



The circular economy "Valve & Hydrant Covers" Case Study



Recycling SMC Valve and Hydrant Covers into new products for the water network.

Daemco Australia manufactures and distributes a range of non-trafficable Valve & Hydrant Covers to the water network, for new sub-division and watermain renewal programs Australia wide. These products are manufactured from Sheet Mould Compound (SMC), which is made of a glass-fibre reinforced polyester. As a company certified to ISO14001 Environmental Management, Daemco Australia instigated an internal review of this product category to identify opportunities to recycle end of life Valve and Hydrant Covers and repurpose into new products for the water network.



The Circular Economy Opportunity.

The article "A foundational Resource for a Circular Economy" presented by Lisa McLean the CEO of Circular Australia at "Connected by Water" conference and summarised by Justin Matters from the Australian Water Association, states that the circular economy is based on three principles ^[1]

1. Design out waste and pollution at every stage of production, use and end of life.
2. Keep products and materials in use at their highest possible value.
3. Regenerate natural systems.

The first principal of "Design out Waste" was explored, and an opportunity was identified to convert the end-of-life Valve and Hydrant Covers into a granulated aggregate material. The second principle of "keep products and materials in use at their highest possible value" was the next opportunity. The granulated aggregate SMC material was trialled and tested for suitability in concrete form applications. The final principal of "Regenerate natural systems", would create a circular economy through reducing waste, minimising use of natural resources, and extending the longevity of the product life cycle.



[1] Lisa McLean, CEO of Circular Australia Water: A Foundational Resource for a Circular Economy

Partnering with like minded organisations.

Daemco Australia needed to find a suitable partner in the concrete manufacturing sector that shared the same vision and willingness to participate in the recycling program. M. Tucker & Sons was an ideal partner, a leading Civil and Trenchless Drainage Specialist. They specialise in the manufacture of sustainable concrete utilising their EPA Licenced waste treatment facility. At this facility they reclaim sand and rock from stormwater, NDD and drill muds where it is diverted from going into landfill and is cast into concrete forms. They currently offer a range of environmental concrete form products that are made up of over 70% reclaimed material.



Innovating a Solution.

The first step of the recycle process was to granulate the SMC material into aggregate sized material. This activity was processed at Corex Plastic Recycling Facility and consolidated into bulk bags.

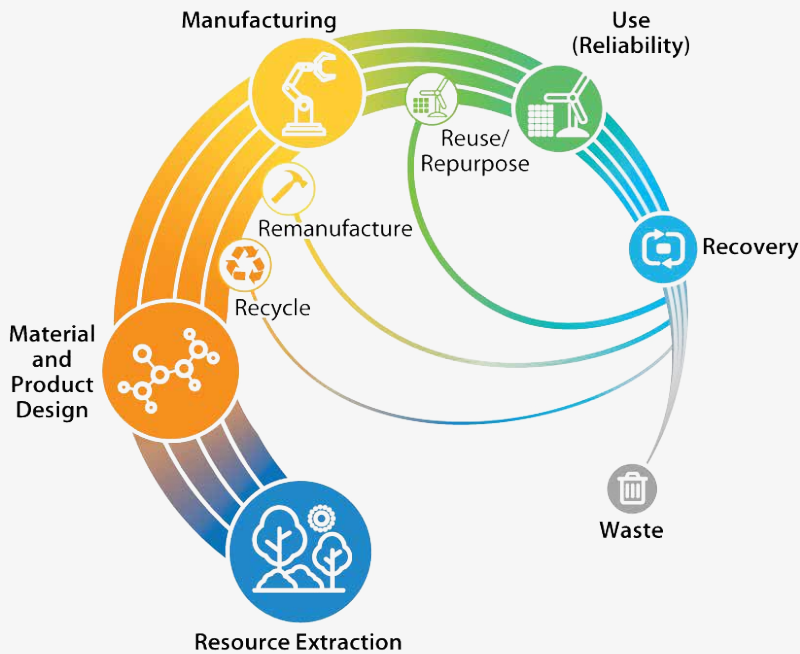


M. Tucker & Son's would develop the initial formulations for the concrete mix, focusing on maximising the balance of SMC aggregate to naturally sourced aggregate. Multiple trials of the formulations were developed, tested and cast into concrete block samples. Strength tests were performed on the samples where results were recorded on days 7, 28 and 56. From these samples, a formulation at 28 days was confirmed to achieve the strength requirement of 25mpa.



Closing the Loop.

M. Tucker & Son's are now looking forward to expanding on this range with the addition of the SMC recycled material into their environmental concrete products, such as thrust blocks, manholes, footpath re-in statements and roadside barriers. This is a major milestone for both organisations and a significant achievement in closing the loop in the circular economy for this product category.



Daemco Australia has integrated this program into their ISO14001 Environmental Management System, with an established collection point at their Tullamarine Distribution Centre. Daemco Australia's range of non-trafficable Valve and Hydrant covers is the only range certified to AS3996 Access Covers and Grates with a published WSAA Product Appraisal.



Don't hesitate to contact Daemco, to discuss your product requirements and needs, we're sure to have an innovative solution for you.

M. Tucker & Sons provide civil and trenchless solutions for a wide range of sewer, drainage and stormwater systems.



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