



Smart Anoxia

User Manual

Anoxia is a treatment that removes oxygen from a controlled environment. It is a safe and universal treatment against insects of any kind that does not damage nor alter treated objects.

Samitech Smart Anoxia is easy to use and allows remote and real time control of the treatment's evolution thus avoiding displacements.

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Introduction

Thank you for acquiring Samitech Smart Anoxia, the most complete and modern technological solution to perform treatments in a controlled environment without oxygen. Smart Anoxia is a really simple and comfortable system that allows anoxia treatments to be performed in a guaranteed, cost-effective and uncomplicated way.

Anoxia treatments consist of removing oxygen from an airtight container in which oxygen is completely eliminated, thereby causing the death of pests by suffocation and dehydration.

The Smart Anoxia system does not use gases such as Nitrogen or Carbon Dioxide. The treatment is carried out by completely removing the Oxygen contained in the treatment bubble.

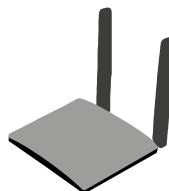
Please read this manual carefully before using the equipment, paying special attention to safety instructions.

Starter Pack contents

The Smart Anoxia Starter Pack includes all necessary equipment and consumables to perform treatments in an Oxygen-free controlled environment.



Wireless control unit with
rechargeable battery



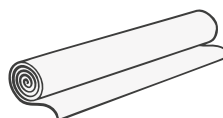
IoT router with 4G/LTE
connection



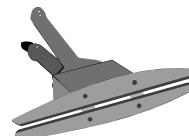
Oxygen absorbers,
10 units



Humidity control,
10 units



Polybarrier film roll



Thermal sealer

Product Description

Maintenance-free IoT sensor technology

Smart Anoxia uses a state-of-the-art electronic device that allows monitoring of oxygen concentration, temperature and humidity inside the treatment bubble. The control unit incorporates a rechargeable battery with 2 months autonomy and is equipped with a WiFi wireless connection used for sending obtained data to the cloud.

The electronics incorporate industrial-grade sensors that are factory calibrated and do not require periodic maintenance. Unlike other products, the Smart Anoxia oxygen sensor does not degrade with use and does not need to be replaced.

Turn on the control unit and place it inside the treatment bubble to control remotely the entire treatment.

The Smart Anoxia control unit requires a wireless Internet connection to send obtained data obtained to the cloud. The factory predefined connection is the low-power IoT WiFi network of the router supplied in the Starter Pack. You can configure your control unit to connect to any other network available at the treatment site. Read the setup instructions below to select another WiFi network.

IoT router with 4G/LTE mobile connection

The Smart Anoxia Starter Pack incorporates a router device with mobile connection to GSM, 2G, 3G, 4G and LTE networks, which works worldwide. The router can service up to 32 Smart Anoxia control devices simultaneously.

Free data service is included for a period of 5 years with coverage in up to 140 countries around the world with mobile phone coverage. Some countries are excluded for political or technological reasons such as China, North Korea, Iran and several countries in underdeveloped Africa.

The data service is intended only to serve Smart Anoxia devices and cannot be used for Internet access of other types of mobile devices or computers. Any unauthorized use, modification of the router configuration or removal of the SIM card included, will result in the definitive interruption of the data service and loss of the warranty.

Oxygen-tight polybarrier film

The Smart Anoxia system incorporates a specific product to create the treatment bubble. It is an aluminum-based film that comes in rolls and allows you to create custom containers or bubbles. Smart Anoxia polybarrier film has a plastic coating that allows hermetic heat sealing. Build the

treatment bubble to fit in the objects you want to treat by sealing strips of polybarrier film with the heat sealer included in the kit.

The Starter Pack includes a 30cm long clamp thermal sealer to facilitate the heat sealing of the treatment bubble.

Oxygen absorbers

The Smart Anoxia system uses oxygen absorbers to fully consume the oxygen contained in the treatment bubble. Insert the recommended dose of absorbers into the treatment bubble (see dosage detail).

It takes between 24 and 72 hours for oxygen absorbers to fully consume the oxygen inside the treatment bubble. Outside temperature influences the speed of oxygen absorption. The absorption time will be extended by approximately 1 day for each degree below 24°C. It is not recommended to perform anoxia treatments in environments below 19°C. Remember that you can follow this process in real time from your computer or mobile device.

The chemical reaction that occurs inside the oxygen absorber packages is exothermic; that is, it produces heat. The oxygen absorber packages might heat up to about 50°C during the first hours, while performing the greatest oxygen absorption inside the treatment bubble. Once the oxygen level is stabilised, inside temperature drops to ambient levels. It is recommended to maintain a separation of about 30cm with any delicate object or use an insulator.

Oxygen absorbers are composed of iron dust, activated carbon, diatomaceous earth and salt. It is a safe and non-polluting product that can be thrown away in small quantities or taken to a waste management center.

Never open the oxygen absorber packets, their contents could leave stains on treated objects. In case the contents of a new package come into contact with the skin, wash immediately with cold water for several minutes.

Humidity control

The heating effect that occurs during the first treatment phase can produce an increase in humidity inside the bubble. Depending on the dimensions and nature of the objects being treated, the ambient humidity could rise by up to 30%. If the objects to be treated can deteriorate with moisture, you should include humidity control sachets inside the treatment bubble to counteract that increase in ambient humidity (see dosage detail).

The humidity control sachets are composed of bentonite clay, a natural and totally ecological product that can be disposed of directly in the trash.

The treatment bubble

The treatment bubble is the container in which we will perform the treatment in a controlled atmosphere with no oxygen. Polybarrier film is a flexible and oxygen-tight material. It comes in rolls and it can easily be used to completely wrap the objects to be treated and build a custom made container.

The procedure consists in joining several strips of polybarrier film using the heat sealer until the objects are completely wrapped. Just before sealing the last bit, leave a small opening in the bubble through which the oxygen absorbers will be introduced.

Preliminary considerations

Polybarrier film has two faces: the outer face with metallic luster and the inner face with plastic appearance. The plastic face allows sealing and should be towards the inside of the treatment bubble; the metallic gloss face should always be the outer face of the bubble.

Group the objects to be treated in such a way that the volume of air between them is as minimal as possible.

Use the utmost caution during handling of polybarrier film so as not to deteriorate it. Avoid any rubbing and puncturing to prevent piercing. Any pore could prevent treatment from being successful.

Use some reinforcing material such as cardboard between the floor and the base of the bubble and where the objects rest to prevent damage to the polybarrier film. If objects have sharp or sharp areas that may come into contact with the film, cover them as well to protect the bubble.

Do not open the plastic bag of oxygen absorbers until it is time to insert them into the treatment bubble so that they will not lose effectiveness.

Connect the IoT router while making the treatment bubble preparations. You will need two to three minutes to establish a connection. You can now turn on the control unit. Performing this process before completing the bubble will help you record the environmental conditions prior to treatment.

Remember to have the control unit's battery fully charged to ensure you can complete the treatment without the battery running out.

Try to foster free air circulation inside the bubble. Leave any type of container, drawer, door or packaging open to avoid air bags that will slow down treatment.

Using the heat sealer

The heat sealer allows to join fragments of polybarrier film making it oxygen-tight. Seal two fragments of polybarrier film in such a way that they are in contact with its inner face with plastic appearance. The sealing should be as uniform as possible. Apply the sealer from the outer edge by clamping to perform the seal. Remove the sealer, wait a few moments until the polybarrier film cools and check that both fragments cannot be ripped off each other.

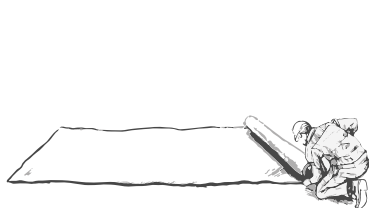
The heat sealer needs a heating time of several minutes to reach the selected sealing temperature. The recommended sealing temperature is 150-160°C. When the sealer reaches the selected temperature, the temperature indicator changes.

Caution: The temperature of the heat sealer is very high. Keep the sealer away from your body and other objects. Disconnect the sealer when it is no longer needed and wait at least 20-30 minutes to store it.

The required sealing time is 1 to 2 seconds and will depend on the selected sealing temperature. No pressure is required. Determine the optimal sealing temperature and duration on a portion of polybarrier sheet that will not be used for treatment. Perform a test seal very quickly and repeat several tests increasing the duration until the sheets do not peel off when pulled apart. A high sealing time will pierce the polybarrier sheet and plastic debris may remain on the sealing surface.

Bubble mounting with polybarrier film

The polybarrier film allows to create a container using several fragments tailored to the objects to be treated. The following indications describe recommended procedure for general use. Practice and experience will allow you to define your own method.



Prepare the bubble base with polybarrier film



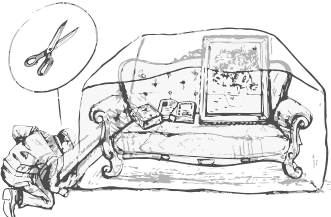
Deposit objects on top of the film



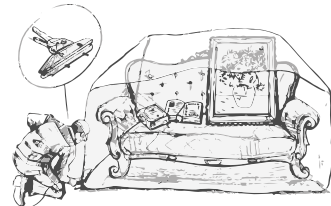
Wrap the objects with the film



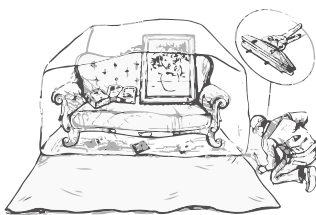
Cover objects until the ends of the film meet



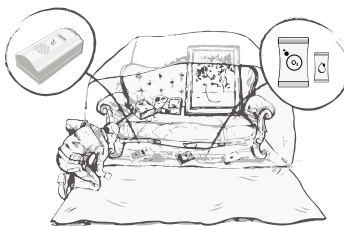
Seal the ends and cut more film pieces for the sides



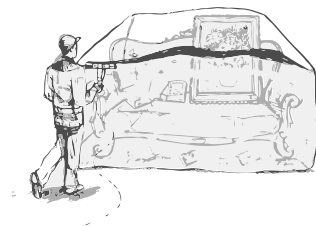
Seal side perimeters



Complete sealing until a small opening is left



Leave the control unit and oxygen absorbers inside the created bubble



Finish the sealing of the bubble

Detailed mounting guide

Calculate the dimensions of the base of the set of objects to be treated to determine if the base is greater than the width of the polybarrier film roll. If necessary, you can seal two or more strips of polybarrier film longitudinally to cover more width.

Prepare a strip of polybarrier film long enough to completely wrap the objects. Place the film on the floor and choose an end that will act as the base of the treatment bubble. Remember the importance of using some protective material so as not to damage the film.

Place the objects on top of the polybarrier film area that will serve as the base. The control unit must be turned on and connected to leave it next to the objects inside the bubble. Be careful not to obstruct the ventilation slots of the control unit with other objects.

Cover objects around them with the strip of film until you can seal both the bottom and top ends. Perform sealing. If the width of the material is sufficient, you can complete the sides of the bubble with perimeter sealing. You can use additional strips of material to compose the side walls of the bubble.

Leave an opening before sealing to insert oxygen absorbers.

At this last moment, you can extract the excess air inside the bubble using a conventional vacuum cleaner. It is not necessary to create vacuum, just remove excess air to save oxygen absorbers. Be careful with objects that may come into contact with the film and damage it when emptying excess air.

Polybarrier film is a reusable material as long as it remains in good condition and without punctures. When opening the treatment bubble, you can cut the polybarrier film next to the sealing area and keep the folded bubble for further treatments.

Use of oxygen absorbers and humidity control

Oxygen absorbers allow the complete removal of oxygen contained in the air of the treatment bubble. For the effectiveness of an anoxia treatment, an oxygen concentration equal to or less than 0.20% is considered enough.

Oxygen absorbers are for single use only. They are completely worn out after each treatment and cannot be reused. They come vacuum-packed in a clear plastic package. If you notice that there is air inside the plastic bag, it means that air has entered and that oxygen absorber may be unusable or have lost effectiveness and should not be used for treatment.

The moisture control sachets allow to absorb the excess moisture generated inside the treatment bubble. Use them when needed.

How to calculate air volume

You can calculate the total volume of your treatment bubble by measuring its dimensions in meters: length x width x height. This will give you the total volume of your bubble in cubic meters. One cubic meter is equivalent to 1,000 liters. For example, if you have a bubble of 2 x 2 x 1.5 metres, the volume will be 6m³ or 6,000L.

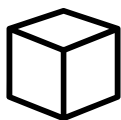
Since the objects to be treated occupy space, the volume of air inside the treatment bubble will be the difference between the total volume of the treatment bubble and the calculated volume occupied by your objects. Consider only the solid parts of objects and air present in drawers, cabinets and the space between chair or table legs.

The dosage of oxygen absorbers should be carried out based on this calculation of the volume of air contained in the bubble.

Dosage

The recommended dosage for a standard treatment is as follows:

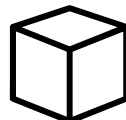
Oxygen absorbers



0.5 m³
500 L

1 pack per 500 liters or 0.5m³ of air

Humidity control



0.5 m³
500 L

1 pack per 500 liters or 0.5m³ of air

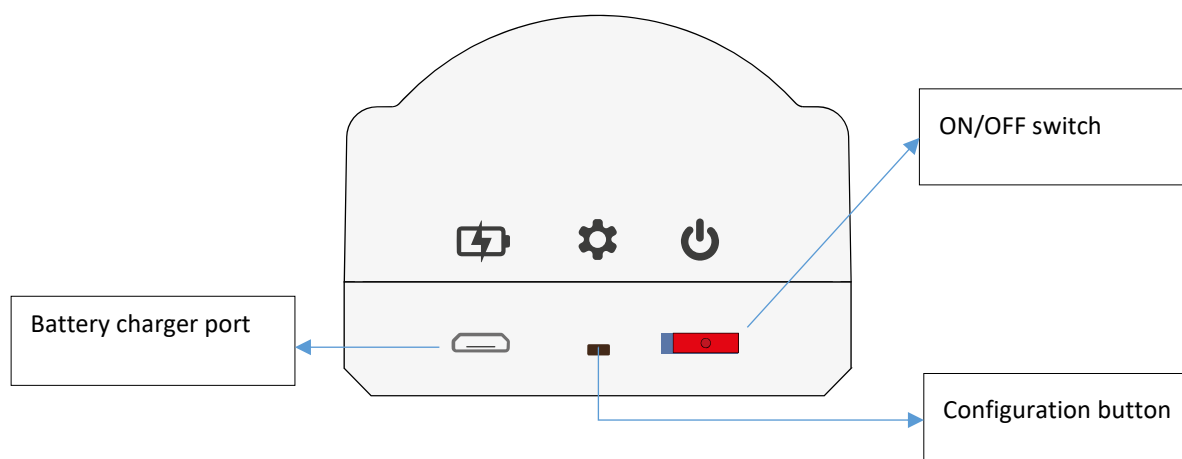
Never use a lower dosage than recommended for the volume of air inside the treatment bubble. When in doubt, always choose to overdose. An insufficient dose will not allow to reach the concentration of oxygen necessary for treatment.

You can follow this guideline in a general way. For the treatment of objects composed of multiple layers or objects that cannot be fully exposed to air, such as books, rolled textiles, packaged objects, etc., you can double the proportion of oxygen absorbers for maximum safety.

Humidity control is optional and will depend on the nature of the objects to be treated. In cases where the objects to be treated are particularly sensitive to moisture, you can safely double or even triple this proportion.

Using the control unit

The control unit is an electronic device that collects information captured inside the treatment bubble and sends it wirelessly to the cloud.



Remove the protective case from your control unit before using it in a treatment. Keep the protective case to store your control unit while not in use.

The device incorporates a high-efficiency rechargeable lithium battery. The estimated battery life is 2 months. It is recommended to start a treatment always with the battery fully charged. Some circumstances such as low signal from the WiFi network, distance to the router or lack of Internet service, can reduce battery life.

Battery charging

You can charge the battery by connecting the supplied micro USB cable to any standard USB charger of at least 1000mAh. Any mobile phone charger will do. The approximate charging time is about 8-16 hours, depending on the available charge. When the charger is connected, the LED indicator on the control unit lights up red and will remain lit throughout the charging process. When the holder is charged, the red indicator turns off and you can disconnect the charger.

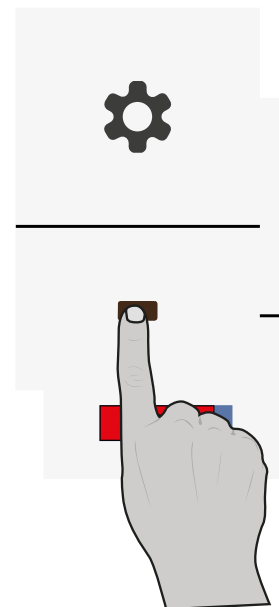


On/off switch

Turn on the control unit by sliding the switch towards the left. While operating, the indicator light inside the control unit lights up green. The indicator light flashes at 10-second intervals indicating normal operation.

The control unit performs a complete operation and connection test at every start. Just after the device has been turned on, the indicator light will turn blue indicating that the device is checking the Internet connection. If this connection is successful, you will hear an acoustic signal such as a brief beep. If the connection has failed, the acoustic signal will indicate connection error with three successive beeps. Check that the IoT router is plugged in and has a mobile connection or, if you are using custom WiFi, check for signal and internet connection.

To turn off the control unit, slide the power switch towards the right of the unit. The indicator light will turn off definitively. If you need to turn the controller unit back on, wait at least 15 seconds to turn it on again.



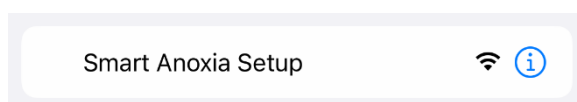
WiFi connection Setup

The control unit connects by default to the IoT router supplied in the Starter Pack. If you haven't purchased a router or want to use another network, you can configure your control unit to connect to any other standard 2.4GHz WiFi network.

The setup process is very simple. You will need a mobile terminal or any other device with WiFi connection.

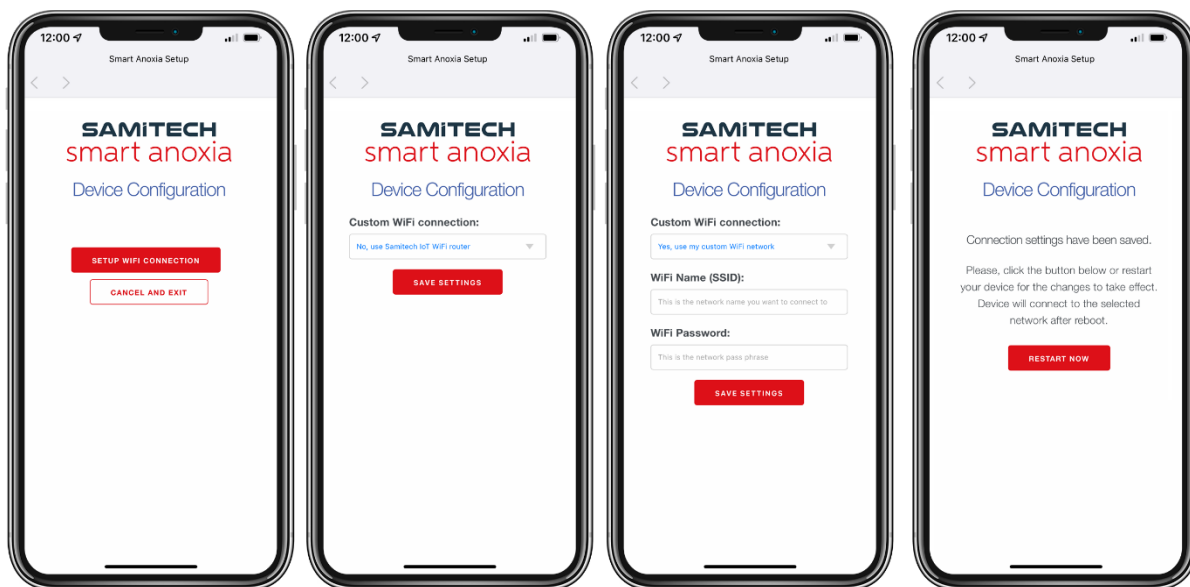
Press and hold the setup button while turning on the control unit. You will hear a long beep and the control unit indicator light will be cyan blue. Release the setup button now. At this point, your control unit is in configuration mode.

Search your mobile terminal for the WiFi network called "Smart Anoxia Setup". Connect to this network. No password needed.



After a few moments your terminal screen will show the configuration interface of your device. On some mobile terminals, due to their configuration, it is required to manually open the Internet browser and visit any page to display the configuration interface of your control unit.

Follow the steps to select whether you want to connect to the supplied IoT router or use a custom WiFi connection. In the latter case, enter the name and password to access your WiFi network. Be careful to enter credentials correctly, remember that it is case sensitive. Press the "save" button when you're done. Press the "restart now" button to end the session and exit the configuration mode. Your control unit restarts in normal mode with green indicator light.



If the settings are correct and your control unit can establish a connection correctly, you will hear an acoustic signal such as a brief beep. If the connection has failed, the acoustic signal will indicate connection error with three successive beeps. You will need to check the WiFi signal and that you have correctly typed the credentials to access your network. You can repeat the setup process until you get a successful connection.

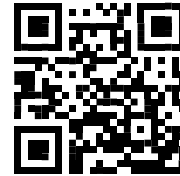
Check by accessing your control panel that updated data is being received from your device.

Control Panel

The data obtained during the treatment are available in real time through the control panel. The control panel is accessible from any device connected to the Internet such as computers, tablets or mobiles by accessing the following address in your browser.

Available information for each device is as follows:

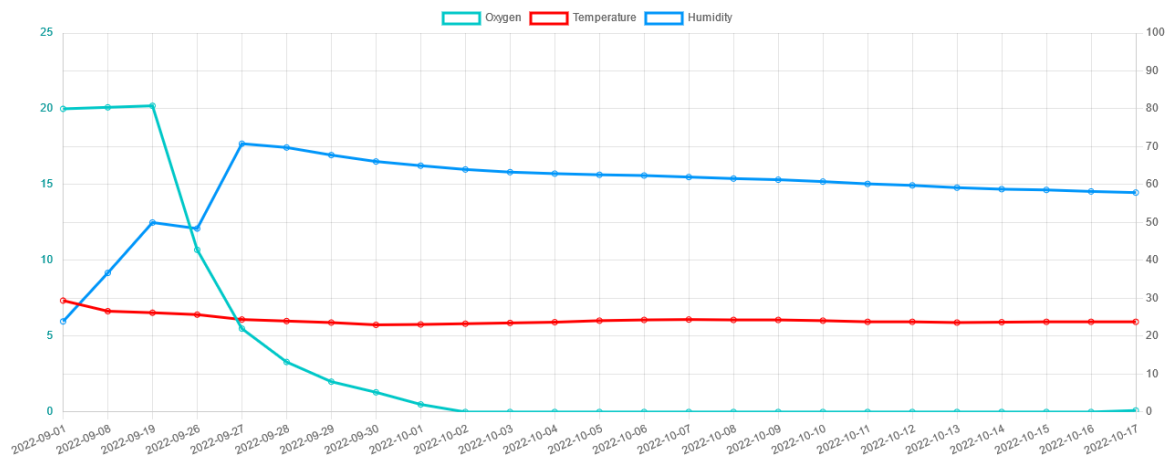
- Oxygen concentration
- Temperature
- Relative humidity
- Device battery status
- WiFi signal quality
- Last connection



<https://panel.smartanoxia.com>



Treatment real time graphics



If you have more than one device, you can manage them and select the device you want to monitor to view the details of each running treatment.

To access the control panel, you will need to use your username and password. Your login credentials are set to during the registration process of your first Smart Anoxia device.

The control panel is extremely simple and intuitive to use and has multiple functions for viewing treatment data and managing your devices. The Smart Anoxia control panel is a living tool in constant

evolution that will incorporate improvements and new functionalities. You can use the contact option to send feedback about your experience and suggestions for adding new features.

Registering a control unit

The registration of your control unit allows you to create your user card and set your password to access the control panel to display the data obtained from your new Smart Anoxia device.

You will need a mobile terminal that can read QR codes. Nowadays most smartphone can do it.

At the bottom of your new Smart Anoxia device is a label that includes a QR code. Open the camera on your mobile phone or your QR code reading app and access the address obtained to register your unit.

Fill out the form indicating your email address and enter a password. Complete the form with the complete details of your organization and contact details. Follow the on-screen instructions to complete your registration.

If your organization already has another Smart Anoxia device, you must access the control panel with your username and password to register as an existing user. This way, all your devices will be correctly associated with your organization.

Feel free to contact us if you encounter any problems during the registration process.

Treatment duration

A period of 24 days with at least an oxygen concentration equal to or less than 0.20% is considered sufficient for an anoxia treatment to be fully effective.

Certain situations of low ambient temperature or the nature, large size or density of the objects to be treated, may require longer treatments.

Analyse the evolution of oxygen concentration in your treatment. Any sudden increase in oxygen could indicate an air intake that would invalidate the treatment.

Fluctuations in oxygen concentration could indicate that there is pocketed air between objects that is gradually being released. You should not consider starting treatment until the oxygen level stabilizes below the 0.20% threshold.

Precautions during treatment

Protect the location of the treatment bubble to prevent damage from rubbing or punctures. Avoid the access of animals to the area where the treatment is being carried out.

The Internet connection must be operational during the entire treatment. If you are using the IoT router supplied in the Starter Pack, keep it plugged permanently and in a place close to the treatment bubble. If you are using a custom WiFi connection, make sure it is always available and in service.

Any interruption of treatment will require repeating a complete treatment to ensure its effectiveness.

How to open the treatment bubble

Once an anoxia treatment has been completed, it is time to open the treatment bubble.

Keep the room ventilated while you open the treatment bubble.

Remember that polybarrier film is reusable. You can make a cut along existing sealing area to use the same container in another treatment. It is recommended not to use knives or cutters to avoid damaging objects inside the bubble.

Make a cut on one side of the bubble until a large opening is completed. Wait a few minutes for oxygen levels to recover before accessing objects.

Oxygen absorbers can heat up when they come back into contact with fresh air, which is normal.

Treated objects can be stored in the same treatment bubble as packaging for better UV preservation and avoid moisture fluctuations.

Safety Instructions

Smart Anoxia is a safe product. Use this device only as described in this manual. The operator assumes all responsibility for the improper use of the equipment.

Avoid blows due to falls from the control unit. Keep the control unit always protected in its protective case when not in use. Prevent dust or dirt from entering the control unit.

Oxygen absorbers should be handled only when the site is properly ventilated. Breathing in environments with low oxygen concentration can cause discomfort, dizziness, headache, etc.

Never open the oxygen absorber packets, their contents could leave stains on the treated objects. In case the contents of a new package come into contact with the skin, wash immediately with cold water for several minutes.

You should exercise the utmost caution with the elevated temperature of the heat sealer, both during operation and during the heating and cooling periods following use. Severe burns may occur in contact with the skin and serious damage including fire to objects. Do not leave the heat sealer connected and unattended.

Do not leave equipment within reach of children or babies. Elements such as polybarrier film could cause suffocation.

Anoxia treatments are indicated for pest control. Do not use an anoxia treatment against other types of living beings.