



Green Building Plastic Pipe in NZ



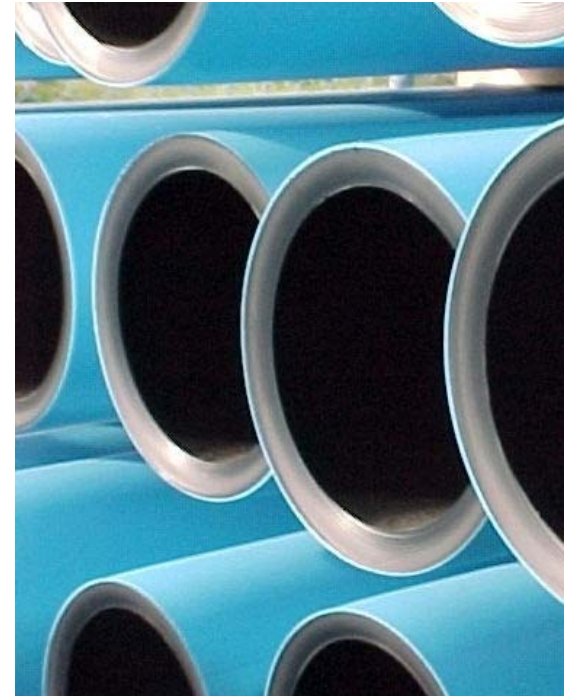
PIPA
New Zealand



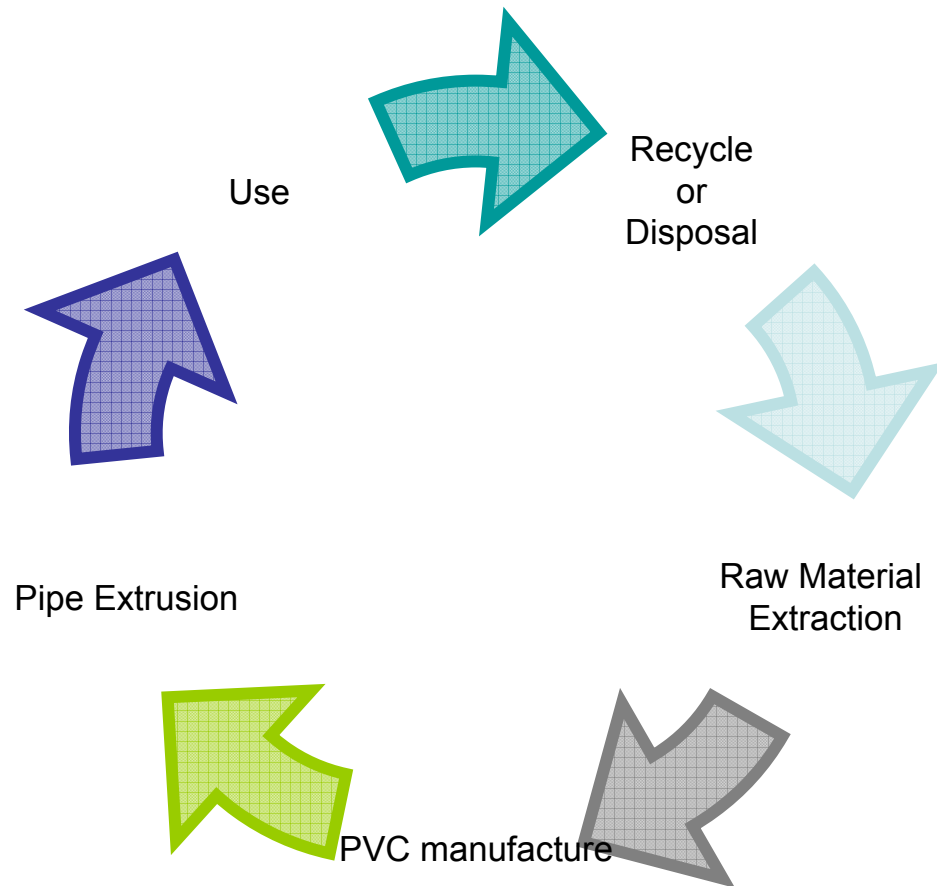
PVC Pipe

This presentation will:

- dispel some of the common myths about PVC
- show you how to use PVC pipe sustainably &
- explain how the NZ green building rating scheme Green Star gives points for plumbing & drainage



Life Cycle Approach



Marley as a Pipe manufacturer now considers each stage of the life cycle of their products through:

- Environmental specifications for suppliers
- Manufacturing efficiencies
- Product design innovations
- Recycling

The Facts: Made in New Zealand

- 3 NZ PVC Pipe Manufacturers, 1 of which is Marley New Zealand Ltd
- >\$300 million pa to NZ economy
- >560 employees
- All have independently accredited and audited quality and Environmental Management Systems
- All comply with AS/NZS Standards - the most stringent in world, with potable water pipe Standards which are tougher than Europe's



In Buildings PVC is most commonly used for non-pressure pipes such as stormwater, gutters and down pipes, waste pipes and sewer pipes.



The Facts: Benefits of PVC

- Strength and durability
- Resistance to corrosion
- Comparative energy efficiency
- Good insulation characteristics
- Resistance to ignition
- Self extinguishing properties
- Lightweight
- Solvent weld capability
- Cost effectiveness in major applications

PVC was invented in 1872 but came into demand after WWII rubber shortages

Rigid PVC irrigation pipe entered the market in the 1950's

The Facts: What is PVC made of?

- Common salt (sodium chloride) & oil
- Salt and water solution is chemically decomposed by electric current producing chlorine
- Oil is refined and cracked to produce ethylene
- Both are combined to produce ethylene dichloride which is cracked to produce vinyl chloride monomer
- Vinyl Chloride Monomer (VCM) is then polymerised to join vinyl chloride molecules together into long chain polymers known as Poly Vinyl Chloride (PVC)



Approx 30,000 tonnes of PVC resin is imported to NZ pa for use in NZ construction products



The Facts

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The Facts: Vinyl Chloride Monomer

- No VCM manufactured in New Zealand
- Residual VCM level is limited to 1ppm by manufacturers (Department of Labour Workplace Exposure Standards 5ppm)
- VCM identified as a carcinogen in 1970's
- Health & safety measures including closed processing methods have eliminated this danger
- VCM is not available or released from pipe during use
- New Best Practice guidelines also include VCM limits





The Facts: PVC Pipe Additives

***Additives are used to ensure performance
e.g. lubricants, heat stabilisers, colorants***

NZ Manufactured PVC Pipe is:

- Free of Lead based stabilisers
- Free of Cadmium based stabilisers
- Plasticiser and phthalate free
- Produced with PVC resin manufactured using a mercury free process
- New Zealand manufacturers of PVC pipe have fully disclosed details of the additives used in their pipes
- Go to www.pipa.org.nz and click on **Environmental** then **PVC Additives** to view
- If you choose to use imported pipe the same cannot be guaranteed.

The Facts: Energy Efficiency

- PVC is approximately 50% hydrocarbon - Uses 50% less fossil fuel than other polymers because over 50% of the feedstock is salt, an abundant resource
- PVC -M and PVC-U 1/4 hydrocarbon content of PE pipeline
- Ductile Iron pipe uses six times more energy than PVC-O (CSIRO)

Key: M = modified O = orientated U =unplasticised

The Facts: Performance & Durability

- 100 year + life expectancy – WSAA, others
- Corrosion free
- Meets AS/NZS4020 'Products for use in contact with drinking water' – rigorous standard
- Better performance than Ductile Iron and Clay – CSIRO
- Resistant to penetration from tree roots - CSIRO



*Our customers need to
keep fit to last as long as
our pipes*

The Facts: Dioxin

- **PVC does NOT contain dioxin**
- Produced when chlorine containing compounds burnt
- Burning PVC can produce dioxins from combustion of chlorine containing compounds
- PVC is inherently resistant to ignition and has self extinguishing properties
- 60% NZ dioxin emissions to air from industrial and landfill emissions balance from domestic fires, accidental building fires and bush fires (MfE)

More info: www.mfe.govt.nz/issues/hazardous/contaminated/dioxin-faq/.

US Green Building Council Report – cites accidental landfill fires & backyard burning as major issues for PVC.

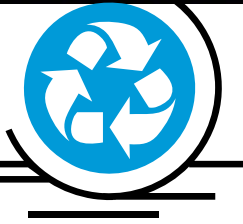
** Risk of landfill fires is*

appropriately controlled and managed in NZ

** Most NZ Councils do not permit outdoor burning*



The Facts: PVC Pipe Recycling



- PVC is thermoplastic – softens when heated – and is easily recycled
- All NZ manufacturers waste is recycled (2,247 tonnes in 2006 (PNZ))
- Installation off cuts and suppliers waste is able to be recycled
- PVC pipe recycling is available in Auckland, Palmerston North & Ashburton and through selected retailers/waste companies
- PVC manufacturers will take back pipe after inspection – the pipe needs to be clean as it is reground for re-use
- Post consumer rigid PVC is recycled into pipe
 - Sandwich pipe and conduits ideal
 - Provides opportunity to recycle larger volumes in future as volume of recyclate increases
- Drain Waste and Vent (DWV), conduit, and stormwater pipe could be major users of recyclate
- Current maximum content specified in DWV standards 15%

Tip: PVC and other plastic pipe can be hard to sort – contact your PVC pipe manufacturer for more information about pipe recycling – most will accept both kinds in the same bin

Marley PVC Recycling

- Trials:
 - Waste Management Auckland
 - Selected plumbing suppliers
- Australian experience shows low volumes in waste stream - 0.0025% construction waste
- Equivalent to ≈ 2050 t pa in NZ
- Equates to only 6.8% of annual production
- Combination of waste minimisation during installation and recycling of waste will take this figure to negligible levels

Tip: Our recycling trial showed plumbers & drain layers are throwing out 3 – 5 metre lengths, reuse these to avoid unnecessary costs



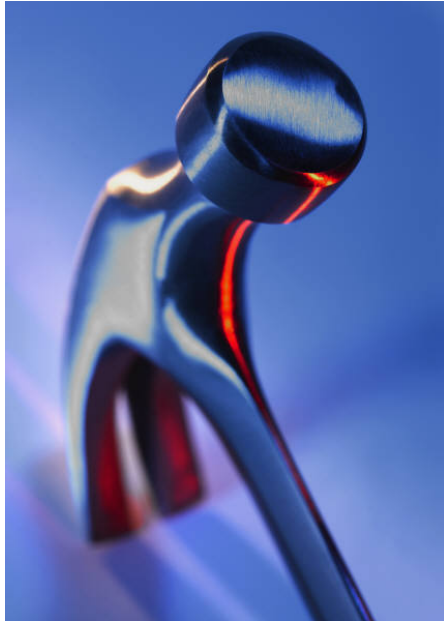
Green Star: PVC Pipe



- New Zealand Green Building Council www.nzgbc.org.nz
- NZ green building rating tool – based on Australian version
- Includes points for reducing PVC usage – only rating tool in world to take this position – now changing to positive points for PVC products which meet best environmental practice
- Positive rating emissions reductions & water efficiencies
- NZ government is using for office buildings & now schools

Green Building Tools are enjoying rapid global growth – they are used as a vehicle for market transformation – designed to focus on top 25% market leaders

Green Star: How it works



- Audit
- Points gained: *management, contractual obligations, indoor air quality, energy, transport, water, materials, land use & ecology, emissions, innovation*
- Materials equates to 10 - 26% available, main weighting energy or indoor air quality or interiors
- Ratings: 4* *Best Practice*, 5* *NZ Excellence*, 6* *World Leadership*

Green Building Council Review

- Australian Green Building Council has just completed a review of their PVC Materials Credit & recommended adoption of a new clause which encourages *best practice life cycle management of the major applications of PVC in the built environment*
- Requires compliance with a Best Practice Guideline and audit and certification as proof of this
- The criteria relate to the full life cycle of PVC product from raw material supply, to manufacture, and disposal.
- The New Zealand Green Building Council is also likely to adopt these changes within next 12months

What you will need: copy of Best Practice audit certification and a recycling contract

Gaining Green Star Points with Pipe

- Download the assessment tools at www.nzgbc.org.nz
- Tools for Office, Industrial, Education & Interiors also a non-Green Star Residential tool under development
- Water efficiency work can double use of pipe/plumbers within a building
- Will soon be able to get points by using NZ made PVC which complies with Best Practice requirements
- Products used for rain water collection, grey water recycling, water detention and storage, or metering and monitoring gain positive points:
 - EMISSIONS 4: Watercourse Pollution (2pts)
 - EMISSIONS 5: Reduced Flow to Sewer (4pts)
 - WATER 1: Occupant Amenity Potable Water Efficiency (5 pts)
 - WATER 2: Water Meters (2 pts)
 - WATER 3: Landscape Irrigation Water Efficiency (1 pt)

Tip: *There are also one off innovation points available – these are tough to obtain – but could provide excellent PR*

NZ Infrastructure Water & Waste Trends

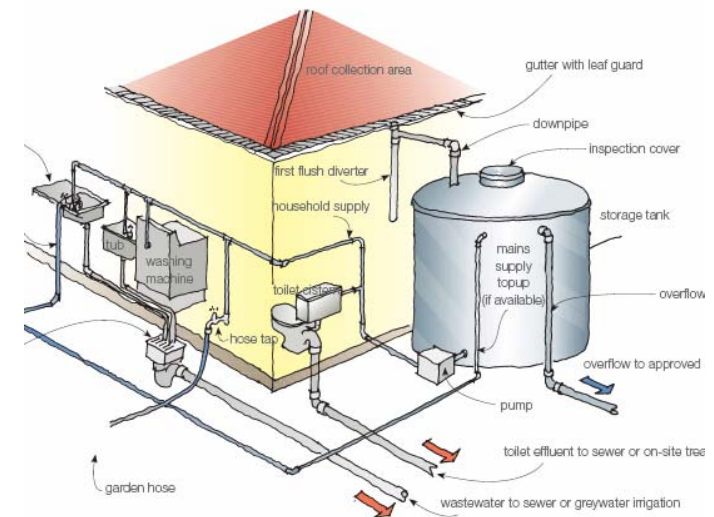
- Under investment in infrastructure
- Capacity issues
- Stormwater Detention
- Climate Change – impacts rainfall – storm events
- Water distribution & allocation mechanisms
- Landscaping / irrigation
- Water efficient appliances
- Grey water recycling
- Regulatory/health barriers to solutions
- Return to open-water systems
- Water usage monitoring
- Increasing water and waste charges



Tip: *Can you offer your customers complete systems which meet Green Star requirements?*

Sustainable Use of PVC Pipe: Your Role

1. Specify to minimise wastage
2. Configure service areas in same area of building
3. Complement with water & energy efficient fixtures, fittings & appliances
4. Use to install options for rain water recovery, grey water recycling, monitored irrigation www.level.org.nz
5. Arrange recycling of all offcuts during construction and any demolition
6. Become a GreenPlumber



Schematic sourced from www.level.org.nz

Challenge: Start thinking about your business in terms of the holistic solutions/systems you can offer for improving water efficiency. GreenPlumber provides you with the skills and knowledge you need.

NZ's PVC Pipe is:

- NZ made by environmentally responsible companies
- Fully recyclable
- Low in embodied energy
- Durable and effective
- Lead free
- Cadmium Free
- Plasticiser Free
- Mercury Free
- Will soon be recognised with points through Green Star





Contacts & Links

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www.pipa.org.nz

- www.plastics.org.nz
- www.pipa.com.au
- www.gbca.org.au/green-star/materials-category/pvc-minimisation-credit-review/2716.htm
- www.nzgbc.org.nz
- www.vinyl.com.au
- www.mfe.govt.nz
- www.smarterhomes.org.nz/water/
- www.level.org.nz
- www.rebri.org.nz
- www.marley.co.nz