

Testing lead aprons used in diagnostic radiology departments

Advisory information

This document has been prepared to assist diagnostic X-ray facilities with fluoroscopic X-ray capabilities to test and assess their own lead protective aprons used within the X-ray department.

Lead aprons recommended for use

The current conditions of registration for fluoroscopic X-ray equipment in Victoria require that lead protective aprons used for fluoroscopic applications must have the following lead equivalence and dimensions.¹

Lead protective aprons must be provided for all staff carrying out X-ray procedures where a fixed protective barrier is not made available. The aprons:

- must have minimum attenuation of 0.35 mm lead (Pb) for the front section and not less than 0.25 mm of lead (Pb) for the remaining parts
- should be designed to cover at least:
 - o the front part of the body from the throat down to and including the knees, the entire breast bone and shoulder
 - o the sides of the body from not more than 10 cm below the armpit to at least half way down the thigh; and
 - o the back from the shoulder blades down to and including the knees.

Testing of lead aprons

All lead protective aprons should be tested for shielding integrity on receipt and thereafter at approximately 12 – 18 month intervals. Each apron should be given an individual identification number, which should not be removed. Testing is performed using fluoroscopy on a floating top table. While this will not measure lead equivalence, it will quickly show faults, holes and apron deterioration. If there is any doubt about an apron, it should be withdrawn from use until further advice is obtained. If damage

to an apron is seen or suspected, it should be reported to the Chief Radiographer immediately. The date on which the testing took place should be logged against the individual identification number for that lead protective apron for future reference.

Criteria for rejection

Based on the cost of replacing lead protective aprons and the estimated radiation dose received from a defect, it is suggested that lead aprons be replaced if a defect is greater than 15 mm².² If the defect is clearly not over a critical organ then continued use of the lead apron may continue, provided the location of the defect is clearly marked on the lead apron and size, location and date that the defect was identified logged in the accompanying documentation.

Defects not in close proximity of critical organs, which are along the seam, or in overlapped areas, or on the back of the lead protective apron should be subject to a less conservative rejection criterion. In these cases, it is suggested that lead aprons be replaced if a defect is greater than 670 mm².²

Thyroid shields with defects greater than 11 mm² should be replaced.²

Further Information

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¹ AS/NZS 4543.3:2000 - Protective devices against diagnostic medical X-radiation Part 3: Protective clothing and protective devices for gonads.

² Lambert, K and McKeon, T "Inspection of Lead Aprons: Criteria for Rejection", Operational Radiation Safety, Supplement to Health Physics, 80, suppl 5, May 2001, S67-S69.