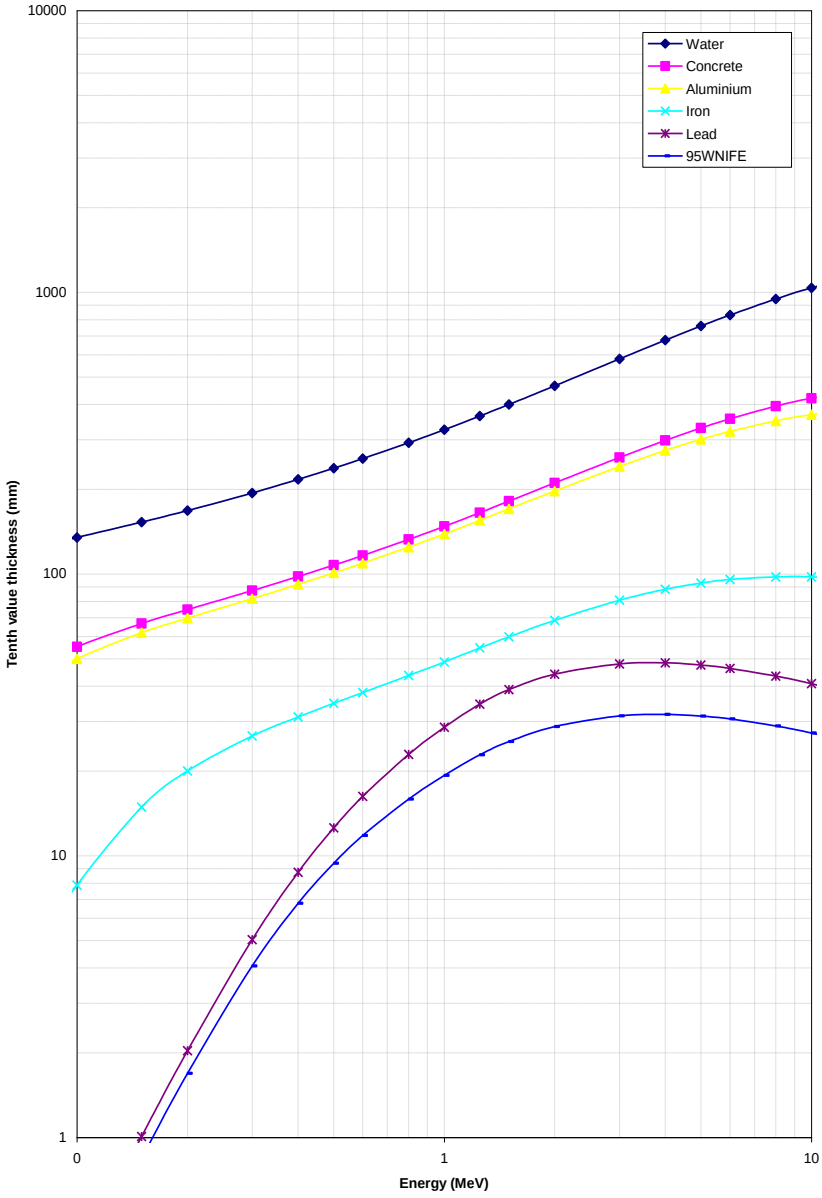
Introduction

Guangxi Chentian Metal Products Co., Ltd 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 95WNIFE and other shielding materials showing tenth-layer thickness (narrow beam/ radiation) as a function of incident beam energy. Data supplied by the National Physics Laboratory.

Graph 1 - Comparative Absorption Data as a Function of Energy



Radiation Shielding

Comparative Absorption Data

Within the 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 Guangxi Chentian Metal Products Co., Ltd 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

	90WNIFE	95WNIFE	Lead
% Tungsten	90.0	95.0	0
Narrow bean Radiation tenth layer thickness, mm	24.8	24.3	38.3
Half thickness, mm	7.5	7.0	11.7

Tungsten Alloy Radiation Shield

Tungsten Alloy Radiation Shield is a best choice for radiation shielding applications, which could be used in both medical fields and industrial areas. Compared to traditional radiation shielding materials, such as lead, it provides excellent properties. High-density alloy can provide the same energy absorption as lead using 1/3 less material. People are taking advantage of tungsten alloy's reliable radiation shielding properties.

Tungsten Medical Radiation Shielding

Guangxi Chentian Metal Products Co. Ltd could offer tungsten alloy radiation shield, which is used for radioactive source containers, gamma radiography, X-ray shields and industrial instrumentation. Tungsten shielding is also serving as collimators and radiation shielding in cancer therapy, as well as syringe protection for radioactive injections. Guangxi Chentian Metal Products Co. Ltd usually offer tungsten alloy radiation shielding as per the following standard. Besides, Guangxi Chentian Metal Products Co. Ltd could also design and make special size based on different properties:

Grade	Application
HA170	HA170 is the most ductile and readily machinable grade. Common application areas include counterbalancing weights for the aviation and aerospace industries, crankshaft and auto racing car, bucking bars for rivet setting, and radiation shielding.
HA175	HA175 is commonly used to produce chatter-resistant boring bars and tool shanks as well as radiation shielding components.
HA180	HA180 is often applied where size is a factor in the placement of balance or ballast weights. It should be typically of parts with small volume but heavy density. Other applications include radiation shields and collimators of x-ray or gamma ray beams.
HA185	The densest of the Ni-Fe binder alloys with tungsten, and is the preferred grade for radiation shielding in the medical imaging industry.
HA170C	Adding copper as a substitute for iron in the binder phase, as there is requirement for nonmagnetic working environment and ideal choice for radiation shielding closing to a magnetic field.
HA180C	Much denser than HA170C that used as large shieldings in nonmagnetic working environment needed.

Tungsten Industrial Radiation Shielding

Tungsten shileding is used in research activities as collimators (devices which guide or focus beams of radiation) or containers for radioactive isotopes.Nuclear research use nuclear reactors or cyclotrons to study or create radioactive materials. Tungsten alloy radiation shielding is ideal for radiation protection for both X-ray and Gamma-ray. High density of it is more than 60% denser than lead, which allows a reduction in the physical size of shielding components.

Tungsten alloy radiation shielding is usually used in the following applications:

Non Destrcive Testing (NDT)

NDT methods may rely upon use of electromagnetic radiation, sound, and inherent properties of materials to examine samples, which includes some kinds of microscopy to examine external surfaces in detail. Although sample preparation techniques for metallography, optical microscopy and electron microscopy are generally destructive as the surfaces must be made smooth through polishing or the sample must be electron transparent in thickness. The inside of a sample can be examined with penetrating electromagnetic radiation, such as X-rays or 3D X-rays for volumetric inspection.Tungsten alloy radiation shielding could be used for radiation protection from the harm radiation.

Geologging

Geologging is an exploration technique used mainly in the oil and gas industries. It is also known as wireline logging and borehole logging. A gamma ray source is lowered into a borehole and the radiation penetrates the rock strata. This data can then be analysed to determine whether deposits of gas or oil are present. Tungsten alloy is used to shield the radioactive source and to act as a collimator for the gamma beam.

Pipe-line inspection Gamma

Radiation is used to inspect welds and to detect cracks in pipelines. A gamma source is mounted on a remote-controlled wheeled trolley (sometimes called a "pig") and travels inside the length of the pipe. A tungsten collimator is used to direct the radiation onto the target, whilst the radioactive source is housed inside tungsten shielding.

Why Use Tungsten Alloy Radiation Shielding?

When Guangxi Chentian Metal Products Co. Ltd designing tungsten radiation shielding, it will be calculated according to requirements of shield to abate the multiple shielding materials' thickness:

Formula: K = e0.693 d / △1/2

K: Shield weakened multiple

△ 1/2: The tungsten nuclear radiation shielding material of the half-value layer values

d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the

material can be obtained. In this way, tungsten alloy radiation shielding could be much thinner to have the same protection ability compared with other material such as lead or Al2O3.

Tungsten Radiation Shielding

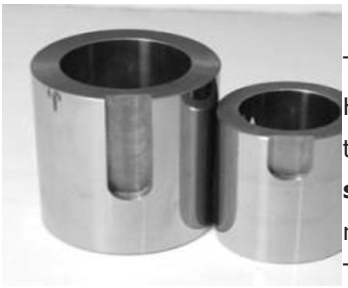
Why Do We Need Tungsten Alloy Radiation Shielding?

With rapid development of medical science, more and more **tungsten radiation shielding**s are used in our lives. Medical instruments x-ray and nuclear power stations have become widespread and are now affecting all our lives. It is essential that people paid more attention to radiation and even more important for the institutions to protect public from the radiation exposure and to make sure to protect every radiation source of X-ray radiation, gamma radiation (energetic electromagnetic radiation), radiation of alpha particles (helium atoms) beta particles (electrons) and cosmic radiation, etc.

In order to protect patients, doctors, nurses and other people who may be exposed to radiation, sources of the radiation must be safely separated and shielded. It is crucial that holding and delivery instruments for radioactive materials would keep the radiation levels low enough, not to create harmful effects of ionizing radiation such as breast cancer, skin cancer, etc. Lead and steel are the traditional protection materials, but **tungsten alloy radiation shielding** is without a doubt the best solution. Excellent radiation-absorption and radiation shielding, twice the density of lead and good physical resistance are main reasons to use tungsten alloy radiation shielding.

Advantage of Tungsten Alloy Radiation Shielding

Experts find that radiation exposure could be reduced by maxing shielding.

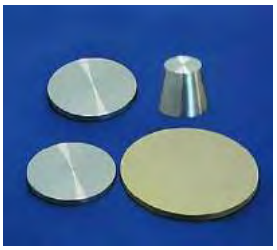


The density of a material is related to its radiation protection ability. Higher density means better stopping and absorbing radiation ray . Due to a higher density than most other materials, **tungsten radiation shielding** has a much higher ability of absorbing and stopping almost rays than others metals such as the traditional radiation shielding - lead. Tungsten radiation shielding greater linear attenuation of gamma radiations means that less is required for equal shielding. Alternatively equal amounts of tungsten shielding provide diminished exposure risks than equivalent lead

Tungsten heavy alloy is the right material for radiation protection, as its combination of radiographic density (more than 60% denser than lead), machinability, good corrosion resistance, high radiation absorption (superior to lead and steel), simplified life cycle and high strength. Tungsten radiation shielding can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers. Besides, compared with lead or depleted uranium (DU),tungsten radiation shielding is more friendship for the environments both lead and DU for it is no any toxic.
PDF Download)

Applications of Tungsten Radiation Shielding

The usage of tungsten heavy alloy in radiation protection is not subject to NRC, EPA, or special OSHA regulations, so it has been widely used in nuclear medicine as collimator, isotope container, cancer treatment source holder, etc.



Radioactive source containers
Gamma radiography tungsten alloy radiation shielding
Tungsten alloy radiation shielding block
Tungsten alloy radiation shielding source holders for oil well logging
Tungsten heavy alloy X-ray collimators
Tungsten alloy PET syringe shield
Shielding in cancer therapy machines

Syringe protection for radioactive injections
Tungsten heavy alloy syringe shielding
Nuclear shielding wall
Tungsten Alloy FDG container
Tungsten heavy alloy inspect welds
Nuclear testing equipment
Nuclear power plant shielding

Radiation shielding barrel
Isotope production, transport, and containment
Personal protection equipment for emergency responders
Large container inspection devices
Oncology Isotopic and accelerator based platforms
Pipe-line inspection Gamma
Defense for nuclear submarines

Tungsten Shielding

Guangxi Chentian Metal Products Co. Ltd have been manufacturing and offering tungsten related products for more than 20 years, and we have been able to manufacture, export and supply an optimum quality of tungsten alloy radiation shielding. Tungsten radiation shielding in different sizes and specifications according to the need of our esteemed clients are available for us to supply. Our tungsten radiation shielding products are widely used in PET rooms, linear accelerators, HDR rooms, gamma knife, and nuclear power plants.

Key Features of Tungsten Alloy Radiation Shielding :

1. tungsten alloy radiation shield is capable for radiation exposure that could be reduced by maxing shielding.
2. tungsten alloy radiation shield is having higher density therefore it has better stopping power and shielding capability
3. Equal amounts of tungsten alloy radiation shield provides reduced risks rather than equivalent lead

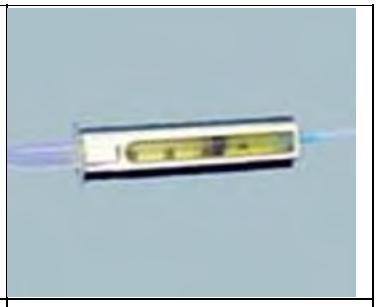
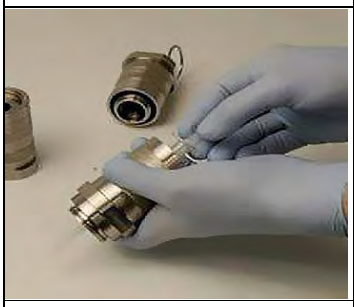
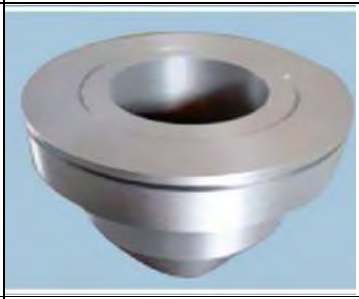
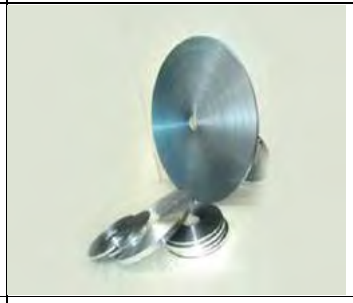
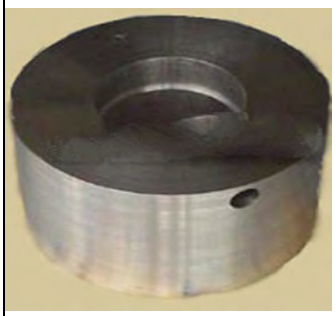
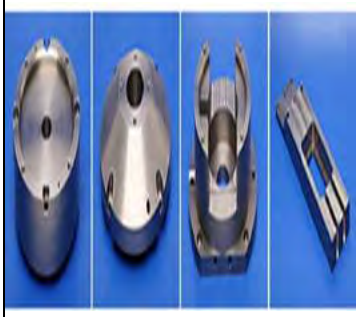
shielding

4. tungsten alloy radiation shield is having radiographic density that is 60 % more denser than lead
5. tungsten alloy radiation is having high level of machineability and this is good corrosion resistance
6. tungsten alloy radiation shield is importantly reducing thickness of containers and shields

Main Application of Tungsten Alloy Radiation Shielding

• tungsten alloy radiation shield is wisely used as radioactive source containers
• tungsten alloy radiation shield is used as Gamma radiography shields
• tungsten alloy shielding block and X-ray colimators are some crucial usage of this tungsten alloy radiation shield
• tungsten alloy radiation shield is shielding in cancer therapy machines
• tungsten alloy radiation shield is used for tungsten syringe shielding and nuclear shielding wall

We are able to customize this tungsten alloy radiation shield as per client's requiremen

		
Radiation Protection Sheets	Tungsten Medical Radiation Shielding Clip	Tungsten Alloy Syringe Shield
		
Tungsten Alloy Syringe Shield Clip	Tungsten Iridium Stream Mouth	Tungsten Alloy Radiation Housing
		
Tungsten Alloy Radiation Cover	Nuclear Shielding	Radiation Shielding Equipment

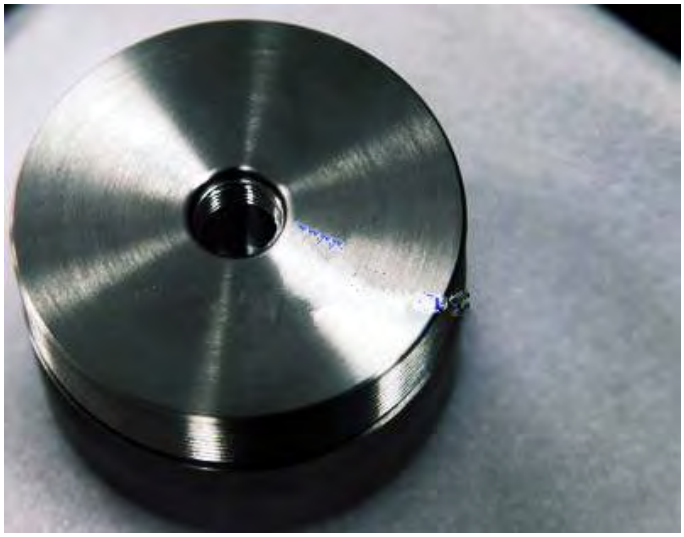
		
Tungsten Radiation Shielding Device	Tungsten Alloy Radiation Shielding	Tungsten Alloy Mobile Radiation Shielding
		
Tungsten Syring	Tungsten Alloy Radiation Shell	Tungsten Funnel
		
Tungsten Medical Radiation Holder	Tungsten Radiation Container	Tungsten Nuclear Medical Radiation Shielding
		
Tungsten Alloy Radiation Cap	Tungsten Alloy X-ray Target	Tungsten Alloy Drum

Tungsten Radiation Safety Precautions

The energy absorbing propertiesof tungsten alloys make them exceptional choices for**Radiation Safety Precautions**in both and industrial settings.

>Compared with other metals tungsten heavy alloy are far superior in terms of absorptionof high energy beams and radiation;They have extremely low gas emissions in high vacuum and are superior in

mechanical strength and processing workability.They are ideal such applications as medical equipment,nuclear power plants and other radiation shielding applications.



Benefits of tungsten alloy for Radiation Safety Precautions

High radiation attenuation good shielding capability
Thinner and often lighter than equivalent lead shields
Easy tosterilise& keep clean
Non-toxic
Easily machined with conventional tools
Dimensionally stable up to 1000°C
Hard and durable–no need for steel or plastic coating
A team with over 20 years experience in tungsten

Our tungsten alloys are used for radioactive source containers gamma ray protection,;radiation;shields,x-ray shielding and source holders;for oil-well,logging,and industrial instrumentation.We can also use our tungsten alloys to make collimators and shielding cancer therapy machines and as syringe protection for radioactive injections.

Medical Applications of Tungsten Alloy

Heavy metal alloys are pseudo-alloys of tungsten with a nickel-iron or nickel-copper matrix. They are produced by powder metal and sintering processes.

Tungsten's hardness and high density make it ideal for the manufacture of heavy metal alloys that are critical in the field of X-ray generation and radiation shielding. Generally, the absorption of X-rays and gamma radiation is in direct proportion to the density of the shielding material. tungsten alloys provide extremely efficient radiation shielding and protection.

The absorption of x-ray and gamma radiation is in direct proportion to the density of the shielding material. Tungsten High Density Composites are more than 1.5 times as effective as lead and provide extremely efficient protection, particularly where space is limited.

Medical Products

X-ray anodes, collimator or anti-scatter plates, radiation shielding, radioactive source containers, and syringe covers for radioactive isotope injection and radiopaque markers

Tungsten Alloy Radiation Shielding Equipment

With rapid development of medical science, more and more **tungsten alloy radiation shielding equipments** are used in our lives. Medical instruments x-ray and nuclear power stations have become widespread and are now affecting all our lives. It is essential that people paid more attention to radiation and even more important for the institutions to protect public from the radiation exposure and to make sure to protect every radiation source of X-ray radiation, gamma radiation (energetic electromagnetic radiation), radiation of alpha particles (helium atoms) beta particles (electrons) and cosmic radiation, etc.

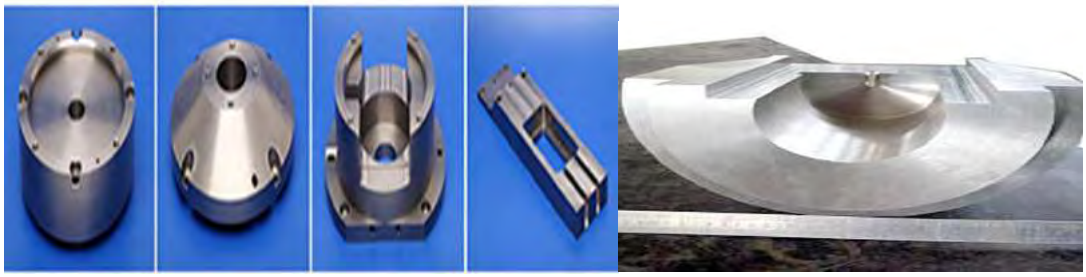
In order to protect patients, doctors, nurses and other people who may be exposed to radiation, sources of the radiation must be safely separated and shielded. It is crucial that holding and delivery instruments

for radioactive materials would keep the radiation levels low enough, not to create harmful effects of ionizing radiation such as breast cancer, skin cancer, etc. Lead and steel are the traditional protection materials, but tungsten alloy radiation shielding is without a doubt the best solution. Excellent radiation-absorption, twice the density of lead and good physical resistance are main reasons to use tungsten alloy radiation shielding.

Applications of Tungsten Radiation Shielding Equipment

The usage of tungsten heavy alloy in radiation protection is not subject to NRC, EPA, or special OSHA regulations, so it has been widely used in nuclear medicine as collimator, isotope container, cancer treatment source holder, etc.

Radioactive Source Containers
Gamma radiography tungsten alloy radiation shielding
Tungsten alloy radiation shielding block
Tungsten alloy radiation shielding source holders for oil well logging
Tungsten heavy alloy X-ray collimators
Tungsten alloy PET syringe shield Shielding in cancer therapy machines
Syringe protection for radioactive injection
s Tungsten heavy alloy syringe shielding Nuclear shielding wall
Tungsten Alloy FDG container
Tungsten heavy alloy inspect welds Nuclear testing equipment
Nuclear power plant shielding Radiation shielding barrel Isotope production, transport, and containment
Personal protection equipment for emergency responders
Large container inspection devices
Oncology Isotopic and accelerator based platforms
Pipe-line inspection Gamma
Defense for nuclear submarines



Tungsten Alloy Radiation Container

Tungsten alloy is used in many radiation-shielding applications including industrial, nuclear and medical. Because of its high density and high atomic number, is an effective construction material for shielding

against gamma rays and x-rays. Lead and boron carbide can shield radiation too, but cannot perform as well as tungsten alloy.

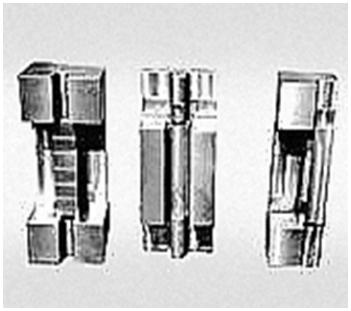
Tungsten alloy is a suitable raw material for **tungsten alloy radiation container**, because of tungsten alloy radiation container combination of radiographic density (more than 60% denser than lead), good machinability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high strength. Tungsten alloy radiation shielding can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers. Moreover, compared with lead or depleted uranium, tungsten alloy is more acceptable in this case, for it is non-toxic and environmentally friendly material.

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shielding provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy radiation container material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for tungsten alloy radiation shielding.

Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Alloy Radiation Shielding



Tungsten Alloy Radiation Shielding

Tungsten Alloy Radiation Container

A main application of tungsten alloy products, tungsten alloy radiation containers are widely applied in medical and nuclear industries.

Owing to its excellent radiation resistance, tungsten heavy alloy has gradually replaced lead shields to become the main shielding materials in many industries to protect the radiation.

Tungsten alloy radiation container is a flexible heat-resistant tungsten alloy raidation shielding made of tungsten and iron metal powder immersed in a silicone polymer. Lead blankets have been the backbone of tungsten alloy radiation shielding applications for years but, in comparison, is a less effective and efficient tungsten alloy raidation shielding choice. Due to the ability to place the maximum amount of weight between the source and the worker, the new generation tungsten alloy radiation shielding has proven to be up to twice as effective as lead in lowering exposure rates.

Designed in custom shapes, tungsten alloy radiation container has the ability to field-fit, providing for attenuation of radiation totaling from 5 to 10 person-Ram/years than provided by the equivalent weight of traditional lead blanket. Additionally, the tungsten alloy radiation shielding weighs 25 to 50 percent less than lead while removing the accompanying toxicity hazard and mixed waste processing costs.

Tungsten Alloy Radiation Cover

The radiation cover has been used for several decades now. The early radiation cover was not very efficient and very expensive due to technological reasons. It was used by the people who worked on radar and microwave transmission. As the development of the technology, the efficiency of the radiation cover has been highly enhanced; it can efficiently resist and refract the X-ray, UV, microwave radiation and so on. As radiation level rise and becomes a problem, it is crucial to protect body from it. **Tungsten alloy radiation cover** for plasma accelerator is necessary. Because of high density and smallest capacity, tungsten alloy material is gaining popularity as body protection, tungsten radiation cover against plasma accelerator radiation. Compared with lead, tungsten is much smaller but with higher density, which is very helpful for high radiation absorption. It is more than 60% denser than lead with excellent machinability and good corrosion resistance. And more important, tungsten ally is environmentally friendly and non-toxic.

Advantages of Tungsten Alloy Radiation Cover

Experts find that radiation exposure could be reduced by maxing shielding. The density of a material is related to its radiation stopping ability. Higher density means better stopping power and shielding. Due to a higher density, tungsten heavy alloy has a much higher stopping power than lead. Its greater linear attenuation of gamma radiations means that less is required for equal shielding. Alternatively equal amounts of tungsten shielding provide diminished exposure risks than equivalent lead shielding.

Tungsten heavy alloy is a suitable raw material for tungsten alloy radiation cover to radiation protection, as its combination of radiographic density (more than 60% denser than lead), mach inability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high strength. Tungsten alloy radiation cover can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers. Besides, compared with lead or depleted uranium in the past, tungsten heavy alloy is more acceptable in tungsten alloy radiation cover, for they are non-toxic.

Why Use Tungsten Alloy Radiation Cover?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation cover provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for radiation shielding.

Tungsten alloy radiation cover for syringe

Tungsten alloy radiation cover plate

Tungsten alloy radiation cover to shield α-ray,β-ray,γ-ray

Tungsten alloy radiation cover to protect the lamp

Medical Application Series of Tungsten Alloy Radiation Cover Shielding Materials in Medical:

1 .Tungsten alloy (tungsten heavy alloy) Multi-leaf Collimator(MLC)

Nuclear Technology Application Series of Tungsten Alloy Radiation Cover Shielding:

1. 60Co and tungsten alloy containers of other radiation shielding;

The Application of Tungsten Alloy Radiation over Shielding Parts:

• Radioactive source containers

• Shielding in cancer therapy equipments

During design of shielding, it is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
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The usage of tungsten alloy radiation cover is not subject to NRC, EPA, or special OSHA regulations, so it has been widely used, such as:
Radioactive source containers
Gamma radiography shields
Shielding block
Source holders for oil well logging and industrial instrumentation
X-ray

Tungsten Alloy Radiation Cap

Tungsten Alloy Radiation Cap

As medical science developing so repaid, there is more and more radiation in our life, which has become a new trouble, such as X-ray radiation, gamma radiation (energetic electromagnetic radiation), radiation of alpha particles (helium atoms) beta particles (electrons) and cosmic radiation, etc. Tungsten alloy radiation cap protect us from the radiation. Tungsten alloy radiation shielding is better than shielding made by other materials.

Tungsten alloy radiation shielding is ideal product against X rays and gamma radiation. The very high density of tungsten alloy radiation shielding allows a reduction in the physical size of shielding components,

without compromising their rigidity or the effectiveness of the tungsten alloy radiation shielding characteristics.Tungsten alloy radiation shielding offered by us is qualified, we can provide **tungsten alloy radiation cap** as your requirements.

Followings are tungsten alloy radiation shieldings

Tungsten Alloy Radiation Cap

Tungsten Alloy Radiation Shielding

Why Use Tungsten Alloy Radiation Cap?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation cap provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy radiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for raidation shielding. Tungsten alloy radiation shielding is better than lead materials for it is non-toxic.

During design of tungsten alloy radiation shielding,tungsten alloy radiation cap is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
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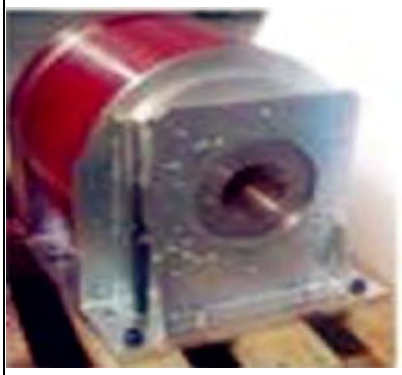
Specification of tungsten alloy radiation cap Nuclear testing equipment Nuclear power plant shielding Radiation shielding barrel Isotope production, transport, and containment Personal protection equipment for emergency responders Large container inspection devices Oncology Isotopic and accelerator based platforms Pipe-line inspection Gamma Defense for nuclear submarines	

Tungsten Alloy Radiation Housing

What Is Tungsten Alloy Housing Shielding?

With rapid development of medical science, more and more radiation instruments are used in our lives. Medical instruments and nuclear power stations have become widespread and are now affecting all our lives. It is essential that people paid more attention to radiation and even more important for the institutions to protect public from the radiation exposure and to make sure to protect every radiation source of X-ray radiation, gamma radiation (energetic electromagnetic radiation), radiation of alpha particles (helium atoms) beta particles (electrons) and cosmic radiation, etc.

In order to protect patients and personnel from harmful effects of ionizing radiation, such as breast cancer, skin cancer, etc an excellent radiation-absorbing medium is badly needed. **Tungsten alloy housing shielding** is the material to be used for radiation shielding.

tungsten alloy radiation shieldingagainst X-rays and gamma radiation. The very high density of tungsten alloy housing shielding (more than 60% denser than lead) allows a reduction in the physical size of shielding components, without compromising their rigidity or the effectiveness of the tungsten alloy radiation shielding characteristics.

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, **tungsten alloy radiation shielding** provide excellent density with small capacity. At the same weights tungsten alloy radiation shielding with high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy housing shielding could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for tungsten alloy radiation shielding and tungsten alloy housing shielding.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

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d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Followings Are Pictures of Tungsten Alloy Radiation Shieldings

Tungsten Alloy Radiation Shielding-01

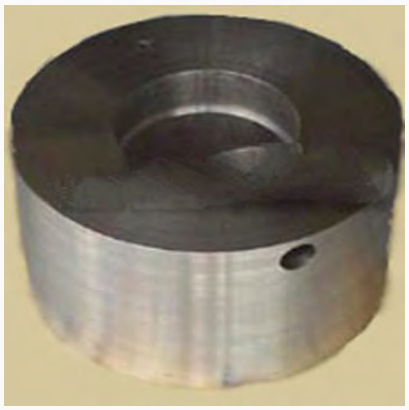
Tungsten Alloy Radiation Shielding-02

Our clients across the world are taking advantage of tungsten alloy housing shielding properties. If you need to protect yourself, your patients or your equipment from the harmful effects of excess radiation, you have come to the right place!
Our products are available as finished machined parts or as short rod, round bar, and rectangular blocks.

With almost everyone using the mobile phone right now, tungsten alloy radiation shielding from mobile phones becomes a notable problem. Electromagnetic radiation is present in mobiles because they use radio frequency (RF) waves to make and receive calls. The doses are considered very small, as the emissions are low power (short range). Nevertheless, there are ways in which you can reduce exposure to these waves. Experts are currently developing ways to avoid mobile radiation and tungsten alloy radiation shielding is very promising material in this field.

Tungsten alloy housing shielding is designed for managing large quantities of high-energy radio nuclides. A convenient lever allows quick adjustment of window to optimal angle for any user and procedures. A special plate with a hex-shaped recess is mounted on the base to facilitate one-handed loading and unloading of dose pigs incorporating hex-shaped bott

Tungsten Radiation Shielding Application



Tungsten alloy is a best choices for **tungsten radiation shielding application**, in both medical and industrial settings. Tungsten alloy radiation shielding provide excellent alternative for traditional radiation shielding materials. High-density tungsten alloy radiation shielding can provide the same energy absorption as lead using 1/3 less material. People are taking advantage of tungsten alloy's reliable radiation shielding properties.

Guangxi Chentian Metal Products Co. Ltd tungsten alloy radiation shielding is used for radioactive source containers, gamma radiography, shields, and industrial instrumentation. Tungsten alloy radiation shielding application is also serving as collimators and radiation shielding in cancer therapy, as well as syringe protection for radioactive injections.

Tungsten alloy radiation shielding gives people best protection from the harmful radiation. Meet to the AMS 21014 and ASTM B777 material standard, we can offer tungsten alloy radiation shielding with finished machining by CNC according to clients drawings.

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy provide excellent density with small capacity. With the same weight, high-density alloy can provide the same energy absorption as lead using 1/3 less space.

While designing, shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the

material can be obtained.

The popular tungsten alloy radiation shielding material properties are as below:

Chemical Properties	90WNiFe	90WNiCu	92.5WNiFe	95WNiFe	95WNiCu
Density (g/cm3)	17.1	17.0	17.5	18.0	18.0
Hardness (HRC)	25	25	26	27	28
Ultimate Tensile Strength (kpsi)	120	110	115	110	100
Yield Tensile Strength (kpsi)	85	75	80	80	75
Elongation at Break (%)	3	10	7	5	2

Tungsten Radiation Shielding Application

Monochromatic Beam Shutters

Geologging

Pipeline inspection Gamma
("pig") and travels inside the length of the pipe. Tungsten collimator is used to direct the radiation onto the target, whilst the radioactive source is housed inside tungsten shielding.

Industrial radiography
pipelineinspection, tungsten radiation shielding application is coupled with a tungsten collimator.

Homeland Security and Border Control

Radiation Shielding Used in Cancer Treatment

Tungsten Radiation Shielding Pictures

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, **tungsten alloy radiation shielding**provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy radiation shielding material could be made

with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for shielding.

Tungsten alloy radiation shielding offered by Guangxi Chentian Metal Products Co. Ltd is qualified, we can offer as per your requirements.

During design of tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
d: Tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Alloy Radiation Shielding Pictures Offered by CTOMS

Name	Tungsten Source Holder
Ref. N.W.	0.222~0.423kg/pc
Density	17.0 g/cm3

Name	Tungsten Radiation Shielding
Ref. N.W.	16.00kg/pc, 7.5kg/pc
Density	17.0 g/cm3

Density(g/cm3)	17.00
Size (mm)	Ø117×378, Ø63.5×348
Ref. Net Weight	49.03kg/pc,18.33 kg/pc

Density(g/cm3)	18.5
Size (mm)	Ø300×Ø51.0×450
Ref. Net Weight	571kg/pc

Density(g/cm3)	17.00+/-0.25	Density(g/cm3)	17.00+/-0.25
Size (mm)	Ø74.3×321	Size (mm)	Ø43×319

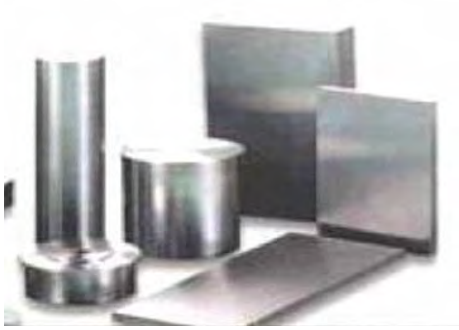
Ref. Net Weight	15.59kg/pc	Ref. Net Weight	7.52kg/pc

Tungsten For Non-Destructive Testing

Nuclear research establishments use nuclear reactors or cyclotrons to study or create radioactive materials. Guangxi Chentian Metal Products Co. Ltd 's tungsten alloy is used in research activities as collimators (devices that guides or focus beams of radiation) or containers for radioactive isotopes. Tungsten alloy is ideal for shielding against both X- and Gamma radiation. The very high density of tungsten shielding (more than 60% denser than lead) allows a reduction in the physical size of shielding components, without compromising the effectiveness of the shielding characteristics.

Non-Destructive Testing:

Industrial radiography uses gamma radiation to detect structural faults in materials such as metal and concrete. As with pipeline inspection, the equipment uses tungsten shielding for **non-destructive testing**, which is coupled with tungsten collimator. Thickness, density and level gauging radioactive sources are used in industrial processes to measure thickness, density or levels of materials during production e.g. paper, plastic film, steel sheet or surface coatings. The material passes between a radioactive source, which is housed in Guangxi Chentian Metal Products Co. Ltd 's tungsten alloy, and a detector. The strength of the detector signal is used to measure the thickness, density or level of the material.



The method of Non-Destructive Testing:

Non-destructive testing methods may rely upon use of electromagnetic radiation, sound, and inherent properties of materials to examine samples. This includes some kinds of microscopy to examine external surfaces in detail, although sample preparation techniques for metallography, optical microscopy and electron microscopy are generally destructive as the surfaces must be made smooth through polishing or

the sample must be electron transparent in thickness. The inside of a sample can be examined with penetrating electromagnetic radiation, such as X-rays or 3D X-rays for volumetric inspection. Sound waves are utilized in the case of ultrasonic testing which belong to Non-Destructive Testing. Contrast between a defect and the bulk of the sample may be enhanced for visual examination by the unaided eye by using liquids to penetrate fatigue cracks. One method (liquid penetrant testing) involves using dyes, fluorescent or non-fluorescent, in fluids for non-magnetic materials, usually metals. Another commonly used method for magnetic materials involves using a liquid suspension of fine iron particles applied to a part while it is in an externally applied magnetic field (magnetic-particle testing which belong to Non-Destructive Testing). Thermoelectric effect (or use of the Seebeck effect) uses thermal properties of an alloy to quickly and easily characterize many alloys. The chemical test, or chemical spot test method, utilizes application of sensitive chemicals that can indicate the presence of individual alloying elements.

Tungsten Alloy Instrument for Non-Destructive Testing:

Tungsten alloy instrument is suitable for radiation protection, as its combination of radiographic density (more than 60% denser than lead), machinability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high tensile strength. The tungsten alloy instrument used in the non-destructive testing can be radiation shielding against gamma radiation and X-rays that are used during the non-destructive testing. Guangxi Chentian Metal Products Co. Ltd provides all kinds of tungsten alloy instruments.

Tungsten Medical Radiation Shielding

Tungsten Medical Radiation Shielding

Tungsten heavy alloy medical radiation shielding is used in applications such as collimator, nuclear shielding, beamstop, PET syringe shield, vial shield, isotope container, FDG container, multi leaf collimator etc.

Main applications for Tungsten Medical Radiation Shielding:

Brachytherapy: when it is difficult to access the diseased cells directly, it is possible to use an alternative type of radiotherapy, known as afterloading (a version of brachytherapy). This technique consists of implanting a radioactive seed inside the patient's body, via a catheter. Before and after treatment the seed is kept in a large tungsten safe, to protect the patient and medical staff from radiation.

Positron Emission Tomography (PET)

Positron emission tomography (PET) is one of the nuclear medicine techniques available for diagnostics. Whilst X-rays provide information on the structure of the body, PET shows the chemical function of a particular organism. PET involves the injection of FDG (a glucose-based radionuclide) from a shielded syringe. As the FDG travels through the patient's body it emits gamma radiation that is detected by a gamma ray camera, from which the chemical activity within cells and organs can be seen. Any abnormal chemical activity may be a sign that tumors are present.

PET scans are frequently used to detect cancerous tumors and diseases of the brain and coronary arteries.

Applications for tungsten medical radiation shielding in PET include: PET syringe shield

Technetium generator

PET syringe shield

Tungsten vial shield

Nuclear Medicine Tungsten Radiation Shielding

What is Nuclear Medicine?

Nuclear medicine is a medical specialty involving the application of radioactive substances in the diagnosis and treatment of disease. Nuclear medicine scans are usually conducted by radiographers. Radiation is an effective tool within nuclear medicine for both diagnostics and

treatment of patients. Techniques such as SPECT and PET utilize radioactive materials injected into the patient, which are then monitored by gamma cameras (SPECT) or scanners (PET) to detect the presence of tumours in the body.

The Applications of Nuclear Medicine Tungsten Radiation Shielding

Tungsten alloy has excellent radiation attenuation properties, with thinner thickness but high effective in blocking harmful X-ray and gamma radiation. Tungsten alloy shielding is the best choice in nuclear medicine. And nuclear medicine tungsten radiation shielding is usually used in the nuclear medical equipment , such as collimator, linear accelerator, multileaf collimator,computed tomography,X-ray energy, absorptiometry, and gamma knife.

Why Use Nuclear Medicine Tungsten Radiation Shielding?

The advantages of tungsten alloy:
High radiation attenuation; good shielding capability
Thinner and often lighter than equivalent lead shields
Easy to sterilise and keep clean
Non-toxic
Easily machined with conventional tools
Hard and durable – no need for coating

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Cancer Treatment Tungsten Radiation Shielding

The Applications of Cancer Treatment Tungsten Radiation Shielding

During cancer radiation treatment, tungsten alloy radiation shielding can be used in cancer treatment tungsten radiation shielding of radiation therapy equipments, such as multileaf collimators (MLC), collimator, linear accelerator, computed tomography(CT), X-ray energy absorptiometry,and gamma knife.

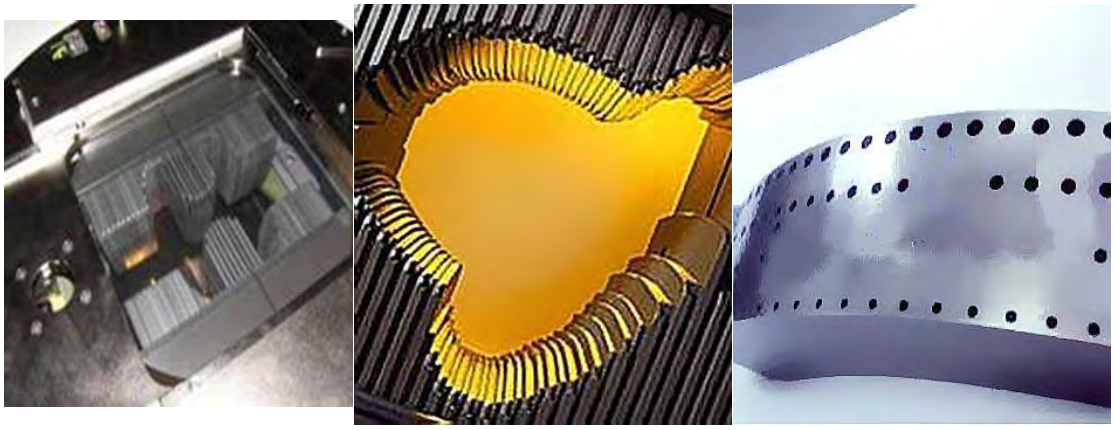
How Cancer Treatment Tungsten Radiation Shielding Works?

Most components of radiation shielding for treatment are tungsten alloy sheet based applications with a thickness range of about 0.1mm to 1.5cm. Cancer treatment tungsten radiation shielding helps to shape the beam of radiation emerging from the machine and can limit the maximum field size of a beam.
Providing the works of multileaf collimator as an example. An electric motor moves each individual tungsten alloy sheet in the collimator to the correct position – with up to 120 tungsten alloy sheets being used to shape the outline of the tumor with millimeter accuracy. Then, the tumor is exposed to high energy radiation. During this process, the tumor is radiated by turning the gantry with tungsten alloy multileaf collimator 360°around the patient. To protect the surrounding healthy tissue, a highly precise tungsten alloy multileaf collimator is necessary.

Why Use Cancer Treatment Tungsten Radiation Shielding?

Due to tungsten alloy materials has high density, which is 60% higher than lead, reduces the size of tungsten alloy ray shields, without affecting the radiation shielding effect the excellent radiation absorption of tungsten alloy. The sensitive of cancer treatment tungsten radiation shielding is much higher than radiation shielding produced by lead in the limit area. Since the environmental friendly characteristics of tungsten alloy, tungsten alloy for radiation shielding better than lead for radiation shielding in environmental protection.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values



Tungsten Alloy Radiotherapy Shield

Tungsten Alloy Radiotherapy Shield

Tungsten alloy radiotherapy shield is a best choice for radiation shielding applications, which could be used in medical treatment. Tungsten alloy radiotherapy shield is wildly used in collimator, linear accelerator, multileaf collimator and so on.Compared to traditional radiation shielding materials, such as lead, it provides excellent properties.

The Advantages of Tungsten Alloy Radiotherapy Shield

The thickness 3mm of tungsten alloy shield can shield 95% of 150keV γ radiation. Tungsten alloy shield is suit for high spatial resolution occasion, such as radiological Imaging array detectors.Tungsten alloy shield has high density, (60% higher than lead), reduces the size of tungsten alloy ray shields, without affecting the radiation shielding effect.Tungsten alloy shield has the ability of various high-ray shielding.Comparing with tungsten alloy and lead, when they with the same performance of radiation shielding, the volume of tungsten alloy is 1/3 of lead .

Tungsten alloy radiotherapy shield is a kind of environmental protection material, compare to lead, it is better to use tungsten alloy shield in radiotherapy treatment to reduce damage.

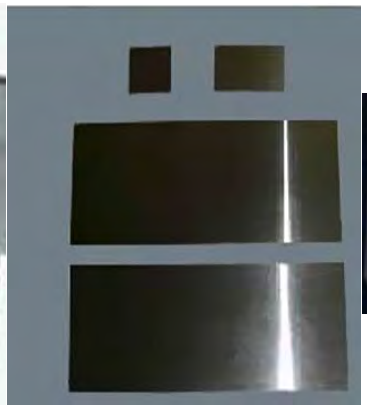
The Applications of Tungsten Alloy Radiotherapy Shield

Collimator
Linear accelerator
Multileaf collimator
Computed tomography
X-ray energy absorptiometry

ASTM B777-99 Standard

Class	1	2	3	4

Tungsten Nominal %		90	92.5	95	97
Density (g/cc)		16.85-17.25	17.15-17.85	17.75-18.35	18.25-18.85
Hardness (HRC) Max		32	33	34	35
Ultimate Tensile Strength	ksi	110	110	105	100
	Mpa	758	758	724	689
Yield Strength at 0.2% off-set	ksi	75	75	75	75
	Mpa	517	517	517	517
Elongation, %		5	5	3	2



Tungsten Alloy Syringe Shield

Tungsten Alloy Syringe Shield 3cc:

Introduction:

9 mm thick glass-5.2g/cc gives optimum protection and tungsten alloy syring shield is easily replaced. Fully exposed needle hub allows you to visually check for correct venous insertion prior to injection.

Weight: without glass:

2.5cc: 0.3 lbs (0.14kg)

3cc: 0.36 lbs (0.16kg)

5cc: 0.4 2bs (0.19kg)

10cc: 0.62 lbs (0.28kg)

With glass:

3cc: 0.42 lbs (0.19kg)

5cc: 0.53 lbs (0.24kg)

10cc: 0.77 lbs (0.35kg)

Drawing Tungsten Alloy Syringe Shield 3cc

Introduction:

2 mm solid tungsten flange helps syringe shield the hand when withdrawing liquid from a vial. Flange is easily removed to allow transition from drawing dose to patient injection. 9 mm thick glass-5.2g/cc gives the greatest protection of any glass in any syringe shield and syringe shield is easily replaced. twist-turn and the syringe is held firmly. Tungsten alloy syringe shield offered by us is qualified. We can provide alloy kinds of syringe shield as your requirements.

Material: tungsten

Weight:

3cc: 0.77 lbs (0.35kg)

5cc: 1.06 lbs (0.48kg)

10cc: 1.5 lbs (0.68kg)

PET Pig Syringe Pig/Syringe Shield

PET Pig syringe shield allows the safe transportation and administration of unit dose PET radiopharmaceuticals. The "T" handle on the PET Pig cap allows the unit to be easily lifted out of traditional "ammo can" delivery cases. The syringe shield use of the thermos style handle reduces hand exposure by permitting the PET Pig to be carried to the imaging suite without holding container sidewalls. Prior to injection, the base unscrews, allowing the center portion to be used as a syringe shield. When placed in the optional PET Pig Cradle, patient administrations can be performed with ease and maximum shielding.
Weight: 7.1kg (15.6 lbs)

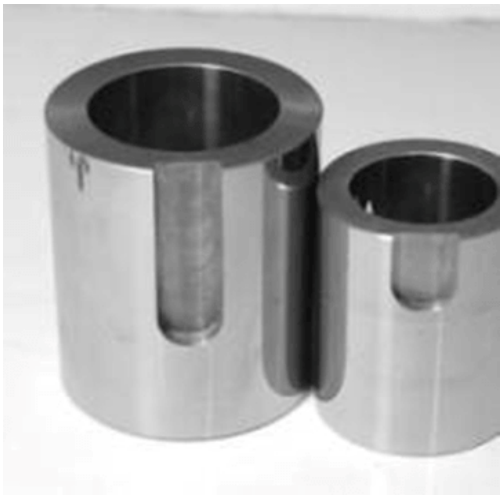
PET Dispensing System Syringe Shield 3/5 cc

The PET **Syringe Shield** magnetically docks with the PET Dispensing Pig. Designed to accept 3cc and 5cc B-D syringes, syringe shield places the needle inside the vial septum when engaged; the external calibration rod allows the precise volume to be withdrawn without a leaded glass viewing port, where high exposure levels cannot be adequately shielded. We can provide all kinds of tungsten alloy syringe shield as your requirement. Tungsten heavy alloy syringe shield is our leader products.

Tungsten Alloy Vessel Shield

We have achieved a commendable niche in the industry by providing our clients optimum quality **tungsten alloy vessel shield**that is basically used in pharmaceutical industry in order to reduce the radiation exposure, especially the partial body dose of the hands. This vessel is precisely manufactured with the help of top notch techniques using finest quality tungsten alloy in conformity with set international standards. In addition, we provide this **tungsten alloy vessel shield** in diversified specifications at nominal prices to the clients.

Tungsten alloy vessel shield is extensively applied in nuclear field and also used as unsealed radioactive sources in diagnosis, therapy etc. We possesses advanced production equipment and high-end technical capacity and perfect quality management system, and we ensure that we could offer high quality tungsten alloy vessel shied to our clients.



Extreme care is taken during production of tungsten alloy vessel shield to ensure that it comes out to be of top notch quality. Widely used in many radiation-shielding applications including industrial, nuclear and medical, the offered product is an effective container for shielding against gamma rays and x-rays because of its high density and high atomic number. The tungsten alloy provided by us is precisely manufactured under the stern observation of our technical experts by making use of excellent quality tungsten with the help of modern techniques. Our treasured clients can avail this tungsten alloy vessel shield from us at cost-effective prices.

Tungsten Alloy Vessel Shield Features:

Ultimate tensile strength

Sturdiness

Anti corrosive

Temperature resistance

Precise Dimensions

High thermal resistance

Tungsten Alloy Medical Radiation Shielding Clip

Tungsten alloy medical radiation shielding clip that is extensively applicable in medical industry. This clip is manufactured with the implementation of the progressive technology and using quality tested tungsten in adherence with international quality standards. Being a quality oriented firm, this Tungsten Medical Radiation Shielding Clip is examined on different parameters to ensure its quality and durability at clients' end.

Features:

Easy installation

Sturdy design

Precise dimensions

Rust resistance

90%W is the most pliable and promptly machinable evaluation. Normal application ranges incorporate counterbalancing weights for the flight and aviation commercial enterprises, crankshaft and auto hustling auto, kicking bars for bolt setting, and radiation protecting.、

92.5%W is normally used to create gab safe exhausting bars and device shanks and in addition radiation protecting segments.

95%W is regularly connected where size is a component in the position of equalization or counterweight weights. It ought to be ordinarily of parts with little volume however substantial thickness. Different applications incorporate radiation shields and collimators of x-beam or gamma beam bars.

The densest of the Ni-Fe fastener compounds with tungsten, and is the favored evaluation for radiation protecting in the therapeutic imaging industry.

Gamma Radiation Shield

Gamma radiation shield: These are forms of electromagnetic shield radiation that occur with higher energy levels than those displayed by ultraviolet or visible light.

Gamma radiation is the product of radioactive atoms. Depending upon the ratio of neutrons to protons within its nucleus, an isotope of a particular element may be stable or unstable. When the binding energy is not strong enough to hold the nucleus of an atom together, the atom is said to be unstable. Atoms with unstable nuclei are constantly changing as a result of the imbalance of energy within the nucleus. Over time, the nuclei of unstable isotopes spontaneously disintegrate, or transform, in a process known as radioactive decay. Various types of Gamma radiation shield may be emitted from the nucleus and/or its surrounding electrons. Nuclides which undergo radioactive decay are called radionuclides. Any material which contains measurable amounts of one or more radionuclides is a radioactive material.

Gamma shielding is better absorbed by materials with high atomic numbers and high density, such as tungsten alloy gamma shielding. Although neither effect is important compared to the total mass per area in the path of the gamma radiation. For this reason, lead shield is only modestly better (20–30% better) as tungsten alloy gamma shielding, than an equal mass of another shielding material such as aluminium, concrete, water or soil, lead's major advantage is not in lower weight, but rather its compactness due to its higher density. Therefore, tungsten alloy material is better in its high density,good radiation absorption, etc.

Tungsten radiation shield including radiation shield container,radiation shield rod and radiation shield parts.

Tungsten Alloy X-ray Target & Tungsten Alloy Collimator

Tungsten Alloy X-ray Target

Tungsten alloy X-ray target can be subjected to higher loadings than stationary anodes. By rotation of dish-shaped X-ray targets under the electron beam, a new, already cooled part of the target surface is continually used as the focal spot. Moreover, tungsten alloy X-ray target cools down more rapidly by radiating its heat. Far more energy per unit time can therefore be supplied to a tube with an X-ray target in comparison with a stationary anode.

Guangxi Chentian Metal Products Co. Ltd can supply the whole range of Mo alloys and tungsten X-ray targets. Tungsten alloy X-ray targets that are optimally suitable for individual customer requirements, such as mammography Mo X-ray targets and tungsten X-ray targets, which are used from the general medical diagnostic and amigo- cardiograph to computer tomography.

In the past two decades, Guangxi Chentian Metal Products Co. Ltd has been developing components for the latest generation of high performance medical devices in close cooperation with the leading medical instruments suppliers.

For diagnosis, Guangxi Chentian Metal Products Co. Ltd supplys tungsten alloy X-ray target and stationary anodes for diverse X-ray applications. Tungsten alloy X-ray target can withstand extreme thermal stress in temperatures of over 2,000℃. All tungsten products are superior quality and durable, guaranteeing longer life.

Electromagnetic blasting is created by the slowing fast electrons down on the anode. 1% of the affected energy is transformed into tungsten alloy X-ray blasting and 99% into heat. Because of that, components within the X-ray should have high thermal resistance and applied material should possess a highest possible melting point, heat sink capacity, good heat conductivity and a smallest possible vapor pressure.

Guangxi Chentian Metal Products Co. Ltd produces tungsten alloy X-ray target components, made of high performance materials (molybdenum, tungsten, WRe alloys), for the assembly of tungsten alloy target technology, which are used worldwide for picture giving systems.

Tungsten Alloy X-ray Target from Guangxi Chentian Metal Products Co. Ltd

X-ray target

Fastening elements for X-ray targets
Rotors
Stationary anodes
Cathode components
Detector components

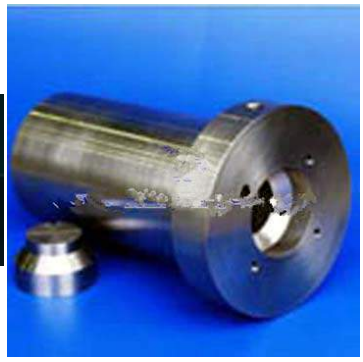
Tungsten Alloy Collimator

Tungsten alloy collimator is a device that narrows a beam of particles or waves. It belongs to input and output element of optical fiber communicaiton devices. Tungsten alloy collimator can be adopted as linear accelerator and cyclotron in medical treatment. It has a simple structure, through which the fiber radiate light can be converted into parallel light (gaussian beam). So its main fuction is to efficiently maximize the light coupling into the device.

Radiotherapy destroys cancer by directing beams of radiation directly onto the tumor. The beams of radiation require a very fine focus to avoid harming the surrounding healthy tissue. This focus is achieved by using a multi-leaf tungsten alloy collimator, consisting of two rows of very thin tungsten heavy alloy plates, which can be configured to match the dimensions of the tumor exactly.

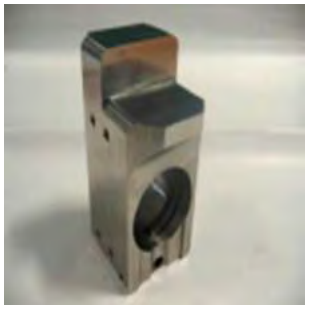
Tungsten alloy collimator and tungsten alloy X-ray target are made of groundbreaking tungsten alloy X-ray targets components in the medical industry. Tungsten alloy collimator contributes significantly to successful radiotherapy through their high density and high shielding capability against X-rays and gamma rays.

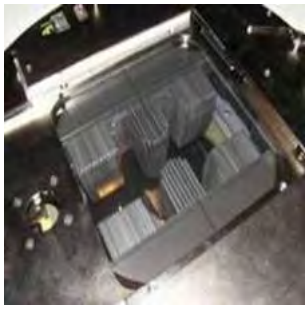
The Classification of Tungsten Radiation Collimators:
There two kinds of tungsten collimators, tungsten panoramic collimators and tungsten directional collimators. Collimators contain and direct the beam of radiation during exposure. This results in improved radiograph quality and safer operating conditions. Tungsten panoramic collimators consist of a stainless steel housing containing two tungsten inserts. The panoramic collimator is constructed with two shields designed to provide a 30 degree panoramic radiation beam. Tungsten directional collimators direct the radiation beam from a side port as a 60° conical side throw. Tungsten alloy shielding for the directional collimator is designed to provide a 50 degree radiation beam and is encased with stainless steel and totally sealed by argon arc welding. The shields are encased with stainless steel and totally sealed by argon arc welding. A wide range of collimators have been developed to meet the variety of applications and techniques used.



Advantages of tungsten alloy collimator:
1. One of the most effective devices for reducing the radiation levels on a job site;
2. Increasing the quality of radiography shots by reducing the scattering radiation around the film;
3. Providing a safer operating conditions for radiographers;
4. Tungsten alloy material is a more effective shielding material than lead. It is an easy handle, non-licensed and very effective shielding material;

5. Do not spark, it is a ideal material for plant operations.

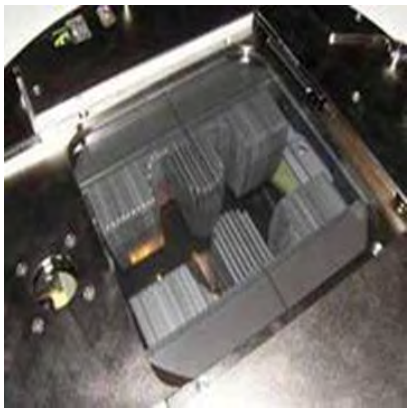





Tungsten Multiple Layer Multileaf Collimator

Tungsten Multiple Layer Multileaf Collimator

Tungsten multiple layer multileaf collimator for using in a radiation system providing a radiation beam in a given beam direction, including a first layer of a plurality of radiation blocking tungsten leaves, the leaves being arranged adjacent one another so as to form two opposed rows of adjacently positioned leaves and being movable in a longitudinal direction, which is generally transverse to the beam direction, defining a radiation beam shaping field between the opposed ends of the leaves. A second layer of a plurality of radiation blocking tungsten leave, the leaves of the second layer being arraigned adjacent one another as to form two opposed rows of adjacently positioned leaves and being movable in a cross-over direction, which is generally transverse to the beam direction and angled with respect to the longitudinal direction, defining a radiation beam shaping field between the opposed ends of the leaves of the second layer.

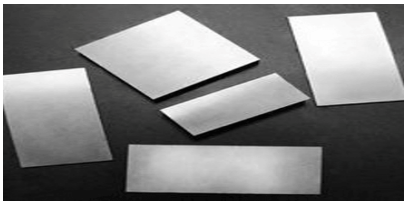
The Applications of Tungsten Multiple Layer Multileaf Collimator

The tungsten multiple layer multileaf collimator is an important tool for radiation therapy dose delivery. It was originally used as a surrogate for tungsten alloy block field shaping and is now widely used for Intensity Modulated Radiation Therapy. For conformal radiotherapy the tungsten multiple layer multileaf collimator allows conformal shaping of the linear accelerator (LINAC) beam to match the borders of the target tumour. For intensity modulated treatments the tungsten alloy leaves of a multi-leaf collimator can be moved across the field to create Intensity Modulated Radiation Therapy distributions (tungsten alloy multi-leaf collimator's really provide a fluence modulation rather than intensity modulation).

The Advantages of Tungsten Multiple Layer Multileaf Collimator

Fast tracking: for parallel tungsten alloy leaves, aperture motion is determined by the time required to cover/uncover target edges parallel to leaf motion and by leaf speed. Since there aren't any such target edges for cross leaf - aperture formation, time is consequently several times faster than that of a parallel tungsten leaf collimator. In addition, cross tungsten alloy leaves smaller weight and lower friction enable higher leaf speed and reliability then conventional MLCs.
Improved conformity:cross tungsten leaf conforms better to complicated targets (e.g., doubly concave) and eliminates collimator rotation. Conformity is significantly improved even for a regular shape.
Due to tungsten alloy materials has high density, which is 60% higher than lead, reduces the size of tungsten alloy ray shields, without affecting the radiation shielding effect the excellent radiation absorption of tungsten alloy. Since the environmental friendly characteristics of tungsten alloy, tungsten alloy for radiation shielding better than lead for radiation shielding in environmental protection.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula:$K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values



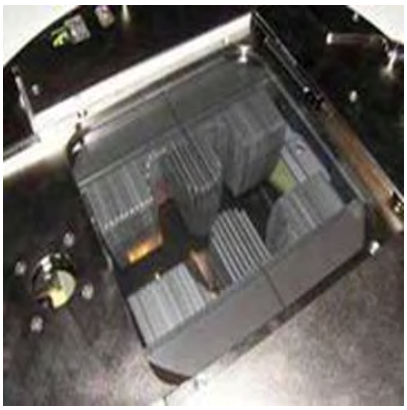
Tungsten Alloy Multi-leave Shielding

What is tungsten alloy multi-leave shielding?

Tungsten alloy multi-leave shielding is a kind of equipment used in medical radiation therapy. Radiation therapy has made many breaks on theory and technology due to the development of high-tech. Tungsten alloy multi-leave shielding is one of the important break.


Advantages of tungsten alloy multi-leave shielding

Tungsten alloy multi-leave shielding is widely used in medical because of its high shielding effect. Tungsten alloy is a kind of high density metal material, and has the function of shielding radioactive material. Tungsten metal has high density of 18.5g/cc which is comparable to that of uranium and gold, but it is much more cheap than gold. Rare metal has a higher density than tungsten, but capacity of rare metal on earth is really low and hard to exploit. Development of powder metallurgy makes tungsten alloy manufacture easier. Tungsten reserve on earth is pretty high. Tungsten alloy will have great development prospects. Tungsten alloy multi-leave shielding is one aspect of medical applications.

How dose tungsten alloy multi-leave shielding realize its radiation protection?

Tungsten alloy is the ideal material of shielding X-ray and gamma-ray. Reduce physical thickness of tungsten alloy won't change its shielding effect.In some condition, thickness of tungsten alloy is two thirds of lead.This advantage of tungsten alloy shielding is very important. Tungsten heavy alloy increases the quantity of leave in multi-leave collimators. With the increase of leave, the accuracy of multi-leave collimators detecting can be improved. Use tungsten alloy multi-leave shielding can make patient detecting more accurate, more pertinence.

Tungsten Grating Blade

Tungsten Grating Blade

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten can be widely used to produce tungsten grating blade in multileaf collimators. Multileaf collimators consist of approximately 50–120 leaves of tungsten grating blade which slide into place to form the desired field shape.

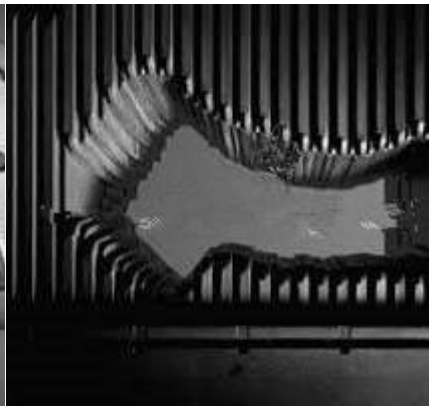
Tungsten Grating Blade for Multileaf Collimators

Tungsten grating blades as the mainly component of multileaf collimators (MLCs) are used to further shape a beam to localize treatment fields in radiotherapy. Multileaf collimators help to shape the beam of radiation emerging from the machine, they can limit the maximum field size of a beam.
For each multileaf collimator, two banks of independent tungsten grating blades face each other and travel linearly perpendicular to the beam central axis. Orthogonal to the direction of motion, the tungsten grating blade edge is parallel to the beam ray line from the target. A cross-sectional and front view of multileaf collimator. All details of the tungsten grating blade design were included in the tongue-and-groove used to reduce radiation leakage through interfaces between adjacent leaves and the complex rounded leaf tip.

The Advantages of Tungsten Grating Blade

The thickness 3mm of tungsten alloy shield can shield 95% of 150keV γ radiation. Tungsten alloy shield is suiting for high spatial resolution occasion, such as radiological Imaging array detectors. Tungsten alloy shield has high density, which is 60% higher than lead, could reach the same absorption radiation effective with the smaller size. Tungsten alloy shield has the ability of various high-ray shielding. Tungsten alloy Compared with lead, when they with the same performance of radiation shielding, the volume of tungsten alloy is 1/3 of lead. Tungsten radiation shielding is a kind of environmental protection material, which is less damage than lead.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values


Tungsten Radiation Protective Tank

What is Tungsten Radiation Protective Tank?

Because tungsten for X-ray attenuation ability is used for all kinds of radioactive source shielding components or container of a kind of ideal material. In addition, tungsten is high density and environmental friendly. Tungsten is usually used to produce into tungsten radiation protective tank for industry and medical applications.

The Applications of Tungsten Radiation Protective Tank

Tungsten radiation protective tank is used as medical tungsten radiation shielding for medical radiation shielding wall. Tungsten can be produced as needle radiation shielding for medical radioactive liquid shielding. Tungsten radiation protective tank can be used as cans, boxes and other containers used to store radioactive matter, collimator, for medical linear accelerator and nuclear technology applications in tungsten series test container system collimator, Co60 radiation shielding.

Tungsten radiation protective tank can be used widely in industry, such as the radiation shielding for radiation detectors, and nuclear industry radiation protection. Tungsten radiation protective tank for shielding X-ray and gamma radiation can greatly enhance both the material properties and the shielding efficiency.

The Advantages of Tungsten Radiation Protective Tank

Tungsten, which is a hard and rare metal, often exists in the form of chemical compound, serves as an efficient lead replacement material. Tungsten has high density and hardness, in fact almost 60 percent higher than lead, which are desirable characteristics for radiation shielding applications. They can be used to mitigate X-ray and gamma rays. Other benefits of tungsten-based materials include their high temperature resistance and environmental friendly.

During design of shielding, tungsten material , which is mixed with Ni, Fe, or Cu, radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$

K: Shield weakened multiple

△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Tungsten Alloy Multi-leaf Collimator

Why Need Tungsten Alloy Multi-leaf Collimator?

When people in the tumor or cancer treatment, more and more hospital commonly uses CT simulation system for image acquisition and patient respiratory motion analysis, and then radiation therapy is required. **Tungsten alloy multi-leaf collimator** is usually used for protect patient from unnecessary radiation.

As we know, tungsten heavy alloy could provide the same energy absorption as lead using 1/3 less material, besides, it is environmental friendly, high density from 17.0 g/cm3 to 18.6 g/cm3 make tungsten alloy multi-leaf collimator an excellent ability for radiation absorption, as it is dense enough to absorb radiation from the radiation therapy machine, so as to make patient safe.

How is Tungsten Alloy Multi-leaf Collimator Radiation Ability?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy provides excellent density with small capacity. With the same weight, high-density alloy can provide the same energy absorption as thinner than other materials, tungsten alloy is a favorable material for somewhere needs great radiation absorption but allow only very small space .

Guangxi Chentian Metal Products Co. Ltd could not only offer tungsten alloy collimator based on the

international standard, but also could design and make tungsten alloy collimator as per clients' requirement. Usually, radiation ability could be calculated basing on the following formula:

Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, people need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

How Tungsten Alloy Multi-leaf Collimator to Make Radiation Protection

According to the lesion target period of the motion, in the allowed setting range of motion, radiation ray beam from treatment machine triggers automatically, out and off, so as to control the movement of the couch, then it is followed with the movement of tumor (target), in this way, to make a real-time dynamic precise radiotherapy. This method is applicable for the treatment with the movement caused by respiratory motion in a larger degree of lung, liver, breast, etc. The whole process for treatment of cancer or tumors, such as chest, abdomen, is an infrared tracking the motion waveform of the surface reflection markers, through surface infrared reflective markers , using fluoroscopic image, so as to do the verified or treatment of disease, this would produces a certain radiation of the radioactive material. If there is no high performance material of radiation shielding as tungsten alloy collimator the treatment device, then other parts of the patient is almost to be simultaneously exposed to radiation damage. It will be very terrible. Therefore, when the radiation source movement, then tungsten alloy multi-leaf collimator could absorb radiation to protect the patient.

Single Photon Emission Computed Tomography

Single Photon Emission Computed Tomography

Single photon emission computed tomography (SPECT, or less commonly, SPET) is a nuclear medicine tomographicimaging technique using gamma rays. It is very similar to conventional nuclear medicine planar imaging using a gamma camera. However, it is able to provide true 3D information. This information is typically presented as cross-sectional slices through the patient, but can be freely reformatted or manipulated as required.

The technique requires delivery of a gamma-emitting radioisotope (a radionuclide) into the patient, normally through injection into the bloodstream. A marker radioisotope is attached to a specific ligand to create a radio ligand, whose properties bind it to certain types of tissues. This marriage allows the combination of ligand and radiopharmaceutical to be carried and bound to a place of interest in the body, where the ligand concentration is seen by a gamma camera.


The Applications of Tungsten Shielding in Single Photon Emission Computed Tomography

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy can be widely used in gamma camera (SPECT) utilize radioactive materials injected as tungsten alloy syringe shield. Radiation is an effective tool within medicine for both diagnostics and treatment of patients. Techniques such as SPECT utilize radioactive materials injected into the patient, which are then monitored by single photon emission computed tomography (SPECT) to detect the presence of tum ours in the body.

Tungsten radiation shielding is one important component of gamma camera (SPECT) to set radiation resources. Tungsten radiation shielding for SPECT can be used in complement any gamma imaging study, where a true 3D representation can be helpful, e.g., tumor imaging, infection (leukocyte) imaging, thyroid imaging or bone scintigraphy. Because SPECT permits accurate localization in 3D space, it can be used to provide information about localized function in internal organs, such as functional cardiac or brain imaging. Tungsten radiation shielding also can be used in the syringe shield for SPECT scanner. 2 mm solid tungsten flange helps syringe shield the hand when withdrawing liquid from a vial. Flange is easily removed to allow transition from drawing dose to patient injection. 9 mm thick glass-5.2g/cc gives the greatest protection of any glass in any syringe shield and syringe shield is easily replaced. twist-turn and the syringe is held firmly.

Why Use Tungsten Shielding in Single Photon Emission Computed Tomography?

The advantages of tungsten alloy:
High radiation attenuation; good shielding capability
Thinner and often lighter than equivalent lead shields
Easy to sterilise and keep clean
Non-toxic
Easily machined with conventional tools
Hard and durable – no need for coating

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values



Tungsten Alloy Mobile Radiation Shielding

What Is Tungsten Alloy Mobile Radiation Shielding?

Tungsten alloy mobile radiation shielding is designed for managing large quantities of high-energy radionuclide. A convenient lever allows quick adjustment of window to optimal angle for any user and procedures. A special plate with a hex-shaped recess is mounted on the base to facilitate one-handed loading and unloading of dose pigs incorporating hex-shaped bottoms.

What Is Mobile Radiation?

Mobile radiation is energy travelling through space in the form of waves or particles. Mobile radiation occurs naturally and has always been around, we've evolved with mobile radiation and we're bombarded with it in one form or another every day of our lives - from the earth, from space and even within our own bodies. Some experts suggest a little mobile radiation is a good thing and we all know of its uses in medical science to combat and diagnose some illnesses.

Nowadays, as almost everyone has a mobile phone, mobile radiation becomes a notable problem. Mobile radiation is present in mobiles because they use radio frequency (RF) waves to make and receive calls. The doses are considered very small as the emissions are low power (short range). Nevertheless, there are ways in which you can reduce exposure to these waves. Experts are currently working on the mobile radiation issue and tungsten alloy is very promising material in this field.

Why Choose Tungsten Alloy Mobile Radiation Shielding?

With high density and small volume, tungsten alloy material is now widely used for making tungsten radioactive shielding to protect body from radiation. Tungsten radioactive shielding can provide a wide field excellent body protection. Two models are offered with varying sized tungsten alloy products.

As we know, tungsten alloy radiation shielding is a durable, shatter resistant protection and provides an

optically clear view. The most important thing is that this kind of material is quite environment-friendly. Tungsten alloy mobile shielding frames are constructed of durable tungsten. The product will maintain appearance for many years. Shields are easily mobile and locked into position.

Why Use Tungsten Alloy Mobile Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy mobile shielding provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten radioactive shielding is been more and more widely used.

During design of tungsten alloy mobile shielding, mobile radiation is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Nuclear Radiation Shield

What Is Tungsten Nuclear Radiation Shield?

Tungsten nuclear radiation can be broadly classified into three categories. These three categories are labeled with the first three letters of the Greek alphabet: ά (alpha), β (beta) and γ (gamma). Alpha radiation consists of a stream of fast-moving helium nuclei (two protons and two neutrons). As such, an alpha particle is relatively heavy and carries two positive electrical charges. Beta radiation consists of fast-moving electrons or positron (an antimatter electron). A beta particle is much lighter than an alpha, and carries one unit of charge. Gamma radiation consists of photons, which are without mass and carry no charge. X-rays are also photons, but carry less energy than gammas. Some materials absorb beta rays. You can measure this absorption by fixing beta source and a radiation monitor so their positions do not change.

Tungsten heavy alloy has high absorption rate on X rays and gamma rays. Tungsten is 60% better than lead in shielding against X rays and gamma radiation therefore; it can be significantly reduced in size.

Tungsten nuclear radiation shielding also has another characteristic, very high melting point. By this, tungsten alloy nuclear radiation shielding can be used in high temperature which can not be used with lead, for example nuclear scrap container.

Due to its unique characteristics, people use **tungsten alloy nuclear radiation shield** in medicine, tungsten nuclear radiation shielding, such as collimator, tungsten alloy nuclear radiation shielding,

beamline , PET syringe shield, vial shield, tungsten alloy nuclear radiation shielding is used to protect workers from the radioactive sources of the scanner used in security and aerodrome, coach stop, etc. Tungsten alloy nuclear radiation shielding is also used in the equipment of industrial radiography, pipe-line inspection (collimator or tungsten nuclear radiation shielding).

Nuclear Radiation Damage

It can damage cells and the DNA inside them through its ionizing effect. This effect happens when a high-energy carrying particle or photon removes an electron within an atom's nucleus from its orbit, thereby changing the properties of the atom. If enough ionization enters DNA, cell and tissue damage result. Radioactive materials can enters the body through breathing, skin wounds and gastrointestinal absorption, causing inside radiation and outside radiation being absorbed into the body, and causing radiation damage. Common symptoms of radiation poisoning are; fatigue, dizziness insomnia, skin redness, ulcers, hemorrhage, hair loss, leukemia, vomiting, diarrhea, etc. What is worse, distorted DNA can increase, hereditary disease incidence, affecting the health of several generations.

The more radiation person receives, the more serious the radiation sickness symptoms and the greater the risk that the cancer and birth defects. So **tungsten nuclear radiation shielding** is necessary for us.

Why Use Tungsten Alloy Nuclear Radiation Shield?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy nuclear radiation shielding provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. In weight certain, high-density tungsten alloy can better resist radiation, and tungsten alloy nuclear radiation shielding is thin, more convenient than others.

While designing shielding, tungsten alloy nuclear radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten nuclear radiation shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Radioactive Source Holder

Tungsten alloy source holder devices for holding a source of radioactive material and directing a beam of radiant energy there from for medical therapy and other purposes; and more particularly to such source holder devices as comprise a main body for containing the radioactive source and shielding the same in a safe manner when in a repose position, and a radiation emergence portion into which portion said source is moved for registry with a radiation emergence laperture therein.

Tungsten source holder device having improved means for effecting actuation of the radioactive source from its repose position to its active position whereby such actuation is greatly facilitated and fail-safe operation of the device is assured.

Tungsten alloys is a best choices for source holder device for tungstenalloy source holder provide excellent value. A high-density alloy can provide the same energy absorption as lead using 1/3 less material. People are taking advantage of tungsten alloy's reliable radiation shielding properties. It can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers. Tungsten heavy alloy source holder device have very high melting point and have a density twice that of steel and are more than 50% heavier than lead. Due to their high density, tungsten alloys offer greater radiation shielding than lead and are non-toxic.

Tungsten Radiation Shielding Advantage

What Is Tungsten Radiation Shielding Advantage?

Experts find that radiation exposure can be reduced by maximizing shielding. **Tungsten radiation shielding advantage**: high density, small volume, etc. The radiation stopping ability of a material is related to its density. Higher density means better stopping power and shielding. Because of its a higher density, tungsten alloy has much higher radiation absorption ability than lead. Its greater linear attenuation of gamma radiations means that less material is required for equal shielding. Alternatively equal amounts of tungsten alloy radioactive shielding provides diminished exposure risks than equivalent lead shielding.

Why Use Tungsten Alloy Radioactive Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radioactive shielding provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy radioactive shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radioactive shielding material is poplar to make radiation shielding.

Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiotive shielding material of the half-value layer values
d: tungsten alloy radioactive shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten alloy is more than suitable raw material for radiation protection because of tungsten radiation shielding advantage, tungsten radiation shielding advantages include its combination of radiographic density (more than 60% denser than lead), machinability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high strength. Tungsten alloy radioactive shielding

can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers. Moreover, it is non-toxic and more environmentally friendly than lead or depleted uranium. Tungsten alloy is more acceptable in this case, for they are non-toxic and tungsten radiation shielding advantages.

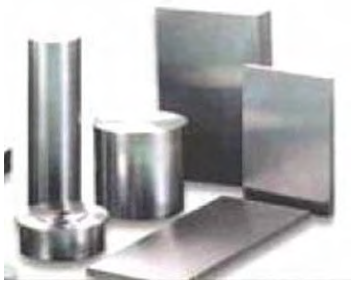
Tungsten Radiation Shielding Industry

Tungsten Radiation Shielding

Nuclear research establishments use nuclear reactors or cyclotrons to study or create radioactive materials. **Tungsten radiation shielding** is used in research activities as collimators (devices which guide or focus beams of radiation) or containers for radioactive isotopes. Tungsten alloy is also ideal for tungsten radiation shielding against both X- and Gamma radiation. The very high density of tungsten shielding (more than 60% denser than lead) allows large reduction in the physical size of tungsten shielding components, without compromising the effectiveness of the tungsten shielding characteristics. Guangxi Chentian Metal Products Co. Ltd can provide all kinds of tungsten shielding as your requirements.

Why Use Tungsten Shielding?

Compared to traditional materials such as lead and boron carbide, tungsten shielding provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten shielding could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten shielding is suitable for radiation shielding. Tungsten shielding provided by us is qualified, and it is our leader products.



During design of shielding, tungsten shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: K = e0.693 d / △1/2

K: Shield weakened multiple

d: tungsten shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the tungsten shielding, divided by the density of tungsten material can be obtained.

These tungsten shielding is about 50% more effective in shielding against gamma and X-radiation than lead, therefore, provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers.

Tungsten Alloy Nuclear Fission Shielding

Tungsten Alloy Nuclear Fission Shielding

Tungsten alloy shielding is a very good nuclear fission radiation shielding material, and it is widely used

in the area of nuclear. Tungsten alloy nuclear fission shielding is commonly used in bombs, fission nuclear power plants or nuclear power plants. Nuclear fusion is defined by heavy nuclei, which mainly refers to the nucleus of uranium or plutonium nuclei, quality of splitting into two or more smaller atoms form a reactor, while releasing two to three neutrons, and a great deal of energy and radiation.
Tungsten alloy nuclear fission shielding is a kind of radiation shielding device. Radiation energy of nuclear fission can cause a lot of damage to the human body and environment, keep away from the radioactive material is way to remain safe. In additional, tungsten alloy nuclear fission shielding is an effective device to prevent the damage of radiation. Tungsten alloy nuclear fission shielding is kind of metal shielding, which is made of tungsten alloy.Tungsten alloy exhibits excellent absorption behaviour against electromagnetic radiation such as X-rays and gamma-radiation.

The Advantages of Tungsten Alloy Nuclear Fission Shielding

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation bricks provide excellent density with small capacity. At the same tungsten alloy radiation brick with weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Tungsten Alloy Isotope Radiation Container

Applications of isotope radiation technology

Radioactive isotope called "radioisotopes." Isotope radiation technology now widely used in industry, agriculture, health, archeology, and environmental protection and other aspects, including radiation detectors, radiotherapy apparatus and medical X-ray instruments. The most important component of radiation technology equipment is the radiation shielding container. When using radiation technology, place radioactive isotope within the shielding container is the most important thing.

Advantages of tungsten alloy isotope radiation container

The main material of isotope radiation shield container is tungsten alloy. Practice shows that tungsten alloy is the best material for shielding. Compared with the traditional shielding materials, tungsten alloy reflects its advantages. Lead is one of the traditional shielding materials. But in practical process, efficiency of lead shielding is not high, and lead will cause serious pollution. Efficiency of tungsten shielding is twice of the lead shielding. Weight of tungsten shielding is 25% to 50% less than lead. Meanwhile, non-toxicity of tungsten can also reduce the costs of waste disposal.

Applications of tungsten alloy isotope radiation container

Industrial instrumentation equipment and petroleum drilling
Cancer treatment equipment
Weld inspection
Large container inspection equipment
Nuclear submarine accessories

Tungsten Storage Container

Tungsten Alloy Storage Container

Guangxi Chentian Metal Products Co. Ltd manufactures a comprehensive line of custom designed **tungsten alloy storage container** designed to your exact requirements. Guangxi Chentian Metal Products Co. Ltd has worked seamlessly with end users including hospitals, laboratories, medical facilities, and Nuclear plants ensuring that a final design is functional and fits within its surroundings and radiation code requirements. We design and manufacture both standard and custom one-off designs. We employ a fully qualified design team to help with every step of the process, from the moment your order is entered until it arrives at your doorstep.

Application of Tungsten Storage Container

Storing and transporting radioactive materials

Vial pigs for PET or other high energy radionuclides

Unit dose pigs for radiopharmaceuticals

Nuclear Densometer storage

Feature and Benefit of Tungsten Storage Container

Manufactured from tungsten alloy.

Free of lead All hardware from heavy-duty hinges, to locks are of the highest quality.

All Storage Containers are ground smooth from sharp corners or edges.

Extreme care is taken in the surface preparation to all surfaces for the supply and application of a finish coat of paint to the desired colour.

All Storage Containers are available with your choice in tungsten alloy shielding from 1/32″ to 2″ thick or more.

All Storage Containers come equipped with a hinged lockable lid or removable lids.

Our Storage Containers combine effective radiation protection and durability in a rugged, attractive and versatile line.

What is Cobalt 60?

Cobalt 60 (Co 60) is a synthetic radioactive isotope of cobalt with a half-life of 5.2714 years. It can emit 315KeV high speed electronic and two beams of gamma rays through beta decay. It is produced artificially in nuclear reactors. Deliberate industrial production depends on neutron activation of bulk samples of the monoisotopic and mononuclidic cobalt isotope Co 59. Measurable quantities are also produced as a by-product of typical nuclear power plant operation and may be detected externally when leaks occur.

The Applications of Cobalt 60 Tungsten Radiation Shielding

Due to its high density and excellent absorption behaviour against radiation, tungsten alloy can be widely used in cobalt 60 tungsten radiation shielding to protect the damage from Co 60 radiation.
The main uses for cobalt 60 tungsten radiation shielding are: tracer for cobalt in chemical reactions, Sterilization of medical equipment, medical radiotherapy, industrial radiography, leveling devices and thickness gauges, pest insect sterilization, food irradiation and blood irradiation,and laboratory mutagenesis.

Why Use Cobalt 60 Tungsten Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shielding provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for radiation shielding.Cobalt 60 tungsten radiation shielding is better than lead materials for it is non-toxic.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values


Cesium 137 Tungsten Radiation Shielding

What is Cesium 137?

Cesium 137 (137 55Cs, Cs-137), Cesium 137, or radioactinium, is a radioactive isotope of cesium which is formed as one of the more common fission products by the nuclear fission of uranium-235 and other fissionable isotopes in nuclear reactors and nuclear weapons. It is among the most problematic of the short-to-medium-lifetime fission products because it easily moves and spreads in nature due to the high water solubility of cesium most common chemical compounds, which are salts.

The Applications of Cesium 137 Tungsten Radiation Shielding

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy can be widely used to produce Cesium 137 tungsten radiation shielding.
Cesium 137 tungsten radiation shielding can be used as place containers of Cesium 137 radiation source, and used in industrial and medical fields.Cesium 137 tungsten radiation shielding can be applied for manufacturing industrial gamma radiation source: for density measurement, thickness measurement and radiation weighting, tobacco density measurement, logging and coal exploration and development, and so on. Cesium 137 tungsten radiation shielding also can be applied for gamma radiation sources in medical: cesium chloride injection can be used for cardiac scan, diagnosis of myocardial infarction and diseases. It also be can used in agricultural and biological applications: high activity of Cesium 137 sources for radiation breeding, storage of irradiated food, sterilization of medical devices. Cesium 137 tungsten radiation shielding can be used make isotopes battery and isotope heat source.

The Advantages of Cesium 137 Tungsten Radiation Shielding

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shielding provide excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for radiation shielding.Cesium 137 tungsten radiation shielding is better than lead materials for it is non-toxic.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values



Iridium 192 Tungsten Radiation Shielding

What is Iridium 192 Radiation

Iridium 192 (symbol 192Ir) is a radioactive isotope of iridium, with a half-life of 73.83 days. It decays by emitting beta (β) particles and gamma (γ) radiation. About 96% of 192Ir decays occur via emission of β and γ radiation, leading to 192Pt. Iridium 192 is also a strong gamma ray emitter. There are seven principal energy packets produced during its disintegration process ranging from just over 0.2 to about 0.6 MeV. Iridium-192 is commonly used as a gamma ray source in industrial radiography to locate flaws in metal components. It is also used in radiotherapyas a radiation source, in particular in brachytherapy.

The Applications of Iridium 192 Tungsten Radiation Shielding

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy can be widely used to produce Iridium 192 tungsten radiation shielding.
Iridium 192 tungsten radiation shielding can be used to storage Iridium 192 radioactive source, that can be used in Iridium 192 gamma detection machine. Since the gamma-ray energy of Iridium 192 is moderate with high specific activity of radioactive sources, and under the common thickness, Iridium 192 gamma detection machine has a high detection sensitivity.This detector does not need a power supply, does not need cooling water, exposure to small size, very suitable for on-site and field application. Iridium 192 tungsten radiation shielding can be mainly used for oil pipelines, wells and other critical structural flaw in the, as well as radiation therapy for cancer, and pressure vessel weld inspection such as spherical tanks.

The Advantages of Iridium 192 Tungsten Radiation Shielding

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation bricks provide excellent density with small capacity. At the same tungsten alloy radiation brick with weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values


Carbon 14 Tungsten Radiation Shielding

What is Carbon 14

Carbon 14, 14C, or radiocarbon, is a radioactive isotope of carbon with a nucleus containing 6 protons and 8 neutrons. Carbon 14 decays into nitrogen 14 through beta decay. A gram of carbon containing 1 atom carbon 14 per 1012 atoms will emit 0.192 beta rays per second. The primary natural source of carbon 14 on Earth is cosmic ray action upon nitrogen in the atmosphere, and it is therefore a cosmogenic nuclide.

The Applications of Carbon 14 tungsten radiation shielding

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy can be widely used to produce Carbon 14 tungsten radiation shielding. Carbon-14 compounds are widely used in chemical and biological research. The different isotopes of carbon do not differ appreciably in their chemical properties. This is used in chemical and biological research, in a technique called carbon labeling: carbon 14 atoms can be used to replace nonradioactive carbon, in order to trace chemical and biochemical reactions involving carbon atoms from any given organic compound.

The Advantages of Carbon 14 tungsten radiation shielding

The thickness 3mm of tungsten alloy shield can shield 95% of 150keV γ radiation. Tungsten alloy shield is suiting for high spatial resolution occasion, such as radiological Imaging array detectors. Tungsten alloy shield has high density, which is 60% higher than lead, could reach the same absorption radiation effective with the smaller size. Tungsten alloy shield has the ability of various high-ray shielding. Tungsten alloy Compared with lead, when they with the same performance of radiation shielding, the volume of tungsten alloy is 1/3 of lead.Carbon 14 tungsten radiation shielding is a kind of environmental protection material, which is less damage than lead.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$

K: Shield weakened multiple

△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Iodine 131 Tungsten Radiation Shielding

What is Iodine 131?

Iodine 131 (131I), also loosely and nonspecifically called radioiodine, is an important radioisotope of iodine. It has a radioactive decay half-life of about eight days. Due to its mode of beta decay, iodine 131 is notable for causing mutation and death in cells that it penetrates, and other cells up to several millimeters away. For this reason, high doses of the isotope are sometimes less dangerous than low doses, since they tend to kill thyroid tissues that would otherwise become cancerous as a result of the radiation.

The Applications of Iodine 131 tungsten radiation shielding

Tungsten alloy has excellent radiation attenuation properties, allowing the thickness of shields to be reduced, while still effectively blocking harmful X-ray and gamma radiation. Tungsten alloy shielding is the best choice for Iodine 131 tungsten radiation shielding. Iodine 131 tungsten radiation shielding is associated with nuclear energy, medical diagnostic and treatment procedures, and natural gas production. It also plays a major role as a radioactive isotope present in nuclear fission products, and was a significant contributor to the health hazards from open-air atomic bomb.

Iodine 131 tungsten radiation shielding can be used in nuclear medicine therapeutically and in seen with diagnostic scanners. Due to use of the 131I as iodide salt exploits the mechanism of absorption of iodine by the normal cells of the thyroid gland, Iodine 131 tungsten radiation shielding also has been used in 131I treatment of thyrotoxicosis (hyperthyroidism) and some types of thyroid cancer that absorb iodine.

Why Use Iodine 131 tungsten radiation shielding?

The advantages of tungsten alloy:

High radiation attenuation; good shielding capability

Thinner and often lighter than equivalent lead shields

Easy to sterilise and keep clean

Non-toxic

Easily machined with conventional tools

Hard and durable – no need for coating

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$

K: Shield weakened multiple

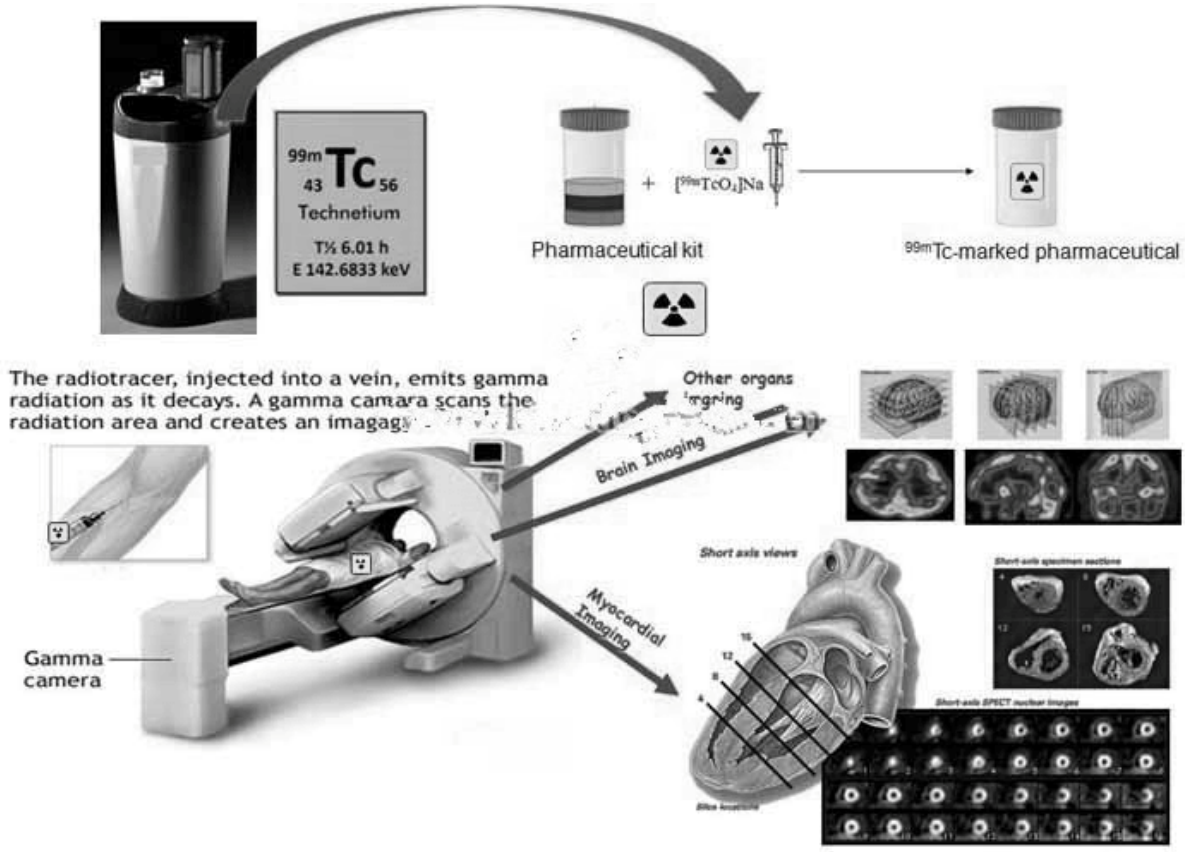
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Technetium 99 Tungsten Radiation Shielding

What is Technetium 99 and Technetium 99m

Technetium 99 (99Tc) is an isotope of technetium which decays with a half-life of 211,000 years to stable ruthenium 99, emitting beta particles, but no gamma rays. It is the most significant long-lived fission product of uranium fission, producing the largest fraction of the total long-lived radiation emissions of nuclear waste. Technetium 99 has a fission product yield of 6.0507% for thermal neutron fission of uranium 235.

Technetium 99m (99mTc)is a short-lived (half-life about 6 hours) metastable nuclear isomer used in nuclear medicine, produced from molybdenum 99. It decays by isomeric transition to technetium99, a desirable characteristic, since the very long half-life and type of decay of technetium 99 imposes little further radiation burden on the body.



The Applications of Technetium 99 Tungsten Radiation Shielding

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy can be widely used to produce Technetium 99 tungsten radiation shielding. Technetium 99 tungsten radiation shielding usually be used in nuclear medicine, which as the radiation shielding and container for Technetium 99m. Technetium 99m is used as a radioactive tracer and can be detected in the body by medical equipment (gamma cameras). Technetium 99m allows for scanning procedures which collect data rapidly but keep total patient radiation exposure low. The same characteristics make the isotope suitable only for diagnostic but never therapeutic use.

The Advantages of Technetium 99 Tungsten Radiation Shielding

Tungsten, which is a hard and rare metal and often exists in the form of chemical compound, serves as an efficient lead replacement material. Tungsten alloys have high density and hardness, in fact almost 60 percent higher than lead, which are desirable characteristics for radiation shielding applications. They can be used to mitigate X-ray and gamma rays. Other benefits of tungsten-based materials include their high temperature resistance and environmental friendly.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$

K: Shield weakened multiple

△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Neutron Tungsten Radiation Shielding

What is Neutron radiation?

Neutron radiation is a kind of ionizing radiation which consists of free neutrons. A result of nuclear fission ornuclear fusion, it consists of the release of free neutrons from atoms, and these free neutrons react with nuclei of otheratoms to form new isotopes, which, in turn, may produce radiation.

Applications of Neutron Tungsten Radiation Shielding

Tungsten alloy can be widely used to produce neutron tungsten radiation shielding. Neutron tungsten radiation shielding can be used in select facilities to treat cancerous tumors and damaging nature to cellular structure. Neutron tungsten radiation shielding can also be used in the nuclear industry, the space and aerospace industry, as well as the high reliability explosives industry.

Why Use Neutron Tungsten Radiation Shielding?

Due to tungsten alloy materials has high density, which is 60% higher than lead, reduces the size of tungsten alloy ray shields, without affecting the radiation shielding effect the excellent radiation absorption of tungsten alloy. Since the environmental friendly characteristics of tungsten alloy, tungsten alloy for radiation shielding better than lead for radiation shielding in environmental protection.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Tungsten Neutron Capture Reaction Shielding

What is Tungsten Neutron Capture Reaction Shielding?

Neutron capture is a nuclear reaction in which an atomic nucleus and one or more neutrons collide and merge to form a heavier nucleus. Since neutrons have no electric charge they can enter a nucleus more easily than positively charged protons, which are repelled electrostatically.

Neutron capture plays an important role in the cosmic nucleosynthesis of heavy elements. In stars it can proceed in two ways: as a rapid (r-process) or a slow process (s-process). Nuclei of masses greater than 56 cannot be formed by thermonuclear reactions (i.e. by nuclear fusion), but can be formed by neutron capture. Tungsten neutron capture reaction shielding can be used during neutron capture reaction process to protect staffs safety, and protect the environment.

The Applications of Tungsten Neutron Capture Reaction Shielding

Due to its high density, excellent absorption behavior against radiation and environmental friendly characteristics, tungsten can be used to produce tungsten neutron capture reaction shielding.

Neutrons are nuclear capture compound nucleus is formed, and then by releasing one or more gamma ray photons back stress reactions, denoted (n, γ).Release the total gamma-ray energy is equal to the excitation energy of compound nucleus. In addition, the (n, γ) reaction is the production of nuclear fuel, transuranic elements and other important reactions. For example by reaction (for antineutrinos) can generate nuclear fuel plutonium Pu. Therefore, tungsten shielding radiation protection device can be used as nuclear fuel and equipment, used in nuclear fuel research and production fields.

The Advantages of Tungsten Neutron Capture Reaction Shielding

Tungsten, which is a hard and rare metal and often exists in the form of chemical compound, serves as an efficient lead replacement material. Tungsten has high density and hardness, in fact almost 60 percent higher than lead, which are desirable characteristics for radiation shielding applications. They can be used

to mitigate X-ray and gamma rays. Other benefits of tungsten-based materials include their high temperature resistance and environmental friendly.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
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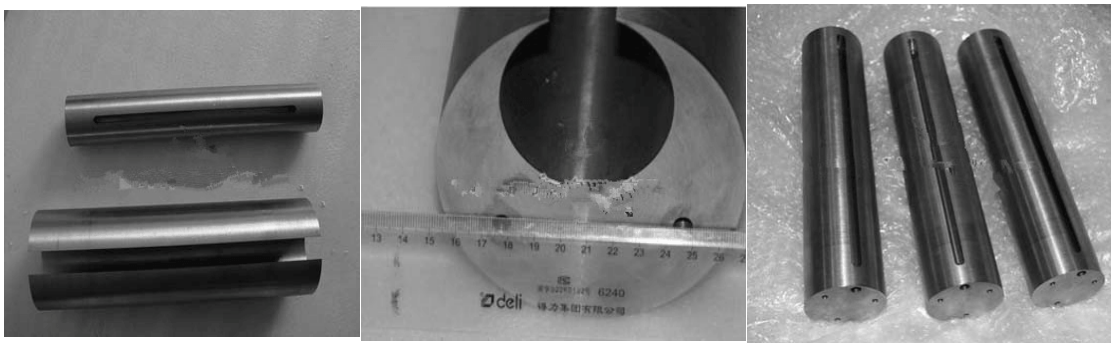

Tungsten Decay Radiation Shielding

What is Tungsten Decay Radiation Shielding?

An energetic electron can scatter easily from a nucleus, because it is so light, losing energy by radiation (accelerated charged particles radiate). The radiation appears in a secondary "bremsstrahlung" (breaking radiation) photon. Then decay is caused. This process can be used to generate continuous energy-spectrum X-rays. Also it could happen in the isotopes decay, such as 137 Cs can decay via two routes to the 137Ba nuclear ground. To avoid any radiation from this process, a kind of excellent radiation protector needed badly, and research states that tungsten should be the most suitable material for decay radiation shielding.

The Applications of Tungsten Decay Radiation Shielding

Due to its high density, excellent decay radiation absorption and environmental friendly, tungsten can be used to produce tungsten decay radiation shielding.

As the density rages from 17.0g/cm3 to 18.5g/cm3, tungsten material could absorb the same radiation energy with the less thickness than the lead. Therefore, it could be used for shielding the heavy decay radiation with smaller capacity. For example, beta particles are produced in a three-body decay and, therefore, have various energies, depending on the share taken by the associated anti-neutrino and the share (quite small) taken by the recoiling daughter nucleus. So the total energy is conserved, but the partition varies for individual decay events. Then there is a maximum beta energy so called the "end point" energy caused. In this case, tungsten decay radiation shielding could have a better performance than other material such as lead.

The Advantages of Tungsten Decay Radiation Shielding

Tungsten has its high density and good machinability, owning more than 60% higher density than lead, which are competitive for decay radiation shielding applications. They can be used to mitigate X-ray, gamma rays and any other decay from the isotopes. Also they are high temperature resistant and environmental friendly, it is more and more popular than lead, as it is no-toxic.

During design of shielding, tungsten radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
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Radium Isotope Tungsten Radiation Shielding

What is Radium Isotope Radiation?

Radium is a chemical element with symbol Ra and atomic number 88, also known as the alkaline earth metals. All isotopes of radium are highly radioactive, with the most stable isotope being radium-226, which has a half-life of 1600 years and decays in to radon gas. When radium decays, ionizing radiation is a product, which can excite fluorescent chemicals and cause radioluminescence.

The Applications of Radium Isotope Tungsten Radiation Shielding

Tungsten alloy is the best choice for radium isotope radiation shielding. Radium isotope tungsten radiation shielding can be used to hold radium isotope, which is the main component in cancer treatment devices or industrial radiography devices. Radium is a radiation source for cancer treatment. Small seeds are implanted in tumors to kill cancerous cells. Radium isotope tungsten radiation shielding is used in some industrial radiography devices, a technology similar to x-ray imaging used in industry to inspect for flaws in metal parts. When radium is mixed with beryllium it becomes a good source of neutrons, useful in well logging devices and research. Radium also has been added to the tips of lightening rods, improving their effectiveness by ionizing the air around it.

Why Use Radium Isotope Tungsten Radiation Shielding?

Compared to traditional materials such as lead and boron carbide, tungsten shielding provides excellent

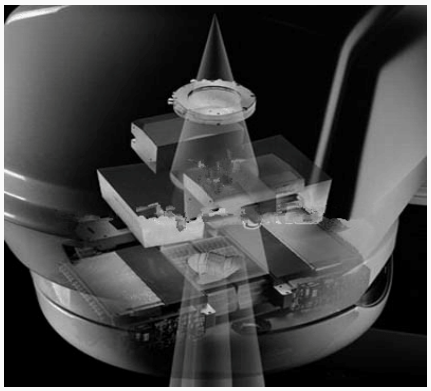
density with small capacity. At the same weights high density tungsten alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten shielding could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten shielding is suitable for radium isotope radiation shielding.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values

Lead Free Radiation Brick

Lead free radiation brick materials are well suited for this task.Lead is quite ineffective for blocking neutron radiation, as neutrons are uncharged and can simply pass through dense materials. It materials composed of low atomic number elements are preferable for stopping this type of radiation because it have a higher probability of forming cross-sections that will interact with the neutrons. The product also named tungsten alloy radiation brick is widely used.

Compounds with a high concentration of hydrogen atoms, such as water, form efficient neutron barriers in addition to being relatively inexpensive shielding substances. However, lead free radiation brick with high density materials can emit gamma rays when blocking neutrons, meaning that it is most effective when tungsten alloy radiation brick incorporates both high and low atomic number elements. We can provide all kinds of it as your requirements.



Lead Free Radiation Brick

Tungsten alloy radiation brick products have excellent radiation resistance, electric and thermal conductivity and corrosion resistance coupled with high density (16-18.5g/cm3) and good mechanical strength. Tungsten alloy radiation brick has small coefficient of expansion and large elastic modulus, and tungsten alloy radiation brick is extensively used in military equipment, mechanical manufacturing, aircraft components, medical shields and sports equipment.

Tungsten alloy radiation brick is used in both medical and industrial settings. The energy-absorbing qualities of tungsten alloy radiation brick makes them excellent choices to protect sensitive electronic equipment, as well as delicate human tissue. We deliver X-ray target and stationary anodes for a variety of X-ray applications. Our tungsten alloy radiation brick, lead free radiation brick materials are used worldwide for the assembly of X-ray tubes, and other precise X-ray technology. Tungsten alloy radiation bricks are used in radioactive source containers, gamma radiography, syringe shields, oncology treatment systems and oncology instruments. Tungsten alloy radiation brick, lead free radiation brick provides unsurpassed strength, control and protection.

Why Use Tungsten Alloy Radiation Brick?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation bricks provide excellent density with small capacity. At the same tungsten alloy radiation brick with weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
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Some additional applications for our lead free radiation bricks are:

Nuclear Medicine
Neutron Shielding
Instrumentation Shielding
Cobalt Shielding

Proton Therapy
I.M.R.T.
H.D.R
Linear Accelerator Vaults

Lead Free Radiation Protection

Most of radiation including ionizing radiation and non-ionizing radiation is harmful. Therefore, in order to protect ourselves from radiation, we have to take extraordinary measures and reduce the radiation to a minimum. We can provide different kinds of **lead free radiation protection** product as your requirements. Guangxi Chentian Metal Products Co. Ltd 's product products are always highest quality. Tungsten heavy alloy is completely it, being comprised of tungsten with minor amounts of nickel and iron. Lead free radiation protection offers a number of advantages as tungsten alloy radiation shielding material for clinical use:

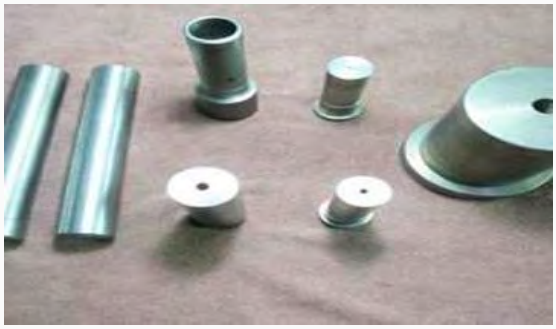
Lead Free Radiation Protection

- Good corrosion resistance under ambient conditions
- Low toxicity
- Superior radiation attenuation compared to lead
- Damage resistant due to much higher mechanical properties than lead

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shielding provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy radiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for the products.Lead free radiation protection products provided by us is qualified.

During design of tungsten alloy radiation shielding, lead free radiation protection is calculated according to requirements of shield to abate the multiple shielding materials' thickness.



Lead Free Radiation Protection

Formula: K = e0.693 d / △1/2
K: Shield weakened multiple

△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values
d: tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the lead free radiation protection products, divided by the density of the tungsten alloy radiation shielding can be obtained.

Internationalists and their team work within a zone of radiation "shade" created by the patient drapes. Light weight, pliable, and lead free radiation protection shields are built into each sterile, disposable drape.
Clinical studies show that when placed directly on the patient, RADPAD cuts harmful scatter radiation by as much as ninety-five percent. Tungsten alloy radiation shielding is widely used in some areas.

While density remains an important characteristic for blocking alpha and beta radiation, thickness is less of a concern. A single centimeter of plastic is sufficient for shielding against alpha particles, as tungsten alloy radiation shielding is a half-inch of paper. In some cases, lead free radiation protection is ineffective in stopping beta particles because it can produce secondary tungsten alloy radiation shielding when passing through elements with a high atomic number and density. Instead, tungsten alloy radiation shielding can be used to form an efficient barrier for dealing with high-energy beta radiation. When negatively charged beta particles hit a high-density material, such as tungsten alloy radiation shielding, the electrons are blocked, but the target that the lead free radiation protection barrier is intended to protect can actually become irradiated.

iPad Tungsten Alloy Radiation Protection

Tungsten Alloy Ipad Radiation Protection

Ipad Radiation Protection

The topic of electromagnetic radiation from iPad, iPhone, mobile phones, laptops, and other electronic devices has created a lot of controversy in the market. Some debate that it's bad for you, some say that it doesn't affect you at all, while some even say that it's good for you.**Tungsten alloy ipad radiation protection** is designed to protect you.
Regardless of your stance on the topic, we now offer tungsten alloy ipad radiation protection in various designs for your inspiration and your gadgets. No guarantees on how effective tungsten alloy ipad radiation protection may be, you can do the research, but tungsten alloy ipad radiation protection provides good insight on the form of products created with specific functionality in mind.

As power generation demands continue to increase and evolve, you need materials that will perform at the highest level in some of the harshest conditions. At GTP, we develop and manufacture tungsten alloy ipad radiation protection materials that will extend the life of your turbines and other equipment, protect

you from harmful radiation and semi-finished parts such as tungsten heavy alloy blanks and weights. We are also starting an exciting new venture into the solid oxide fuel cell market with the manufacture of inter-connect plates and LSM powder.

Followings Are Pictures of Tungsten Alloy Ipad Radiation Protection

Tungsten Alloy Ipad Radiation Protection

Tungsten alloy radiation shielding is designed for the iPhone, iPad and other Smartphone, which has a 3.5MM audio output. The radiation protected telephone handset, convenient and practical.
-Easy to use and easy to hold when you making phone calls. Tungsten alloy ipad radiation shielding can protect you against radiation during calling.
-Elegant, simple design, so you can use anytime, anywhere.
-Comes with hang up buttons, simple operation and convenient.
-Can be also used for iPad Skype.

The tungsten alloy radiation shielding, ipad radiation protection and tungsten alloy ipad radiation protection is a pad designed with a special material that boasts nearly 100% radiation blocking. Tungsten alloy ipad radiation protection is used by placing ipad radiation protection under your laptop, where most of the electromagnetic fields are emitted and comes in various sizes.

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shieldings provide excellent density with small capacity. At the same weights tungsten alloy radiation shielding with high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thckness would be thinner. Tungsten alloy radiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for tungsten alloy ipad raidation protection.

During design of tungsten alloy radiation shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple

△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values
d: tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the tungsten alloy radiation material can be obtained.

Tungsten Alloy Radiation CT Target

Tungsten alloy is a best choice for **tungsten alloy radiation CT target** applications, CT target used in both medical and industrial settings. Compared to traditional radiation shielding materials, tungsten alloy radiation shielding CT target provides excellent value. A high-density alloy CT target can provide the same energy absorption as lead using 1/3 less space. More and more industries are taking advantage of tungsten alloy's reliable radiation shielding properties, especially used in CT target.

Tungsten alloy is ideal for shielding against tungsten alloy radiation CT target and gamma radiation. The very high density of tungsten alloy radiation shielding (more than 60% denser than lead) CT target allows a reduction in the physical size of tungsten alloy radiationCT target components, without compromising tungsten alloy radiation CT target rigidity or the effectiveness of the CT target shielding characteristics.

CT target can be subjected to higher loadings than stationary anodes. By rotation of dish-shaped CT targets under the electron beam, a new, already cooled part of the CT target surface is continually used as the focal spot. Moreover, the CT target cools down more rapidly by radiating CT target its heat. Far more energy per unit time can therefore be supplied to a CT target tube with a CT target in comparison with a stationary anode.

Applications for tungsten alloy radiation CT target in other medical include:
PET syringe shield
Tungsten vial shield
Tungsten FDG transport container
Collimator for gamma camera
Technetium generator

Why Use Tungsten Alloy Radiation CT Target?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shieldings CT target provide excellent density with small capacity. At the same CT target weights high density alloy can provide the same energy absorption as lead using 1/3 less material in CT target.
When the CT target weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy radiation shielding CT target material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for radiation shielding for CT target .We can provide all kinds of CT target as your requirements. During design of shielding,tungsten alloy radiation CT target is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple

△ 1/2: the half-value layer values
d:thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the CT target material can be obtained.

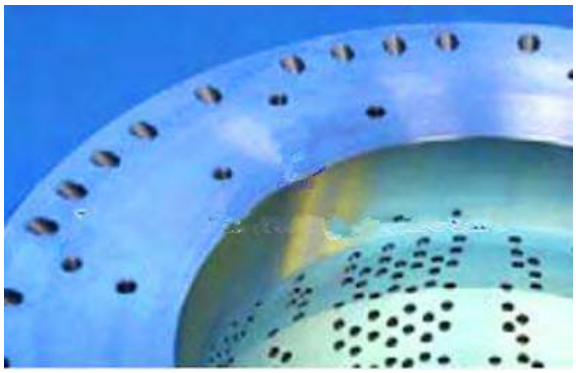
Tungsten Alloy Radiation Focusing Ring

What Is Tungsten Alloy Radiation Focusing Ring?

Focusing ring used to adjust the lens so that the subject appears sharp on the film or CCD. Most cameras now have automatic focus (AF), some have manual focus override (MF) and some have a fixed focus (F) lens that ensures things from about 1.5 meters to infinity are relatively sharp. A few cameras have a power focus (PF), which is a manual method, using a motorized **tungsten alloy radiation focusing ring**. Lenses with a ring that allows a good grip make tungsten alloy radiation focusing ring easier to adjust and focus manually. We can provide tungsten alloy radiation focusing ring as your requirements and tungsten alloy radiation focusing ring offered by us is qualified.

A low-cost lens doesn't have a tungsten alloy radiation focusing ring. Found in very basic cameras. The lens is set to a distance of around three meters and relies on the depth of field to bring everything from about one and a half meters to infinity. The quality is always a compromise over a lens with adjustable focusing.Tungsten alloy radiation focusing ring is good to our health.

An optical device is built into older cameras or added as an attachment. That is used to work out the subject distance by comparing two viewpoints. You see a double image and adjust the lenses until the images form one which gives a distance reading that can then be transferred to the focusing ring.



As we know, all microelectronic have radiation when we used. In order to resistant radiation from theses products, we have to protect measures to prevent it. Tungsten alloys is a best choices for tungsten alloy radiation focusing ring. Compared to traditional radiation shielding materials, tungsten alloy radiation focusing ring provide excellent value. A high-density alloy can provide the same energy absorption as lead using 1/3 less material. People are taking advantage of tungsten alloy reliable radiation focusing ring properties.

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shieldings provide excellent density with small capacity. At the same weights tungsten alloy radiation shielding with high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the tungsten alloy radiation shielding weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy radiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for raidation shielding.

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Tungsten Alloy Radiation Room

Tungsten Alloy Radiation Room

Our tungsten alloys are used for radioactive source containers, gamma radiography, shields, and source holders for oil-well logging, and industrial instrumentation. High-density tungsten alloy radiation shielding in tungsten alloy inside radiation room also serve as collimators and radiation shielding in cancer therapy, as well as syringe protection for radioactive injections. When you need to direct a specific amount of radiation to a targeted area, **tungsten alloy radiation room** provides the control you need. Chinatungten's high-density alloys will continue to perform, even under extreme, high-heat conditions. We can provide tungsten alloy radiation room products as your requests.

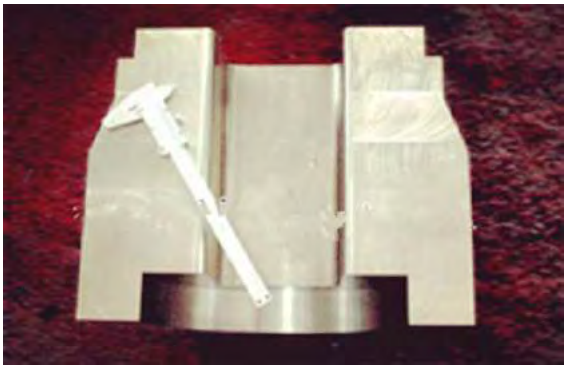
Gamma radiation and X-rays are absorbed most effectively by high-density materials. Guangxi Chentian Metal Products Co. Ltd high-density materials are a family of tungsten alloy radiation shielding materials with densities 50% greater than that of lead. The high-density, good mechanical strength and excellent mach inability of AT&M materials make them ideal for shielding applications. Tungsten alloy radiation room products are our leader products. A variety of sizes and shapes are available in tungsten alloy radiation room.

Tungsten alloy radiation room properties:

Tungsten content (wt %): 90-97

High density 16.0~18.5g/cm3

High strength 580~950Mpa



Advantages of tungsten alloy radiation room:
Good plastic
Good corrosion-resistant
Good machining property
High thermal conductivity
Low coefficient of thermal expansion
High mass absorption coefficient

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials in tungsten alloy radiation room such as lead and boron carbide, tungsten alloy radiation shieldings provide excellent density with small capacity. At the same tungsten alloy radiation shielding weights high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy radiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for raidation shielding products.

During design of shielding,tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values
d: Tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Alloy Radiation Shell

What Is Tungsten Alloy Radiation Shell?

Experiments on the generation of argon tungsten alloy radiation shell during the implosion of double-shell

plasma liners are described. The optimum liner length with respect to the maximum **tungsten alloy radiation shell** yield is determined. At a liner current of ~1.4 MA, the conversion efficiency of the generator electric energy into the shell energy attains 8–9%. The spectrum of the argon shell is measured by a set of photoemission X-ray diodes with different filters (including an argon gas filter). Based on the measurements of the emission power in different spectral intervals and calculations by the collision-radioactive model, the ion density and electron temperature of the pinch plasma are estimated.

Appliance for Tungsten Alloy Radiation Shell

The usage of tungsten alloy radiation shell is not subject to NRC, EPA, or special OSHA regulations, so it has been widely used, such as:
Radioactive source containers
Gamma radiography shields
Shielding block
Source holders for oil well logging and industrial instrumentation
X-ray collimators
Tungsten alloy PET syringe shield
Shielding in cancer therapy machines
Syringe protection for radioactive injections
Tungsten syringe shielding
Nuclear shielding wall

Why Use Tungsten Alloy Radiation Shell?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thckness would be thinner, tungsten alloy material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for raidation shell.

During design of shielding, tungsten alloy radiation shell is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2

K: Shield weakened multiple

△ 1/2: The shielding material of the half-value layer values

d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

The shell gives you best protection from the harmful radiation. Meet to the AMS 21014 and ASTM B777 material standard, we can offer tungsten alloy radiation shell with finished machining by CNC according to clients drawings.

Tungsten Alloy Radiation Shielding Door

The density of tungsten heavy alloy makes it the first choice for radiation shielding applications in the medical imaging and treatment industry. We can offer various grades of tungsten alloy radiation shielding door that will best satisfy your specific requirements. Tungsten alloyradiation shielding rood is the inert alternative to materials such as lead and depleted uranium, making it safe for use even in the most environmentally sensitive areas.

What Is Tungsten Alloy Radiation Shielding Door?

Tungsten alloy radiation shielding door is filled with special shielding materials in order to protect devices and human beings from invisible radioactive rays, electromagnetic waves, and magnetic fields. Depending on the purpose of use, the tungsten alloy radiation shielding door is categorized into tungsten alloy radiation shielding doors installed in X-ray rooms, nuclear medicine rooms, RI(Radioactive Isotope) laboratories or the radioactivity control rooms of industrial facilities, and electromagnetic wave shielding doors installed at magnetic wave shielding compartments protecting medical instruments in hospitals or MRI rooms.

The radiation shielding door is applied in facilities like Linear Accelerators or places that handle Radioactive Isotopes such as nuclear power plants, medical facilities or institutions. Shielding Effectiveness(SE) is calculated in such a way that the radiation dose is less than the legal dose limit and then the proper amount ofradiation shielding door materials is filled inside the door in order to minimized bombing damages caused by radioactivity.



Tungsten alloy radiation shielding doors are manufactured with the highest quality materials and workmanship. Typical applications include linear accelerator neutron doors, Nuclear Therapy doors, and radiation room doors. Each radiation shielding door and frame is custom designed and fabricated to meet the requirements of your radiation shielding project. We can provide all kinds of highest quality tungsten alloy radiation shielding door according to your requirements, and that shielding offered by Guangxi Chentian Metal Products Co. Ltd is qualified.

The product features excellent radiation protection performance, reasonable door structure, smooth door opening/closing, novel and elegant appearance, as well as perfect match between visual effect and high-quality medical equipment. Therefore, it is really an ideal quality product applicable to radiology rooms for such equipment as linear accelerators, gamma knifes, post-loading equipment, Cobalt-60, PET-CT, CT, DR, DSA, and X-ray machines in modern high-grade hospitals.Tungsten alloy radiation shielding door is our leader products

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation shielding provide excellent density with small capacity. At the same weights radiation shielding with high density alloy can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thckness would be thinner. Tungsten alloyradiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for raidation shielding products.

During design of shielding,radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Alloy Radiation Wall

Why Use Tungsten Alloy Radiation Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy provides excellent density combined with small volume. At the same weights **tungsten alloy radiation shielding** with-high density alloy can provide the same energy absorption as lead using 1/3 less space.
When the weight is certain, more density, more denser, and the thickness would be thinner, tungsten alloy radiation shielding material could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for radiation shielding.

During design of shielding,tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: K = e0.693 d / △1/2

K: Shield weakened multiple

△ 1/2: The radiation shielding of the half-value layer values

d: Tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the tungsten alloy radiation shieldingl can be obtained.

What Is Tungsten Alloy Radiation Wall?

Tungsten alloy radiation wall is based on the principle of attenuation, which is the ability to reduce a wave or ray's effect by blocking or bouncing particles through a barrier material. Charged particles may be attenuated by losing energy to reactions with electrons in the barrier, while x-ray and gamma tungsten alloy radiation shieldings are attenuated through photoemission, scattering or pair production. Neutrons can be made less harmful through a combination of elastic and inelastic scattering, and most neutron barriers are constructed with materials that encourage these processes. Tungsten alloy radiation shielding offered by us is of highest quality.

Radiation is a serious concern in nuclear power facilities, industrial or medical x-ray systems, radioisotope projects, particle accelerator work, and under number of other circumstances.Tungsten alloy radiation shielding can protect us from it. Containing radiation and preventing it from causing physical harm to employees or their surroundings is an important part of operating equipment that tungsten alloy radiation wall emits potentially hazardous rays. Preserving both human safety and structural material that may be compromised from radiation exposure are vital concerns, as well as tungsten alloy radiation wall, such as electronic devices and photographic film in tungsten alloy radiation wall. Tungsten alloy radiation wall is our leading products.

The process of regulating the effects and degree of penetration of radioactive rays varies according to the type of radiation involved. Indirectly ionizing radiation, which includes neutrons, gamma rays, and x-rays, is categorized separately from directly ionizing radiation. Tungsten alloy radiation wall involves charged particles. Different materials of tungsten alloy radiation wall are better suited for certain types of radiation than others are, as determined by the interaction between specific particles and the elemental properties of the tungsten alloy radiation wall. We can provide tungsten alloy radiation wall products in strict accordance with your requirements.

Tungsten Alloy Cover Shielding Radiation

As radiation becomes a problem. To protect body from radiation is very important. **Tungsten alloy cover shielding** for plasma accelerator is quite necessary. Depending on heaviest density but smallest capacity, tungsten alloy material is more and more popular be used for making tungsten alloy cover shielding to protect body from plasma accelerator radiation. Compared with lead, tungsten is much smaller but with

heavier density, which is very helpful for high radiation absorption. It is more than 60% denser than lead, meanwhile, it has excellent mach inability, good corrosion resistance. The most important thing is that, tungsten material is environment-friendly.

Advantages of tungsten alloy cover shielding

Experts find that radiation exposure could be reduced by maxing shielding. The density of a material is related to its radiation stopping ability. Higher density means better stopping power and shielding. Due to a higher density, tungsten heavy alloy has a much higher stopping power than lead. Its greater linear attenuation of gamma radiations means that less is required for equal shielding. Alternatively equal amounts of tungsten shielding provide diminished exposure risks than equivalent lead shielding.

Tungsten heavy alloy is a suitable raw material for radiation protection, as its combination of radiographic density (more than 60% denser than lead), mach inability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high strength. It can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shields and containers. Besides, compared with lead or depleted uranium in the past, tungsten heavy alloy is more acceptable in this case, for they are non-toxic.

The usage of tungsten alloy cover shielding is not subject to NRC, EPA, or special OSHA regulations, so it has been widely used, such as:

Radioactive source containers

Gamma radiography shields

Shielding block

Source holders for oil well logging and industrial instrumentation

X-ray

There is no licensing required for tungsten alloy materials. It is stable at high temperatures. You can use

one-third less material than lead and receive the same energy-absorbing effectiveness.
Our high density tungsten alloy cover shielding is a first choice wherever radioactivity has to be controlled and directed.

Tungsten Alloy Housing Shielding Radiation

As medical science developing so repaid, there is more and more radiation in our life, which has become a new trouble, such as X-ray radiation, gamma radiation (energetic electromagnetic radiation), radiation of alpha particles (helium atoms) beta particles (electrons) and cosmic radiation, etc.

In order to protect patients and other people safe from harmful effects of ionizing radiation, such as breast cancer, skin cancer, etc. One type of excellent radiation-absorbing medium is badly needed. **Tungsten alloy housing shielding radiation** is more and more popular.

Tungsten alloy is ideal for shielding against X-rays and gamma radiation. The very high density of tungsten alloy housing shielding Radiation (more than 60% denser than lead) allows a reduction in the physical size of shielding components, without compromising their rigidity or the effectiveness of the shielding characteristics.

Compared to traditional radiation shielding materials, tungsten alloys provide excellent value. A high-density alloy can provide the same energy absorption as lead using 1/3 less material! Unlike lead, you'll also reduce administration costs by eliminating the need to obtain special licensing—it's not required.

Clients all across the globe are taking advantage of tungsten alloy's reliable radiation shielding properties. If you need to protect yourself, your patients or your equipment from the harmful effects of excess radiation, come to us!

Our products are available as finished machined parts or as short rod, round bar, and rectangular blocks. Nowadays, mobile phone is more and more popular, but radiation from mobile becomes a notable problem. The type of radiation emitted from mobile phones is electromagnetic radiation. It's present in mobiles because they use radio frequency (RF) waves to make and receive calls. The doses are considered to be very small as the emissions are low power (short range). Nevertheless, there are ways in which you can reduce exposure to these waves. There are various types of radiation but we won't get into the physics of atoms, neutrons and protons. To avoid body from mobile radiation has been a subject for most experts.

Tungsten alloy housing shielding Radiation is designed for managing large quantities of high-energy radio nuclides. A convenient lever allows quick adjustment of window to optimal angle for any user and procedures. A special plate with a hex-shaped recess is mounted on the base to facilitate one-handed loading and unloading of dose pigs incorporating hex-shaped bottoms.

Tungsten Alloy Shielding in Industry

Nuclear research establishments use nuclear reactors or cyclotrons to study or create radioactive materials. **Tungsten alloy shielding in industry** is used in research activities as collimators (devices which guide or focus beams of radiation) or containers for radioactive isotopes. Tungsten alloy is ideal for shielding against both X- and Gamma radiation. The very high density of tungsten alloy shielding in industry (more than 60% denser than lead) allows a reduction in the physical size of tungsten alloy shielding components, without compromising the effectiveness of the shielding characteristics.

Application of Tungsten Alloy Shielding in Industry

Tungsten alloy could be widely used in industry fields, such as monochromatic beam shutters, geologging, pipeline in spection gamma radiation protection, oil logging explore, non-destructive testing radiation protection, etc.

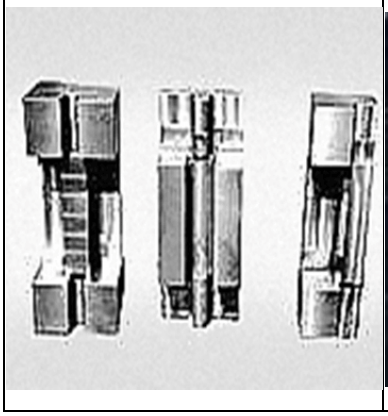
Why Use Tungsten Alloy Shielding in Industry?

Compared to traditional radiation shielding materials, ttungsten alloy provide excellent density with small capacity. At the same tungsten alloy radiation shielding in industry has high density allo which can provide the same energy absorption as lead using 1/3 less material.
When the weight is certain, more density, more denser, and the thickness would be thinner. Tungsten alloy shieldingin industry could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy radiation shielding material is suitable for raidation shielding products.

During design of shielding,tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple

△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values
d: Tungsten alloy radiation shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Some Photos for Tungsten Alloy Shielding in Industry



Industrial Instrument Explore Tungsten Radiation Protection

The Applications of Industrial Instrument Explore Tungsten Radiation Protection

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy can be widely used in industrial instrument explore tungsten radiation protection. Industrial instrument explore tungsten radiation protection can be used in welding inspection, container inspection, and oil and gas logging.

Manufacture Processes of Industrial Instrument Explore Tungsten Radiation Protection

The main manufacturing techniques of industrial instrument explore tungsten radiation protection can be divided into four process, mixing, pressing, sintering, and machining.
The process comprised the mixing of a tungsten alloy powder (such as: with content of 92.5 et.% W and the balance of Ni, Fe) with an organic binder, thermoplastic shaping of mixture to a green sheet material by an extrusion process, followed by de-binding and sintering. The sintering step was performed in hydrogen atmosphere under liquid phase sintering conditions at a temperature range of 1450°C to 1500°C. Depend on the different needs of customers, tungsten radiation shielding can be produced into different thickness and sizes through machining including milling, punching, drilling, polishing and threading.

The Advantages of Industrial Instrument Explore Tungsten Radiation Protection

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation bricks provide excellent density with small capacity. At the same tungsten alloy radiation brick with weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: K = e0.693 d / △1/2

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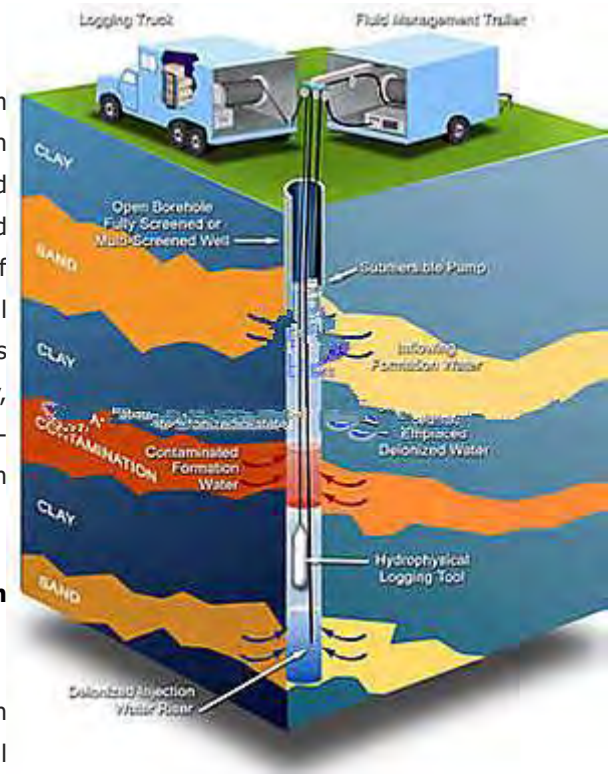
Nuclear Logging Tungsten Radiation Shield

What is Nuclear Logging?



Nuclear logging has been used in some form since the late 1920s to provide information on lithology and rock characteristics. Continued technological advances have provided improved methods for analyzing the measurements of natural and induced nuclear readings. The goal of log analysis is to map out the downhole values of reservoir characteristics chiefly as porosity, fluid saturations, and permeability. Nuclear-logging tools measure gamma ray or neutron count rates at cleverly positioned detectors.

Applications of Nuclear Logging Tungsten Radiation Shield

Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics, tungsten alloy is the best choice to produce nuclear logging tungsten radiation shield. Nuclear logging tungsten radiation shields work because gamma rays and neutrons are penetrating radiation.

Nuclear logs are based on the interaction of nuclear radiation with matter—materials like sand, clay, water, and hydrocarbons that together make up a reservoir. For logging, the interactions are primarily particle-

scattering interactions.Gamma rays tungsten radiation shields are usually used to discuss as electromagnetic radiation, for nuclear logging they are treated as photons—classical particles. Neutron tungsten radiation shield can be used in oil exploration, and undersea exploration.Neutron tungsten radiation shield also can be sed in logging or exploration boron, copper, silver, manganese, tungsten, mercury, rare-earth elements, and other minerals.

Why Use Nuclear Logging Tungsten Radiation Shield ?

Due to tungsten alloy materials has high density, which is 60% higher than lead, reduces the size of tungsten alloy ray shields, without affecting the radiation shielding effect the excellent radiation absorption of tungsten alloy. Since the environmental friendly characteristics of tungsten alloy, tungsten alloy for radiation shielding better than lead for radiation shielding in environmental protection.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
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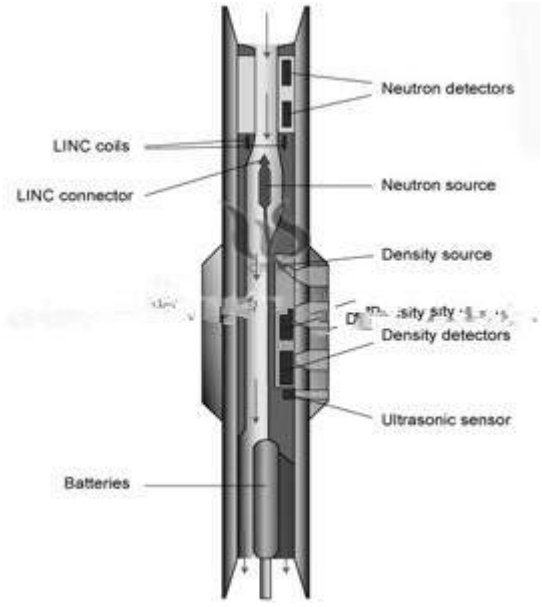

Welding Inspection Tungsten Radiation Shield

Welding Inspection

Radiography welding inspection is a nondestructive examination method that uses invisible X-ray or Gamma radiation to examine the interior of materials. It gives a permanent film record of defects that is relatively easy to interpret. It is a positive method for detecting porosity, inclusions, cracks, and voids in the interior of castings, welds, other structures. X-ray generated by electron bombardment of tungsten,

and gamma rays emitted by radioactive elements are penetrating radiation whose intensity is modified by passage through a material. The amount of energy absorbed by a material depends on its thickness and density. Energy not absorbed by the material will cause exposure of the radiographic film. Those areas will be dark when the film is developed. Areas of material where the thickness has been changed by discontinuities, such as porosity or cracks, will appear as dark outlines on the film. All discontinuities are detected by viewing shape and variations in the density of the processed film.

The Applications of Welding Inspection Tungsten Radiation Shield

Due to its high density and excellent absorption behaviour against radiation, tungsten alloy can be widely used to produce welding inspection tungsten radiation shield. Welding inspection tungsten radiation shield is used in examination of weldments in all types of materials and pipeline industry to ensure proper welding quality.

Why Use welding Inspection Tungsten Radiation Shield?

The thickness 3mm of tungsten alloy shield can shield 95% of 150keV γ radiation. Tungsten alloy shield is suiting for high spatial resolution occasion, such as radiological Imaging array detectors. Tungsten alloy shield has high density, which is 60% higher than lead, could reach the same absorption radiation effective with the smaller size. Tungsten alloy shield has the ability of various high-ray shielding. Tungsten alloy Compared with lead, when they with the same performance of radiation shielding, the volume of tungsten alloy is 1/3 of lead.Welding inspection tungsten radiation shielding is a kind of environmental protection material, which is less damage than lead.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: $K = e^{0.693\ d\ /\ \triangle 1/2}$
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Container Inspection Tungsten Radiation Shield

Container Inspection System

Container inspection or non-intrusive inspection (NII) refers to non-destructive methods of inspecting and

identifying goods in transportation systems. It is often used for scanning of intermodal freight shipping containers. Container inspection system is using X-rays and γ-rays to detect the items in containers, airline tray, transport trucks, or freight trains.

The Applications of Container Inspection Tungsten Radiation Shield

Container inspection tungsten radiation shield is usually used in container inspection system as the main components of gamma radiation detectors, gamma radiation detectors, and neutron radiation detectors. Those detectors can be used in ports, prisons, and border, which can detect weather mass destruction weapons, explosives, weapons, drugs and undeclared goods are hiding in the vehicles.

Why Use Container Inspection Tungsten Radiation Shield?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy mobile shielding provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material. When the weight is certain, more density, and the thickness would be thinner. Tungsten alloy material could be made with thinner thickness but high absorption of radiation in high density.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
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Nuclear Submarine Tungsten Radiation Protector

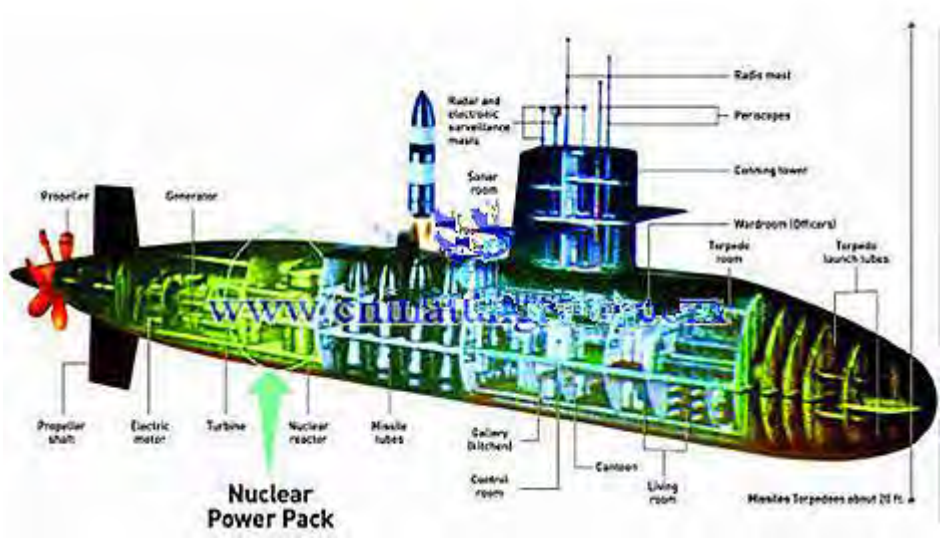
Nuclear Submarine Tungsten Radiation Protector

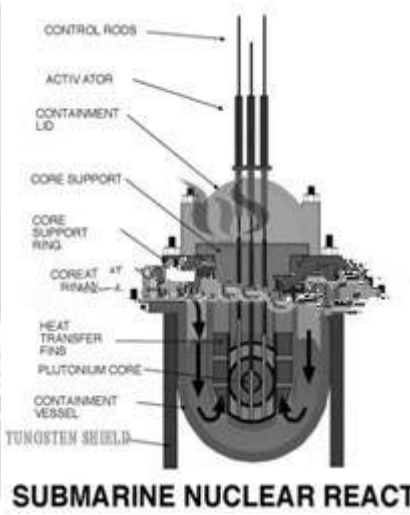
Tungsten alloy radiation shielding is the high density metal, which is mixing of a tungsten alloy powder (such as: with content of 92.5 et.% W and the balance of Ni, Fe) with an organic binder. Due to its high density, excellent absorption behaviour against radiation and environmental friendly characteristics,

tungsten alloy can be the best choice to produce nuclear submarine tungsten radiation protector.

The Applications of Nuclear Submarine Tungsten Radiation Protector

A nuclear submarine is a submarine powered by a nuclear reactor. The performance advantages of nuclear submarines over "conventional" (typically diesel-electric) submarines are considerable: nuclear propulsion, being completely independent of air, frees the submarine from the need to surface frequently, as is necessary for conventional submarines the large amount of power generated by a nuclear reactor allows nuclear submarines to operate at high speed for long periods of time.
Nuclear submarine tungsten radiation protector can be used as radiation shielding for nuclear reactor. Nuclear submarine tungsten radiation protector can be produced into plank boards to separate nuclear engine room from other rooms in nuclear submarine. Nuclear submarine tungsten radiation protector also can be used in the nuclear engine system as the radiation protector encase nuclear reactor to absorb radiation and reduce the damage of nuclear decay.





The Advantages of Nuclear Submarine Tungsten Radiation Protector

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy radiation bricks provide excellent density with small capacity. At the same tungsten alloy radiation brick with weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

During design of shielding, tungsten alloy radiation shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
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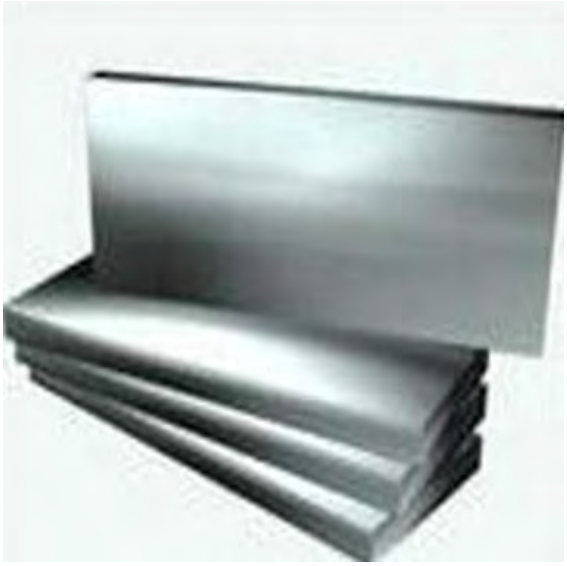


Tungsten Alloy Stopper Shields

Tungsten alloy is ideal for shielding against radiation. The very high density of tungsten alloy shielding (more than 60% denser than lead) allows a reduction in the physical size of shielding components, without compromising their rigidity or the effectiveness of the shielding characteristics.

Tungsten Alloy Stopper Shields Features

Tungsten heavy alloy stopper shield is 50cm thick (concrete brick) around the 288cm tungsten alloy stopper shields.
Concrete tungsten alloy stopper shields before and after tungsten alloy stopper shields to stop the particles having interacted at or before the tungsten alloy stopper shields.

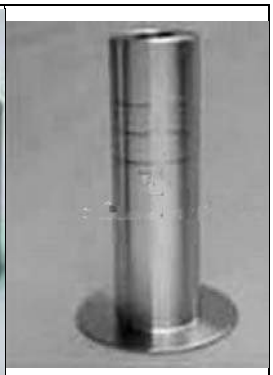
Tungsten heavy alloy stopper shield usually made of concrete 50cm thick, with an inner aperture of 110cm and an outer aperture of 160 cm the all length of the beam stopper. It leaves a layer of air of 15cm around the tungsten heavy alloy stopper shield.

Concrete tungsten heavy alloy stopper shield made as a tube of concrete 50cm thick, with inner aperture 35cm and outer aperture 85 cm, they are located around the quadruples with half length 508.5cm, before and after the tungsten heavy alloy stopper shield. This leaves a layer of air of about 14cm around the quads.

Tungsten heavy alloy stopper shield of concrete at the entrance of the detector is made of two pieces. a) A trapezoid, asymmetric located away in x from the detector aperture (considered at most the size of BQ5) but covering in y and with $\triangle z$=2m.b) A tube of concrete around the detector aperture, 50cm thick with $\triangle z$=2m.

The radius of the production vertex of those muons is reported versus z in figure 3 for the muons in the halo and in the wings of the beam. This figure represents and event simulated by geant with a layout with "vacuum" walls and no shielding but with a beam stopper of tungsten alloy.

Tungsten heavy alloy stopper shield has been chosen instead of iron. Both material have a similar dE/dx (iron has even slightly higher one); therefore the particle absorption is as twice as the absorption in iron. We will add concrete walls around the beam setup. We will then add various shielding to absorb the background from various sources, e.g. around the tungsten alloy stopper shields and to the quads next to it and close to the detector.

			
Tungsten Alloy Stopper Shields-1	Tungsten Alloy Stopper Shields-2	Tungsten Heavy Alloy Stopper Shield-3	Tungsten Heavy Alloy Stopper Shield-4

Tungsten Stopper

What Is Tungsten Stopper?

Tungsten alloy is suitable material for radiation shielding, because of **tungsten stopper** combination of radiographic density (more than 60% denser than lead), good machiability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high strength. Tungsten stopper can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of shield and containers. Moreover, compared with lead and depleted uranium, tungsten alloy is more acceptable in this case, for it is non-toxic and environmentally friendly material.

Advantages of Tungsten Stopper

Experts find that radiation exposure could be reduced by maxing shielding. The density of a material is related to its radiation stopping ability. High density means better stopping and shielding. Due to high density, tungsten alloy has a much higher stopping power than lead. Its greater liner attenuation of gamma radiations means than less is required for equal shielding. Alternatively equal amounts of tungsten stopper provide diminished exposure risks than equivalent lead shielding.

Why Use Tungsten Stopper?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten stopper provides excellent density with small capacity. At the same weights, tungsten alloy can provide the same energy absorption as lead using 1/3 less material. When the weight

is certain, more density, and the thickness would be thinner. Tungsten stopper could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for radiation shielding. Tungsten stopper is better than lead materials for it is non-toxic.

During design of tungsten alloy radiation shielding, tungsten stopper is calculated according to requirements of shielding to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten stopper is widely used in medical and nuclear industry. Tungsten stopper can be used as radiation container, multi-leave collimator, plasma accelerator shielding, etc.

Our clients across the world are taking advantage of tungsten stopper properties. If you need to protect yourself, your patients and your equipment from the harmful effects of excess radiation, you have come to the right place!

Tungsten Generator Shields

Tungsten Generator Shields

Tungsten generator shields contains a radioactive core loaded with an isotope called molybdenum 99, which decays to a daughter isotope, technetium 99m. This radioactive fluid is collected and diluted with sodium chloride, mixed with a range of diagnostic agents, and injected into patients. The radioactive substance collects in certain parts of the body and can be viewed by a gamma camera. The parent molybdenum 99 has a 2.75-day half-life, while the daughter isotope has a half-life of only 6 hours, minimizing its time in the body.

Used for the on-site conversion of saline solutions into usable dosages of radiopharmaceuticals, Medi-RayTM's tungsten heavy alloy generator shields provide both the efficiency and the safety that is our hallmark.

Since introducing its first Technetium99 generator in 1972, Medi-RayTM has continued to perfect its tungsten heavy alloy generator shields designs and has become the recognized world leader in the manufacture of Technetium99 generators.

Our physicists and engineers have over 34 years of expertise in designing and manufacturing the tungsten generator shields solutions to meet your needs.

Supplied with knurled and brass-threaded closures, leaded glass viewing windows, and our ergonomic non-slip finish, these tungsten generator shields provide the optimum solution for "milking" your generators.

Tungsten Generator Shields-1

Tungsten Generator Shields-2

Tungsten Generator Shields-3

The Advantages of Tungsten Heavy Alloy Generator Shields

The density of a material is related to its radiation stopping ability. Higher density means better stopping and absorbing radiation ray. Due to a higher density than most other materials, tungsten heavy alloy generator shields has a much higher ability of absorbing and stopping almost rays than others metals such as the traditional radiation shielding - lead. Tungsten radiation shielding greater linear attenuation of gamma radiations means that less is required for equal shielding. Alternatively equal amounts of tungsten heavy generator shields provide diminished exposure risks than equivalent lead shielding.

Tungsten heavy alloy generator shields is the right material for radiation protection, as its combination of radiographic density (more than 60% denser than lead), machinability, good corrosion resistance, high radiation absorption (superior to lead and steel), simplified life cycle and high strength. Tungsten heavy alloy generator shields can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of tungsten heave alloy generator shields and containers. Besides, compared with lead or depleted uranium (DU), tungsten generator shields is more friendship for the environments both lead and DU for it is no any toxic.

Tungsten PET Shields

What is PET?

Brachytherapy positron emission tomography (PET) is one of the nuclear medicine techniques available for diagnosis. Whilst X-rays provide information on the structure of the body, PET shows the chemical function of a particular organism. PET involves the injection of FDG (a glucose-based radionuclide) from a shielded syringe into the patient. As the FDG travels through the patient's body, it emits gamma radiation detected by a gamma camera, from which the chemical activity within cells and organs can be seen. Any abnormal chemical activity may be a sign that tumors are present. PET scans are frequently used to detect cancerous tumors and diseases of the brain and coronary arteries.

Tungsten PET Shields Dispensing System

The solid tungsten PET shields dispensing system permits the safe dispensing of high- energy PET radiopharmaceuticals without the need for expensive remote handling systems. The magnetic "docking" feature of the solid tungsten syringe shield into the dispensing pig allows low exposure dose drawing. It is designed with 3.5 cm thick walls and accommodates up to a 30ml vial.

Tungsten PET Shields Dispensing Pig 30ml

Tungsten PET shields dispensing pig provides a full 3.5 cm of solid tungsten to safely shield high energy PET radiopharmaceuticals. Designed to accommodate 30ml vials (adapters are available for smaller vials).The threaded lid attaches to the body of the pig so that no radiation "shine through" occurs .Tungsten stopper, with attached pull ring is held in place magnetically. The handle permits the pig to be easily carried as a transport container as well as a dispensing pig. Weight 43 lbs.

Tungsten PET Shields 3/5cc

Tungsten PET shields magnetically docks with the PET dispensing pig. Designed to accept 3cc and 5cc B-D syringes, it places the needle inside the vial septum when engaged. The body of the shield is constructed of solid tungsten 2.1cm thick for maximum shielding. The external calibration rod allows the precise volume to be withdrawn without a leaded glass viewing port, where high exposure levels cannot be adequately shielded. The system allows the plunger to be pulled back with a pair of forceps, allowing you to keep your exposure ALARA. Weight 5.8 lbs

Tungsten PET Shields for Pig TM Syringe

PET Pig TM permits the safe transport and administration of unit dose PET radiopharmaceuticals. It's constructed with solid tungsten walls 2.25cm thick and yet weighs only 15.6lbs. The "T" handle on the PET Pig TM cap allows the unit to be easily lifted out of traditional "ammo can" delivery cases. The threaded top provides easy access to the 3cc or 5cc syringe. The use of thermos style handle reduces hand exposure by permitting the PET Pig TM to be carried to the imaging suite without holding container

sidewalls. Prior to injection, the base unscrews, allowing the center portion to be used as a syringe shield.

Tungsten PET Shields Block

Specially designed for PET facilities or nuclear medicine departments that are working with high-energy positron emitting isotopes. Large tungsten PET shields block, which is the ideal addition to labs performing these specialized exams. Usually, the density would be control at the high level raging from 17.0 g/cm3 to 18.5g/cm3, which is the most popular material for radiation protection.

Tungsten Alloy Vial Shield

Tungsten Alloy Vial Shield Description

High strength tungsten heavy alloy, virtually unbreakable
Inside height and diameter sized specifically for the reaction vial
Removable top and bottom to minimize exposure during vial transfer
The tough tungsten will retain its shape under the roughest handling and is virtually unbreakable.
Safe handling of radioactive liquids

Tungsten alloy vial shield is designed to greatly reduce exposure to vials containing liquid radioisotopes. The shield is constructed of .19" (.48 cm) thick tungsten, equivalent to .38" (1 cm) lead at 150 keV.
They can be loaded from the top or bottom of the shield. A loss-proof slide injection port on the top allows easy access to the vial septum.
Customized design：Thickness and inner diameter

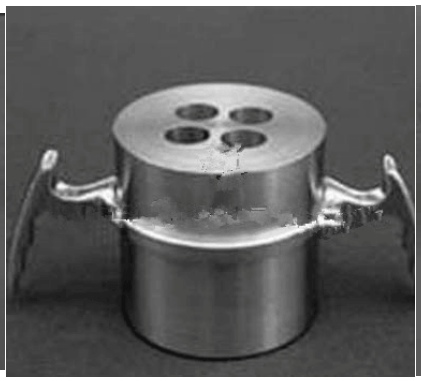
Tungsten Alloy Vial Shield

Guangxi Chentian Metal Products Co. Ltd vial shield have a unique sliding cover that is thicker and provides more shielding than our traditional "swing-top" vial shields. It is designed to be ergonomically operated with only the thumb, providing safe and efficient one-handed operation.
With brass-threaded removable tops and bottoms our vial shield allow for the insertion of the vial into the vial shield from either end, whichever suits your particular situation and protocols.
Plastic inserts are available for all our vial shields in order to safely accommodate smaller vial sizes.

Flip Top Tungsten Alloy Vial Shield

Our flip-top tungsten alloy vial shield provides substantially thicker shielding as well as the convenience and safety of a gravity-operated top closure.
The flip-top tungsten alloy vial shield can accommodate larger vials than our smaller modular design vial shields.
Plastic inserts are available for all vial shields in order to safely accommodate smaller vial sizes.

Tungsten Heavy Alloy Vial Shields-1



Tungsten Heavy Alloy Vial Shield-2

Tungsten Heavy Alloy Vial Shields

Tungsten Funnel Shielding

In order to protect patients and other people from harmful effects of ionizing radiation, a type of excellent radiation-absorbing material is badly needed. For this reason, tungsten alloy radiation shielding is becoming more and more popular.

Tungsten alloy funnel shielding is a suitable raw material for radiation protection, as its combination of radiographic density (more than 60% denser than lead), machinability, good corrosion resistance, high radiation absorption (superior to lead), simplified life cycle and high strength. Tungsten heave alloy funnel shielding can provide the same degree of protection as lead whilst significantly reducing the overall volume and thickness of tungsten funnel shielding and containers. Besides, compared with lead or depleted uranium in the past, tungsten heavy alloy funnel shielding is more acceptable because they are non-toxic.

The most effective utilization of tungsten, out of many, will be achieved after evaluation of several key factors (space/environmental considerations, long-term storage/disposal and potential for multiple applications) on the prospective application. Though not cost-beneficial for "ordinary" shielding applications, when properly selected as the shielding material, does avoidance exceeding that of lead will be achieved.

Tungsten funnel shielding possesses a high density of 19.25 g/cc (the density of lead is 11.34 g/cc). Where tungsten gains the advantage is in the ease of blending into plastic for extrusion or molding into custom shapes and sizes. Tungsten funnel shielding also differs from lead in that is virtually non-reactive and non-toxic. This eases handling requirements and minimizes issues associated with lead use such as long-term disposal and the potential characterization as a mixed hazardous waste.

Tungsten Funnel Shielding-1

Tungsten Funnel Shielding-2

Tungsten Funnel Shielding-3

Tungsten Alloy Funnel Shielding Application

Tungsten heavy alloy funnel shielding is applied in the area of glass fiber, refractory aluminum silicate fiber, construction materials, discharging tungsten funnel shielding for smelting materials.

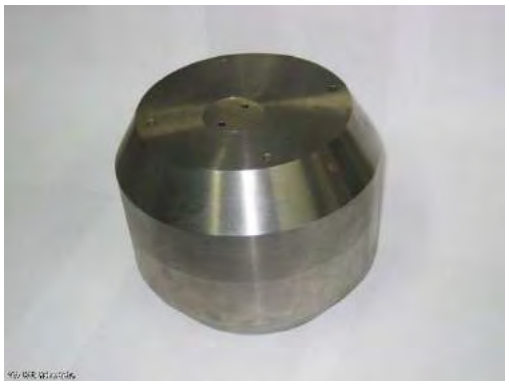
Why Use Tungsten Alloy Funnel Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten funnel shielding provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

During design of tungsten funnel shielding, tungsten heavy alloy funnel shielding is calculated according to requirements of shield to abate the multiple shielding materials' thickness.
Formula: K = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The shielding material of the half-value layer values
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Alloy Brachytherapy Shielding

Tungsten Alloy Brachytherapy



It is possible to use an alternative type of radiotherapy, which is known as afterloading (a version of brachytherapy) when it is difficult to access the diseased cells directly. Tungsten alloy brachytherapy technique consists of implanting a radioactive seed inside the patient's body, via a catheter. Before and after treatment the seed is kept in a large tungsten safe, tungsten alloy radiation shielding is used to protect the patient and medical staff against radiation

in the treatment. Guangxi Chentian Metal Products Co. Ltd is a professional tungsten alloy products manufacturer who can provide all kinds of tungsten alloy radiation shielding products used in the technique.

Tungsten Alloy Brachytherapy Shielding

When it is difficult to access the diseased cells directly, it is possible to use an alternative type of radiotherapy, known as afterloading (a version of**brachytherapy shielding**). This technique consists of implanting a radioactive seed inside the patient's body, via a catheter. Before and after treatment the seed is kept in a large tungsten safe, to protect the patient and medical staff against radiation.

Tungsten Alloy Brachytherapy Shielding Purpose

Tungsten alloy brachytherapy shielding is an integral part of the treatment regimen for cervical cancer and, generally, outcome in terms of local disease control and complications is a function of dose to the disease bed and critical structures, respectively. Therefore, it is paramount to accurately determine the dose given via brachytherapy to the tumor bed as well as critical structures.

Why Use Tungsten Alloy Brachytherapy Shielding?

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloy shielding provides excellent density with small capacity. At the same weights high density alloy can provide the same energy absorption as lead using 1/3 less material.

When the weight is certain, more density, denser, and the thickness would be thinner. Tungsten alloy brachytherapy shielding could be made with thinner thickness but high absorption of radiation in high density. That is why tungsten alloy material is suitable for radiation shielding. Tungsten alloy brachytherapy shielding is better than lead materials for it is non-toxic.

During design of tungsten alloy shielding, it is calculated according to requirements of shield to abate the multiple shielding materials' thickness.

Formula: K = e0.693 d / △1/2

K: Shield weakened multiple

△ 1/2: The shielding material of the half-value layer values

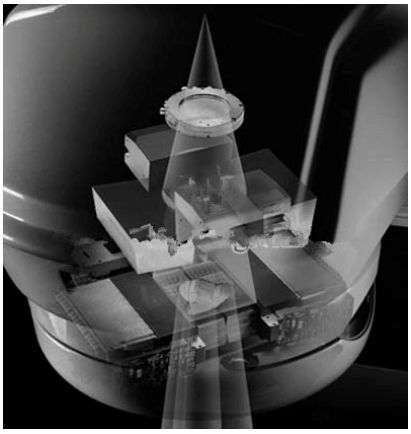
d: Shielding thickness, with the half-value layer thickness of their units, you need to half-value layer thickness of the quality of translation into the thickness of the material, divided by the density of the material can be obtained.

Tungsten Alloy Intracavitary Brachytherapy Shielding Conclusions

Utilizing an S&S imaging method in conjunction with prototype applicators that feature movable interovoid shields, they were able to acquire artifact-free image sets in a clinically applicable geometry. MR images were acquired of a phantom applicator that contained shields composed of a novel tungsten alloy. Artifacts

were largely limited to regions within the ovoid cap and are of no clinical interest. The second generation A3 utilizes this material for interovoid shielding.

Tungsten Alloy Health



Studies now show that tungsten, which is also used in welding, metal cutting, and other applications, is not as chemically inert as previously thought. Some forms of tungsten can move readily though soil and groundwater under certain environmental conditions. Both the U.S. Department of defense and the environmental protection agency now classify the element as an "emerging contaminant" of concern. Tungsten alloy material is widly used as substitution for lead, and is considered as tungsten alloy health material working as fishing weight and military fitting parts compared with DU.

Scientists think that tungsten is much less toxic than lead or mercury. Tungsten has been shown to act by antagonizing the action of the essential trace element, molybdenum. Long industrial experience has indicated no pneumoconiosis to develop among workers exposed solely to W or its insoluble compounds.

In order to protect patients, doctors, nurses and other people who may be exposed to radiation, sources of the radiation must be safely separated and shielded. It is crucial that holding and delivery instruments for radioactive materials would keep the radiation levels low enough, not to create harmful effects of ionizing radiation such as breast cancer, skin cancer, etc. Lead and steel are the traditional protection materials, but tungsten alloy radiation shielding is without a doubt the best solution. Excellent radiation-absorption, twice the density of lead and good physical resistance are main reasons to use tungsten alloy radiation shielding. Tungsten alloy health is a hot tipic for environment protection and human protection from radiation.

Compared to traditional radiation shielding materials such as lead and boron carbide, tungsten alloys provide excellent density with small capacity. With the same weight, high-density alloy can provide the same energy absorption as lead using 1/3 less space.

Tungsten heavy alloy is best choices for tungsten alloy health applications, in both medical and industrial settings.Tungsten alloys radiation shield provide excellent alternative for traditional radiation shielding materials. High-density tungsten heavy alloy radiation shielding can provide the same energy absorption as lead using 1/3 less material. People are taking advantage of tungsten alloy's reliable radiation shielding properties.

Tungsten Alloy Environment

Tungsten is a metal with many industrial and military applications, including manufacturing of commercial and military ammunition. Despite its widespread use, the potential environmental effects of tungsten are essentially unknown. **Tungsten alloy environment** is a hot topic for environment protection. This study

addresses environmental effects of particulate and soluble forms of tungsten, and to a minor extent certain tungsten alloy components, present in some munitions formulations. Dissolution of tungsten powder significantly acidifies soils. Tungsten powder mixed with soils at rates higher than 1% on a mass basis, trigger changes in soil microbial communities resulting in the death of a substantial portion of the bacterial component and an increase of the fungal biomass. It also induces the death of red worms and plants. These effects appear to be related with the soil acidification occurring during tungsten dissolution. Dissolved tungsten species significantly decrease microbial yields by as much as 38% for a tungsten media concentration of 89 mg l-1. Soluble tungsten concentrations as low as 10-5 mg l-1, cause a decrease in biomass production by 8% which is possibly related to production of stress proteins. Plants and worms take up tungsten ions from soil in significant amounts while an enrichment of tungsten in the plant photosphere is observed. These results provide an indication that tungsten compounds may be introduced into the food chain and suggest the possibility of development of photo remediation-based technologies for the cleanup of tungsten contaminated sites.

Very little tungsten has been detected in the dew soils that have been analyzed for it, although around an ore-procession plant in Russia levels as high as 2000 ppm was found. The concentration of the element in natural waters is very low.

There are several minerals of tungsten; the most important are sheltie and wolfram. The main mining area is China, which today accounts for more than two-thirds of the world's supply. Other places with active tungsten mines are Russia, Austria, Bolivia, Peru and Portugal. World production is around 40.000 tones per year and reserves are estimated to be around 5 million tones. Tungsten is also recycled and it meets 30% of demand.

Effects of tungsten on the Environment

Tungsten metal powder administered to animals has been shown in several studies as not altogether inert. One study found that guinea pigs treated orally or intravenously with tungsten suffered from anorexia, colic, in coordination of movement, trembling, dispend and weight loss. This product is not expected to be hazardous for the environment. No specific ecotoxicity data is available for this product. Tungsten alloy environment friendly is more and more popular of public.

For many years, lead and depleted uranium were commonly used as a functional, cost-effective, and reliable choice in the manufacturing of munitions. When first brought into use, scientists knew little about the environmental effects of these materials. Depleted uranium was typically seen as constituent of kinetic

energy penetrators (which uses kinetic energy to penetrate the target) in medium to large caliber munitions. Lead, most frequently used in small arms ammunition, was at that time also found in a variety of household products such as gasoline, rubber, paint, and printing supplies.

It was only after decades of use that scientists revealed that these materials pose serious threats to the environment. The search was on for a "green" alternative in munitions components.

Extensive analysis resulted in the testing of tungsten (W), a naturally occurring element that exists in the form of minerals and other compounds, as a replacement for lead in small arms ammunition. Tungsten was considered to be environmentally benign, relatively insoluble in water, and nontoxic. Furthermore, tungsten-based munitions performed the same and were similar in costs to lead alternatives.

It seemed to be the ideal solution for greener munitions. Through the Department of Defense's (DoD) Green Ammunition Program, the lead core in military bullets was replaced with tungsten composites. The DoD hoped to save millions in remediating contamination while at the same time contributing towards advancements in green technology.

However, after years of tungsten use, the DoD chose to re-evaluate the material's potential environmental impact. Researchers from Stevens Institute of Technology identified a growing concern that tungsten was not as "green" as initially thought, and began investigating how a cooperative pursuit of improved environmental protection and DoD requirements may be beneficial.

In response to this concern, Professors Christos Christodoulatos and Washington Braida of the center for environmental systems have undertaken a massive research effort aimed at identifying the specific nature of tungsten-based munitions and ultimately at minimizing the life-cycle environmental impacts and cost of munitions by researching the DoD's triple bottom line: mission, environment, and community.