

LEAD CABINETS – White Paper

By David Holden

Lead Lined Cabinets or Laboratory Furniture is designed for the safe storage of radioisotopes or radioactive materials inside the cabinet to ensure full protection of healthcare providers from harmful radiation. Standard cabinets are usually lead lined with 6.35 mm or 1/4" thick lead up to 25.4 or 1" thick lead. Cabinets are fabricated from low carbon steel that clad the lead on both sides, resulting with the lead fully encapsulated with no exposure to it. Cabinet designs include cupboard doors with or without shelving or individual drawers or a combination of both. Cabinets can be a flat top painted surface of a stainless steel top with backsplash and marine drip edges. The top may include drop through chutes for sharp containers. Custom designed cabinets can be provided that support higher energy radiation sources and can be lead lined as thick as 6" of lead.

Standard features include individual key locks for every drawer or door with magnetic locking lever closures to prevent unauthorized access. Legs with adjustable height allow cabinet to be adjusted for unlevelled floors or reducing the height to fit under exist sting countertops. Leveling the cabinet ensures doors do not swing open or slam shut. These freestanding legs allow full access underneath the cabinet from either direction for a pallet jack or forklift to lift and move the cabinet to its final dedicated spot within the laboratory or nuclear medicine area. All doors and drawers include a recessed notch step style to allow the door or drawer to seat inside of the cabinet rather than a flush door or drawer. This ensures a much higher and more reliable prevention of radiation loss through any seams. All drawers and adjustable pull out shelves incorporate heavy duty glides to make an effortless trouble free use and all carry a maximum 1000 lb. capacity. All doors incorporate heavy duty hinges with grease bearings and bronze thrust washers to prevent them from sagging and easier opening and closing of them. Cabinets receive a coat of paint that can easily be washed down to ensure unit is disaffected and safe for users. On receipt of an order the client always receives a detailed drawing of the cabinet with dimensions to review before signing off and allowing production to begin. Heavier lead cabinets are fabricated with lead poured into all walls floor, top and bottom as well as all doors and drawer panels, ensuring the absolute maximum lead shielding free form seams or penetrations.

Cabinets can be custom designed with built-in seismic anchor brackets. Shielded cable ports or outlets, lined with borated polyethylene for Neutron shielding. Card slots in drawers, fabricated in all stainless steel or partial. Custom paint colors and finishes are available. Different door swings, Wheels for moving them around with or without push handles. Any custom size possible. Shelves adjustable in height, sliding or fixed. Drawer dividers, flat bottom cabinets with no legs. Double or single doors. Backless or bottomless cabinets. Cabinet stands. Wall bracing or floor anchoring. Stackable cabinets

CABINET DESIGN: Type or design or requirement to ensure there is adequate storage room for product or item placed into cabinet. The internal cupboard, shelf or drawer size when door or drawer is closed must be considered to ensure it is adequate in size. The level of adequate shielding or protection must be known. The room where the cabinet will be placed, how will it look and fit with other equipment or furniture. Will our standard beige color match or clash with other equipment or casework. What will be placed onto the top of the cabinet or inside the cabinet.

CABINET TYPE:

1. LEAD LINED DECAY CABINET

- Model # MS-DC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-DC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-DC – 1.0 (This is for the 1" lead lined unit)

2. LEAD LINED DECAY AND STORAGE CABINET

- Model # MS-DSC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-DSC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-DSC – 1.0 (This is for the 1" lead lined unit)

3. UNIT DOSE CABINET

- Model # MS-UDC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-UDC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-UDC – 1.0 (This is for the 1" lead lined unit)

4. WASTE AND STORAGE CABINET

- Model # MS-WSC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-WSC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-WSC – 1.0 (This is for the 1" lead lined unit)

5. RADIOISOTOPE STORAGE CABINET

- Model # MS-RSC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-RSC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-RSC – 1.0 (This is for the 1" lead lined unit)

6. WASTE CABINET

- Model # MS-WC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-WC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-WC – 1.0 (This is for the 1" lead lined unit)

7. PREPARATION ENCLOSURE BASE CABINET

- Model # MS-PEBC – 0.25 (This is for the .25" lead lined unit)
- Model # MS-PEBC – 0.5 (This is for the .5" lead lined unit)
- Model # MS-PEBC – 1.0 (This is for the 1" lead lined unit)

CABINET SIZE: either outside dimensions or inside dimensions whatever is critical as one dictates the other based on what lead shielding is needed? Note quiet often there are critical dimensions like trying to fit a cabinet between other existing cabinets, or matching current countertop heights or ensuring the product or item fits inside of the cabinet box, drawer, shelf or cupboard. Keep in mind that all our cabinets typically are built on adjustable height legs rather than sitting flat on the floor like our competitors builds. This allows the end user to move from a loading dock to final position via forklift or pallet truck. A flat bottom doesn't allow for this. It also allows the end user to adjust for uneven floors or when a cabinet due to its heavy weight sinks into a soft tiled floor to adjust the height. These adjustable legs add approximately 4 inches to overall height.

CABINET TOP: can be a flat carbon steel top, stainless steel top. We can offer any style but need to know type of stainless steel and finish (e.g. 304 s.s.) and whether it has a front drip edge, back splash, drop port holes for sharp containers or any other modifications.

CABINET DOORS: Cabinet doors can be a single door, or double doors. All doors require us to put a step into the design to prevent radiation leakage out from the door seams. Double doors would have an overlap seam of lead or an astragal that is a common term in the door industry.

INTERNAL CABINET OPTIONS: We can offer shelves, drawers or other modifications/options. If you require shelves we need to know the load or weight for each shelf and whether the shelf has to be fixed or adjustable in height or if it needs to slide out. We will need to know the adjustments in height or increments if this option is required. For drawers we need to know whether they require dividers, what the weight will be placed into each drawer and the internal size. We can put a lock on each drawer again on the outside or have a door close over all the drawers with one lock. Sometimes it is preferred to have no door and just all drawers. In this method we would make each drawer with a lead faced front but not lead lined in between the drawers. There is no lead placed between any drawers, cupboards, shelves or any other space. Only the outer walls, sides, top, bottom, drawer or door faces.

LEAD SHIELDING: We can shield the cabinet from 1/32 to 2" or more of lead. In shielding less than 5/8" thick we layer sheet lead inside the cabinet and weld all seams. For lead over 5/8" thick we pour lead into the walls. When we pour lead it generates a good amount of heat that leaves the opportunity of the walls wanting to budge or distort. To prevent this we must manufacturer the cabinet from thicker steel plate and add temporary reinforcement prior to pouring. Unfortunately thicker plate adds to the inside or overall size of the cabinet.

CABINET FINISH: Our standard finish is a beige spray on enamel. It can be touched up onsite if scratched quite easily. We can offer a baked powder coat however it does leave the opportunity for chipping if banged and cannot be re-touched if chipped. Our painting is an industrial paint finish and not a fine hospital finish that you might find on a filing cabinet or office furniture. They may be slight imperfections that show through the paint.

CABINET WEIGHT: We can shield the cabinet from 1/32 to 2" or more of lead. In shielding less than 5/8" thick we layer sheet lead inside the cabinet and weld all seams. For lead over 5/8" thick we pour lead into the walls. When we pour lead it generates a good amount of heat that leaves the opportunity of the walls wanting to budge or distort. To prevent this we must manufacturer the cabinet from thicker steel plate and add temporary reinforcement prior to pouring. Unfortunately thicker plate adds to the inside or overall size of the cabinet.

CABINET TRANSPORTATION: All our cabinets are built on 4" high adjustable height legs rather than sitting flat on the floor like what our typical competitors build. This allows the end user to move from a loading dock to final position via forklift or pallet truck. A flat bottom doesn't allow for this. It also allows the end user to adjust for uneven floors or when a cabinet due to its heavy weight sinks into a soft tiled floor to adjust the height. These adjustable legs can be clad in a steel panel and hidden with a removable or fixed cover.

CABINET DRAWERS:

QUALITY CONTROL:

CABINET VERSATILITY: All cabinets can be used individually, or in any combination to meet your storage, decay, and workbench requirements. Unified stainless steel countertops with 4" backsplash and 0.5" lip are available for multiple cabinet configurations. Tops can be ordered 6" deeper than cabinets to accommodate pipes and services.

CABINET SAFETY: Completely shielded with lead on all six sides, most units are available with shielding thickness of 0.25", 0.5" and 1".

MODULAR: As needs change, so may department layouts. Biodex Lead-Lined Laboratory Furniture can stand alone or be combined with additional units at any time – without costly room alterations.

SECURITY: All doors have key locks for security. All cabinets include a set of brackets for seismic anchoring.

OTHER CABINET OPTIONS:

- Tops can be ordered 6" deeper than cabinets to accommodate pipes and services.
- card slots for labels
- built-in seismic anchor brackets
- Cabinets can also be ordered with loose countertops, oversized countertops to cover additional cabinets or with extended tops.
- Alternative paint colors or a durable powder coat oven baked paint finish is available.
- When ordering multiple units for grouped configuration, a unified countertop may be ordered to provide a continuous work surface.
- Shielded cable port holes or shielded vent holes
- Fume hoods.
- L-Blocks shields or lead brick caves or enclosures
- Table top Shields
- Dose calibrator Shield
- Sharp containers.
- Waste containers
- Decay Drums for low or high energy
- Lead pig Vial containers
- Custom cabinets: wider, deeper, higher, longer with lead thickness up to 4" thick
- Cabinet stands to raise small cabinets from floor to a workable and useable height
- Floor dollies for transporting your small cabinets with removable handles
- Bottom skirts

Considerations in ordering your cabinet should be as follows:

- Colour or finish
- Type or design
- Hardware, locks, hinges, and handles etc.
- Adjustable legs or flat bottom
- Thickness of lead shielding
- Overall dimensions which will dictate internal dimensions
- Drawers, cupboards, sliders or shelves
- The positioning or handling of your cabinet into your workspace and through doorways.
- Type of work surface, carbon or Stainless Steel
- Floor Loading due to weight of cabinet
- Top surface cut outs for sharp ports
- Weight or size of product to be placed onto or into drawers, cupboards etc.
- Accessories for your cabinet; L-Block Shield, Sharp Container etc.
- Available room where cabinet will be positioned, how will it look and fit with other equipment or furniture.

LEAD-LINED RADIOISOTOPE STORAGE CABINETS # MS-RSC

Our Radioisotope Storage Cabinets are available in 3, 6, 9, or 12 drawer configurations.

Each Drawer is lockable to prevent unauthorized use. Drawers can have an optional divider placed into them separating the contents. The standard external cabinet size is; 24" deep x 30" wide x 36" high. The cabinet is complete with a 304 stainless steel top work surface with 4" high backsplash and front drip edge. Internal dimensions along with the drawer dimensions are based on the amount of shielding required. Lead Shielding is available in ¼" to 1" thick. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED UNIT DOSE CABINETS # MS-UDC

Our Unit dose Cabinets is ideal where space is a factor and limited. With multiple storage compartments this cabinet design becomes functional to house a host of radioactive sources.

The top cupboards can have an optional sharp container cut out with lid for spent syringes or simply the storage of spent waste. The bottom draws are perfect for storing source pigs on their sides, syringes or radioisotopes. The two drawers can be of equal size or two separate top drawers and one single bottom one. All drawers and cupboards are lockable and are lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions along with the drawer dimensions are based on the amount of shielding required. All six sides including drawer and cupboard faces are lead lined. Top work surface is a 304 stainless steel with 4" high backsplash and front drip edge. Drawers can have an optional divider placed into them separating the contents. The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire

cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED DECAY AND STORAGE CABINETS # MS-D-SC

Our Decay and Storage cabinets incorporate functionality and needs into its design. Featuring stackable drawers on one side with a large cupboard on the opposite side housing heavy duty shelves. All drawers and the cupboard are lockable and are lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions along with the drawer & cupboard dimensions are based on the amount of shielding required. All six sides including drawer and cupboard faces are lead lined. Top work surface is a 304 stainless steel with 4" high backsplash and front drip edge. Drawers can have an optional divider placed into them separating the contents. The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED WASTE AND STORAGE CABINETS # MS-W-SC

Our Waste and Storage cabinets feature stackable drawers on one side with a large cupboard on the opposite side for the storage of radioactive waste. The top of the cupboard can have an optional sharp container cut out with lid for spent syringes or simply the storage of spent waste. All drawers and the cupboard are lockable and are lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions along with the drawer & cupboard dimensions are based on the amount of shielding required. All six sides including drawer and cupboard faces are lead lined. Top work surface is a 304 stainless steel with 4" high backsplash and front drip edge. Drawers can have an optional divider placed into them separating the contents. The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED WASTE CABINETS – # MS-WC

Our Waste cabinets are designed for radioactive storage safely through the chute located in the top work surface complete with shielded lid. The opening allows the waste to be dropped directly into your polyethylene container prior to decay and disposal, where it will be stored until you are ready to safely move it. The cupboard door is lockable and is lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions of the cupboard are based on the amount of shielding required. All six sides including cupboard door face are lead lined. Top work surface is a 304 stainless steel with 4" high backsplash and front drip edge. The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED DECAY CABINETS # MS-DC

Our Decay cabinets are designed for storage of decay material. Heavy-duty adjustable shelves incorporated into the cabinet allow the waste to be placed directly onto them for long term until it can be safely disposed of. Each shelf is manufactured with high strength shelf guide supports that will hold a minimum of 100 lbs. per shelf. The cupboard door is lockable and is lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions of the cupboard are based on the amount of shielding required. All six sides including cupboard door face are lead lined. Top work surface is a 304 stainless steel with 4" high backsplash and front drip edge. The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED PET UNIT DOSE CABINETS # MS-PUDC

Our Pet Unit Dose cabinets are ideal for the small PET hot labs. This robust cabinet is intended for the placement of your L-Block, and built in dose calibrator shield to the top work surface. A cut out for your sharp container is included with a shielded lid. A dose calibrator can be placed on a raised stand that can be bolted to the work surface. The top work surface is a 304 stainless steel with a partial 4" high backsplash. The lower portion of the cabinet has two locking cupboard doors house four independent sliding shelves capable of supporting 100 lbs. each. Perfect for storage of your PET shipping containers. The cabinet is lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions of the cupboard are based on the amount of shielding required. All six sides including cupboard door face are lead lined.

The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED PHANTOM CABINETS # MS-PC

Our Phantom cabinets are primarily designed to store flood sources and phantoms on their ends. And is used with our diversified multi cabinet configuration. The standard external cabinet size is; 28" deep x 9" wide x 34" high. The cupboard door is lockable and is lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions of the cupboard are based on the amount of shielding required. All six sides including cupboard door face are lead lined Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.

LEAD-LINED SINGLE OR DUAL CUPBOARD BASE CABINETS # MS-S/D-CBC

Our Single and Dual Cupboard Base cabinet is our most popular cabinet. It features either one single cupboard door or two side by side. The internal space can be one large storage space or shelves can be added. The top of the cupboard can have an optional sharp container cut out with lid for spent syringes or simply the storage of spent waste. The cupboard door is lockable and the cabinet is lead shielded to your choice of ¼" to 1" thick Lead. Internal dimensions are based on the amount of shielding required. All six sides including cupboard door face are lead lined. Top work surface is a 304 stainless steel with 4" high backsplash and front drip edge. The standard external cabinet size is; 24" deep x 30" wide x 36" high. Entire cabinet receives surface preparation followed by the application of a baked-on powder coating finish. (Ivory is our standard colour). Cabinet comes standard with adjustable legs for uneven floors or a flat bottom. Crated and shrink wrapped for maximum protection during transit.