

# CUPOLEX (SDS) AUSTRALIA

## Carbon Footprint Information





# Carbon Footprint information and comparison

This booklet provides a comparison between the carbon footprint of two products Cupolex Domes and waffle pods in slab construction. **Firstly** it analyses the raw materials used and the manufacturing of Cupolex Domes and waffle pods in the Sydney area.

**Secondly** it explores the distribution from these manufacturing plants in Sydney to a hypothetical domestic construction project within a 100km radius. In calculating the estimations the concrete batching plant would be 20kms from the site. The building project would be based on the average 200square metre domestic building using 300mm pods or 350 Domes.

**The analysis is divided into 5 areas:**

1. Raw material used to obtain each product
2. Manufacturing process of each product
3. Transport from manufacturing plant to site
4. Waste
5. Concrete delivery

The total of each comparison area is measured in diesel litres and these are combined to determine the final carbon footprint comparison. The total of each comparison area is measured in diesel litres and these are combined to determine the final carbon footprint comparison.

## 1. Raw material used to obtain each product

Waffle Pods—EPS begin from a derivative of ethylene and benzene with 2.2kgs of raw material used per 300mm pod.

For this analysis we have estimated that 1 litre of petroleum base product (diesel) has been used to produce 2.2kilograms of raw EPS product. With 135 waffle pods per house x 1 litre of diesel.

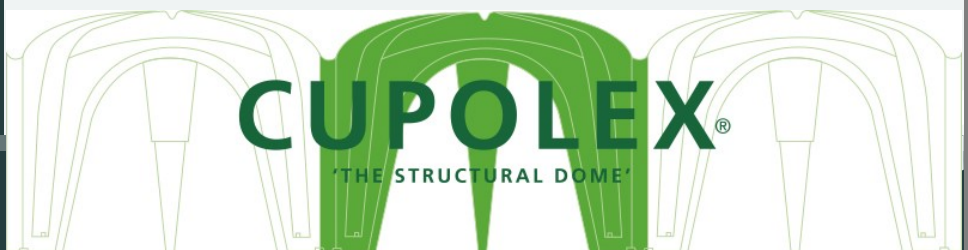
**Diesel volume per waffle pod slab construction / House**  
= 135 Litres

**Cupolex Domes** are manufactured from 100% recycled car batteries here is no petroleum based products used in obtaining their raw material.

**Diesel volume per Cupolex Dome slab construction / house**  
= 0 Litres

This analysis does not measure the volume of diesel required to deliver the raw material from overseas manufacturers to the pod or Cupolex manufacturers in Sydney.

- Raw materials - Pods and Domes
- Manufacturing Process
- Transport to site
- Waste
- Concrete delivery
- Conclusion



Cupolex Dome slabs for 17 homes on 1 truck

## WEB SOLUTIONS

Cupolex delivered to site with Reo steel



## 2. Manufacturing process of each product

Energy used to manufacture both products is similar in electricity consumption for both the moulding process and the heating and cooling of water during the moulding process. Water consumption volumes will be equal.

Steam is required in the Styrene (EPS) process to expand the raw material to 40 times its raw material size.

Cooling water is required in the moulding process for Cupolex products. Cool water is circulated around the Injection mould so the product can be released from the mould.

As both Waffle pod and Cupolex Domes use similar electricity volumes 20 litres of diesel per house has been accounted for.

**(0.5ltrs of diesel per 3.5klwats of power)**

## 3. Transport from manufacturing plant to site

In this hypothetical 135 x 300mm Waffle pods are delivered directly to the site from the manufacturer by semi trailer truck or a 6 tonne truck with trailer,.

This means an extra delivery is required to site as the reinforcing steel and accessories will be delivered on another 6 tonne truck.

A 6 tonne truck with trailer requires 30 litres of diesel per 100kms  
= **30 litres per house**

Cupolex Products are delivered to the reinforcing reseller by Semi Trailer (Truck) (17.6 houses per semi truck) at a distance of 30kms ( 100 litres per 100kms) **17 litres per house delivered to the Reseller /Distributor.**

**The delivery to site from the reseller/distributor—0 litres as Cupolex products would be delivered with the reinforcing steel.**

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On site waste to be returned



## 4. Waste

Each Waffle Pod slab has after construction establishment process, on average, two large full scrap bags to be returned to the original manufacturing plant for recycling. There is an additional cost for the collection of this waste by a utility or small truck

Diesel usage on a vehicle—approx. 10 litres per house **10 Litres**

**Cupolex Domes / Products —no waste or scrap returns 0 Litres**

No allowance has been made for Waffle Pod damage due to storms, vandalism or accidental fire on sites

## 5. Concrete

Concrete volumes for this analysis are averaged across all site classes “S” - “E” , using 25mpa concrete.

**Across Australia, Cupolex slabs use on average 5-8% less concrete.**

200sq mtr Waffle Pod slab—300mm pods—100mm topping + wastage = 44.2 Cubs

200sq mtr Cupolex slab—350 dome—60mm topping + wastage = 39.6 cubs.

Based on a concrete truck holding 6 cub mtrs of concrete and averaging 2.2kms per litre of diesel, traveling 20kms to site from the batching plant, the diesel consumption for each slab would be the following:

Waffle pod slab total = 7.3 truck trips advance to 8 trips x 9.09 litres per house = **72.72litres**

**Cupolex slab total = 6.6 truck trips advance to 7 x 9.08 litres per house = 63.63litres**

For this analysis the measure does not take into account the diesel to supply the raw material to the batching plant, nor the return trips from the site delivery.

Reduce your concrete volumes



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**Conclusion:** From the table it is demonstrated that a Waffle Pod slab requires an extra 182.39 litres of petroleum base fuel( diesel) to manufacture from raw material , deliver to site, deal with waste, and deliver concrete to complete a domestic slab, compared to the diesel usage of a Cupolex slab. **In the Australian Standards (1 litre of Diesel = 2.7kg CO2 gas.)** From the information shown in this analysis the following can be concluded:

**1 completed Waffle Pod slab within a radius of 100kms from the centre of Sydney is admitting an extra 492.45kg of CO2 into the atmosphere more than a completed Cupolex Dome slab.**

We understand this is a limited analysis it does not measure power or water or any of the process that Australian Urethane and Styrene PTY has no control over. The comparisons offer AUS (Cupolex Australia) opportunities to improve our carbon foot print in the supply chain.

### Diesel Volume Totals

Stage	Waffle Pod	Cupolex
Raw materials	135ltrs	0ltrs
Manufacturing	20ltrs	20ltrs
Transport	30ltrs	1.7ltrs
Waste	10ltrs	0ltrs
Concrete	72.72ltrs	63.63ltrs
<b>Total</b>	<b>267.63 Litres</b>	<b>85.33 Litres</b>

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