

ALC 10,000 SYSTEM



Aluminum Construction
Simply Professional



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Simply Professional

Aluminum Construction Ltd is Israel's leading curtain wall engineering and manufacturer for tall buildings (towers). Aluminun Construction Ltd was founded in 1987 and boasts 2 plants in Israel and in Europe. Aluminum construction Ltd Develops and designs curtain wall systems and is renowned for its quality and professionalism both in Israel and in Europe.



LIVE IN
HARMONY
WITH
NATURE

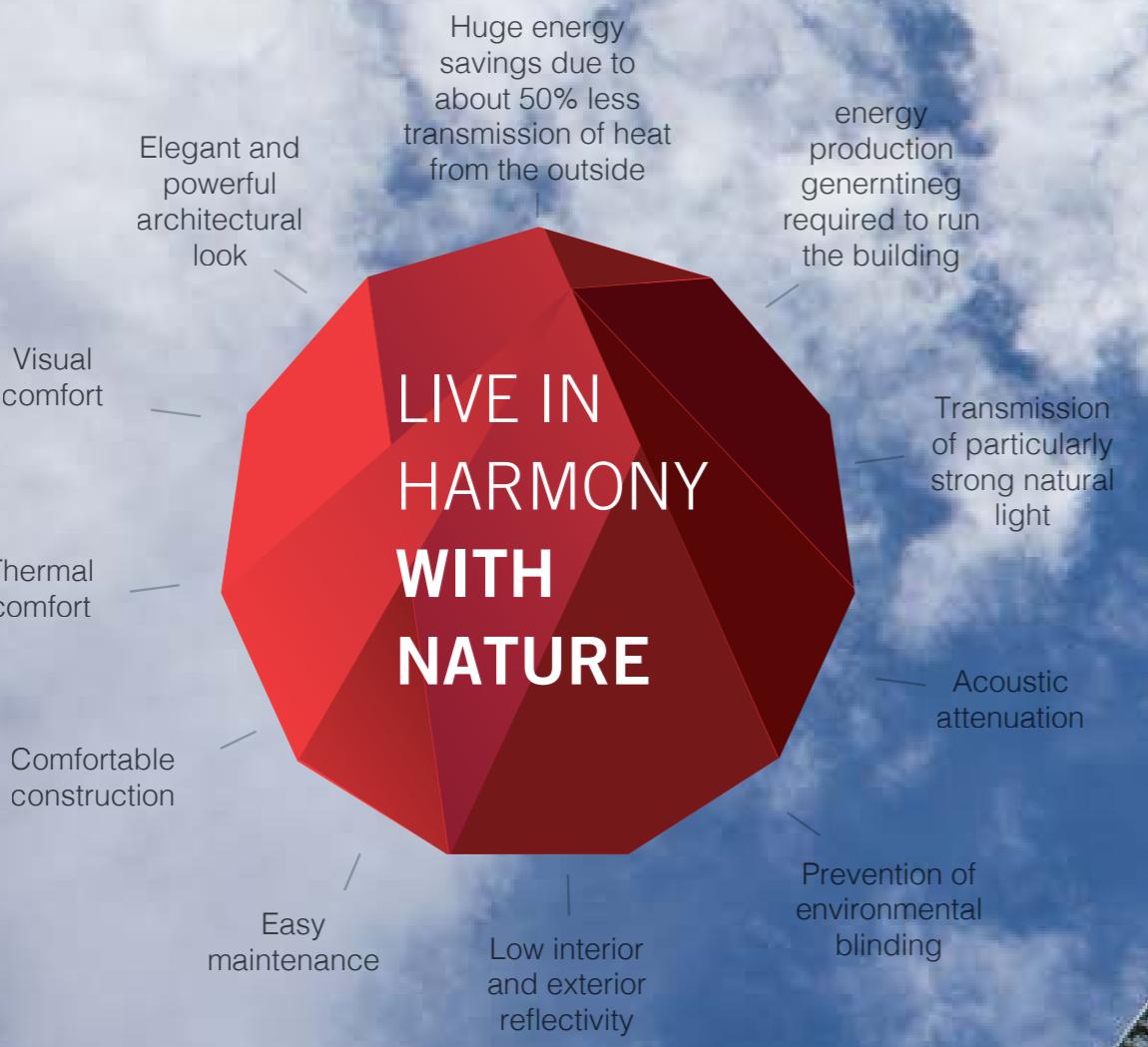
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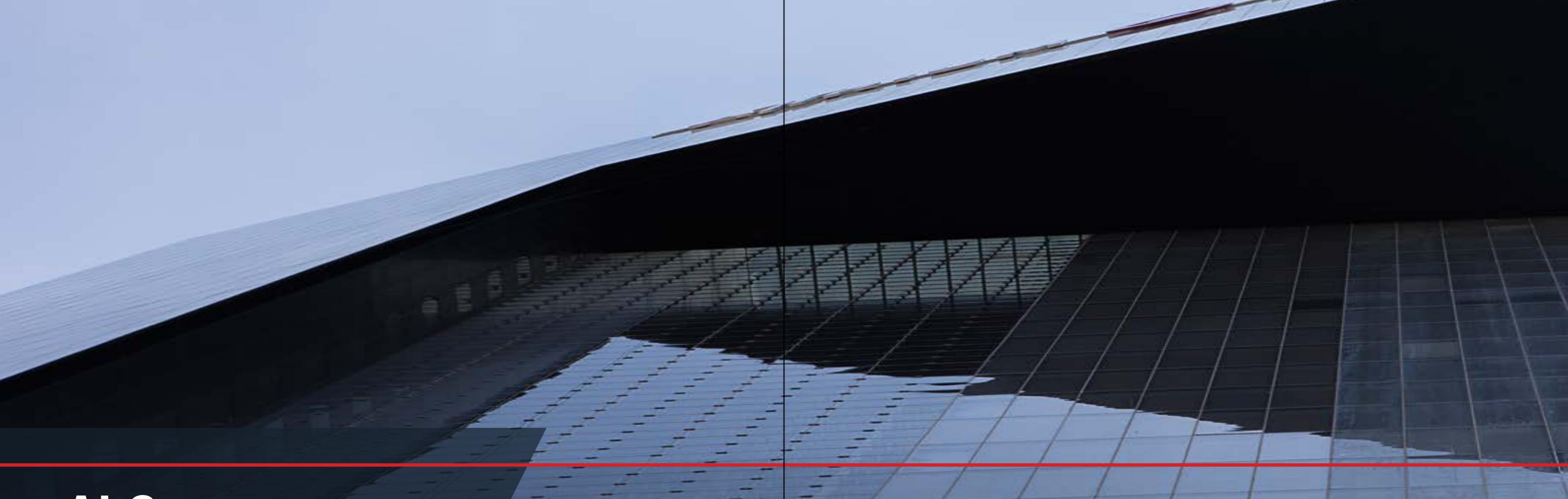
atrium אטריום

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The background features a complex geometric pattern composed of thin black lines forming various triangles and polygons. A large, solid red triangle is positioned on the left side, pointing towards the center. The rest of the background is filled with a lighter shade of grey.

THE ALC 10,000
SYSTEM PROMOTES
SATISFACTION,
HAPPINESS AND
AN INCREASE IN
THE PRODUCTIVITY
OF EMPLOYEES,
MANAGERS AND
OCCUPANTS





ALC

10,000 SYSTEM

Historically, screen walls were used in buildings to create a lightweight, transparent outer shell. Their lighter weight reduced overall tower weight, while minimizing the size and construction costs of the skeletal structure. Their transparency met the aim of using natural light to illuminate the spaces where people work or live. For these basic reasons, curtain walls capable of dealing with wind, seismic, snow and heat loads, water and air permeation and more, have been designed and developed over the last 100 years.

But let's face it: life behind curtain walls is intolerable. Why?

The transmission of heat from the outside to the inside through radiation, conduction and convection was unbearable; and when it was made more bearable through various methods, the transmission of light to the inside inevitably decreased by a significant percentage, and we found ourselves living in the dark.

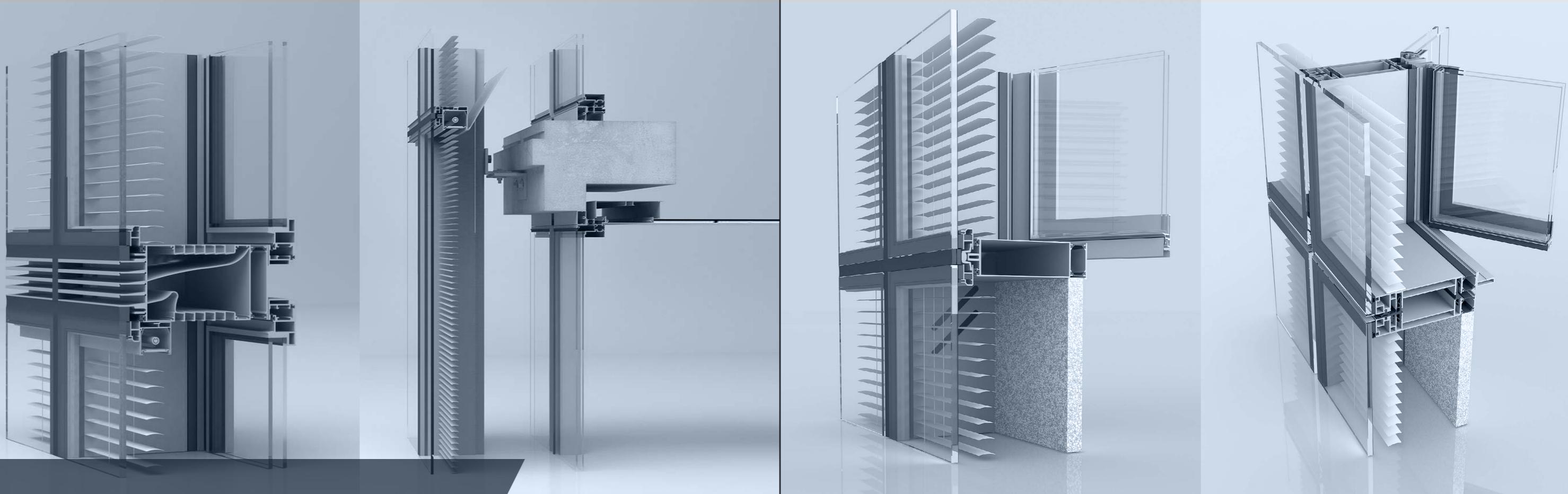
The use of natural lighting in offices improves work efficiency as well as employee satisfaction and health. Natural light has positive psychological effects due to its unique qualities: a full radiation spectrum of different wavelengths and therefore better distinction of a wide range of colors.

Many studies show that the dynamics of natural light, manifested in slight changes of illumination intensity, spectrum and shading, create a stimulating psychological effect. Exposure to natural light allows us to track changes in the external environment such as time of day, season and weather. In

our minds, sunlight is related to clarity, joy, warmth and health. Natural light affects the mood and the perception of space in the office. It also has positive physical effects on workers' health: solar rays help dry up, disinfect and prevent bacteria in space; aid in the processing and assimilation of vitamins; and maintain the integrity of the human body's daily biological cycles.

In addition, screen walls can comprise a perfect platform for energy production by exploiting the solar radiation and wind forces to which they are naturally exposed.

For all these reasons, the Aluminum Construction Company developed the ALC 10,000 System, which promotes a comfortable work environment and extraordinary living experience, while producing immense amounts of energy by turning sunlight into electricity.



ALC 10,000 SYSTEM

SYSTEM PRINCIPLES

The ALC 10,000 is a screen wall system using the STICK or UNITIZ method. The system consists of 2 glass sheets about 200 mm apart, where the outer layer is particularly transparent glass transmitting about 92% of the light frequency spectrum; and the inner layer is insulated glass 6-12-6 of the LOW E type, having LOW EMISSIVITY.

In the space between the glass sheets, and next to the external one, are 25-50 mm-wide Venetian blinds, which perform automatic tracking of the sun's movement, and actually reflect the solar radiation that passes through the glass back to the outside. Thus, heat transmission is avoided but light that does not originate from direct solar radiation is allowed inside, in especially large quantities, from 30-70%.

The space between the glass sheets also incorporates an air switching system which causes air warmed by solar radiation, and its impact on the Venetian blinds, to be deflected out and replaced by colder air, even though this air comes from the outside.

Prismatic photovoltaic cells that produce electricity from solar radiation, with 15-20% efficiency, are installed in SPANDRAL areas of the screen wall, and from this area extend photovoltaic shading winglets that track the sun, by means of the same tracking system that operates the Venetian blinds.

The ALC 10,000 System is unique in the world and has been tested in company labs for conformity with ASTM standards.

ENERGY SAVINGS

Inner glass reflects remaining radiation and insulates from conduction and convection
The result: about 50% reduction in heat transmission

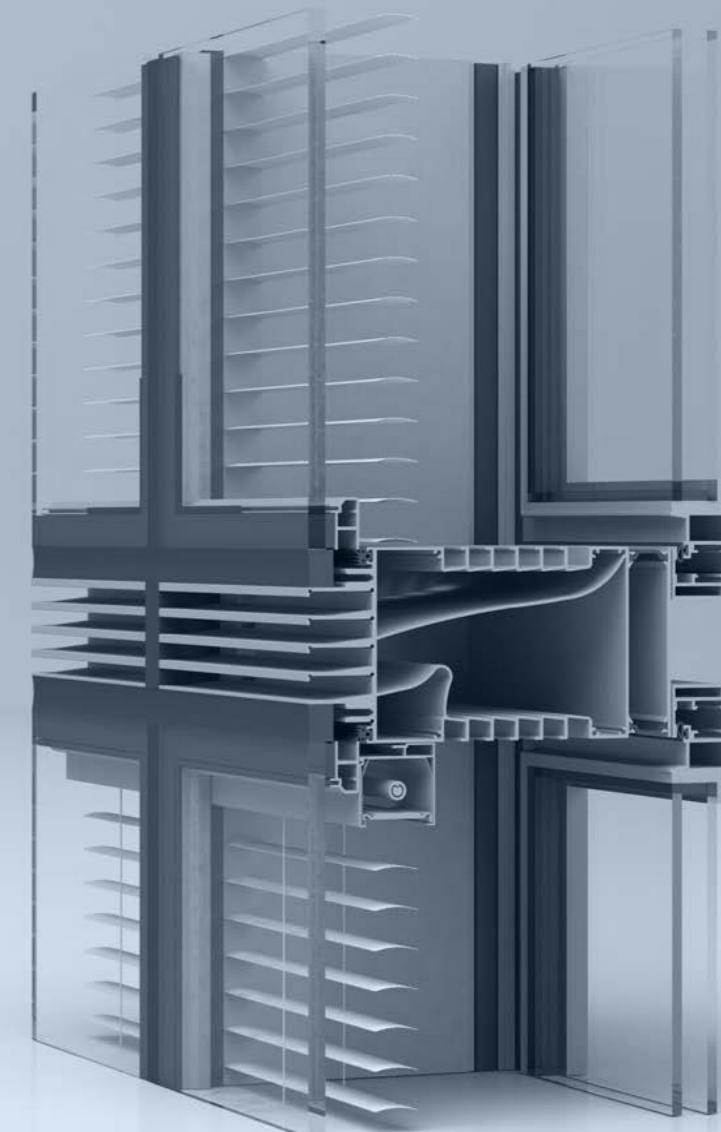
Reducing heat transmission from the outside to the inside

The ALC 10,000 System employs a number of principles which together reduce heat transmission from the outside to the inside by about 50%. Of course, heat energy moves from place to place in three different ways:

- A. Radiation, responsible for about 80% of heat transmission**
- B. Conduction, responsible for about 10% of heat transmission**
- C. Convection, responsible for about 10% of heat transmission**

The ALC 10,000 System deals with radiation, conduction and convection as follows:

- A.** Solar radiation penetrates the outer glass and hits an electronic Venetian blind that follows the position of the sun and is always at 90° to the sun. The radiation that hits the Venetian blind is reflected back through the transparent outer glass to the outside and thus direct radiation is prevented.
- B.** Heat conductivity occurs in the metallic parts that make up the ALC 10,000 System, but these are cut off from the interior by a “polyamide” type insulation system, and prevent heat conduction from the exterior to the interior.
- C.** Convection occurs when air molecules are trapped between the wall skins. To neutralize heat convection from the exterior to the interior, air switching is performed regularly whenever the air temperature between the system skins is higher than the outdoor temperature.
- D.** The heat which remains in the system, from heat radiation, conduction and convection, is reflected outside by a coating of silver dioxide deposited on the inner glass. The property of silver dioxide is to reflect the heat radiation frequency spectrum back to the outside.



Huge energy saving, reducing
by about 50% transmission of
heat from the outside



ENERGY PRODUCTION



The ALC 10,000 System enables 100% production of the electricity required to operate the building's electro-mechanical, air conditioning and lighting systems throughout the year.

The ALC 10,000 System combines two systems for power generation inside screen walls. The first is a prismatic system inserted into glazed insulating glass in the SPANDREL areas of the screen walls; the second is a winglet aluminum system with polycrystalline photovoltaic panels placed on the winglet, extending outward from screen walls for shading purposes.

ALC 10,000 System – SPANDREL Zones

As stated, in these areas, the insulating glass is glazed, and photovoltaic cells are installed inside on a glass prism or PMMA prism (UV- resistant transparent plastic). These cells receive the solar rays regardless of the sun's position, as the prism concentrates solar rays and brings them to the PV (photovoltaic) cell. The PV cell converts radiant energy into electricity. The SPANDREL zone of a tower wrapped in screen walls is about 40% of the screen walls' total area.

ALC 10,000 System – PV Aluminum Winglets

The winglet system is built from aluminum winglets upon which mono or polycrystalline PV panels are installed. The system tracks the sun along one or two axes and harnesses solar energy for electricity production, using up to 40% more than a static system. It has an elegant, futuristic look, and also in itself helps prevent direct sunlight from entering the building.

The electricity generation system installed in the ALC 10,000 System contains everything needed for its full operation, including all the components required for converting electricity's direct current to an alternate current.



TRANSMISSION OF NATURAL LIGHT

The ALC 10,000 System features three layers of glazing that allow the transmission of a particularly large amount of intense light.

1. The outer layer is LOW Iron Glass with 92% light transmission.
2. The inner layer is insulating glass consisting of two glass sheets. The inner one is Low Iron Glass with 92% light transmission and other is LOW-E glass with 70% light transmission.

The result is transmission of 70% natural light for most of the day. The ALC 10,000 System allows the transmission only of diffused light. This is light reflected from the sky and not from direct sunlight. This light is softer and more pleasant, and provides an exceptional feeling of comfort.

The ALC
10,000 System
allows full
enjoyment of
natural light.

ACOUSTIC ATTENUATION

The ALC10 00 System superbly neutralizes environmental noise pollution.

The ALC10,000 System has impressive acoustic attenuation, because it incorporates multi-regions that dampen sound vibrations. Sound waves first encounter the outer glass, which is at least 10 mm thick, followed by an air layer around 200 mm thick containing the Venetian blinds, a 6 mm-thick glass sheet, a 12 mm-thick air gap, and then another 6 mm-thick glass sheet.

The multiple layers and the size of spaces allow exceptional acoustic attenuation of up to 45 dB.





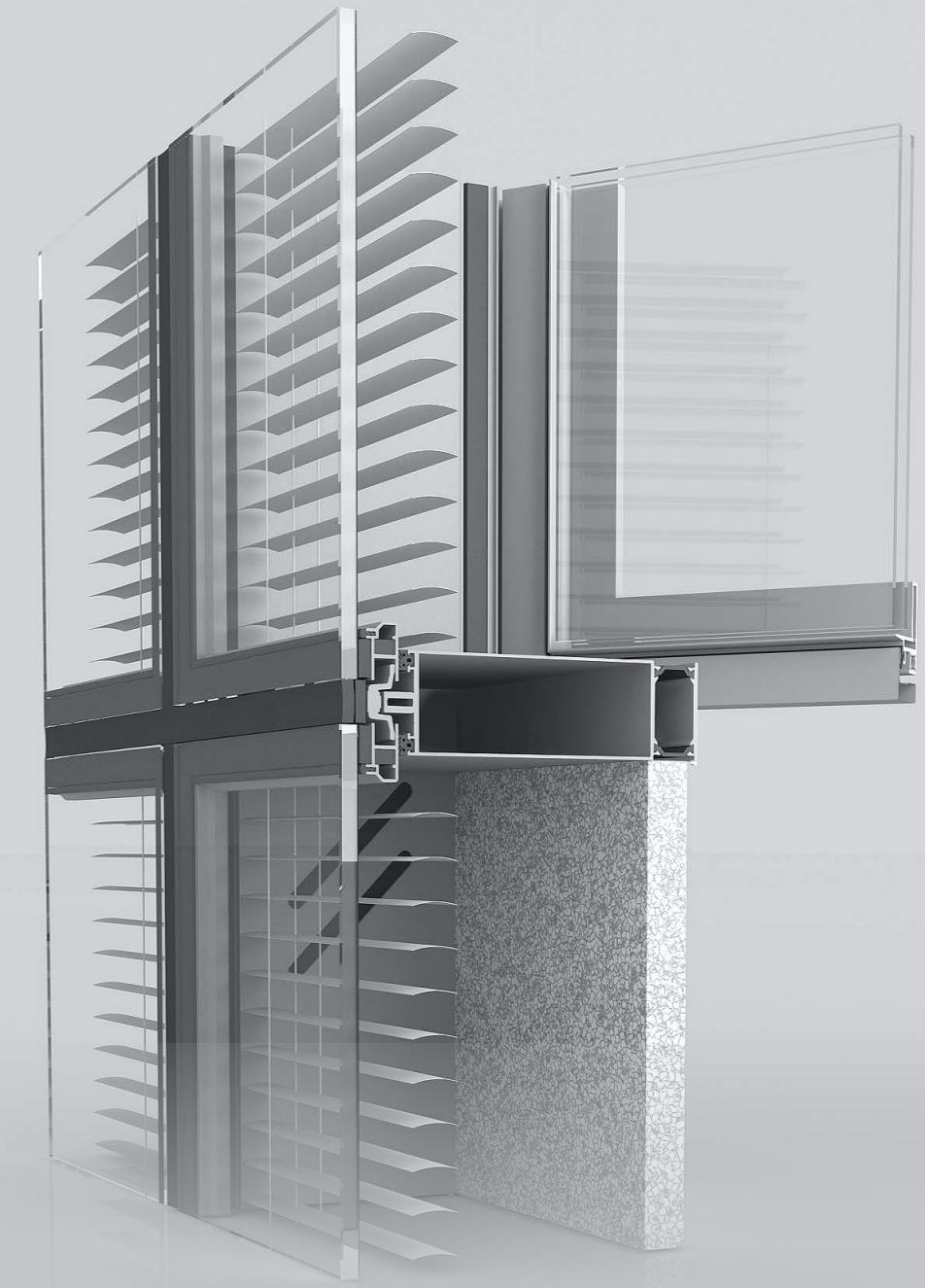
The ALC
10,000 System
prevents the
blinding of
neighboring
buildings.

Venetian blinds that track the course of the sun are installed in the ALC 10,000 System. A retro-reflector sheet developed by the 3M company is placed on each slat of the blinds. The sheet is built in such a way that the sun's rays striking the blind slats are always reflected back to the radiation source, i.e., the sun. This is the perfect method for preventing the occupants of neighboring buildings from being "blinded" by glare.

PREVENTION OF ENVIRONMENTAL BLINDING



INTERIOR AND EXTERIOR REFLECTIVITY



The ALC 10,000 System contributes to a sense of comfort.

The interior and exterior reflectivity level of the ALC 10,000 System is only 11%, meaning that it generates almost no reflections. The low level of reflectivity derives from the use of very transparent glass. When the reflectivity level is low, the sense of comfort increases.

EASY MAINTENANCE

In the ALC 10,000 System, maintenance is infrequent, convenient and easy, which saves time and money.

Easy maintenance means that any component that requires servicing or cleaning will be particularly easy to reach and treat. Each module of the system has a service door located on the inside of the wall that can be opened for replacing blinds and cleaning glass. The interior glass and blinds only need to be cleaned every 3-5 years, since this area is not exposed to dust or contaminants and is therefore classified as “clean.”





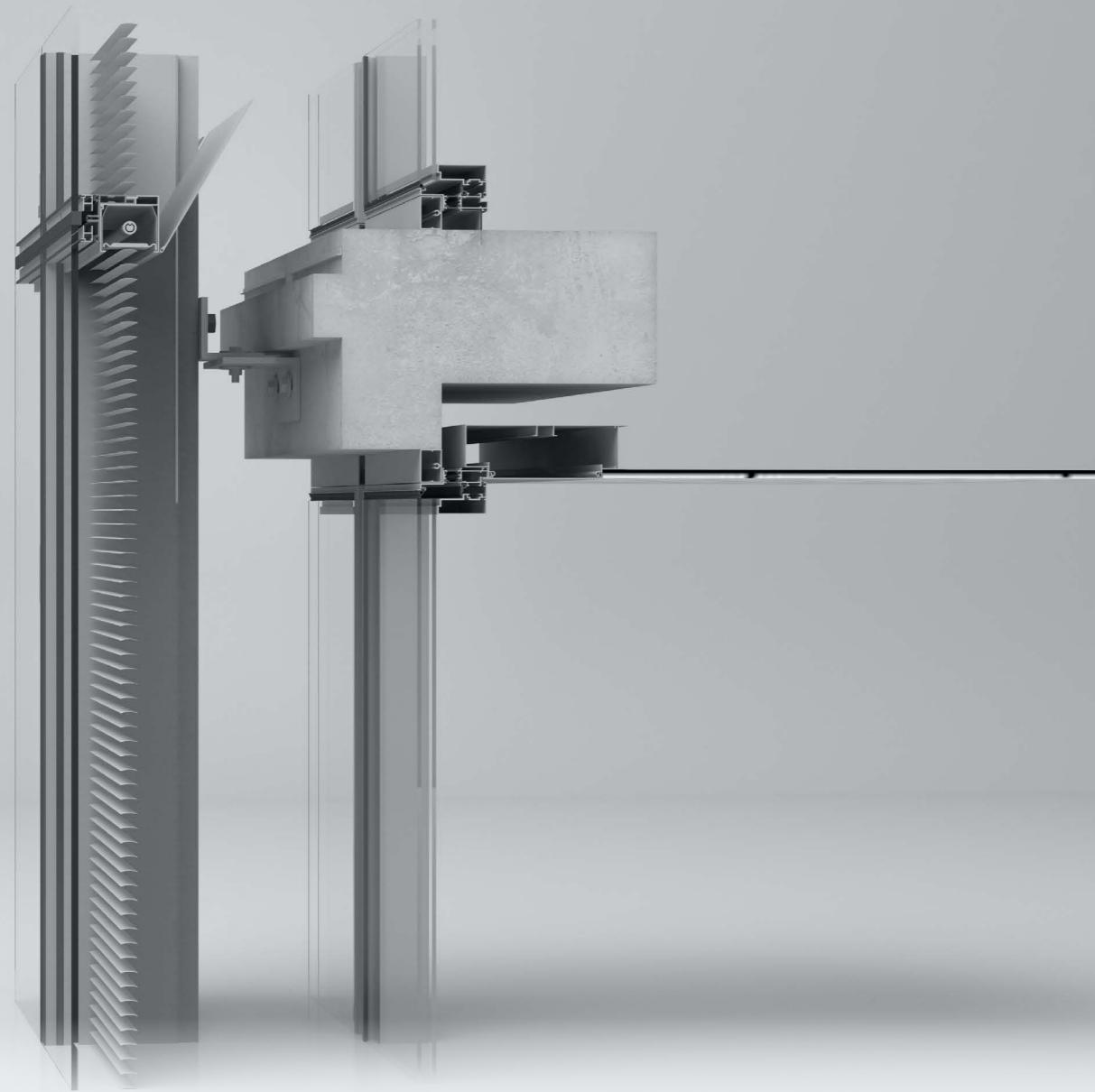
Constructive **Comfort**

The ALC 10,000 System meets all requirements of the American, European, and Israeli standards for F-Level screen walls.



Fully Impermeable to Water and Air

The ALC 10,000 System is completely insulated against the entry of water and air up to pressures of ± 5000 Pascal, due to the way the screen wall is built. The wall's vertical and horizontal seams are insulated with structural silicon at the outer glass level and over its entire surface, constituting a hermetic seal against the passage of water and air from the outside to the inside.



THERMAL COMFORT



The ALC
10,000
System
is the
answer to
achieving
thermal
.comfort



Thermal comfort is defined as a subjective sensation experienced by the human body under certain thermal conditions. This sensation varies from person to person, but there is an average thermal comfort zone in which the centerline body temperature ranges from 36.5-37.5°C, and skin temperature from 33-35°C. This zone precludes sweating and muscular shivers.

Thermal comfort is affected by several factors:

1. Air temperature in space
2. Intensity of direct and reflected sunlight
3. Relative humidity in the room
4. Speed of air movement

The ALC 10,000 System takes all these factors into account and is designed to comply with the average comfort zone.



The ALC 10,000 System allows perfect visual comfort, since the light entering through the wall is diffused light reflected from the sky and not direct sunlight (see attached image).



VISUAL
COMFORT

Definition

Visual comfort is a state of mind reflecting satisfaction with the visual environment. The two main factors affecting visual comfort are the amount of light reaching the eye and the degree of contrast between different regions of the visual field. A sufficient amount of light is needed to allow the eye to notice small and subtle details. Light that is too intense can cause discomfort.

Blinding inside the Building Space

When enough light reaches the eye, but the light contrast between the various fields of vision is too great, a glare is triggered that might cause functional disturbance.

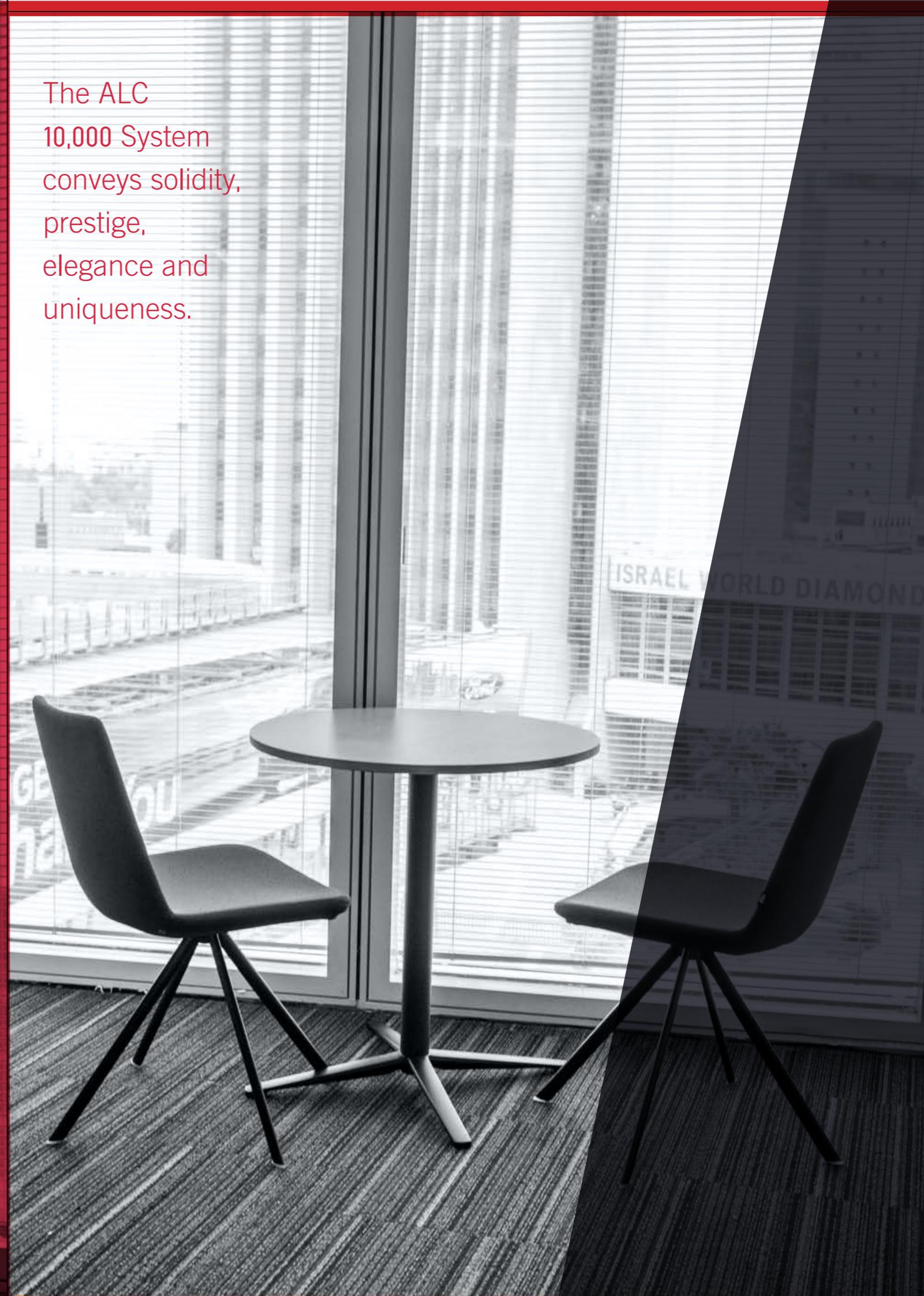


A modern interior space featuring large windows overlooking a city skyline and a spiral staircase.

AN ELEGANT
ARCHITECTURAL
LOOK



The ALC
10,000 System
conveys solidity,
prestige,
elegance and
uniqueness.





The wall's impressive look starts with the exceptional size of the glass. Since the wall is a four-sided structural glass type without external aluminum profiles, the look is smooth and very clear. The elegant architectural appearance also stems from the glass being particularly transparent, allowing full visual connection of the exterior with the interior. The outer glass rises up the entire height of each story, uninterrupted from the floor of the story to the floor of the story above it. The inner glass rises from the floor to the acoustic ceiling line on each story.