

First edition  
1999-02-01

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## **Photography — Sensitometry of screen/film systems for medical radiography —**

### **Part 3:**

**Determination of sensitometric curve shape, speed and average gradient for mammography**

*Photographie — Sensitométrie des ensembles film/écran pour la radiographie médicale —*

*Partie 3: Détermination de la forme de la courbe sensitométrique, de la sensibilité et du contraste moyen pour la mammographie*



Reference number  
ISO 9236-3:1999(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9236-3 was prepared by Technical Committee ISO/TC 42, *Photography*.

ISO 9236 consists of the following parts, under the general title *Photography — Sensitometry of screen/film systems for medical radiography*:

- *Part 1: Determination of sensitometric curve shape, speed and average gradient*
- *Part 2: Determination of the modulation transfer function (MTF)*
- *Part 3: Determination of sensitometric curve shape, speed and average gradient for mammography*

Annexes A and B of this part of ISO 9236 are for information only.

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This is a preview of "ISO 9236-3:1999". [Click here to purchase the full version from the ANSI store.](#)

## Introduction

This part of ISO 9236 provides methods for determining the sensitometric curve shape, the average gradient and the speed of radiographic screen/film/filmholder/processing systems used in mammography.

The sensitometric curve, which is also needed for the determination of other properties (as, for example, the modulation transfer function) is measured under low-scatter conditions via intensity scale X-ray sensitometry, using a sensitometer which is mainly based on the photometric inverse square law. For the determination of the sensitometric curve shape, the irradiation of the screen/film/filmholder combination need be measured only in relative units.

While the average gradient is determined from the sensitometric curve shape, speed has to be measured in a separate way, since the exposure conditions should simulate as closely as possible those which are used in practice. Therefore, scattered radiation is included, accompanied by a slight change of beam quality compared to the beam quality used for intensity scale sensitometry. The clinical exposure is simulated by using both an appropriate phantom and tube voltage. The screen/film/filmholder combination is exposed behind the phantom. The exposure shall be measured in absolute units (gray, Gy) in order to determine the speed.

Speed is generally dependent on X-ray energy, the amount of scattered radiation and the exposure time. Therefore, some variation in speed values may be expected under practical conditions. However, as the range of tube voltages applied in screen/film mammography is small, this part of ISO 9236 describes only one beam quality for speed measurement. The measurement conditions described in this part of ISO 9236 provide values for speed and average gradient which are representative of those found under practical conditions.