

# Are we accelerating into the wall?

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## Why talk about chemicals in fashion?

- Synthetic fibres dominate global and Australian markets.
- Chemical additives such as flame retardants, PFAS, phthalates, dyes, and antimicrobials are used in these garments, but their use is often undisclosed and inconsistently regulated.
- These chemicals pose risks for human health and environmental safety.



## Why this matters in Australia

- Australians are among the world's largest consumers of clothing.
- Chemical contaminants in synthetic garments may persist, change form, accumulate or be released.
- There is a need to manage chemical risks in garments to avoid their indefinite circulation.



## About our project *Testing Toxic Textiles*

- This work is funded by the NSW Environmental Protection Authority Plastics Research Fund.
- Collaboration at UTS between the Institute for Sustainable Futures & the Climate Change Cluster.
- Investigating the presence and persistence of harmful chemicals in new and recycled plastic-based textiles.



## The scale of the issue

- Synthetics account for approx. 70% of textiles globally, and over 80% in ultra-fast fashion.
- Ultra-fast fashion has accelerated production with low costs, minimal oversight, and rapid turnover.
- Research has found hazardous chemicals in garments, including children's clothing, exceeding legal safety limits.



90mg/kg

Health  
Canada

Levels of Lead Found

1702.5mg/kg

## What are we testing?

- 50 garments were sampled, including new, recycled content, and second-hand.
- Categories include children's wear, basics, uniforms, and activewear.
- Samples are collected systematically, pre-treated, and screened to establish baseline composition before chemical analysis.



# What are we looking for?

- We are looking for a range of potential contaminants, including:
  - flame retardants
  - UV stabilisers
  - Legacy chemicals
  - Use-related contamination
- Applying high-sensitivity methods (GC-MS, FTIR, ICP-MS) to build chemical profiles by garment type.



## Preliminary findings

- Children's clothing has exceeded legal lead limits.
- Flame retardants are common in everyday items.
- Antimony is consistently present across samples.
- Recycled polyester garments show signs of legacy contamination.
- Raises questions about chemical accumulation, persistence, and transparency.



## Implications for circularity

- Chemical contamination risks undermining recyclability, fibre quality, and safe reuse.
- Unknown inputs create unpredictable risks, increase the burden for recyclers, and weaken trust in outputs.
- Implications span design, brand responsibility, and the need for proactive rather than reactive regulation.



## We can't underestimate complexity

- Garment design adds potential physical barriers for recycling.
- A recent study found that less than 2% of textiles are suitable for fibre-to-fibre recycling, and over one-third are likely to be incinerated.
- We need to treat recyclability not as a downstream problem, but a design and policy challenge.



## What's next

- Complete testing and conduct comprehensive risk assessments.
- Engage industry stakeholders and policymakers with evidence-based findings.
- Share recommendations and resources through reports, webinars, and outreach.



## Are we accelerating into a wall?

- Many garments contain hazardous substances, lack transparency, and are sold at scale with little accountability.
- Australia's reactive approach creates a further barrier.
- Better data, stronger regulation, and interdisciplinary collaboration are key.



# Thank you!

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