



SNS COLLEGE OF ALLIED HEALTH SCIENCES- COIMBATORE 35



DEPARTMENT : RADIOGRAPHY AND IMAGNG TECHNOLOGY

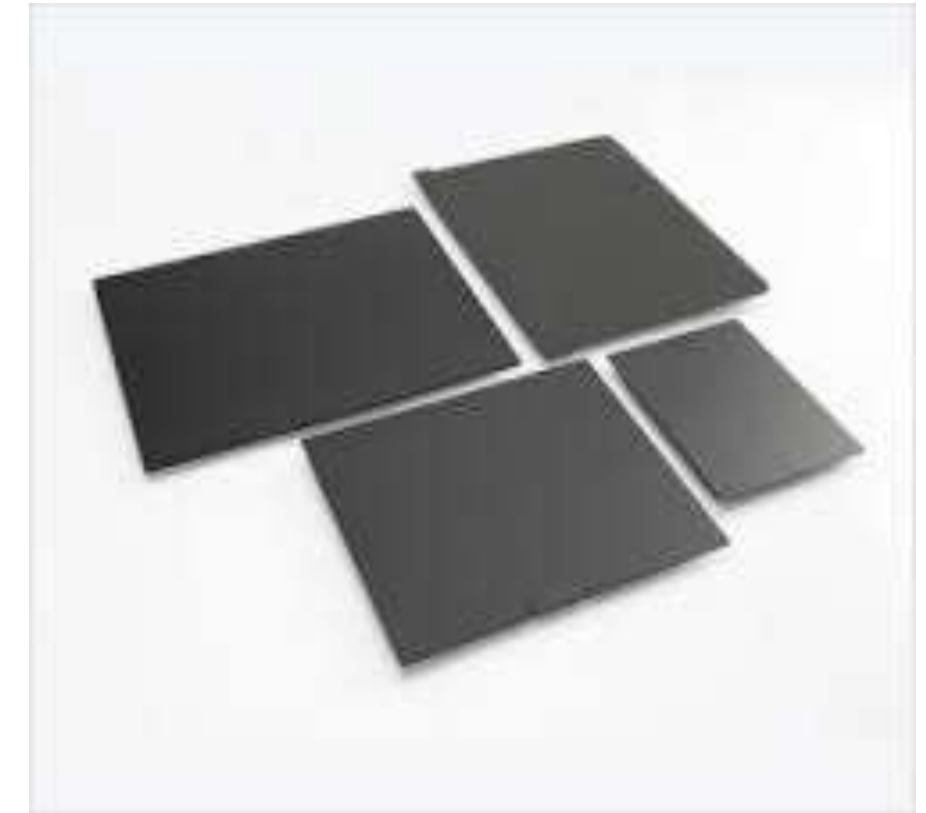
**SUBJECT : GENERAL PHYSICS, RADIATION PHYSICS AND PHYSICS OF
DIAGNOSTIC RADIOLOGY**

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

TOPIC : 5. GRIDS AND TYPES OF GRID

X-ray GRIDS

- The grid was invented by Gustave Bucky. It is made up of a thin plate, in which very thin strips of Lead are placed in a specific pattern.
- The spaces between the strips are filled by low-attenuating materials like aluminum or carbon fiber.
- Grids are used to reduce the amount of scattered radiation.
- Grids are placed between the patient and the X-ray film.
- It consists of alternating strips of lead.
- These strips of lead can either be parallel or angled.
- When using a grid, the exposure factor needs to be doubled from the non-grid exposures because it will absorb some of the primary radiation.



TYPES OF GRIDS

LINEAR GRID

- In a Linear grid, the Lead strips are parallel to each other in their longitudinal axis.

PARALLEL GRID

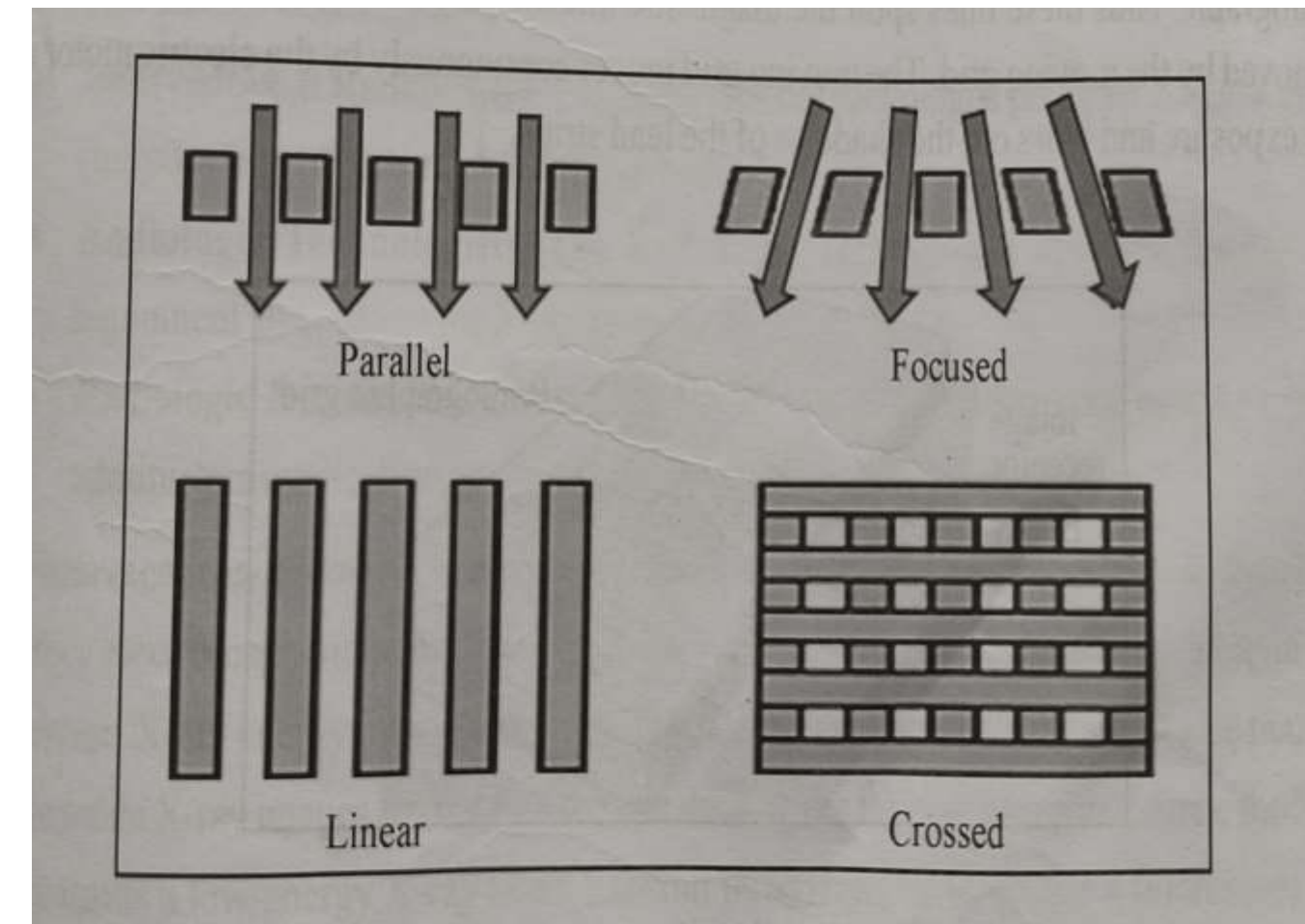
- In a parallel grid, the strips are mounted parallel to each other.

CROSSED GRID

- Crossed grids are very efficient in removing scattered radiation. This consists of two superimposed parallel grids that have the same focusing distance.

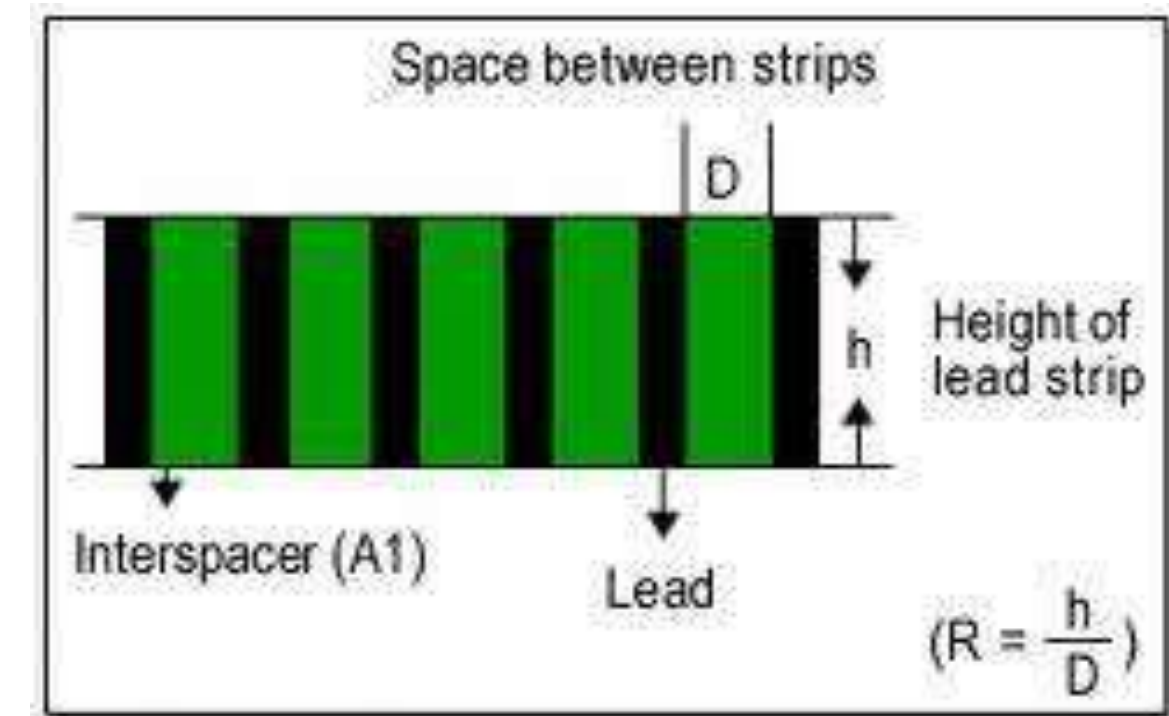
FOCUS GRID

- Focused grid is made up of the lead strips that are slightly towards the focal spot. A focused grid may be linear or crossed.



GRID RATIO

- The ratio of the height of the lead strips to the distance between them is defined as the grid ratio.
- **Grid ratio= h/D**
- h-Height of the lead strips.
- D-Distance between the lead strips.
- A higher grid ratio will remove scatter radiation better than a lower grid ratio.
- The higher grid ratios are used for higher kVp techniques, and lower grid ratios are used for lower kVp techniques,
- Usually, low grid ratios such as 8:1 and high grids ratio such as 12:1 are preferred in radiography.



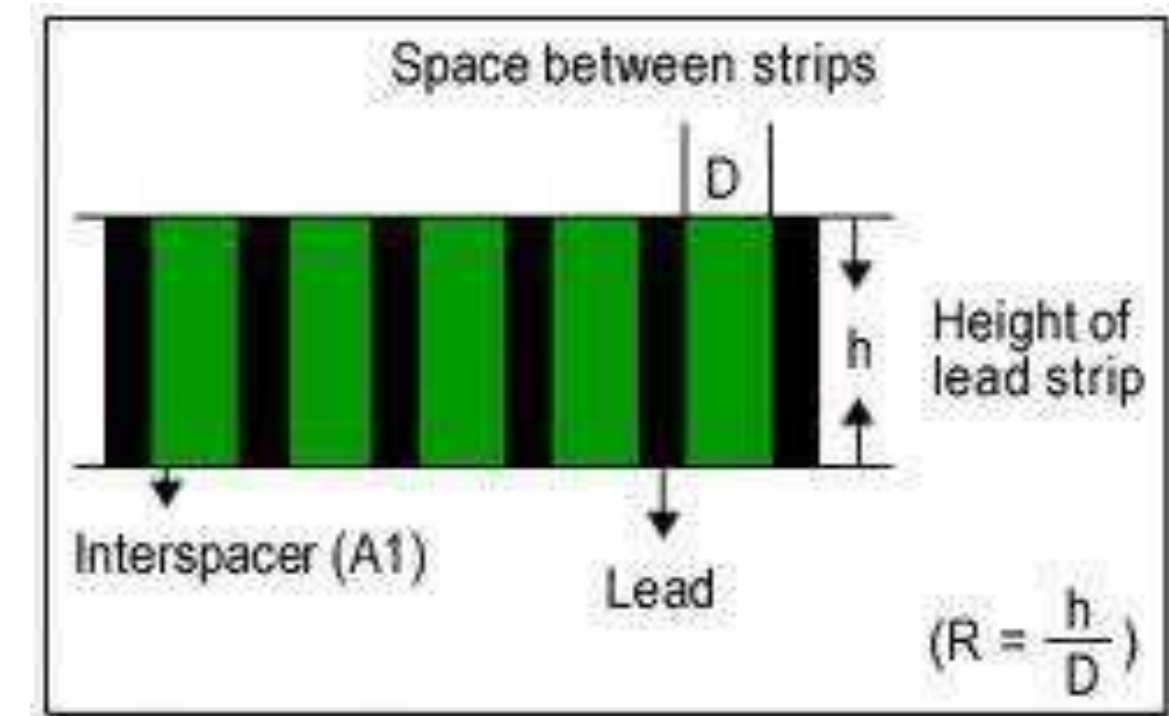
GRID

GRID FREQUENCY

- It is the number of grid lines per unit distance.

EFFICIENCY OR GRID FACTOR

- It is measure by K.
- $K = \text{Radiographic contrast with grid} / \text{Radiographic contrast without grid}$.
- The higher the K factor greater the image contrast.
- The range of 40-50 lines/cm is called low-frequency grids.
- The range of 50-60 lines/cm is called medium frequency grids.
- The above 70 lines/cm is called high-frequency grids.
- High-frequency grids are used in digital radiography systems.



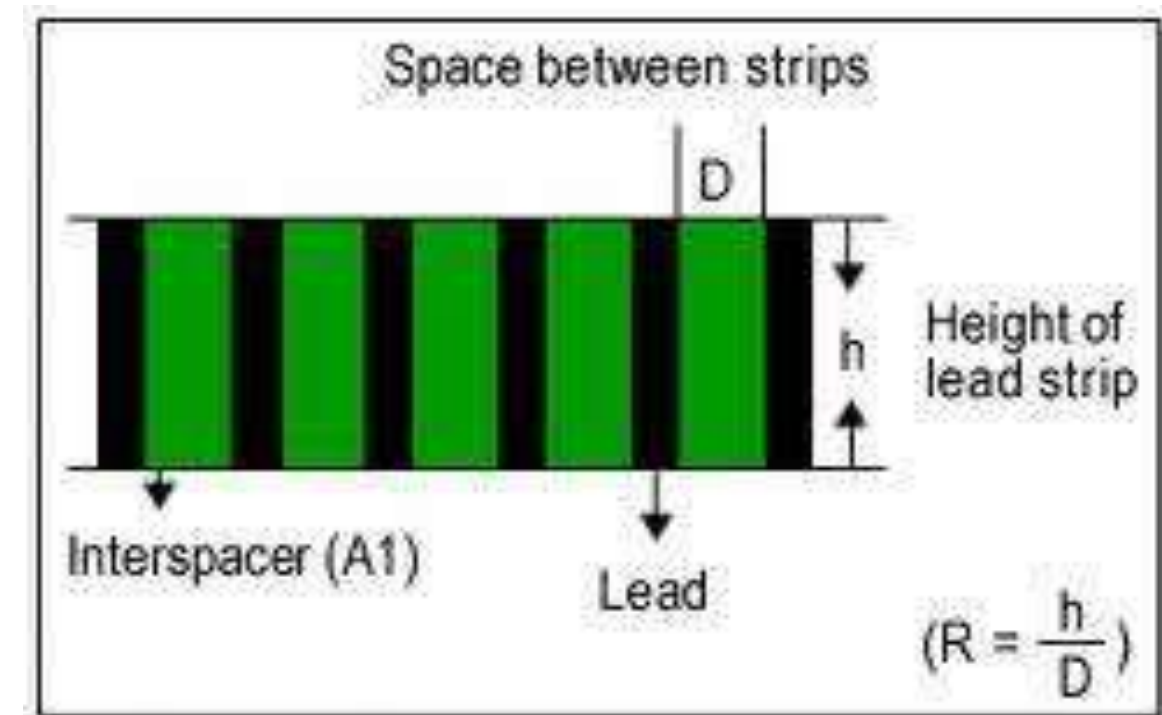
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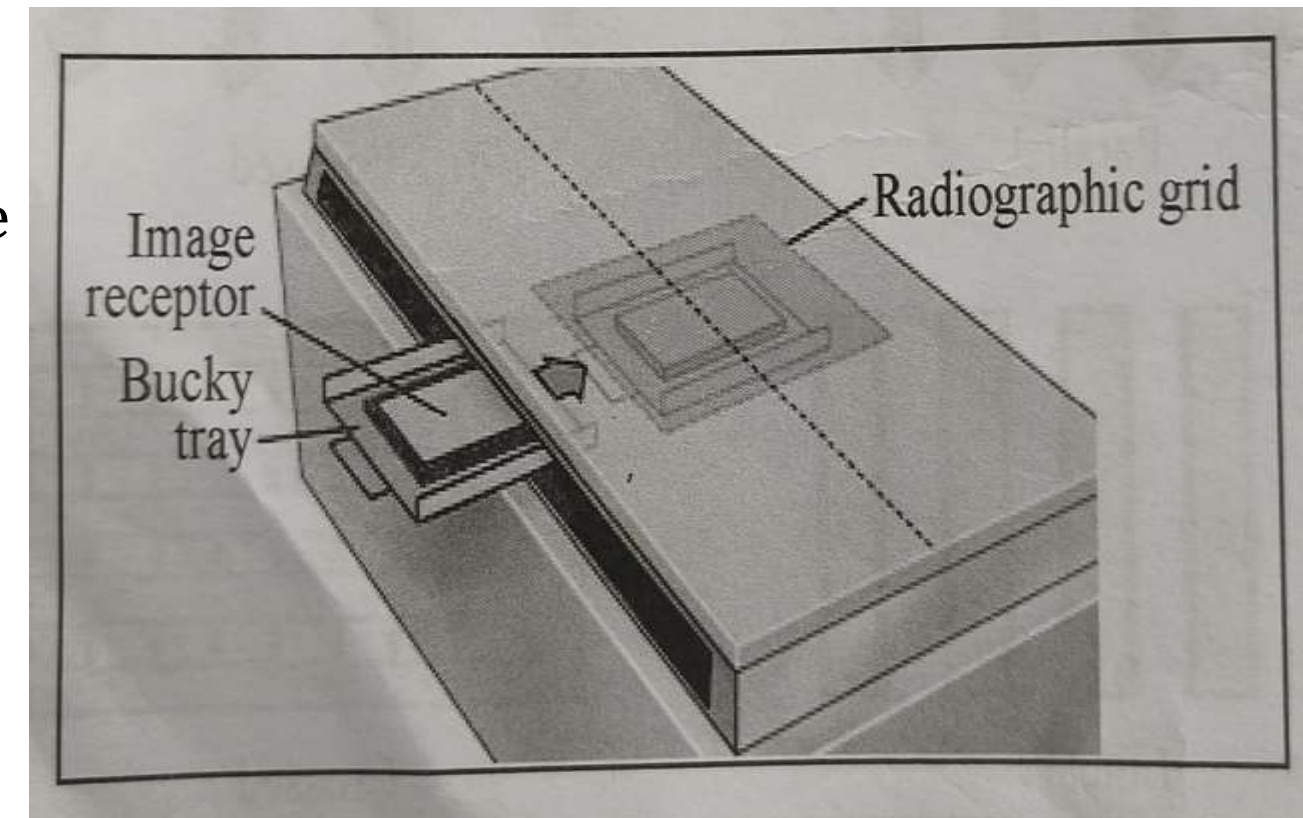
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GRID

POTTER-BUCKY GRID OR MOVING GRID

- The moving grid was invented by Hollis Potter, so it is called a Potter-Bucky grid.
- A reciprocating or moving grid is a device in which the grid oscillates while the X-ray is being taken.
- When a stationary grid is used, the lead line will appear on the radiograph.
- Thus these lines spoil the diagnostic information in the film.
- These lines may be removed by the moving grid.
- The moving grid moves continuously by the electric motor during the exposure and blurs out the shadows of the lead strips.





INTERROGATIONS



1. What are the grids use for Radiology ?
2. What is the use of Grid ?
3. What is Grid Ratio ?



INTERROGATIONS



1. What is Attenuation ?
2. What is Absorption ?
3. What is Scattering ?



REFERENCES

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



THANK YOU