



minigarden

minigarden® by Quizcamp, SA, Portugal



## Mini-garden Green Wall system

### The Birth Of “mini garden”

Mini garden is a trademark of “Quizcamp SA” from Portugal,

Starting from “Urban Green Revolution”, Quizcamp involves plants growing, efficiency, sustainability and green proximity for urban greening solution in Europe.

After several years of intensive research, prototype production, experimental tests and lots of field tests with plants, as well as having in mind that costumers being sometimes quite conservative regarding innovative systems, it was taken the decision to collaborate with the national university in polymer lab.

The goal was, specify its physical properties, from raw material to its structural details. The new piece was finally designed and ready for mass production. This new model, known as Minigarden®, which is its trade mark, was also protected under industrial design model worldwide.



mini garden, make your plants growing longer and healthier, thus lower your total cost of green wall investment.



Modular design, large space for roots growing, thus reduce the maintenance cost of plants changing.

### Advantages of “mini garden”?

With a good independent drainage and irrigation system, easy to fertilize, plants achieve significant grow and massive production

A modular system that provide to plants the best conditions to grow in a vertical solution, it provides an excellent growing medium, it permits to provide the precise amount of water, nutrients, drainage and air.

Minigarden is either freestanding or wall mounting, self-draining and can be installed inside or outside. Its modularity permits to design and install vertical gardens very easily, leaving full room for creativity.



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### Think clever irrigations and drainage systems

For large scale settings we developed an unique watering systems for the Minigarden™, consisting in a drip irrigation pipe (Ø 6,6mm) or a porous micro tube (Ø 9mm), both applied inside the module. Extremely easy to install an “Fertigation” system or semi-hydroponic.

Designed with an innovative gravitational drainage mechanism. This feature ensures that eventual irrigation excess be drained to the tray at the unit base. This system is very important to ensure the planting sustainability in the long run.



Independence drainage system, drain water will be blocked by dividers and directly pass to the bottom tray. It protects the plants to minimize the risk of infection.



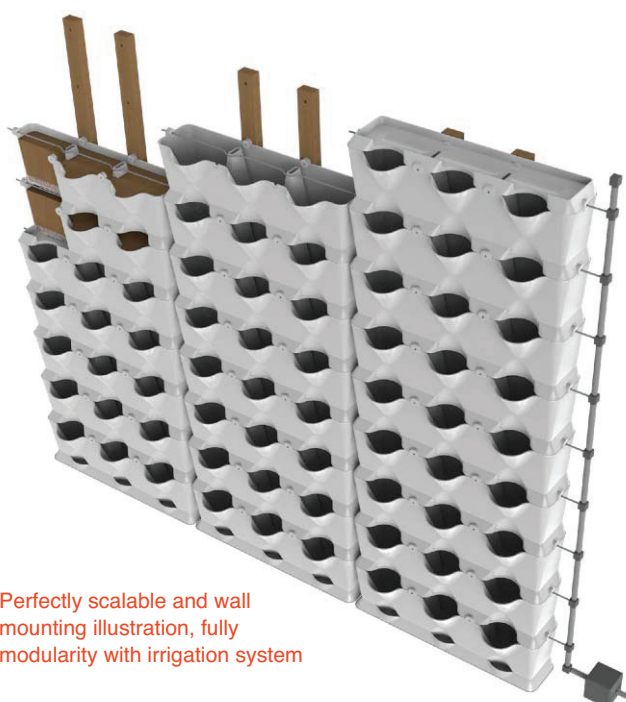
Easy to install with irrigation system

### “mini-garden”, ideal for green wall installation

Perfectly scalable Minigarden, soon the market start to realize that the modularity, the good conditions for plant grow and the smart irrigation system make of

Minigarden a very effective system for green walls both outdoor and indoor.

The extremely easy to install irrigation system and the very low exigencies in watering due to a extraordinary efficiency in use of water, make of Minigarden the perfect solution no matter, if there is or not, lot of water, it can be used in situations where availability of water is difficult.



Perfectly scalable and wall mounting illustration, fully modularity with irrigation system





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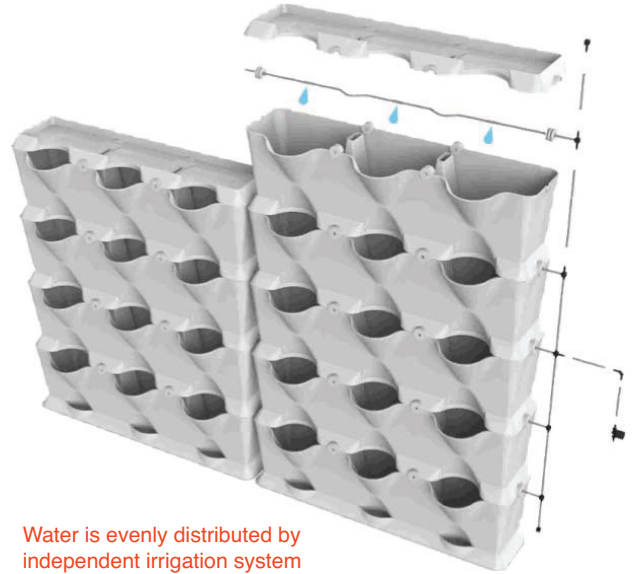
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## Why “mini garden”?

Despite most of existing “green walls” appear to be primarily motivated by art and aesthetics and its visual impact, we do believe there are also strong environmental, ecological benefits when considering the installation Minigarden® green walls.

Minigarden® green wall provides multiple solutions when dealing with the vertical space in urban environments, no matter if we talk about indoor or outdoor spaces.



Water is evenly distributed by independent irrigation system

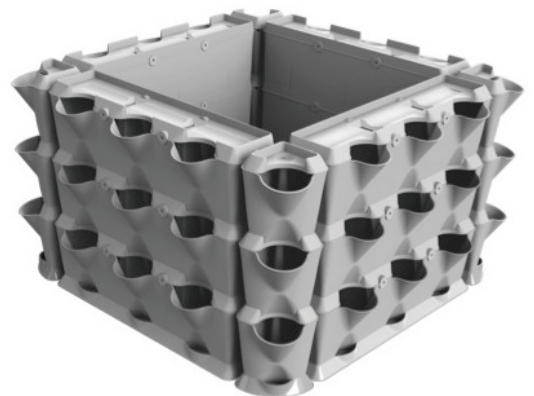


Easy wall mounting by wood post or metal profile

No other solution is as easy to install as Minigarden, extremely easy to be scalable both in height and length.

Very effective, Minigarden develop concern was also about maximize water efficiency and energy savings. No other system make such efficient use of water, there is no need for excess of water (most of plants don't like it).

No other system permits the use of extremely distinct plants in water exigency, in the same wall, with Minigarden it is possible to have desert plants and tropical plants, irrigation is independent.





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## Main Features

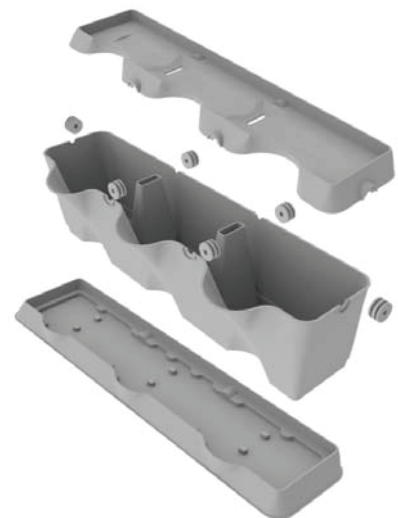
- Made of high resistance PP copolymer, including very high UV protection additives, in order to be used in extreme weather conditions in terms of solar radiation and temperature (10 year life cycle exposed to temperatures between -20°C and + 40°C)
- This PP copolymer respects the full standards of International Safety Food Code
- Long term sustainable green wall – low rate of dead plants
- With innovative and patented drainage system, allow micro-pipe dripping watering system
- Easy to install – do not need skilled hand labor
- Very low installation cost – do not require long time preparation and plantation;
- Minigarden Green walls can permit air flow between it and the walls, avoiding moisture infiltration
- Low weight – only 65 kg per square meter of installed green wall
- Each module is an very resistant piece that can stand more than a 200 kg distributed vertical weight (the value of the deformation pressure is above 10 MPa at points of greater fragility)
- Extremely easy to assemble irrigation and fertilizing system, it can work in perfect conditions with pressure as low as 0.1 MPa.
- Modules can be reused and at the end of its life span, fully recyclable.



## Technical Information

The mini garden is owned by 'Quizcamp SA' portuguese company, it is protected by a world-wide patent via PCT (Patent Cooperation Treaty) which was allocated the number PCT/PT2006/000003 and also by design/model registries.

**Product contains 'Module', 'Divider' and 'Clips'**  
**Dimensions: 640 x 140 x 190 mm (W x D x H) for full module with tray**  
**Maximum Capacity: 12 L per module**  
**Weight: 1.01Kg**  
**Material: Polypropylene Moplen ref. EP548S (Test Report Attached) with UV: 40559-A UV PP MB (Test Report Attached) ; 100% recycle**  
**Finishing: Matt, Grain MT-11007**  
**Color: White, Black, Green**



white



black



green





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## UV Test report on 45009-A

16-10-2007 11:00

DE-POLIVERSAL SA

+351263470000

P-218 P.002/002 DE922



## PRODUCT INFORMATION

AMPACET EUROPS S.A.  
Rue d'Ampacet, 1  
B-6780 MESSANCY-BELGIUM

Tel : + 32/ 63-38.13.00  
Fax : + 32/ 63-38.13.92

**40559-A**  
**UV PP MB**

### 1.0. PHYSICAL PROPERTIES

#### 1.1. CARRIER RESIN :

- Type : PP Homopolymer

#### 1.2. MASTERBATCH

- Spec. gravity (g/cm<sup>3</sup>) : 0.92  
- Additive (%) : 20 (nominal) MDE-02  
- Melt index (g/10 min) : 40 (nominal)  
ASTMD 1238 (230°C;2.16kg)  
- Bulk density (g/l) : 500 (nominal) MDE-66

### 2.0. STORAGE

It is recommended to use this masterbatch within a 12 months period.  
It should not be stored outside.

### 3.0. APPLICATION

This product has been developed for polypropylene fibers, films and tapes. Use level of this product depends on various factors, such as exposure time and climatic conditions.

Issued : March, 1998  
Revised : March, 2002

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2002

ENRIL-NO

16/10 2007 11:40 FAX 351 244 574801



## Product Data and Technical Information

<b>Name</b>	Moplen
<b>Grade</b>	EP548S
<b>Resin type</b>	Polypropylene, Impact Copolymer
<b>Description</b>	<i>Moplen</i> EP548S is a nucleated heterophasic copolymer with antistatic agent used for injection moulding applications. It exhibits an outstanding balance of mechanical properties combined with a medium high fluidity. <i>Moplen</i> EP548S is extensively used in housewares and in thin-walled containers for food packaging (e.g. margarine tubs, yoghurt pots, etc.). <i>Moplen</i> EP548S is suitable for food contact.
<b>Availability</b>	Europe, Africa-Middle East
<b>Technical data</b>	
<b>Density</b>	0.9 g/cm <sup>3</sup>
<b>Melt flow rate (MFR)</b>	44 g/10 min (230°C/2.16kg)
<b>Melt volume flow rate</b>	59 cm <sup>3</sup> /10min (230°C/2.16kg)
<b>Tensile Modulus</b>	1550 MPa
<b>Tensile Stress at Yield</b>	28 MPa
<b>Tensile Strain at Break</b>	30 %
<b>Tensile Strain at Yield</b>	5 %
<b>Charpy unnotched impact strength</b>	85 kJ/m <sup>2</sup> (-20 °C)
<b>Charpy unnotched impact strength</b>	100 kJ/m <sup>2</sup> (0 °C)
<b>Charpy unnotched impact strength</b>	110 kJ/m <sup>2</sup> (23 °C)
<b>Charpy notched impact strength</b>	3.0 kJ/m <sup>2</sup> (-20 °C)
<b>Charpy notched impact strength</b>	3.5 kJ/m <sup>2</sup> (0 °C)
<b>Charpy notched impact strength</b>	5.0 kJ/m <sup>2</sup> (23 °C)
<b>Heat deflection temperature B (0.45 MPa) Unannealed</b>	95 °C
<b>Ball indentation hardness</b>	68 MPa (H 358/30)
<b>Ductile/Brittle transition temperature</b>	-53 °C
<b>Vicat softening temperature A/50</b>	151 °C
<b>Vicat softening temperature B/50</b>	80 °C
<b>Product Data Sheets</b>	 ISO Data Sheet  RAPIDS
<b>MSDS</b> (Material Safety Data Sheet)	European  Moplen EP548S



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### Mini-garden Corner

Mini-garden 'Corner' is a follow-up product on the original mini-garden, i.e. Vertical.

It is ideal for building green wall with inner or outer corner, not only allows to close the ends and create 90° connections in the mini-garden vertical. It also has countless uses as a standalone product.



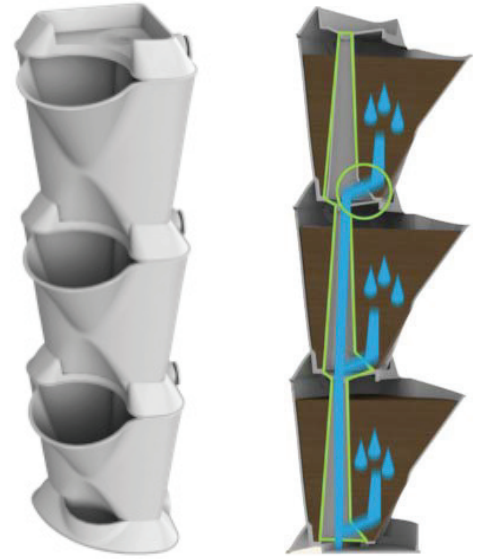
Each module of the 'Corner' system comprise only 4 easily mounted parts, such as lid, clips and module itself.

Irrigation, materials and all features is the same as the 'Vertical'.

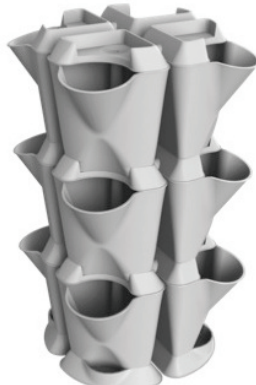
Dimension: 140 x 140 x 190 mm (W x D x H)

Maximum Capacity: 1.6 L

Weight: 0.25 kg



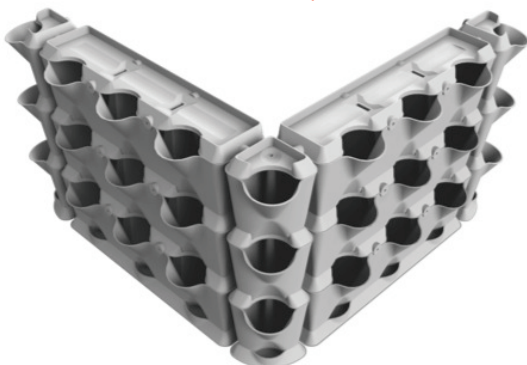
Independent drainage system



2 x 2 or 4 x 4 to form a plants column



Corner can be installed in both end



Outer or Inner Corner is possible



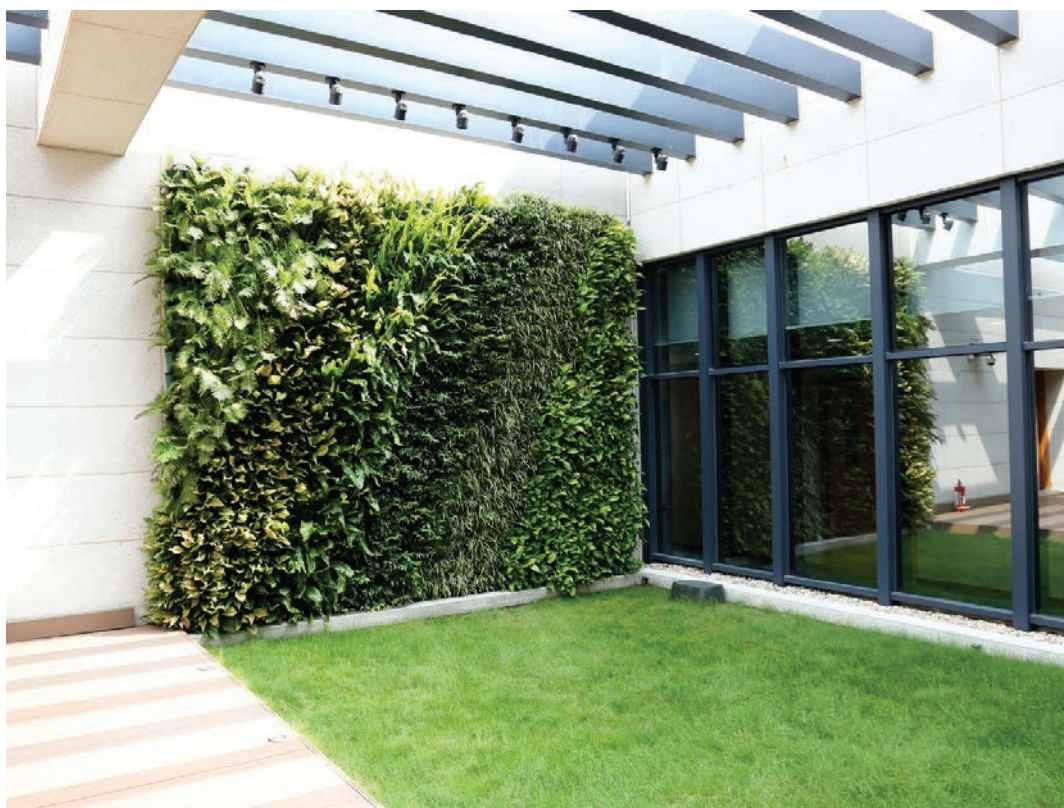
Full 'Corner' to form a green wall



## Project Reference in Macau



Escola Primária Luso-Chinesa da Flora / 二龍喉中葡小學, 2015



Universidade de Macau / 澳門大學 / University of Macau, 2014



Project reference in Hong Kong



The Peak Galleria, completed in 2010



The Peak, Mount Kellett Road completed in 2011





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The Peak, Mount Kellett Road Completed in 2011



Shatin Park Completed in 2011



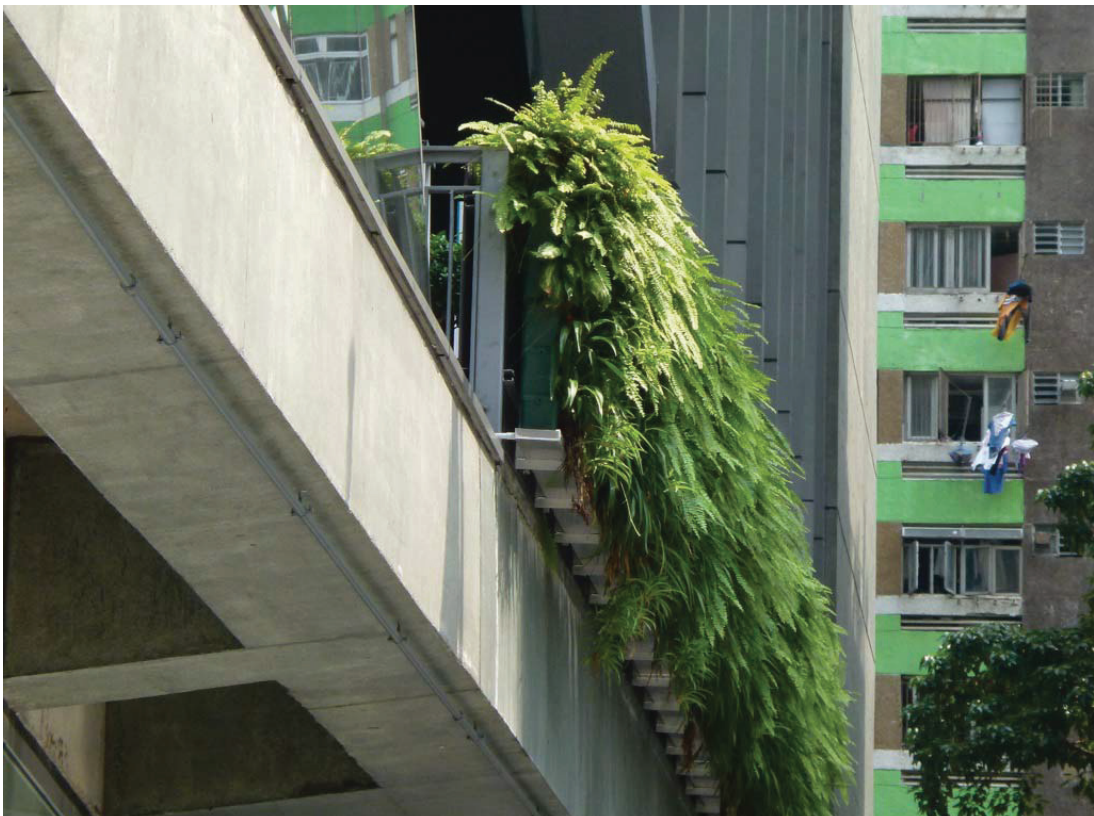


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Youth Square, Chai Wan Completed in 2012



Youth Square, Chai Wan Completed in 2012



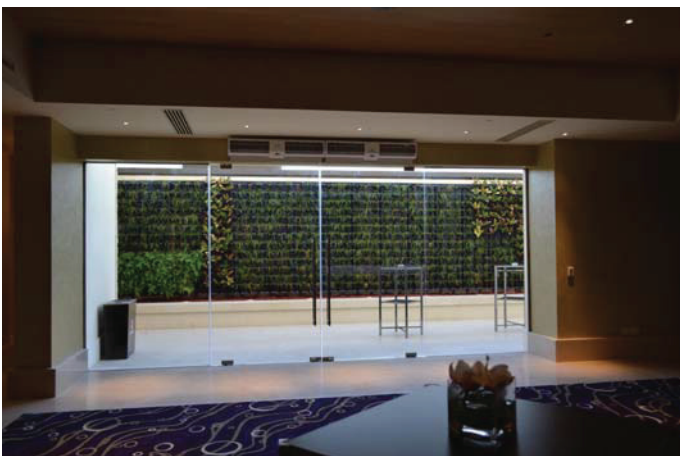


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## Green Wall by mini garden system in Westin Hotel Abu Dhabi Completed in 2010







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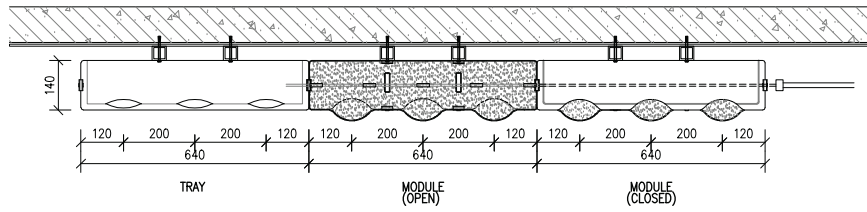
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## Green Wall system by mini-garden in Europe Completed in 2011



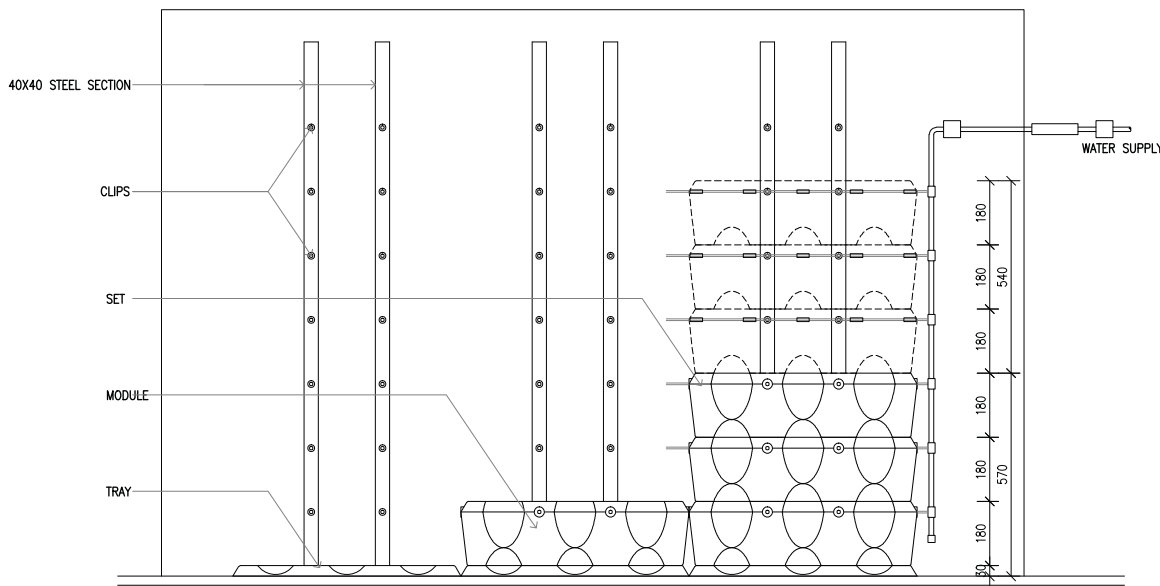




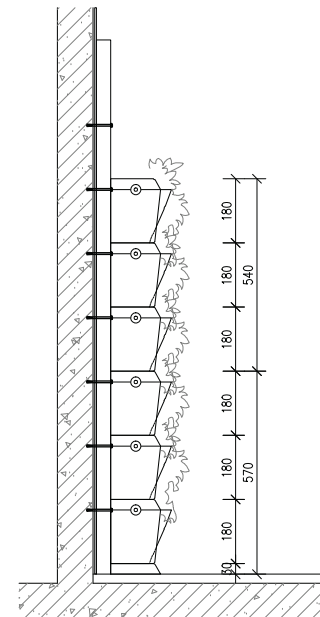
**ECOAMIGO**  
Vida Verde



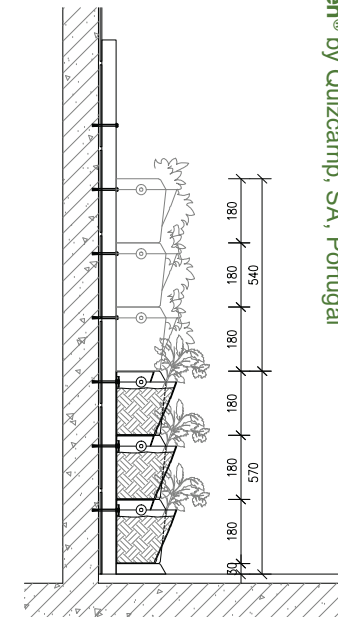
**A** PLAN  
SCALE 1:15



**A** ELEVATION  
SCALE 1:15



**A** ELEVATION  
SCALE 1:15



**A** SECTION  
SCALE 1:15

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MINI-GARDEN PLANTER SYSTEM



## Regulatory Affairs Product Information Data Sheet (RAPIDS)

### Moplen EP548S

#### • FOOD APPROVALS

EU (A; B; DK; SF; F; D; GR; IRL; I; L; N; P; E; S; CH; UK; NL; Czech Republic)

For all types of food.

Compliance as above refers to Directive 2002/72 and to National Regulations for the additives not yet listed in Directive 2002/72

There is a SML established for an additive.

There is a processing aid for which a SML is established. The SML will not be exceeded even with a 100% migration for a container up to 0,25 mm thick

The final item producer is responsible for evaluation of global migration at the real time/temperature conditions.

#### United States of America

The base resin in **Moplen EP548S** meets the FDA (Food and Drug Administration) requirements contained in the Code of Federal Regulations in 21 CFR 177.1520 (a) (3) (i) and (c). According to information received from all of our suppliers, all other ingredients used in **Moplen EP548S** meet the requirements of their respective FDA regulations and 21 CFR 177.1520 (b). **Moplen EP548S** meets the FDA criteria in 21 CFR 177.1520 for food contact applications, listed under conditions of use C through G in 21 CFR 176.170 (c), Table 2. **Moplen EP548S** can be used in contact with food of types II, III, IV, V, VII-A, IX as listed in 21 CFR 176.170 (c), Table 1.

#### • Chemical Inventories

All ingredients in **Moplen EP548S** are in compliance with the following chemical inventories:

<http://pwebdb.basell.com/P&R/rapidssearch/rapidsview.asp?url=RAPIDS%20-%20EP548...> 7/16/03

United States: Toxic Substances Control Act Inventory (TSCA)

Canada: Domestic Substances List (DSL) – Non Domestic Substances List (NSDL)

Europe: European Inventory of Existing Commercial Chemical Substances (EINECS)

European List of Notified Chemical Substances (ELINCS)

Australia: Australian Inventory of Chemical Substances (AICS)

Korea: Korean Existing Chemicals List (ECL)

Philippines: Philippine Inventory of Chemicals and Chemical Substances (PICCS)

**Moplen EP548S** has no special requirements under US TSCA (e.g. consent orders, test rules, 12 (b) requirements, etc.).

- European Pharmacopoeia (EP)

**Moplen EP548S** cannot be certified for E.P.

- Toys (CEN Standard EN71.3)

**Moplen EP548S** is in compliance with CEN Standard EN71.3.

- Ozone Depleting Substances

Ozone Depleting Substances are not used in the manufacture of or the formulation of **Moplen EP548S**.

- OESTROGEN MIMICS

Substances actually identified as oestrogen mimics are not used in the manufacture of or the formulation of **Moplen EP548S**.

- Phthalates in toys

The phthalates ex art.1 of Decision 1999/815/EC are not used in the manufacture of or the formulation of **Moplen EP548S**.

- Phthalates in polymers and rubbers

The phthalates as for Decree of Italian Ministry of Health n°538 of 17/12/1999 are not used in the manufacture of or the formulation of **Moplen EP548S**.



- Latex

"Natural rubber latex", "synthetic latex" or "natural rubber" are not used in the manufacture of or the formulation of

*Moplen EP548S*.

- Drug Master File (DMF)

The product *Moplen EP548S* is not listed in our DMF.

- US Pharmacopeia (USP)

*Moplen EP548S* cannot be certified for USP.

- Heavy metals (Directive 94/62 EEC)

CADMIUM, CHROMIUM (VI), MERCURY, LEAD are not intentionally added to our grade *Moplen EP548S* and the incidental sum of the concentration in this product does not exceed 100 parts per million by weight.

*Moplen EP548S* can be recycled according to Directive 94/62 requirements.

- Coalition of Northeastern Governors (CONEG)

Cadmium, chromium, lead and mercury are not used in the manufacture of or the formulation of *Moplen EP548S*, therefore it meets the CONEG requirements of less than 100 ppm for total incidental cadmium, chromium, lead and mercury.

- SWITZERLAND "VOC-LENKUNGSABGABE"

*Moplen EP548S* contains less than 3% VOC's of the Substances in the positive lists of the above Regulations.

- AROMATIC AMINES

"AROMATIC AMINES" are not used in the manufacture of or the formulation of *Moplen EP548S*.

- ASBESTOS

ASBESTOS is not used in the manufacture of or the formulation of *Moplen EP548S*.

- PCB's/ PCT's

"PCB's" / "PCT's" are not used in the manufacture of or the formulation of *Moplen EP548S*.

- **KOSHER**

**Moplen EP548S** cannot be certified under KOSHER rules.

- **Tin compounds**

"Tin compounds" are not used in the manufacture of or the formulation of **Moplen EP548S**.

- **Composting** (Ref: CEN Standard prEN 13432)

This raw material is not suitable for composting.

- **Energy Recovery** (Ref: CEN Standard prEN 13431)

The calorific gain from this raw material in an energy recovery process is 24MJ/Kg.

Ultimately customers must make their own determination that their use of our product is safe, lawful (except as provided in the above certifications) and technically suitable in their intended applications. Because of possible changes in the law and in regulations, we recommend that customers continuing to use our product verify status every six months from this date.

Certified for Basell by:

---

Patrizia Busi – Regulatory Affairs Manager

[ph: 0039-0532-468653; e-mail: [patrizia.busi@basell.com](mailto:patrizia.busi@basell.com)]

(update : 01 / 04 / 2003 - **This certificate shall continue in effect for 6 months from its effective date**)

Printed from an electronic system. Valid without signature



## Moplen EP548S

### Polypropylene, Impact Copolymer

#### Product Description

"Moplen" EP548S is a nucleated heterophasic copolymer, suitable for injection moulding applications, and contains an anti-static agent. It exhibits an outstanding balance of mechanical properties combined with a medium high fluidity.

"Moplen" EP548S is extensively used in housewares and in thin-walled containers for food packaging (e.g. margarine tubs, yoghurt pots, etc.).

"Moplen" EP548S is suitable for food contact.

#### Product Characteristics

<b>Status</b>	Commercial: Active
<b>Test Method used</b>	ISO
<b>Availability</b>	Europe, Africa-Middle East
<b>Processing Method</b>	Injection Moulding
<b>Features</b>	Antistatic, Copolymer, Impact, Flow, High, Food Contact Acceptable, Nucleated
<b>Typical Customer Applications</b>	Containers, Sports, Leisure and Toys, Housewares, TWIM Food Containers

Typical Properties	Method	Value	Unit
<b>Physical</b>			
Density	ISO 1183	0.905	g/cm <sup>3</sup>
Melt flow rate (MFR) (230°C/2.16Kg)	ISO 1133	44	g/10 min
Melt volume flow rate (230°C/2.16Kg)	ISO 1133	59	cm <sup>3</sup> /10min
<b>Mechanical</b>			
Tensile Modulus	ISO 527-1, -2	1550	MPa
Tensile Stress at Yield	ISO 527-1, -2	28	MPa
Tensile Strain at Break	ISO 527-1, -2	30	%
Tensile Strain at Yield	ISO 527-1, -2	5	%
<b>Impact</b>			
Charpy unnotched impact strength	ISO 179		
(23 °C, Type 1, Edgewise)		110	kJ/m <sup>2</sup>
(0 °C, Type 1, Edgewise)		100	kJ/m <sup>2</sup>
(-20 °C, Type 1, Edgewise)		85	kJ/m <sup>2</sup>
Charpy notched impact strength	ISO 179		
(23 °C, Type 1, Edgewise, Notch A)		5.0	kJ/m <sup>2</sup>
(0 °C, Type 1, Edgewise, Notch A)		3.5	kJ/m <sup>2</sup>
(-20 °C, Type 1, Edgewise, Notch A)		3.0	kJ/m <sup>2</sup>
Ductile/Brittle transition temperature	ISO 6603-2	-53	°C



#### Hardness

Ball indentation hardness (H 358/30)	ISO 2039-1	68	MPa
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#### Thermal

Heat deflection temperature B (0.45 MPa) Unannealed	ISO 75B-1, -2	95	°C
Vicat softening temperature	ISO 306		
(B50 (50°C/h 50N))		80	°C
(A50 (50°C/h 10N))		151	°C

#### Notes

Typical properties; not to be construed as specifications.

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For the contact details of the Basell company selling this product in your country, please visit the Basell website at [www.basell.com](http://www.basell.com).

Before using a Basell product, customers and other users should make their own independent determination that the product is suitable for the intended use. They should also ensure that they can use the Basell product safely and legally. (Material Safety Data Sheets are available from Basell at [www.basell.com](http://www.basell.com).) This document does not constitute a warranty, express or implied, including a warranty of merchantability or fitness for a particular purpose. No one is authorized to make such warranties or assume any liabilities on behalf of Basell except in a writing signed by an authorized Basell employee. Unless otherwise agreed in writing, the exclusive remedy for all claims is replacement of the product or refund of the purchase price at Basell's option, and in no event shall Basell be liable for special, consequential, incidental, punitive, or exemplary damages.

*Adflex, Adstif, Adsyl, Avant, Catalloy, Clyrell, Hifax, Higran, Histif, Hostacom, Hostalen, Hostalen PP, Hostalen ACP, Lucalen, Luflexen, Lupolen, Lupolex, Lupotech G, Lupotech T, Metocene, Moplen, Pro-fax, Pro-fax Ultra, Purell, Softell, Spherilene, Spheripol, Spherizone and Stretchene* are trademarks owned or used by Basell.

*Adflex, Adstif, Adsyl, Clyrell, Hifax, Hostacom, Hostalen, Lucalen, Luflexen, Lupolen, Lupotech, Moplen* and *Pro-fax* are registered in the U.S. Patent and trademark office.

Unless specifically indicated, the grades mentioned are not suitable for applications in the pharmaceutical/medical sector

Release Date: 31 Jan 2006



TVA : BE04284777  
RC ARLON 18681

**Ampacet Belgium Sprl**  
Rue d' Ampacet, 1  
6780 Messancy  
BELGIUM

Phone Number (32) 063.38.13.00  
Fax Number (32) 063.38.13.93

Date 15/07/2008

POLIVERSAL  
E.N. 366 - KM 21,7  
AZAMBUJA  
PT Fax 35.11.313.83.09  
ANTONIO MARTINS

Product Number : 40559-A UV PP MB  
Job Number : 528263  
Production Date : 23/04/2008  
Your Order Number : n. PO08-037 04/07/08  
Our Order Number : 258320 SO

**CERTIFICATE OF ANALYSIS**

Data from our quality control tests relating to this product are as follows :

Tests	Description	Method	Result Min	Test Value	Result Max	U/M
0001	MELT INDEX	MDE-15 (230/2.16)	36.00	37.00	37.00	G10
0009	MOISTURE (KARL-FISCHER)	MDE-09	.02	.02	.02	%
0010	VOLATILES	MDE-07	.05	.05	.05	%
0012	PELLETS PER GRAM	MDE-17	50	55	60	%
0014-A	ADDITIVE CONTENT BY IR	MDE-40	18.00	19.60	20.50	%
0020	BULK DENSITY	MDE-66	520	520	520	G/L
0035	GRANULE ASPECT	O	K	OK	OK	
0075	CONTAMINATION	O	O	O	O	

*Antuv*  
*Quant: 200kg*  
*De 12 Entregas: 07/10/2008*  
*Poliverso*

These values have been taken from measurements of statistically representative samples for the product sequence noted above. The materials detailed hereabove are certified as conforming with the product specifications. This certificate was generated electronically, and in accordance with our ISO 9001 procedures it does not require a signature.