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ATTENTION!

CERTAIN PARTS OF THE BUDDYSUN™ BARRIER MAY HAVE SHARP EDGES, TAKE CARE TO AVOID ACCIDENTS WHEN HANDLING EACH PIECE.

ALWAYS WEAR GLOVES WHEN HANDLING THE BUDDYSUN™ BARRIER.

FOR SAFETY REASONS, READ THE INFORMATION IN THIS MANUAL BEFORE COMMENCING INSTALLATION OF THE BARRIER

1. Product description

The roofs of homes are normally a popular gathering place for pigeons, which are attracted by the heat escaping through the roof and chimneys.

In the case of roofs fitted with solar systems, the release of heat accumulated by the panels thanks to solar radiation is even higher.

Pigeons therefore tend to rest on the warm surface of the solar panels during the day, and sleep underneath them at night.

The nests and droppings between the panels and the roof will eventually be washed away by the rain, building up inside the gutters and clogging the drain pipes, consequently causing an overflow of rainwater. The space between the panels and the roof offers pigeons a cozy place to nest and rest, giving rise to a number of problems in addition to the build-up of droppings described above, such as the presence of parasitic insects, pathogenic viruses, etc.

The acidity of the droppings tends to tarnish the glass, causing a rapid decline in the performance and output of the panels. The subsequent need to use aggressive and abrasive cleaning products only further damages the surface of the panels, which therefore become rapidly worn and damaged

BUDDYSUN™ is a self-adapting Ecobirds® innovative bird barrier, patented in Italy, for the fight against pigeons, crows, magpies and large rodents such as dormice, squirrels and beavers, which may gnaw on the electrical cables near the panels.

BUDDYSUN™ allows the complete and rapid sealing of the gap between the roof surface and top-mounted solar panels. Combined with the specific "BUDDYTAPE" product - a double-sided adhesive tape highly resistant to atmospheric agents, temperature fluctuations, water, snow and smog - the BUDDYSUN™ barrier does not require any drilling into the frames of solar panels for its installation.

Once laid and properly shaped, the barrier seals off all points of entry for pigeons and large rodents. It is quick and safe to install.

2. BUDDYSUN™ kit

The following description summarizes the composition of the BUDDYSUN™ barrier

BUDDYSUN™ is a rigid barrier with vertical self-adapting teeth in painted aluminum. The barrier is made up of 48 parallel vertical teeth, which automatically adapt when positioned on corrugated roofing. Highly resistant to impact and atmospheric agents, the barrier can be anchored, for example, using specific BUDDYTAPE double-sided adhesive tape, or with silicone, screws, etc.

The following description summarizes the composition of the BUDDYTAPE double-sided tape

A roll of double-sided adhesive tape, made with viscoelastic acrylic foam with closed cell structure, perfect for outdoor applications. Its special shape ensures excellent compensation in the case of thermal expansion and shock, persistent humidity and water infiltrations. Treated with anti-UV additives, it is resistant to solar radiation. Intended only for the attachment of aluminum parts onto aluminum surfaces.

2.1. Characteristics and limits of BUDDYSUN™ barrier

- Structure of barrier: painted aluminum
- Color of barrier: dark brown
- Thickness of material: 0.8 mm
- Length of single piece constituting barrier: 1006 mm
- Height of single piece constituting barrier: 235 mm
- Number of teeth in one meter: 48
- Height of teeth: 180 mm
- Width of single teeth: 16 mm
- Depth of top strip: 5 mm
- Obscured surface of a single piece: 210 mm²
- Ventilated surface of a single piece: 25 mm²
- Suitable for maximum gap height of: 220 mm
- Classification of BUDDYSUN™ barrier: CE

2.2. Characteristics and limits of BUDDYTAPE double-sided tape

- Composition of double-sided tape: acrylic foam
- Height of double-sided tape: 25 mm
- Length of double-sided tape: 5 – 10 – 12.5 – 15 m
- Thickness of double-sided tape: 1200 µm
- Classification of double-sided tape: CE
- Resistance on aluminum: 34 N/cm
- Temperature of use of double-sided tape: - 20° C / +90° C
- Application temperature of double-sided tape: +10° C / +40° C
- Classification of BUDDYTAPE double-sided tape: CE

3. Installation of BUDDYSUN™ barrier

The BUDDYSUN™ system is a professional product and as such must be treated accordingly. To ensure its correct installation, specific procedures must be followed, which allow optimal, durable results over time. For installation, see the following chapters

3.1. Preparation of recommended equipment

Prepare the following equipment and materials:

- Permanent marker
- Tape measure
- Standard scissors
- Sheet metal shear
- Highly volatile thinner for degreasing
- Cotton or microfiber cloth
- manual roller
- Silicone

3.2. Preparation of personal protective equipment

Foreword to Safety.

Given the assumption that the barrier will be installed at height, that is, on the pitch of a roof or in any case in areas with a risk of accidental falls from height, installation works should be performed using all means and devices useful in avoiding personal injury and damage to property. In case of doubt, contact expert and trained personnel in possession of all legal requirements.

Prepare the Personal Protective Equipment to prevent accidental falls from height and protect your own safety:

- Helmet
- Gloves
- Non-slip shoes
- Full harness
- Positioning lanyard with carabiner
- Goggles
- Dust masks

3.3. Preparation of the BUDDYSUN™ barrier

Thoroughly clean the inner side of the barrier where the double-sided tape will be positioned, using a highly volatile degreasing product to remove all residual grease due to the manufacturing process.

3.4. Preparation of solar panels

Thoroughly clean the outer part of the perimeter frame of the solar panels with a high volatility degreasing product that removes any dust residue, dirt or residual grease due to smog and atmospheric agents.

3.5. Application of double-sided tape on the BUDDYSUN™ barrier

Apply the double-sided tape on the inner side of the BUDDYSUN™ barrier, against the upper longitudinal fold. Apply the tape, unrolling it slowly and very carefully, taking care not to repeatedly stick and unstick the tape, thus weakening its hold.

Pass your hands or a roller over the tape, applying pressure, to ensure it is evenly applied and remove any air bubbles. Carefully remove the silicone-coated film along the entire tape, taking particular care not to destabilize the adhesive surface by touching it with your hands, equipment, or dirtying it with liquids or dust.

ATTENTION!

Do not leave the double-sided tape exposed without the silicone-coated film for long periods of time in dusty areas, at temperatures below 10 °C and above 50 °C, to moisture, rain and other conditions that may destabilize the adhesive properties of the tape.

3.6. Anchorage of the BUDDYSUN™ barrier to the solar panel

Apply (optional) a line of silicone in the inner corner of the “L” shaped longitudinal fold. The silicone, applied as such, will prevent rainwater and dew from reaching the BUDDYTape double-sided tape, which although specifically manufactured for use in these types of weather conditions, may weaken its hold.

Apply the BUDDYSUN™ product to the solar panel frame, resting the “L” shaped longitudinal fold of the barrier on the edge of the solar panel frame. During this stage, make sure to keep the adhesive tape attached to the inside of the barrier away from the solar panel frame. Once the exact position of the barrier has been established, turn it face down and move it toward the solar panel frame, using the “L” shaped fold as a pivot. Safely lay the barrier and double-sided tape attached to the back of the barrier itself against the solar panel frame and press evenly along the entire length. Continue to apply repeated pressure along the entire length of the barrier with the palm of your hands, or using a roller, in order to eliminate any residual air between the double-sided tape and the surface of the solar panel.

ATTENTION!

Once installed, the teeth of the BUDDYSUN™ barrier must not protrude or be folded under the solar panels, but rather must be facing outwards.

3.7. Adaptation of the BUDDYSUN™ barrier to the roof

The BUDDYSUN™ barrier self-adapts to corrugated roof formations, however in order to obtain best results, the teeth should be checked and if necessary, manually adapted.

ATTENTION!

During application, the elastic thrust effect of the teeth on the underlying roof may act as a counterforce to the action of the double-sided tape, thus reducing its hold during the initial polymerization of the adhesive.

To reduce the elastic effect, it is recommended to hold the barrier in position behind the frame of the module with one hand, using the other hand to adapt the most rigid teeth having a greater elastic thrust effect.

The elastic force must be reduced in order to ensure the optimal polymerization of the double-sided tape, thus avoiding any accidental detachment over time.

3.8. Structural modifications to the BUDDYSUN™ barrier

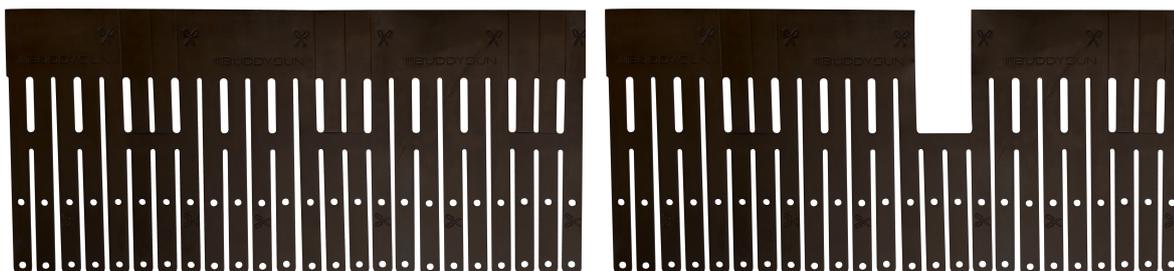
The BUDDYSUN™ barrier is designed to be cut and modeled according to the needs of the operator and the layout of the solar system.

The barrier can also be manually shortened without the need for any cutting tools. Near the points distinctly indicated by the scissor symbol, a force can be exerted on the barrier, repeatedly folding it in both directions, thus allowing it to be rapidly cut.

The ductility of the material allows a right angle to be obtained, which is essential for the correct positioning of the barrier in the corners of the solar panel, without it needing to be cut. Near the distinctly marked points on the barrier, fold the

barrier once only in a right angle to obtain a perfect 90° shape.

Near the profiles supporting the solar panels protruding from the perimeter of the panels themselves, the BUDDYSUN™ barrier must be shaped in such a way that it slots in, perfectly sealing all points of entry by unwanted animals. There are special distinctive markings on the barrier indicating the exact positions where to cut and obtain, using a sheet metal shear, the specific slits. These slits allow the exact positioning of the barrier along the profiles protruding from the solar modules.



4. Precautions for use

- a) Do not install the BUDDYSUN™ barrier if the gap requiring protection is greater than 22 cm.
- b) Do not apply the BUDDYTape double-sided tape if the residual grease due to the manufacturing process has not been entirely removed.
- c) Do not apply the barrier using the BUDDYTape double-sided tape without first thoroughly cleaning the surface of the frame of the solar panels. If this is not possible, follow instructions for correct application in the next paragraph 5, point c)
- d) Do not apply the barrier using the BUDDYTape double-sided tape if the solar panel frame is wet or damp.
- e) Do not apply the barrier using the BUDDYTape double-sided tape if it's raining or if the relative humidity cannot guarantee the perfectly dry condition of the solar panel frame.
- f) Do not apply the barrier using the BUDDYTape double-sided tape if the solar panel frame is made of materials other than aluminum (for example but not limited to, plastic, wood, glass fiber, etc.) In this case, follow instructions for correct application in the next paragraph 5, point b)
- g) Do not apply the barrier using the BUDDYTape double-sided tape if the solar panel frame is powder-coated. In this case, follow instructions for correct application in the next paragraph 5, point d).
- h) Do not apply the barrier using the BUDDYTape double-sided tape in ambient temperatures below 10° C or above 40° C. In this case, follow instructions for correct application in the next paragraph 5, point e).
- i) Do not apply the barrier if the BUDDYTape double-sided tape has been repeatedly stuck and unstuck. With each sticking/unsticking action, the adhesive power of the double-sided tape is drastically reduced.
- j) Avoid exposure of the BUDDYTape double-sided tape in the worksite to temperatures below 10° C in order to prevent the irregular stiffening of the acrylic foam and the crystallization of the glue with an evident reduction in viscosity.
- k) Avoid exposure of the BUDDYTape double-sided tape to dust or humidity in the worksite.

5. Precautions for correct application

- a) Check the height of the gap needing to be protected, if this is higher than 22 cm, use other protection systems that allow the hole to be completely sealed.
- b) Check the consistency and type of material constituting the frame of the solar panel. If the material is not aluminum, where possible, use other anchorage systems as opposed to the BUDDYTape double-sided tape, for example clips, screws, rivets, etc.
- c) Check that the frame of the solar panels is perfectly clean before applying the barrier. If the frame is not perfectly clean of all residue, the perfect hold of the double-sided tape cannot be guaranteed over time. In this case, where possible, use other anchorage systems such as clips, screws, rivets, etc.
- d) Check that the frame of the solar panels has not been powder-coated, and if so, use a primer on the frame before applying the BUDDYSUN™ barrier. If in doubt, where possible, use other anchorage systems such as clips, screws, rivets, etc.
- e) Check that the ambient temperature before installation is within a range between 10° C and 40° C. If the temperature is below 10° C, the surface of the solar panel frame must be heated with a heater. If the temperature is above 40° C, wait for the temperature to fall, checking either way that the surface of the solar panel frame is not greater than 50° C. If in doubt, where possible, use other anchorage systems such as clips,

- screws, rivets, etc.
- f) Once installation is complete, check for any holes between teeth that may allow access by birds or large rodents. If so, carefully adapt the teeth of the BUDDYSUN™ barrier by hand, sealing all possible points of entry. In certain cases the teeth of the barrier need to be closer together, joined by way of a rope threaded through the holes on each single tooth.
 - g) Check that the teeth of the BUDDYSUN™ barrier do not create an elastic effect and counterforce on the barrier. In this case manually adapt the teeth, thus reducing the elastic effect to such a point that it no longer exerts any strain on the barrier and relative double-sided tape.

6. Safety precautions

Works at height and on sloping surfaces may be dangerous if performed by non-expert persons and entail the risk of falls from height.

- a) Do not improvise the installation of the BUDDYSUN™ product, underestimating the hazards associated with this type of activity.
- b) Do not install the BUDDYSUN™ product without having the necessary skills, psychophysical conditions and technical requirements, as well as any equipment necessary to protect your safety. Falls from height entail serious damage to your health and a hazard to your life. In case of doubt and uncertainty, contact expert personnel trained for works at height.
- c) Do not install the product on the roof of the building without adopting the necessary safety precautions. Use suitable personal protective systems to avoid cuts and abrasions, a mask to protect your airways or prevent contact with dust and liquids, goggles to prevent accidental contact with splinters or other processing residue that may affect the eyes.

7. General precautions

It is very important for this instruction handbook to be read prior to commencing installation of the BUDDYSUN™ product.

Do not install the BUDDYSUN™ barrier for scopes other than that for which it has been designed and developed.

Respect all the precautions in this manual in order to prevent the malfunctioning of the BUDDYSUN™ barrier and to avoid endangering your own health.

For further details and information visit the website

Europe – www.buddysun.it

USA – www.buddysun.eu

The BUDDYSUN™ barrier is covered by patent ITA 0001421939

The BUDDYSUN™ brand is the property of:

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