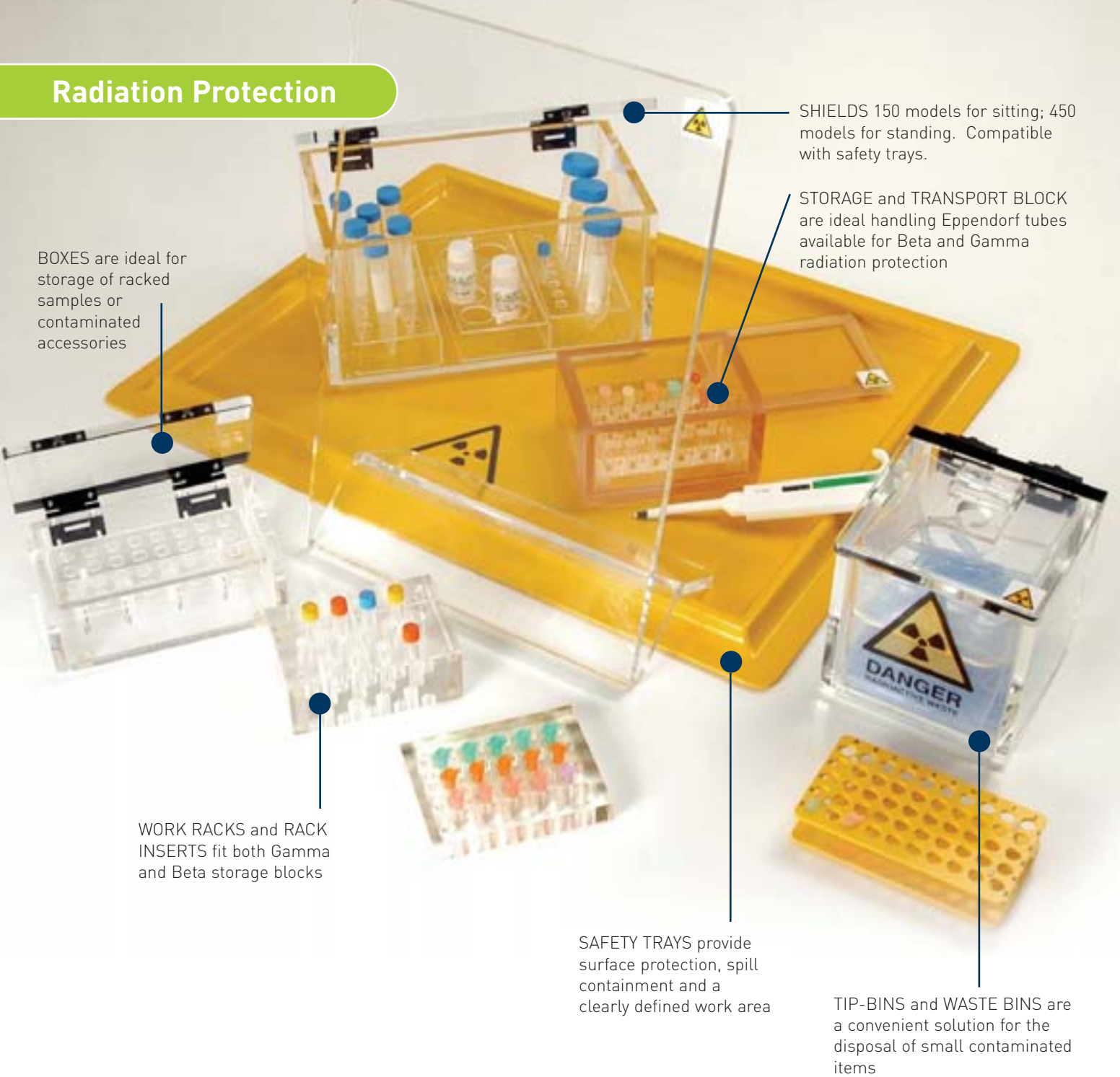




Radiation Protection

Radioactive compounds have been used in research laboratories for many years and the results of this research have benefited mankind considerably. In life science research radioactive compounds are used in the detection of nucleic acids and proteins, as well as in other techniques such as radioimmunoassay and as tracers in metabolic studies. The most commonly used isotopes which emit Beta (β) radiation particles are [^{32}P] phosphorus, [^{35}S] sulphur, [^{14}C] carbon and [^3H] tritium, while [^{125}I] iodine, [^{133}Xe] xenon, [^{57}Co] cobalt, [$^{99}\text{Tc}_m$] technetium, [^{123}I] iodine and [^{67}Ga] gallium emit Gamma (γ) particles.

Radiation Protection



BOXES are ideal for storage of racked samples or contaminated accessories

SHIELDS 150 models for sitting; 450 models for standing. Compatible with safety trays.

STORAGE and TRANSPORT BLOCK are ideal handling Eppendorf tubes available for Beta and Gamma radiation protection

WORK RACKS and RACK INSERTS fit both Gamma and Beta storage blocks

SAFETY TRAYS provide surface protection, spill containment and a clearly defined work area

TIP-BINS and WASTE BINS are a convenient solution for the disposal of small contaminated items



SAFETY PRECAUTIONS

12mm thick lead-acrylic is suitable only for the protection of Gamma emissions from ^{125}I and not from higher energetic isotopes of iodine. Lead or lead-acrylic is not recommended for shielding Beta emissions. When a Beta particle collides with an atom of a higher atomic number, such as lead, a hazardous X-ray like emission known as BREMSSTRAHLUNG is generated. To avoid producing significant amounts of bremsstrahlung, use only optical clear acrylic products to shield Beta emissions.

Radiation Protection

Generally, Beta emissions are negatively charged particles (electrons) emitted from the nucleus of an atom. Depending on the particular atom, the energy level of the charged particle will vary. Phosphorus is regarded as having a high energy level of Beta radiation particles, being 10 times greater than that of tritium, which can travel up to seven metres in air. Phosphorus is therefore known as a "hard" emitter of Beta radiation, while tritium, sulphur and carbon are regarded as "soft" emitters of Beta radiation.

^{125}I Iodine is a weak emitter of Gamma radiation particles. Gamma emissions are a form of electromagnetic radiation, similar to that of light generated by the nuclear decay of an unstable isotope. They are much more penetrating than Beta emissions and can travel very long distances in air.



CUSTOM BUILT PRODUCTS

Scie-Plas Limited manufacture the complete range of radiation protection products shown in this catalogue. Many styles and sizes of apparatus are listed for use with different applications.

However, if you cannot find the exact product you are looking for, it can be custom made to your specific requirements at little extra cost. Please contact sales@scie-plas.co.uk for a quotation.

BETA PROTECTION PRODUCTS

Beta emissions of ^{32}P , ^{35}S , ^3H and ^{14}C can be effectively blocked by using 10mm thick optical acrylic, which is now the accepted standard for shielding Beta emissions in biological research. The properties of this acrylic material are ideal for the construction of Beta radiation protection products. It is easy to bend, fabricate and machine into a wide range of products. Also, being transparent, the visibility of the working environment is not impaired.



GAMMA PROTECTION PRODUCTS

Protection from Gamma emitting isotopes such as ^{125}I , ^{133}Xe , ^{57}Co , ^{99}Tcm , ^{123}I and ^{67}Ga has, until recently, been achieved by lead shielding. This has its obvious disadvantages, being very heavy and non-transparent. However, a new lead containing acrylic copolymer resin is 30% wt/wt and is chemically introduced into the acrylic resin as an organolead salt. This material is transparent with a very light brown tint and it exhibits virtually all the normal chemical and physical properties of conventional acrylic resin.

Scie-Plas Limited provide a range of products using 12mm thick lead-acrylic, which is equivalent to 0.5mm thick lead. This range of products effectively blocks Gamma emissions from ^{125}I and any Gamma emitters of lesser energy. It is NOT suitable for use with more energetic isotopes of iodine. However, a 35mm thick shield is available which is equivalent to 1.7mm thick lead. This can be used with isotopes of higher energy

