

PIPA recycling PVC pipes into new product

Introduction

The Plastic Industry Pipe Association (PIPA) has been working with two of its members, Iplex and Vinidex, to increase recycling rates of polyvinyl chloride (PVC) pipes in Australia. The common plastics used for pipe production are PVC and Polyethylene, thermoplastics that can be readily reprocessed. Scrap generated during manufacture is routinely reground and fed back into the manufacturing process, and the industry is now recycling post-consumer waste where pipe is collected from the waste stream and recycled back into pipe products.



Plastic pipes are long-life products with an expected lifespan of over 100 years. Therefore the amount entering the waste stream is relatively small, as the products are largely still in their first life cycle.

Use of recycled and re-used material

The PIPA recycling scheme recycles 300–400 tonnes of demolition and offcut PVC pipe in Sydney and Melbourne from new construction and temporary pipe systems.

Based on the New South Wales Office of Environment and Heritage's *Report into the Construction and Demolition Waste Stream Audit 2000–2005*, the total proportion of plastics in C&D waste in New South Wales was 13 000 tonnes per year out of 450 000 tonnes. Breakdown of the proportion of plastics beyond this was not published in the audit report due to the low volume. Anecdotally, the total PVC amount is between 1000 and 3000 tonnes per year. The PVC pipe waste is an undetermined proportion of this.

Drivers and benefits

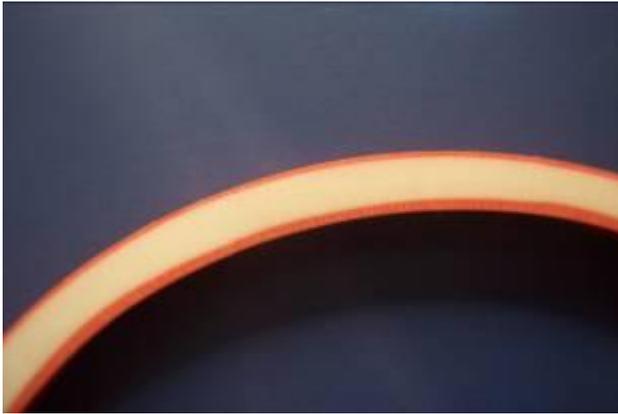
Drivers:

PVC has been a controversial material over many years due to concerns over the toxicity of additives such as plasticisers that give PVC its flexibility and the dioxins produced when PVC is burnt. The main risk of PVC being burnt is in uncontrolled landfill fires when PVC products reach the end of their life cycle. Avoidance of this risk is a driver for recycling and re-use of PVC products. If the material can be extracted from the waste stream before it arrives at landfill, and is re-used, then the potential hazard is eliminated. This is good product stewardship. Regulation and industry self-regulation has been a significant incentive for PVC re-use, such as the Green Building Council of Australia's PVC credits for PVC products that meet best practice guidelines, and other design guidelines that specify standards for PVC products.

The industry continues to strive for best practice, and increasing recycling rates means saving virgin material, a business driver.

Benefits:

- Avoidance of waste from landfill and the commensurate dioxin releases
- Virgin material savings
- The total life cycle for PVC pipe becomes more sustainable



Left: Dissected PVC pipe displaying the brown recycled material (in the middle).

Challenges and solutions

There are low volumes of PVC pipe waste in the waste stream according to the New South Wales Office of Environment and Heritage waste audit figures and subsequent estimates. This low volume creates scale issues for the recycling process. The cost of recycled material is the same as virgin material. This is mostly due to the cost of transporting materials to the recycling facility. The industry needs greater scale or a higher value for PVC to

incentivise more PVC recycling. The industry is working with a small number of recyclers to concentrate volumes into viable quantities.

Ensuring the recycled material is free of contaminants such as dirt and fixings is an issue which is being addressed by industry efforts to source the material before it becomes co-mingled with other building and demolition waste. The use of washing facilities is also being encouraged to deliver a cleaner recycled product to the processors.

Recycled materials are produced from mixed colour PVC pipes, resulting in a brownish colour. PVC pipes are colour-coded for particular applications: water pipes are blue, electrical conduits are orange and stormwater pipes are white. The brownish colour of recycled material makes it most appropriate for multi-layer pipes, where the inside and outside are made from a virgin material and the middle layer is made from recycled material. Multi-layer pipes are more rigid and are used for non-pressure applications, such as electrical conduit pipe.

PVC can be recycled six to seven times. With a product life of 100 years, this means that PVC material could potentially have a lifespan of 600 years. All recycled PVC can be utilised in multi-layer non-pressure pipe. There is an opportunity to raise awareness of the market for waste PVC pipe—PVC pipe can be extracted from the waste stream and have an extended useful life.

Contacts and links

PIPA website:

www.pipa.com.au

Consultation

Mark Heathcote, Technical Marketing Manager, Plastics Industry Pipe Association (PIPA)

George Stavrou, Safety Health and Environment Manager, Vinidex

Photos

Mark Heathcote, Plastics Pipe Industry Association

© Commonwealth of Australia 2011
This work is copyright. You may download, display, print and reproduce this material in unaltered form only (retaining this notice) for your personal, non-commercial use or use within your organisation. Apart from any use as permitted under the Copyright Act 1968, all other rights are reserved. Requests and enquiries concerning reproduction and rights should be addressed to Department of Sustainability, Environment, Water, Populations and Communities, Public Affairs, GPO Box 787 Canberra ACT 2601 or email public.affairs@environment.gov.au

The views and opinions expressed in this publication are those of the authors and do not necessarily reflect those of the Australian Government or the Minister for Sustainability, Environment, Water, Population and Communities.

While reasonable efforts have been made to ensure that the contents of this publication are factually correct, the Commonwealth does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication.

