

## NEW ASPHALT PRODUCED RECYCLING TONER CARTRIDGES IN AUSTRALIA

In Australia the [innovative asphalt TonerPave](#) is being produced with a high recycled content. It has a smaller carbon footprint to comparable mix designs due to the replacement of bitumen with post-consumer recycled polymers derived from waste toner powder.



In addition to allowing recycle of a waste material for road paving, this solution therefore has great advantages for the environment. This innovative asphalt is the result of a partnership between the [Close the Loop](#) and the [Downer](#) Australian companies, being an example of industrial ecology in practice.

[TonerPave is made by adding MTP](#) (Modified Toner Polymer) to standard asphalt. MTP is made from post-consumer recycled toner powder, which is predominantly plastic. Other ingredients in toner include small amounts of wax, minerals and pigments.

The toner powder used to make MTP come from the cartridges collected and recycled by *Close the Loop* in collaboration with other associated companies. This toner powder is homogenized to minimize variability between batches and then agglomerated to produce a finished particle of 1-3mm in diameter. During the agglomeration process one or more other materials such as recycled engine oil may be added. The finished product is MTP and it is delivered to Downer as a polymer-based additive.

The Downer company then adds MTP to the bitumen and aggregate at their asphalt plant. The MTP asphalt is then trucked to site as done for any standard asphalt. TonerPave is applied with the same equipment and process for standard bitumen. TonerPave shows improved performance over control asphalt of similar mix design in physical, mechanical, and environmental aspects.

The test results show increased stiffness, reducing rutting and cracking and entirely the life costs. Downer consumes everything Close the Loop can produce of TonerPave in Australia Local Governments are also involved in the innovative system because 80% of Australia's roads are in charge of local Councils. Close the Loop works with the Councils putting in evidence how many cartridges are collected in their municipality and how many kilometers of TonerPave road it equates to. This circular economy approach encourages the Councils and the municipal engineers to adopt the new TonerPaver asphalt in the road construction activities.

The city of Sydney first tested the TonerPave and has recycled more than 20,000 tons of cartridge waste since 2012. The city estimates that the toner asphalt reduces emissions by 40 percent



compared to conventional asphalt. The City of Sydney currently uses 6,000 tonnes of asphalt mix to resurface roads every year.

The process created to produce and use the PaverTone asphalt is an example on a national system implemented by a big company as Close the Loop is, engaged with the [zero waste national strategies](#). Close the Loop is the Australia's largest recycling and resource recovery company. Since the company was founded in 2001 it has been supported by a growing number of shareholders, which today amount to 456. The company recycles the waste materials of 13 major brands (inkjet or laser printer cartridges, toner bottles, drum units or fuser kits, from printers, photocopiers or fax machines). 30% of these end of life products is returned to the original manufacturer for remanufacturing and re-using. The remaining products are processed for the recovery of raw materials.

With a network of over 35,000 collection points for used cartridges, the Company also offers a free service to the end user. The TonerPave asphalt is the result of 13 years of research assured by the Close the Loop company into the reuse of 'waste' toner powder.

The system implemented in Australia to produce and use the TonerPave brings significant advantages, including:

- Saving energy - the printer toner mix is warmed 20 to 50 degrees less than regular asphalt using significantly less energy to produce.
- Reducing landfill - reusing printer toner in our roads means fewer cartridges end up in landfill.
- Reducing crude oil in roads – using printer toner in the asphalt mix reduces the amount of bitumen, which is derived from crude oil.
- Generation of a product of great resistance reduce rutting and cracking on roads, diminishing maintenance costs and increasing their durability.

Useful information on the process and operational methodologies adopted is available in the TonerPave website.

### To know more

[TonerPave website](#)

[TonerPave press release](#)

[Close the Loop Company website](#)

[Downer Company website](#)

[Brochure in Downergroup.com](#)

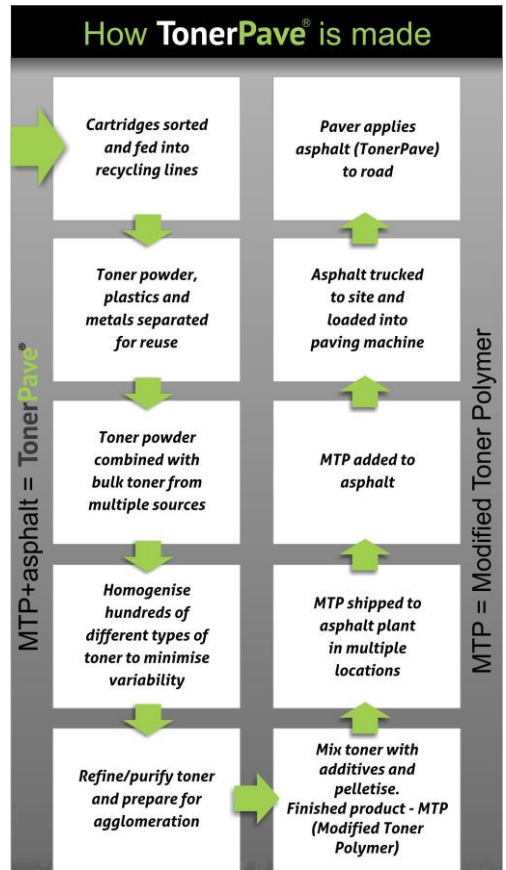
[Zero Waste Network Australia](#)

[Article in CNBC website](#)

[Article in abc.net.au](#)

[Article in wastemanagementreview.com.au](#)

[Article in fmmagazine.com.au](#)



[www.tonerpave.com.au](http://www.tonerpave.com.au)



[Article in therecyclor.com](http://therecyclor.com)

[Video in wonderfulengineering.com](http://wonderfulengineering.com)

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