

SMARTHEATER®
by Polibox®

✓ Brevettato/Patented

**THE WORLD'S MOST
ADVANCED TEMPERATURE
CONTROL SYSTEM!**



**THE IDEAL SOLUTION
FOR THE CATERING INDUSTRY!**

POLIBOX®



(R)evolutionary

POLIBOX®



(R)evolutionary

TAKING PART IN A BETTER FUTURE

POLIBOX® is always focused on researching materials, finished items and technologically innovative products. POLIBOX® conceives the products as components of integrated systems and follows the production of the items faithfully and totally. POLIBOX® deals with the processes that go from the direct purchase of some raw materials to the total control of all the productive activities of specialized companies that work in partnership.



EPP WITHOUT CFC



LOW IMPACT



HEALTHY ENVIRONMENT



EVERY TIME YOU USE IT, YOU'RE GOING TO:



**RESPECT THE
ENVIRONMENT**



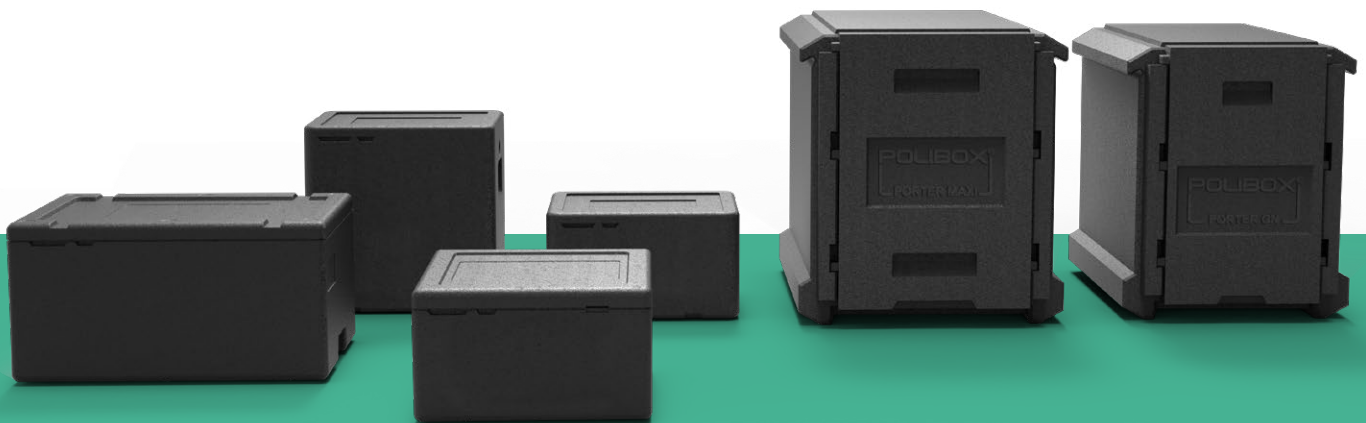
REDUCE WASTE



SAVE ENERGY

POLIBOX® CONTAINERS

Food and perishable items have very high conservation requirements. They must be maintained in a safe environment regarding health and hygiene. The other important requirement is the mechanical protection caused by the delivery of food products. And finally we have the temperature control. Today the need of HO.RE.CA. and catering companies is caring about ecological and environmental aspects. Our commitment has been and will be, in the coming years, to create product culture by promoting the reduction of environmental impact with our isothermal containers, as they are reusable, not disposable and above all 100% recyclable.



EXPANDED POLYPROPYLENE

Expanded Polypropylene used in the production of POLIBOX® is an ecological material: it is composed of 98% air and is recyclable. The basic material is oil. For the production of EPP, the pearls (form in which the polypropylene is presented at the early step) are swelled up to 50 times their initial volume by putting them in contact with hot water steam and nothing else. Hence chlorofluorocarbons are used neither for production nor for processing. Therefore the EPP does not harm the environment neither for its productive effect nor as a raw material, as it consists of air and only 2% of pure hydrocarbon structural material.

CO₂ REDUCTION

For the production of POLIBOX® only first quality virgin EPP is used, environmentally friendly: without CFC, polyurethane foams or other expanding gases. The goal is to use materials that minimize the environmental impact of CO₂ pollution. CO₂ reductions are the result of the ability to manufacture isothermal containers for foods that weigh up to 37,5% less.

100% RECYCLABLE

EPP can be burned with other municipal solid waste without producing poisonous or acidic substances, as if incinerated it produces only carbon dioxide (CO₂) and water (H₂O). 1 kg of expanded polypropylene saves about 1.3 kg of naphtha in incinerator operation.

You are allowed to dispose of the containers in normal landfills without affecting the environment, as the product is chemically neutral and does not pollute either the air or the aquifers.

We can safely say that these manufactured goods, shredded with solid urban waste, made mostly of air, contribute to the decomposition of organic waste.

PPE BENEFITS

RECYCLABILITY

POLIBOX is 100% recyclable.



LIGHTNESS

The reduction of the mass of the material and the number of minimized components drastically reduce the weight.

PPE



STRUCTURAL RESISTANCE

Main structural support thanks to the high strength/weight ratio.



ENERGY ABSORPTION

The closed cell structure guarantees a return to the original shape after the dynamic stresses.

UNIVERSITY OF STUDIES MILAN

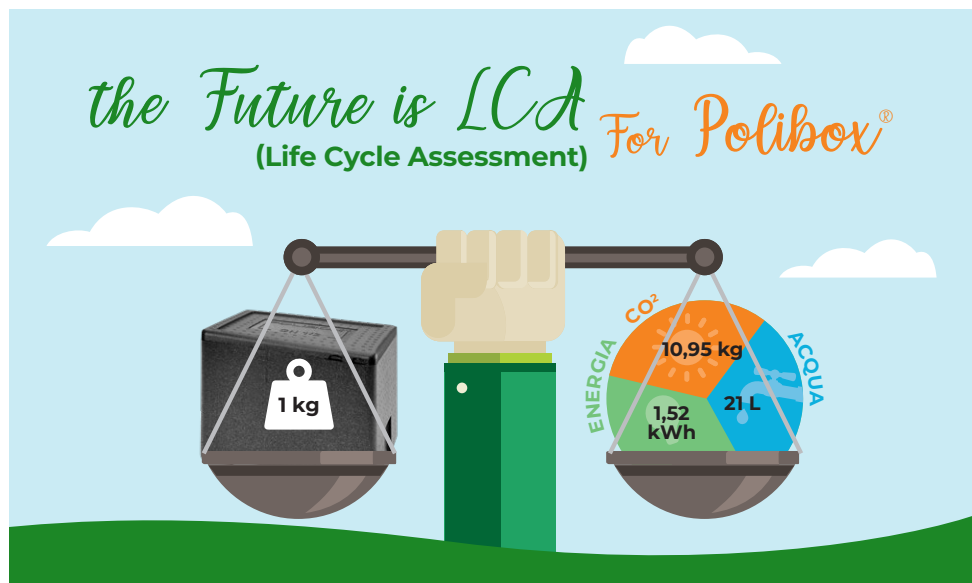
Department of Agricultural and Environmental Science production, territory, agro-energy.

Analysis of the life cycle of an innovative isothermal container for food preservation:

collection and analysis of data in reference to the production phase.

PURPOSE

Due to the collaboration between the Department of Agricultural and Environmental Sciences of the University of Milan and the company POLIBOX®, the environmental impact of the life cycle of a Polibox isothermal container was assessed.



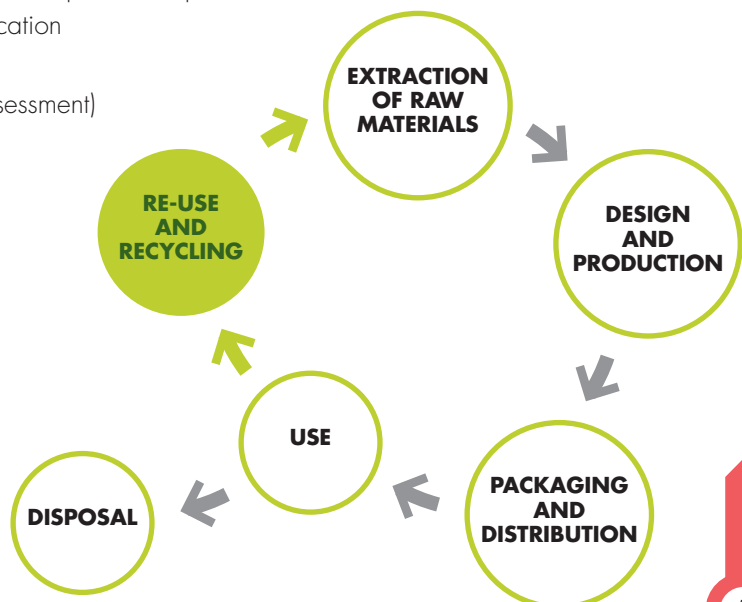
WHAT IS LCA (LIFE CYCLE ASSESSMENT)?



LCA (Life Cycle Assessment) is a quantitative tool to estimate the environmental impact of a product defined in the ISO 14040: 2006 and 14044: 2006 standards.

LCA is fundamental for companies who want to make decisions involving the environmental domain.

The ISO standards establish the structure of the LCA and define 4 steps for its implementation:

- Step 1: Definition of the objective and the field of application
- Step 2: Inventory analysis (LCI Life cycle inventors)
- Step 3: Evaluation of impacts (LCIA life cycle impact assessment)
- Step 4: Interpretation





In order to meet the growing demand of food operators to be able to **control the temperature of meals and foodstuffs**, a new concept was born:

SMARTHEATER®
by Polibox®

✓ Brevettato/Patented



Frame the QR-code
with your smartphone camera to
**GET MORE
INFORMATION**

WHAT IS

SMARTHEATER POLIBOX®

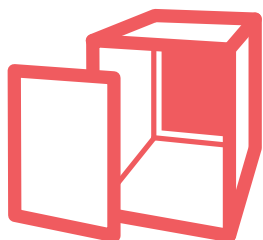
The world's most advanced **temperature control** system.
Innovation meets excellence.

+ **TECHNOLOGY**
+ **SAFETY**

+ **GREEN**
+ **CONTROL**

The SMARTHEATER® uses **modulating heaters** that independently, and therefore without the need for any control circuit or thermostat, depending on the temperature of the food placed in the POLIBOX® increase or decrease the heat generated (to almost zero consumption).

THE SYSTEM IN BRIEF



SMARTHEATER®

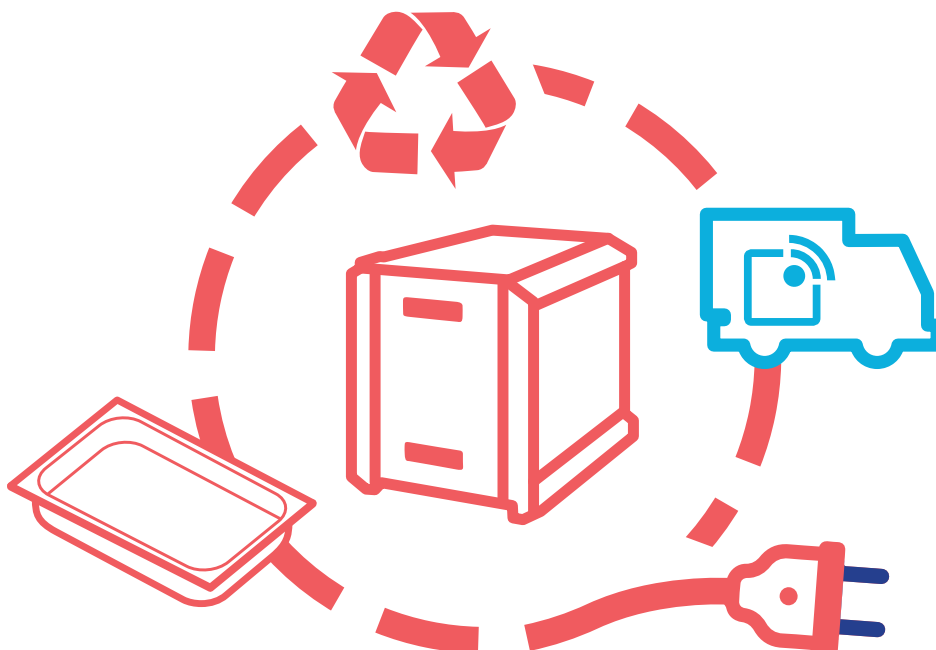
+



Electricity

=

TECHNOLOGY
SAFETY
GREEN
CONTROL



SMARTHEATER®
can be integrated with

SMARTPOLIBOX®

THE MOST ADVANCED
SOLUTION FOR MONITORING
THE TRANSPORT OF
FOODSTUFF.



Frame the QR-code
GET MORE
INFORMATION

HOT FOOD WITHOUT CONSUMING ENERGY

It is not difficult to have happy and satisfied customers, who allow to enjoy food at the right temperature. A tangible result that conforms to the best standards that the customer demands today.



The problems of conveyed food have been the same for years:

- dishes arrive not in perfect condition;
- some container models are heavy and require continuous maintenance
- constraints on the shifting of weights for workers are increasingly stringent;
- food transport vans consume more fuel as the extra weight increases.

Without forgetting how necessary and urgent it is to focus on the green aspects of product and process and on the circular economy, investing in products that contribute to improving the world in which we all live.

Challenges that prove to be complex but, above all, not to be postponed!

INTRODUCTION

The expanded polypropylene isothermal container **SMARTHEATER POLIBOX®** is equipped with highly innovative heating technology using a system of self-regulating heat generators in combination with heat accumulators and a dissipating plate. The supply voltage is 220 V.

The operating mode of the heating system ensures that it consumes the minimum amount of energy to stabilise the required temperature, while also storing also the heat of the contained product to then release it.

Simply plug it in and the SMARTHEATER stabilises at 65° C by self-regulating the heat output. The user is free to concentrate on somethings with higher added value.

The supply voltage is 220 V.
The housing is engineered to stabilise itself at a temperature of 65° C.



NOT JUST AN ISOTHERMAL CONTAINER

WHAT IS IT EXACTLY?

It is an advanced ready-made food maintainer/regenerator designed to manage the correct temperature while consuming little energy, remaining light and manageable, as well as being durable while remaining 100% recyclable.

PASSIVE HEAT STORAGE

The SMARTHEATER works as a **thermal equaliser**: when the temperature of the food placed in the POLIBOX® is higher than the temperature of the thermal accumulator (65° C), the excess heat is absorbed.

ACTIVE HEAT STORAGE

By connecting an empty container to the mains, the heat generators raise the temperature of the air in the POLIBOX® in parallel and that of the thermal storage tank until stabilising once reached **65°C**.

HOW DOES IT POSSIBLE?

The SMARTHEATER exploits thermal inertia by behaving like a glider. Charged with energy, the accumulator turns into a real thermal flywheel capable of releasing heat at different speeds and intensities depending on the needs of the moment.

The SMARTHEATER's accumulator immediately releases thermal energy when the temperature of the food placed in the POLIBOX® drops below that of the accumulator itself (65° C).

BUT HOW MUCH DOES IT CONSUME?

Thanks to the thermal flywheel provided by the accumulator, the Smart continues to transfer heat to the food (for an extended period) even after the container has been disconnected from the mains.

Once 65° C is reached, consumption stabilises at around 30 watts.

MULTIPLE LOADER

Isothermal containers can be stacked and connected in series, obtaining a maintainer trolley powered by a single socket.

**The solution for transporting
of large volumes of food
at a controlled temperature
in mass catering.**



NOVITÀ

THE ANSWER TO CUSTOMERS OF MASS CATERING!

Diners increasingly question the temperature of the food that arrives on the table, but this is not the only problem: one must ensure that one can be able to appreciate the organoleptic properties and the degree of cooking of the food served.

The kitchen staff strive every day to ensure that all this happen, but they struggle with the tools they have at their disposal and very times, they race against time.

All this causes stress for the operators, and results in a level of service that does not satisfy the customer.



A gap between promises made and reality that is easy to reduce by adopting the right equipment. It is not impossible to solve these issues: you just have to be ready for change; just rely on an innovative system such as



SWITCH IT ON 1 HOUR BEFORE USE!

Simply plug it in (220 V) and the SMARTHEATER stabilises at $+65^{\circ}\text{C}$ by self-regulating the heat emission and consuming between 20/40 kWh.



HAVE YOU UNDERSTOOD WHY IT MAY BE THE SOLUTION TO YOUR CONTINUING PROBLEMS?

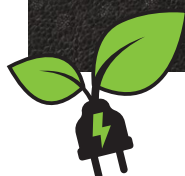
The kitchen staff work with commitment and professionalism but, because of the last mile, the transport, the result perceived by the customer is not not up to expectations. SMARTHEATER becomes the key weapon for a company that wants to grow and have satisfied customers, thanks to its convenience and versatility.



AND THE ENVIRONMENT?

SMARTHEATER is made of EPP, remaining 100% recyclable.

The food arrives at its destination still hot, ready to be consumed as if freshly prepared, ensuring a better culinary experience for customers. The use of a SMARTHEATER isothermal container system can also help reduce food waste, as meals stay hot for longer and are therefore less likely to become unusable, helping to improve environmental sustainability in catering and reduce operating costs.



It consumes less than a light bulb!

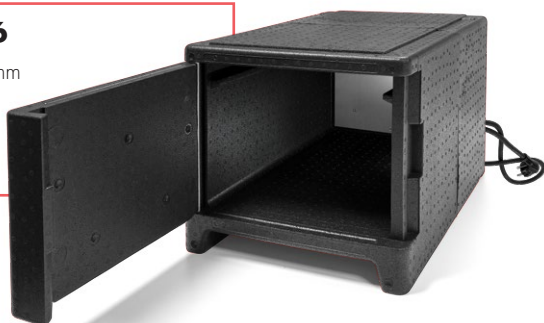
THE SMARTHEATER® RANGE

Porter MINI

Cod. **120866**

605x406x376 mm

Ideal for
Gastronom
1/1

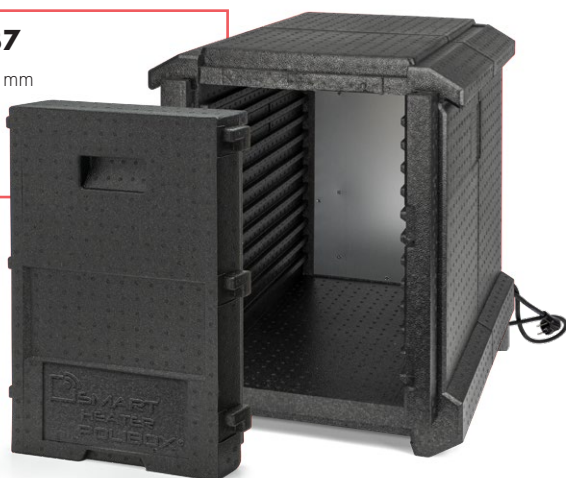


Porter GN

Cod. **120137**

650x500x610 mm

Ideal for
Gastronom
1/1



Porter MAXI

Cod. **124808**

720x600x630 mm

Ideal for pans
60x40 cm



TROLLEYS CARRY

for Porter MINI

Cod. **124894**

650 x 435 mm



for Porter GN

Cod. **115839**

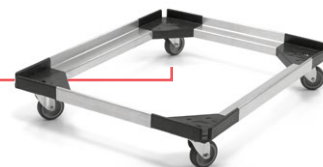
680 x 520 mm



for Porter MAXI

Cod. **115841**

750 x 610 mm



MULTISPINE CABLE

for Porter MINI

Cod. **124879**

Column of 4 containers
Porter Mini stacked

for Porter GN e MAXI

Cod. **124880**

Column of
3 containers
Porter GN o
Porter MAXI
stacked



THE FRESH-HOT SYSTEM AND THE SECOND PRINCIPLE OF THERMODYNAMICS IN COLLECTIVE CATERING

PURPOSE OF SCIENTIFIC STUDY

The purpose of this study was to assess at the preliminary stage how new technologies can support the supply chain and production processes.

Taking advantage of the physical principles of the **second principle of thermodynamics**, it uses accumulators as thermal flywheels, releasing heat at different intensity and speeds, only when the temperature inside the container drops below 65 °C.

Production systems, in particular the warm cool applied in high-production cooking centres while inserted into a correct spatial design, are affected by temperature time flows characterized by inadequate moments not sufficiently projected during which critical points can be evidenced.

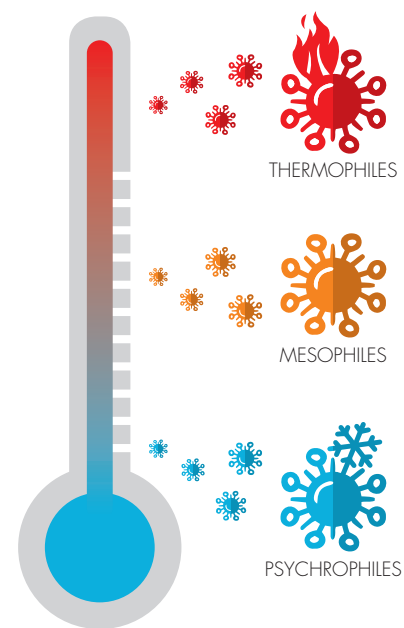
Restaurant operators are exposed to a number of disadvantages which result in poor quality production performance and potential areas of microbiological risk due to a lack of knowledge of physical principles, such as the **second principle of thermodynamics**.

RESULTS HAVE SHOWN THAT:

Smart Heater is an excellent temperature maintainer that provides consistent thermal stability and yield at 65°C, consistent with current regulations.

Low electricity consumption with **economic** benefits and environmental sustainability.

Sustainability, given that expanded polypropylene, due to its intrinsic characteristics and ability in ensuring high performance in terms of thermal insulation and shock protection, is also recyclable.



CONCLUSION

Innovative new technologies offer performance consistent with health and sensory safety criteria, thereby offering end-users higher quality foods.

It should be borne in mind, however, that the design of the flows must acknowledge the specific production reality in addition to the technical characteristics of the equipment in use and temperature time parameters associated with the physical principles that govern the thermal balance.

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