

### A. Trapezoid distortion

Front projections typically produce a trapezoid distortion (keystoning). The projected picture is larger at the top of the screen than at the bottom. This distortion is caused by an inclined projection onto a straight hanging screen. Special keystone eliminators allow for an inclined positioning of the screen to provide for an appropriate means to avoid the trapezoid distortion when using OHP. With the modern data and video projectors, the trapezoid effect can also be avoided or reduced with the keystone eliminators.

### B. Gain factor

The gain factor describes the luminance of a fabric or a projection screen. The higher the gain, the stronger the reflection of the screen fabric. With an increasing gain factor, the viewing angle of the screen decreases.

### C. Angle of view

The angle of view describes the angle in degree where the picture on the screen is still adequately visible. It is measured with reference to the normal of the screen center. The double angle of view (= viewing angle) thus describes the area within which an audience should be seated.

### D. Selecting the right screen

Selecting the right screen depends on four variables:

#### 1. Type of screen

- Rear or front projection (the latter is the most common method).
- Mounted firmly or portable.
- Operated electrically or manually.

#### 2. Screen size

- Depends on projection room and seating arrangement.
- Ideally, the following criteria are considered:
  - The screen width (X) should amount to at least half the distance between screen and first row of seating (D1) (example: With a distance of 4 metres between the first row and screen, the minimum screen width is 2 metres).
  - The distance between screen and last row of seating (Y) should not be larger than 6 times the screen width (X) (example: With a screen width of 2 metres, the last row should be at 12 metres as a maximum).
  - The distance between floor and bottom edge of screen (A) is 90 cm, preferably 125 cm for row seating.

#### 3. Screen format

It is determined by the projection method. The format (also referred to as aspect ratio) is defined by the ratio of height to width of the screen. Depending on the projection type, the following formats are distinguished:

- 1:1 for overhead projection (also referred to as square)
- 4:3 for video projection (also referred to as NTSC or video)
- 3:2 for slide projection
- 16:9 for widescreen projection

#### 4. Type of fabric

The type of fabric is determined by the following factors:

- The projection method (front projection or rear projection).
- The projector. Each projector has a specific luminous efficacy (measured in ANSI lumen). If several projection devices are used (e.g. beamer and OHP), it is recommended to match the luminance (gain factor) of the fabric to the lowest ANSI lumen value.
- The size of the projection room. The size and the layout determine the seating of the audience. The wider the seats are apart, the larger the recommended viewing angle of the screen.
- The ambient light.
  - The lighting conditions of the projection environment affect the presentation quality. When the lighting can be controlled, e.g. by darkening or a high luminance of the projector, the "SuperLux" fabric can be used.
  - The rule of thumb is: keep the ambient light away from the screen; the brighter the ambient light, the higher the luminance of the projector and/or reflection of the fabric should be.
  - Rear projection is substantially more insensitive to ambient light!

#### E. Care of screens

Frequent use of a screen requires an appropriate care. All screens can be cleaned with a carefully applied weak soapsuds. When not in use, the screens should be retracted to their casing to protect them against depositing dust.

Avoid to touch the screen fabric with bare hands since, in the course of time, dust will stick better to the (greasy) imprints than on clean spots.

