Protective Material Evaluation Guide and Return Policy

Products returned after evaluation to this policy must adhere to the following:

- Obtain a RMA from Burlington Medical Account Managers or the Burlington Medical office
- Mark the areas of concern with tape, DO NOT MARK WITH INK
- Provide an image of the areas via email or with the product in the box

Inspection parameters – Inspection must be performed between 80 – 110 kV, do not inspect in auto mode as the kV will be automatically adjusted too low. Inspection below 80 kV will result in false indications when inspecting no lead products. Burlington Medical highly recommends consulting your facilities Radiation Safety Officer or Health Physicist prior to rejecting any products for use. JCAHO compliant facilities utilize an inspection plan with acceptance criteria stated in the plan.

For those facilities without documented acceptance criteria, Burlington Medical recommends the following:

- **"Pin Holes"** – In reality are not holes but tiny pieces undissolved plasticizers or metallic powder. They can be seen during fluoroscopy and x-ray due to the density difference with the surrounding material. They are usually less than 0.50mm in size and do not create a void in the protection material. These tiny specs have been tested and represent no measurable reduction in protection and will not compromise the integrity of the protection material. Products should not be returned for these manufacturing anomalies.
- **Actual Holes** – Tears, cuts, rips, and any area that actually penetrates the protection material. These areas will have sharp defined edges and are bright white during fluoroscopy and black during x-ray. Compare any areas in question to the needle holes to ensure it's an actual hole and to determine its size. Needle holes are 1.6mm in diameter.
- **Worn Areas** – Creases, dents, wrinkles, and any area worn but doesn't completely penetrate the protection material. The outer edges will blend in with the surrounding protection material and is not as bright as an actual hole. The protection level in these areas is reduced depending on the depth of wear.

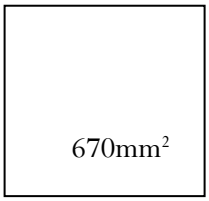
Determine the disposition of aprons with holes and worn areas by evaluating the location, depth, and size in conjunction with your facilities acceptance criteria or Burlington Medical's as provided below.

In a perfect world a radiation technologist would be protected against 100 percent of the scatter radiation produced by medical and diagnostic x-ray sources. However, we know this is not feasible. Aprons, gonad shields, thyroid collars, and the like cover vital organs, but no apron protects the body from head to toe. Protection could be enhanced with greater thicknesses of protective material, but at a cost of greater weight, discomfort, and other stresses. The goal is to keep doses as low as reasonably achievable (ALARA). This principle was applied by the authors of "Inspection of Lead Aprons: Criteria for Rejection" (Kent Lambert and Tara McKeon, *Operational Radiation Safety*, Vol. 80, suppl. 5, May 2001)[1]

Using the ALARA philosophy, Lambert and McKeon computed the area of cumulative holes that would be deemed acceptable, depending on the location of the defects. They concluded 670 mm^2 is the recommended rejection criterion for cumulative holes along the seam, in overlapping areas, or on the back. Rejection criterion greater than 15 mm^2 for defects located over critical organs and reject criterion greater than 11 mm^2 for defects located on thyroid shields. The diagrams below show the sizes of these areas as squares.

☐ 11mm^2

☐ 15mm^2



References

The information on this page is based on the article "Inspection of Lead Aprons: Criteria for Rejection" by Kent Lambert and Tara McKeon, published in *Operational Radiation Safety,* 80:5:S67-S69, May 2001