Light-weight lead aprons – light on weight, protection or labeling accuracy?

Authored by : S. Muir, R. McLeod and R. Dove
Department of Medical Physics and Bioengineering, Christchurch Hospital, Christchurch New Zealand

INTRODUCTION

In this report the authors, whose credentials are not included and cannot be determined, have attempted rather blatantly to discredit the Infab GL Greenlite protective material. Numerous attempts were made to contact the author at the e-mail address provided in his report to try and determine what, if any, qualifications he had. No response was ever received. It was later determined, independently, that the authors are Radiologic Technologists, not Physicists, with no actual scientific background at all. This paper is to rebut the glaring biased reporting of these individuals

COMMENTARY

In nearly all developed countries throughout the world there are standardized testing procedures for determining the lead equivalency of radiation protection materials. In the U.S. the testing procedure is prescribed by the ASTM under designation F 2547. In New Zealand it is AS/NZS 4543.1:1999. Quite interestingly the authors ***did not*** employ the New Zealand standard for testing. In fact, on page 2, paragraph 5 under the title "Discussion" and sub title "Test Setup" the authors state "**The test setup used (by us) in figure 1 is not ideal".**

Figure 2 of the report is perhaps the most misleading in the whole report. It illustrates the percent of transmission at 81 KvP direct beam. The GL Greenlite material shown in the second of the bar graphs is in fact a .25mm lead equivalent sample although the authors do not readily identify it as such in the figure. It is identified as a single thickness, which in the case of Infab aprons is .25mm and clearly labeled as such. (See footnote 2 for copy of actual labels that are placed into every Infab apron) No other manufacturers .25mm product is included in the test and therefore, the size of the bar in the graph where labeled Greenlite, would give one the impression it is inferior to other products. The fact of the matter is, the double layer of Greenlite (.50mm lead equivalency) which is the last bar in the graph is a mere **1% different** than all the other manufacturers' products.

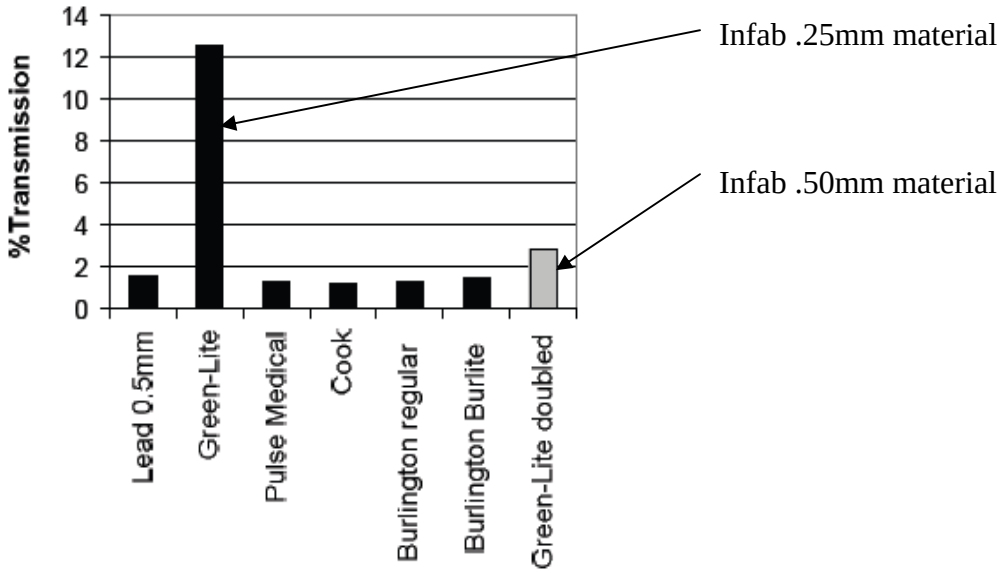

Figure 2. *X-ray transmission at 81 kVp through a single thickness of 0.5mm vest (double thickness of Green-Lite shown at the end for comparison).*

Figure 3 of the report is again wholly misleading and designed, at first glance, to fool the reader into thinking there is a major difference between the protection levels of the products listed and GL Greenlite, by using a bar chart with very narrow parameters. The plain fact of the matter is, the chart in Figure 3 illustrates there is a very small difference of less than 1.5% in the protection level between .50mm lead and GL Greenlite. While the careful reader will note this and this would serve to reinforce that GL Greenlite is in fact a highly desirable product when compared to it's counterparts product, the causal observer would only notice the disparity in height of the bar chart and wrongly assume that GL is inferior.

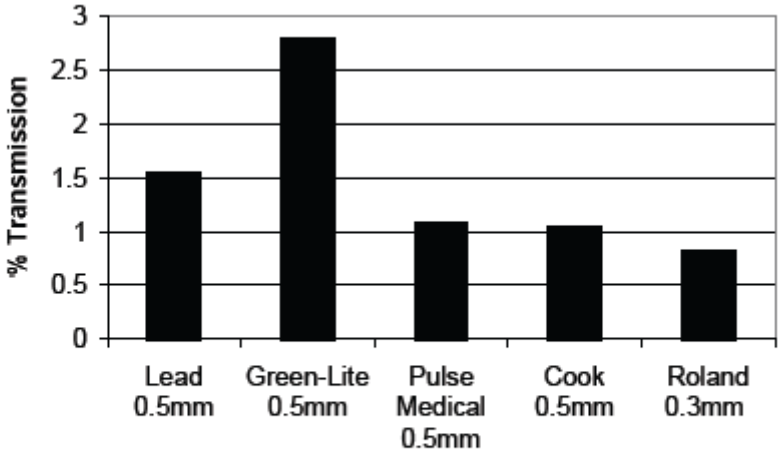

Figure 3. *X-ray transmission at 81 kVp through a double thickness of apron. Note the Roland 0.3 mm apron provides greater protection than the 0.5 mm aprons.*

In Figure 4, the authors once again use a narrow range graph chart in an attempt to visually mislead the reader. Careful perusal of the chart will show, yet again, that the GL Greenlite product performs within 1% of all other products tested, at energy levels between 50 and 125 kVp DIRECT beam.

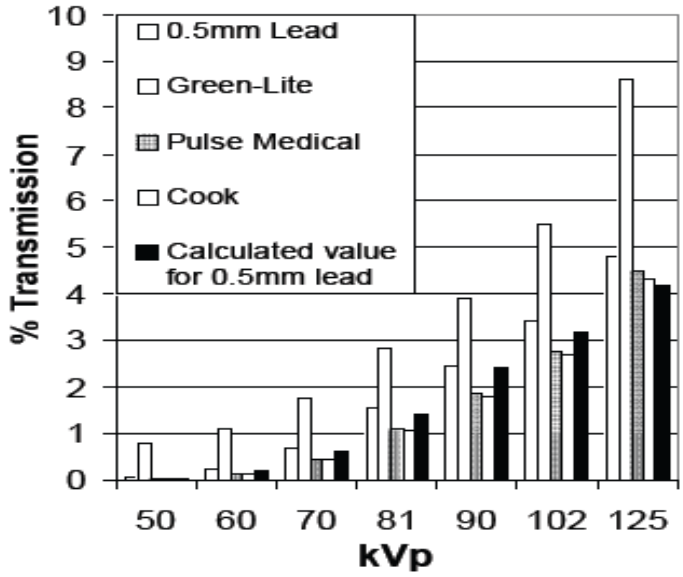

Figure 4. *X-ray transmission through a double thickness of 0.5 mm lead aprons and 0.5 mm lead over a range of diagnostic energies.*

In addition, there are no control numbers indicated to verify what exactly was tested, nor did the authors utilize a certified .50mm Standard in their testing so they would have no way to accurately determine the lead equivalency of anything they tested.

The very fact that these authors openly make the claim that a .3mm apron performed better than ***anybody else's*** .50mm apron is enough to make one question their qualifications or the authenticity of their report.

It should also be noted that the author's ridiculous claim that "The Roland apron at .0.3mm apron performed better than all the 0.5mm wraparound aprons" must be because Roland is actually the only ***Australian*** manufacturer represented in the testing. There is simply no other explanation for such a patently false and unscientific statement.

CONCLUSION

The Infab distributor in New Zealand commissioned their own report with the National Radiation Laboratory, a special unit of the New Zealand Ministry of Health in July 2005, some three months after the Muir, et al report was published. (See attachment A) This report clearly indicates the GL Greenlite aprons perform at a very high level and are well within the acceptable parameters tow arrant a .50mmlead equivalent label. Attempts were made to contact the authors of the report and correspondence was exchanged between Infab and the appropriate parties at Christchurch. (See attachment B). Because of the obvious and glaring misrepresentations in the report, the almost comical response by the person in charge at Christchurch and the phenomenal global acceptance of Geenlite all over the world, the decision was made to avoid expensive litigation and simply publish the facts as contained in this rebuttal.

Please direct all inquires and questions to Don Cusick, V.P. Sales and Marketing, Infab Corporation. Telephone: 805-987-5255 E-Mail: doncusick@sbcglobal.net or xray@infab.org