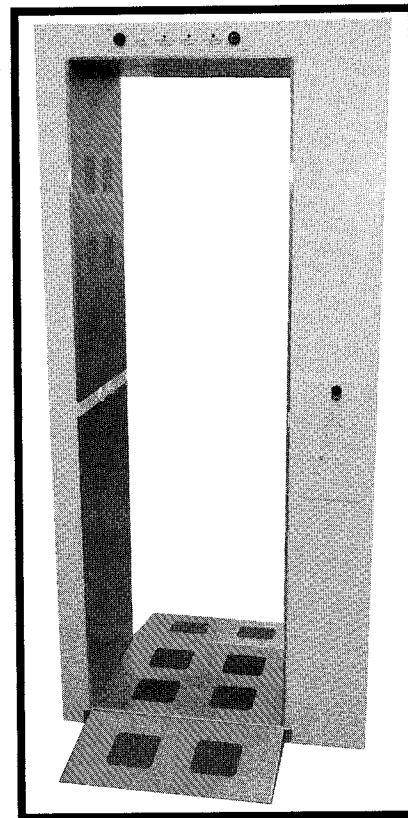


Model 53

The Model 53 is designed to detect very low levels of radiation on personnel walking through the portal. It can be used in a dynamic mode to allow personnel to walk through, or in a static mode where the person steps into the portal and stands for a predetermined amount of time, thus allowing for greater sensitivity. The system utilizes 2 infrared sensors for detection of personnel in the portal. The system also offers automatic background updates, and self-diagnostic routines to insure proper operation.



INDICATED USE: Beta/
gamma personnel monitoring

DETECTORS: 5 ea. 630 in³
shielded plastic scintillation
detectors for a total of 3150

COUNT TIME: Adjustable
from 1 – 10 seconds (*used in
static mode only*)

**BACKGROUND UPDATE
INTERVAL:** Adjustable from
18 seconds to 144 seconds

More on Beta Efficiencies

by Beth Hall and Rollie Cantu

As is obvious to most readers of the Ludlum Report, this regular feature is intended to inform and educate users of LMI instruments, regarding relevant and (hopefully) timely topics. Sometimes the topic concerns well-established and long-understood knowledge and only bears repeating. Sometimes the discussion centers around a new technique which will facilitate use and/or servicing of LMI instruments.

Today is different. We want to break some new ground by presenting data on beta efficiencies and elicit your comments.

A few weeks ago, LMI purchased new beta sources to supplement the ones we have been using. Specifically, we bought a beta source set, containing Ni-63, Pm-147, Sr-90/Y-90, and Cl-36. We also purchased two individual

sources of C-14. We then started comparing the 2 pi and 4 pi efficiencies obtained using the new sources with our previously published values.

It should be noted that we, like others in our industry, have traditionally used the stated activity as the basis for calculating both 2 pi and 4 pi efficiencies for C-14. To determine the 4 pi efficiency, we calculate the dpm value corresponding to the stated activity given in (micro)curies, and then divide the measured detector count rate by this dpm value.

To determine the 2 pi efficiency, we use the same method, with the exception that we divide the dpm value by 2 and call it the emission rate, in cpm. Source backscatter and self-absorption are not considered for C-14 efficiencies.

When we bought the new

sources, we requested that the source manufacturer state the source's emission rate on the Certificate of Calibration, in addition to the activity. This is noteworthy in that these emission rates account for backscatter and self-absorption. While we normally consider these factors in calculating 2 pi efficiencies for high-energy beta sources, we do not for the C-14 sources. What we found is that the C-14 efficiency using the emission rate is approximately twice the value published in our catalog.

We have not yet published any new values for C-14 efficiencies in the LMI catalog or detector instruction manuals, but this may be forthcoming.

In the meantime, please call if you have any questions or feedback related to this issue. We are very interested in hearing from you.

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