
RESEARCH WHITEPAPER

Filtration Technology & Research Studies

Powered by Advanced Engineering
& University Research Partnerships

R&D Collaborations & Scientific Validations

AUSTRALIAN WATER. ENGINEERED PROTECTION.

puretapaustralia.com.au

info@puretapaustralia.com.au | 0433 236 236

WHITEPAPER OVERVIEW

Contents

Executive summary	02
01 Advanced filtration materials	03
02 Cartridge hydrodynamics	04
03 Redox media chemistry	05
04 UV pathogen sterilisation	06
Product safeguards & brand commitment	07

Executive Summary

At PureTap Australia, we deliver healthy, clean, and crystal-clear water directly to Australian households and businesses. Our filtration systems are built on validated Australian scientific research, developed in close engineering collaboration with leading Australian academic research institutions including UNSW Sydney and Curtin University.

All laboratory evaluations and performance validations are conducted through NATA-certified laboratories to ensure rigorous, unbiased water treatment standards tailored to local municipal water profiles.

Source note: Prepared from the supplied PureTap Australia research summary. University affiliations, laboratory validations and performance claims are reproduced as provided; supporting study citations and laboratory reports were not included in the source.

STUDY 01

Advanced Filtration Materials

Emerging contaminants: PFAS, nitrates & heavy metals

Research Institution	School of Chemical Engineering, University of New South Wales (UNSW Sydney)
Lead Engineering & Industry Partner	PureTap Australia
Research Focus	Targeted elimination of PFAS ("forever chemicals"), nitrates, and heavy metals
Year	2025

Background & Objective

Per- and polyfluoroalkyl substances (PFAS, PFOS, PFOA) represent one of the most persistent and critical drinking water challenges across Australia. Traditional mechanical sediment filters and basic carbon filters lack the binding affinity to consistently intercept microscopic fluorinated surfactant molecules and dissolved heavy metals.

Key Findings & Engineering Outcomes

- **Enhanced Adsorption Media:** Evaluated multi-composite filtration media that combine high-density activated carbon block matrices with targeted ion-exchange properties.
- **PFAS Removal Efficacy:** Demonstrates high-efficiency capture of long-chain and short-chain perfluoroalkyl compounds down to parts-per-trillion (ppt) thresholds compliant with National Health and Medical Research Council (NHMRC) guidelines.
- **Heavy Metal Chelation:** Accelerated catalytic reduction and sorption for lead, copper, cadmium, and arsenic, preventing household pipe leaching from entering tap water.
- **PureTap Implementation:** Directly integrated into PureTap Australia's whole-home and benchtop core filtration cartridges.

STUDY 02

Filter Cartridge Hydrodynamics

Multi-stage optimisation

Research Institution	Faculty of Science and Engineering, Curtin University
Lead Engineering & Industry Partner	PureTap Australia
Research Focus	Cartridge test protocols, pressure drop reduction, and water quality monitoring
Year	2024

Background & Objective

Domestic and commercial water filters often suffer from uneven channel flow, premature clogging, or severe water pressure degradation in high-flow household fixtures. This project benchmarked hydraulic flow characteristics and filter medium packing density under variable Australian water pressure conditions.

Key Findings & Engineering Outcomes

- **Channeling Prevention:** Redesigned interior cartridge fluid dynamics to eliminate bypass channels, guaranteeing 100% of water passes through the active media beds.
- **Extended Service Life:** Optimised staged micron gradients (coarse sediment pre-filtration down to sub-micron blocks), extending cartridge life by up to 35% without flow restriction.
- **Continuous Monitoring Compatibility:** Standardised performance metrics for domestic and commercial real-time water quality monitoring apparatus.
- **PureTap Implementation:** PureTap systems maintain full household water pressure while delivering consistent multi-stage purification across showers, kitchens, and appliances.

STUDY 03

Redox Media Chemistry

KDF-55 & KDF-85 pre-treatment

Engineering Focus	Copper-Zinc Kinetic Degradation Fluxion (KDF) synergy
Target Compounds	Free Chlorine, Chloramines, Hydrogen Sulfide, Dissolved Heavy Metals

Key Findings & Outcomes

- Utilises electrolytic oxidation-reduction (redox) reactions where electrons are transferred to convert soluble chlorine into harmless, water-soluble chloride ions.
- Forms a bacteriostatic environment within the filter housing, inhibiting microbial growth, algae, and biofilm accumulation even during periods of non-use.
- Protects downstream sub-micron carbon blocks from chlorine degradation, dramatically extending overall system longevity.

STUDY 04

Ultraviolet (UV) Pathogen Sterilisation & Photon Kinetics

Engineering Focus	Germicidal UV-C wavelength (254 nm) disinfection
Target Organisms	Bacteria (E. coli, Legionella), Giardia, Cryptosporidium cysts, and viruses

Key Findings & Outcomes

- Evaluates fluid residence time and irradiance dosage (mJ/cm^2) required to disrupt microbial DNA/RNA bonds.
- Achieves verified 99.99% microbial inactivation without introducing chemical additives, disinfection by-products (DBPs), or altering natural water taste.
- Applied across PureTap Australia's premium UV-integrated benchtop and point-of-entry purification units.

TECHNOLOGY AT A GLANCE

Product Safeguards

Summary of PureTap Australia Product Safeguards

Contaminant Category	Target Compounds	Validated Technology	University / Lab Partner
Emerging Chemicals	PFAS, PFOS, PFOA	High-density specialized composite carbon blocks	UNSW Sydney & NATA Labs
Disinfection Agents	Chlorine, Chloramines, THMs	Catalytic Carbon & KDF Redox media	Curtin University & PureTap Australia R&D
Heavy Metals	Lead, Copper, Mercury, Arsenic	Kinetic reduction fluxion & ion-exchange matrix	UNSW School of Chemical Engineering
Microorganisms	Bacteria, Viruses, Cysts	UV-C germicidal sterilisation & sub-micron barriers	PureTap Australia Technical Facility
Physical Sediments	Microplastics, Rust, Silt	Multi-gradient sediment pre-filters	Curtin University Faculty of Science

PureTap Australia Brand Commitment

Through our dedicated research and engineering initiatives, PureTap Australia bridges world-class university scientific discovery with accessible home water wellness.

- **Tailored for Australian Water:** Designed specifically for Australian water conditions, chloramine profiles, and regional mineral hardness.
- **Independently Validated:** Rigorously tested with NATA-certified analytical benchmarks.
- **Reliable Home Protection:** Premium pure water across every tap in your home.