

# PLUMBING CONNECTION

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WINTER 2017



## A WEIGHTY ISSUE

**Lead contamination in  
premises water supply**

**+ INSIDE:**

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AUSTRALIA'S NO. 1

## COVER STORY

**12 LIKE A LEAD BALLOON**

Despite the acknowledged health hazards of lead in drinking water, Australian homes and workplaces continue to be blighted by this scourge, mostly via lead leached from brass tapware and related fittings.



## FEATURES

**22 ISH 2017 WRAP-UP**

The world's biggest showcase for innovative bathroom design, energy efficient heating and air-conditioning technology and renewable energies has been and gone for another year.

**38 EBBS AND FLOWS**

WELS has had a significant impact on the plumbing supply sector, but is it enough to ensure ongoing compliance with Standards? Terry Nguyen reports.

**58 WHEN I'M 64**

Ever complained about feeling old? Julyan Sumner will be 68 when he completes his plumbing apprenticeship and says his age has been nothing but an advantage.

**68 TESTING TIMES**

A consortium of industry heavyweights, including the Stormwater Research Group, has redefined the testing mechanism for balcony and roof drains.

**72 BACK TO BACK... FLOW**

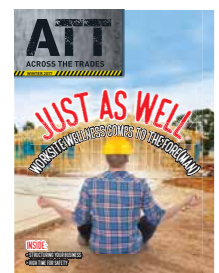
Backflow Prevention Association of Australia president Peter McLennan outlines everything you need to know if and when you are considering the use of an RPZ.

## REGULARS

- 06** Editorial
- 10** Industry News
- 60** ABCB
- 88** New Products
- 113** Trade Stuff

**ATT**  
ACROSS THE TRADES

- 90** Tips
- 102** Tools
- 104** Transport



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## LOOK MA, I'M ON TV

Over the years, Nine Network's *A Current Affair* has focused on the plumbing industry on numerous occasions, though not as frequently perhaps as fad diets and push-up bras.

And it hasn't been all good news either.

This industry seems to be forever maligned by reporters – and their viewers – who see us in a very stereotypical way.

Overcharging, poor workmanship, noisy utes and bum cracks often sum up the public profile of this industry, and that's damaging in so many ways. The reality is that 98% of this industry goes about its business every day, protecting the nation's water supply and community health.

But you can't really blame Tracy Grimshaw and her producers; that other 2% keeps delivering them juicy stories – irate consumers mixed with a few profanities and tears.

Aren't we just the industry that keeps on giving?

Viewers are regularly told they are paying exorbitant hourly fees

for plumbing services; however, you never hear complaints about the local physio giving you a 30 minute rub and creaming for \$75.

### THE MIFSUD FILES

Late last year, plumber extraordinaire Jordan Mifsud hit TV screens across the nation.

If the *A Current Affair* story is correct, if ever there was a bloke that needed to be banned from the plumbing industry then this is the guy. He appears to have caused untold damage to the image of this industry and to date nobody seems capable of stopping him.

Mifsud used to run a suburban business in Melbourne called QBH Plumbing. When his notorious behaviour was exposed by Channel 9, he did a phoenix job and changed his business name to Lightning Drains quick smart.

Channel 9 says they had been on his tail for a while. They claimed he specialised in digging up Melbourne backyards using his 'investigative' skills to 'solve' common sewer

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blockages. But consumers could have bought a new family SUV or put a deposit on a home for the same price as a few days of Mifsud's work.

Then Mifsud met an unsuspecting senior citizen with a blocked toilet.

Older people can often be vulnerable to tradesmen and door-to-door salesmen, but Mifsud supposedly took things to a new level by charging \$230,000 for a blocked toilet [yes, you read that right].

As the reporter said: "To Jordan these aren't backyards, they are gold mines..."

Previously, Mifsud had charged \$20,000, \$30,000, \$40,000 or more. But would you believe an eye-watering \$230,000 for a blocked toilet? That would even be unbelievable to Maxwell Smart.

The 70-year-old semi-retired postie had to dig into his superannuation as well as take out a \$50,000 loan to pay the bill. And the result was a backyard that resembled the early gold fields at Ballarat.

Mifsud's arrogant cowboy response to the reporter's questions about overcharging and taking vulnerable people for a ride clearly demonstrated that authorities need to be on the front-foot, taking action against such miscreants.

But that doesn't happen over-night.

In Victoria, if someone has a complaint about regulated plumbing work [e.g. poor installation, damage to property, etc.] it falls within the jurisdiction of the Victorian Building Authority [VBA]. It is likely the same with similar bodies in most states.

However, if there is a challenge to a business practice [e.g. unscrupulous conduct, significant over-charging] then it will generally fall under the purview of a Corporate Affairs Department.

Cue the dodging and weaving.

In the UK, a Birmingham court recently locked up a team of plumbers who charged over £5,000 to unblock a toilet. Two plumbers turned up at the resident's home in Rugby and charged a rate of £672 per hour + VAT to unblock the toilet.

They returned the following day to do non-emergency work on a soil pipe at the property, where an emergency rate was again charged.

The total cost for 'unblocking' the toilet came to £5,642, of which £2,474 was paid before Warwickshire County Council Training Standards was alerted and intervened.

When on trial, company director Duane Linton pleaded guilty to fraud by false representation and was jailed for two years and eight months. Subcontractors Chris Wray of Birmingham was jailed for nine months, Peter Hawkins of Kings Norton was jailed for 16 months and Patrick Thawe, also from Birmingham, was sentenced to 20 months in jail.



Back in Australia, there is no transparency with Corporate Affairs Departments during an investigation, so things can proceed pretty much as 'normal' and no public comment is made.

For now, we'll have to get by with updates from the likes of *A Current Affair*.

Enjoy the read,

*Jeff Patchell*  
Jeff Patchell



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### ZIP INDUSTRIES CONSIDERS FLOAT ON ASX

Zip Industries is considering a float on the Australian Stock Exchange (ASX) valued at \$500m based on a 20-25 times profit.

Known for developing single tap systems that deliver boiling and chilled water, Sydney-based Zip Industries had the majority of its equity purchased by Quadrant Private Equity in 2013.

The Zip systems are now in 70% of workplaces in New Zealand and the company has enjoyed sales growth of 10% per year. It has annual revenues of over \$200m a year and the opportunity to expand on its success in Asia, Europe and the Middle East.

Zip Industries is also making headway in the residential market and has made a big push into the retail industry.

Plumbing sector industrial stocks are becoming favourites with stock brokers due to their performance in markets that are growing at a steady pace. Zip will follow Reliance Worldwide Connection's (RWC) successful ASX float last year and the much sought after Reece shares, which have been long-time excellent performers delivering their shareholders a steady return.



### WGE ACQUIRES LHO GROUP

Wood & Grieve Engineers (WGE) has acquired LHO Group to expand the hydraulics services team within the company's Sydney office.

LHO Group is one of the leading specialists in hydraulics and fire design, and for 50 years it's been at the forefront of the hydraulics industry in Australia. The company has been involved in iconic projects across the country, including the Sydney Opera House, the Brisbane International Airport, Parliament House in Canberra, the Sydney 2000 Olympic aquatic centre and the Queensland and Sydney conservatoriums of music.

The current team has extensive experience across all aspects of hydraulic services design on projects across NSW and will continue servicing existing clients with the additional support of the WGE hydraulics division.

WGE Sydney office manager Joseph Walsh says the team from LHO Group will strengthen WGE's offering in the Sydney market.

"We are seeing some very exciting projects in the pipeline for Sydney and NSW, and we have taken the opportunity to expand our hydraulics group. LHO Group is highly respected and we are very excited to welcome the team," he says.

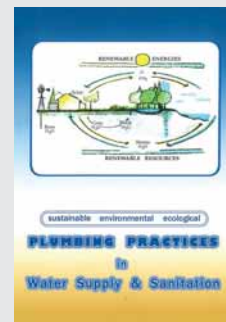
### AUSTRALIAN PERSPECTIVE ON SANITARY SCIENCE PUBLISHED

A new handbook that takes on an Australian perspective in the specialised field of sanitary science has been published by John Dnistriansky. Sustainable Environmental Ecological Plumbing Practices in Water Supply and Sanitation is composed of well-researched information based on current and recognised practices, principles and procedures for the plumbing industry.

John was previously a TAFE lecturer, mentor, RPL examiner, technical writer and author. He has taught in various programs, including plumbing, ranging from basic trade to diploma levels for 30 years of his working life.

The publication has been primarily written for the plumbing industry, in particular for plumbing practitioners, consultants, equipment specifiers and suppliers, as well as water treatment and allied industries. It contains 22 relevant topic headings, with the majority addressing modern plumbing practices, products and technologies that deliver sustainable solutions to the twin services of water supply and sewage disposal.

The publication can be purchased for \$30 plus postage.



For more information or to purchase a copy, please contact John Dnistriansky at (08) 8336 3856 or email [pump\\_imp@bigpond.com](mailto:pump_imp@bigpond.com).

### 'SUPER SEWER' TO CLEAN UP THAMES RIVER

A massive 25km-long overflow pipe, called the Tideway Tunnel, is being built deep beneath the Thames River in London to stop tonnes of filth flowing into the river each year.

Nicknamed the 'super sewer', the Tideway Tunnel will store diluted sewage and will only ever flow into the river after three days of solid rain.

It was designed to ease pressure on the overwhelmed London sewage system, which was built in the 19th century. Once considered an engineering marvel that helped rid cholera from the city, the sewers were built to cater for two million people and now service eight million, resulting in regular overflow.

Labour politicians have criticised the \$7bn Tideway as too expensive and unnecessary but those building the tunnel claim the costs will only add an extra \$42 per year to water bills for most customers. They argue this is a small amount to pay for a Thames River free of sewage and cleaner than it's been in 150 years.

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# LEAD IN DRINKING WATER: UP TO 720,000 HOMES AFFECTED

DESPITE THE ACKNOWLEDGED HEALTH HAZARDS OF LEAD IN DRINKING WATER, AUSTRALIAN HOMES AND WORKPLACES CONTINUE TO BE BLIGHTED BY THIS SCOURGE, MOSTLY VIA LEAD LEACHED FROM BRASS TAPWARE AND RELATED FITTINGS. **JOHN POWER** REPORTS.



Elizabeth O'Brien, co-founder and president of The LEAD Group, says unsafe levels of lead in household drinking water must not be tolerated. [Photo: Peter Kozaitis.]

**L**ead is a neurotoxic metal that causes lifelong debilitating effects, and yet its presence in Australian household drinking water is widespread. While there is clear evidence dating back many decades of a massive problem, the precise extent of the hazard is unknown, as [incredibly] there are no systematised water testing processes at the customer side of street mains to produce comprehensive data on the subject.

There are no 'safe' levels of lead ingestion; worryingly, lead is most harmful to humans at the developmental stages of childhood.

In this article we'll examine the current regulatory frameworks designed to protect Australians from exposure to harmful levels of lead in household drinking water, and attempt to identify weaknesses in the methodologies, applications and enforcement processes underpinning these regulations. Finally, we'll address ideas – some of

them radical – to overcome this problem in the interests of community health.

## UP TO 8% OF HOMES AFFECTED

Last year, two significant events shone a spotlight on unsafe lead levels in potable water: the first was a Macquarie University study that, for the first time, tested lead levels in water consumed in a broad cross-section of homes in New South Wales. Tests involved the sampling of first-draw water in the morning, when water had been in contact with fittings overnight. The study involved the sampling of potable water drawn from the kitchen taps of 212 homes across the entire State, and detected lead in 56% of samples; some 8% of the total test samples exceeded recommended lead thresholds of 0.01mg/L of water, as stipulated in the Federal Government-approved advisory document *Australian Drinking Water Guidelines*. A straightforward extrapolation

of the findings at a national scale, based on Australia's nine million dwellings, equates to approximately 720,000 households with unsafe levels of lead in their drinking water.

Importantly, the study provides scientific evidence that, notwithstanding possible additional, alternative or zonal lead contamination from roof flashing, pumps, water tanks, pipework, tainted soil, etc, the primary problem can be attributed to lead leaching from tapware and associated fittings: 'The case studies [Phase 2] show that the likely source of drinking water lead contamination is the components within the internal property plumbing,' the study report states. NB: there is no suggestion that elevated lead levels in water can be blamed on civic water supply lines, which are monitored routinely for purity and safety. The problem, it is worth repeating, lies with plumbing systems within homes, with the worst culprits in the Macquarie study being taps less than one year old.

The second event was the announcement that the newly constructed Perth Children's Hospital could not open due to the detection of unsafe lead levels in the building's drinking water. At the time of going to print the hospital remains closed, and the source of the contamination has not been identified.

Both of these events have highlighted an unacceptable public and professional ignorance of the prevalence of high lead content in the drinking water of buildings, reminding the plumbing industry in the most painful fashion that a problem ignored is not a problem solved.

At present there are no systematised checks of lead levels in water [drawn from the tap] in Australian buildings. This observation forms a good starting point for the obvious question: What checks and balances, if any, do exist to tackle the issue of lead in drinking water?

On the face of it, formal regulatory frameworks would appear to be robust and comprehensive. All plumbing products that come into contact with potable water must be certified under Australia's national mandatory WaterMark scheme, which itself requires compliance with a range of supposedly rigorous quality assurance protocols and laboratory checks defined under relevant Standards such as AS/NZS 4020 and AS 3718. Products that adhere to full WaterMark provisions and constituent standards 'to the letter' should release sub-threshold levels of lead [ $<0.01\text{mg/L}$  in normal circumstances and conditions]. Nevertheless, the presence of lead in Perth Children's Hospital, combined ➤

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with the disturbing findings of the abovementioned study and previous smaller studies, demonstrate that current quality assurance processes are far from bulletproof. So, where are current systems breaking down?

#### **INNATE PROCEDURAL WEAKNESSES**

Non-WaterMarked products, manufactured and imported without any WaterMark certification whatsoever, may be sold legally in Australia – though the installation of such products is not permitted. In fact, a plumber can be charged for installing a non-compliant product, even if another party actually sourced the product. While such potentially non-compliant products are freely available in mainstream stores and via online retail portals, the true extent of their use in Australian homes is unknown. By all accounts the Water Efficiency Labelling Scheme (WELS) regulator says it is actively pursuing online and retail miscreants. Nevertheless, it would be ludicrous to suggest that all problematic fittings are non-WaterMarked items, clandestinely installed by lawless plumbers or consumers. On the contrary, common sense indicates that significant numbers of WaterMarked products are responsible for a proportion of excessive lead leaching from tapware.

The WaterMark certification process itself, which is administered by the Australian Building Codes Board (ABCB) and implemented through a number of Conformity

Assessment Bodies (CABs), as approved by JAS-ANZ (Joint Accreditation System of Australia and New Zealand), contains innate procedural weaknesses, according to a number of industry professionals.

Product certification under the WaterMark scheme, which is currently subject to revision (updated version due for release 1 July 2017), is essentially a materials-based assessment based on submitted sample products and accompanying scientific test reports, followed by supposed scrutiny of products via ongoing sampling, as well as annual examinations of manufacturing premises and processes (shortly to become five-year intervals under the revised version). However, following initial certification, a number of variables can affect the integrity of subsequent product batches or even permanent production runs, rapidly diminishing the value of the certification. These variables include [a] changes to the supply chain, affecting the quality or type of raw materials used during manufacturing processes; [b] substandard or erratic process control within the factory; [c] questionable test reports (many with a five-year validity), which may bear little relevance to evolving product characteristics in the market; and [d] inadequate or insufficiently regular (unpublished) product sampling and assessment.

These concerns may have been less pressing generations ago when there was a higher level of local manufacturing ➤



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activity, as supported by entrenched, linear and transparent supply chains. These days, however, there are some Australian supply companies who have never even seen the offshore facilities where their products are made, and who have scant understanding of the complex, dynamic and remote supply chains that service them.

Richard Michaels, the managing director of Zetco Group and the president of the Plumbing Products Industry Group (PPIG), says WaterMark certification should definitely be more robust to help curtail excessive lead levels in fittings.

"When a manufacturer submits a product for testing there is no doubt in my mind the product will meet all the [WaterMark] requirements – it's what happens afterwards that is the issue," Richard says.

For example, Richard says the use of Dezincification Resistant (DZR) brass, which is recommended for brass used to manufacture high-quality tap fittings, is visually indistinguishable from non-DZR material. In the absence of regular product testing, it is tempting for unscrupulous manufacturers to use non-DZR brass, which is [a] cheaper to purchase, [b] easier to machine or hot press and [c] provides 15%–20% more hits in a die [i.e. significantly larger production runs] compared with more resilient DZR brass, which is much harder on tools.

"Over the years we have come across brass in 3" valves made by our competitors – and the brass wasn't DZR!"

Another practical factor to consider, Richard notes, is that new brass supplies are typically composed of a mixture of virgin material and scrap. It is therefore important that the quality of the brass scrap be monitored by the manufacturing organization to ensure lead content does not exceed the required levels. As a quality control measure during manufacture, DZR brass swarf is not supposed to be intermixed with non-DZR brass swarf.

"And we have had cases where products coming in from our neighbours to the north have had far too much lead in them because they have bought very bad scrap or their controls are very poor," Richard explains.

Further, he says mechanisms designed to monitor and ensure premium factory processes are hardly reliable: "In order to get a WaterMark a factory has to get ISO 9000 accreditation," he explains.

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"Despite this, we just had a major company who shall remain nameless having to remove a full range of DZR ball valves because they didn't comply! In this day and age!"

#### FULL OVERHAUL REQUIRED

While these kinds of day-to-day instances of WaterMark breaches are alarming, there are some critics who say the entire certification and regulation system needs reworking.

Elizabeth O'Brien is the co-founder and president of the registered charity organisation The Lead Education & Abatement Design Group (aka The LEAD Group). She has been campaigning for a lead-free living environment for almost 30 years.

Her voluntary efforts have been directly instrumental in the removal of lead petrol and paint, for example, from the Australian market, and her work has been recognised with a United Nations Association of Australia Award for Outstanding Service to the Environment.

According to Elizabeth, any domestic assessment of water quality must commence with an examination of what comes out of the tap, rather than relying on stand-alone product-based certifications.

"At present there is no requirement on anybody to test water at the tap, and there should be," Elizabeth says.

"And if there were then a) we could do a baseline of what percentage of Australian homes have too much lead in their water at the tap, and b) we would know which plumbing products, particularly new ones, were to be taken off the market."

Further, Elizabeth says existing WaterMark certifications lack credibility because they fail to address 'full system' plumbing installations. In other words, fittings or components that receive certification 'individually' might breach water quality guidelines when installed collectively as a system.

Metropolis Solutions director and forensic plumber Russell Kirkwood agrees that this concern is legitimate, particularly in relation to larger buildings, where lead concentrations in fittings become elevated overnight, in particular, due to prolonged contact between still water and surrounding fittings. This point reinforces the dangers of using first-draw water in the morning, as noted above in relation to the Macquarie University study. NB: thorough flushing is by no means a panacea, and cannot be relied upon to mitigate lead leaching in all circumstances.

"In larger apartment blocks you have a lot more water sitting in the building than you do in a single house," he says.

"So, if you have an apartment block with 90 premises in it – and I went to one the other day in Docklands [Melbourne] with 460 – there's a lot of water just sitting there in that building in contact with whatever brassware the plumbers have put into that building. Now, that water was fine when it passed through the meter, but once it enters a customer's piping system it is the water seller's

problem no more. It's passed through the property's main meter, it's been sold, it's passed through POS [point of sale] which is at the meter, so who knows what's in that building?"

Given the difficulties of assessing 'full system' plumbing installations, Elizabeth says the only logical solution is to reduce the amount of lead in fittings "to undetectable levels". She believes the ADWG threshold of 0.01mg/L is too high, and should be reduced by a factor of 10 to 0.001mg/L. This call would appear to be feasible in practice based on the findings of the Macquarie University study, which recorded average detectable lead content levels in tested fittings of 2.84%, roughly 10 times the permitted levels in the US. Since January 2014, American regulations have stipulated that lead content of fittings in contact with potable water must not exceed 0.25%. If the Americans can produce low-lead fittings, then surely we can do the same. In fact, both Elizabeth and Russell agree that our local plumbing industry's goal should be non-detectable lead levels in all plumbing fittings.

As Russell says, "If the technology exists to rid the world of lead in drinking water systems, then that should

be where we are going. If you say there is lead-free product, then there should be incentives for everyone to use it."

#### SOLUTIONS – THE WAY FORWARD

There are many initiatives, some more obvious than others, which could help reduce or remove lead from Australian drinking water:

#### REDUCE LEAD CONTENT

Australia's regulatory systems have a long history of adopting US models. As discussed above, the new benchmark of 0.25% maximal lead content in plumbing fittings contacting potable water now applies in all US States. The same policy could be enacted in Australia as a means of minimising primary lead exposure 'at the source', much as lead removal from paint and petrol simplified the challenge of cleaning up those industries.

#### POINT OF SALE (POS)

While much of this article has focused on ways of tightening WaterMark-certified product, we must not



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forget the presence of non-WaterMarked product in the marketplace, which should be banned outright. There are few realistic uses for kitchen or bathroom taps in non-potable applications, so the presence of such non-WaterMarked product in the marketplace has no commercial justification.

As Richard Michaels notes, the burden of obtaining compliant product currently rests on the shoulders of plumbers, who are required to discern and reject non-WaterMarked products at the point of sale.

"We want POS legislation to apply to WaterMarked product so the requirement for selling [only] WaterMarked products comes back to the retailer," he says.

Master Plumbers and Gasfitters Association (WA) chief executive Murray Thomas says removal of non-compliant product would greatly assist law-abiding manufacturers, installers and end users.

"Industry is advocating strongly for consistency across all the products our retailers offer to consumers," Murray says.

"At the moment this doesn't happen.

"The playing field needs leveling to outlaw any retailers selling untested and inferior products at a lower price.

"Alarming, we've started to see an emergence of issues where drinking water is being contaminated because of products used that do not carry the Australian Watermark.

"It is all about protecting consumers.

"The threat of lead poisoning is heightened if products are not being tested to ensure compliance with our current regulatory standards.

#### TEST KITS – LEAD IN WATER

Plumbers and allied professionals seeking to check lead levels in drinking water – either as a one-off case or as part of their regular services – can purchase low-cost test kits from The LEAD Group.

Once samples have been collected, as instructed, and returned for laboratory analysis, results are usually ready in a week to 10 days.

Results include data interpretation, as well as advice about subsequent actions that might be required. Prices are discounted for partners of the Lead Safe World Project.

There are two kit sizes which can be used for the two samples required to assess lead (and other metals) in water from each tap:

- Water Kit – two-sample kit – \$100 (\$85 for partners);
- Comprehensive Kit – eight-sample kit for more complex assessments of multiple fittings – \$275 (\$250 for partners).

Available now from The LEAD Group.

Visit [www.leadsworld.com/shop](http://www.leadsworld.com/shop) or phone (02) 9716 0014.



"Consumers simply should not be able to go into a hardware store and buy a \$20 sink mixer that is non-compliant.

"The industry, for the sake of all Australians, needs a level playing field where all products are tested to meet the compliance standards and can only be sold if they do so.

"The Master Plumbers and Gasfitters Association can't emphasise enough how important it is that governments work with us to ensure consistency in regards to product compliance across the country."

#### BUILDING INSPECTION 'SIGN OFF'

At present there are elaborate 'sign off' procedures designed to ensure quality control of major structural elements of newly constructed buildings. These procedures could be expanded to include mandatory testing of lead content in water, which means lead levels could be checked as a formal part of the handover of all new buildings. Alternatively, the process might be limited to representative samples of buildings, or to specific structures like schools, kindergartens or healthcare facilities accommodating children.

#### ONGOING WATER QUALITY TESTS

Selective, random tests of the lead content in the water of existing Australian buildings could become accepted policy as a means of identifying non-compliant older fittings or problematic 'full system' applications leading to lead contamination. Russell suggests that this kind of testing could be incorporated into regular examinations, for example, of thermostatic mixing valves and backflow prevention devices.

Comprehensive testing of the water quality in existing buildings could also help refine our understanding of baseline metrics in relation to a range of issues, including the presence of zonal hotspots, trends of elevated lead levels linked to specific product models or suppliers, as well as fluctuating lead levels based on geopolitical boundaries. There are no solid data for such important issues at present, which critics like Elizabeth O'Brien say is amazing in the 21<sup>st</sup> Century.

#### ENFORCEMENT

At the moment State-based authorities have the power to enforce the correct installation of WaterMark-certified products. For instance, in 2015 the Building Services Board in WA fined the building company Choi Homes Pty Ltd for installing non-WaterMarked plumbing fittings in a 13-unit complex.

But what penalty regimes apply to manufacturers or suppliers who produce non-compliant products in the first place? The severest threat seems to be withdrawal of Watermark certification, which is a commercial penalty; but one might argue that such a penalty is both misdirected and inadequate in light of the serious health hazards pertaining to lead contamination. Surely the manufacture of fittings that leach lead above permitted levels should be regarded as a breach of health department regulations. Such

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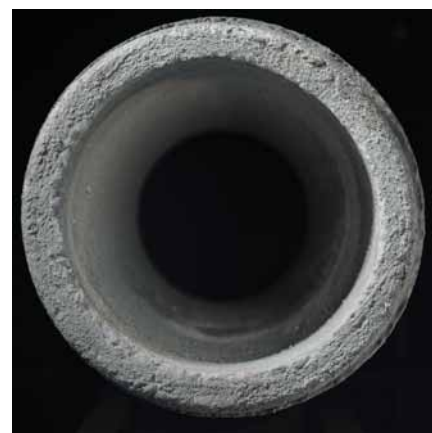


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regulations [through instruments like *The Food Act 2008*] are applied by third-party agencies including municipal councils, and result in prosecution through local courts. Convicted offenders are named on a web-based register.

This process establishes an arm's length between the code-setting body or certifier and the enforcement agency, removing any perceived conflict of interest between the fee-collecting code administrator/certifier and the fine-paying offender.

### IMPROVED SAMPLING

One of the major arguments against pervasive sampling of plumbing fittings is excessive cost: full laboratory tests can cost up to \$15,000 and take several months to complete. Fortunately, as far as lead contamination is concerned, there are affordable alternatives. In simple terms, a systematised process of random \$100 water tests to determine lead content in household water would suffice to identify whether or not a problem existed in a given household or public building. An 'all clear' result would be a welcome end to each enquiry. On the other hand, detection of unsafe lead levels could kickstart an appropriate examination of relevant fittings and conduits, delineating a clear pathway to identify chronically offending manufacturers or system types.

In the meantime, plumbers wishing to perform their own lead content water tests can obtain affordable test kits from The LEAD Group in NSW – see the previous page for an overview of these test kits and pricing.

### USE COMPLIANT PRODUCTS

Thankfully, home owners and plumbing professionals already have discretion to use 'lead free' devices [this may mean 'non-detectable' levels of lead] for peace of mind. Such products consist of stainless steel or specialised proprietary brassware and are generally more expensive than conventional fittings, but they are certainly recommended by organisations such as The LEAD Group.

Elizabeth says companies like the stainless steel tapware company Vinco have shown solid support for the group's activities, and she invites other likeminded advocates of lead-free plumbing to become members of Lead Safe World, a LEAD Group initiative championing lead-free products.

Vinco Architectural Hardware office coordinator Steve Virag says Vinco's decision to supply lead-free tapware recognised the tightening of regulations in the US and Europe relating to lead in drinking water. Moreover, Steve says the wider industry should be bound by stricter controls to reduce the public's exposure to lead.

"I feel we definitely need to be policing the current Standards, as studies show the evidence is becoming more prominent and a major concern for all Australian households," he says.

Another proud advocate of safe plumbing products is Methven.

Methven general manager – marketing and customer experience Laura Keogh says Methven uses a product called Eco Brass® in the company's Aio and new Surface tapware ranges. Eco Brass, Laura explains, is a revolutionary, high-quality, high-strength material that is lead- and heavy metal-free [less than 0.2% lead], which is equivalent in strength to stainless steel 303 grade, and exhibits the highest strength of any wrought copper alloy.

### ACT IMMEDIATELY

The presence of lead in Australian drinking water is beyond an anomaly – it is the predictable outcome of distribution practices that prioritise the needs of the manufacturer/retailer over the consumer, and which favour expedience over regulatory strictness as competitors race to reach the lowest possible price point.

As the Macquarie University study states so damningly, "It is evident that the current Australian method of regulation and testing of products containing lead pursuant to the goal that the 'elimination of unnecessary sources of lead would be of benefit in reducing the exposure to children' has not been met."

That goal, the study notes, was written in 1993, and nothing has improved since then.

If the plumbing industry wants to continue believing it is the guardian of the nation's health and safety when it comes to water and sanitation, it needs to demonstrate that it actually knows something about lead contamination and what can be done about it – the subject gets no mention in apprentice training other than an acknowledgment as being the oldest material used in the earliest times of plumbing...

The plumbing industry would be wise to seek government funding to conduct a baseline study along similar lines to the Macquarie University study, but on a national level. ■

*John Power is a freelance journalist based in Cherokee, Victoria, and a former editor of Plumbing Connection.*

### SORRY TO BE REPETITIVE...

Many readers will recall our cover story in Autumn 2014, which also dealt with the subject of lead in household water – and yet it appears our industry has made little progress since then to wipe out the menace of lead in potable water once and for all.

We welcome your feedback: have you had to deal with lead contamination in domestic water supplies? Share your experiences via a 'Letter to the Editor', c/o Jeff Patchell, Connection Magazines. Email [JeffPatchell@build.com.au](mailto:JeffPatchell@build.com.au).





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# ON WITH THE SHOW

FROM THE HALLS OF FRANKFURT AM MAIN, **JEFF PATCHELL** REPORTS ON ALL OF THE LATEST INNOVATIONS ON SHOW AT ISH 2017.

**M**ost years I visit the biennial ISH Exhibition in Frankfurt, Germany, it isn't unusual to experience snow storms and biting winds. But the world seems to have gone mad and this year ISH was a light jacket affair, maybe a result of that devil called climate change...

In the lead-up to the show, many punters thought Brexit would bring a level of uncertainty to proceedings, but it ultimately played no role (yet) and the markets across Europe remain robust. (In reality, few people have any idea of what impact Brexit might have on the plumbing sector so life goes on as normal across the EU.)

This year, Australian contractors, hydraulic consultants and suppliers visited the show in record numbers. Aussies are an inquisitive mob and some 350 (of the approximate 200,000 total attendees) made the long trek to Germany. Sure, that's only around half the number of North American visitors; but on a per capita basis, we are the true travellers from the East in search of good ideas.

One thing was clear in 2017 and that was the fact that we have entered a period of 'incremental development'. It's certainly getting harder to spot that new 'wow' product or technology like we could 20 years ago.

A lot of brands were offering new smart phone apps, but I'm not sure all of these will go the distance. Still, there were some smart uses of new technology – a few of which will probably make it to Australia.



More than anything though, ISH does show just how far behind the rest of the world we are in terms of standards development. Because of this, there are some great European products and technology that we are missing out on in Australia.

Mind you, Europe is its own mess in terms of bringing new certified product to market – it has some 26 different ways of testing plumbing products so as to meet the various country requirements.

Maybe the British are right and cutting themselves free from the EU is the best move? ■

*Anyway, let's head down to the exhibition floor and show you a few of the interesting products we came across.* ➤



David Cole, Rehau Australia's product manager, is enthusiastic about this new U-shaped wall plate elbow which enables continuous water flow to the tap, to eliminate dead legs on hot water lines, thereby reducing the risk of bacterial growth in potable water lines.



Gold is back! Geoff Anderson, owner of Abey Australia, which imports high level tapware from Italian supplier Gessi, was very impressed with Gessi's new matching set.



Thin ceramics are in. A number of suppliers featured thin-edged baths with contrasting colours and basins with sharp contoured edges.

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Infection control is on everyone's radar. This basin for medical facilities features a built-in hydrofoam, which resembles an upside-down winged keel, to reduce splash and the accidental spread of infection.



Duravit claims its new BioTracer is the first app-controlled toilet to offer urine analysis. This may well be timely, with baby-boomers globally looking for the secret to a long, healthy life.



Italian company Aquatechnik is in the throes of entering the Australian market with a composite pipe and fittings system that flares the pipe before mating with the fitting and ensures no loss of water flow through the connections.



Hansgrohe's iBox goes horizontal. What was once a round in-wall combi bloc has been converted to accommodate Hansgrohe's new shower range. A very sleek and stylish solution that elegantly conceals the mixer technology behind the wall.



Eric Lander, Geberit's Australian product manager, explains some of the new technologies that will find their way to Australian shores. This urinal system features easy access to their inner workings, making for far easier maintenance in high use facilities.



Sydney-based architectural firm Carver Partners has developed a space-saving bathroom module that combines the toilet, sink, shower and storage space into a very small unit.



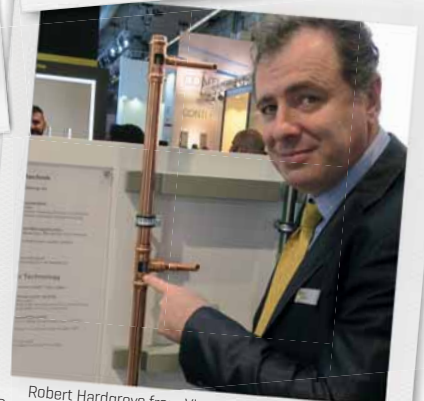
Adam Clement, Rotherberger's Australian marketing and sales manager, looks over a new model drain cleaner heading our way, which will be a replacement for the popular drum-style Marco units that are no longer in local production.



Toto's new Zero Dimension wellness bath claims to change the 'language centre' in the left side of the brain. This indicates that the area is at rest. Toto's shapely engineering delivers a constant flow of relaxing water around the back of the neck, while your body is suspended in near zero gravity.



Grohe presented this smart control mixer panel which controls up to three water outlets at the simple push of a button.



Robert Hardgrove from Viega Australia explains it's SmartLoop system, which features an inline circulation pipe and eliminates the need for a separate return line, thereby reducing space requirements, material and labour costs, energy requirements and wait time for hot water delivery.



Very, very out-there. This flexible outdoor tapware concept from Italian supplier Dueaccia had a certain Aussie feel to it. Architects would love the idea of creatively incorporating this flexible and stylish stainless steel system with exposed supply pipe into their designs.



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# WITH A PINCH OF SALT

IT'S NOT OFTEN YOU HEAR OF SOMEONE COMING INTO THE PLUMBING SECTOR FROM THE ALCOHOL INDUSTRY – AFTER ALL, WHO'D WANT TO TRADE LIQUOR FOR LAVATORIES? BUT THAT'S EXACTLY WHAT GWA'S NEW MANAGING DIRECTOR AND CHIEF EXECUTIVE TIM SALT HAS DONE. **JACOB HARRIS** REPORTS.

**B**efore being appointed to his current role, Tim Salt was managing director at Diageo Australasia [a company that owns brands like Guinness and Johnnie Walker]. At *Plumbing Connection*, we thought this sounded like a very interesting transition to make so we were keen to catch up with Tim to get the perspective of a relative newcomer to the industry.

Aside from the dinner party conversations – Tim says he used to talk about Bundy and Smirnoff but now talks about toilets – we asked Tim his opinion on the most notable differences between the plumbing and alcohol industries.

"Coming into a new industry with different customers and competitors, I was expecting it to be fairly unfamiliar. But what I found was that there are far more similarities than differences," he says.

"At the end of the day you've got consumers, or users of your product, who make a call based on reputation, service, quality or brand perception – which is no different whether you're selling bathroom products or vodka.

"Ultimately, I've not really seen that there's much difference in the way you need to build those brands and consumer confidence. If we can demonstrate to merchants that we can help them grow their businesses, they're going to want to do business with us. So the very basic things we need to get right for customers are the same."

In almost any sales-oriented industry, the ability to stay ahead of market trends can be key to the overall success of a company. So we asked Tim what he saw as the major consumer trends happening in bathrooms and kitchens.

"The move from fat- to thin-edged sinks is trending at the moment; the whole design aesthetic has changed substantially. We're bringing in ranges where we have 6mm-8mm edges. Some of those are made in Asia while others have been brought in from Italy.

"Another trend is the move into more muted, earthy colours and metals. Chrome is always going to be the dominant player but we're also seeing a lot of matte blacks and brushed stainless steel come through in tapware.

"You're going to see a lot more muted brass and gun metal, and rose and pinks and that sort of thing. While they're never going to be the dominant part of the market, people want statement pieces in their bathrooms and kitchens in the same way they might have one in a lounge room. People want to bring a bit of interest and excitement



After several years leading Australasia's largest liquor distributor, Diageo, Tim Salt has accepted a new role as managing director and chief executive of GWA Group – the parent company of Caroma, Dorf, Fowler and Clark.

to the bathroom and that is starting to play through.

"As houses get smaller, we're also seeing the idea of compact fixtures become popular. We've launched a bath that's just 1,400mm long so you can get it into small spaces and that's actually going really well. In the Clarke range, we've done compact tubs for smaller laundries. So we're certainly seeing people's lifestyles changing and products changing to accommodate that.

"I think there'll be a range of technology coming through too. The whole idea of sustainability and energy saving is gaining popularity. So in what a lot of people would say is a fairly staid industry, I think a lot of really interesting things are happening," says Tim.



Caroma's Cleanflush rimless toilet range has made the company an industry leader when it comes to innovation and design. So how much importance does Tim and the rest of Caroma place on research and development?

"If all we were going to be is a business that goes to Asia, looks around the supermarkets of a ceramic plant, chooses a few designs and tries to bring them back into this country, our business would be dead. That's why Steve Cummings [Caroma's head of research and development] and his team design and develop for Australian consumers in Australian conditions [which, with our water pressure, bore water and the like are harsher than pretty much anywhere else in the world].

"I want to continue to drive that really hard because I think it's a real point of difference that will give us a competitive advantage in this market. We have about 30

people on Steve's team, from designers and industrial designers to engineers here in Australia as well as about 20 people in Asia, whose job is to take what we've designed and developed and translate that into the manufacturing

process. We've got process engineers, innovation engineers, quality managers and the like in Asia who work with our suppliers to ensure what we design here actually can be made to the right standards – it's quite a long process."

With a net profit after tax of \$26 million for the half-year ending 31 December 2016 – an increase of 8% – the company is undoubtedly performing well. And given Tim's

drive and enthusiasm for innovation, GWA looks likely to continue on this trajectory for years to come. ■

“

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In February this year, Bosch launched the OptiFlow: a gas continuous flow hot water unit that comes with some remarkable features, like Bluetooth connectivity.

"The major differentiating feature is the unit's connectivity. This is something completely new for all hot water technologies in this market. So currently, irrespective of whether it's a storage or continuous flow technology, nobody is selling a connectivity feature like this with an app. That's the big point of difference but in addition to connectivity, we've got a couple of other patented technologies in there as well," says Bosch thermotechnology general manager John Lake.

The unit is a completely new design and, in addition to the connectivity, contains two patented technologies. The first, namely the 'OptiFlow Combustion Management System' is a software algorithm that is constantly adjusting the gas and air ratio in the burner.

"Typically with this type of product – including our previous generation – you set the gas/air ratio range in the factory and that's how it stays for the next 15 years or so. Obviously, in that time operating conditions change, the internal conditions in the product may change – not to mention the effects of external factors like altitude. So it's conceivable that after 10-15 years, you will no longer have optimum combustion conditions. But this product senses those conditions four times per second and adjusts in the software. So for the life of the product, it is self-adapting to its environment."

According to John, this will have a modest effect on the efficiency of a new unit that will become more pronounced with time in service.

The second technology in the unit is called 'Easy Minimum'. This is about extending gas continuous flow technology in situations where low flow and energy input is required, for example when the incoming water temperature is very warm. This technology optimises performance at these very low power inputs.

But arguably the most interesting feature of the unit is its connectivity and what that means for both the consumer and the plumber.

"In the hot water space we've taken a step towards greater connectivity with a Bluetooth feature. We provide two apps that allow either an end-consumer or a tradesperson to communicate with the appliance," says John.

The consumer app lets users interrogate the appliance in regard to running costs. They have access

to features that show how long a shower's running and the quantity of water and gas being consumed. Users can also input their gas and water rate information from utility bills and the app will calculate the cost of their showers.

The trade app has all that basic information but includes a lot more technical detail. It also gives a visual display of all incoming and outgoing parameters such as temperatures, and flow rates of water, gas and air in real time, so the plumber can see exactly how the product is performing.

"It will also assist the plumber if there's something that needs to be checked. The app gives assistance by telling the plumber what the issue is and what needs to be corrected.

This is a radical departure from where the trade is today, having to work back from basic principles. This leads you straight to where you should be looking so it's a substantial productivity enhancement for the plumber."

The plumber downloads the app and opens it when they are in close proximity to an appliance. The app will then find that unit. On the underside of the unit there's a six digit code – once that's keyed in, the app and appliance are immediately paired. So if the installing plumber comes back at some point in the future, they can open the app and be immediately linked to the appliance.

"This is a great first step towards greater connectivity, particularly for the trade because of the potential to speed up a job. So in terms of productivity enhancement for the trade, we think it's a pretty good hint to what the future holds," says John. ■



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# WE ARE LEGION

IT SEEMS FITTING THAT THE CITY THAT SUFFERED AUSTRALIA'S MOST SERIOUS OUTBREAK OF LEGIONELLA NEARLY 30 YEARS AGO NOW PLAYS HOST TO SOME OF THE MOST CUTTING EDGE RESEARCH IN THE FIGHT AGAINST THE DEADLY BACTERIA. **JACOB HARRIS** REPORTS.

**P**lumbing Connection has been looking at the issues surrounding legionella in the plumbing industry for almost as long as we've been in print [the above mentioned outbreak even made the cover of *Plumbing Connection* back in 1987]. So when we heard about a collaboration between industry and academia that was trying to make some meaningful headway in the fight against the bacteria, we went to find out more.

Specialist plumbing and personal safety equipment manufacturer Enware has developed a partnership with University of Wollongong's [UOW] Intelligent Polymer Research Institute [IPRI] and the ARC Centre for Excellence for Electromaterials Science to investigate new strategies in the development and manufacture of active polymers with properties that will prevent the growth of legionella in warm water systems.

"A few years back we did a design integration course through the Department of Industry, Innovation and Science. That helped us to understand that in order to build a sustainable future, we really needed to be going a hell of a lot deeper into the market segments that we were involved in and the only real way to do that was to invest significantly in our research efforts," says Enware managing director Adam Degnan.

"We're the market leader in commercial plumbing products in Australia and so people expect us to be the experts. I'm very happy for that to be the case but if we are to be the experts, sitting there and catching ideas from the market place is not good enough – we've got to go out and investigate."

Enware began by sponsoring university design programs, competitions and student projects and that blossomed into something much broader. The company has now connected with UOW, Monash and UNSW – all on different levels but all based on research.

"At UOW, we're working with Environment Engineering, IPRI and the ARC Centre to understand microbial growth within water systems. We supply products that go on the end of those water systems and the challenge for the people who manage the systems is dealing with the outcomes of microbial growth like legionella. Our products can impact on those outcomes. In low use areas if our taps don't produce sufficient flow for long enough, customers are going to end up with stagnant water and that increases the risk of microbial growth," says Adam.



Intelligent Polymer Research Institute [IPRI] research fellow Dr Paul Molino at work in the lab.

The partnership started with a series of 'Sandpit Workshops' with a range of different researchers from various fields within IPRI, including research fellow Dr Paul Molino who is an expert in bio-fouling. These were basically a platform to throw around blue-sky ideas about what Enware hoped to achieve and outline some industry problems that, according to Enware research and development manager Jason Hinds, at the time seemed impossible to solve.

"We had this range of expertise in the room from bio-fouling, microbiology, water chemistry, electromaterial science to chemical engineering and they started discussing possibilities, drawing on experience from past projects, and all of a sudden those problems didn't sound impossible to solve anymore – we realised the solutions were possible and that's how it started," says Jason. ➤

■ GEBERIT

“

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easy it is  
to install  
a Geberit  
concealed  
cistern

Adam Powell  
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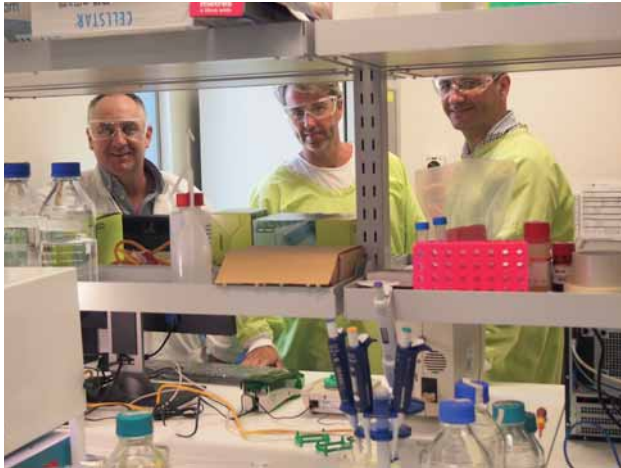


Set water level



Fit button

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From left to right: Michael Higgins, Jason Hinds, Paul Molino.

Strategically, Enware was looking to leverage their new product development ideas off research and the academic experts at UOW. So they signed a collaborative research partnership with IPRI and decided to work together to develop a better understanding of microbial agents in water systems especially with regard to plumbing products and services.

Their initial project started with exploration into strategies in which active materials can kill and resist bacteria within the plumbing system. This involves trying to develop new, more advanced materials that can be used to mitigate legionella growth risk and potential outbreaks. Although this was the original goal, what they discover through research and testing along the way is potentially just as important as the outcome of a new material.

"We started the project by doing some baseline testing of materials, typically used in plumbing products, with certain bacteria to try and get a better understanding of how and why bacteria grow more rapidly on different polymers, metals and different surface finishes.

The bacterial testing is performed by seeding a small quantity of bacteria known to be a problem in water systems and then using high resolution fluorescence microscopy techniques, we can study how well they can adhere to the materials, and then grow to form colonies that can persist in water systems for long periods. This information can then be used to predict how these materials will behave in the real-world, and also to compare with the new antibacterial materials we are developing.

There is a lot of marketing hype around what materials are better suited or more resistant to microbial growth within plumbing however Enware wanted to see the evidence and understand why in order to make more informed decisions. From there, we drilled down on a couple of specific polymers and how active agents could be fabricated to them to create an ideal material solution."

Both Enware and the team from UOW are more interested in polymers because they're more mouldable than metals [metals can also impact biofouling and microbial growth through oxidation with chlorine which is another subject requiring further research]. Polymers, while cheaper and lighter than metal based plumbing parts, are also perfectly placed to exploit the revolution we are seeing in advanced manufacturing such as 3D additive fabrication and the development of multifunctional polymer materials. For example, we are already developing new composite polymers that have been impregnated with materials designed to kill the bacteria or prevent them from adhering to the polymer surface.

"Many of the traditional methods used to blend active materials into polymers such as melt blending, are not suitable for many of the specific chemistries we are interested in, and therefore we have had to find new ways to formulate these new bioactive polymers that considers their molecular properties.

Paul also points out that an important aspect of this project is the level of engagement between the University and Enware. Instead of taking Enware's material and coming back in several months time with a report that was useless to the company in terms of what its eventual goals were, the team at UOW have made a point to really try to understand what their industry partner is interested in – what they want out of the partnership and how they can get there together.

"When we consider the processing conditions and the properties of the polymers, we try and develop them with anti-microbial compounds in a way that is compatible with the methods Enware uses to process its products and handle its polymers, so that's one example of how we try and stay connected with the industry process," says associate professor Michael Higgins who has been involved in the project from its outset.

Whether the end result is a patented, Legionella inhibiting material or just an overall advance in our general understanding of the bacteria and how it behaves, surely nothing bad can come from a collaboration of this kind between industry and academia.

"It's a journey. We're doing some testing to establish benchmark materials, some testing in relation to different types of active materials and then testing to work out how we can fabricate them later on, eventually tying it into something we can use in the future. While we are early in our relationship with IPRI and UOW, we are already reaping the benefits of knowledge and a deeper understanding of the problem and ideas on how we can tackle it. Addressing the challenges that face this industry can only be done through establishing joint partnerships between industry and academia, and we are excited in what our partnership with UOW will bring to Enware and the industry," says Jason. ■





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# CAROMA INTRODUCE NURSE CALL BUTTONS TO TOILET SUITES

Nurse call systems are commonly used throughout hospitals and aged care facilities, allowing the patient to activate an alert to the healthcare staff when help is required. Caroma have introduced a clever design to integrate the alert system into their range of care toilet suites – so what do you need to know about this new product?

## SAFETY ASSISTANCE

Often nurse call devices in the bathroom look out of place and can be hard to keep clean. Caroma provides an advantage to help the patient easily access nurse assistance without having to reach around to the wall, all within a simple design that is easy to clean.

The new Caroma Advantage nurse call button integrates the toilet suite with new and existing nurse call system installations to ensure quality and reliability.

## DESIGN

The design provides connectivity directly from the toilet suite and minimises the institutional look that traditional solutions provide.

The nurse call button is available as a left or right hand option and comes with the toilet roll holder included.

The button is located to the side of the armrest to avoid any accidental triggers. However, when activated, the LED light will appear for reassurance to the patient.

The Nurse Call button is available in three of Caroma's most popular care suites, the Opal II Easy Height, Caravelle Easy Height and Caravelle Support suite.

## INSTALLATION

The toilet suite installation requires no change for the plumber. The integrated nurse call button allows for fast and easy installation by the nurse call installer. A durable cable is hard wired into nurse call system, Caroma will include a wall plate and cable gland in the same box as the arm rests for that professional finish.

## IP56 RATING

Suited for use in damp environments, the nurse call button is rated to IP56 to ensure lasting reliability in bathroom applications. IP56 rating means the wiring is protected against jet sprays of water and dust – making the Caroma Advantage nurse call button perfect for your next hospital or aged care installation.

Now available for specification on [specify.caroma.com.au](http://specify.caroma.com.au), the Caroma Advantage Nurse Call products will release in July, 2017.









# WHEN THINGS GO WRONG

WHEN STUPIDITY, NEGLIGENCE AND APATHY COMBINE, THE RESULT CAN BE A COSTLY NIGHTMARE FOR YOUR CUSTOMERS. CHARTERED LOSS ADJUSTER **DAVID POCKETT** AND LICENSED PLUMBER **RUSSELL KIRKWOOD** LOOK AT A RECENT EXAMPLE OF HOW THINGS CAN GO TERRIBLY WRONG.

**R**ecently, Metropolis Solutions was involved in a significant insurance claim involving the air conditioning installation in an expansive extension of a bayside Melbourne multi-million dollar property.

The relationship between the builder and property owner soured during the build due to concerns about the quality of the builder's work. As a result, the contract was prematurely terminated.

For unrelated reasons, but likely due to an underlying quality issue on many more of their jobs, the builder went into liquidation and the property owner was left to try and resolve the mess left behind on their unfinished project.

The air conditioning installation turned out to be an unmitigated disaster. A mechanical services engineer later reviewed the equipment and found it to be significantly undersized. It was confirmed that at no stage was a heat-load analysis ever carried out on the dwelling, which had significant north-facing glazing and expansive living areas with hard floor surfaces. Unfortunately, by the time this was identified the equipment was already built-into the finished structure and could not be replaced without major (and enormously expensive) structural changes to the property.

Under the Victorian plumbers' warranty insurance scheme, a claim was made by the property owner against the original licensed mechanical services plumber – whom the owner had never dealt with. Said plumber was only able to be identified by a single recovered document as he had also failed to issue the mandatory Compliance Certificate. His contract had been with the (by then) liquidated builder.

To make matters worse, another



licensed mechanical services plumber had been engaged to take over the air conditioning job and install the corresponding outdoor condenser units. This was also done without any review of the overall job or the sizing requirements of the dwelling, and so the original sizing error remained completely undetected. This plumber then added to the owner's problems by incorrectly installing the condenser units.

As a result of this situation, both licensed mechanical services plumbers ended up being responsible for defects.

The second plumber's insurance company eventually paid out a small amount of money, which only covered the defect in the location of the outdoor equipment, which was determined to be too close to a neighbouring fence; the fundamental sizing fault however remained attributable to the original plumber.

The property owner pursued the insurance company of the original plumber but due to stalling and obstruction tactics – where they claimed that there was no proof that the plumber had even carried out the

job – the property owner eventually paid \$40,000 out of her own pocket to augment the undersized and defective system just so she could cool her house properly. The owner ended up with five separate air conditioning systems in her dwelling, even though if the job had been correctly sized in the first place it could have been achieved with a single system. This will have ongoing cost and hassle implications with maintenance in the future as well as taking up significant amounts of garden and private space on what is a very valuable block of land.

As part of our detailed investigation, Metropolis Solutions recovered documents from the builder's liquidator including the original plumber's tax invoices and the builder's own payment records. Those documents proved beyond doubt that the original plumber

had done the work and was fully responsible for the undersizing issue.

But even after being presented with these documents the insurer of the original plumber still failed to deal with the claim in any way, so the client then engaged a law firm who litigated the claim in the Magistrate's Court.

The property owner recovered her entire claim, including legal expenses and claim preparation costs. This was all paid by the insurer of the plumber who had obviously made a major error in not correctly sizing [or made any attempt to correctly size] the original air conditioning system as he was legally required to do.

The outcome of the claim provides a very clear example of how the responsibility for carrying out work according to the relevant Standards lies with the certifying plumber.

As with all licensed plumbers in Victoria, the plumber was fully insured against claims just like this one; however, he was very poorly served by his insurer who unjustifiably tried to avoid and delay the claim for over four years. That resulted in litigation against the plumber personally and in the end, the whole process ended up costing his insurer a bundle of unnecessary legal costs.

Hopefully, the insurer in question has now learned this is not how to deal with such claims. ■

**Metropolis Solutions investigates plumbing disasters and provides sensible, compliant solutions plus cost recovery services for property owners. Visit [www.metropolis.melbourne](http://www.metropolis.melbourne).**

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Prove Standards & Engineering directors Frank Iapozzuto (left) and Terry Nguyen perform continual proficiency testing on plumbing products.

## GOING WITH THE FLOW

WELS HAS HAD A SIGNIFICANT IMPACT ON THE PLUMBING SUPPLY SECTOR, BUT IS IT ENOUGH TO ENSURE ONGOING COMPLIANCE WITH STANDARDS? **TERRY NGUYEN** REPORTS.

**T**he Water Efficiency Labelling and Standards (WELS) Scheme has been in operation for well over a decade now with results that suggest the initiative is definitely here to stay. WELS has reduced the water consumption of dwellings in Australia by considerable amounts, but have WELS registrants learned all the secrets of the ongoing compliance strategy?

WELS requires the mandatory certification and testing for water consumption of many plumbing fixtures and appliances to ensure efficient use of the precious commodity. The certification and testing is a once off check, which provides a 'design freeze' for the product under the premise that leaving its configuration unchanged will maintain its continued performance and compliance. While in principle this technique helps to keep compliance costs down, it comes at the cost of potential exploitation in a highly competitive market environment.

PROVE Standards & Engineering is a NATA-accredited laboratory that is required to perform continual proficiency

testing on the same product against similarly accredited laboratories as an additional validation that the results are reproduceable and repeatable. In performing such testing, products are often sourced from the market where it is in a new condition to limit the amount of any effects or degradation from previous tests. Most products purchased and tested between PROVE and other laboratories usually produce results consistent with the WELS label presented on its packaging, but not all of the time. On occasion, results from testing between the laboratories inadvertently reveal that the product is in fact non-compliant with current Australian Standards.

Easy targets can be simple products such as taps and showers which almost always rely on integral flow controllers to achieve the star rating being sought. Flow controllers are small and relatively inexpensive but are still an added cost to the final product. Exchanging carefully selected flow controllers to cheaper inferior alternatives can be an attractive proposition, particularly as it can be



extremely difficult to detect. A shower packaged in a box with a flow restrictor fitted isn't going to raise alarm bells.

Similarly, large overhead rain showers that appear identical to that which was initially tested may in fact be missing vital internal components that correctly distribute the water flow evenly to the outer nozzles rather than bias the majority of the flow through the centre. Small changes in the products' construction all effect how efficiently the product works with direct impacts on overall water consumption. Multiplying this across all products nationally is likely to show a significant amount of unnecessary consumption, not to mention the increase in energy to heat the extra water.

Products can appear completely normal from the outside and it's only when the product has been purchased, installed and used that problems may be realised, typically resulting in frustrated phone calls to plumbers from a customer for an explanation as to why their new fixtures are not performing.

Appliances, such as refrigerators and air conditioners, that are subject to mandatory energy efficiency standards are regularly retested to ensure ongoing compliance and surety to consumers on performance claims. With WELS now being in operation for well over a decade, perhaps it

is time for the creation of a similar program to assist in rectifying a weakness in the scheme which looks to have been identified and targeted.

PROVE has had initial discussions with WELS where mutual benefits to all stakeholders can be shared in a carefully structured program. Effective check testing could be co-ordinated by the regulator where accredited laboratories would also meet their obligatory requirements for regular ongoing proficiency testing. The cost of testing is likely to be at no or very low cost for an activity that is already performed regularly by NATA-accredited laboratories. A discussion paper of an independent review on the WELS scheme was published seven years ago highlighting the need for check testing; however, nothing yet has eventuated. With WELS looking to strengthen the compliance and enforcement areas of the scheme in the near future the concept of WELS and laboratories collaborating could have great potential. ■

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# TURNING UP THE HEAT

AN AUSTRALIAN INVENTION IS REDEFINING THE WAY WATER IS HEATED AND THE RESULT COULD LEAD TO A REDUCTION IN LEGIONELLA, TOO. **JEFF PATCHELL** REPORTS.

**A**t a time when Australia is losing more and more manufacturing jobs overseas, it's clear that only those who innovate really stand a chance of surviving.

MicroHeat is a name that few plumbers, consultants and merchants will have come across, other than when we featured the company in the *Handy Water Heaters* feature that ran in the Spring 2013 edition of *Plumbing Connection*. In the subsequent years, continuous flow electric heaters – like MicroHeat – have been growing in popularity, particularly given so much multi-residential development is taking place nationally.

But, it's not just in multi-dwelling units where this company is aiming to find traction.

Recently, we had the opportunity to review this innovative technology, which is breaking the fundamental rules of heating water.

MicroHeat is based on a technology that originated back in the 1800s; but, for the longest of times controlling the amount of electrical energy needed when using this method of heating has evaded developers. And to date, it has never been cost effectively commercialised.

Having isolated the reason for this failure, MicroHeat inventor Cedric Israelsohn, together with his team, has been able to develop, protect and successfully commercialise what is now known as 'MicroHeat technology'.

What separates MicroHeat technology from other forms of electric water heating is that it doesn't use a traditional hot wire or bare element design. Traditionally, these wires/elements sit inside a tube, a voltage is applied and then the water passing through the tube is heated by coming in contact with the wire/element, until the temperature of the water reaches the desired, predetermined temperature setting.

MicroHeat offers a radically different solution. The system uses electricity to directly energise



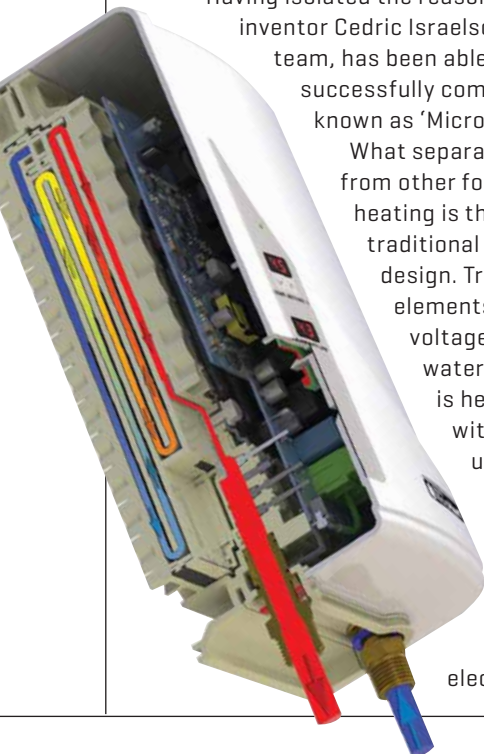
MicroHeat uses electricity to directly energise the water coming into the unit, by using the water as the 'connecting wire' between electrically-energised inert electrodes.

the water coming into the unit, by using the water as the 'connecting wire' between electrically-energised inert electrodes.

Directly energising the water in such a manner causes it to heat up without the need for heating elements. The unit precisely calculates and controls the exact amount of electrical energy that needs to be supplied to heat the water, by emulating the thermal heat equation.

As the electrodes are the same temperature as the water being heated, it doesn't cause them to scale or suffer the same stress corrosion experienced by traditional heat exchangers.

Further, temperature control to within 1°C is delivered via a microprocessor. Combined with a sensor that



activates every hundredth of a second, MicoHeat technology claims to save energy and water as well as prevent overheating.

Since there is no heat generated internally, there is also no need for thermal shielding within the unit, to protect any plastic/metal casing.

The MicroHeat unit sits on a compact footprint [about the size of an A4 piece of paper] and claims >99% energy transfer efficiency, thus offering a calculable energy saving. The unit doesn't heat the water until the tap is turned on, which is why it uses almost zero energy when in standby. Depending on the flow and heat setting required, the unit will almost immediately provide heated water within  $\pm 1.5^{\circ}\text{C}$  of the setting.

**“ WHAT SEPARATES MICROHEAT TECHNOLOGY FROM OTHER FORMS OF ELECTRIC WATER HEATING IS THAT IT DOESN'T USE A TRADITIONAL HOT WIRE OR BARE ELEMENT DESIGN. ”**

MicroHeat units have been available in a single-phase format for a while now but the company recently launched a three-phase version that significantly improves its appeal to the plumbing market.

In addition, the MicroHeat team is starting to find new opportunities for the technology that were not so evident early on. The product's patented method of energy control can be used to safely limit water temperature from exceeding  $43.5^{\circ}\text{C}$  [the limit set by the health industry for use in special circumstances where scald prevention is mandatory]. This means that in the right circumstances, the need for a thermostatic mixing valve could be eliminated. The control of aspects that relate to the prevention of legionella bacteria growth are also accommodated.

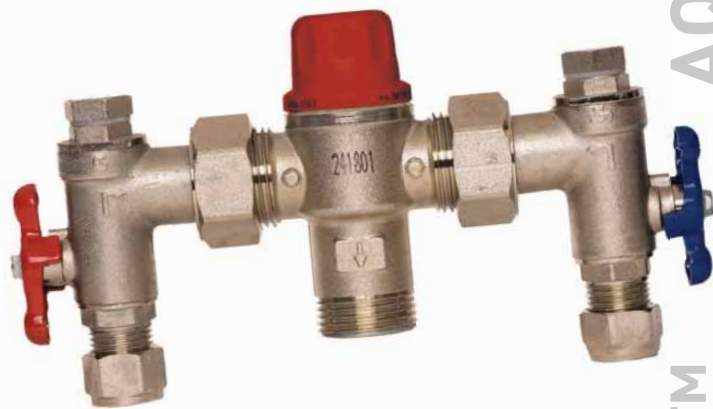
Most recently NSW Health has ticked off on the product, so you can likely expect other states to take an interest in due course.

Keep an eye out for the product at innovative merchants or get onto the MicroHeat website for more detail. It proves that Australian R&D and manufacturing can be innovative. ■

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### ENVIRONMENTAL PROTECTION AGENCY ANNOUNCES FUNDING TO REDUCE PATHOGENS IN PREMISE PLUMBING SYSTEMS

The US Environmental Protection Agency (EPA) has announced it will provide two universities with approximately \$4m in funding to research water quality issues regarding flow conditions of drinking water in premise plumbing systems.

As water shortages become more common across the US, the use of low-flow plumbing fixtures has increased, and as a result water demands have dropped. This has led to lower flows of water through water system pipes designed to manage higher flows, which could negatively impact water quality.

The two universities, Drexel University in Philadelphia, Pennsylvania and Purdue University

in West Lafayette, Indiana will create methods, tools and models to help design plumbing systems that will maintain appropriate flows and water pressures to deliver clean drinking water at actual consumption levels.

Purdue University is working with researches from Michigan State University and San Jose State University to identify piping network design and operational conditions that can reduce health risks and develop integrated water quality models.

The three year project will test hypotheses using various systems, including those in a residential home converted into a 'net-zero' structure known as ReNEWW house, a school and two office buildings. The data from this research will be used to produce the predictive water quality models.

### NEW NON-FLAMMABLE, NON-CARCINOGENIC GLUE AND PRIMING FLUID DEVELOPED BY ROWDY'S

Rowdy's Trade Safe products, a new company started by former plumbing supplies manager Linda Lonsdale and Neil Graae from Ngee Plumbing, has developed a non-flammable, non-carcinogenic glue and priming fluid that does not compromise performance.

Linda developed the product to reduce the chemically derived risk to users of PVC glue and has created a product that claims to be safer than the methyl ethyl ketone (MEK) and acetone based products currently used.

Tested and approved for AS/NZS 3879 and 4020, Rowdy's Trade Safe glue and primer have VOCs of 1% tested to 50°C, are Benzene and MEK free and are not classified as a flammable Class 3 under the Australian Dangerous Goods Code.

The products have been five years in the making and were developed with the help of Simon Lewer, an industrial chemist at Gauge Industrial & Environmental.

Although the glue and primer are fully developed, Rowdy's is still looking for investor support to get the product to the Australian market. The company set up a crowd-funding campaign, which started in April 2017, and aims to launch the product online in August 2017.

Rowdy's Trade Safe glue and primer have been tested on site in a confined space by Gold Coast based Saul's Bearings, Engineering & Machine Shop. The company said the low odour and toxicity of the products saved approximately 72 man hours by allowing the team to work for longer intervals within a confined space.

For more information about Rowdy's crowd-funding campaign please visit [www.rowdys.com.au](http://www.rowdys.com.au).



### AQUATECHNIK POLYMER PIPE SYSTEM ARRIVES IN AUSTRALIA

aquatechnik has announced the arrival of its safety [R] piping and fitting system into Australia.

Made from polymer used in aircraft components and high quality composite pipe, the system completely avoids brass and metal ions coming into direct contact with water.

The system features multi-colour pipe and safety fittings, which are completely reusable.

The pipe is made from cross-linked polyethylene internal and external layers and has an aluminium layer

in between. Unlike most multi-layer pipes the aluminium layer is TIG butt-welded using a control camera rather than lap jointed. The layers are bonded using an adhesive compound designed to withstand the pipe enlargement process during joint assembly.

Designed for potable hot and cold water, compressed air, HVAC, industrial, marine and agricultural use, the system has sizes DN16 to DN63, and is assembled using affordable patented tooling.

The system is now available direct from [www.aquatechnik-australia.com.au](http://www.aquatechnik-australia.com.au).



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**H**aving spoken with plumbers Australia-wide, I know many of you find repairing solar hot water systems a little daunting. Hopefully, this article will give you some good advice that you can refer to when the need arises next.

In it, I have covered off many of the most common problems you'll come across while troubleshooting out there. And I've detailed some of the not-so-obvious symptoms to look for.

One of the biggest problems I still come across with customers or industry colleagues is the need to replace like-for-like components when fixing solar hot water systems. This is often the best option with major brand systems that have been more recently manufactured. But it is certainly not the best practice, nor even possible, with a lot of the older systems that are no longer manufactured and original spares are in short supply.

So you need to learn what options are available and to replace outdated products with new versions and solutions. That's particularly so if it means the system can be maintained easier in the future. In some cases it can mean a larger cost up front to the client, but in the long run, it is a cheaper and wiser decision. A repair could cost anywhere from a few hundred to a thousand dollars, but with rising energy costs, the outlay of repairs can normally be recovered in a 12-month period. It can sometimes be a difficult sell initially but if you know what to look for and can clearly explain what you need to do to the client's equipment then the process is relatively easy.

Let's start by getting a good idea of what might be wrong, even before setting foot on the client's property.

The three most important questions I find useful when I take a call from a customer are:

- How old is your system?
- What repairs have been done previously?
- Can you please email me a picture of the current installation, controller and pump?

With these three basic questions, over time you will start to know what parts you need to carry and the problems you are likely to come across, that are associated with the repair of the system. It helps you prepare for the job and better communicate with the customer when you get on site. Over time you will have different questions depending on the age and type of system. Knowing to ask these questions

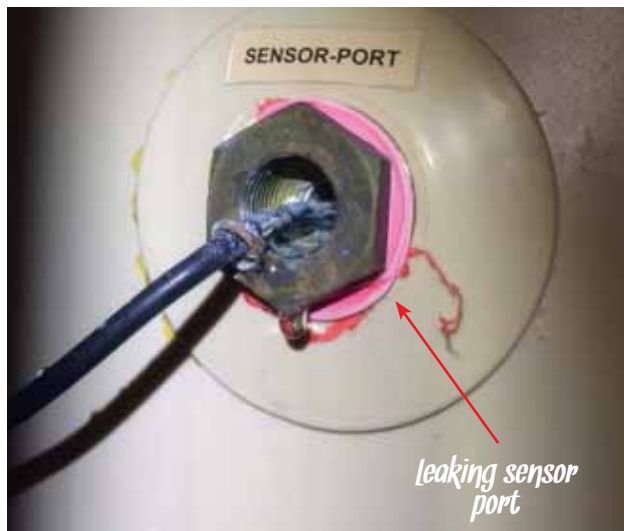


Figure 1

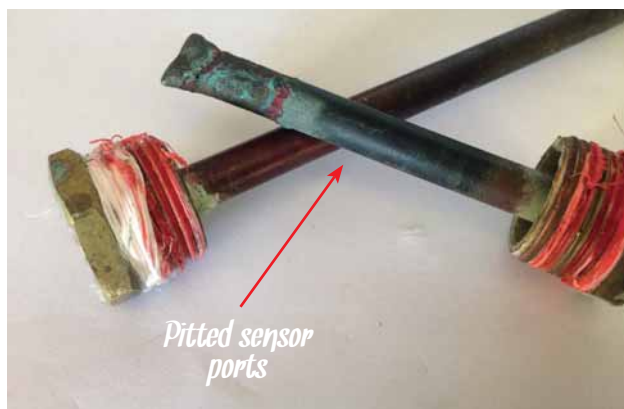


Figure 2

helps you relay information to the customer and gives them confidence that you can fix their problem. If your customer is happy and confident with your repair solution and service, the rest is easy.

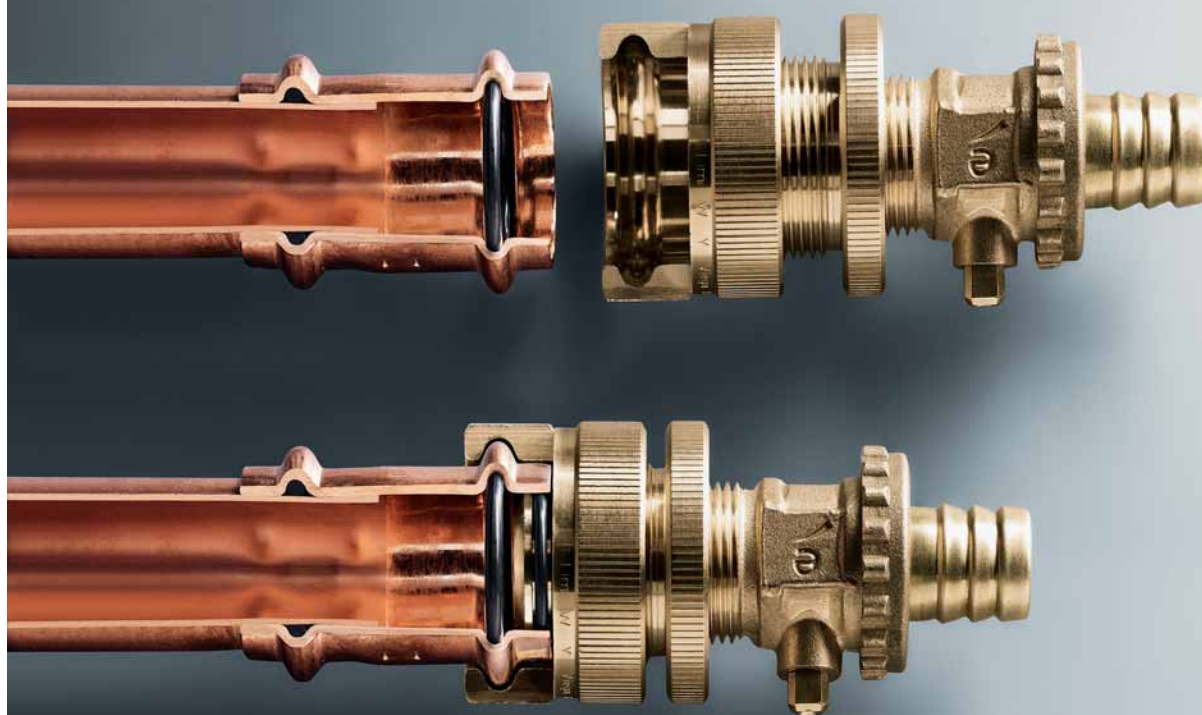
**Here are some of the more common problems that can easily be missed at time of diagnosis:**

- **Leaking sensor ports** [see Figure 1]: This usually occurs in stainless steel tanks that have copper immersion sleeves or sensor ports. The copper is the weaker metal and ➤



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Figure 3



Figure 4



Figure 5



Figure 6



Figure 7

can sometimes act similar to an anode. Pitting occurs in the copper causing pinholes. The problem is that sensors are siliconed in and they are affected by moisture. The moisture will lead to inaccurate readings. This can cause the sensor to read a much higher temperature than the temperature really is. This can have a flow-on effect with the other components causing further damage. It can also lead to you replacing the wrong parts and ending up with the same problem a few weeks later. So it is important to check for moisture at the tank sensor [see Figure 2]. There are chrome-plated or stainless steel sensor ports or immersion sleeves available in the market to fix these problems. This can also happen in glass-lined tanks for different reasons [see Figure 3].

- **Leaking elements:** Leaking elements can be common in some of the older stainless tanks, like Everlast tanks, and it is a similar reason as to why you may have a leaking sensor port. So always check both. Check with the manufacturer, where possible, what type of element they recommend be used [see Figure 4].
- **Replacing roof sensors** [see Figure 5]: Replacing roof sensors is not difficult but you need to make sure the

sensor you have suits the controller that is used on the system. Just because the sensor cable that you have in your truck is black and looks similar to the one you are fixing, this does not mean it is the same type of thermistor. If you are not sure of the type of sensor you have, do not use it. If you use the wrong sensor, the controller light will no longer show a fault, but the temperature reading will be inaccurate (up to 40°C higher or lower). The controller will only show a fault if there is a break in the circuit and it does not get a resistance reading. Tank sensors for 95% of all controller brands do not work as a roof sensor. They are not high temp rated and in some controllers the tank sensor is a different thermistor to the roof. If you are replacing a roof sensor you need to ask yourself why has this failed? Something has caused it to fail and it is not always because they were unreliable. Check the circulation, particularly the pump and non-return valves. Sensors often fail because they have over temp out, this is from inaccurate reading and circulation issues [see Figure 6].

- **Sensor port locations** [see Figure 7]: It is good to take note of where the sensors are located. If the



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Figure 8



Figure 9



Figure 10

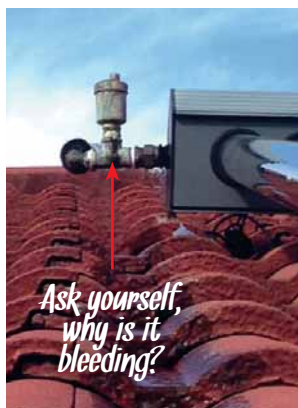


Figure 11



Figure 12



Figure 13

sensor port is on the return pipe it is not going to work well. Some controllers have retrofit kits available [see Figure 8].

- **Circulating pumps** [see Figure 9]: When replacing circulators, don't always look to replace like for like because it seems easier. There are often better options available. At the time the original system was manufactured, often this was all that was available. Imported non-approved or non-watermarked pumps can cause health risks [see Figure 10]. When replacing a circulating pump, stop and ask 'why?'. What has made the pump fail? Is it a faulty roof sensor, leaking sensor port, blocked non-return valve, controller relay, etc.? As a rule of thumb, often if I am replacing a pump, I also replace the roof sensor. They are heavily used parts and cause a lot of the problems.
- **Air bleed valves** [see Figure 11]: Replace or remove? If it is tank water I tend to replace, mains water I remove. This is debatable between some tradies. I remove because you should not have air in the system and they mask problems. If you come across a leaking air bleed valve you need to ask the question why is this leaking? It is normally

from over temp out at the collector, this is caused mostly from a combination of the above problems. Normally I find it is a roof sensor and pump that has caused this [see Figure 12].

- The ticking 'time bomb' [see Figure 13]: These are systems that are sold by fly by night resellers from some time ago. They are non-watermarked, electrically non-approved solar hot water systems. Every now and then we come across them. All you can do is duck for cover as you hand over the quote to remove it and replace with a new system.

I hope that gives you a few short cuts to identifying what's wrong with a system and you can get off the job quicker and be home on time to see that family. ■

*One final word of warning. Always check with the manufacturer of the original equipment about what is required, so you don't void the warranty.*

Mathew Briggs is the director of the specialist solar parts business: [www.solarhotwaterparts.com.au](http://www.solarhotwaterparts.com.au)

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# AT CROSS PURPOSES

HOT AND COLD WATER TAP TECHNOLOGIES ARE RAPIDLY CHANGING AND ONE OF THE CHALLENGES FOR PLUMBING PRODUCT MANUFACTURERS IS TO ENSURE THE STANDARDS THAT SUPPORT THESE PRODUCTS ARE BEING APPROPRIATELY UPDATED. PLUMBING PRODUCTS INDUSTRY GROUP TECHNICAL DIRECTOR **TIM FISHER** EXPLAINS.



**T**he following are some observations of current tap type technologies and anomalies as to their function, which is causing confusion in the market.

AS/NZS3500 requires that with tap sets, the hot tap is positioned on the left and that the cold tap is on the right side as you look directly at the fixture. This has been the traditional way of plumbing three hole tap sets be they for the kitchen, wash basin, shower or bath. The introduction of single lever mixer technology saw this basic positioning and understanding retained with a movement through an arc controlling temperature while flow was now controlled by lifting a lever.

However, with the development of numerous new ceramic disc headworks and touch-free electronic products delivering improved energy, hand hygiene and water efficiency outcomes, their modes of operation have also changed, which are vastly different from traditional three hole and basic single lever mixer technologies. Further innovation has also been introduced with sequential headwork designs being incorporated into single lever, point-of-use, thermostatic mixer technology adding precise temperature control to the mix. In these designs the operation of the lever of the thermostatic mixer technology sees that cold water delivery begins with the lever in the left hand position and as water begins to flow, the lever is moved through a radius towards the right where temperature controlled heated water is now delivered.

Safe enough? Yes, of course. Energy efficient? Yes, of course. However, our installation and product codes remain significantly behind such innovations providing significant opportunity for Plumbing Products Industry Group to drive technical change, not only in this instance but across numerous product areas where innovation developed by members has left outdated standards in their wake.

This may also pose the question of liability. From a water temperature and scald protection perspective we are fortunate that code changes introduced in the late '90s have effectively minimised these risks through the mandatory installation of temperature control products such as TMVs and tempering valves. However, it is understood that while new build and high risk installations have been addressed, significant existing infrastructure across the country has been left unaddressed.

So, whose responsibility is it to ensure that users of a facility know how to operate taps that may have been specified and installed, especially if a scald risk remains in the installation?

As an example, discussions with various service companies have identified that some of the new technologies installed, especially in public accessible areas have resulted in increased maintenance where no signage exists or is desired, leaving the public attempting to operate products in a manner that they believe they should operate them, only to finish up causing damage most often through frustration.

Recent questions have again been raised as to whether 'new' products such as the wide variety of sequential

thermostatic mixer technologies now available on the market actually comply with the provisions of AS/NZS3500 as discussed earlier? In this instance, the response has been that the hot/cold positions stated are specifically for a tap. Thermostatic mixer technologies are currently not able to be classified as taps, given that AS/NZS3718 *Water Supply – Tapware* is specifically for non-thermostatic taps.

Current certifications for the thermostatic mixer technology are based on AS4032.1 *Thermostatic Mixing Valves*, while AS4032.4 *Thermostatically Controlled Taps* are in the process of being accepted into the WaterMark Scheme. However, once this adoption has been verified do we finish up with conflict?

Then, what about WELS ratings?

Finally, shall the impending introduction of touch-free, sensor-operated thermostatic mixer tapware also pose

challenges to the installation codes currently in place? Intuitive functions with visual indicators of some proposed technologies are anticipated to see the user increasing temperature of the water through a left to right movement

and decreasing temperature through right to left movements of the hand, all of which are opposite to the traditional hot on the left cold on the right functionality.

What this does, though, is provide PPI Group the opportunity to identify and address the need for alignment between product and installation code change proposals and future development.

And in this litigious world we live in, unless these issues are

addressed, we leave the industry open to attack in a legal form. ■

**“ WITH THE DEVELOPMENT OF NEW CERAMIC DISC HEADWORKS AND TOUCH-FREE ELECTRONIC PRODUCTS, MODES OF OPERATION HAVE ALSO CHANGED. ”**

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# REGISTERED BUILDERS AND DISCIPLINARY MATTERS

SOME CRITICAL CHANGES ARE HAPPENING IN THE FIELD OF BUILDING PRACTITIONER DISCIPLINARY MATTERS. **PAUL COTT** TAKES *PLUMBING CONNECTION* THROUGH THE DETAILS.

**T**he position in all states will be examined in this article but at present the bulk of the changes are occurring in Victoria, arguably due to the increased consumer protection focus the government has currently in that state. That is certainly not to say that some or all of the changes won't occur in the other states. Broadly speaking, New South Wales often tends to follow Victoria as does South Australia, with Queensland and Western Australia often 'out on their own.' That is the position anyway among the 'major states' in this respect.

## REVIEW OF DECISIONS

Registered building practitioners, in one of the changes, can now apply to the Victorian Building Authority (VBA) by way of requesting the VBA to review a decision refusing registration [for example because of a 'disciplinary

matter' past or current] or imposing a condition on the builder's licence, because of a 'disciplinary matter'. In the case of the building practitioner being dissatisfied with the VBA's review decision, they can apply to VCAT [the Victorian Civil and Administrative Tribunal] for VCAT to undertake another review.

In the *Building Act*, some significant change has occurred. The relevant part of the Act has been rewritten. A critical thing for many readers to know is that building practitioners will now be held to a much higher standard of conduct.

## DISCIPLINARY ACTION

As is the same, broadly, in other states, the grounds for which an action for disciplinary sanction can occur are much the same. They are that the builder allegedly failed to maintain required insurance, engaged in unprofessional ➤



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conduct, was grossly and or repeatedly negligent or incompetent in what they did [or didn't do], not being a fit and proper person to hold a registered builder's licence, doing work in a class of work outside which the practitioner is permitted to do, breaching the relevant domestic building or building legislation or regulations, not abiding by a direction of a relevant home warranty insurer, and obtaining a registration as a builder when you shouldn't have [i.e. through fraud or false statements and or documentation].

Now, however, as a key example of the changes this article is concerned about, the grounds or bases upon which disciplinary action can be brought have been widened to now include a failure to abide by a condition which may have been imposed on registration [for example because of a previous disciplinary matter], importantly, a failure to comply with an order of direction of a building surveyor, or the VBA or VCAT [these last two perhaps being less controversial]. Other possible bases for disciplinary action can include a failure to abide by a direction or an order of the new dispute resolution body [which is to be largely conciliation based] which is planned to exist in Victoria and perhaps surprisingly, a failure to complete or undertake CPD [continuing professional development] requirements in the form usually of courses or training many professionals must undertake to keep themselves acquainted with developments in their chosen field.

#### SHOW CAUSE NOTICES

These are defined as written notices, issued relevantly for present purposes by the VBA, which commence the disciplinary action procedure and which ask the registered practitioner to explain why the current circumstances and/or facts as alleged should not lead to action against them. A time period within which a written and or oral response is to be given is provided, which is usually 14 days. Then, once the 'show cause response' is in, a further period elapses within which the VBA considers the response.

This new procedure is a bit different to the old process where a 'notice of inquiry' was issued by the [now abolished] Building Practitioners Board after which, at the BPB's option, a formal hearing may ensue. Now, a formal hearing is not required in every case and the VBA may now decide, even if not satisfied completely that the allegations have been answered in the 'show cause response' to not hold a formal hearing.

In a serious case of certain breaches, the VBA can now immediately suspend a registration before a show cause

notice is issued! Such a drastic step would only be taken where the builder or practitioner becomes insolvent, breaches a building act or other law, doesn't hold required insurance, breaches a registration condition, or is convicted of certain offences.

As to what many of you may be wondering, the issue of the consequences of disciplinary action, the possibilities are firstly, and hopefully more often, no further action. Then, a reprimand is possible, a financial penalty [of up to \$15,167] conditions on registration can be imposed, the practitioner can be required to undertake a specified training course, and in the worst case scenario, suspension or even cancellation of registration can occur. As part of the changes which lead to this article being written, now the VBA can direct

or compel the practitioner to do a certain thing, or not do it, such as being ordered to rectify and or complete certain building work. Finally, an undertaking can be given by the practitioner to do or not do a certain thing, which undertaking can be accepted in lieu of other action against the builder.

As to other states, it is Victoria which is at present the state undergoing the most significant changes. However, other states may well follow suit in respect at least of some of the changes, as stated above. All other states have broadly

equivalent authorities [such as the Building Professionals Board in NSW] and procedures as in Victoria in regards to disciplinary matters. The specific situation in each state should be examined if further detail is desired.

#### CONCLUSION

The 'devil can be in the detail' in relation to these changes and this article is more meant to be a 'primer' or a 'call to action' to those involved who are, or who in the future become somehow embroiled in a disciplinary matter. As always, it is best to avoid the temptation to attempt to resolve a 'disciplinary matter' yourself if you are a registered builder, and it is therefore generally best to seek professional advice earlier rather than later. ■

Paul Cott LLB [Hons], Grad Dip Legal Practice, LLM is a Senior Associate Lawyer. Working in commercial litigation for a number of years has seen Paul amass a wealth of knowledge and experience in building and construction litigation which he is willing to share. Paul is also a member of the Building Dispute Practitioners Society.

“ THE VBA CAN DIRECT OR COMPEL THE PRACTITIONER TO DO A CERTAIN THING, OR NOT DO IT, SUCH AS BEING ORDERED TO RECTIFY AND OR COMPLETE CERTAIN BUILDING WORK. ”



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# TEACHING AN OLD DOG NEW TRICKS

JULYAN SUMNER WILL BE 68 WHEN HE COMPLETES HIS PLUMBING APPRENTICESHIP AND SAYS HIS AGE HAS BEEN AN ADVANTAGE. **ADELLE KING** REPORTS.

**A**t 65, Julyan Sumner isn't a traditional plumbing apprentice, beginning a new career at a time when most of his peers are entering retirement, or at least thinking about it.

"I don't want to fully retire," says Julyan, who has been keeping busy his whole life.

Originally from England, Julyan has spent most of his life on farms and spent nearly 40 years working as a shearer in country WA before a shoulder injury required 18 months off. Despite fully recovering and still being able to shear, this absence made it difficult for Julyan to find sufficient work.

It was a chance encounter with a young plumber he'd known for years that opened up the possibility of a career change.

"My present employer came into the shearing shed to see the farmer and I was listening to his conversation over lunch," says Julyan.

"He was looking for a reliable worker so I asked him if it was something I could do."

Julyan began working as a trades assistant and when the business moved to Perth his boss approached him about the possibility of starting a plumbing apprenticeship.

Although it was something he'd thought about, Julyan found the prospect of apprentice level wages off-putting and thought about returning to work in the logging industry in Hyden.

Friends encouraged him to go for it though, and the more he thought about it the more he realised an apprenticeship could benefit him in the long-run, recognising his practical skills and providing a guaranteed profession.

"In the back of my mind was the fact that my superannuation was negligible and I thought at my age it would be advantageous to have a piece of paper saying I'm qualified," he says.

"If an opportunity comes along you can't turn it down because of pay, you have to take it."

Now Julyan is thoroughly enjoying being an apprentice and says the work environment has been brilliant.

"I think the other apprentices were initially somewhat amused, but I get on very well with all the guys in the company."

On whether he'd faced any issues at work because of his age, Julyan says it had been suggested that he was taking the job of a young person.

"Not in a nasty way, but in a discussion it was implied that because I'm in the workforce someone who just left school missed an opportunity."



Overall though, he says the responses have been overwhelmingly positive.

"The funny thing is I go to places with my boss and people talk to me because they think I'm the boss."

While Julyan may seem like an oddity among a group typically made up of teenagers straight out of high school, according to the National Centre for Vocational Education Research (NCVER), he's just one of a growing number of people aged over 45 commencing new apprenticeships.

But it's not easy starting an apprenticeship later in life, warns Julyan, who sees himself as the exception rather than the rule.

"There's a lot of background things that enable me to do what I'm doing, which may not be available to other people," he says.

"To hold me up as an example that older people can follow is problematic."

"I had an employer who was willing to take me on but then there's also my wife who's prepared to let me do this with a more than 50% cut in pay."

Receiving one of Rheem's Plumbing Apprentice Grants in 2015 was therefore a welcome helping hand that allowed Julyan to purchase new tools.

He has just under two years left of his apprenticeship but Julyan's not making too many plans for what he'll do afterwards.

"To use a modern expression, I'm just going with the flow," he says. ■

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# A SNEAK PEEK AT THE IMPROVED WATERMARK PRODUCT DATABASE

IMPROVEMENTS HAVE BEEN MADE TO THE WATERMARK PRODUCT DATABASE. IT IS NOW EASIER TO CHECK IF YOUR PLUMBING AND DRAINAGE MATERIALS AND PRODUCTS ARE WATERMARK CERTIFIED.

Following the launch of the improved single level WaterMark Certification Scheme on 1 July 2016, the Australian Building Codes Board [ABCB] has developed key documents and further improvements to the scheme. The latest being the WaterMark Product Database. The main changes to the database are the improved design and search functionality resulting from feedback received from stakeholders.

With a new look and responsive design, consistent with the ABCB website, the dynamic database is freely accessible from the Product Certification, WaterMark section of the ABCB website.

## KEY FEATURES

The key features include:

- a synonym pop-up library when entering text into search fields;
- additional information such as WELS ratings and a product's scope of use; and,
- the capacity to produce a Licence Summary.

## IMPROVED SEARCH FUNCTION

Searching for certificates and/or products is easier. Users have the ability to use a free text search bar, or narrow down results using a drop down filter. Filters enable refined searching by Product Category, Product Specification or Brand Name. The synonym pop-up library feature complements filtering to allow for predictive and exploratory searching. It also enables multiple selection [see Figures 2 and 3].

Once a search has been refined, results will be shown containing relevant certification and product information, such as:

- WaterMark licence number;
- Licensee name;
- Product specification;
- Product type;
- Brand name;
- Model name; or,
- Model identification.

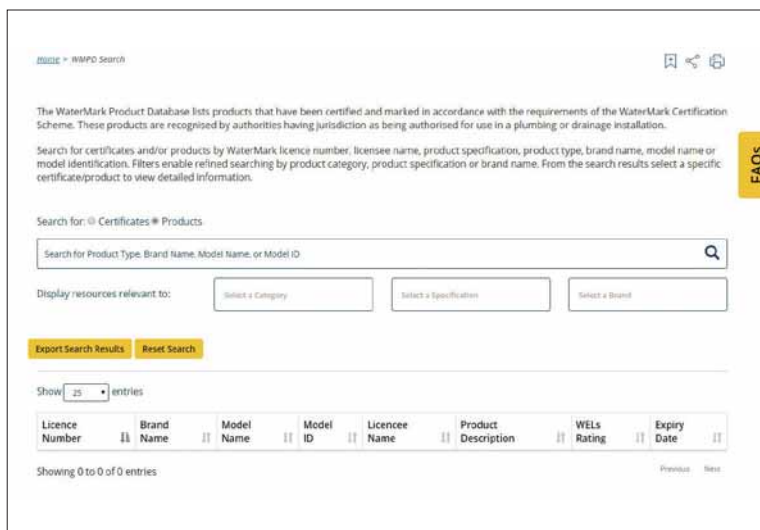


Figure 1.

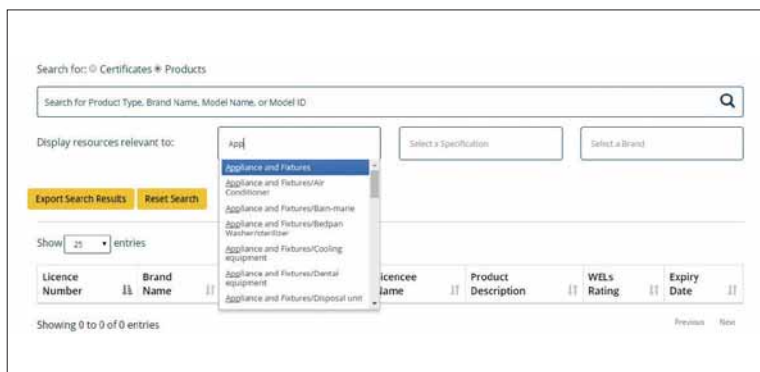


Figure 2.



Figure 3.

### IMPROVED PRODUCT DETAIL

Upon selecting a certificate and/or product, users are directed to the product detail information. This page provides essential information about a current WaterMark material or products. It is here that users can learn more about the installation compliance with the Plumbing Code of Australia, WaterMark scope of use, the certification body and certification specifications [See Figure 4].

### PRINT FUNCTIONALITY

Users are also able to print and export search results. This feature allows for a licence summary to be printed, which combines relevant certificate and product information.

### STAY UP-TO-DATE

To ensure you are kept up-to-date with the latest developments, register for the NCC Online and agree to receive information on National Construction Code related materials, news and events at [www.abcb.gov.au/User/Register](http://www.abcb.gov.au/User/Register).

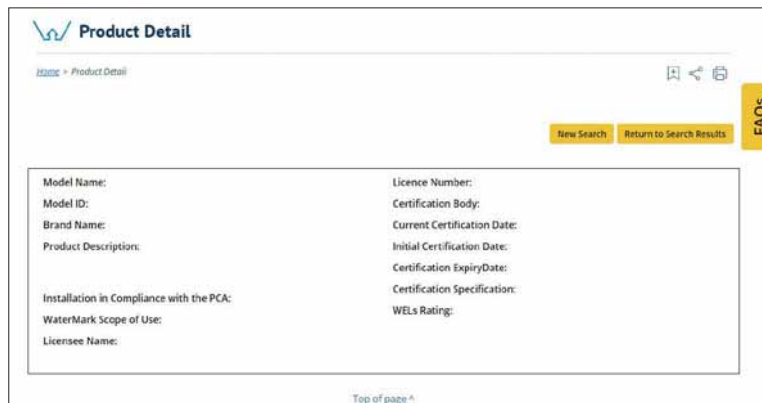


Figure 4.

The improved database represents the culmination of a significant body of work and the ABCB appreciates the substantive contribution Scheme stakeholders have made to its design and functionality. ■

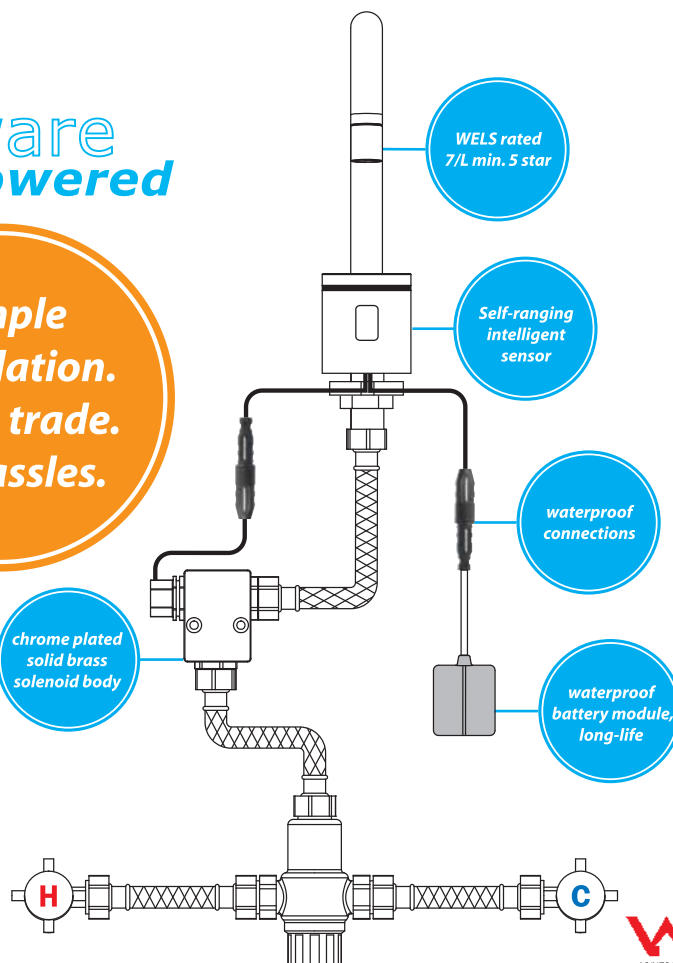
More information on the WaterMark Certification Scheme is available at [www.abcb.gov.au](http://www.abcb.gov.au).



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# ACCESS IS THE KEY

STANDARDS AUSTRALIA IS COMMITTED TO A DIGITAL PUBLISHING FUTURE TO MAKE THINGS EASIER FOR USERS AND CONTRIBUTORS. PAUL SKELTON REPORTS ON THE FUTURE OF ACCESSING STANDARDS.

There's no denying that standards are large, expensive and numerous. This means getting information when you need it most, in a way that is most suitable, can be a challenge.

It turns out that the team at Standards Australia has been thinking along the same lines and is taking steps towards better access to Australian Standards.

As it stands, Standards are distributed to the market by SAI Global, which in 2003 signed a 15-year deal to be the exclusive publisher of these documents. A five-year option exists on market terms following the end of the contract in December 2018.

Standards Australia is assessing what the future holds for publishing when that deal ends. And it all comes down to one word: digital.

"The future of Standards publishing is definitely digital, but what that means exactly we don't yet know. Our objective is to position ourselves for this digital future," Standards Australia chief executive Dr Bronwyn Evans says.

"We have an understanding of how people consume content today, but we need to be ready for a very flexible future.

"We need to be ready for people to use and consume information in any way they want."

Bronwyn says Standards users expect information access and distribution to evolve, and it's up to Standards Australia to ensure everybody who needs information can get it.

"We're investing strategically in our platforms, our people and our processes to ensure that we deliver on users' expectations.

"We're also making sure that Standards and the processes for

creating them are fast as well as simple."

The organisation is busy developing a 'digital repository', which will become the heart of the new system.

"This will house the content our contributors and users require. That way, we can make our data available to anyone on any platform – be it a smart watch, smart phone or PC. One day this list could also include virtual reality or augmented reality. It could even include your shoe, as in *Get Smart*.

"We're making sure that we're ready for the future, whatever that future may be."

Better access is all well and good, but if Standards Australia is to keep up with demand it needs to provide better tools to industry volunteers who sit on technical committees.

"Currently, our primary objective is improving the contributor experience," Bronwyn says.

"Anyone who has worked with us at a committee or contributor level will have used the SharePoint platform, which is affectionately called 'the hub'. We are looking at how this can be simplified.

"We'll be looking to introduce new and better editing tools. We're introducing XML to streamline direct text adoptions of International Standards and changing the way we submit international ballots using the International Standards Organisation online tool called ISolutions."

For the full digital Standards experience, users will have to wait to see what the technology and distribution arrangements allow.

"Ultimately, we will move away from a paper-based model," Bronwyn says.

"However, we won't abandon paper completely because there is still a need for it. But it will play a lesser role.



Dr Bronwyn Evans is the chief executive officer of Standards Australia.

"Above all else, we want Standards to be used. They result in better outcomes in terms of safety and efficiency, so better access is vital."

In the meantime, Standards Australia will be talking with stakeholders to find out how people actually use Standards.

"What do they find impenetrable? What tables or text do they use all the time but wish could be explained in a video? What would help people in a virtual reality environment?

"By working with us and giving us ideas, you can have a greater input into how Standards Australia works.

Digital publishing has revolutionised consumer media. Bronwyn's aim is that it will now fundamentally change the way Standards are consumed.

"We want to make sure our 95-year-old organisation will be around for another 95 years." ■





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# COPPER'S 'HOT SPOT'

COPPER PIPES AND FITTINGS HAVE BEEN USED FOR HOT WATER PLUMBING FOR OVER 100 YEARS AND IT'S NOT HARD TO SEE WHY, WRITES INTERNATIONAL COPPER ASSOCIATION AUSTRALIA CHIEF EXECUTIVE **JOHN FENNELL**.

**W**hen it comes to hot water, copper has most of the advantages. Its considerably lower thermal expansion makes it much easier to accommodate movement than plastic pipes and for complex installations – like high-rise buildings – there are several well established methods available for dealing with expansion and contraction of heated water pipework.

All materials used in pipework experience length change due to the change in temperature. This is very important with hot water systems that can vary from cold to hot many times a day. Copper has one of the lowest rates of thermal expansions with some plastic pipe material expanding more than eight times that of copper.

If the pipework is locked into position and does not allow for thermal movement, related stresses in the material will occur that may cause premature failure, including:

- Failure of the piping from overstraining, in particular at junctions or branches.
- Leakage at the location where the material has reached its yield point.
- Distortion in the piping or connected equipment.

The design and installation of pipework must take into consideration each material type, the method of installation and the change in temperature. Heated water supplies must have free length of piping around the bend or along the branch, a clear space to allow movement or expansion loops, or offsets located at or near the midpoint in straight lengths.

Thermal length changes are calculated based on the difference between the coldest temperature in the pipework (i.e. during installation of the system, or when the system is not in operation) and the highest temperature during operation.

## CALCULATING THERMAL LENGTH CHANGE

To calculate the thermal length change of a pipe section [Table 1], the following mathematical formula is used for the temperature range:

$$X = L \times (T2 - T1) \times a \quad \text{Formula 1}$$

### Where;

X = Thermal length change [mm]

L = Length of pipe section [m]

T1 = Coldest Temperature [°C]

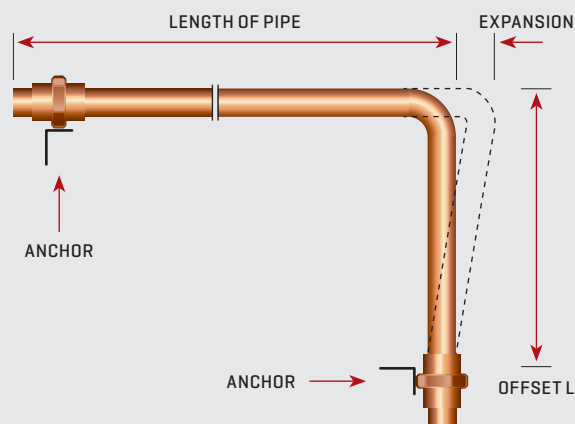
T2 = Highest Temperature [°C]

a = Coefficient of thermal expansion [mm/(m°C)], (for copper this is 0.0177 – see Formula 1)

**TABLE 1 - CHANGE IN LENGTH OF COPPER PIPES DUE TO TEMPERATURE CHANGES**

Pipe length, m	Change in length, mm								
	Temperature change, °C								
	20	30	40	50	60	70	80	90	100
≤3	2	2	3	3	4	4	5	5	6
>3 ≤5	2	3	4	5	6	7	8	8	9
>5 ≤9	4	5	7	8	10	12	13	15	16
>9 ≤12	5	7	9	11	13	15	17	20	22
>12 ≤15	6	8	11	14	16	19	22	24	27
>15 ≤20	8	11	15	18	22	25	29	32	36
>20 ≤25	9	14	18	23	27	31	36	40	45

**FIGURE 1**  
PROVISION FOR EXPANSION

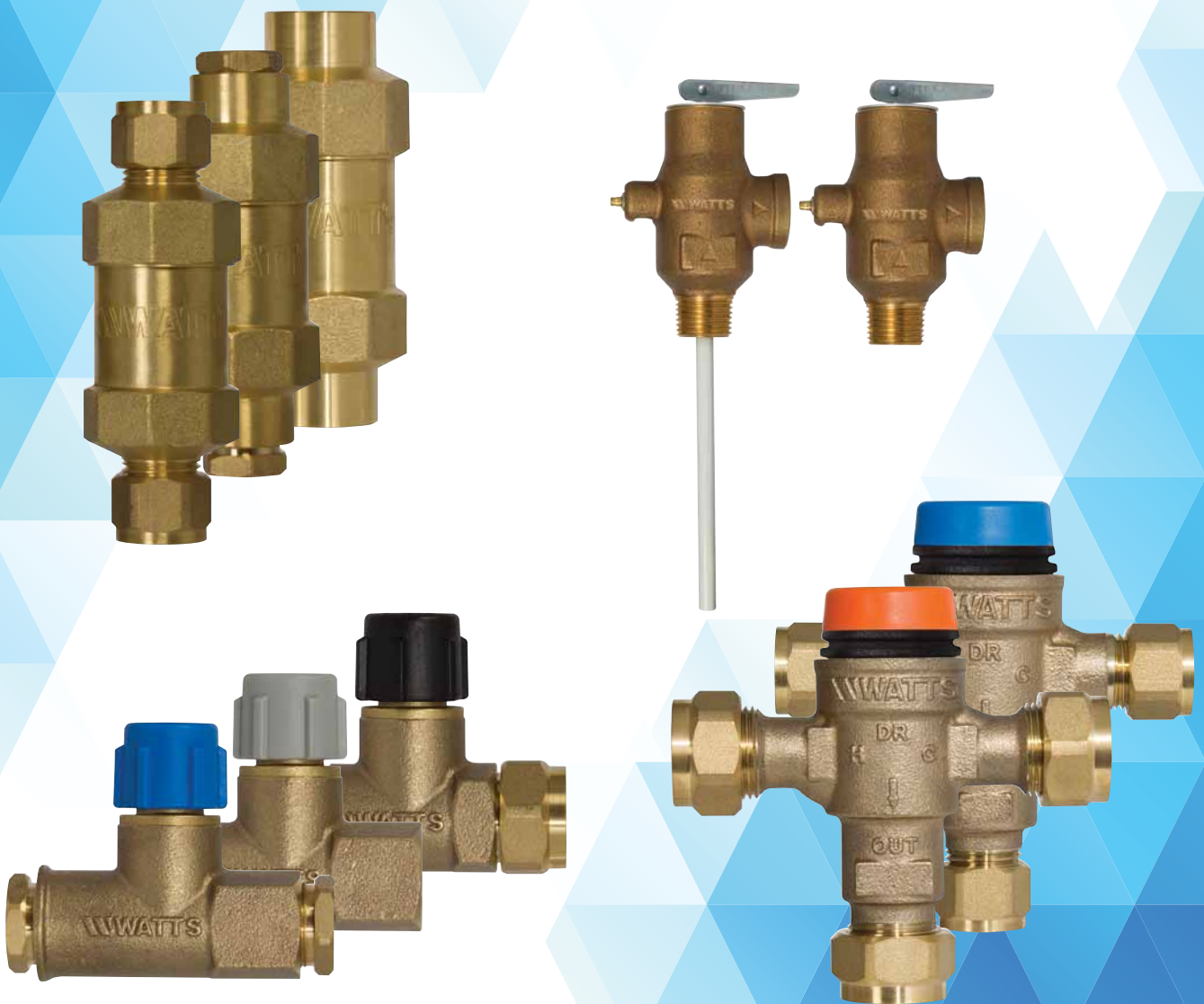


### Coefficient of thermal expansion [a] for material:

Copper	0.0177
Stainless steel	0.0159
PE-X	0.15
PB	0.13
PP-R	0.15

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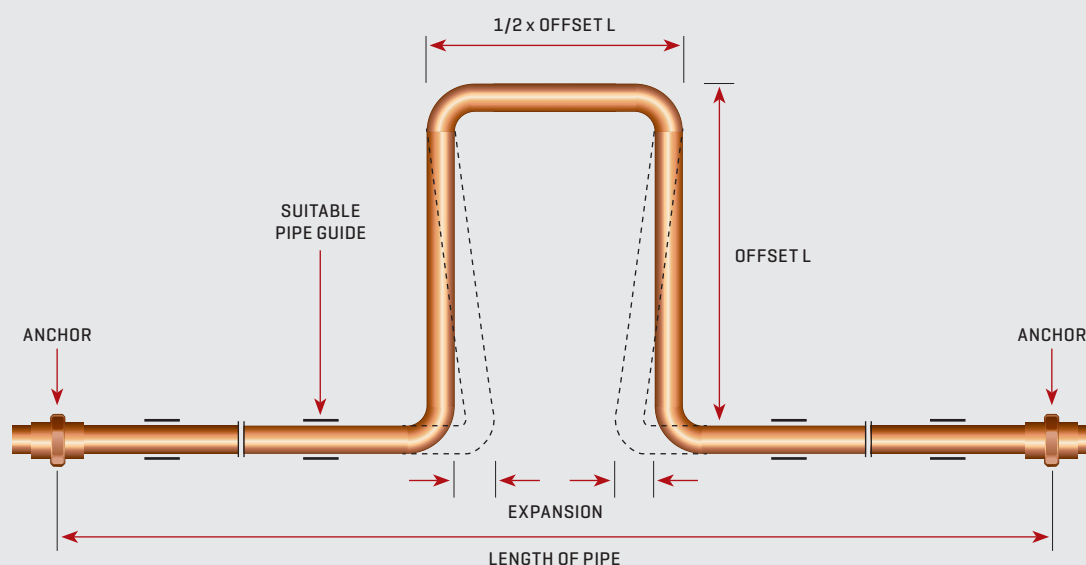


**TABLE 2 - CALCULATING THE OFFSET LENGTH L**

Expansion [mm]	Length of Offset for Copper [m]										
	DN 15	DN 20	DN 25	DN 40	DN 50	DN 65	DN 80	DN 90	DN 100	DN 125	DN 150
5	0.53	0.61	0.68	0.86	0.96	1.10	1.22	1.29	1.36	1.54	1.67
10	0.75	0.86	0.96	1.22	1.36	1.56	1.73	1.83	1.93	2.17	2.36
15	0.92	1.06	1.18	1.49	1.67	1.90	2.11	2.24	2.36	2.66	2.89
20	1.06	1.22	1.36	1.73	1.93	2.20	2.44	2.59	2.73	3.07	3.34
25	1.18	1.36	1.53	1.93	2.16	2.46	2.73	2.89	3.05	3.44	3.74
30	1.29	1.49	1.67	2.11	2.36	2.69	2.99	3.17	3.34	3.77	4.09

NOTE: For pipe sizes DN 18 and DN 32, the next larger pipe size shall be used.

**FIGURE 2**  
EXPANSION LOOPS OR U-BENDS



**TABLE 3 - CALCULATING THE OFFSET LENGTH L FOR AN EXPANSION LOOP OR U-BEND**

Expansion [mm]	Length of Offset for Copper [m]									
	DN 15	DN 20	DN 25	DN 40	DN 50	DN 65	DN 80	DN 90	DN 100	
10	0.53	0.61	0.68	0.86	0.96	1.10	1.22	1.29	1.36	
15	0.65	0.75	0.84	1.06	1.18	1.35	1.49	1.58	1.67	
20	0.75	0.86	0.96	1.22	1.36	1.56	1.73	1.83	1.93	
25	0.84	0.96	1.08	1.36	1.53	1.74	1.93	2.05	2.16	
30	0.92	1.06	1.18	1.49	1.67	1.90	2.11	2.24	2.36	
40	1.06	1.22	1.36	1.73	1.93	2.20	2.44	2.59	2.73	
50	1.18	1.36	1.53	1.93	2.16	2.46	2.73	2.89	3.05	

NOTE: For pipe sizes DN 18 and DN 32, the next larger pipe size shall be used.

## PROVISION FOR EXPANSION

Provisions for expansion must be considered when designing tube runs and fixing points in order to allow freedom of movement at bends, branches and tees.

The easiest and most common method of accommodating expansion is to provide an offset or change in direction and allowing the tube to move. This requires that the tube not be fixed within a certain distance of the end [see Figure 1].

## CALCULATING THE OFFSET LENGTH L

The length of the Offset L [see Table 2] can be calculated from formula 2:

$$L_{\text{Offset}} = C \times \sqrt{d \times X} \div 1000 \quad \text{Formula 2}$$

### Where;

$L_{\text{Offset}}$  = Offset length [m]

C = Material constant [for copper this is 61.2 – see Formula 2]

d = Pipe outer diameter [mm]

X = Expansion or thermal length change as determined by Formula 1 [mm] or from Table 1

Note: The Length of pipe section L is the length between the anchor point and the offset bend.

### Offset constant [C] for material:

Copper	61.2
Stainless steel	61.2
PE-X	12
PB	10
PP-R	20

## EXPANSION LOOPS OR U-BENDS

Long pipe sections may need to be split up in sub-sections by installing more than one anchor point. Between any two anchor points a provision for thermal movement must be created, i.e. by installing an expansion loop or U-bend [see Figure 2]. Expansion loops and U-bends should be located near the centre of the length of pipe and placed horizontally to avoid forming air locks at the top of the loops and to ensure circulation of the water.

## CALCULATING THE OFFSET LENGTH L FOR AN EXPANSION LOOP OR U-BEND

Because the expansion loop or U-bend consists of two offsets back to back, half of the expansion is accommodated by each side of the U-bend. Therefore when using Formula 2, the expansion or thermal length change [X] is half of the expansion that the entire length of pipe experiences [see Table 3]. ■

John Fennell is the chief executive officer of the International Copper Association Australia.

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## TAPPING INTO THE ‘DRAIN TRUST’

A CONSORTIUM OF INDUSTRY HEAVYWEIGHTS, INCLUDING THE STORMWATER RESEARCH GROUP, HAS REDEFINED THE TESTING MECHANISM FOR BALCONY AND ROOF DRAINS. **PLUMBING CONNECTION** REPORTS.

In the Autumn 2017 edition of *Plumbing Connection*, page 40, Dr Terry Lucke of the Stormwater Research Group [SWRG] at the University of the Sunshine Coast [USC] explained how much of Australia’s building and property flood damage is caused by undersized or inadequately designed grated balcony and roof drainage outlets.

The issue stemmed from the fact that many of these outlets and their associated components had had their flowrate capacity estimated using traditional methods that were based more on anecdotal evidence than by scientific research.

Now, the SWRG has completed a research project in collaboration with the Association of Hydraulic Services Consultants Australia [AHSCA] Research Foundation and Specialty Plumbing Supplies [SPS] of Sydney that could redefine the way that balcony and roof drainage outlets are designed and tested for use in the Australian construction industry.

The project aimed to develop a national testing protocol for grated balcony and roof drainage outlets used in the Australian construction industry. Currently there are many products on the market that have no recognised benchmark for testing.

“Having no recognised industry testing protocol means that roof drainage system designers must rely on performance data supplied by the manufacturer. This can have serious liability issues in the event of system failure,” says Dr Terry Lucke from the SWRG.

“By developing a national testing protocol to which products are then certified, AHSCA members can be confident that the performance characteristics quoted by a manufacturer are reliable.”

The second phase of the project was to use the newly developed AHSCA testing protocol to quantify the hydraulic behaviour and flow capacities of more than 40 of SPS’ proprietary grated roof and balcony drainage outlets under typical Australian rainfall conditions.

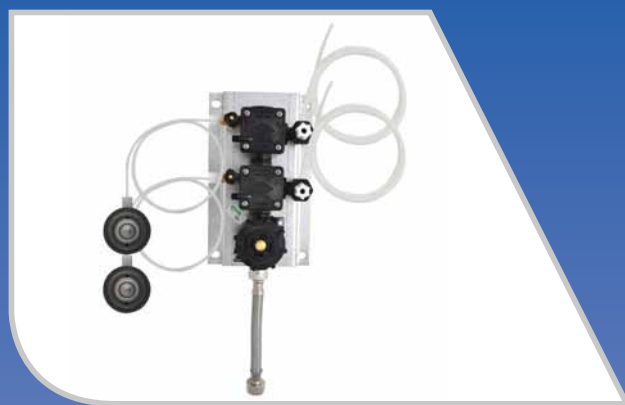


In order to carry out testing, a fully functioning Outlet Performance Testing Rig (OPTR) was designed and constructed by Chris Cunningham at the SWRG. The OPTR was incorporated as an extension of the existing National Roof Drainage Research Facility, a facility jointly owned by the AHSCA Research Foundation and USC that is located at USC's Sippy Downs campus.

Data from the flow meter [L/s] and water head [mm] is logged using four standard outlet pipe configurations connected to the roof drain and downloaded as raw data to a CSV file for development of a flow/head characteristic curve.

Contact the Stormwater Research Group at [stormwaterresearch@usc.edu.au](mailto:stormwaterresearch@usc.edu.au).

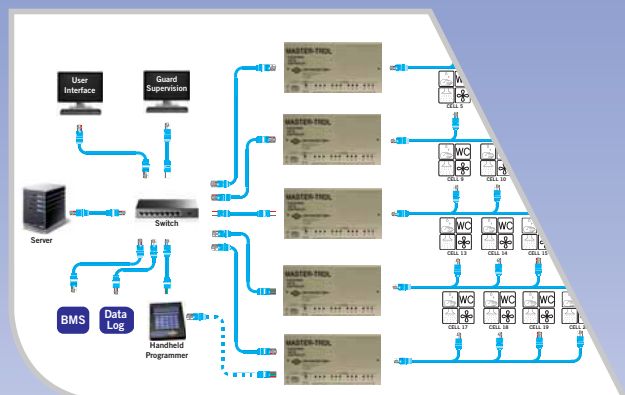
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# PREVENTING A DISASTER

BACKFLOW PREVENTION ASSOCIATION OF AUSTRALIA PRESIDENT **PETER MCLENNAN** OUTLINES EVERYTHING YOU NEED TO KNOW IF AND WHEN YOU ARE CONSIDERING THE USE OF AN RPZ.

**W**hether you're a hydraulic designer, plumbing consultant, contractor or commercial property owner, there are numerous decisions that you must make when considering a backflow prevention device, in particular a Reduced Pressure Zone Valve (RPZ).

An RPZ is a safety valve that protects a drinking water supply. They are used extensively but many people don't understand how they operate or the limitations and constraints applicable to these devices.

**The following topics need to be addressed when considering the use of an RPZ:**

- Backflow basics.
- Pressure drop.
- Flow rates.
- Discharge.
- Installation guidelines.

## BACKFLOW BASICS THE PLUMBING CODE

AS/NZS3500.1-2015 is called up in the National Construction Code, Volume 3, the Plumbing Code of

Australia. Section 4 is *Cross Connection Control* and lays out the backflow prevention requirements mandated through legislation. When a state or territory calls up the National Construction Code in its plumbing regulations, unless otherwise stipulated, it makes the use of backflow preventers mandatory.

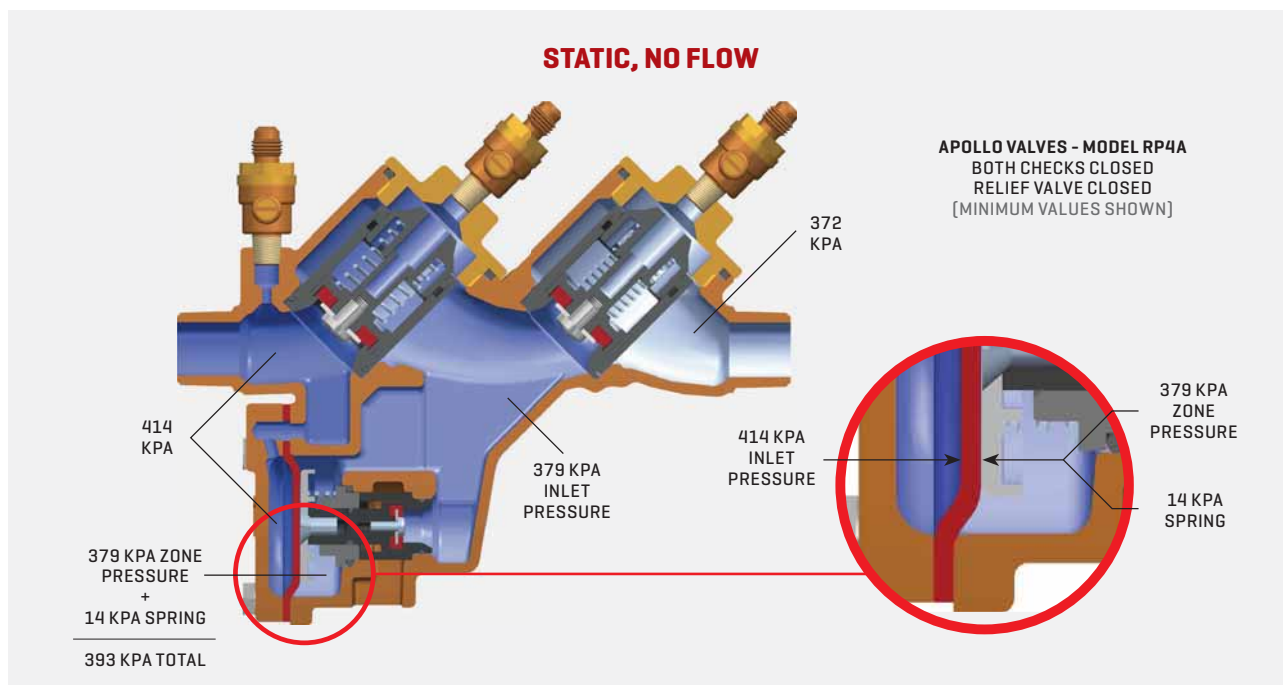
## THE STANDARD

Backflow prevention devices must be WaterMarked to AS/NZS2845.1-2010 or AS/NZS2845.1-1998. This WaterMark is your assurance that the device has been manufactured and tested in accordance with the relevant Standard. If it does not have a WaterMark it should not be installed.

## HAZARD RATINGS

The abovementioned Standards also identify three levels of 'hazard' [i.e. contamination or pollutants that can come in contact with the drinking water]:

- High – The pollutant or contaminant, if ingested, could kill you.
- Medium – The pollutant or contaminant, if ingested, is unpleasant and may make you ill.



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- Low – The pollutant or contaminant is non-toxic but is objectionable and should not be present in drinking water.

### **CROSS CONNECTION TYPES**

1. A direct connection. This is where the cross connection is 'hard piped' and is often installed by people unaware of the possible consequences. It could be a bypass line or a submerged tank-filling connection.
2. An indirect connection. The most common cross connection is a hose. A hose is an indirect connection as the outlet can be used and left in myriad conditions. For example, drain cleaning, chemical mixing, pipe flushing, pool filling, etc.

### **BACKFLOW TYPES**

1. Back siphonage – where the pressure in the supply line is reversed causing the water to be sucked or run backwards. This is usually caused by a water main break in the street but can be caused by mechanical devices that rely on the Venturi effect to draw water from the supply line.
2. Back pressure – where the water pressure within the facility is greater than the supply pressure. Causes can include high head pressure found in high rise buildings and at the top of hills, and mechanical equipment failures.

### **BACKFLOW PREVENTER TYPES**

1. Testable – for use in high hazard applications.
2. Non- testable – for use in low hazard applications.

### **PRESSURE DROP AND FLOW RATES**

Backflow preventers rely on pressure drop across the check valves for effective operation. The minimum spring differentials are stipulated in the Standard and all watermarked devices must comply.

Testable backflow preventers are field tested for effective operation at least annually by an accredited tester trained in backflow prevention.

Always check the manufacturer's published literature for the pressure drop curve to ensure you have enough available pressure to supply the amount of water required. This is especially important where a fire connection is concerned.

**The following examples are from manufacturers' published literature and should be used as a minimum:**

- 100mm RPZ valve at 20L/s has a head loss of 68kPa.
- 100mm double check valve at 20L/s has a head loss of 20kPa.
- 100mm double detector check valve at 20L/s has a head loss of 68kPa.
- 100mm single check valve detector testable at 20L/s has a head loss of 57kPa.

These figures are for devices only and do not include

strainers or isolating valves. These values need to be taken into account where pressure is limited.

### **DISCHARGE FROM RPZ VALVES**

All RPZ valves will dump water through the vent in the valve. It is a safety feature that ensures that if the device fails or there is a backflow event, the drinking water is protected.

The spillage of water is often inconvenient, but when an RPZ valve is installed where water cannot get away, it can become dangerous to property and humans.

All manufacturers publish the discharge rates applicable to their devices so be aware of these when you install an RPZ; otherwise, you may have a flood on your hands. For example, a 50mm RPZ with a pressure of 700kPa can discharge sufficient water to empty an Olympic-size swimming pool in six hours.

### **INSTALLATION GUIDELINES**

Backflow prevention devices are mechanical devices that require regular testing and maintenance. To facilitate this, they must be installed where ease of access is available. The Standard addresses some aspects, but each manufacturer outlines specific installation requirements in their published literature.

**The three questions you need to ask yourself are:**

1. Is the device I am installing suitable for vertical and horizontal installation, or just horizontal?
2. Is the device I am installing suitable for concealing in a valve box or pit?
3. Does the device I am installing have ease of access for regular testing and maintenance without the need for special equipment or dismantling from the line?

Concerns surrounding backflow are quite serious and should not be easily dismissed. In the next edition of *Plumbing Connection*, I will continue to look into the issue and offer readers more practical advice on how to prevent a potential disaster. ■

Peter McLennan has been involved with backflow prevention in Australia since the late 1980s. He is the president of the Backflow Prevention Association of Australia Inc., and secretary of the Backflow Prevention Association of Australia Inc. Queensland Chapter. Visit [www.bpaa.org.au](http://www.bpaa.org.au) to find out more about how the Backflow Prevention Association of Australia Inc. can help you understand cross connection control and backflow prevention.

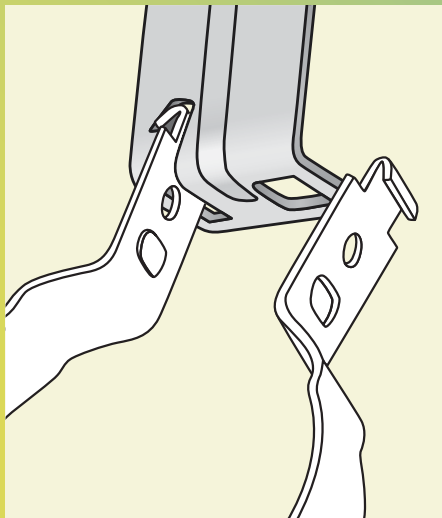


# The worlds fastest clipping system now got even faster...

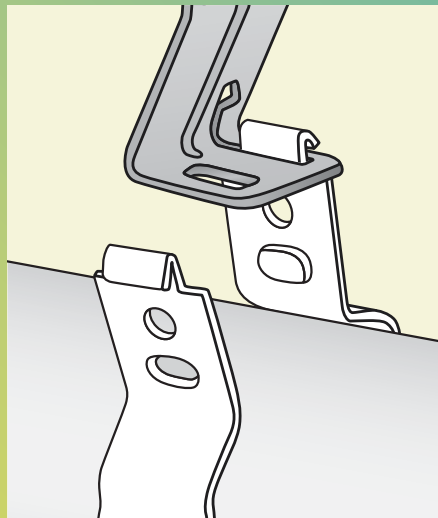
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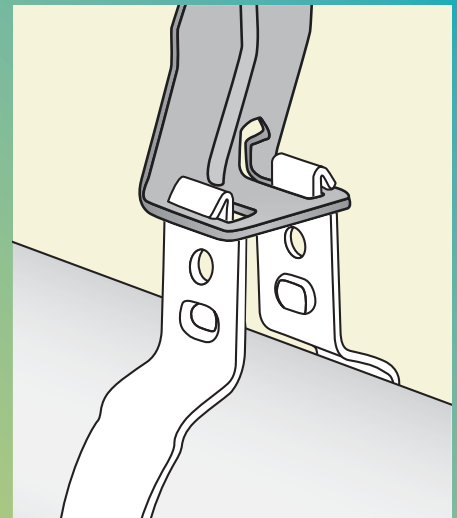
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**STEP 2** Install pipe as required – can be pre-hung



**STEP 3** Simply lock clip to bracket

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## SIMPLY ELEMENTAL, MY DEAR WATSON

MONIER HAS RELEASED A NEW ROOFING TILE TO THE AUSTRALIAN MARKET. **PETER COLL** WAS AT THE LAUNCH TO BASK IN THE AMBIENCE AND GET EXPOSED TO THE ELEMENT[AL]S.

**A**s most people who know me well will tell you, I love metal roofing. In fact, I live and breathe Zinalume and Colorbond – but my business also entails the installation and repair of alternate roofing materials, namely tiles.

Late last year I was invited to the launch of a new tiling product from Monier, the Elemental Series.

The launch itself was interesting for several reasons. I'm a fairly seasoned veteran at such industry events and I was impressed with the way they re-educated the attendees about the extensive existing Monier product range. Sometimes you forget the diverse range of options we have available to us to sell and install, that these companies have in their kit bags.

Monier's new Elemental composite roofing has a traditional slate tile look and is available in a palette of six colours.

But the big reveal came later in the evening from behind a large black curtain.

Before we get to that, CSR Monier showed off its existing products up against Colorbond and steel roofing in general. It even displayed aged/damaged steel sheets next to shiny new roof tiles to dramatise matters.

Leading up to the reveal, the CSR spokesperson then took to the stage to explain that 'the roof cat was back!'. It made me feel like a kid again, to see those great nostalgic Monier [Top Cat in Roof Tiles] advertisements from the '80s and '90s. But then the presentation was dragged back through the faults with metal roofing all over again. Maybe I'm old school but I was always taught that if you can't say anything nice about your opposition, don't say anything at all.

Tiled roofs should be able to stand on their own – and they do in many ways. Yes, steel has knocked a fair bit of market share off them over the years, particularly with the trend towards lower pitch designs. But that's beside the point.

Then, the moment we all came for arrived and the big reveal was Monier's new Elemental Series composite roofing.

While there has been a bit of lightweight composite roofing finding its way to market here, when someone like CSR gets behind such a product you know things are about to get serious with the category.

Although there was no mention of where the product is manufactured, I was assured that extensive local testing [CSIRO] had been done to mimic our robust climatic conditions.

I was pleasantly surprised by the appearance and the variable sizes on offer.

Elemental has a very traditional slate tile look and is available in a palette of six colours – Midnight, Graphite, Urban Ash, Ink Stone, Sand Storm and Salt Spray.

The product is created from an advanced, fibre reinforced, engineered material that was developed from technology commonly used in the automotive and aerospace industries.

These advanced composites are made using a process that sees high-strength resin reinforced with glass and subsequently compressed; this then cures and enables the material to harden permanently to form a strong, stable and durable material that is very lightweight.

Monier has really thought through the real world application of this product. Unlike conventional roof tiles, Elemental can be installed on roof pitches as low as 10°, is only 12mm thick, can withstand up to 300kg of weight and is backed by a 30 year structural guarantee. They also claim with its innovative new clipping system, it is very quick and easy to install.

Currently there is no proprietary ridging or capping system for Elemental, so they will be forced to rely on their old arch nemesis, Colorbond, to complete the installation for now but they tell me that these accessories are in the pipeline.

On its own, I think this product is the best roof tile option I've seen come to market. It's a premium product, which I am sure will be deservedly priced at the top level, it's just a shame that they have gone down such a negative road with its release. But we'll get over that.

One of the first trial installations of Elemental was in Noosa on a Paul Clout Design home which won the 2015 HIA Queensland Home of the Year award. I'm sure we'll start to see a fair amount of this attractive roofing on the skyline around the suburbs and coastline very soon. ■

Peter knows his metal roofing with 20 years of experience in design, manufacture and installation. He is the general manager of Johnson Roofing, which supplies and installs metal roofing to projects throughout Victoria. Peter is also currently the director of the Residential Metal Roofing Industry Association of Victoria.

If you have any questions: [peter@johnsonroofing.com.au](mailto:peter@johnsonroofing.com.au)

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## GAS, GAS OR GAS?

AS MORE HOME OWNERS TURN TO PLUMBERS TO RECOMMEND GAS WATER HEATERS, *PLUMBING CONNECTION* ASKED RHEEM TRAINING MANAGER **JON PALFREY** TO EXPLAIN THE DIFFERENCES BETWEEN THE THREE MOST COMMON TECHNOLOGIES AND HOW TO DECIDE WHAT'S BEST FOR YOUR CUSTOMERS.

**W**hether on reticulated natural gas or in a dwelling supplied by 'bottled' gas, it's becoming increasingly common that a customer will request your expertise and recommendation on the type of gas water heater that will best suit their needs and expectations.

Selection of a water heater needs care as the wrong decision can lead to years of unsatisfactory supply of heated water or a system that can allow high running costs.

This article will explore the basic differences between the three gas-type domestic water heaters available in today's market – mains pressure gas storage, continuous flow gas and mechanical/instantaneous gas systems – and will explore the differences and benefits of each to provide you with the necessary information to recommend the most suitable gas option for your next water heating job.

Information available in many forms today allows customers to gain some understanding of system choices relating to services in their home. Water heating is often

something that's out of mind as long as there is sufficient delivery during peak demand periods and when hot water is needed quickly and at the desired temperature.

Water heater selection and recommendation then falls into two categories; replacement and new dwelling installations. It's the replacement installation which often has more constraints than a new dwelling installation and sometimes can be problematic in endeavouring to meet a customer's needs, expectations and previous water heating experiences.

If some alternatives are considered and the customers' needs factored into the recommended option/s, a better more cost effective outcome can often be found.

The following information is designed to provide the basic details outlining the three domestic gas-type systems available to the market today and to explore the reasons why each system can be considered for the various sized dwellings now found in metropolitan and regional areas of Australia. ➤

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ROOF & FLOOR  
DRAIN SYSTEMS





Training by Rheem on gas continuous flow systems will shortly be followed by modules on gas storage.

### MAKING THE RECOMMENDATION...

In most situations when a water heater installation is needed by a customer, the advice and recommendation of the plumber gasfitter is taken with justified authority and trust.

The customers' expectations can be accurately met when you, the plumber, are in the position of providing a considered recommendation for your customer.

The following key questions when initially discussing a new or replacement gas system will ensure a satisfied customer who has their hot water expectations met:

- Has the old system met your needs, particularly during peak demand periods? If so, a same for same installation can be the most suitable outcome.
- Are you looking to reduce running costs with a more efficient system?
- Does the customer's usage patterns provide for one or more options?
- What are the customers' expectations relating to performance, recovery/re-heating, multi point use, delivery time to fixtures, system position etc.?
- Are the household's usage patterns changing possibly with a growing [or shrinking] family or with teenage children?

Let's explore the three gas choices for domestic water heating requirements.

### MAINS PRESSURE GAS STORAGE

Mains pressure gas storage systems, as their name suggests, deliver the water pressure that is plumbed to the unit via cold mains supply so they can serve several taps at once without a significant loss of flow. They are very popular when replacing an existing gas storage unit particularly when the customer is seeking the same performance in terms of simultaneous flow to fixtures, and the combination of pressure and temperature.

A gas storage unit holds a quantity of hot water in a thermally-insulated cylinder ready for immediate use. As heated water is drawn from the system, cold water enters to replace it. During operation, reheating [recovery] continues after the flow of hot water has ceased to bring the tank temperature back to a normal setting of 65°C [75°C in stainless steel cylinder models].

In a well-designed water heater, hot and cold water will co-exist for a period of time without mixing. This allows the maximum volume of heated water to be drawn off at full temperature, providing maximum time for incoming cold water to be heated.

Referred to as the displacement principal, this design is fundamental to the performance of a mains pressure storage system and is one reason why it can provide more flexibility in performance than continuous flow or instantaneous systems.

All Rheem, Vulcan and Aquamax mains pressure gas storage systems, for example, work on the displacement principal.

With advances in flue design and cylinder insulation, high efficiency, mains pressure delivery as well as quick recovery are all intrinsic benefits of this system type. The best performing gas storage systems [e.g. Rheem Stellar] recover as much as 200L/hour to full temperature – critical in winter to ensure your customer has no shortage of hot water supply.

With no need for electrical supply, labour and material costs in a replacement installation are minimised which is often popular with the customer. When replacing an old two-star energy rated gas storage system, new four- and five-star models can reduce gas consumption by up to 21% while supplying the same amount of heated water per day.

Compatible with any tapware, mains pressure gas storage systems are a popular choice to meet varied household usage patterns.

With homes now being built on a larger footprint and with more fixtures and distance between points of use, a mains pressure gas system positioned close to the kitchen and the main wet areas is a good choice to provide hot water as quickly as mains pressure water will flow throughout pipework to fixtures.



## GAS CONTINUOUS FLOW

Continuous flow gas systems have been available in Australia since 2002 and have seen continual design improvements since their introduction.

Six-star energy-rated gas continuous flow systems are a popular energy efficient option for the supply of domestic hot water.

Small in size and now with fluing options to allow installation in confined spaces [e.g. balconies] gas continuous flow systems meet most households' hot water needs where space/footprint is limited. Internal systems with co-axial fluing are also available providing an option where the internal position has limited fixed ventilation provisions.

When installing a gas continuous flow system, care must be given to correct fitting line sizing and gas meter or gas bottle supply volume due to high mega joule consumption when operating. Electrical power is required for ignition and component operation [i.e. the fan]. Both factors can make these systems a more expensive alternative in replacement installations.

Rheem's continuous flow systems are advanced gas

appliances that enable heated water flow and inlet and outlet temperature to be constantly measured to ensure consistent temperature and flow from the unit at all times.

Once the minimum flow rate of around 3L/min is achieved through the system, the unit continuously heats water [hence the term] as it passes through the heat exchanger.

Consideration must be given to appropriate tapware as some low flow taps can create resistance to water flow that could cause issues with system performance.

Factoring that most people shower around 40°C, it can be determined if the number of showers in the dwelling will have sufficient flow from the water heater to meet the household needs and therefore if the system's flow rate capacity can support the customers expectation of simultaneous fixture operation.

While a gas storage system holds a volume of heated water at a minimum of 60°C to be readily supplied at mains pressure, a continuous flow system is measured by its flow rate capability in litres per minute heated at a 25°C rise from incoming cold water mains supply.

The continuous flow system will if necessary reduce water flow to achieve the required temperature rise so in winter ➤



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when cold water supply temperature can be below 15°C, the flow rate can be reduced.

### **MECHANICAL/INSTANTANEOUS GAS**

Mechanical/instantaneous gas water heaters can be a simple means to provide heated water for small to medium sized domestic applications with minimal fixtures.

Not requiring electrical power to operate, they are popular for ease of installation and reliable basic operation as they lack some of the advanced electronic operating functions of gas continuous flow systems.

While mechanical/instantaneous systems may offer pre-set hot water temperature options, you will need a suitable tempering valve to be installed where required by AS3500.4.

Recent improvements in technology relating to componentry and function mean these systems now have some performance benefits equivalent to continuous flow gas models such as improved temperature control, accessible temperature adjustment, flue terminal design for more consistent operation in high wind areas and multiple water temperature monitoring points within the system.

As an example, the Rheem Pronto instantaneous is such a system and can be considered not only as a replacement option for previous generation models, but also as an alternative to other gas systems with a potential savings in installation due to no power requirement and lower gas consumption compared to some continuous flow models.

These units have energy efficiency rating of 5.8-6-star and a 7% reduction in gas consumption applies per star when replacing older models.

### **SO THE QUICK COMPARISON...**

Some system benefits will outweigh others. Balancing your customer's needs, expectations and installation cost will allow a considered recommendation to be made.

Lower running costs, limited space and footprint and the availability of touch pad temperature control are factors that would point to a customer having a gas continuous flow installed, providing its size and flow capacity meet their delivery performance requirements.

Where mains pressure flow and high temperature to kitchen and laundry outlets are needed, combined with a user adjustable thermostat as well as lower supply and fit costs are key factors, a gas storage system is 'hard to beat'.

For a smaller dwelling where electrical power is not available where the unit is to be installed, a gas instantaneous model could be considered suitable particularly if it was remotely positioned from the main wet areas of the house, possibly as the second water heater option for an ensuite bathroom.

Often a same-for-same gas system replacement can be the most suitable recommendation and easiest/lowest cost option.



Face-to face plumber training is being conducted by Rheem during 2017 all around Australia.

Please remember to remind your customers once that you have installed the new system that all gas water heater options require servicing to guarantee consistent, efficient and durable operation.

Service requirements relating to how often and what needs checking are typically all listed in installation instructions/owners' guides.

### **RHEEM TRAINING...**

For more technical detail regarding the Rheem gas range, Rheem E-learning training modules are now available on the Rheem website.

Training modules currently on Rheem gas continuous flow systems will shortly be followed by modules on Rheem gas storage, instantaneous, heavy duty and eventually commercial systems.

Completion of each training module (currently there are six) accrues one CPD point in those states where ongoing training is necessary. A certificate of completion is available from the associated training module site. ■

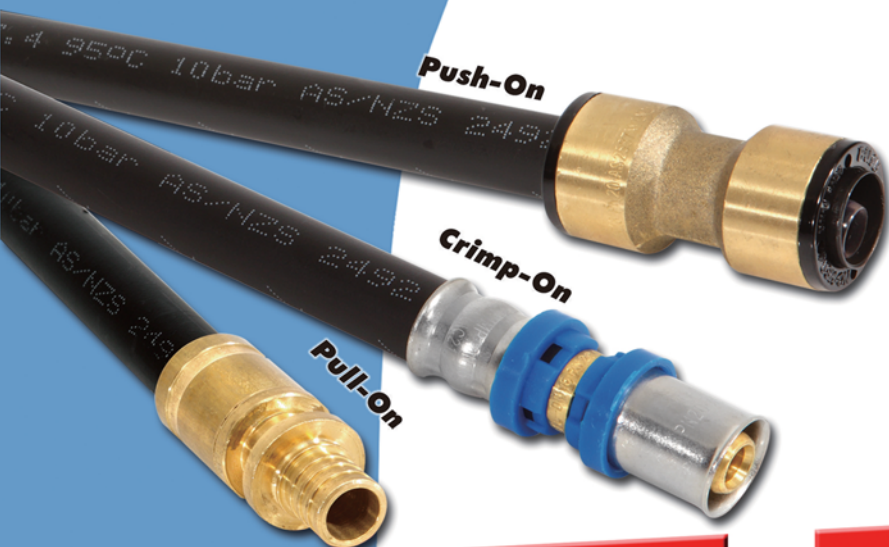
*Contact Rheem for locations throughout Australia where face-to face plumber training is also being conducted during 2017.*

John Palfrey is Rheem Australia's Training Manager.



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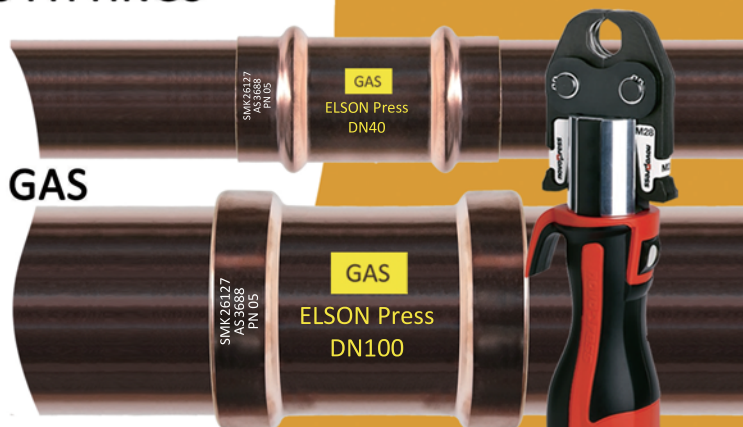
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# OPEN CHANNEL FLOWS

FLOW RATES IN OPEN CHANNELS CAN BE DIFFICULT TO PIN DOWN. **DR TERRY LUCKE** OF THE UNIVERSITY OF THE SUNSHINE COAST IN QUEENSLAND EXPLAINS HOW TO WORK OUT A PROPER ESTIMATION.

In the Winter 2016 edition of *Plumbing Connection*, page 32, I discussed some of the fundamental causes of pressure losses in pipework systems, such as pipe friction and form losses.

You may remember that I explained that there are generally two different types of pipe flows: pressurised pipe flow (such as water supply systems that flow full) and open channel pipe flow (which have a free surface open to the atmosphere, as in stormwater drainage pipes).

There are, of course, many other common types of open channel flows including roof gutters, roadway gutters, stormwater drainage channels, and rivers and streams.

In this edition, I will provide some background to open channel flows and try to explain how to estimate flow rates in open channels.

The difference between pressurised pipe flow and open channel flow is in the fundamental mechanism that drives the flow. For open channel flow, gravity is the only driving force acting on the fluid, i.e. water flows downhill. While gravity can also influence fluids in full-pipe, pressurised systems, the flow is usually driven by a difference in pressure along the pipe, i.e. fluid flows from higher to lower pressure zones.

There are many ways to classify a flow: developing; fully-developed; laminar; turbulent, and so on... Because open channel flow has a free surface above it, this allows

additional types of flow to develop that cannot occur in full-pipe flow systems. Some of the classifications of the flows are described below.

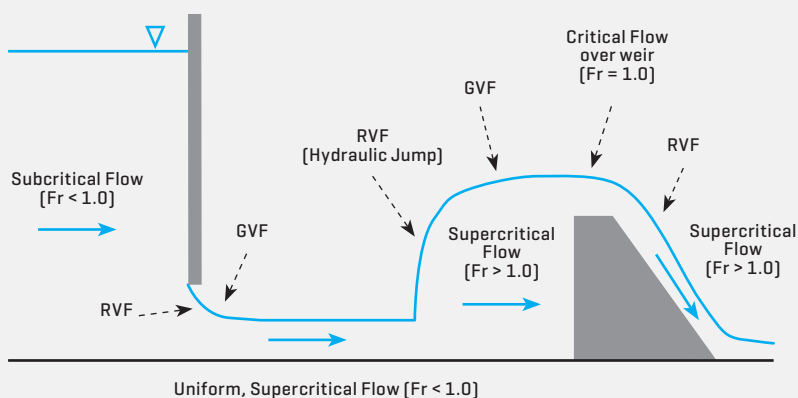
The manner in which the fluid depth varies with time and distance along the channel is used to partially classify a flow. For example, the flow is unsteady or steady depending on whether the depth at a given location does or does not change with time.

Open channel flow can be classified as uniform and non-uniform flow according to its flow characteristics. For uniform flow, the velocity, depth, and cross sectional area are constant along the channel (see Figure 1); whereas for non-uniform flow, they vary in the direction of the flow. Irrigation and water supply channels are often designed to have uniform flow conditions. The depth associated with uniform flow is called the normal depth.

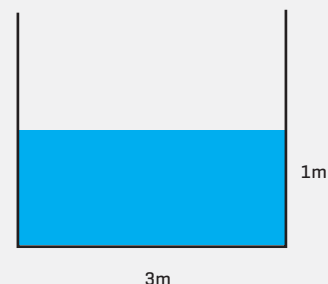
Non-uniform flows are further classified as rapidly varying flow (RVF) if the flow depth changes considerably over a relatively short distance [e.g. flow under a sluice gate or a hydraulic jump]. Gradually varying flows (GVF) are those in which the flow depth changes slowly (see Figure 1) with distance along the channel [e.g. a slow-flowing river].

The relative importance of the various types of forces involved [pressure, weight, shear, inertia] is different for the different types of flows. As for any flow geometry, open

**FIGURE 1 - DIFFERENT FLOW CONDITIONS ALONG A CHANNEL**



**EXAMPLE 1**



channel flow may be laminar, transitional or turbulent, depending on various conditions involved. Which type of flow occurs depends on the Reynolds number [Re], which is ratio of the inertial forces to the viscous forces within a fluid. Higher Re numbers mean more turbulent flow conditions. A general rule is that open channel flow is laminar if  $Re < 500$ , turbulent if  $Re > 12,500$  and transitional otherwise.

One of the most important parameters in open channel flow hydraulics is the Froude number. The Froude number [Fr] is ratio that compares the average flow velocity [V] in the channel to the speed [c] that a wave would travel in the fluid [ $Fr = V/c$ ]. When Fr is less than 1.0, the flow is termed subcritical [see Figure 1]. The waves created by any surface disturbances downstream [e.g. throwing a stone in the water] can travel upstream in subcritical flow conditions as  $V < c$ . On the other hand, a Froude number greater than 1.0 indicates supercritical flow [ $V > c$ ]. This means all surface disturbances will be swept downstream. A Froude number equal to 1.0 indicates critical flow [ $V = c$ ] conditions [see Figure 1], which means the waves will remain stationary. Open channel flow Froude numbers play an important role in the design of flow control structures such as weirs and culverts.

## CHEZY AND MANNING EQUATIONS

The basic equations used to determine the uniform flow rate in open channels were derived many years ago. One of the oldest equations in fluid mechanics is the Chezy equation, which is used to calculate flow rates in open channels. This was developed in 1768 by A. Chezy [1718–1798], a French engineer who designed canals for the Paris water supply.

Continual refinements of the Chezy equation have taken place over the years to obtain better values of the empirical coefficients involved. The result is a semi-empirical equation that provides reasonable engineering results. After a series of experiments in 1889, an Irish engineer, R. Manning [1816–1897], developed a modified and more accurate version of the Chezy equation for to calculate flow volume in open channels which is still widely used today. This is known as the Manning equation:

$$Q = \frac{AR_H^{2/3} S_0^{1/2}}{n} \quad \text{Eq. 1}$$

### where:

- Q = Channel flow rate [ $m^3/s$ ];
- V = Average channel flow velocity [ $m/s$ ];
- $R_H$  is the hydraulic radius of the channel [Flow Area/Wetted Perimeter] [m];
- $S_0$  = Channel slope [m/m]; and
- n = Manning resistance coefficient.

The Manning resistance coefficient value [n] is dependent on the surface material of the channel's wetted perimeter and was obtained from experiments. The rougher the wetted perimeter, the larger the value of n. For example, a finished concrete channel has an approximate n value of 0.012, whereas a grass-lined channel may have an n value of approximately 0.035. Manning n values for different surfaces are easily found in common references.

A variety of interesting and useful results can be obtained from the Manning equation [Eq. 1]. However, it must be noted that the Manning equation assumes uniform flow conditions in the channel and the results refer to the Normal depth. While this may be an appropriate assumption for some man-made channels, it is unlikely to apply to natural channels. Determining the flow rate of a given channel is a relatively straightforward calculation as shown in Example 1.

### EXAMPLE 1

Calculate the flow rate Q [ $m^3/s$ ] through the finished concrete channel [ $n = 0.012$ ] at the given depth if the slope of the channel is 1%?

$$Q = \frac{AR_H^{2/3} S_0^{1/2}}{n} = \frac{3 \cdot 0.6^{2/3} \cdot 0.01^{1/2}}{0.012} = 17.8 m^3/s \text{ [ans]}$$

### Solution:

$$A = 3 \times 1 = 3 m^2; \quad P = 1 + 3 + 1 = 5 m; \quad R_H = 3/6 = 0.6 m; \\ \text{Slope} = 1\% = 0.01, \quad n = 0.012$$

So, as you can see, it is relatively simple to calculate flow rates in open channels using the Manning equation if the channel dimensions are known. A more common design problem, however, is how to size a channel to convey a particular design flow rate. This is the case for example when designing stormwater drainage channels to cope with the catchment runoff flows from during a prescribed storm event like the 1 in 100 year ARI. The design process involves trialling different channel types and dimensions until a suitable solution is found. This process also uses the Manning equation but in a slightly different way.

I hope this article has helped somewhat to improve your understanding of the characteristics and design of open channel flows. I have purposely tried to simplify the article as much as I could to make it easier to understand. The underlying fluid mechanics principles are obviously a bit more complicated than this, but not that much! ■

Dr Terry Lucke is an Associate Professor in Hydraulic and Civil Engineering at the University of the Sunshine Coast's School of Science and Engineering. He can be contacted at [tlucke@usc.edu.au](mailto:tlucke@usc.edu.au).

# STEP UP TO THE PLATE

REQUIRED ONLY IN A HANDFUL OF JURISDICTIONS, ENERGY SAFE VICTORIA TECHNICAL WRITER **MICHAEL WEBER** LOOKS AT GASFITTING COMPLIANCE PLATES FOR CARAVANS AND BOATS.

**W**ithin Australia and New Zealand there are no cohesive legislative requirements set aside for the registration of caravans and boats in which there are gas installations.

Some jurisdictions require that a gasfitting compliance plate is attached to caravans before they can be sold and registered. Others do not.

This means that the sale and registration of caravans and boats interstate and in New Zealand may be compromised due to a lack of harmonised legislative requirements. The same situation applies to imported caravans and boats with non-compliant gas installations. The introduction of a gasfitting compliance plate will provide evidence that the gas installation has been certified by a licensed gasfitter. Customers will also be able to confirm their gas installations are correctly installed through their Technical Regulator.

Of Australian and New Zealand jurisdictions, Tasmania, Northern Territory, Western Australia, Queensland and New South Wales require compliance plates for the gas installations, while the Australian Capital Territory, South Australia, Victoria and New Zealand have no current legislative requirements for compliance plates at all.

There are some caravans and marine craft, either manufactured in Australia or New Zealand or imported from overseas, that have not been certified by a licensed gasfitter and are entering the market and being sold to unsuspecting customers. A gasfitting compliance plate will assist in addressing this situation and covers the following vehicles and marine craft:

- Caravans.
- Mobile holiday homes, incorporating fixed gas installations.
- Trucks and trailers incorporating fixed gas installations.
- Boats.
- Houseboats.
- Floating restaurants, whether fixed or mobile.
- Catering vehicles, whether self-propelled or towed.

New South Wales (NSW) has already prepared a proposal [based on its own legislation] for the introduction of a compliance plate. NSW's example of the gasfitting compliance plate is provided in the image attached.

A similar compliance plate could be adopted by the other gas jurisdictions.

The major benefits of such a gasfitting compliance plate for caravans and marine craft includes:

**Gas Installations - AS/NZ 5601:2**  
**Gas Compliance Plate**

**State/Territory of installation:**  
 ACT ☐ NSW ☐ NT ☐ QLD ☐ SA ☐ TAS ☐ VIC ☐ WA ☐ NZ ☐

**Type of Installation:**  
 New Installation ☐ Alteration-Addition ☐ Test ☐  
 Mobile: ☐ Marine: ☐

Vin/HIN No: \_\_\_\_\_  
 Gas Compliance Certificate No: \_\_\_\_\_  
 Date of Test: \_\_\_\_\_  
 Tested By: \_\_\_\_\_ (Contractor Licence No)

Some jurisdictions require that a gasfitting compliance plate is attached to caravans before they can be sold.

- Removing the problems in cross border acceptance, sales and registration.
- A uniform approach to the manufacture of caravans and boats in that no matter where manufacturing takes place caravans and boats will be accepted by the Technical Regulator in that state, territory or country.
- Evidence of compliance with Australian and New Zealand Standard AS/NZS 5601.2.
- An assurance of safety to the public in that the risks of gas explosions, fires, carbon monoxide poisoning, burns and other injuries are reduced to a minimum.

In addition, it is expected that there is a reduction in risks associated with the environment, competition and economic impact.

In order to achieve acceptance of a gasfitting compliance plate throughout Australia and New Zealand a proposal has been submitted to Standards Australia for an amendment to AS/NZS5601.2 *Gas Installations: LP Gas installations in caravans and boats for non-propulsive purposes* to include a requirement for a gasfitting compliance plate.

It is anticipated that the project to amend AS/NZS5601.2 will commence shortly and stakeholders will be given an opportunity to provide feedback through the publication of a draft for public comment subject to acceptance of the project proposal by Standards Australia. ■



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**DEWATERING PUMP**

Australian Pump Industries has released a heavy duty dewatering pump that is factory-fitted with an automatic stop/start function. The new pump is part of Tsurumi's heavy duty KTZ series and can be left to operate unattended. The level electrode has a timer function that eliminates excessive activations caused by agitated water and the pump will operate for a minute after the water/electrode contact is lost. The new system is now available with Tsurumi's KTZ series heavy duty cast iron dewatering pumps. The automatic versions of the KTZ series (identified as KTZE), vary in power ratings from 1.5kW to 3.7kW with flows of up to 1,420L/min and heads to 37m.



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**AUSTRALIAN-MADE RVASS**

Tec-Vent is a new Reduced Velocity Aerator Stack System [RVASS] from Plastec Australia.

It is the only Australian-made RVASS and has been designed to balance the positive and negative pressure in drainage stack systems. This eliminates siphonage of trap seals without the need for a relief vent.

Tec-Vent is ideal for high rise building, hotels and multi-storey residential buildings as it is most effective in buildings higher than three storeys.



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**MOBILE GENERATORS**

JCB Construction Equipment Australia has announced new mobile generators that are built-to-last in even the harshest environments. Nine models from the QS Series are coming to Australia, fitted with JCB engines that have been tried and proven in 200,000 machines around the world. The new generators are fitted with a high quality steel canopy incorporating a single-piece roof that is protected by a phosphate dip and a seven stage paint process. They provide easy programming and monitoring performance with the standard-fit Deep Sea Electronics 4510 control panel, and come with an optional DSE 4520 control panel.



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Enware has introduced the new Leva Sequential range, which has been designed for ensuite showering and hand-washing applications in the health and aged care markets. Complementing the Leva range, the new products offer benefits including ease of use, potential for energy savings and reduced risk of legionella compared to traditional single lever mixer type tapware. They are suitable for most basin types, with the option of adding a suitable spout, and unlike other single lever mixers, offer some adjustability with up to 25mm of depth variability.

**Enware**  
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New from Plumbtool is a purpose-built handsaw specifically designed to cut PVC. It features a bespoke teeth design to cut PVC without shattering the pipe and has a deburring blade built into both sides of the handle. The deburrer cleans the edges of the cut pipe in a quick and clean motion. The saw is 350mm overall with a 280mm blade so it fits easily into a tool box or tool tote.

**Plumbtool**  
[www.plumberschoice.com.au](http://www.plumberschoice.com.au)

**INSTANTANEOUS GAS WATER HEATER**

Rheem Australia has entered the instantaneous mechanical gas water heater segment with the new Rheem Pronto.



Rheem Pronto uses the same mounting point locations as the most common mechanical water heaters, which makes installation – particularly replacement – simple. And once in place, all the connections are also in an identical position, so there's no need to adjust the pipework.

Available in 12L or 16L/minute capacities and natural gas or propane models, its compact size means the Pronto is easier to install into tight spaces than other comparable mechanical hot water heaters.

**Rheem**  
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# ATT

## ACROSS THE TRADES

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# A CONSTRUCTIVE CONVERSATION

Mental health is a subject that is often avoided like the plague. While people are more than happy to bang on for hours about back pain and sports injuries there is still a stigma associated with stress, depression and the like. But it looks like that's finally changing.

In Australia, rates of suicide in the construction industry are higher than average for men and over twice the national average for young men. For both employers and employees in the industry, there needs to be increased awareness of the signs and a willingness to talk about these issues openly.

And it would seem industry awareness is increasing. Many larger companies and organisations are introducing Employee Assistance Programs (EAPs) and 'wellness' programs either in-house or outsourcing to specialist providers. But there are many ways that smaller players can get on board too.

"I think it really is about making sure you understand the signs of stress and other mental health issues in the people you work with through your own education and self-awareness. If you are an employer, creating an environment where you encourage people to talk (which is always difficult with males) is going to go a long way in supporting them," says AccessEAP CEO Sally Kirkright.

Employers have a duty of care to provide a physically and psychologically safe workplace but it's also important to encourage people to build their own resilience skills. The added challenge with the construction industry is that job insecurity, the hours of work and limited flexibility lead to an inability to empower people.

According to Sally, one of the best things you can do if you suspect a work mate is experiencing depression is simply to ask them about it.



"The minute you ask, people feel much better – just being invited to have a conversation is a really good step towards them seeking support. But you also need to realise that you're not a counsellor or a psychologist.

"The simplest way of asking someone is just saying, 'I have noticed that you don't seem to be quite the same, are you ok?'. But before you ask that question, think about what you will do if they reply 'no I'm not'."

According to Sally, you should suggest they talk to somebody. So make sure that your work environment has someone to talk to. If your work has an EAP then that's who you'd suggest

they call. If your business doesn't have an EAP you would suggest they go and speak to their doctor and have a conversation.

Tradies are notorious for bottling up their problems. There's a perception that it's weak to admit you're having a hard time but this needs to change.

"Make sure that, as a business owner or co-worker, you know what the signs are to look out for.

"It could be simply that someone might be a bit more irritable, they may have lost weight or put on weight, might be short tempered or introverted. And if that's the case, just ask the question," says Sally. ▲



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## IF YOU WANT IT DONE WELL...

Ten years ago, if you heard a couple of blokes on a jobsite discussing 'wellness', you'd probably have wondered what was in their Thermos. But in recent times 'wellness' and discussions around it, are becoming synonymous with a healthy workplace. **Jacob Harris** explains.

**T**he term 'wellness' relates to both mental and physical health so covers a much broader range of issues than traditional occupational health and safety. And many businesses and industry organisations are introducing programs to ensure their employees or members are tracking alright in every aspect of their lives.

A great example of this is The National Electrical and Communications Association (NECA) and the new 'wellness portal' on their website. NECA decided to look into this area because they felt the electrical industry was lagging behind in this space compared to other industry groups. The construction industry, for example, has organisations such as 'R U OK?' which have already made significant headway in the space.

"We engaged a consultant to look at some strategies around how NECA can best portray this area for the electrical trades and bring them up to speed, similar to the other trades," says NECA HSEQ manager Phyllis Edwards.

"Very little was being done looking into mental health issues such as suicides and depression. From an economical perspective alone, the sick days alone are making a significant impact on costs and productivity."

While efforts in the construction industry look at issues such as fly-in, fly-out and remote working conditions, NECA is focussing on a range of issues more relevant to the electrical trades – from those faced by young apprentices who are working in the trade for the first time, right through to electricians who have been in the trade for a number of years but don't get much help or support.

"One of the things we looked at was just having an Employee Assistance Program (EAP), which allows members to phone someone and have a chat with them if they're having a bad day. We found that often electrical trades are still trying to put the 'H' back in HSE. They are doing a lot of safety, which is great, but the health component could use some attention.

"We are looking to engage sponsors who can offer health



programs for our members. What we aim to do is be the connector,” says Phyllis.

While more females are moving into the trades, most trade businesses are still largely male-dominated working environments. Generally speaking, many blokes are reluctant to talk about fluffy things like ‘feelings’ so NECA has developed what it calls a ‘No Bull’ approach to try to get tradies more comfortable talking about these issues.

“There is a bit of a macho image with the electrical industry. And it’s true that a lot of programs out there are very ‘soft’. So we want to target that macho image and say ‘this information we’re providing and upholding as NECA is no bull’. That was one of the things that came about from the health consultant Helen Remington – who was also one of our speakers at the NECA wellness event.

“It’s all about giving members the facts, giving them exactly the right information to use at the right time and the right place – as opposed to all the historical data that goes on with this area a lot of the time.

“At the pilot event of our Wellness program, a lot of guys were saying things like ‘wow I didn’t know this existed’. Because it was so new to them we got a lot of really positive testimonials. Our members were expecting NECA to come out with more technical data or a product but not an engaging pilot event.”

NECA has also included health topics within its ‘Toolbox Talks’. These are essentially topics that businesses can discuss with their staff over a BBQ or staff safety meeting. The talks include factual information on a range of issues from binge drinking and loneliness to how stop yourself from getting angry in three seconds.

The success of NECA’s program, and others like it, can be in part attributed to the fact that while caring for a worker’s wellbeing is morally sound, it also pays real dividends economically.

“You can demonstrate an ROI on a wellness program. There are some formulas out there that allow businesses to plug in data from the company (sick days, productivity times etc.) and pull out how much they’re going to be saving. So there’s value in it apart from it being the right thing to do by your employees in terms of growing with them, getting to know them and creating a community or family orientated atmosphere,” says Phyllis.

“Going forward, we will be launching more wellness events this year, and ensuring we engage the right sponsors to provide health programs and assist our members in setting up their policies, Employee Assistance Programs, health management and promotion information.”

Long term, NECA also hopes to gather some statistics on electrical contractors (without the confidential details) to determine the common risks and issues relating to mental health and wellness. Things like whether they use an EAP, common topics being discussed and where some of the raw sensitivities lie. NECA then hopes to publish the information to generate a conversation.

“It’s like what we do with safety subjects. We discuss the incidents and reflect on the solutions to prevent the incident from recurring.



**The pilot event of NECA’s Wellness program was well received by industry and will hopefully be the first of many.**

“The cost of not focusing on this area can be quite dramatic. Because a lot of SMEs set up their business without setting up these checks and programs, they’re introducing risk without realising it. Ignoring the health of your employees will impact your bottom line, so rather than just being reactive, get proactive and put a health promotion program in place from the outset,” says Phyllis. ▲

**NECA**  
[neca.asn.au](http://neca.asn.au)



## TIPS



# DON'T FALL INTO BAD HABITS

Falls are a common cause of death and serious injury in Australian workplaces, particularly in construction where they are the most common cause of death and account for half of the total hospitalisations.

**D**avid Crawford is an ex-carpenter who became a quadriplegic after a roof he was working on gave way in 1991. Now a height safety advocate who works with Spinal Cord Injuries Australia's (SCIA) Teamsafe program, he implores tradies not to leave their harnesses sitting in the back of their ute.

"Your harness is not going to help you unless you're actually wearing it. I constantly see guys standing on roofs without harnesses. I see plumbers erecting and cleaning gutters. I see tradesmen hanging over the edges of buildings. They have no fall protection, no harnesses, nothing," David says.

He also pleads with workers to speak up about their safety concerns and for management to listen – citing this as critical to improving all aspects of safety on site.

While wearing a harness will definitely improve your chances of survival, it must be appropriately designed and fitted. According to chief technical officer of LINQ Height Safety Equipment Stephen Sugden, many workers who are wearing a harness are rescued unconscious after a fall which is attributed to a violent collision between the fall arrest connection hardware and a worker's head during the moment of impact.

"Many harnesses have a floating rear dee setup (a piece of plastic holding the dee in place) so that in the moment of impact there is a significant risk that it will break through the plastic holder, resulting in the dee and associated hardware smashing the back of the worker's head," Stephen said.

He cited LINQ research which led to the design of harnesses with what he calls "a closed loop system", which he said means the dorsal dee will not move during the moment of impact.

Stephen also stressed the importance of the harness fitting correctly and having a central front attachment point – as required in Australian Standard AS/NZS 1891.1 – so as to limit vectorial (sideways) forces during the moment of impact (MOI).

"You can bruise or crack a rib or even puncture a lung," he says.

Even if you survive a fall uninjured, the danger doesn't end there. The tourniquet effect of ongoing suspension (hanging) in a harness, combined with the effect of gravity on the body, limits blood flow to vital organs and can lead to "orthostatic intolerance" or "suspension trauma".

"Symptoms include increased heart rate, sweating, tingling in the arms, dizziness, pins and needles, nausea, heart palpitations and confusion, followed by fainting and in some cases death." ▲

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# TRADIES, INC.



You wouldn't build a house without solid foundations – and your tradie business needs solid legal foundations in exactly the same way. **Martin Checketts** explains how the legal structure of your business is the key to your prosperity.

**W**hen it comes to your business name, it's often the bit at the end that counts. Joe Bloggs, Sole Trader. Joe Bloggs Pty Ltd. Joe Bloggs & Partners.

So what's the difference? These variations signify an important distinction in the legal status of the business – a difference which could protect your family home and any other assets in the event of the business running into trouble. Choosing the right business structure is a vital part of protecting not only your business interests, but your personal interests too.

This article will look at some of the most common types of business structures and the pros and cons for tradies. But first, let's take a look at some of the key issues you'll need to get your head around before dealing with the legal stuff.

## ASSET PROTECTION

No doubt you've heard the colloquialism "cover your arse" on site. "Asset protection" is basically lawyer-speak for the same concept.

Asset protection means that if something goes wrong with your business – for example, if a client is unhappy with your work, or you are unable to pay your suppliers for any reason – that person can't demand recompense from your personal assets, such as the family home or your personal savings.

The objective of asset protection is to keep your business dealings separate from your personal affairs. This may not always be possible – the courts, of

course, have their ways of dealing with blatant abuse of the system – but the right business structure will help give you some peace of mind.

## DIVISIBILITY AND EXIT STRATEGY

The ownership of your business is likely to change over time. You might want to bring on a partner. You might start with a partner and then decide you're better off on your own. You might be planning to sell your business after five years and retire on an island in the Caribbean.

All of these plans have one thing in common: you may need a business structure which is flexible enough to accommodate a single owner, multiple owners or a transition of ownership. A company structure, with its capacity for assorted shareholdings, is the most obvious example.

The structure is also important if you're planning to sell your business in the foreseeable future. Certain types of structures may be preferred by large

corporate buyers, for example. So if your dream is to build an empire and to sell out, the interests of your preferred target buyer should be taken into account.

## TAX

So your new business has just made \$1m profit in the first year (lucky you). Where does that profit go? Do you invest it back in your business – or do you distribute it to your partners and shareholders?

Lurking in the shadows, of course, is the ATO. Your corporate structure, and the manner in which you distribute (or retain) your profits, will have an impact not just on how much tax you pay, but also when it is paid and who pays it.

And then there is the question of how much tax you will pay when you ultimately sell or transition the business.

The tax issues are complex and the law in this area changes often. So, up to date advice from an expert is crucial.

So these are the top three considerations when choosing a business structure. Let's take a look at the four most common structures and their pros and cons.

## SOLE TRADER (AKA JOE BLOGGS, PLUMBER)

This is the "no frills" option. There's no fancy stuff here – all you need is an ABN, to register for GST and any other accreditation relevant for your trade and off you go.

The main advantage of being a sole trader is simplicity. The disadvantage is that this structure offers pretty much nothing in the way of asset protection or flexibility. Adopting a sole trader structure may save time and money at the outset, but if you're planning to be in business for the long haul, it is worth investing some time and investigating more sophisticated options.

## THE COMPANY (AKA JOE BLOGGS PLUMBING PTY LTD)

The obvious option, with obvious benefits: an easily divisible ownership structure and a good level of asset protection.

That said, it's important to keep in mind that a company is not a foolproof solution to the asset protection problem.

You still may be asked to provide a personal guarantee to your suppliers or your bank. And, company directors can still be held personally liable in certain situations – for example, if you allow the company to trade whilst insolvent.

## THE TRUST (AKA THE JOE BLOGGS TRUST)

Trusts are divided into discretionary trusts, which allow you to distribute profits flexibly to family members and others, and unit trusts, where each beneficiary has a specific entitlement to proceeds.

"Lurking in the shadows, of course, is the ATO."

Profits "flow through" the trust and are taxed when they reach the ultimate beneficiary. This may prove to be more tax-effective, but it means that you generally have to distribute all of the profit each year to ensure a tax-effective outcome.

However, if you are planning to sell your business in the near future, you should note that trusts are not the preferred vehicle for large corporate buyers. Discretionary trusts also lack the benefit of divisibility – meaning that you can't sell off (say) 20 percent of the trust to one of your employees.

Bottom line: trusts can be tax effective, but you have to know what you're doing – or have a lawyer who knows what they're doing.

## PARTNERSHIP (AKA JOE BLOGGS AND PARTNERS)

Proceed with caution: a partnership may expose you to personal liability and you also become liable for the actions of your partner, whether you agreed to or approved them or not. This is called "joint and several liability" and needs to be handled with care.

However, partnership can also be tax effective and there can be ways to get around or reduce the liability issues.

## IT'S YOUR CALL

As we have seen, each type of structure has its merits and your choice of structure comes down to what you plan to do with your business in the medium to longer term and what you see as your priorities. Needless to say, there is no "perfect" structure for a tradie business. It's up to you to weigh your priorities, to do your research and seek advice from a suitably qualified person. We all know that there are no certainties in business – but using an appropriate structure will ensure that you're giving yourself the best chance of success. ▲

*Martin Checketts heads up the Private Advisory Team at national law firm Mills Oakley. Martin specialises in advising the owners of private and family businesses and high net wealth individuals on issues such as business succession and asset protection.*

*This article is for general information purposes only and is not (and should not be relied upon as) legal advice. You should seek specific advice from a professional legal advisor on matters arising from this publication.*

[www.millsokley.com.au](http://www.millsokley.com.au)



**Martin Checketts.**



# BREAKING FREE OF THE QUAGMIRE

**Michael Mekhitarian** from the Tradie Accountant walks *Across the Trades* through the first steps to building a better business.

**A**s accountants in public practice we know tradies come to us because you have to. We know you have to get your BAS and income tax sorted and the only reason you do this is because the ATO will hit you with a big stick if you don't. Not much of a motivation – especially when your accountant then hands you a tax bill and tells you, "it's due tomorrow". Sound familiar? No wonder most tradies see accountants as pseudo tax collectors and not much more.

No one wants their service to be seen as a grudge purchase but, as accountants, we have brought this on ourselves. The reason is that during our formal study we were never taught how to do a BAS or an income tax return and probably spent about half an hour on bookkeeping.

We aren't complaining. We accept there are parts of all jobs where you have to grin and bear it but we also want to do more for our tradie clients. That 'more' is wanting to help tradies build better businesses.

Over time, we have found that tradies who crush it focus on three things:

1. How to get money in fast
2. How to be more profitable
3. How to grow the business

So you can't really blame us when we yell this from the roof tops.

## **WHY BUILD A BETTER BUSINESS AND WHO CAN TRADIES TURN TO GET HELP?**

We are going to assume you are already a quality tradie who knows your stuff. Maybe you're starting out or maybe you have been doing this for a while and already have a team working with you.



Either way, if you want more from your accountant than just taxes, we ask you to take 10 minutes and figure out your 'why'.

This is a conversation we have many times every week – it often unfolds in the following way.

The tradie says: "You just do my tax. How could you possibly help me in my business when you don't know anything about what I do out there in the real world?"

We get it. We are professional shiny-bums in ivory towers no less! We usually reply with something along the lines of: "A doctor doesn't have to have cancer themselves to be able to diagnose and treat it".

We believe that if we help our tradie clients build better businesses, this will in turn help our tradie clients build better lives. And, if we can have a positive impact by helping lift productivity and increasing efficiency by reducing administration tasks (the nemesis of all tradies), surely that has to benefit our country at a national level.

So that's our 'why' but, more importantly, only you can figure out your 'why'. If that's too cryptic, we always suggest start with your end game in mind. Picture 'what' you want. Is it more time with your spouse and kids? More money? Less time on the tools? No doubt you get the picture but we suggest you write it down on a piece of paper. Once you've done that you're ready to take the next step in your journey, which we'll tackle in our next article. ▲

*Can't wait and want to get cracking now? Jump on to [www.tradieaccountant.com.au](http://www.tradieaccountant.com.au) and get in contact with your nearest Tradie Accountant Australia.*

If you want more from your accountant than just taxes, we ask you to take 10 minutes and figure out your 'why'.





Innovation  
that excites

# BUILT FOR BUSINESS



## INTRODUCING THE NEW NAVARA SL

With 140Kw of Power, a wide body and durable vinyl floors, the Nissan Navara SL is built to handle more. Throw in a reversing camera and you've got a vehicle that works for any business.

Register to test drive now at [nissan.com.au/builtforbusiness](http://nissan.com.au/builtforbusiness)



# BEWARE OF THE DODGY TWO-WAY RADIO

Two-way radios—also known as walkie talkies—are common and easily bought online. But sometimes these products can be dodgy. So, while your radio may seem to operate properly, it could be stopping a critical service from doing its job.

**D**odgy two-way radios are often cheap and typically sold from overseas with a package of pre-programmed frequencies. In many cases, the supplier hasn't determined whether you're allowed to operate on these frequencies in Australia.

Take, for example, the Baofeng BF-888S and Boefeng BF-888S Plus models. Through spectrum monitoring activities, our field officers have found a number of Baofeng two-way radios operating in the harmonised government spectrum (HGS). HGS is primarily used by state and territory government for law enforcement, emergency services and public safety communications.

## HOW CAN I AVOID BUYING A DODGY TWO-WAY RADIO?

If you're planning on buying a two-way radio, here are some tips to avoid interfering with critical services:

### 1. Buy from a reputable supplier, preferably based in Australia

Before an Australian supplier can sell a two-way radio, that company or individual must meet a range of compliance requirements, including record-keeping, labeling and ensuring the device complies with ACMA-mandated technical standards.

### 2. Make sure you have the right radiocommunications license

You can't operate a two-way radio without an appropriate license, so check you understand and meet your radiocommunications licensing requirements.

### 3. Hire through a short- or long-term rental company

Companies all over Australia hire two-way radios. This can be quicker and easier because the company does the leg work to ensure the device can be lawfully operated in Australia, and they can also take care of any radiocommunications licensing requirements.

### 4. Buy a Citizen Band (CB) radio

Depending on your communications needs, you could buy a CB radio—a short-distance device that can be used by anyone in Australia. However, because the frequencies programmed



into a CB radio are shared by other users, it may not suit those wanting commercial or private frequencies. Always check you meet the conditions of the *Radiocommunications (Citizen Band Radio Stations) Class Licence 2015* first.

## WHAT HAPPENS IF I'M CAUGHT?

The consequences can be serious if you're caught operating an unlicensed two-way radio. Under the *Radiocommunications Act 1992* (the Act), individuals found guilty of this offence may face jail terms of up to two years; body corporates may receive a penalty of up to \$270,000 (1,500 penalty units). Other penalties may apply, such as the interference offence provisions in Part 4.2 of the Act.

## WHERE CAN I FIND MORE INFORMATION?

- If you have questions about the ACMA's regulatory arrangements or radiocommunications licensing, contact the ACMA's Customer Service Centre on 1300 850 115 or [info@acma.gov.au](mailto:info@acma.gov.au).
- For advice on product safety, see the Australian Competition and Consumer Commission's Product Safety website [www.productsafety.gov.au](http://www.productsafety.gov.au).
- Information on electrical safety matters is available from state and territory energy regulators. ▲

*This information is intended as a guide only and should not be relied on as legal advice or regarded as a substitute for legal advice in individual cases.*



# Changes to standard form contract law

The new law to protect small businesses from unfair contracts came into effect on **12 November 2016**

## WHO DOES THE NEW LAW PROTECT?



Small businesses with fewer than 20 employees that enter into, or renew, a standard form contract:



On or after 12 November 2016



Valued up to \$300,000 (\$1 million if the contract is for more than 12 months)

## WHAT IS A STANDARD FORM CONTRACT?

An agreement where:



The terms and conditions are set by the other business



You have little or no opportunity to negotiate the terms of the contract

## HOW WILL THE NEW LAW PROTECT MY BUSINESS?



Under the new law, a court or tribunal can cancel a contract term it finds unfair. This means the term will be treated as if it never existed and your business won't have to meet it.

The rest of the contract will remain in effect to the extent it can operate without the unfair term.

## WHAT IS AN UNFAIR CONTRACT TERM?

A term may be unfair if it:

- causes a significant imbalance in the rights and obligations of each business
- isn't reasonably needed to protect the interests of the business that benefits from the term and
- would cause harm to a small business if it was kept in the contract.

For example, a term may be unfair if it allows one business, but not the other, to:

- change or cancel the contract
- limit or avoid their obligations
- breach the contract without penalties.

The new law doesn't apply to terms that set the price to be paid under a contract.

Make sure you understand how the new laws work. You can find out more on the Australian Competition & Consumer Commission (ACCC's) Unfair contract terms page. [www.accc.gov.au](http://www.accc.gov.au)

Source: [www.buisness.gov.au](http://www.buisness.gov.au)





## TOOLS

### RECIPROCATING SAW

**Worx**

[www.worx.com](http://www.worx.com)

The WORX Trans4mer combines two saws in one compact tool. The unit is compatible with both reciprocating saw blades and jigsaw blades, saving time and money, and reducing clutter.

WORX's tool-less blade change system makes for simple and efficient use and is compatible with the reciprocating system, while an ergonomic, moulded rubber handle enables fatigue free use. Featuring a 1pc reciprocating saw blade capable of cutting 100mm, and a 3pc t-type shank jigsaw blade set capable of cutting up to 50mm, the Trans4mer is as tough as it is versatile.



### MAGNETIC DRILL PRESS



**Magswitch**

[www.magswitch.com.au](http://www.magswitch.com.au)

The MagDrill Disruptor 30 uses patented shallow-field magnetic technology that offers an incredibly strong grip, even on steel as thin as 1/8 inch. On top of this, the patent-pending base automatically pivots to conform to any pipe 3" or larger.

Another attribute is the engineering behind the MagDrill Disruptor 30's power distribution, as no electricity is required for the magnets to be effective. This means that more power goes to the motor, resulting in increased efficiency and safety as that the magnetic grip will not be lost if there is a sudden loss of power to the device.

### TAPE MEASURE

**Lufkin**

[www.lufkintool.com](http://www.lufkintool.com)

Featuring a high contrast, low glare, innovative black blade, the Black Widow tape measure is made for measuring in bright, high glare work environments. Made to withstand the toughest treatment and guarantee longer life, the blade is nylon coated and includes new blade printing with coloured increments every 100mm.

The Black Widow uses the Ezy-Read vertical blade style and a 360° sure grip four-rivet end-hook for increased durability. With a focus on achieving better accuracy and productivity on your worksite, Lufkin has designed an incredibly tough, precise and practical tape measure. Fitted with belt clip and lock button, the Black Widow is everything you need.



### CORDLESS BLUETOOTH FLOODLIGHT

**Bosch**

[www.bosch-pt.com.au](http://www.bosch-pt.com.au)

Bosch Blue is expanding their range of professional work lights – introducing the cordless GLI 18V-1900 and GLI 18V-1900 C featuring industry-first Bluetooth connectivity.

Offering tradies the versatility to work under any conditions, at any time of day, Bosch Blue's new cordless floodlights feature a high-powered LED with up to 1900 lumens of brightness – providing excellent illumination of the worksite.

Two of the most reliable floodlights available, the GLI 18V-1900 and GLI 18V-1900 C offer a runtime of up to 8 hours – giving tradies the flexibility to work in sufficient light for longer.

Both of these efficient lights are equipped with a durable frame and tripod thread with five adjustable positions which allows the light to be rotated up to 120°.



## BLUETOOTH SPEAKER

**Altec Lansing**

**[www.alteclansing.com](http://www.alteclansing.com)**

The Lifejacket III Bluetooth speaker will stand up to any environment. The Lifejacket III is dustproof, shock proof and waterproof. It even floats, just in case you "accidentally" drop it in a giant water puddle. The rugged outer casing is what lends this speaker its everything-proof tag.

With up to 30 hours of battery life, once you're finished work for the day you can throw it in the ute and belt out the tunes all the way home then serenade the wife and kids with your best Acca Dacca rendition. The built in power bank ensures that your phone won't run out of juice either, as you can just pop it into the Lifejacket III and charge it right up.



## KNEE PADS



**Tommyco**

**[www.kneepads.com](http://www.kneepads.com)**

Unprotected knees can cause damage to both kneecaps and create unwanted back pain. Made with injected honeycomb gel that weighs 50% less than regular gel, the Tommyco All-Terrain Honeycomb Gel Knee Pads are designed for comfort and protection. The Knee Pads feature a wide lycra bottom strap secured with hook and loop fastener and an extended heel on the knee pad cover allowing the user to sit back on their heels while working, distributing body weight evenly and helping to eliminate back problems. Whichever surface you decide to kneel on be certain that your knees are being protected with the Tommyco All-Terrain Honeycomb Gel Knee Pads.

## EARTH GROUND CLAMP

**Fluke**

**[www.fluke.com](http://www.fluke.com)**

Testing the grounding components of equipment by disconnecting parallel grounds and finding suitable locations for auxiliary ground stakes can be dangerous and time-consuming. With the new Fluke 1630-2 FC Stakeless Earth Ground Clamp, electricians and maintenance technicians can measure earth ground loop resistances for multi-grounded systems using only the dual-clamp jaw, so measurements can be taken quickly and safely without having to expose conductors.

The clamp automatically records data at pre-set intervals and saves up to 32,760 measurements in memory at the set logging intervals. Its heavy-duty clamp jaw is designed to stay in alignment and calibration even in the harshest industrial environments.



## TORCH



**Milwaukee**

**[www.milwaukeetools.com.au](http://www.milwaukeetools.com.au)**

Milwaukee Tools continues to expand its family of high output lighting solutions with the introduction of the M18 LED Search Light (M18SLED-0). Designed to provide maximum performance and versatility in the toughest jobsite environments, the new light boasts a beam distance of more than 640m with 1250 lumens of light, allowing users to spot farther and flood brighter.

The M18 LED Search Light is the ideal solution for users who need to illuminate or spot an area at long distance or overhead, but also often need flood lighting for task work. With four modes to address a variety of lighting situations, just one of these torches can do the job of two lights at once.





## HSV MALOO

If you have a cool \$100,000 or so to spare and want to be the envy of pretty much every tradie on every jobsite around the country – at least, that's how it looks to us – Holden Special Vehicles has created a hot-blooded, high-performance slice of Australian automotive history as a fitting send-off for Australian motor vehicle manufacturing.

Billed as the most powerful, advanced and expensive Aussie ute ever produced, the Maloo GTSR comes with a recommended retail price of \$96,990 for the manual (automatic transmission adds \$2500) and features an uprated version of the supercharged 6.2L LSA V8 that now produces 435kW of power (+5kW) with the addition of a new high-flow air filter.

These figures are not quite as phenomenal as the GTSR W1 sedan that HSV has created, developing no less than 474kW with a variety of LS9 engine mods (and priced from \$169,990), but the two-door Maloo still packs in plenty of W1 in terms of stopping power, aesthetics and personality.

The latter is aurally defined by a recalibrated bi-model exhaust system that opens up earlier in the rev range to deliver an unprecedented set of bass notes from the back of the brutish ute.

Sitting on 20" 'SV Panorama' forged alloy wheels which are nine inches wide at front, 10 inches wide at the rear and have a 'Hyper Dark Stainless' finish, the Maloo GTSR has a wider, lower-slung stance accentuated by new 12mm-wider front fenders with horizontal vents and an all-new front fascia that gives it a distinctive race-inspired look and serves to maximise air intake.

A bold front splitter also makes its presence felt, along with new daytime running lamps and, at the rear, a wider and lower

diffuser and quad exhaust outlets.

Within those wheels sit AP Racing brakes comprising six-piston monobloc callipers and massive 410mm rotors at the front, complete with 'S-vane' cooling technology and large, lightweight Ferodo 4488 brake pads.

HSV describes it as a world-class braking package that takes the radical design to new heights, "delivering outstanding stopping power and brake modulation and an even firmer pedal feel".

Inside, the GTSR Maloo has 'HSV Podium' seats finished in Alcantara with diamond-quilted stitching and leather bolsters, while red herringbone twin-needle highlights are used across the cabin. For a bit more cash, an Alcantara-wrapped, sports-profile steering wheel and gear selector can also be ordered.

Not ending the home-grown ute story with just the GTSR, HSV has also turned to the 'regular' Maloo R8 LSA and implemented sweeping changes as part of a '30 Years' series that marks three decades in business as Holden's performance car division.

There is more power and torque (to 410kW/691Nm), a torque vectoring system is now fitted, the throater bi-model exhaust can also be heard here and a variety of styling tweaks complete the look.

The price of entry to the '30 Years' ute rises \$3000 on Maloo R8 LSA, available from \$79,990 plus on-road costs, but this will not be a deterrent for those who see it as the final run of something truly special. ▲

HSV

[www.hsv.com.au](http://www.hsv.com.au)



## HOLDEN 2017 VFII UTE

**H**olden is now building its final run of Commodores – including the ute – with the release of the 2017 VFII series that will take the lion brand through to October, when its factory in Elizabeth, South Australia, closes forever.

The last series of the unique Aussie-bred two-door tray-back includes a variety of cosmetic enhancements, including black accents and three new colours to the exterior palette (orange, green and gunmetal grey), as well as extra equipment such as a head-up display and satellite navigation on SV6 and SS.

The SV6 picks up black accent 18" alloy wheels while the SS has a newly designed set of 19" rims, and the SS-V Redline adds a number of fresh items including black grille, fender vents, exterior mirrors and daytime running light surrounds, a black sports bar, new 'V' sill plates and a jade black appliqué on the instrument panel and steering wheel.

There are no changes to the baseline Evoke ute, which remains at \$33,490 plus on-road costs, while prices have increased for the other models in accordance with the MY17 update. SV6 is now priced from \$37,190 (auto, the manual gearbox is no longer available), SS starts at \$43,990 (manual, auto adds \$2200), while SS-V Redline starts at \$52,490 (auto: \$2200).

The non-Redline SS-V is also no longer being built.

This is the time to take particular note of 'plus on-road costs' as some customers have found that 'dealer delivery' charges have, in some instances, been ratcheted up at certain retail outlets, particularly with V8-powered models, as dealers take advantage of the hot demand and limited supply. ▲

**Holden**  
[www.holden.com.au](http://www.holden.com.au)



## FORD RANGER FX4

**F**ord has launched a dark and menacing special edition of its Ranger, dubbed the FX4, as the Blue Oval brand keeps the pedal to the metal in terms of marketing and sales for its volume-selling Thai-built utility.

Just as Ford top brass recently confirmed in Detroit that Australia would continue to drive development for the next-generation version of the Ranger and other vehicles built off the same platform (including a reborn Bronco SUV), the FX4 has emerged based on the current PX Series II and, specifically, the 4x4 XLT dual cab model with a 147kW/470Nm 3.2L five-cylinder TDCi turbo-diesel engine.

There are three exterior colours available on the FX4 – white, silver and black – but the directive was clearly to 'paint it, black' to set the vehicle apart in areas such as the uniquely designed grille, fog lamp bezels, exterior mirrors, fender features, the bonnet, tailgate, roof rails, sports bar, rear bumper, side steps and door handles.

Tying in neatly are larger 18" 'Stark Grey' alloy wheels, while the cabin features dark FX4-branded leather-accented seats, black interior highlights and specially tailored floor coverings.

Pricing starts from \$58,915 plus on-road costs for the six-speed manual, or \$61,115 for a six-speed auto, which in both cases represents a \$3500 increase over the donor XLT. ▲

**Ford**  
[www.ford.com.au](http://www.ford.com.au)

# ISUZU D-MAX

Isuzu Ute Australia has upgraded its D-Max utility for the 2017 model year, ushering in fresh styling, an equipment upgrade, improved cabin refinement and, not least of all, a powertrain and driveline overhaul which includes a new turbo-diesel engine coupled to six-speed manual and automatic transmissions.

Now compliant with the Euro 5 emissions standard and specifically designed for the Australian market, the new engine is the headline act of the latest series, still with a 3.0L displacement and maximum power of 130kW but with an extra 50Nm to ratchet up torque to 430Nm – available from a narrow band of 2000-2200rpm, although 380Nm (the previous maximum) is on tap from 1700-3500rpm.

The engine has new pistons, fuel injectors, fuel pump, a variable geometry turbocharger, larger exhaust gas recirculation cooler, newly designed exhaust gas bypass valve, ceramic glow plugs, intelligent battery sensor and a diesel particulate diffuser.

The new 3.0 '4JJ1-TC Hi-Power' engine – and the introduction of six-speed transmissions (up from five-speed units) – brings fuel economy improvements of around 5%, ranging from 7.1L per 100km on the official combined cycle for the 4x2 manual single cab chassis to 8.1L/100km for the top-spec 4x4 manual crew cab pick-up.

A newly designed differential also slots in to handle the extra grunt, while the cabin benefits from reduced noise, vibration and harshness (NVH) levels with the addition of new firewall insulation and screens between the front guards and the body.

Numerous styling changes come with typical claims of "rugged appeal" and "purposeful appearance" but also serve to improve the aerodynamics of the D-Max, which is not typically a strongpoint in this class of vehicle. Notable reference points are a redesigned front fascia, bonnet, headlights (with projector lamps and LED daytime runners for LS variants), fog lamps and, on the LS-T variant, new 18" alloy wheels with full-size spare.

Every D-Max now has hill-descent control fitted standard, providing an extra degree of control in steep country.

All LS model variants are now fitted with a reversing camera, while lower-series SX and EX variants have the safety feature as an optional extra – the former with camera compatibility in a new 7" touch screen display system and the latter making do with an interior mirror with in-built camera screen.

Other detail specification changes include a new 8" touch screen with built-in satellite navigation for LS-U and LS-T variants, while crew cab versions of the LS-M and SX pick up an upgraded audio system in conjunction with the 7" screen.

There are also now three USB ports in all LS variants, two in the front and one in the rear.

Prices have risen across the range, although Isuzu Ute says the equipment upgrade, improved mileage and reduced maintenance costs stemming from longer service intervals easily offset any sticker shock at the point of sale.

There are about two dozen variants across the current D-Max range, spanning single, space and crew cab bodies, cab chassis and ute rear ends, the two transmission and driveline choices, and the various model grades – from workhorse EX through to SX, LS-M, LS-U and LS-T.

A limited-edition X-Runner version was also created to coincide with the new series, celebrating a century of Isuzu automotive manufacturing.

Priced from \$46,990 drive-away, the X-rated model has dark elements inside and out including gunmetal grey grille, alloy wheels and side steps, a black sports bar and under-rail tub liner, and, in the cabin, exclusive dark interior trim and two-tone red and black seats.

It also comes with climate-control air-conditioning and a reversing camera with rear park assist, while the exterior colour is limited to black metallic or pearlescent white paint. ▲

Isuzu

[www.isuzu.com.au](http://www.isuzu.com.au)





## VOLKSWAGEN AMAROK

**V**olkswagen has quietly dropped the single cab version of its Amarok one-tonne utility, soldiering on with only the dual cab body style as the German brand recently upgraded the four-cylinder diesel range to bring it into line with the V6 TDI models launched late last year.

There are no mechanical changes but the six-speed manual gearbox has also been removed from the 4x2 line-up, leaving the eight-speed automatic as the sole transmission choice in the rear-wheel-drive department that now has only two variants – a dual cab chassis or dual cab ute, priced from \$38,490 and \$39,990 plus on-road costs respectively.

In a further cut-back to the range, the entry level 103kW/340Nm TDI340 single-turbo version of the 2.0L four-cylinder diesel engine has been deleted, leaving only the twin-turbo in service: the 132kW/400Nm TDI400 that combines with the manual gearbox and the gruntier 132kW/420Nm TDI420 paired with the automatic.

In explaining the changes, a Volkswagen Group Australia spokesman told us: “Essentially, we have streamlined our range to meet customer needs. The TDI340, for example, was a niche model that was predominantly sold to small fleets, like local councils.

“Because most customers in this space buy automatic models, we have decided not to offer the TDI340 engine currently.”

Priced between \$41,990 and \$50,490 (plus on-roads), the six-variant 4x4 range is now split between Core and Core Plus trim levels – Trendline has gone and Highline and Ultimate variants have become the exclusive domain of the V6 TDI twins – and all four-cylinder models benefit from a general technical

equipment upgrade which includes a multi-collision braking system and ‘Composition Media’ unit with Apple CarPlay and Android Auto connectivity.

The new multimedia system includes a rear-view camera and rear parking sensors as standard on all 4x4 tray-back models, remaining optional on 4x2s and unavailable on cab chassis variants.

The revised front bumper design employed on the V6 models makes its way onto the four-cylinder Amarok range, while 4x4 models now come with heavier-duty closed-type undercarriage protection that serves to increase ground clearance by up to 34mm, depending on the variant.

The higher-spec Core Plus line is roughly equivalent with the previous Highline spec, and with the latest changes adds a post-collision braking system, front parking sensors, extra body coloured exterior parts (mirror casings and doorhandles), upgraded cloth seat trim, carpet floor covering, additional 12V power outlets and rear grab-handles and interior lights.

Meanwhile, Volkswagen is planning to introduce a six-speed manual gearbox version (with selectable 4WD system) for the Amarok V6 TDI later this year, having launched the powerful 165kW/550Nm 3.0L turbo-diesel engine with an eight-speed automatic transmission and permanent 4WD.

The Australian subsidiary of the German manufacturer is also expected to add a rugged off-road-focused ‘Canyon’ variant to the V6 range around October, slotting in between the Highline and Ultimate models. ▲

**Volkswagen**  
[www.volkswagen.com.au](http://www.volkswagen.com.au)



# CUTTING METAL HAS NEVER BEEN EASIER

**THE METAL PECKER®** is specifically designed to cut penetrations in profiled metal roofing for in-situ vent pipe and skylight installation ...as well as air-conditioning duct, furring channel and other straight or formed metal sheet. The tool's precisely engineered slot-shear cutting action eats up folded sheets, seams and joints, like no other hand or power tool, you've ever used. The more you use the tool, the more uses you will find for it onsite.

## HOW IT WORKS

The Metal Pecker's bolt-cutter sized handles provide far greater cutting leverage than other metal cutting hand tools.

Its precision cutter blade shears the metal between the anvils and pushes out a 1.7" (43mm) x 0.24" (6mm) slug with each cutting stroke. There is no blade face to blunt.

To cut, you simply punch a pilot opening in the metal sheet, poke the beak of the Metal Pecker's cutting jaw into the opening and commence cutting.

## A MULTITUDE OF USES

The Metal Pecker compliments other tools that do their best work on single thickness profile cutting at ground level, or on flat sheet.

However, when the going gets tough with in-situ penetrations and other tools pass up under-folds or have difficulty cutting through a profile, reach for the Metal Pecker.

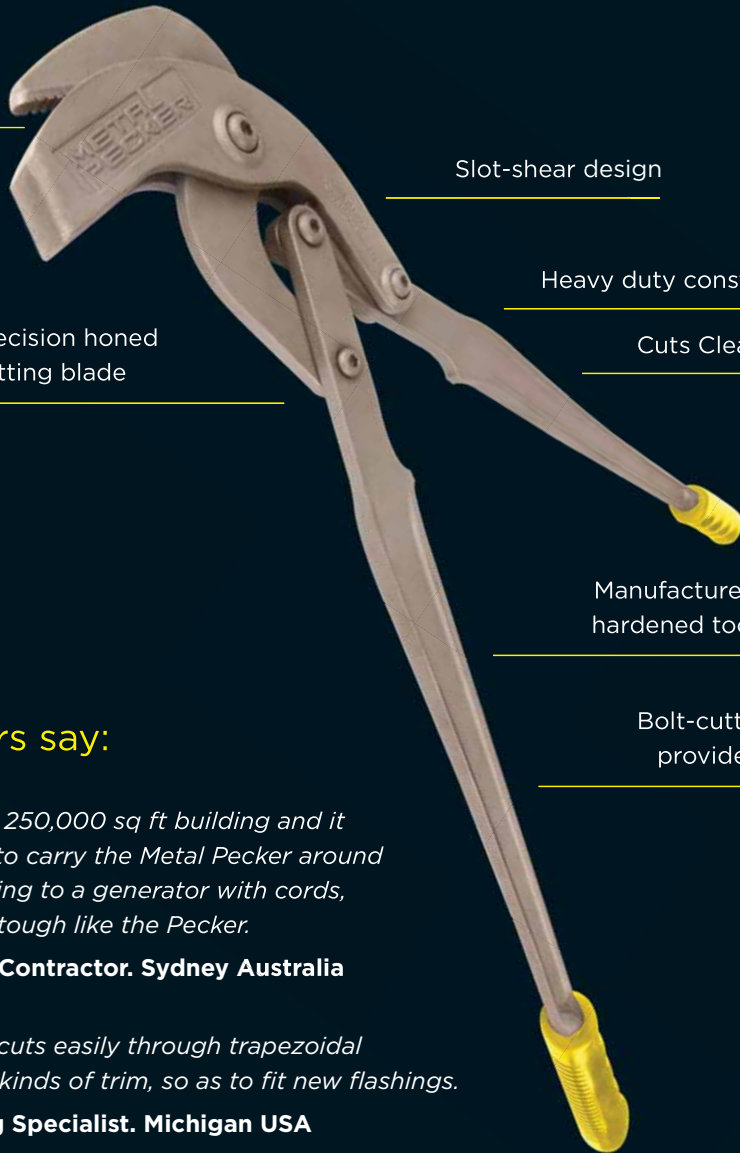
Its extended handles keep you away from the sheet's sharp edges and provide greater reach and leverage in hard to access places - reducing your work time.

Cutter blade shears the metal between the anvils





## Every tool kit needs a Metal Pecker The tool with 1001 deconstruction uses



Non-slip serrated  
cutting jaw

Slot-shear design

Precision honed  
cutting blade

Heavy duty construction

Cuts Clean - no swarf

Comfort-grip PVC  
moulded handles

Manufactured from  
hardened tool steel

Bolt-cutter length handles  
provide greater leverage

### Read what the users say:

*I've just finished work on a 250,000 sq ft building and it was more efficient for me to carry the Metal Pecker around than any other tool, or having to a generator with cords, as cordless tools can't cut tough like the Pecker.*

Barney Smethers **Roofing Contractor. Sydney Australia**

*I like the fact that the tool cuts easily through trapezoidal standing seam ribs and all kinds of trim, so as to fit new flashings.*

James Gunnerson **Building Specialist. Michigan USA**

**ORDER TODAY AT**  
[www.metalpecker.com](http://www.metalpecker.com)



## RENAULT TRAFIC CREW

**R**enault has bolstered its Traffic range with the addition of a new six-seater Crew body style that adds an extra layer of functionality as well as high-level features to the mid-size van.

Pitched as an alternative to one-tonne dual cab utilities – at least until Renault gets its hands on its own ute, the Alaskan, which is expected in 2018 – the Traffic Crew is priced from \$42,990 plus on-road costs at launch and can be up-specced with a \$2490 'Premium' pack or purchased as a fully equipped Lifestyle variant from \$46,780.

The Crew is based on the top-spec long-wheelbase model, with the rear compartment featuring three individual seats – all with three-point seatbelts – as well as two 49L seat storage boxes, additional seat storage pockets and a 12V accessory socket.

There is also an integrated glazed bulkhead positioned behind the second row, upgraded door and roof trim, an anti-slip floor covering and dual glazed sliding side doors.

Power comes from the familiar Euro 5-compliant 1.6L four-cylinder twin-turbo diesel producing 103kW at 3500rpm and 340Nm of torque from a low 1500rpm, driving the front wheels through a six-speed manual gearbox only. There is no automatic transmission option.

Fuel consumption remains steady at 6.2L per 100km on the official combined cycle, despite the extra kerb weight that increases to 1822kg in Crew form, compared to 1736kg for the equivalent LWB van. An automatic engine idle-stop system is fitted standard.

The 2000kg maximum braked towing capacity and front and rear axle loads (1585kg and 1650kg respectively) are also unchanged, although maximum payload falls slightly to 1118kg (-156kg) and GVM comes in at 2940kg (-70kg).

Cargo capacity naturally takes a hit with the extra seating, now at 4m<sup>3</sup> compared to six with the three-seat model. Floor

length is 1740mm to the bulkhead (extending to 2423mm in some configurations), height is 1387mm and width 1662mm (1268mm between the wheel arches).

Standard equipment is typically high for this European workhorse, evidenced by a list of safety items that include front and side-impact/head-protecting airbags, reversing camera, rear parking sensors, automatic headlights/wipers, daytime running lights, fog lights at both ends (with a cornering function at the front), electronic traction and stability control, hill-start assist, and ABS brakes with electronic brake-force distribution and brake assist.

Other features on-board include cruise control (with speed limiter), air-conditioning (with pollen filter), an auto-dimming rear-view mirror, leather-clad steering wheel, multi-function trip computer, remote central locking and a high-grade stereo with two USB audio inputs, 3.5mm auxiliary jack and Bluetooth hands-free connectivity with audio streaming.

The Premium Pack on the Crew adds 17" 'Cyclade' alloy wheels (up from 16" steel wheels), a deadlocking system and anti-theft spare wheel holder, heavy duty 800A battery, body coloured exterior components (bumpers, exterior mirrors, etc), dark cloth upholstery, heated driver's seat and a top-end multimedia system with 7" touch screen, Arkamys audio system and built-in satellite navigation.

It also includes higher-grade treatment to the dash, including a laptop storage compartment, chrome and gloss-black trim detailing and a leather-clad gearshift.

On the Lifestyle variant, the rear windows can be opened, automatic climate-control air-con kicks in, access to the vehicle becomes hands-free (with Renault's entry card system) and extra chrome and black detailing is added to the exterior. ▲

**Renault**

[www.renault.com.au](http://www.renault.com.au)



# RENAULT KANGOO

**R**enault has overhauled its Kangoo compact van range with the introduction of a smaller-displacement but higher-performance petrol engine – a 1.2L turbocharged four-cylinder that not only offers extra power and muscle, but lower running costs via significantly improved fuel economy.

Replacing the naturally aspirated 79kW/148Nm 1.6L petrol, the force-fed direct-injection 1.2L engine is a more advanced, all-aluminium unit that delivers 84kW of power at 4500rpm (1500rpm earlier than in the atmo 1.6) and 190Nm of torque from 2000rpm to 4000rpm – a broader, more useable spread across the rev range than before.

Renault points to the new engine's light weight (-10kg), low-friction timing chain, variable-displacement oil pump, new Eco Mode function and, on the manual gearbox version, an automatic engine idle-stop system as key factors behind a 21% improvement in the petrol-powered Kangoo's average fuel economy across the official combined cycle, down from 7.7L per 100km to 6.2L/100km when mated to the new six-speed manual transmission.

A six-speed EDC (Efficient Dual Clutch) automated gearbox with a manual shift mode is available as a \$3000 option, offering faster shifts times (at 290 milliseconds, according to Renault) and lower revs at cruising speed, which in turns helps improve driving comfort, refinement and, not least of all, economy – now down to 6.5L/100km compared to 8.2L/100km with the previous four-speed automatic.

Renault claims that over five years and 100,000km, the fuel savings alone will make the petrol-powered Kangoo – priced from \$23,490 plus on-road costs in manual guise – less expensive to own than the vehicle it replaces, which retailed for \$21,990 with the manual and \$24,490 as an auto.

An 81kW/240Nm 1.5L turbo-diesel engine remains available, though with a manual gearbox only and restricted to the long-wheelbase Maxi and five-seater Maxi Crew variants priced from \$26,990 and \$29,490 respectively.

Significantly, the new petrol powertrain for Kangoo – now dubbed the 'Compact' to denote its short-wheelbase status – also heralds a broader specification upgrade for these variants, with a variety of new features added including hill-start assist, Grip Xtend traction control, side airbags for the driver and front passenger, cruise control (with speed limiter), reverse parking sensors and a cargo mat for the load area.

Essentially, the new equipment brings the Compact Kangoo up to the same level as the diesel-powered Maxi versions.

As before, the Compact Kangoo offers 3m<sup>3</sup> of load space in an area that measures 1476mm long, 1218mm wide (between the wheel arches) and 1251mm high. Access is made via dual sliding side doors and a tailgate. Rear barn doors are optional.

Kerb weight is 1245kg (EDC: 1270kg), payload 675kg (EDC: 540kg), GVM 1920kg (EDC: 1810kg) and maximum braked towing capacity remains at 1050kg.

A variety of factory and dealer-fit accessories are available, with the petrol-powered versions now offering Renault's R-Link satellite navigation system (with 7" colour touch screen and rear-view camera), side door glazing, a fold-flat passenger seat, overhead parcel shelf, steel bulkhead, anti-slip timber floor, a 'Girafon' retractable roof flap and 15" 'Aria' light alloy wheels as seen on the Maxi Crew.

R-Link, the extra storage and glazed doors can be bundled into a newly developed (\$790) Pro Pack. ▲

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**Renault**  
[www.renault.com.au](http://www.renault.com.au)



# MERCEDES-BENZ VISION VAN

**M**ercedes-Benz is investing heavily in electrified powertrains for its commercial vehicles, developing prototypes and conducting trials as it works toward putting highly advanced new plug-in trucks and vans into series production over the next few years.

While a new 12-month trial of its heavy-duty (18t/25t) zero-emissions Urban eTruck is now underway in Europe, gathering real-world data and feedback from potential customers ahead of a market launch inside three years, Mercedes-Benz recently announced that mass production of a still-to-be-revealed light-commercial van with a full-electric e-drive powertrain will begin in 2018.

Mercedes-Benz Australia/Pacific is upbeat about bringing the electric van here, despite a lack of recharging infrastructure across the nation, while its parent company also has an eye on the long-term future with a new five-year strategic plan that heralds some radical changes ahead for the industry.

Presented in conjunction with a Vision Van concept, the so-called 'adVANCE' strategy invests around €500 million (\$A695m) into not only the forthcoming electrified powertrains – known to include a 75kW/270Nm electric motor and battery system offering a driving range of up to 270km between recharges – but hi-tech applications spanning digitisation, automation and robotics in vans.

The aim is to keep pace with customers' changing requirements as the transport industry moves forward as a result of various economic and social trends, including

ever-increasing urbanisation, the growth in e-commerce, intelligent networking of a broad range of technologies and the proliferation of platform-based business models.

The Vision Van has a variety of thought-provoking elements, including a fully automated cargo space and integrated drones that can drop off items to various jobsites autonomously by air, reducing the time spent with manual delivery via road.

Another area of innovation centres on integrating smart technologies into the service vehicle – the tradie's mobile workshop – that can make management of parts and tools more efficient.

"In future, new holistic system solutions will enable parts to be ordered in a fully automated way by means of an intelligent inventory management within the vehicle, as well as for the relevant parts to be placed overnight directly into the van," Mercedes says.

"Intermediate steps such as inventory evaluation, ordering parts manually and the tradesperson having to equip the vehicle are no longer necessary."

It might sound fanciful but Mercedes sees it as keeping abreast with the rapid rate of technological change occurring in the industry – as seen with autonomous driving systems, for example – and that integration of the work van and its contents into the entire transport system, from loading up to getting there and performing the job, is the best way forward. ▲

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**Mercedes-Benz**  
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# TRADESTUFF

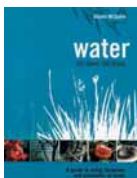
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## Water: not down the drain

### A guide to using rainwater and greywater at home

Water Not Down the Drain is a comprehensive guide to sustainable water use around the home. With Australia experiencing one of its driest phases in history, everyone has to think about how they use the water available to them and find ways to reduce their day to day water use.



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## HB 233-2008 Fire Protection Systems Testing

### Water Conservation Handbook

A Handbook to assist in minimizing wastage of water during fire tests and a companion guide to AS 1851-2005 Maintenance of fire protection systems and equipment. This Handbook considers the systems listed which require flowing water as part of the testing and maintenance, and makes recommendations as to how that water usage can be minimized, reduced and/or recycled.



**\$95.55**.....CODE 763

## Plumbing & Drainage Guide

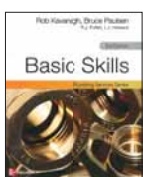
This guide explains in simple terms the general principles of the building codes and Standards for sanitary plumbing and drainage in Australia and New Zealand. It is intended as an aid for designers, builders, students and owner/builders. It also serves as a useful reference guide for plumbers, drainers and building officials. This book covers most common plumbing and drainage solutions.



**\$71.90**.....CODE 424

## Basic Skills

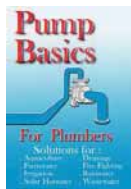
The third edition of Basic Skills has been completely updated to incorporate the wide ranging revisions that meet the requirements of CPC08. New features include a trade maths chapter for applied plumbing, chapters on sustainability, communication and OHS in the workplace, a competency grid to the Training Package, worksheets and interviews with plumbers.



**\$59.00**.....CODE 604

## A quick reference and solution handbook

This handbook covers broad topics such as pump types and suitability. Emphasis is directed mainly on centrifugal pumps and their characteristics including capacity, head speed, power and efficiency, supported by charts, tables, formulas and graphs. There is a useful trouble-shooting chart and has installation hints.



**\$25.95**.....CODE 362

## Solar Hot Water

This is a very small book with a lot of big information and will help you with many applications. Plan your own solar hot water system. It gives you an understanding of solar water heaters and the most common models and their features. It also covers retrofits, size and site locations, including mains pressure versus low pressure, collectors, tanks, boosting and freeze protection, warranties, rebates and Standards. A very helpful booklet.



**\$16.95**.....CODE 589

## Domestic Plumbing & Drainage Standard

AS/NZS 3500.5:2012 Prepared to provide a suitable Standard for domestic plumbing work associated with buildings not exceeding three floors in height. The objective is to describe in a simplified way the installation requirements for hot and cold water services, sanitary plumbing and drainage and stormwater drainage. This standard is a MUST HAVE if you are involved with any domestic plumbing.



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## TRAMEX Moisture Encounter Plus

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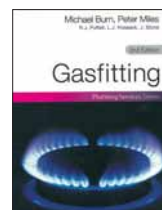
This is an upgraded version of the world's most popular and successful non-destructive moisture meter, the Moisture Encounter. It incorporates all the features and benefits found in the original Moisture Encounter such as: non-destructive moisture measurement of wood, plastic, drywall, block, brick, roofing and most materials found in the building envelope. It uses three ranges of sensitivity; deep signal penetration to detect elevated moisture through most covering materials such as ceramic tile, drywall, carpet, vinyl flooring, VCT, floor laminates, wall coverings, roof membranes and coatings without damaging or puncturing the materials being tested; rubber electrode pads in direct contact with material being tested for better sensitivity and depth of signal penetration.



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## Gasfitting: Plumbing Services Series

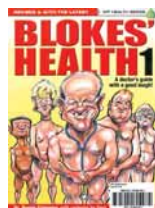
This text assists the licenced gasfitter to understand and correctly interpret the Standards laid down in the current code for the installation of gas burning appliances. This new second edition incorporates thorough and wide ranging revisions to bring it up to date with the requirements of the Plumbing and Services Training Package.



**\$69.95**.....CODE 165

## Blokes Health

This is an absolute gem of a publication and a valuable resource for men of all ages. Written by Dr Bernie Crimmins, Blokes Health provides extremely useful health advice in a simple manner. There aren't many books you can buy that could actually SAVE YOUR LIFE!



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### HB 230-2008 Rainwater Tank Design and Installation Handbook

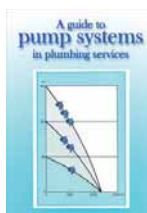
This handbook has been developed to provide practical information for the collection, storage and use of rainwater within an urban environment on private residential property. It outlines the minimum standards and performance requirements criteria for all development works associated with rainwater tank installations. It applies to new installations as well as alterations, additions, maintenance and repairs to existing installations.



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### A Guide to Pump Systems

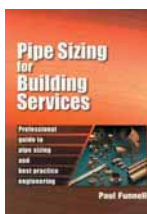
A guide to Pump Systems in Plumbing Services is an Australian first publication specifically written for plumbing designers, practitioners, consultants and specifiers of plumbing installations and equipment involving the use of pumps for all classes of buildings and construction. The content of the handbook includes information on pump systems associated with water supply, rainwater, harvesting, bush fire protection, sewage, disposal by pumping, special purpose installations and dewatering systems.



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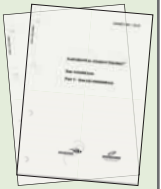
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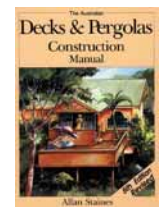


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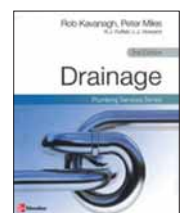


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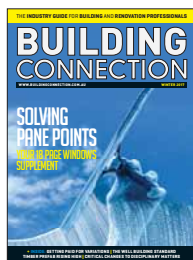
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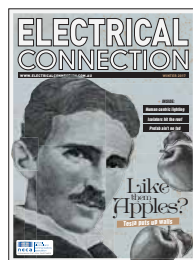
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