

The European Federation of Organisations for Medical Physics

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Dose /Kerma Area Product display on X-ray equipment

Dose/Kerma Area Product (DAP/KAP) is a required display on radiography and fluoroscopy equipment as in the IEC standard. It is essential that the value displayed is readily understood by the user who may be working with many other items of X-ray equipment from multiple manufacturers. *N.B. Kerma is the terminology recommended by the ICRU.*

The SI unit for DAP/KAP is Gy m^2 . However, the IEC Standard specifies that SI prefixes are permissible and a multiple of different combinations are presently in use. The problem then arises that the units themselves are not always displayed and when different equipment is being used in the same clinical environment, differences in magnitude of the numerical values obtained can cause problems of interpretation. The following issues concern the SI prefixes used on the display:

- The SI prefixes used for the display should be a combination that is familiar to the user.
- For ease of interpretation of dose data, it is desirable that the SI prefixes are the same for all equipment within an organization carrying out the same examinations.
- The sensitivity of the display must be sufficient for the lowest doses likely to be delivered for any examination to be carried out on that equipment.
- The SI prefixes used and the number format (i.e. number of digits following a decimal point) should be identical at all locations at which DAP/KAP is displayed, e.g. on the generator and on the image display monitor.

It is proposed that standard prefixes be used (across Europe at least), either $\text{Gy}\cdot\text{cm}^2$ or $\text{cGy}\cdot\text{cm}^2$ and that the chosen unit is indicated on the equipment so that the numerical values for DAP/KAP are in a reasonable range for interventional radiology in the first case ($\text{Gy}\cdot\text{cm}^2$) and all other diagnostic radiology in the second case ($\text{cGy}\cdot\text{cm}^2$).

Consequently, the EFOMP recommends that the NMOs support the following statement with respect to DAP/KAP units:

The display of DAP/KAP should be in one of two possible units, $\text{Gy}\cdot\text{cm}^2$ or $\text{cGy}\cdot\text{cm}^2$. The choice of which unit to display should be determined by the institution where the equipment is installed.

Institutions that want to have a single unit across all modalities can do so, and institutions that want one unit for interventional fluoroscopy (for the higher cumulative values) and one unit for the rest of radiology can do so also. The decision on the appropriate unit should normally be taken between the Medical Physics Expert and the Radiology Service Management.

EFOMP Officers

Trieste, Italy

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