Medical

Royston
Specialist Lead Products

Lead has long been regarded as the only reliable barrier against primary and secondary sources of radiation in healthcare environments. The properties which make it an excellent shielding material are its density, high atomic number, ease of fabrication, level of stability and flexibility. The density enables x-rays and gamma-rays to be dissipated.

To put the effectiveness of lead into perspective, six times the thickness of concrete would be required to provide the same level of performance.

Royston Lead provides a comprehensive range of products for medical shielding applications and provides technical assistance in the design, construction and testing of purpose-built research, storage and testing facilities. Our experience with such products includes lead-lined boards, lead bricks and vessels all of which can be certified to ensure they are fully durable and will fulfil their intended design life. We are able to liaise customer approved radiation protection advisors (RPAs) who determine the ultimate specification for an X-ray room and the immediate environment leading from it or can offer to support the specification process with independent RPA advice. Supplying lead to meet such high performance standards places a significant burden of responsibility on the manufacturer so our products are subjected to intensive quality assurance procedures and can additionally be scintillation tested if required.

Walls and ceilings

Lead is installed in various forms to meet the primary requirement of a shielding material and is often installed with plasterboard or plywood to form partitions and ceilings in X-ray rooms where dose rates permit or as bulk shielding in brick form. It can also be found in radiotherapy, CT and PET scanner, radiology and angiography units in addition to fluoroscopy and cardiac catheterization labs, mammography rooms, mobile and static screening facilities, dental surgeries and veterinary practices.

Lead-lined gypsum fibre plasterboard provides an extremely effective means of radiation protection with gypsum fibre being heavier, stronger and denser than standard plasterboard. It is also fire, impact and moisture-resistant and does not need to be skimmed, so boards are quicker to install in projects where build times are always very limited. Either machine cast or rolled lead can be used to line boards, depending upon whether the specification calls for British Standard-certified material. Lead is bonded to the gypsum fibre using a high performance, single pack, moisture-curing polyurethane adhesive. This has been formulated specifically for ‘sandwich constructions’, typically those with an outer layer of metal and a core material such as plasterboard. The adhesive is non-combustible and spray-applied using a minimum bonding pressure to guarantee effective overall bonding.

For stereotactic radiosurgery and brachytherapy units, thicker lead shielding is required while radioactive materials in laboratories and hospitals are usually handled from a position of safety behind a wall of lead bricks.

Doors

Lead provides a radiation shield as a core material in doorsets. It is also used in frames and architraves and its positioning within the door is critical if full protection is to be ensured. Doors are usually lipped on two edges in hardwood with lead fillets extending through the full thickness of the lipping. Single-leaf and double-leaf assemblies are used with double-leaf assemblies having astragals (a small convex moulding, usually with a semi-circular cross section). Lead is used to maintain performance at meeting edges.

Windows

Leaded glass and safety glass is used in medical diagnostic imaging control and observation windows, to provide full protection of the structural opening.

Containers

In nuclear medicine, there is a need to house radioactive sources (isotopes) safely. Specialist containers enable such material to be moved from the point of production to that of its ultimate use. Modern radiation physics also requires the movement of radioactive gases and liquids and lead's high radiation attenuation and shielding properties meet the demands of all such situations.

Bespoke medical requirements

Lead can be tailored to individual project requirements in relation to any of the above uses as well as applications such as pipe shielding. The specialised nature of bespoke lead production inevitably requires us to provide assistance from design through to installation.

Quality

Royston Lead takes pride in having achieved key standards of certification for quality assurance including:

ISOQAR ISO:9001 – Quality management system for the manufacture and sale of lead products

ISOQAR ISO14001:2004 Environmental management systems for the manufacture and sale of lead products and production of milled lead sheet

ISOQAR BS OHSAS 18001:2007 – Health and safety management systems for the manufacture and sale of lead products and milled lead sheet

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