# So you need a compost toilet?

**Check us out at: https://www.youtube.com/watch?v=7EteG_TvUBg**

When we started up, we were the only compost toilet that could be located without installing groundworks or other infrastructure, and the only company offering hire in the UK. In the past few years, we've seen a lot more products come on to the market and that can be a bit of a minefield for consumers. Our main advice to those looking at lots of different options is "Is it really a Compost Toilet?" There are some nice looking sheds out there, but any small batch system that requires regular changing and emptying of buckets of raw material could be unpleasant to maintain and a possible health risk, and won't comply with Environment Agency regulations. And if composting doesn't occur in situ, then it's not a 'Compost Toilet'!

We now have over 25 years of experience in constructing and working with compost toilets at all levels, and user comfort and wellbeing is of utmost importance to us. The Thunderbox system is a low maintenance one and we have worked with the Environment Agency to recognise this under their 'low risk provision' section of composting standards. We have supplied many organizations including the National Trust, the Woodland Trust, the Crown Estate and the Forestry Commission as well as allotment associations, campsites, forest schools, churches and private estates. We also have a hire fleet supplying events such as Glastonbury Festival, so we know they really work! There has been a growing interest in the forest school and allotment market and we have assisted a number of sites of varying sizes with Thunderbox toilet provision. All seem more than satisfied, with many repeat orders, but more importantly their customers are very happy to be using a Thunderbox!

All Thunderboxes incorporate urine separators which are located under the seat. We believe these are fundamental to assisting good composting. You are considering a "compost" toilet after all! The exit point for the urine pipe has various options and we can best advise on this once we know your set up. In general, the urine can be collected in various tanks for future use (fertilising your other compost heaps for instance?) or can be piped away to a soak-a-way point (the least maintenance – up to 10L/day can be diverted without a license from the Environment Agency). We can also supply a male urinal if necessary (included as standard in the All Access Thunderbox).
Unless you would like a wooden roof, our Thunderboxes come with green coroline roofs, although other colours are available – please let us know.

We also supply male urinals to ensure liquids are kept out of the composting tank. These are supplied as standard in our All Access Thunderboxes and can be easily incorporated into our other models, so please consider one of these if you have male users.

All our Thunderboxes come as DIY self assembly kits with all the fixings needed and clear assembly instructions and are along the lines of a large garden shed to install. However, we have an experienced team that can do the installation for you if you prefer. Contact us with your post code if you would like us to provide a quote.

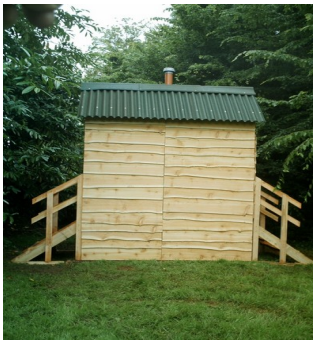
We welcome customers that can come and collect their Thunderbox kit from us. Otherwise we can deliver to anywhere in the UK and Eire. We also give discounts for local projects and multiple orders – talk to us!

## The Single



A single seater for smaller scale operations or remote individual siting. With low volume use and the large capacity over one seat, this option can be almost maintenance free. However, good compost should always be the overall aim, and you'll have to empty it one day!
2.9m x 1.2m x 3m
**£2350**

## The Double



This is our most popular Thunderbox and based on our hire fleet. A back to back unit giving a two cubicle provision over one tank. Male and female separation is possible and extra "seating" helps with the "rush hour!" A unit designed for average to heavy usage.
4.2m x 1.2m x 3m
**£2650**

## The Family



This is probably our most versatile Thunderbox with one large cubicle giving plenty of space for parents to accompany small children or to incorporate a nappy changing station or male urinal, ideal for keeping maintenance as low as possible.
3.2m x 1.2m x 3m
**£2500**

## The Shed Single/Sink Single/Urinal Single



Based on our classic double unit but with either a kitchen sink, storage area or male urinal instead of the second toilet cubicle.
3.2m x 1.2m x 3m
**£2500**

## The All Access



With one cubicle to suit everyone, this all Access Thunderbox is suitable for wheelchair users and comes with a ramp with sliding door to access the cubicle. As with our other Thunderbox models, it uses a urine separator but also comes with a male urinal, solar lighting, hand sanitiser and dispenser, a bucket of sawdust and a toilet roll holder so your Thunderbox is ready to use.
4.5m x 2.7m x 3m
**£4250**

## The Woodsman



Originally built for a friend who lives in a woodland, we have moved away from using an IBC to collect the solid material and instead use a much smaller wheelie bin which can be removed by hand when full. Material will need to remain in the wheelie bin to adhere to Environment Agency guidance and regular turning is needed to achieve optimal conditions for composting. Suitable for situations with really light usage or where using an IBC is completely impractical.

2.1m x 1.2m x 3m

**£2700**

## Site visits

If you would like us to visit and talk through the system and your site requirements with you, we would be happy to do so.

**£150/day + expenses**

## Installation

All our Thunderboxes come as DIY self assembly kits with all fixing and clear assembly instructions but we can also send our team to do the installation if the support is needed.

**POA**

## Tank changes

We can supply full instructions on how to change over the composting tanks once they are full, and would prefer to facilitate clients on how to do this to keep our 'poo miles' down, but could also send the team if you require that extra support.

**£400/day + expenses**

## <u>Additional Thunderbox products</u>:



### Wooden Roof

For a smarter look, making your Thunderbox even more sustainable, these wooden roofs are the answer! Add **£300** for singles/doubles or **£500** for the All Access Thunderbox. Only available for installation by our team.



### Male urinal stand

To ensure that male users aren't adding liquids into the composting tank, the addition of our urinal stand is the answer. With 2 separate urinal stations, it offers an independent facility, easily attached to the side of one of our double Thunderboxes.

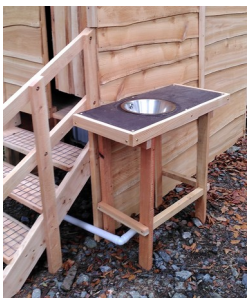
**£1000**



### Male urinal

This waterless urinal with wipe down back board made from recycled plastics is the ideal addition to keep all liquids out of the composting tank. Comes as standard with our All Access Thunderbox.

**£200**



**Hand wash stand**
Incorporate hand wash facilities with this practical stand containing a stainless steel hand basin, space to store a water container and the pipes needed to divert the waste water.
**£300**

**To Go Pack From £200**
For customers wanting a smarter finish and their Thunderbox ready to use. This includes:
additional screens to hide the composting chamber, buckets full of sawdust, loo roll holders and solar lighting sets.

**Extra Tanks**
We can supply additional tanks already adapted for Thunderbox use.
**£100** for standard Thunderboxes, **£300** for All Access Thunderboxes

**Hand Sanitizer £60 for 5L and dispensers £30 each**
For sites without hand washing facilities, we can supply stainless steel soap dispensers with a refreshing professional quality hand sanitizing gel.

**Urine separators**
For those on a small budget or with the materials and expertise to build their own loo, we can provide you with the urine separator needed to ensure you keep the solids from the liquids for composting to occur. These are manufactured by a local company and unlike other models available, come with a guard which prevents the exit from becoming blocked by paper and sawdust. They can be fitted to standard 68mm gutter down pipe and are part of a system that has been tried and tested by thousands! They are also easy to wipe clean.
**£120** including p+p (further postage charges may occur outside mainland UK)

**Extra parts**
In order to keep your Thunderbox looking fresh after several years of use, you may like to replace some of the components or add an extra handrail where you have small children or elderly users. Or maybe you want to construct your own shower or shelter to match the Thunderbox? We can provide individual parts to ensure maximum user satisfaction! **Please ask us for current prices**.

**Maintenance**
Thunderboxes are designed to be easily dis-mantled for servicing the tank and allowing transportability. Go onto www.youtube.com/watch?v=7EteG_TvUBg for more info. Some sites have a low season when it is possible to put the woodwork into dry storage for the more extreme months. This definitely gives extended life and looks, but all Thunderboxes are designed to withstand the worst of it, if they need too! The tanks can be replaced in situ with most of our Thunderboxes, however with double Thunderbox, it is easiest to dismantle the unit. The tank can then be sealed to prevent water from entering but still allowing oxygen flow - fundamental for the composting process to occur, turned and eventually emptied or put back into service. It all depends on the level of usage as to how much deposit you get and how full the tank will become in a given time scale. The beauty of the Thunderbox system compared with other low cost compost toilets is that the compost collection tanks have a capacity of 500-1000L (depending on the model) and in most cases, this will be plenty to avoid regular replacement, along with the unique venting system which allows composting to occur in situ.

## Sustainability

As a family and a company, we have always had a strong environmental ethos, and our Thunderboxes are probably the most sustainable compost toilets on the market. The timber that we use is sourced from sustainably managed woodlands a few miles away from our workshop and is certified organic with the Soil Association. We use durable timber species to avoid having to pressure treat with chemicals. The large capacity tanks are recycled food containers and we use strong recycled plastic board to mount the toilet seats on. This provides an extremely cleanable surface that we feel is essential for toilets that are used by lots of people. We use a strong but light corrugated tar felt for our roofing material but can also provide wooden roofs – ideal for permanent installations and even more sustainable. Our urine separators are especially made for Thunderboxes by a local fabricator and have been tried and tested by thousands, so we know they work! We use standard fittings and fixings that are available from any builders merchant, including the vent pipe to dispel any smells and assist aeration needed for the composting process.
And finally we use a local haulage firm to deliver our Thunderbox kits to avoid driving all over the country ourselves.

## Planning permission

To date we have had no difficulties with Thunderboxes within the Planning system. Thunderboxes are designed and built as moveable units. They are technically temporary structures so allow some freedom! However they could be considered as Operational Development on a site and may need to be incorporated within any application for Change of Use if the site is being developed for use beyond 28 days. We can advise within our limited experiences but strongly suggest you seek sound professional advice on your individual planning issues.

## Ordering a Thunderbox

We operate a simple order/financial system to enable fairness to all and to make sure we meet our deadlines! Unless we have a product in stock, construction usually involves 4-6 week period from order to completion, depending on the time of year and our existing order list. We're a small family business and also run a farm and woodland so bear with us.....we're always busy! We ask for a 50% deposit up-front to confirm your interest and then your order will be placed in our construction queue. At this point we can give you a likely completion date and it enables us to budget resources. We can do this via a pro-forma invoice for the deposit amount so please let us have your address. We receive the bulk of our orders between February and May so if you can order before then, it would help our work schedule and guarantee you prompt delivery. Once the hire season kicks in, we have a lot less time to spend on construction, so there may also be a longer lead in time for orders placed during the summer months. Full payment is required on completion/delivery. We are happy to work with you on your paper trail but detailed paperwork for planning/grant applications may incur additional costs.
We do get a number of enquiries from clients who are seeking funding. We know some of these work out, which is great for all of us! If you do hear of possibilities we'd appreciate any links as these can help others to achieve their goals.

## Vaults vs.Batch

The vault system is a traditional way of building composting toilets. Two brick lined chambers or vaults are built. A double toilet shed is built over the top. Often the vaults are sunk into a slope to reduce the building height. When one chamber is filled, loo 1 is closed off and loo 2 is used. The first filled vault is allowed to compost for a year and then dug out as mature compost. Once vault two is full the loos swop over again.
With the batch system, only one toilet is technically needed and a container beneath the seat is changed. This allows less initial construction energy (and in our case mobility!) but relies on managing the batches.
When thinking about a compost toilet you first need to consider composting. Like most green technology, some convenience may be lost in doing things in a better, more sustainable way. However, no one wants the hair shirt treatment! Things have to be done safely too. No one wants a tummy bug blamed on their toilet facilities and your insurance may not pay out if there is a claim. At Thunderboxes we are proud of the lowest maintenance regime of any compost toilet on the market

without reverting to the vault system. With the large capacity of our tanks and our venting system, composting will occur safely in situ.

The first Thunderbox was showcased at the 2003 Big Green Gathering. Since then we have been refining the art of composting because this is what a compost toilet should do. Small batch composting is labour intensive and means regular handling of "fresh" material which will need moving to additional safe storage somewhere else. Urine separation and venting are essential as if the composting is not good, nor will your toilet be and will smell unpleasant. We have worked long and hard with the Environment Agency to get their approval for our method so you have the reassurance of a safe and pleasant compost toilet. If your user community is very small, a bucket may suffice, but in locations with a wider user base, secure sealable tanks are essential. We have seen lovely looking sheds out there which have unsealed and un-vented bins beneath them, greatly risking cross contamination from flies and rats, as well as smells, so beware!

## IBC's

Intermediate Bulk Container, used by all kinds of industry to move 1000L batches of materials around. They suit us so well as the containers are a standard size, very well constructed (to withhold 1 tonne of liquids if it is accidentally dropped off a forklift!) and for their size very easy to handle and cheap! We're also doing our bit to re-cycle. Generally speaking, if they come from a regular seller of these things they'll be ex-food/cosmetic industry. Technically the industries aren't allowed to sell of containers with dangerous contents, however small….so beware if buying off eBay!

Maintenance is a very important factor when deciding which system is best for you and your customers. The vault system enables relatively simple compost toilet operation. Batch composting means working batches. That means handling. Handling fresh material is never nice and may not be safe. Old material that is still un-composted is even worse. Small batches (less than 250L) must be regularly turned to prevent settlement which inhibits compost break-down and can lead to sticky mess syndrome. Larger volumes seem to sort themselves out better, as "critical mass" is achieved. If a wheelie bin fills in two weeks, that's 14 bins to handle/process/empty/clean and store per year on a six month opening period. The compost is best rested for at least 12 months and preferably 2 years....That's a lot of wheeling...assuming your site is suitable for little wheelie wheels! And you may need a license from the environment Agency for your composting operations.

We use the IBC. Why?

- Industrial strength and secure (no lids that open!)
- Built for handling, manual or mechanical. Will slide, tip, roll, or pallet fork lift.
- Voluminous capacity (1000l) "Critical Mass" and easily vented.
- Clean and like brand new, but re-cycled!
- Cheap!
- Waste is completely contained., although liquids can be drained if necessary.

The big capacity gives long service intervals. A 1000 person day capacity without accounting for composting! On a low usage site, it may never need emptying! The size and our design means the best of vault and batch composting in one. Real time composting without massive infrastructure. Bigger batches compost much better than smaller ones, so a "critical mass" is reached where composting may match or exceed incoming material.
When it comes to handling/emptying they are easy to lift mechanically or will roll/slide around on their cages. All terrain pallet forks can be hired from builder's merchants if you don't have access to tractor forks. Everything stays in the IBC until ready as compost. Any handling gives more aeration and improved composting.

## Access and Installation

Our flat pack shed design allows the whole unit to be carried in anywhere....even up mountains and over rivers.....we've been there! And another important consideration for many projects is Planning Permission. The more permanent your structures, the more likely you will need planning permission. We've helped a number of folks through the planning process and can offer plans to be included in your application on request. The Thunderbox was always designed as a moveable

structure and gets around permanent structure complications. Of course they're completely happy as permanent buildings....just flat packable whenever you want.
But buildings are buildings and that means building regulations! Not always enforceable, but if your steps are not to British Standard and someone comes a cropper, your public liability insurance may not pay up. All our steps, handrails and dis-abled features are to British standard building regulations.

## 20 Questions

### 1. When is a compost toilet not a compost toilet?

Composting toilets rely on the natural breakdown of deposits rather than relying on valuable water, sewage systems and expensive to build and operate sewage works. They require no direct services, so can be built virtually anywhere, with the composting process occurring in situ. The deposits are no longer "waste" and over time can be returned to the soil,. This gives users a sense of connectedness to the bigger picture rather than a "private convenience." If the material needs to be removed from the toilet for composting, then it's not a compost toilet!

### 2. How many people will a toilet serve?

There is usually a "rush hour" in the mornings, so the more seats the better as numbers rise. Festival/local authority guidelines stipulate one toilet/100. Refugee camps recommend one/30! Neither of these models are ideal! We suggest 1/15 maximum for a single and 2/50 maximum for a double. Your customer experience will be proportionate to queue time!

### 3. How often will I have to empty and how?

How big is the average turd?! With deposit, sawdust, paper and maybe a little liquids, one person will produce about a litre/day if that person is present for the full 24hr period. Day visitors will need more urinal facilities and leave much less solids. So our 1000L IBC's will last 1000 person days if it all happened at once! (This is what happens at festivals!) However, because of "critical mass," far greater capacity is achieved by the composting down of the deposits as they arrive. Strong aeration created by our airflow system further reduces bulk by de-hydration and improved composting. Due to this process,1 composting tank lasts our family of 6 around 500 days, whereas according to the statistics provided by other compost toilet manufacturers, we would fill a wheelie bin in 25 days! Once a tank is full, it can then be replaced/removed, sealed up and left to compost down. Deposits arrive via the urine separator chute which fits an aperture in the top of the IBC. This is what we have to empty out through. It's big enough for a regular spade/small shovel but quite a tight working space. A quick release hatch is a nice idea, but we find half an hour is all that is needed, which after a year of waiting is not much to ask. Any hatch would have to retain the IBCs' integral strength and ends up over engineering a simple system.

### 4. Will I have to handle un-composted material?

No! This is why we like IBC's so much; you're always a safe distance from the deposits and composting occurs in situ without the need to turn the containers.

### 5. Is it true you can't pee in a compost loo?

Too much liquid means the compost will go anaerobic (lacking oxygen) and different bacteria will result. These bacteria often give off methane and other offensive smells and make the whole process very unpleasant! A urine separator is the answer, thereby diverting urine away from the deposit container. These are more easily used by women than men as they are generally designed for the sitting position which is why we recommend adding a male urinal to prevent the boys peeing into the composting tank.

## 6. Where does the urine go?

The pee is separated off by the urine separator (generally under the seat) and is removed from the building via its' own pipe. Our separators exit pipes use a large diameter to prevent blockages. This is more an issue than pee volume which most commercial separators are designed around. The pipe can be directed to a soak-a-way on suitable soils, straw bale or liquids container. The latter can be exploited to transfer pee as a fertiliser to compost heaps(useful on an allotment site) but involves carrying liquids. (always heavy!) Urine is pretty much benign as a waste product on its own. A healthy soil, ideally containing lots of carbon(woodland/hedge soils) is a good soak-a-way but if the soil is heavy or with restricted drainage, a small brick/stone filled hole may be necessary. On very sensitive sites or very close to rivers, containment and carrying may be the only option. The Environment Agency generally do not have a problem with pee soaking-a-way as long as it's no more than 10L a day and more than 60m from a well or borehole. Once pee and poo mix this is known as" black water" and this does pose a danger to health and the environment and should not be drained off into soil.

## 7. Do I need to use sawdust?

To create the best conditions for good composting it's important to get the chemical composition right. This sounds technical but actually all that is needed is a good nitrogen/ carbon balance. Deposits are the nitrogen part, so by adding a carbon containing "soak," such as sawdust or shavings balances up the chemistry. Covering the deposits also helps prevent smells and fly activity in the chamber. To achieve the ideal 1:30 ratio of nitrogen to carbon, only a small quantity of sawdust is necessary. Too much will slow composting and fill the container more quickly. We prefer sawdust but you can also use anything else with a high carbon content such as grass clippings or leaf litter.

## 8. Do compost toilets smell?

They shouldn't, but do have a reputation because of poor practice. Two things are vital, low moisture content and aeration. Low moisture content is achieved using a urine separator and male urinal. Aeration is achieved using a good ventilation system which should ideally dehydrate the deposits as they arrive. Our large flue and effective seals ensure an excellent "draw" thereby assisting aeration and eliminating smells. Eco-cubes are available to breakdown bacteria associated with urine smells and can be placed in the urine separator.

## 9. How long do I have to leave the compost before its safe?

Allowing the deposits to compost for a year renders the compost safe to use. Leaving it for two years allows the sawdust or shavings to break down even further thereby producing really nice soil like compost.

## 10. Where can I use the compost...are there regulations?

There are no specific regulations regarding small batches of humanure compost, however the Environment Agency or even Environmental health may take an interest in your operations via the Planning system. Full containment and good long composting periods ensure an easier life! We use most of the compost we produce on fruit trees and our roses. Even running a hire business we produce less than 1000L of compost a year and that makes our trees and roses very happy. If we use any on our food growing areas, we use our own and have never had any issues as a result.

## 11. Can I put loo paper down there? Or the inner cardboard roll or nappies?

Paper, cardboard and even kitchen compost can all go in. The paper and cardboard are useful sources of carbon, so assist the nitrogen/carbon ratio. Nappies on the other hand are not bio-degradable; in our experience, not even the bio-degradable ones! Other sanitary waste is not desirable either so a sanitary deposit bin is a good addition to the housekeeping of any compost loo.

## 12. Will I need planning permission?

Not for a Thunderbox in general as they are moveable structures and have always been designed so. However, if you are changing the use of a field or even your garden to a camp site for more than 28 days, you may well need Planning Permission. In that process, the planners may well want detailed information on your facilities including the toilet. We've helped a lot of folks through this process and can provide Thunderbox plans by arrangement. Your best bet is a planning consultant if you are setting up a business that requires planning permission to ensure the best possible advice.

## 13. What laws and regulations apply to compost toilets?

The law is rather vague on compost toilets specifically. However, we have had our system of composting approved as a low risk operation by the Environment Agency www.environment-agency.gov.uk/static/documents/Business/MWRP_RPS_114_Waste_from_composting_toilets_-_Aug_2011.pdf and have built a code of practice with them. Moving waste to a separate site for composting will require a waste handlers license. Building regulations and Planning laws may also apply as above. Environmental Health may get interested in your operations if you do not fully contain waste for composting or prevent smelly deposits. And your insurance may not cover you.

## 14. Do I have to dig holes or other ground works?

Not with Thunderboxes! A reasonably flat site is all that is needed, approximately 5.5m x 2m allowing for access. A soak-a-way may be needed for the urine exit. For the wheelchair accessible Thunderboxes, a level site is required as it's a much larger unit and the structural integrity may be compromised if the unit is uneven.

## 15. What do kids think of compost toilets?

Kids can be a bit scared of the deep dark hole some compost toilets have. Anything out of the ordinary can also cause concern to children. We've found kids generally love our toilets and often warm to them as a sort of wendy house! This may not always be desirable and sometimes the sawdust becomes an irresistible play material! The only thing we suggest is to help kids or advise their parents the first time they use one, is to sit back to avoid depositing in the urine separator. If toddlers are using it, then the addition of a step and toilet training seat will help achieve this.

## 16. What about flies and rats?

Closing the lid is important to prevent flies entering but is not always possible. The presence of flies usually indicates a lack of sawdust in the right places. A quick dusting usually helps. Little tiny fruit flies can set up camp in the box occasionally and again, a sawdust dusting is the answer. Rats are another thing altogether! Human deposits are chocolate to rats...think sewers! Super tight seals and **FULL containment** is vital. Tipping fresh deposits into any open or enterable container will soon bring the rats. The solution is prevention from the beginning because once you've got them they are very difficult and brutal to remove.

## 17. What cleaning products are OK to use in compost toilets?

A compost toilet relies on naturally occurring bacteria and fungi to breakdown the deposits. Therefore conventional cleaning products that "Kill all known germs dead!" are not welcome in the compost toilet world. In other words, no bleach or serious chemical cleaners. Benign cleaning products such as Ecover or similar will effectively clean but not harm the composting process.

## 18. Is lighting important?

Lighting is important, particularly where the toilet will be used overnight. There are a number of solar shed lights quite widely available now that are ideal. They require no specific electrical supply and generally work fine in the summer. A timed light is more useful in the winter to conserve the limited charge available in the darker winter months.

### 19. What about hand washing?

Well of course but how? It's an important consideration and often difficult in remote situations. Gutters can be fitted to feed barrels of rain water or specific barrels which can be added to our wash stand. Cleansing gels can be used but are often rather "chemical" which we've always felt a bit at odds with a "natural" toilet! We can supply dispensers and bottles filled with hand sanitizer as well as an external hand wash stand.

### 20. And finally.....Why a Thunderbox?!

Simply the best and most sustainable!

We hope this is helpful and do not hesitate to contact us if you wish to discuss things further.

Happy days,
Thunderbox Rosie and Dave

T: 07814 052742
E: info@thunderboxes2go.co.uk