

APPLICATION NOTE

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Revision A, July 2010

Energy Correction Factors for the R100B/PDP Solid State Detector

This application note describes the energy correction data for radiographic dose and dose rate measurements. These data are stored in our display programs QABrowser, oRTIgo and Ocean and are used to automatically compensate the readings of dose and dose rate according to kVp and Total Filtration.



Piranha Dose Probe (PDP)



R100B Dose Probe



Introduction

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When using the Piranha or Barracuda with the R100B/PDP in the radiographic range, all dose and rate values measured are automatically compensated for the energy dependence of the detector. This application note specifies the correction factors which are used by our display programs. The kV range is 50-150 kV and the total filtration ranges from 2.2 to 23 mm Al. The reference point is at 70 kV with 3.0 mm Al filtration.

Correction Factors

The correction factors used by the RTI programs can be seen in table 1 below.

kVp	2.2 mm	2.5 mm	3.0 mm	3.5 mm	4.0 mm	5.0 mm	6.0 mm	7.0 mm	8.0 mm	10.0 mm	15.0 mm	20.0 mm	23.0 mm
50	1.04	1.03	1.01	1.00	0.98	0.97	0.95	0.94	0.94	0.93	0.93	0.94	0.93
60	1.03	1.02	1.00	0.99	0.98	0.97	0.96	0.95	0.95	0.95	0.95	0.97	0.98
70	1.02	1.01	1.00	0.99	0.98	0.97	0.97	0.96	0.96	0.96	0.98	0.99	1.00
80	1.02	1.01	1.00	1.00	0.99	0.98	0.98	0.98	0.98	0.98	0.99	1.00	1.00
90	1.02	1.01	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	1.00	1.01	1.01
100	1.02	1.01	1.00	1.00	0.99	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.00
110	1.01	1.01	0.99	0.99	0.99	0.99	0.98	0.99	1.00	1.00	1.00	1.00	0.99
120	1.01	1.00	0.99	0.97	0.98	0.98	0.98	0.99	1.00	1.00	1.00	0.99	0.99
130	1.01	1.00	0.99	0.99	0.99	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99
140	1.01	1.00	0.99	0.99	0.99	0.98	0.99	0.99	0.99	0.98	0.99	0.99	1.00
150	1.01	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.98	0.98	0.98	1.00

Table 1. Correction factors C_q for the R100B/PDP

The factor is multiplied with the measured value in the following manner:

Let us assume a total filtration of 5.0 mm Al, a kVp of 70kV and a measured dose of 1.20 mGy

Corrected dose = $1.20 \times 0.97 = 1.16$ mGy