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MDSolution research treats industrial waste-water into clean water

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Concern about the environmental impact arising from industrial waste, researcher from the Faculty of Technology Engineering (FTeK) at Universiti Malaysia Pahang (UMP), Dr. Nadzirah Mohd Mokhtar, took the initiative to invent a membrane distillation system to treat waste-water from several industries, like rubber, palm oil and textile factories, and food and beverage.

Code-named MDSolution, this membrane distillation system is wholly formulated at UMP, with the assistance of both academic and technical staff, as well as cooperation from under- and post-graduates students.

According to Dr. Nadzirah, the ongoing research – which commenced in 2017 and a continuation of the one she did for her doctorate degree – examines water quality from various industries by testing them with various membranes.

She discovered that the research output proves waste-water can be treated into clean water, with quality characteristic benchmarked against Standard B of the Environmental Quality Act 1974.

“I can see potentials of expanding this membrane distillation technology to the industries in Malaysia and abroad, as earlier membrane distillation technology was mainly focused on de-crystallization of sodium chloride from sea water.

“With direct cooperation from the rubber factory of MARDEC (Malaysian Rubber Development Corporation) Bhd. in Mentakab and the palm oil factory of LCSB (LKPP Corporation Sdn. Bhd.) Lepar in Gambang, waste-water samples for this research were collected under UMP’s Fundamental Research Grant Scheme (FRGS) and University Research Grant (RDU), with total cost of formulating MDSolution amounting to RM40,000,” she highlighted.

Dr. Nadzirah explained what the membrane distillation system does is to treat waste-water by producing clouds of vapor when heated waste-water solution turned cold using membrane parting.

“The difference in temperature for the two solutions allows for the clean water to pass through the membrane, while the impurities are separated back into the waste-water tank,” she added.

Dr. Nadzirah plans to commercialize the membrane distillation system as it will not only help treat industrial waste-water, but more importantly, it can also produce clean drinking water.

Judging from the results of her latest research, she discovered clean water can be extracted from industrial waste-water, but felt that more research needed to be carried out to test and determine the durability of the membrane distillation system before introducing it to the industries. She plans to conduct the processes of the research on a bigger scale.

Dr. Nadzirah is hopeful that she can soon introduce the membrane distillation system to the communities and industries, to help resolve industrial waste-water problems.

She also hope that she will be able to produce MDSolution in a more efficient, low-cost, easy-to-use and durable form.

To date, MDSolution has won the gold medal and the Green Technology Award at the recent Creation, Innovation, Technology and Research Exposition (CITREX), and last year, it took home the gold medal from the Industry Networking and Business Pitching (Ereka) event held at Universiti Malaysia Perlis (UniMAP).