

# Radiation Protection Garment BUYER'S GUIDE



How to Select the Proper  
Radiation Protection Garment

## Proper Protection

Workers in the Medical professions who are exposed to ionizing radiation from X-ray and fluoroscopy need to be certain they are being properly protected. The long term harmful effects of x-ray radiation on the human body is well known, therefore every precaution and consideration must be taken and perhaps the most important decision is what protective garment to select.



There are three basic styles of protective garments in the marketplace today, **Front Protection**, **Full Wraparound** and **Vest and Skirt** combinations.

## Front Protection Garments

A protective garment generally comprised of a front panel from 30" to 40" long and 24" wide covering the torso from the neck to below the knee. Different types of closure straps generally criss cross the back and fasten to the front of the apron. Used in a variety of different environments, mostly where radiation exposure to the back is not a major concern or in situations that the wearer will not be turning their back towards the radiation source.



## Partial Overlap

## Full Overlap

### Wraparound Garments

A protective garment generally comprised of two overlapping front panels and a single back panel sewn together at the sides and ranging from 30" to 40" long and 50" wide covering the entire torso, front and back from the neck to below the knee. Different closure systems are available and some varieties have orthopedic elastic support belts to center the bulk of the weight on the hips. Worn in environments with higher dose radiation such as Cardiac Catheterization and EP Labs.



### Vest and Skirt Garments

A two piece garment consisting of a vest to protect the upper torso front and back and an overlapping skirt designed to protect the lower torso front and back. Like their counterpart Full Wraparound Garment, the Vest and Skirt Garments generally rely on overlapping panels of protective material to achieve the desired protection level. The unique two piece design of the Vest and Skirt apron splits the total weight of the garment between the shoulders and the waist. It is also thought to be a cooler option than the Full Wraparound apron because it allows more air to circulate. Worn in environments with higher dose radiation such as Cardiac Catheterization and EP Labs.



# REVOLUTION Partial Overlap

## Neckline Height

High enough that when worn in conjunction with thyroid collar there is no space between the thyroid collar and the apron neckline.

## Armholes

Snug fit, but not restrictive to movement of the arm

## Shoulder Panel Width

Wide enough to support the apron weight across as broad a surface area as possible without restricting movement or causing discomfort

## Shoulder Padding

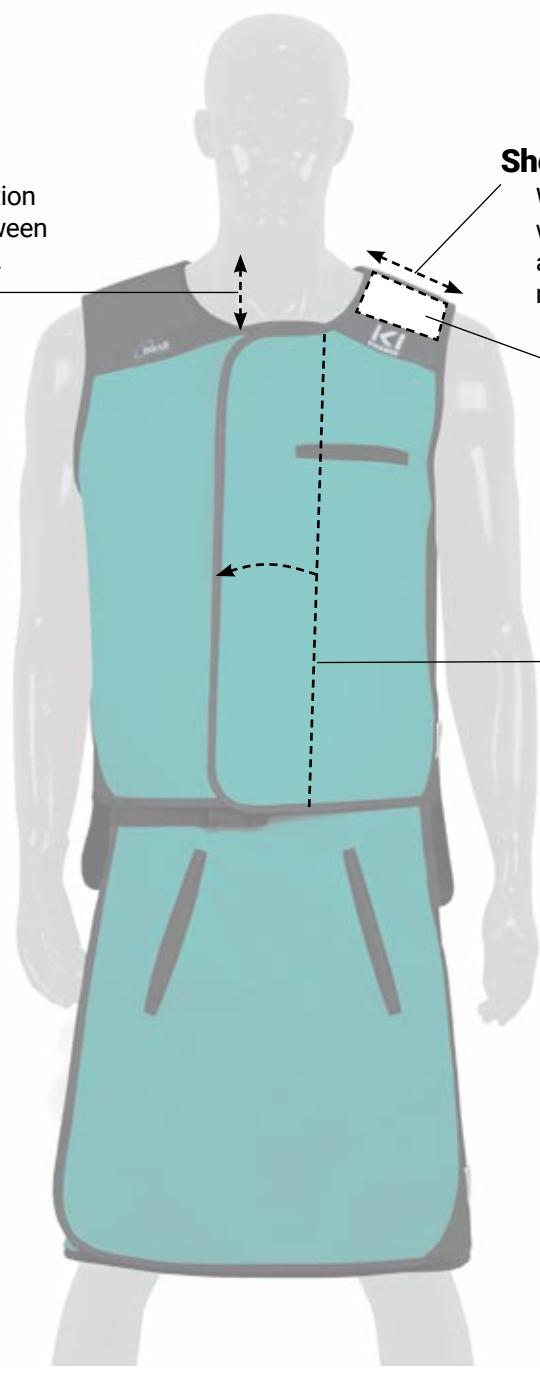
Helps alleviate discomfort to the shoulder area.

## PARTIAL Overlap

Each panel contains the full level of protection. It does not rely on overlap to achieve the stated lead equivalency.

## Proper Length

Make sure your torso is covered to just below the knee.



## Comfort

Neckline height, shoulder panel width, shoulder padding, arm hole size, amount of overlap (in those aprons utilizing overlapping panels to achieve the desired beam attenuation) proper length, flexibility and even the actual covering materials are all exceedingly important factors in the comfort

of your protective garment. Some manufacturers produce garments in Male and Female tailored cuts with narrower shoulder panels and smaller armholes for females. This can be an important factor in the decision making process. Whenever possible you should ask your suppliers sales representative to try on an apron in your size and gender to see how it feels.

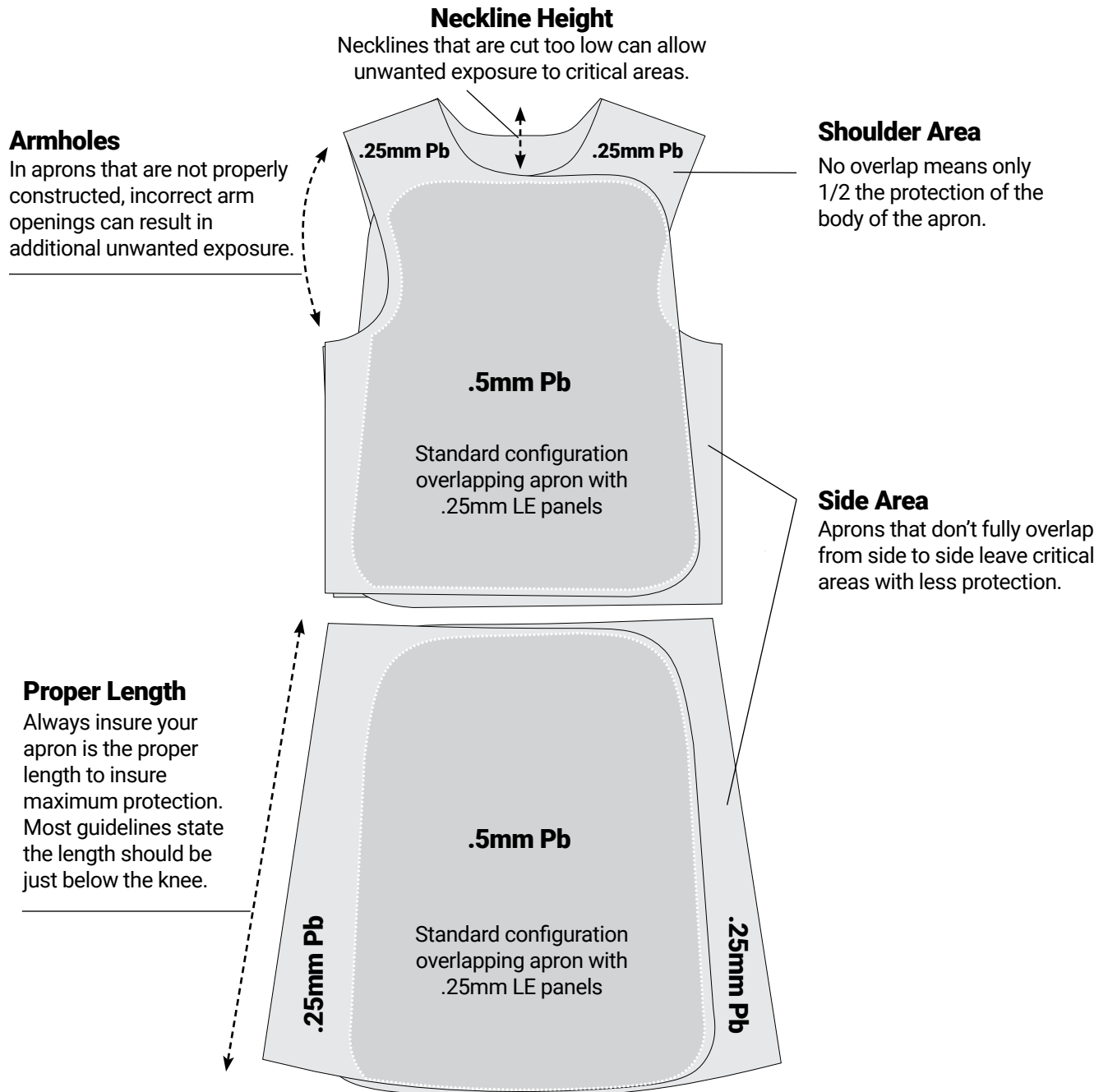
# Areas of Concern in Full Overlap Style Aprons

Different manufacturers of protective aprons use different techniques for constructing their aprons. The example below is a line drawing showing a basic vest and skirt apron for demonstration purposes. Of particular concern is the lead equivalency in each of the overlapping front panels as well as the actual fit of the apron.

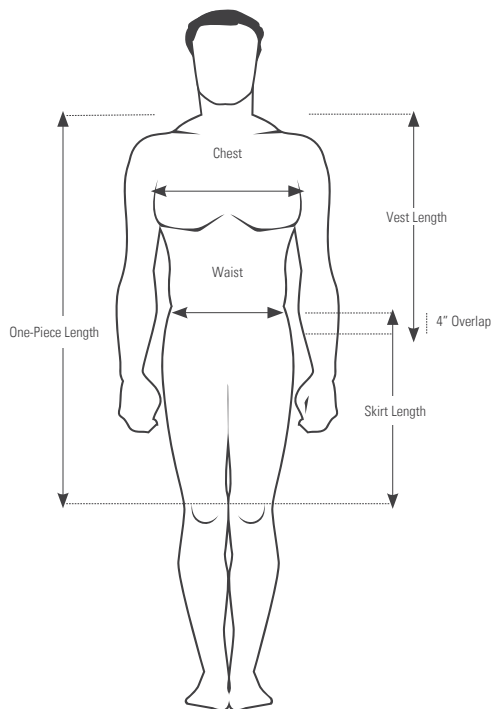
Overlapping aprons with .25mm LE in each panel must FULLY overlap from side seam to side seam to provide the same protection as a partial overlap apron with .50mm LE in each panel. Ill fitting aprons or aprons that are too small for the person wearing it and do not fully overlap are not offering the full protection level intended or represented.

Also, pay close attention to the LE in the front panels as some manufacturers are now offering so called "lightweight" .35mm LE aprons where each front panel is only .175mm LE. Anything less than .25mm LE in any panel is a violation of regulations worldwide.

**In the diagram below we have outlined other areas of possible concern in aprons that rely on the overlapping panels for their protection.**



Always insist on a properly fitted apron and always verify the lead equivalency in each panel. "Lightweight" aprons, that is, aprons that seem or feel considerably lighter than others are compromising your protection.



## Proper Fit

Proper fit is exceedingly important. Aprons that are too small or too large will allow unwanted exposure to radiation. Make sure your torso is covered to just below the knee and that the armholes are a snug fit, but not restrictive to movement of the arms. Make sure the neck line is high enough that when worn in conjunction with your thyroid collar there is no space between the thyroid collar and the apron neckline. In the case of Full Wraparound or Vest and Skirt styles where the attenuation factor relies on the overlap of the front panels, make sure the front panels fully overlap from side seam to side seam.

## Protection

Some companies have developed aprons with only a small overlap down the center of the garment for fastening purposes. These types of garments have a full amount of protective material in each panel and are not reliant on overlap.

Use great caution in determining the attenuation percentages and/or lead equivalency in each panel.

Some manufacturers offer “lighter weight” aprons that do not contain the correct amount of protective material in each panel. Anything less than .25mm lead equivalency in each panel is illegal worldwide.

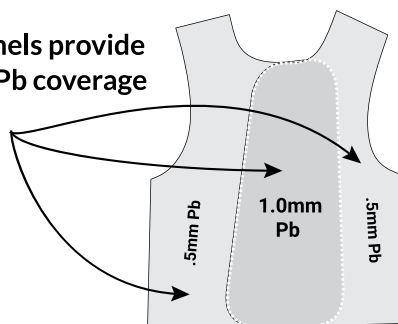
Your radiation protection garment is an important and vital piece of your safety. Careful consideration must be given to the selection of the proper garment for you and the job you perform.



It is always a smart choice to consult with your Radiation Safety Officer or other qualified person to determine the type of apron and level of protection necessary to keep you protected in your work environment.

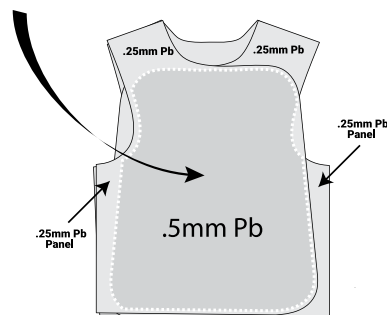
### TYPE 1: Protects Even Without Overlap

All panels provide  
.5mm Pb coverage



### TYPE 2: Must be Overlapped to Protect

Front panels must overlap  
to provide .5mm Pb coverage





If you have any questions about choosing the right radiation protection garment for you, please *contact us*.

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