Australian Standards, PVC and circularity in the built environment.

The interim report “Australia’s Circular Economy: Unlocking the Opportunities” identifies the built environment as one of six priority areas. It touches on the large amounts of materials, waste and emissions involved in the construction of buildings and civil infrastructure. However, we believe it overlooks a key opportunity to increase circularity - PVC in the built environment context.

As a small business in regional Australia leading the way in PVC recycling and manufacturing, we encourage the productivity commission to consider the role of PVC in the built environment. Addressing PVC as part the proposed reform areas identified in the interim report could make a meaningful contribution to sustainability and circularity outcomes in the built environment context.

PVC in construction

More than 60% of the PVC produced in Australia is used in construction[i]. Attributes of PVC, such as its durability make it ideal for a range of different applications within building and construction, such as pipes and fittings, cable insulation, floor coverings, window profiles, cladding and roof membranes.

The wide range of construction applications means that, depending on intended use, PVC products used in construction could be subject to a range of different Australian Standards.

PVC, recycling and the environment

Globally, PVC is one of the most used but least recycled plastics. PVC is a versatile polymer, requiring additives in varying formulations to control several different attributes:

- Heat Stability
- Bulk Density
- Impact Strength
- Internal Lubrication
- External Lubrication

Currently, there are around 10,000 active formulations in use in Australia, and when combined with different manufacturing processes results in a wide range of applications for PVC.

This versatility and number of possible formulations creates challenges for effective recycling on both sides of the equation – the formulations of feedstock going into recyclate, as well as the formulations required for products manufactured using recyclate.

Leveraging decades of experience as both a recycler and manufacturer of PVC products, we identified analysis as a way to overcome this problem. In 2022, through a research partnership with CSIRO, funded in part by Sustainability Victoria, we refined our innovation in analysis. The resulting technology is currently in use, at scale, in our recycling dosing pilot plant. Commissioned in 2024, the pilot plant has led to the recycled content in our proprietary range of products increasing to 90% in 2024.

PVC and circularity in the built environment

Despite recycling challenges, in a construction context, PVC is viewed as a sustainable alternative to many traditional materials, in part due to its long effective life, which can be up to 100 years. This may position PVC recycling as a lower priority for circularity initiatives than other materials used in the built environment. However, with the advances in technology that have been achieved through our research partnership, Australia has a unique opportunity to stop kicking a can further down the road and instead become a world leader in the recycling and use of PVC products.

Why aren't more PVC products used in construction made from recycled PVC?

While switching from prescriptive to performance-based standards and specifications may be an appropriate action for other construction materials, based on our experience, we anticipate this will have little impact on the amount of recycled PVC in use.

PVC used in construction needs to meet the Australian Standards for the relevant end-product. Given significant variability in the supply of recycled PVC feedstock, and with no standards for testing or modifying PVC recyclate, there is currently no way for recyclers and manufacturers to confirm the consistency of feedstock supply across batches.

This creates a barrier that effectively prevents investment and innovation in the use of recycled PVC products in construction. We recognise that PVC is not the largest share of construction material in use, however we note that construction is the largest use of PVC produced in Australia. This means that any measures that drive investment and innovation in the use of recycled PVC in construction will have positive secondary impacts on other PVC uses and the broader PVC industry.

Our suggestion

Introducing Australian Standards around PVC recycling is the next logical step in realising the benefits of the public/private research partnership that supported the development of this world first technology.

Effective standards around PVC recycling should include both standard testing methodology to analyse the attributes of PVC recyclate (determining accurate values for heat stability, bulk density, impact strength, internal lubrication and external lubrication for each batch of recyclate) as well as standard methods of modifying those attributes/values (chemically, or through synergistic batch dosing.)

Standards of this nature would:

- ensure that PVC formulations are replicable across different recyclers and manufacturers.
- allow use of a broader feedstock supply increasing the resilience of the Australian PVC industry in relation to disruptions of the global supply chain
- provide confidence to authorities who are responsible for approving infrastructure plans (eg water authorities)
- support government decision makers to accurately monitor the effectiveness of sustainable procurement initiatives in relation to public infrastructure
- provide an effective foundation for addressing recycling challenges that will continue to grow as the volume of PVC products used in construction to date, reach their end of life.

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[i] PVC in Construction - Vinyl Council of Australia