



SNS COLLEGE OF ALLIED HEALTH SCIENCES- COIMBATORE 35



DEPARTMENT : RADIOGRAPHY AND IMAGNG TECHNOLOGY

**SUBJECT : GENERAL PHYSICS, RADIATION PHYSICS AND PHYSICS OF
DIAGNOSTIC RADIOLOGY**

PAPER : PAPER II (UNIT 5 – PHYSICS OF DIAGNOSTIC RADIOLOGY : X-ray TUBE)

TOPIC : 8. X-ray CASSETTES

X-ray CASSETTES

- The cassettes are used in conventional screen-film radiography.
- The cassettes are used with intensifying screens and screen films. The cassette is rectangle or square-shaped and consists of plastic or metal.
- It is used to hold the exposed or unexposed X-ray film. The intensifying screens are mounted on each side of the cassette.
- The cassette has a rubber sheet at the backside, which allows adequate contact between screen and film.
- The front side of the cassette is made of low atomic number material, and the back is made of high atomic number material to reduce backscatter.
- The different cassette sizes are 17 x 14, 15 x 12, 14 x 14, 12 x 12, 12 x 10, 108, 126 (OPG) inches.





FUNCTIONS OF CASSETTES



- The cassettes hold the X-ray films and exclude light and provide protection from dust to the films.
- The cassettes hold the radiographic film.
- Protect the film from dust.
- Protect the film from exposure to light.
- Protect the film from bending and scratching during use.
- Contain intensifying screens, keeps the film in close and uniform contact with the screen.



FUNCTIONS OF CASSETTES

THE FRONT OF THE CASSETTE

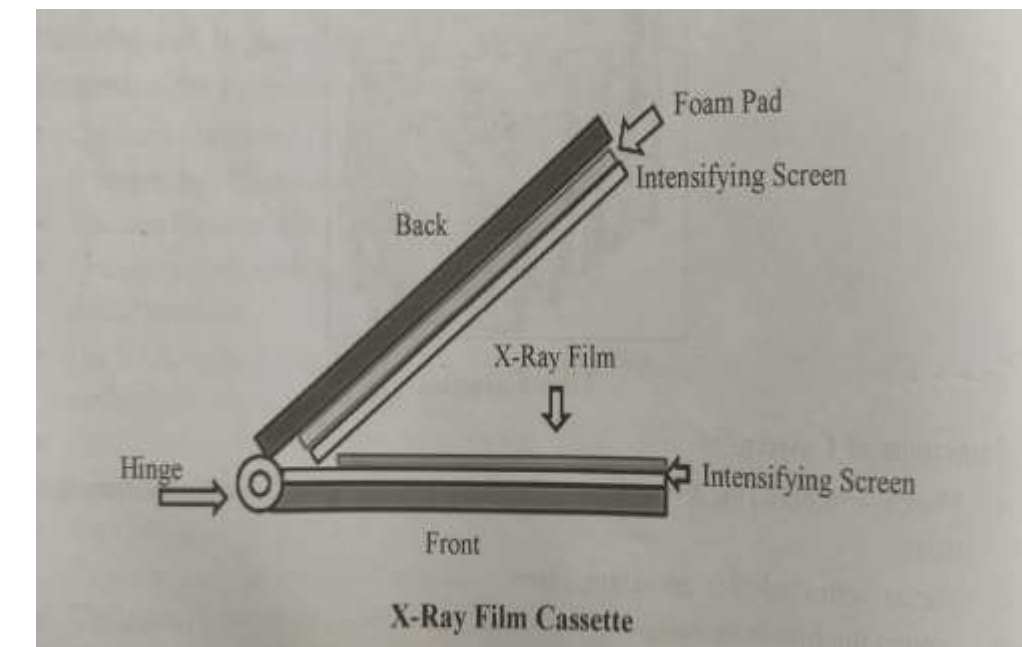
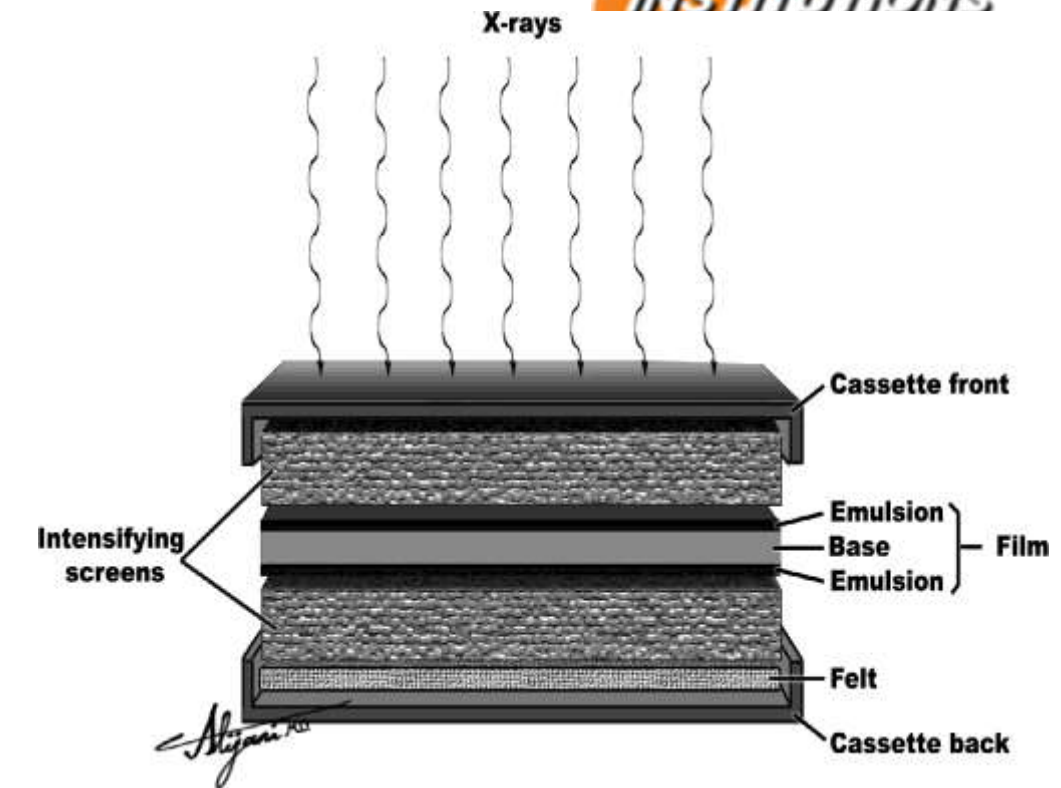
- It faces the X-ray tube and consists of a radiolucent material like lightweight metal alloy or plastic so the X-rays can easily penetrate. Inside of front side, a thin Intensifying screen is mounted.

THE BACK OF THE CASSETTE

- The back of the cassette is made of metal or plastic. Inside the back, a layer of the lead sheet is present for the prevention of backscatter radiation: The back contains a layer of padding. It maintains a good screen-film contact. The backside intensifying screen is thick than the front and mounted on padding

THE CASSETTE LOCKING SYSTEM

- The front and back portions of the cassette are held tightly together by the locking system to protect the film from light and for good screen-film contact. The different cassette locking systems are used in a cassette which is - locking bars, spring clips and locking lever sliding locking bars, spring clips and locking lever.





X-ray FILM CASSETTE



SINGLE INTENSIFYING SCREEN CASSETTE

- It is used in mammography. A single intensifying screen is mounted on the backside of the cassette. Thus, a single emulsion film is used.

Double Screen Cassettes

- It is used in conventional radiography in which double emulsion coated film is placed between two intensifying screens within the cassette.

CURVED CASSETTE

- Curved cassettes are available in a smaller sizes. It has a front side curve shape to provide good object and cassette contact. It is used in mandible radiography.

GRIDDED CASSETTE

- It has a secondary radiation grid on the front side of the cassette to reduce scatter and improve radiographic quality. It is used in bedside radiography.

MULTI-SECTIONAL CASSETTE

- It is used in multi-sectional radiography. It holds 3 to 7 films at one time. The Spacers are used in this cassette to separate the films and screens.

FILM CHANGER CASSETTE

- The rapid film changer device has a number of the cassette in series. When the upper cassette is exposed, it may be withdrawn manually. It is used in angiography procedures.



X-ray FILM CASSETTE



INSPECTION AND MAINTENANCE

- The cassettes should be inspected at regular intervals.
- If the intensifying screens come loose in cassette, they should be re-attached immediately
- If the foam rubber in the back of the cassette becomes damaged, the cassette should be changed.
- If screens became old stained, or cracked, they should be replaced immediately.
- If light leakage occurs, the cassette should be replaced immediately.
- The cassette should never be left open because dirt and dust will mount up on the screen.

LIGHT LEAKAGE TEST- QUALITY ASSURANCE

- If the film is fogging and the light leakage is suspected. The suspected cassette is placed on a table under a 100 watts bulb at 4 feet height. The light exposure is made for 15 minutes for each side of the cassette, then process the film. If the dark area is seen on film, the cassette is not safe.



INTERROGATIONS



1. What are the components of X-ray cassettes ?
2. Structure of X-ray cassettes
3. What is the size of X-ray cassette in Chest X-ray ?



REFERENCES

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2. Ball and mores essential physics radiographers, IV edition, Blackwell publishing.
3. Basic Medical Radiation physics – Stanton.
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5. The physics of Radiology and Imaging – K Thayalan.



THANK YOU