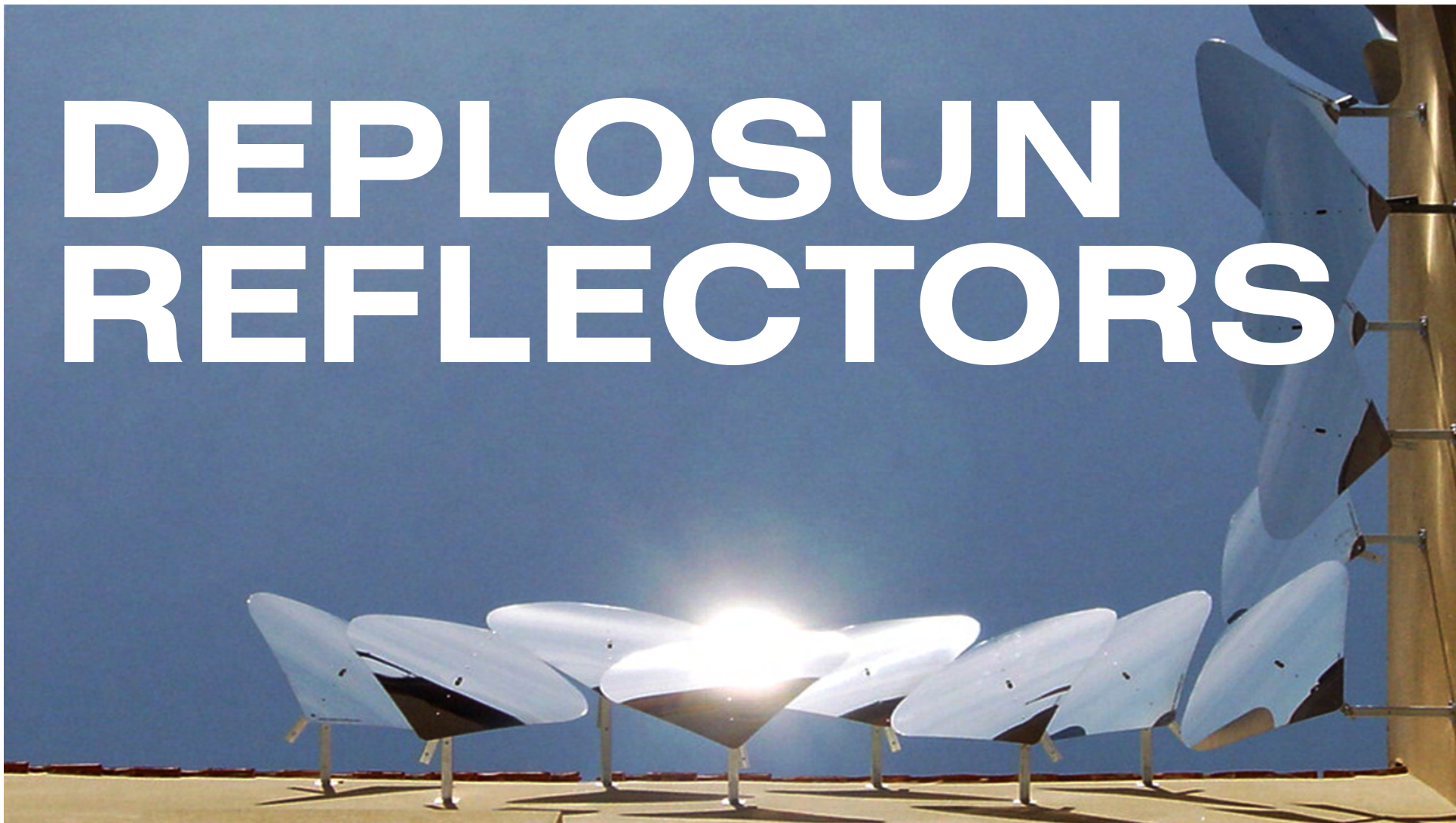


DEPOSUN REFLECTORS



DEPOSUN REFLECTORS · Technical Sheet
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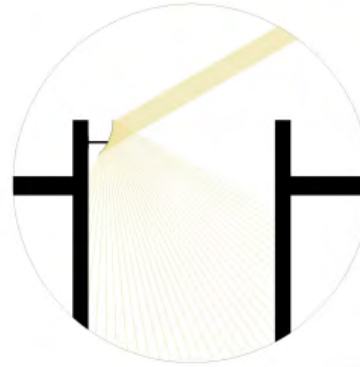
ESPACIO SOLAR
REFLECTORS · SOLAR SYSTEMS

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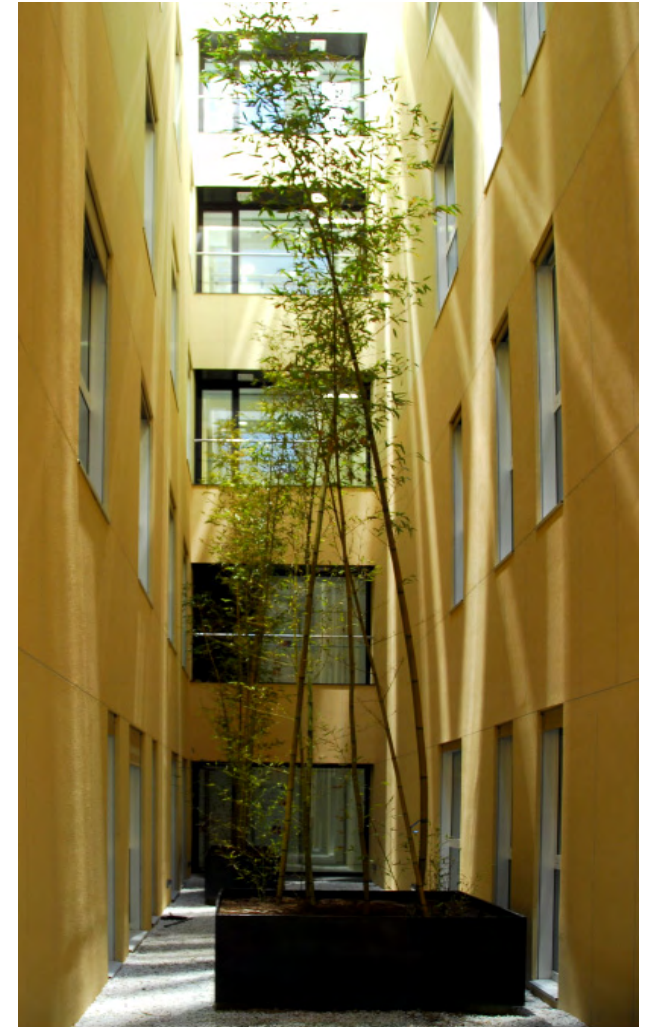
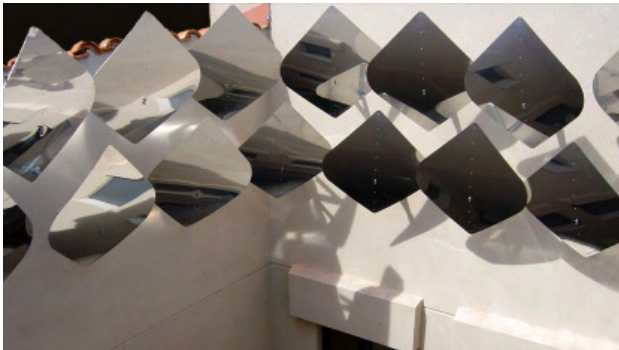
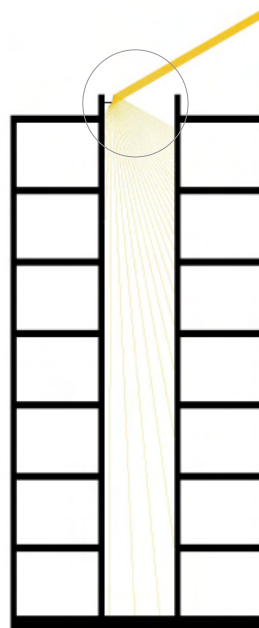
DEPOSUN REFLECTORS

DEPOSUN REFLECTORS is an innovative reflector system which captures the sun rays in the upper part of the atria and redirects them downwards, increasing daylight levels dramatically and transforming the atria into a light box inside the building. The result is an amazing lighting level increase around seven times the original situation. Multiple sun rays bathe the walls throughout the day lightening as well all the adjacent spaces.



Installation detail

Reflectors should be installed in the upper part of the atria . From there they can reflect the sun rays to the inner walls and bottom



SYSTEM DESCRIPTION

DEPOSUN REFLECTORS is a system formed by solar reflectors designed to improve daylight inside atria

The reflectors are installed on the upper part of the atrium, from where the sun's rays are reflected over the walls and the floor, all with fixed elements, with no movements or maintenance.

The reflectors are oriented according to a sunlight study conducted by ESPACIO SOLAR in order to achieve maximum efficiency.

For a correct installation of the system it is essential that the reflectors are mounted on a sunlit area with no shadows of any architectural element, installation or neighboring buildings.

The atrium can be open or be covered by a skylight. In the latter case, the skylight must be completely transparent using laminated glass. Cellular polycarbonate skylights, corrugated glass or "ice" finish are not suitable for the installation of reflectors.

Prior to the installation of DEPOSUN REFLECTORS, it is necessary that the atrium walls are in good condition and painted in a light color.

The system is designed to offer better results during the autumn and winter months (especially in mid latitudes), when the sun is low and is most needed.

The reflectors have been designed for a solar altitude range between 5° to 60°. The azimuth range for best performance is SSE to WSW, ie about 150 ° in mid-latitudes. In equatorial latitudes, the azimuth range corresponds to solar positions achieved during the early morning and late afternoon. For latitudes above 50°, the system has an optimal performance all year round.

The result is an increase in the brightness of the atria interior of up to 7 times the original illuminance. Several sun spots are generated along the walls and bottom of the atrium that will move along the day according to the movement of the sun. These patches of sunlight will enter through the windows overlooking the atrium creating a feeling of connection to the exterior thanks to daylight. The main advantage is the vision of a brighter space from the interior of the rooms. This vision transmits a pleasant connection to the exterior and the feeling that the atrium is a lot less "deep" than it actually is.

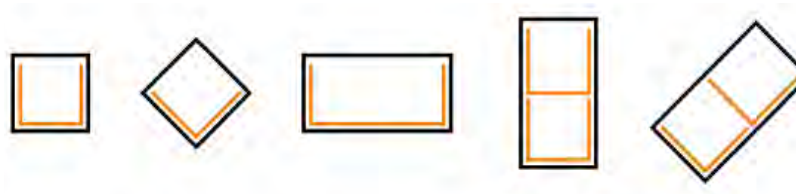
Do not expect that the windows facing the atrium will be equivalent to windows placed on a sunny façade. More than sunlight inside the rooms, expect a pleasant vision of a well lit atrium.

To avoid an excess of sun exposure or a sensation of heat, the system operates to a lesser extent during the spring and summer months, when the sun is much higher. During these months, the daylighting levels inside the atrium are usually high and need no enhancement.

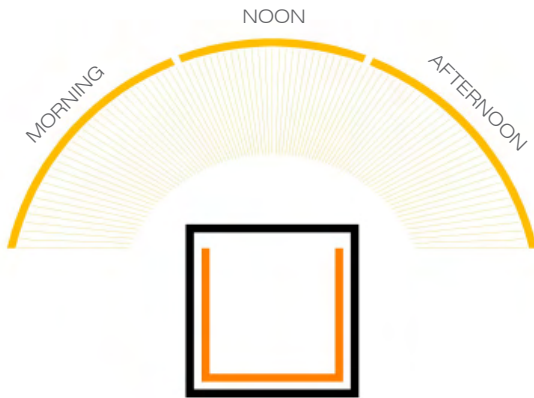
HOW TO INSTALL



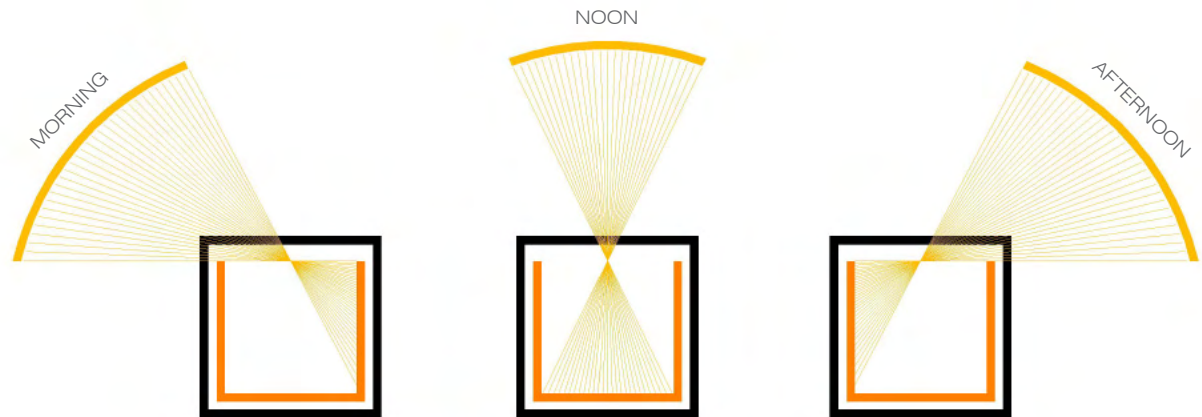
DEPOSUN REFLECTORS should be installed in the upper part of the atria walls where they can capture sun rays and reflect them downwards. This position avoids shading and allows an optimum performance along all day and all year round. Reflectors should be installed in a “half crown” shape properly orientated in order to capture optimally the solar movement. Each reflector is orientated towards a specific solar position, so only some reflectors will work during morning hours, others along mid-day hours, and finally others during the afternoon hours.



Reflectors can be installed on top of the atria walls adapting to its geometry and orientation. This means that almost in any case it is possible to offer an installation that obtains maximum performance along the whole day.



Reflectors are installed in different orientations so they can reflect the sun during morning, noon and afternoon hours.

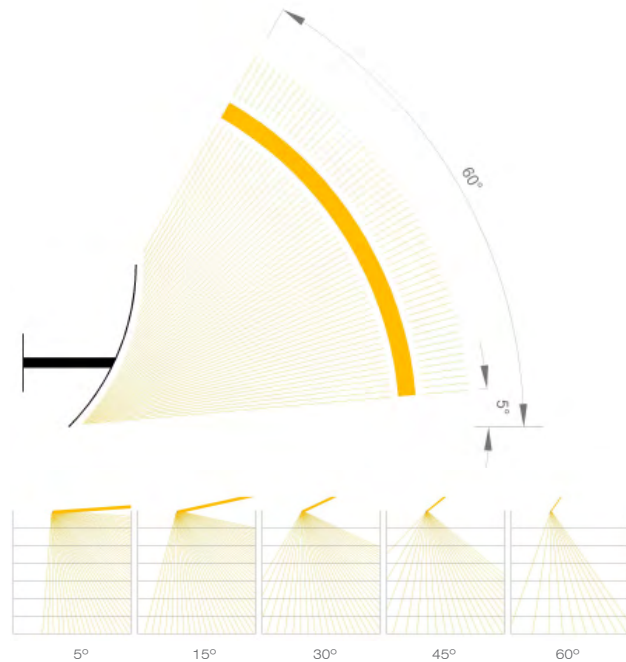


As it can be seen in the drawing, reflectors installed in the right side of the atrium are orientated to reflect the morning sun, those in the bottom side, to reflect the mid-day sun and those in the left, the afternoon sun.

PERFORMANCE

SOLAR HEIGHT RANGE

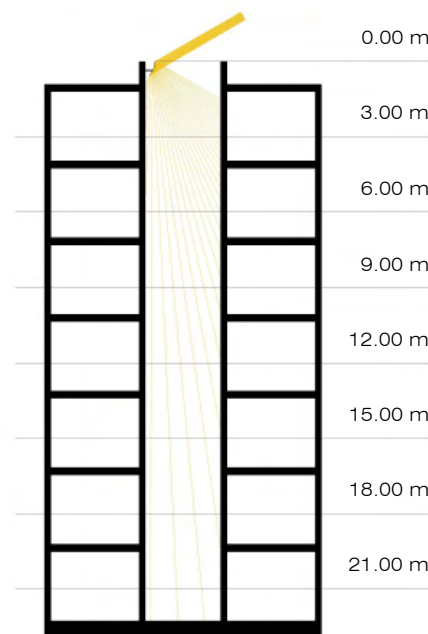
DEPOSUN REFLECTORS work properly in a solar height range from 5° to 60°. Above 60° the geometry of the reflector itself limits progressively its performance, preventing from a solar radiation gain in the interior of the atrium during noon hours in summer months.



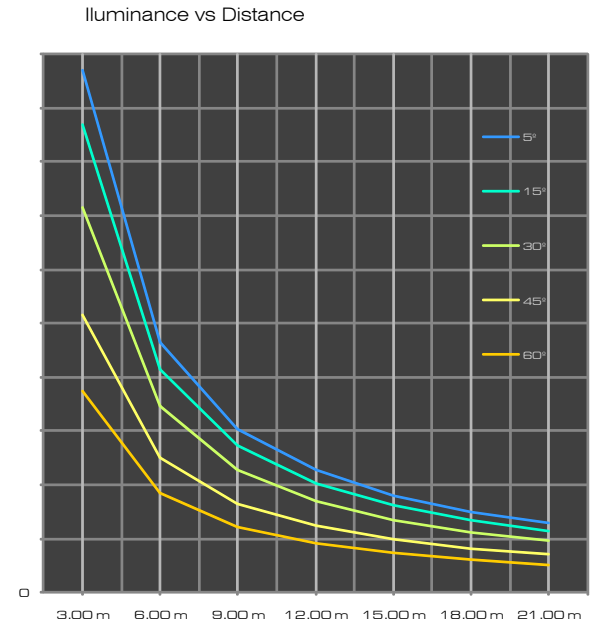
To obtain the optimum performance of the reflectors the sun height angle should be in the 5° to 60° range

ILUMINANCE vs DISTANCE

The curved geometry of the reflectors ensures the reflection of solar rays whatever the solar height is (as long as it is between the 0° to 60° range). At the same time this convexity creates a reflected ray that decreases its intensity as it moves away from the reflector. That's to say, the intensity of the reflected ray at 10 m distance from the reflector will be lower than that at 1 m distance. We measure this light intensity in LUX and in lighting terminology it's called "iluminance".



Iluminance of the reflected ray decreases with distance, though at 20 m. distance we can still obtain values over 1000 Lux.

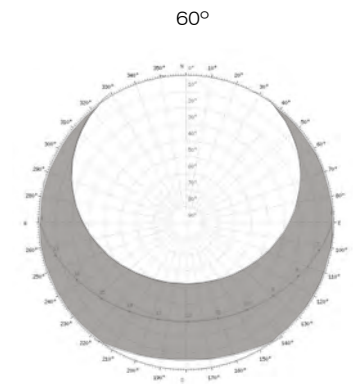
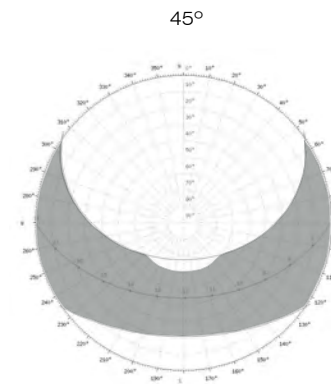
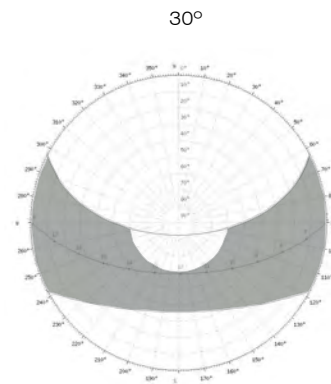
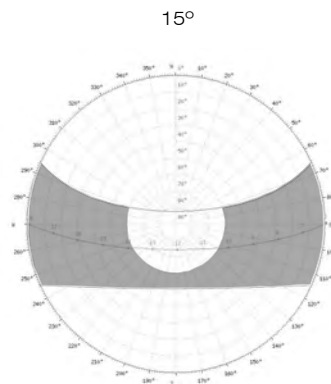
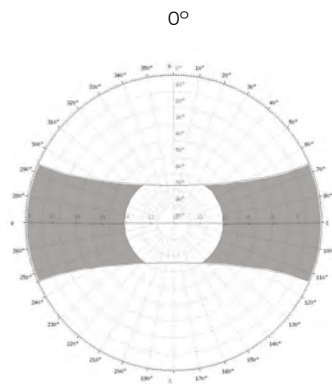
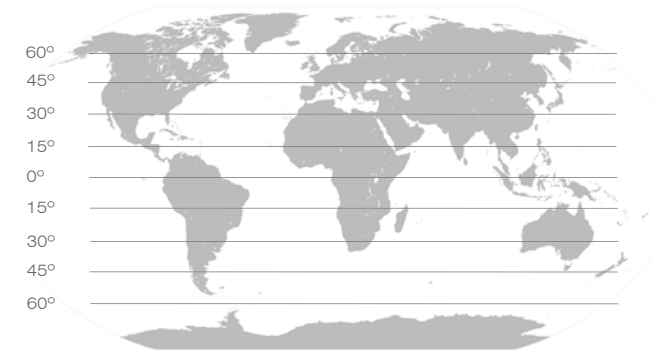


The graphic shows the iluminance levels of the reflected sun ray versus the distance to the reflector for several solar heights.

HOURS OF CORRECT PERFORMANCE vs LATITUDE

DEPLUSUN REFLECTORS are designed to work in an optimum way when they reflect the sun from heights between 5° and 60°. However, this does not limit the latitude at which the system can be installed, as we can consider that in every latitude it exists an important number of annual hours when the sun is situated inside this range of heights.

In the following graphics representing the solar path for every latitude, we can see shaded in grey the amount of annual hours during which the system offers an optimum performance. We can also see that in equatorial latitudes, east/west orientations are those of maximum performance, while in more northern or southern latitudes, the south and north orientations gain importance as we move away from the equator.



Hours of performance:

- Winter Solstice: 7,5 h
- Equinox: 8,0 h
- Summer Solstice: 7,5 h

Hours of performance:

- Winter Solstice: 9,0 h
- Equinox: 8,0 h
- Summer Solstice: 7,5 h

Hours of performance:

- Winter Solstice: 8,5 h
- Equinox: 12,0 h
- Summer Solstice: 9,0 h

Hours of performance:

- Winter Solstice: 8,0 h
- Equinox: 12,0 h
- Summer Solstice: 10,0 h

Hours of performance:

- Winter Solstice: 4,0 h
- Equinox: 12,0 h
- Summer Solstice: 14,0 h

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