

## Open discussion on MOSAN toilet design

Posted by Mona - 10 Oct 2012 14:44

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Hello everyone,

I am the designer of the portable sanitation solution MOSAN, which was designed for the urban poor in 2011.

MOSAN is an urine-diversion dry toilet which is used in a sitting posture. The toilet has 3 main components: a main pot, a separation toilet seat and a lid. There are two inner containers for excreta collection.

The toilet only collects excreta, no flushing water, no anal washing water or any kinds of waste should be added. Faeces has be be covered properly with dry material like ash or saw dust. This avoids smell, keeps faeces dry (reduces pathogens) and makes the content less unsightly for the next user.

In December 2011 we built 2 functional prototypes in Germany. One is currently exhibited at GIZ headquarters in Eschborn. For more information about the prototyping process in Germany, Bangladesh and our work, please read the topic &quot;[moSAN - mobile toilet for the urban poor in Bangladesh](#)&quot; t; or have a look at our tumblr blog [mosan-bangladesh.tumblr.com](http://mosan-bangladesh.tumblr.com)

In May 2011 simple prototypes were tested for 4 days in Bangladesh and in summer 2012 two willing users, one male and one female, tested one advanced prototype in Germany (see pictures below). The test results will now be used for a redesign and further development of the concept.

In this regard we would also like to get YOUR FEEDBACK. What do you think about the toilet design?

We would like to discuss ideas and sketches to optimize the MOSAN toilet to become the most desirable toilet on earth ☺

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## Re: Open discussion on MOSAN toilet design

Posted by bracken - 21 Nov 2012 14:23

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hi Lukas,

I'll be in Zambia soon on a short term mission for the GIZ water programme out in Chipata looking at rural sanitation. I'd be interested in hearing what progress you may have made so far. Please mail me at [bracken@aht-group.com](mailto:bracken@aht-group.com).

Thanks.

Patrick

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## Re: Open discussion on MOSAN toilet design

Posted by petersluk - 21 Nov 2012 15:35

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Hi Mona,

I think it might be helpful to consider the types of disabilities shown when designing a supportive structure for the people with disability. In some cases people that normally use wheelchairs crawl around on all fours since the houses are too cramped or the floors too uneven to use a wheelchair. This means they will have to get up on the Mosan toilet from the floor.

Hope this helps

Cheers,

Lukas

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## Re: Open discussion on MOSAN toilet design

Posted by Mona - 28 Jan 2013 16:22

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Dear readers,

we are finally producing the long-awaited prototypes. Last week the mold for the main pot was milled, the seat is in production right now. On Thursday we will deep-draw the first prototype made from durable ABS plastics. All parts will have different wall-thicknesses to optimize stability, weight and costs. The lid will be produced in the end, after we tested the stability of the seat and the main pot. It could be necessary to choose thicker plastic sheets for deep-drawing and this will affect the size of the lid.

As a "sneak preview" here a picture of the CAD draft.

If you are wondering where the side-handles are: the outer edge between seat and main pot is big enough to grab the toilet and carry it easily.

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## Re: Open discussion on MOSAN toilet design

Posted by Mona - 02 Feb 2013 14:50

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Dear readers,

please check out the [MoSan blog](#) for first results from deep-drawing with thermoplastics! The day at the workshop was great and the results are amazing. I am very happy we took the time to change the process from manual laminating to deep-drawing. With the new way of production the design was optimized:

- all parts are stackable
- surfaces are smooth and easy to clean
- measurements are optimized regarding ergonomic feedback
- simplifications for easier production

Cant wait to hear your feedback!

Best,

Mona

[mosan-bangladesh.tumblr.com](http://mosan-bangladesh.tumblr.com)

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Re: Open discussion on MOSAN toilet design

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Posted by JKMakowka - 04 Feb 2013 08:39

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Looks great so far, and I see you lowered the interior a bit for male users 🍌

Quick remarks:

-Color should definitely be looked into, a light yellow or brown is probably the best.

-How much weight does the new bottom withstand? It looks quite flexible, so there might be a risk of the top slipping partially into it, when uneven pressure is applied from the top.

- I see the grips at the sides where cut from the design... I guess since it will be mostly the containers inside that are moved, that isn't such a big issue, but the mobility inside the house is definitely lowered by that.

-can you post pictures of the lid? I think since this is partially an innovation for the disabled and elderly, special care needs to be taken designing the grip so that it can be used without help. Edit: the easiest for that would probably be the option to attach an additional wire hook to it somehow, which can then be formed for the best usability individually. So two solid flanges which can be drilled for holes to hold the wire would probably be best.

P.S.: If you are interested in a pilot of the new design in urban Kampala (Uganda) we could probably arrange for it. Here in Kampala there are also PE production capacities, so it could be locally produced (if one comes up for funding to make the molds).

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## Re: Open discussion on MOSAN toilet design

Posted by Mona - 06 Feb 2013 15:16

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Dear Julius,

great, many thanks for your feedback and offering your support for piloting the toilet in Uganda. We should definitely discuss this further by email and skype! Please let me know your email address.

Regarding your remarks,

- **Weight:** we stressed the toilet (main pot+seat) with 130kg at the workshop. The seat bends slightly and goes directly back to its initial shape. PE has the great property that it is more flexible than brittle. Which means, it is very difficult to break it. I tested this by throwing the toilet on concrete ground, the reaction was, the toilet just "jumped" away without any damage.

- Since the shape of the seat is angled and becomes wider till the edges, the weight distributes evenly and the seat doesn't slip inside the main pot.

- **Handles:** It is right, the two side handles were removed for several reasons (simpler molds=easier demolding=cheaper production) But instead I designed the outer edge between seat and main pot big enough to work perfectly as a **all round handle**. This means, even if the toilet is placed at a very narrow space you can lift the toilet from all sides, without being limited to 2 handles. This is meant to add mobility than lowering it!

- **Lid:** The lid is in production this week. On Friday I can post more pictures! Thanks for this advise. We are currently discussing with GIZ in Zambia to test the MoSan toilet with people with disabilities.

- **Colour:** The colour is caused by production and not chosen on purpose. White (called "nature") is the most common colour of PE and also the cheapest. All other colours, like black or blue are inked by pigments and are more expensive. If we produce more than 10 prototypes it is of course possible to order colored plastics, but so far it is not feasible. My preferred colour is still a blue-turquoise, since I think it communicates cleanliness, freshness and nature at once 😊



all the best,

Mona

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Re: Open discussion on MOSAN toilet design

Posted by Amos - 06 Feb 2013 17:10

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Hello Mona,

Your toilet appearance and design is very unique! It should be very good in many places. Thanks to this forum for bringing those concerned with seeking simple sanitation together.

Regarding design perfecting as another poster said, the bowl should be deep enough so males sitting on the toilet don't have a problem with skin contact inside the bowl. On the toilets I have been developing this has been an issue, and I simply had to make the bowl deeper than I first thought. It is rare, yet it also happens that the water level in a normal flush stools is too high, and males do not appreciate the resulting physical contact with the water.

In my development it also has been a challenge to put the urine feces divider as the right place. That is to put it back far as possible to intercept as much urine as possible, yet still forward far enough so feces do not end up on the urine pan.

One of the toilets I have been working on is quite a bit like yours (although not as attractive). One difference is that I employ a gate that covers the feces compartment, and which only needs opened for defecating. Admitted this feature has both pro and cons. The cons being a gate needs opened to defecate, and the bowl cannot be quite as nicely rounded. Yet it has the advantage of additional sanitation, as the solid waste area is additionally obstructed and can even remain obstructed when one needs to merely urinate. The gate cuts greatly cuts the odor, while using a minimum of covering material. Another vital advantage of the gate is that more urine is intercepted and less enters the feces area. This also saves mess and covering material and space in the feces container. I believe I can get up to a 98 percent average urine interception with my toilet with the gate. The only time it does not intercept all the urine is when females use it with the gate open for defecating, then some urine is not intercepted.

You possibly could make one model with a gate and one without. Feel free copy my design in anyway you wish. My aim is to help people and help bring better sanitation to those who need it. You can see one of my toilet designs with a gate at this link. [forum.susana.org/forum/categories/34-uri...on-bucketmate-toilet](http://forum.susana.org/forum/categories/34-uri...on-bucketmate-toilet) . [www.exnapo.com](http://www.exnapo.com) shows many others.

Blessings

Amos Bender

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**Re: Open discussion on MOSAN toilet design**

Posted by JKMakowka - 08 Feb 2013 21:47

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@Mona: You can reach me via

This e-mail address is being protected from spambots. You need JavaScript enabled to view it

(Ich spreche ebenfalls deutsch). UWASNET could link you up with local NGO/CBOs working in urban slum areas and facilitate the process. However, as a local Ugandan NGO network we do not have a lot of financial means available to directly support this interesting project.

Note by moderator (EvM): This thread is now closed for discussion. Further discussions on MoSan are taking place here on the forum:

[forum.susana.org/forum/categories/52-mob...n-mosan-now-in-kenya](http://forum.susana.org/forum/categories/52-mob...n-mosan-now-in-kenya)

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