

# PROJECT TO HELP PUDDLE PROBLEM

Students develop substance to enhance concrete endurance

DT News Network  
news@dt.bh  
Manama

Two Bahraini civil engineering students managed to develop a substance that enhances concrete endurance by double and allows water to pass through it.

University of Bahrain (UoB) Engineering College students Zainab Abdulla and Dua Majeed presented the new substance in the university's graduation projects contest and exhibition, which was recently organised under the patronage of UoB President Dr. Ibrahim Janahi.

Explaining the idea of the project, Abdulla said, "We were inspired by the never ending puddles problem that usually recurs during winter and rainy seasons. When added to concrete mixtures, the substance allows the water



UoB students Zainab Abdulla and Dua Majeed

to pass through it. It could be used in rainwater drainage systems, as it will allow water to easily pass through to sewerage networks or underground reservoirs."

Abdulla said that they used more than 60 mixtures before they came to the final result. She confirmed that they have conducted three tests

on the final combination. "The substance doubles the endurance of concrete mixtures," she added.

Both students expressed their gratitude to member of the teaching board at UoB's Civil Engineering College Dr. Raad Kadhem for his constant directives and follow up. They also

**When added to concrete mixtures, the substance allows the water to pass through it. It could be used in rainwater drainage systems**

thanked the technicians at Al Manarain Block Factory and UoB laboratories.

Abdulla and Majeed's project came third in the contest from 190 other projects by students of civil, chemical, electrical, electronic and mechanical, engineering departments besides industrial operations management, architecture and interior design.

## UoB students' research paves way for 'stronger' aluminium



Maram Al Aradi, Sarah Al Shamlan and Noor Bucheeri

Fatima Bastaki/DTNN  
Manama

Three Chemical Engineering students from the University of Bahrain have made a breakthrough in the field of Aluminium Alloy conditioning as part of their senior project.

Maram Al Aradi, Sarah Al Shamlan and Noor Bucheeri's senior project on 'Enhanced mechanical and electrochemical properties by interrupting ordinary heat treatment with low temperature cycles for Aluminium Alloy,' was supervised by Dr. Oday Al Buhamad and Dr. Hosni Zubeir, who specialise in

corrosion testing. The students have plans to escalate the project to an industrial level as well.

Their project involved heating Aluminium Alloy 6061 at different temperatures followed by rapid cooling using water.

This manipulates the microstructure of the alloy, thus enhancing its properties in terms of maximum tensile strength, yield, hardness, fracture toughness, electrical conductivity and corrosion resistance.

Four different heat treatment cycles on the alloy were performed by the

**The process manipulates the microstructure of the alloy, thus enhancing its properties**

students - each containing 24 alloy samples in two different diameters.

"This project was chosen because our kingdom's economy depends on producing and exporting aluminium and aluminium alloys from Alba and Midal Cables respectively," Maram Al Aradi told DT News.

"In addition, aluminium alloys are widely used in electricity cables, bridges and building vehicles including motorbikes, bicycle frameworks and ships," she added.

The student said that improving the performance of the aluminium alloys would serve greater benefits for customers and the industry.

"We selected this project in particular, as this idea is

not very common in the gulf countries," added the University student.

"Any slight improvements might be a breakthrough in this field. On top of that, we wanted to challenge ourselves, our limits and creative thinking as this type of study and investigation were quite different from what was being taught in the university," added Al Aradi.

The alloys developed through such heat treatment become stronger and more resistant to fracture, tension and corrosion.

Hence, cables, frameworks and bridges become more reliable and sustainable, using similar alloys.

The students did face some challenges while pursuing this project. Sarah Al Shamlan explained, "The biggest challenge of the project was finding the space and means to perform the heat treatment cycle."

"Usually, aluminium alloys are produced in large quantities and the heat treatment should be conducted in a large oven with sufficient heating capacity," she added.

Thinking  
green

Rehan Ahmed



## Meeting the Challenge of Water Crises

Recently an international report has revealed that Bahrain is listed among the top ten countries that are likely to suffer from a water crisis in the next 25 years. Researchers from the World Resources Institute (WRI) mention that half of the Middle East countries would suffer from a sharp water crisis by 2040.

With the aggravation of the water crisis globally, there are more warnings of the possibility of an increase in the severity of the conflicts and disputes to obtain water and its sources. Researchers from WRI estimated that 33 countries, half of which are in the Middle East, would suffer from a severe water crisis by 2040. According to the study that included 167 countries, the top ten countries that would face water crisis in the future are Bahrain, Kuwait, Palestine, Qatar, the United Arab Emirates, Saudi Arabia and Oman.

Researchers further stated that the Middle East is already probably the least water-secure region in the world.

We need to understand that with such a problem looming, we have to understand the potential risks we may face in terms of the water needed to run our economies, societies and industries as well as to meet with the challenge of increasing population and uncertain impacts of climate change.

The country has already taken positive steps in meeting with the forthcoming challenges and having initiated massive waste water treatment, recycling and reuse schemes to provide water to non-essential fields and more domestic water to its people and industries.

Our major water demand is being met by desalination process, which is a high cost option. The cost of water treatment, storage, supply and again collection of waste water and its treatment needs to be publicized enabling the residents to understand how much the government is spending on this basic necessity.

Water consumption in Bahrain is around 600 liters/day, compared to the international standard of up to 265 liters daily. The annual growth rate in water use is also increasing around 10 percent. The basic requirement of a person doesn't exceed 100 litres/day. In Bahrain we have access to an abundance of water and we're accustomed to having it available at the twist of a faucet.

Water conservation measures are urgently required to tackle with the water crises. It is unfortunate to see people who are misusing this expensive resource. There is an urgent need to initiate awareness campaigns at all levels and cross sections of the society starting from industries, farms, agricultural land, residents and potable water users. The subject is to be initiated at schools, colleges, universities and other educational institutions. NGOs should be mobilized and community support should be obtained in tackling with this urgent issue.

Conserving water is every body's task. We can conserve water at domestic level inside our homes, kitchens, toilets and laundry. Let us start with few water conservation tips which we can easily practice at home:

- Using Low-flush toilets.
- Using low-flow shower heads and taking shorter showers.
- Avoid using excess water in car washing, watering plants and gardening.
- Check for dripping faucets, running toilets and leaks.
- Don't let the faucet run while tooth brushing, shaving, hair and face washing.
- Operating washing machine and dishwasher only when they are full.

\* Head of Waste Disposal Unit, Supreme Council for Environment, Bahrain. (rahmed@sce.gov.bh)

The author heads the Waste Disposal Unit for the Supreme Council for Environment, Bahrain. He can be reached at rahmed@sce.gov.bh