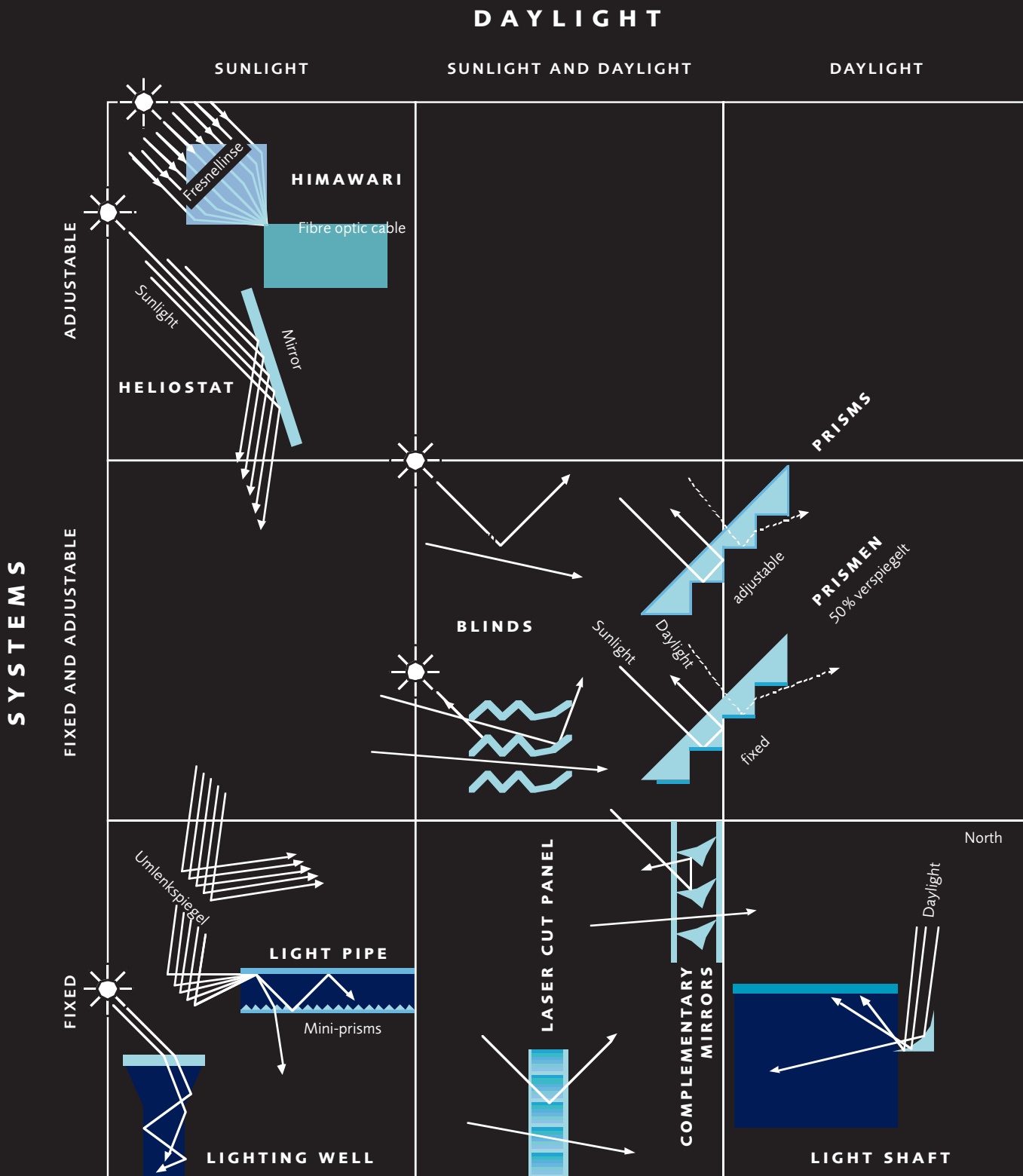


Series (8):

Functions and elements of daylight systems



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Light Shelf (not illustrated)

Flat horizontal reflector, as a rule installed above eye level, casts shadow on the workplace near the window and reflects light onto the ceiling. The reflector may be curved and/or adjustable to make optimum use of the incident sunlight. The reflector may also be mounted inside the building.

Laser Cut Glass and Laser Cut Panel

An acrylic glass panel installed in the cavity between the panes of glass is laser cut in such a way that it reflects daylight onto the ceiling.

Reflector blinds

Specular aluminium louvres curved downwards reflect light onto the ceiling. The louvres are semi-perforated to allow a clear view outside when closed.

The louvres can also be applied as a combination of pleated and curved louvres. The pleating allows the sunlight to be reflected twice in parallel. At skylight level the shapes and positions of the louvres are different, since the function of the system here is to direct light onto the ceiling.

Light-deflecting glass (not illustrated)

Acrylic profiles curved downwards and installed in the cavity between the panes of glass direct light onto the ceiling.

Prismatic panels

Prismatic panels mounted in front of the facade are adjusted to reflect direct sunlight. Daylight is refracted and directed onto the ceiling. If the angle of the incident sunlight exceeds the set angle of the prisms, it too is directed into the space, like the daylight. For this reason, the prismatic panels have to be adjustable, to follow the course and position of the sun.

If the prismatic panels are fixed, the horizontal surfaces are mirrored to reflect the light. The limiting angle does not apply. These prismatic panels are installed in the cavity between the panes of glass.

Himawari system

A Fresnel lens controlled by a photoelectric cell is aligned to follow the sun. The rays of sunlight are focussed and fed into a flexible light guide (fibre optic technology). Light is emitted at the end of the fibre.

Heliostat system

A flat, computer-controlled reflector is set up to follow the course and position of the sun, whereby the sunlight is always reflected from a fixed light-deflecting mirror. This means that the sunlight reflected by the mirror is always directed in a fixed direction. If the mirror has focussing properties, the light can be fed into a light pipe. This is a sturdy acrylic glass tube inlaid with a layer of fine prismatic film. The light pipe works according to the law of the critical or limiting angle (Total Internal Reflection): if the incident light is within the limiting angle, the light is reflected in total, and when the limiting angle is exceeded, the light is refracted and emitted. Since the light in the light pipe comes from many different directions, light is constantly emitted by refraction: the light pipe is bright along its entire length.

Holographic optical elements or HOEs (not illustrated)

Layers of holographic film are housed in the cavity between the panes of glass. They can deflect or reflect light coming from specific directions. To maintain a constant angle of incidence the HOEs have to be controlled to follow the course and position of the sun.

The respective paths of light rays on the following two fixed systems indicate how these systems work:

Lighting well for transporting sunlight into buildings

Light shaft for transporting daylight into basement rooms

Prof. Gero Canzler