Tungsten Medical Radiation Shielding

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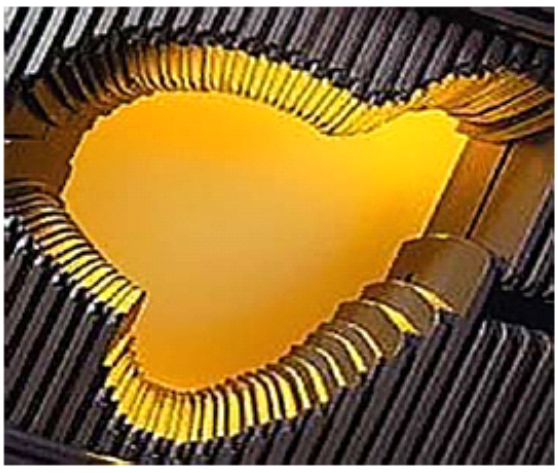
Tungsten heavy alloy medical radiation shielding is used in applications such as collimator, nuclear shielding, beamstop, PET syringe shield, vial shield, isotope container, FDG container, multi leaf collimator etc.

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

Technetium generator

PET syringe shield

Tungsten vial shield

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 = e0.693 d / △1/2
K: Shield weakened multiple
△ 1/2: The tungsten alloy radiation shielding material of the half-value layer values