

CAN YOU MAKE A DIFFERENCE?

Hubba-Bubba | Muslim Engineers | Desalination Basics

The Plastic Bag

Remember when plastic bags were free? Those were the good old days. Then came the 5p charge and it changed everything.

For the better of course. An implementation of a 5p charge was all it took to reduce plastic waste nationally, a small change but big difference.

I don't want to use this example to highlight the capitalistic grip money has on the average consumer, but rather highlight how through small steps you can make an enormous difference.

The micro affected the macro. This is something many groups aim to achieve; be it activists, entrepreneurs or big corporate industries. We aim to influence the small decisions of the average 'consumer' to contribute to an overall goal or objective.

This is something to keep in mind whenever you commit to something. Your seemingly insignificant actions can have an enormous effect down the line. So if you have a goal to 'make the world a better place', (something this network aims to achieve), all it takes is small steps, dua and consistency.

And Allah knows best.

A Muslim Engineer

A few years ago I was on an industrial placement in Surrey. It was a truly blissful period in life. The south was affluent, sunny, lots of trees and casually demanded £1100 monthly rent for substandard living (oh what a housing crisis they have down there).

Anyhow, that year I attended the first networking dinner hosted by the Network and it was fantastic. On the way to the venue my dear friend and I were passionately discussing what we as Muslims need to do to improve the state of the Ummah. We'd cover topics on sustainable development, consumerism, extravagance, sectarianism, economics, solar panels, decentralisation etc, but to no conclusions.

When we got to the venue and heard the opening presentation, we were flabbergasted by the similarity between our discussions and the themes of the presentation. There was particular emphasis on the following Hadith (Tirmidhi) regarding the 5 questions we will be asked by Allah on the Day of Judgement:

- 1 How one Lived Life on Earth
- 2 How one Utilized his Youth
- 3 How one Earned his Wealth
- 4 How one Spent his Wealth
- 5 What one Did with his Knowledge

From hearing this, it became apparent to me that as a Muslim engineer, I have potential and I have a big responsibility. I have to do something. I have to do more with my time. I can't just get my degree, get a job, do the 9-5 and come home to watch 'Come Dine With Me' for the 1st quarter of my working life.

Hubba-Bubba

Did you ever buy Hubba-Bubba chewing gums and chew them till your taste buds went numb? If you did then I'll make the daring assumption that you grew up in the 90s.

Did you ever wonder where those Hubba-Bubbas were made? Or how much was made?

I want you to try and comprehend how much Hubba-



Bubba chewing gum has been made since the 90s up until this very moment.

Now what would you do with all that chewed Hubba Bubba? How would you get rid of it?

What I'm trying to highlight is just how much waste we humans are inevitably generating, based off one consumable - that we could quite easily live without.

But how do we find the balance between waste production and rapidly growing populations?

Send us your thoughts.

Email
contact@mengineersnet.com

I realised how much I needed to immerse my self in working for the sake of Allah, in seeking knowledge, in entrepreneurial efforts to better my family, my community and my Ummah.

And I have the potential to do this. Allah blessed me to be born in a country where I am given free education. Something that millions around the globe do not have. I WILL be questioned with what I did with my time. Allah WILL ask me whether I spent my wealth accordingly and how I used my knowledge.

It was frightening really. Because looking at these questions, I still to this day feel that I haven't fulfilled any of them and would not be able to answer in front of my Creator. May Allah guide us.

I felt this is what distinguishes Muslim Engineers. Our efforts to better ourselves, our communities and the world.

But are we being distracted by the work life? Are our jobs actually providing us with skills that can better the world? How can the engineering line of work better the world? Say if you and 10 other engineers from various disciplines were tasked with building a sustainable water sanitation system for a developing village in Sudan, would you be able to do it? If not, how can you learn this skill? And what's stopping you?

Engineers can communicate complex ideas, problem solve and ultimately help produce an end product. This end-product can benefit a community, and this is what we must capitalise on. We must strive to become capable of applying these skills in all walks of life, especially outside the workplace.

It's these kind of efforts that this Network aims to promote and facilitate. No matter how big or small. It's the effort that counts. If you want to help the Network contact us via email on contact@mengineersnet.com.

A brief introduction to Desalination

An experienced engineer working in the water industries has kindly written a short article explaining the basics of water sanitation.

This is a fascinating topic that I feel we should all know a bit about, as water is essential to all human life and without the process described below, the world would be very different.

Desalination

Water will be a major commodity within the next few years. It is said that by 2040 water will be a more valuable commodity than crude oil in certain countries in the Middle East. Without an adequate amount of clean water, populations will not be able to survive, and industries will not be able to be maintained. Hence, it is expected that those with a good knowledge of water purification will be in great demand in the coming years.

Desalination in simple terms, '**de**' means '**removal**', and '**saline**' means '**salts**'. Literally, therefore, desalination, is the process of removal of salts.

What are the sources of water?

Water can come from two sources, Groundwater and Seawater. Groundwater can contain high level of salts and is known as '**brackish**' water, and seawater is from the sea, and can contain high level of salts and impurities. The salt content is typically measured in TDS (Total Dissolved Solids).

What desalination processes are there?

There are two main desalination processes: MSF (Multi Stage Flash Distillation) which uses heat energy to evaporate the salty water to produce water with a lower TDS. This water desalination process distills sea water by flashing a portion of the water into steam in **multiple stages** of what are essentially countercurrent heat exchangers.



Multi Stage Flash (MSF) Plant

The other main desalination process is RO (Reverse Osmosis) which utilizes high pressure and membranes to remove TDS from salty water.

Both processes are very energy intensive. The MSF utilizes heat energy, whilst RO utilizes high pressure upto 85 bar. This article will mainly deal with Reverse Osmosis.

What is the principle of Reverse Osmosis?

To understand Reverse Osmosis, Osmosis first needs to be understood.

Imagine there are two volumes of water separated by a semi permeable membrane. Each volume of water has a different saline concentration, with one volume of water being much more saline than the other. During natural osmosis, water flows from the less concentrated saline solution to the more concentrated saline solution until both concentration on both sides is the same.

Under REVERSE OSMOSIS, the opposite to OSMOSIS occurs. Water particles in the more concentrated saline solution, is FORCED BY HIGH PRESSURE to go to the volume where of less saline concentration.

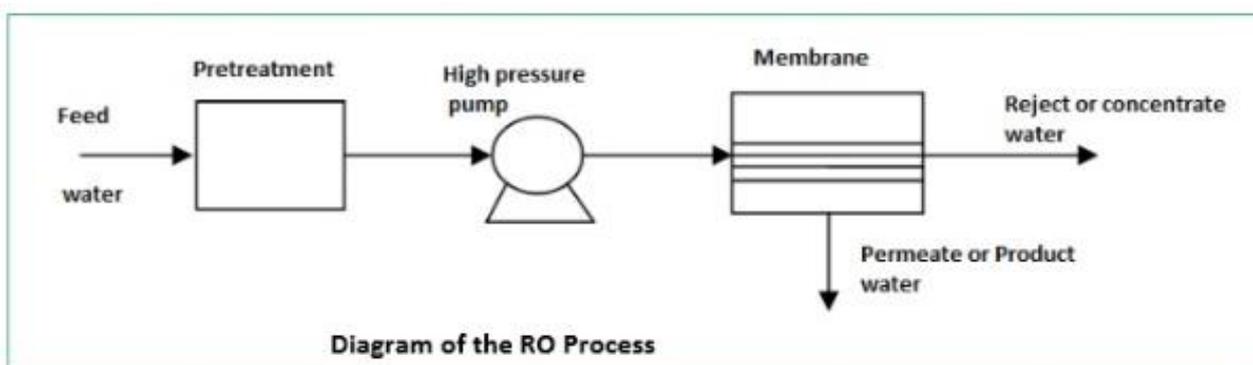
Desalination Treatment

Pretreatment is vital to the Reverse Osmosis Process. It is incorrect to think of a RO plant of consisting only of membranes. In reality, the RO process consists of pretreatment process units and post treatment depending on the type of water required. Pretreatment is vital.

The actual membranes are very sensitive, and are prone to biological and physical fouling. Therefore a number of process units are added as pretreatment.

Sand filters are added to remove particulates such as suspended solids. Chlorination is added to prevent biological growth, Sodium Bisulphate is added downstream of the chlorination process to remove any chlorine as it can damage the membranes. Antiscalant is added to the water to prevent scaling of the membranes. The last step before the salty water enters the membranes itself are cartridge filters to remove any fine particulate material.

The membranes themselves are housed in Pressure vessels because very high pressure is used. Any reject is either discarded or sent on to another RO unit to obtain more product (permeate).



Reverse Osmosis Process Flow

At the moment, the water industry is undervalued, however, it is expected that there will be a huge demand in the coming years.

Having a good detailed knowledge of water and wastewater systems will be extremely useful, not only in industry but also for small scale projects and sustainable urban developments.

Abdullah ibn Amr reported: The Messenger of Allah, peace and blessings be upon him, passed by Sa'd while he was performing ablution. The Prophet said, "What is this extravagance?" Sa'd said, "Is there extravagance with water in ablution?" The Prophet said, "Yes, even if you were on the banks of a flowing river."

Source: Sunan Ibn Mājah 425

Grade: Sahih (authentic) according to Ahmad Shakir