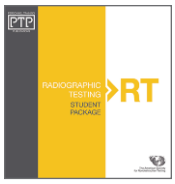

Radiographic Testing Student Guide, Second Edition

Errata – 2nd Printing 08/18

The following text correction pertains to the second edition of the *Radiographic Testing Student Guide*. Subsequent printings of the document will incorporate the corrections into the published text.

The attached corrected page applies to the second printing. In order to verify the print run of your book, refer to the copyright page. Ebooks are updated as corrections are found.

Page	**Correction**
18	In Figure 4, the second instance of iridium in the sample dated decay curve should be 12.5 Ci.

Note: Slide 81 in the Level I, Lesson 2, PowerPoint® Presentation that accompanies the Lecture Guide will also show this same correction.

52 Question #29 should be revised as follows:

Calculate the geometric unsharpness given the following: Object thickness of 1 in. (25.4 mm), source-to-film distance of 14 in. (355.6 mm), and source effective size of 0.125 in. (3.175 mm).

a. 0.01 in. (0.25 mm)
b. 0.18 in. (4.57 mm)
c. 0.17 in. (4.32 mm)
d. 0.1 in. (2.54 mm)

114 The box in the top left corner of Figure should read:
Ir-192 exposure factors
$T = EF \times D^2/S$
T = time (min) for density 2.0
EF = exposure factor
D = source-to-film distance (ft)
S = souce strength (Ci)

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Half-Life

1. The length of time required for the activity of a radioisotope to decay (disintegrate) to one half of its initial strength is called its *half-life*.
2. The half-life of a radioisotope is a basic characteristic dependent on the particular isotope of a given element.
3. Dated decay curves, as shown in Figure 4 for Ir-192, are supplied when a radioisotope is obtained.

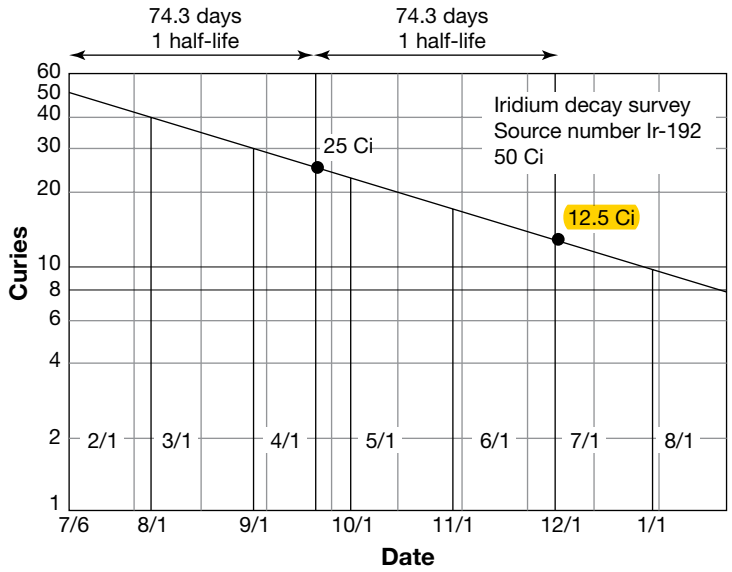

Figure 4: Sample dated decay curve.

Gamma Ray Quality Characteristics

1. Radiation from a gamma ray source consists of rays whose wavelengths (energy) are determined by the nature of the source.
2. Table 2 lists the most-used radioisotopes and the energy of their gamma ray emissions.

Gamma Ray Sources

1. The effective focal spot in X-radiography is the X-ray generating portion of the target as viewed from the test object.
2. In contrast, in gamma radiography, because all of the radioactive material is producing gamma rays, the focal spot is the surface area of the material as viewed from the test object.
3. Table 3 summarizes the characteristics of the most-used radioisotopes.

25. Discontinuity enlargement occurs:

    a. when the discontinuity is closest to the film/imaging plate/detector.
    b. when the discontinuity is farthest from the film/imaging plate/detector.
    c. when the discontinuity is farthest from the radiation source.
    d. never; enlargement doesn't occur in radiographic imaging.

26. Calculate the radiation intensity at 20 ft (6 m) using the inverse square law if the original distance was 10 ft (3 m) with an initial intensity of 50 mR/h (500 µSv/h).

    a. 10 mR/h (100 µSv/h).
    b. 15 mR/h (150 µSv/h).
    c. 12.5 mR/h (125 µSv/h).
    d. 14.5 mR/h (145 µSv/h).

27. With other variables unchanged, an increase in kilovoltage (kV) of an X-ray machine will generate:

    a. high-intensity hard X-rays.
    b. low-intensity hard X-rays.
    c. same-intensity hard X-rays.
    d. high-intensity soft X-rays.

28. Which of the following types of radiation is determined by the composition of the disturbed atom?

    a. Continuous X-rays.
    b. Characteristic X-rays.
    c. Bremsstrahlung radiation.
    d. Co-60 gamma radiation.

29. Calculate the geometric unsharpness given the following: Object thickness of 1 in. (25.4 mm), source-to-film distance of 14 in. (355.6 mm), and source effective size of 0.125 in. (3.175 mm).

    a. 0.01 in. (0.25 mm)
    b. 0.18 in. (4.57 mm)
    c. 0.17 in. (4.32 mm)
    d. 0.1 in. (2.54 mm)

30. The principle of geometric unsharpness is that:

    a. all radiographic exposures have equal sharpness.
    b. results may vary greatly due to various factors.
    c. the farther the distance between the test object and the film, with the source in the same position, the greater the penumbral shadow.
    d. the farther the distance between the test object and the film, with the source in the same position, the greater possibility of image distortion.

31. Optimum geometrical image sharpness in film radiography is obtained with a combination of a:

    a. smaller source, greater distance between the source and the test object, and a shorter distance between the test object and the film.
    b. larger source, greater distance between the source and the test object, and a shorter distance between the test object and the film.
    c. smaller source, shorter distance between the source and the test object, and a larger distance between the test object and the film.
    d. smaller source, shorter distance between the source and the test object, and a shorter distance between the test object and the film.

Gamma Ray Exposure Chart

1. A typical *gamma ray exposure chart* is shown in Figure 2.
2. The variables in gamma radiography are the source strength and the source-to-film distance (SFD). These are related on the chart to each of three different speed films.
3. By selecting a film, the radiographer can determine the exposure time for a desired image density.
4. Similar to X-ray exposure charts, gamma ray exposure charts are adequate to determine exposures of test objects of uniform thickness but should be used only as a guide when radiographing a test object of wide thickness variation.

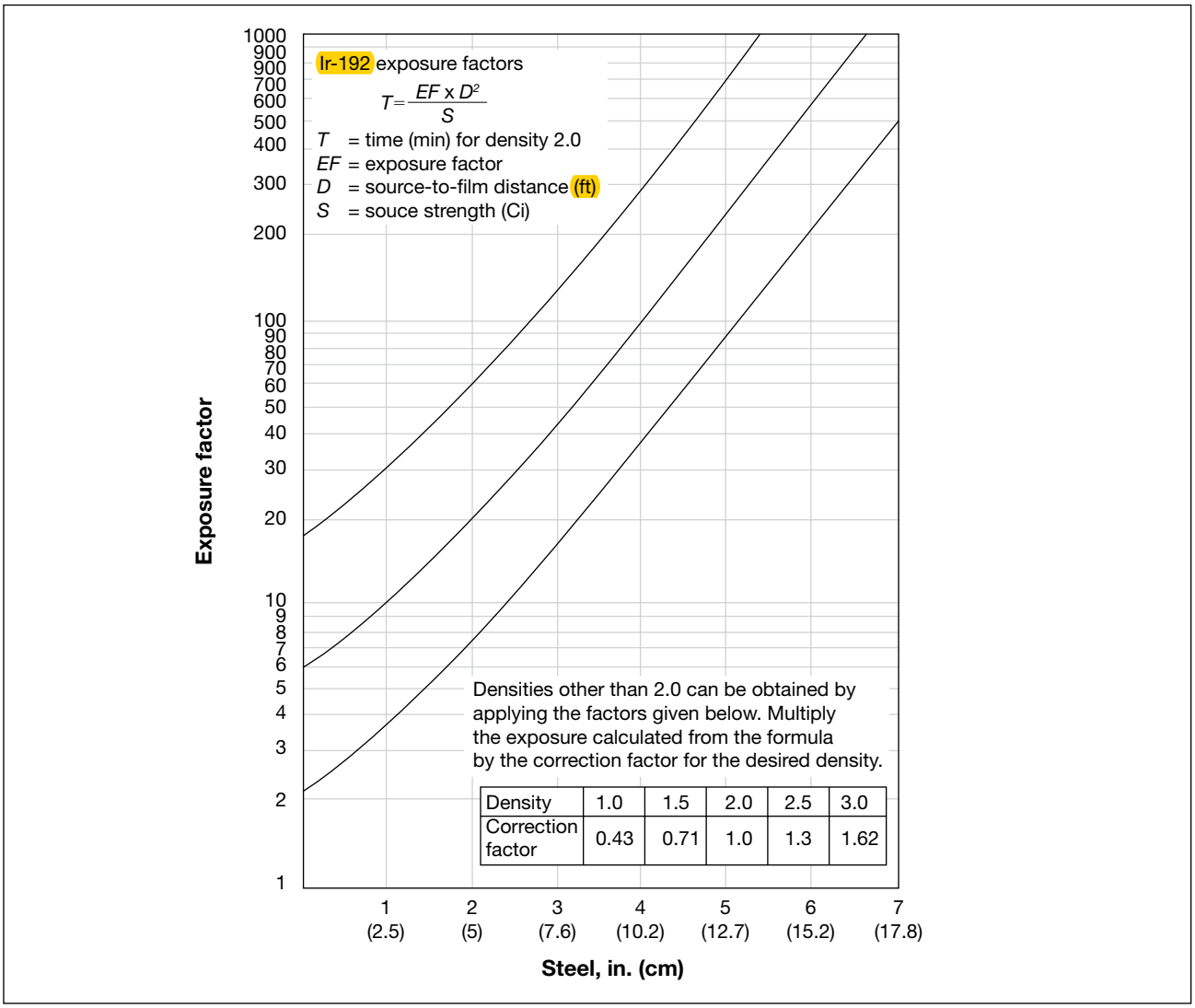

Figure 2: Typical gamma ray exposure chart.