

No need for old tyres to be an environmental hazard thanks to new recycling technology

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A new recycling process could be the answer to alleviating the environmental burden of old tyres.

Researchers with Deakin University's Institute for Technology Research and Innovation worked with industry partner VR TEK Global to develop a new cost-effective and environmentally friendly solution for turning old tyres into high quality ingredients for the manufacture of new rubber products.

"What we have developed is a significant breakthrough in tyre <u>recycling</u> that is superior to the current practices of shredding and burying tyres in landfill, burning tyres or recycling them into low quality materials of limited use," explained Deakin research engineer Chris Skourtis.

"Our process does not rely on chemicals and uses less power—making it more environmentally friendly. It also results in high quality ingredients that can replace virgin and synthetic rubbers in the manufacture of products such as new tyres, car parts, insulation materials, conveyor belts and ashphalt additive for roads."

Each year more than 20 million tyres in Australia, and one billion worldwide, reach the end of their working lives. Only a small percentage of these tyres are recycled with most making their way into landfill; placing a burden on the environment and human health.

"There is a world-wide need to address the issue of disposing of end-of-



life tyres in a responsible, <u>environmentally friendly</u> manner," Mr Skourtis said.

"Tyres simply dumped or placed in landfill are known to leach harmful chemicals into the environment; cause fires; and provide a perfect breeding ground for pests like mosquitoes and rats.

"We have come up with a way of giving new life to old tyres that should eliminate the need for them to end up in landfill."

The Deakin researchers, led by Professor Qipeng Guo, developed a small scale facility at the University's Waurn Ponds Campus to test and refine the recycling technology developed and patented by VR TEK Global.

"We now have a technology that is far better than any other tyre recycling processes," Mr Skourtis explained.

"First, the tyres are segmented in a way that allows for each part to be treated differently which eliminates impurities and results in a higher quality end product. For example, the steel reinforcement in the tyre is separated without fragmenting, which is not common in current tyre recycling.

"We have then created an efficient means of devulcanising and activating the tyres into rubber powders for recycling into rubber products.

"Devulcanisation essentially reverses the chemical process used to create the tyres. This is normally done using environmentally harmful chemicals. We have developed a mechanical method that requires no chemicals.

"We have also developed a way of using ozone gas to activate the rubber



powder which makes it more compatible with other materials. This extends the usability of the powder for producing a wider range of rubber and plastic products than currently possible."

Provided by Deakin University

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