

# PLUMBING CONNECTION

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WINTER 2015



## INSIDE:

THE LOW DOWN ON  
PIPE LAGGING

SOLVING THE  
BACTERIA PUZZLE

BECOMING AN EXPERT  
IN YOUR FIELD

THE INDIAN TOILET  
REVOLUTION



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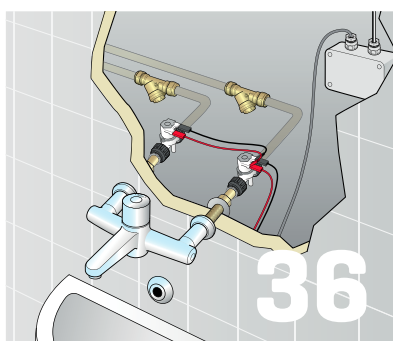


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## COVER STORY

**46 ISH 2015 TRADE REPORT**

Jeff Patchell walked the hard yards for readers once again with a look around this year's ISH Exhibition in Frankfurt. He took a particular interest in a shower heat water recovery product that could make a big impact in Oz...



## FEATURES

**18 PIPE DOWN**

While some consider it outdated, pipe lagging is still the most specified solution to combat plumbing noise because quite simply, it works. Justin Felix explains.

**30 CHARGED BY THE METER**

Water meters play an important role in determining how much water is used by individual households; however, they can only do so if functioning correctly.

**32 AN EXCITING ACQUISITION**

When two big brands combine and integrate with a clear vision in mind, there's usually something exciting around the corner. That's what lies ahead for Brivis under Rinnai.

**36 THE BACTERIA PUZZLE**

Legionella and pseudomonas bacteria have a presence in hospitals and aged care facilities around the world. Kate Jordan looks at what can be done to prevent further infections.

**42 LEGIONELLA IN THE U.S**

ASHRAE recently took comments on changes made in the draft of its pending standard 188P, Legionellosis: Risk Management for Building Water Systems, which could affect change here.

**52 RIMLESS TOILET FACTS**

When it comes to research, the Germans leave nothing unturned. We examine their research into rimless toilets and what it means for the potential adoption of the technology in Australia.

**60 ARE YOU EXPERIENCED?**

Governments, insurers and lawyers are often looking for construction experts who can weigh in where they're needed. Find out how to put your experience up for consideration.

**72 THE EBB AND FLOW OF RESEARCH**

Research is critical in any industry, and plumbing is no exception. We catch up with ASFlow to find out what the research team has been up to.





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## FEATURES

### 74 8 WAYS TO OBTAIN MEDIA COVERAGE FOR YOUR BUSINESS

There's no such thing as bad publicity [or so they say]. Even if that's not the case, some positive press can make a huge difference to your business. Cecelia Haddad explains how to get noticed.

### 76 ACCESS RULES

Jerry Tyrell has recently Introduced 'the RULES project' that, in conjunction with Connection Magazines, is being prepared in part as a valid alternative to the sometimes hard to determine Australian Standards.

### 82 A COMPACT PUMP-UP SOLUTION

It's fairly to take the humble toilet for granted. Until it needs to be replaced or a new one needs to be installed, that is. Saniflo has developed a compact toilet solution that is not only aesthetically appealing and easy to install but cost effective too.

### 88 PLUMBING GOES TO BOLLYWOOD

India's economy will outpace China's this year and could one day be the world's largest, so maybe we should be taking more than a passing interest in what's happening on the sub-continent from a plumbing sector point of view.

### 92 INDIA'S TOILET REVOLUTION

At this moment, government inspectors are combing the Indian countryside. Their quarry being the many toilet-less homes still found dotting the subcontinent.



## REGULARS

- 08 Editorial
- 12 Industry news
- 24 Standards Australia Update
- 26 Metal Roofing
- 44 Backflow Prevention
- 56 Pump School
- 62 Gas Matters
- 68 Hot Water Clinic
- 84 Solar Fix
- 94 Business as Usual
- 98 Hot Water News
- 100 Copper Connection
- 104 New products
- 129 Trade Stuff

**ATT**  
ACROSS THE TRADES

- 108 Tools
- 112 Tips
- 122 Transport



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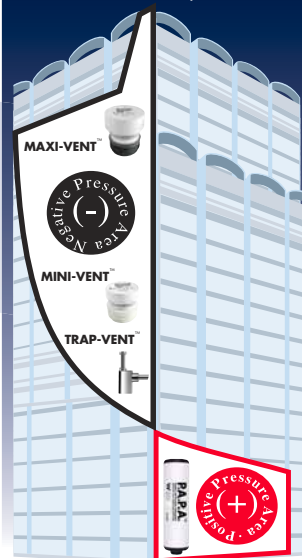
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# WHET YOUR APPETITE

I probably sound like a broken record but I'm constantly blown away by the innovation that goes into plumbing products and systems.

The money spent on R&D is quite staggering and when you think about the wish-lists of clients these days, it's no wonder so much time and effort is spent in the area. As a human race we've become lazy. Or perhaps it's the technology that's made us that way? I'm not so sure. We want everything 'now', we want everything automated and we want it to work, first time, every time. It's not just Gen Y either... everyone is guilty of it.

It is what it is and it seems as though this industry is no different when it comes to feeding the insatiable appetite of the consumers. Such was highlighted at the 2015 ISH exhibition in March, hosted in Frankfurt, Germany.

Jeff Patchell took one for the team and headed over with the intention of delighting in this year's menu. Needless to say, he was well fed and while he wasn't as blown away by innovation as he has been in previous years, I was once I caught glimpse of all the brochures he kindly picked up for me.

In his ISH Trade Fair report on page 46 he shares some of the more interesting new products with us. From the outlandish toilet 'with the lot' and 360 degree shower to the more practical like a soft touch shower tray and body dryer, all manner of innovation was on display.

Most interestingly perhaps is the product displayed on the cover of this magazine. You may recall a story we ran on shower heat recovery systems in the spring edition of 2013. We featured three systems that, while still in their infancy, aimed to save both energy and water by reusing heat from shower water that typically goes down the drain, never to be seen again.

The product being held on the front cover is the Joulia-Inline. Its manufacturers claim that it's able to save more than 50% of the energy normally lost in the flushed shower water.

The compact Joulia unit is unnoticeable once installed in the shower floor and has no moving parts that require maintenance. It's a simple idea – which means it has a high chance of being adopted.

## THE BATTLE AGAINST BACTERIA

Bacteria are one of those things that can be easily forgotten about until an outbreak occurs and people get sick. It's an old cliché but the 'out of sight, out of mind'



saying certainly rings true in the case of these small but deadly pathogens.

We take a look at legionella and pseudomonas and how the problem of each is being dealt with across Australia and abroad. It appears as though Australia has much catching up to do in the area, with the UK and the United States taking a more combative approach.

Kate Jordan takes an in-depth look at the problems, possible solutions and how you as plumbers and consultants can help to stop bacteria from spreading.

Matt Freije, leading expert on legionella, shares with us an update from the US and the potential impact of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) pending Legionella Standard on Australia.

Both articles contain some real food for thought as bacteria outbreaks can be devastating. It's time to arm up for the battle.

*Justin Felix*

Justin Felix





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**RON ASTALL**

Ron Astall is a Mechanical Engineer with long pump industry experience. With his consultancy, Astech Pumping Services and through Strategic Achievement, he has also been an active provider of pump industry training. Ron is the current President of Pump Industry Australia.

See **Pump School** on page 56.

**MATHEW BRIGGS**

Mathew Briggs has built up a passion for all things related to solar hot water parts over the years, including sourcing parts, installing new systems and repairing existing units. Mathew is a commercial plumber and director of [www.solarhotwaterparts.com.au](http://www.solarhotwaterparts.com.au).

See **Solar Fix** on page 84.

**JOHN FENNEL**

John Fennell has been the CEO of ICAA since 1998 and oversees Oceania and approximately 12 ICA Building Construction Programs across Asia. Previously John was the owner and MD of the exhaust manufacturer, Genie, and prior to that with Price Waterhouse Cooper.

See **Copper Connection** on page 100.

**BRAD FALLON**

Brad Fallon is the Director of Ivy St Plumbing and comes from a generation of plumbers. Brad specialises in maintenance and emergency plumbing, including strata management.

See **Business as Usual** on page 94.

**ROGER LAMBIE**

Roger is a registered plumber and gasfitter and has been involved in gas appliance approvals, investigated gas related incidents and set up gas spares sales for Reece plumbing. Eventually Roger became the Gas Safety Officer for Energy Safe Victoria.

See **Gas Matters** on page 62.

**JON PALFREY**

Jon Palfrey is Rheem Australia's Training Manager and also a qualified plumber. He conducts training to plumbers and specifiers across the southern states, covering the latest water heater technology and key water heating issues facing plumbers.

See **Hot Water Clinic** on page 68.



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### WORLD DEMAND FOR PLUMBING TO EXCEED \$70 BILLION IN 2018

Through 2018, global demand for plumbing fixtures and fittings is projected to advance 5.3% annually to over \$70 billion, accelerating from the 2008-2013 pace. In lower income countries, including many in the Asia/Pacific and Africa/Mideast regions, continued strong increases in building construction spending and rising personal income levels will support growth. In a number of West European countries and the US, expected rebounds in building construction spending will drive demand for plumbing products. These and other trends are presented in World Plumbing, a new study from The Freedonia Group, Inc., a Cleveland-based industry market research firm.

The Asia/Pacific region will post the fastest overall growth in plumbing products demand. According to analyst Allison Blackburn, "Even with an expected deceleration in demand, China alone will account for over one-third of the increase in global plumbing products demand generated between 2013 and 2018."

China's vast population makes infrastructure and sewage system development a necessity, and therefore new homes are constantly being connected to water delivery

systems. These systems are reaching previously unserved areas, thereby creating new customers and generating demand for plumbing products. Other industrializing countries in Asia, such as India and Indonesia, and in the Africa/Mideast region will also contribute to overall demand gains.

North America is also expected to post significant gains in demand for plumbing fixtures and fittings. A rebound in the US housing market will be the primary driver of gains. Accelerating building construction activity in Canada and recovering building construction spending in Mexico will also contribute to demand growth in North America.

Western Europe is expected to post the slowest gains in plumbing products demand through 2018. The region's mature building infrastructure and slow population growth have combined to limit building construction activity, restricting plumbing products gains. While construction spending in Western Europe is forecast to grow at the slowest rate globally, it will nonetheless reflect a recovery from a low 2013 base. As a result, plumbing products demand growth in the region is forecast to reverse the declines experienced during the 2008-2013 period.

#### WORLD PLUMBING PRODUCTS DEMAND (BILLION DOLLARS)

Item	% Annual Growth				
	2008	2013	2018	2008-2013	2013-2018
Plumbing Demand	50.0	54.4	70.5	1.7	5.3
North America	11.0	10.8	14.3	-0.3	5.7
Western Europe	12.6	10.4	12.0	-3.8	3.0
Asia/Pacific	15.8	22.4	30.7	7.2	6.5
Central & South America	3.4	3.8	4.7	1.9	4.6
Eastern Europe	3.7	3.4	4.1	-1.8	3.7
Africa/Mideast	3.4	3.6	4.7	1.4	5.1

### REAL MEN ALSO WEAR BLUE...

The Prostate Cancer Foundation of Australia (PCFA) has recently teamed up with RWW Group to launch its Blue Gear range of safety workwear. A dollar portion of the proceeds from the sale of each Blue Gear safety workwear item will go directly towards raising vital funds and awareness about the dangers of prostate cancer - the most commonly diagnosed male cancer in Australia.



The Blue Gear workwear range includes high-vis shirts, safety vests, hard hats, polo shirts and various other items. RWW Group supplies safety wear for the mining, transport and construction industries.

"Each day 54 men across Australia are diagnosed with prostate cancer," says Associate Professor Anthony Lowe, the CEO of the PCFA. "Sadly, it kills nine men every single day."

"These are devastating statistics which PCFA is determined to help change. It is important to raise awareness of this major men's health issue in the Australian community in male-dominated industries such as mining, transport and construction. We hope these industries get behind the Blue Gear and also use our Ambassador speakers to educate their employees and workmates."

Anthony Firth, General Manager of RWW Group adds "Aussie men in male-dominated industries need our support. Many will have been affected by prostate cancer personally or know someone who has. Getting behind PCFA and the Blue Gear safety range is a great, practical way to generate vital funds and help raise awareness of this male cancer killer."

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### **WORLD PLUMBING DAY HERALDS IN A NEW TRAINING SITE AND A NEW ERA FOR PLUMBING APPRENTICESHIPS**

The unveiling of the first stage construction of a world class training facility in Geelong, Victoria and a new industry partnership to deliver a new era in plumbing apprenticeship training were some of the highlights from the World Plumbing Day celebrations, held at the Plumbing Industry Climate Action Centre (PICAC) in Melbourne.

CEO of PICAC, Shayne La Combre said that the announcements were an exciting development in ensuring Victoria remained at the top of providing innovative training and skills development for all plumbers.

"In February 2015, the new Certificate III in Plumbing Apprenticeship qualification was delivered at PICAC's Centre in Melbourne with training delivery overseen by the board of a new partnership organisation, Plumbing Industry Training (PIT)," Mr La Combre said.

"Through this new training opportunity, apprentices can learn their trade on the most up to date plumbing and related industry equipment in a world class, industry owned and run training facility.

"It was exciting to also see at World Plumbing Day, the first stage construction of the new Trade Development Centre for PICAC, which will also be used for this type of training and other industry related courses, in Geelong."

The new multimillion dollar investment in Geelong will have dedicated training rooms with state of the art IT and audio visual equipment, as well as machinery and operating areas to allow apprentices to gain hands on experience in all aspects of plumbing. It is expected to open at the end of October 2015.

The plumbing apprenticeship has been set up to train the group scheme apprentices employed by Plumbing Apprenticeships Victoria. All apprentices must have completed the Certificate II in Plumbing (Pre-apprenticeship), which is also delivered at PICAC with the PIT Board consisting of representatives from the Master Plumbers and Mechanical Services Association and the Plumbing Trades Employees Union.

Ken Gardner, CEO of the Master Plumbers Association says, "Ensuring plumbing training keeps pace with industry has never been more important. In the plumbing sector the skill requirements of industry are evolving and changing constantly, and new and innovative products and systems are emerging all the time, particularly relating to water use and re-use. It's great to see the industry investing in training and education to provide jobs for the future."

Attending World Plumbing Day were senior government Ministers and key industry representatives.

"World Plumbing Day is a great opportunity to demonstrate how critical the industry is to improving public health and safeguarding the environment," Mr La Combre said.

"In Victoria it is fantastic to have a dedicated facility that provides the men and women in our industry with the knowledge and capabilities to navigate the ever changing landscape of this vital trade. With the unveiling of the new Centre in Geelong and the planned Centre in Narre Warren, in Melbourne's outersouth east growth corridor, we will be able to train more people, make sure that current plumbers stay abreast of the latest technology, making our plumbers the most highly skilled in Australia."

World Plumbing Day is held on March 11 each year to mark the vital role plumbing plays to maintaining global health.



Delegates were invited to hear from a range of key industry speakers. They also caught a glimpse of PICAC's new trade development in Geelong, Victoria.

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### BUTANE CANISTER "LUNCHBOX" COOKERS BANNED

Energy Safe Victoria is warning the Australian public not to use butane canister or 'lunchbox' cookers due to concerns they may overheat, catch fire or explode.

Recent investigations have found that these cookers don't comply with the Australian Standard and their safety devices may fail if they overheat.

Certification has been withdrawn from more than 70 products, which are also known as cookers with enclosed cartridges, and they have been removed from sale across Victoria.

Victoria's Director of Energy Safety, Paul Fearon, said ESV was advising consumers not to use the cookers following six reported incidents across the state in the past year.

"The safety devices have failed

when these products have not been used in accordance with the manufacturer's instructions," he said. "The use of oversize pots and pans reflects heat onto the butane canister and causes it to overheat. If the safety device does not operate, there is a risk of fire or explosion."

It is estimated there are 5 million of the portable cookers around Australia.

"State regulators have referred the uncertified products to the ACCC, and discussions are underway with suppliers about rectification," Mr Fearon said.

In March all "lunch box" gas cookers designed for camping were banned from sale in New South Wales and South Australia after reports of explosions from a design fault.

A national meeting of state regulators decided to ban all single and dual gas stoves.



### A TIMELY MESSAGE FROM SNAP FIRE SYSTEMS

Following high profile apartment fires in Melbourne and Brisbane, and a new trend toward independent audits post-handover by Site Managers, Building Owners, Body Corporates and Insurance Companies, compliance with the National Construction Code (NCC) and Standards for Fire Protection has never been more important.

Reliance on certification is not always a guarantee a building is compliant and costs for the rectification of defective works are being pushed back onto sub-contractors.

Accordingly, it is essential that

sub-contractors are aware of what is required by the NCC. For instance, in the case of service penetrations, a full Test Report, Regulatory Information Report (RIR) or Assessment must be supplied for the pipe/element/collar system.

Additionally, subcontractors must be aware of changes to the codes, e.g. since 2007 it has been mandated that a floorwaste collar be used in a shower waste.

Always seek expert advice before going ahead with works. When defects are found, rectification costs can be expensive, even without the time and cost of any legal proceedings.

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### PHYSIOS URGE TRADIES TO MAKE HEALTH & SAFETY A PRIORITY

The Australian Physiotherapy Association [APA] has urged employers and workers to make health and safety a priority to reduce the \$60 billion spent on work injuries each year.

A figure, which we can all agree, is far too high.

APA National President and physiotherapist Marcus Dripps said now is the time to review occupational health and safety procedures to ensure a safe workplace.

"While workplace injuries are on the decline, each year we spend billions of dollars on work-related injury and illnesses, many of which should be prevented. And tradies are among those highest at risk," Mr Dripps said.

"This is the time of year to review your safety procedures, retrain and educate your staff, develop a supportive return-to-work culture, and make sure you've got the best measures in place to prevent injuries," said Mr Dripps.

Research shows one in five serious workplace-related injuries involve a tradie. Tradies are also among one of the largest proportions of occupations with the highest incidence of early retirement.

"If you do injure yourself – our message is simple: stop ignoring aches and pains and seek treatment immediately," Mr Dripps said.

"Often we'll see tradies with injuries that could've been managed well before they became serious.

"It's unfortunately a common mentality of the sector that needs to change."

The APA is urging trade workplaces to make health and safety a priority and confirm their involvement in Tradies National Health Month for 2015 via [www.tradieshealth.com.au](http://www.tradieshealth.com.au).



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# PIPE DOWN!

AS THE TREND TOWARDS HIGH DENSITY LIVING CONTINUES ON AN UPWARD CURVE, ACOUSTIC CONSULTANTS ARE UNDER CONSTANT PRESSURE TO ENSURE NOISE POLLUTION REMAINS AT A MINIMUM. WHILE SOME CONSIDER IT OUTDATED, PIPE LAGGING IS STILL THE MOST SPECIFIED SOLUTION TO COMBAT PLUMBING NOISE BECAUSE QUITE SIMPLY, IT WORKS. **JUSTIN FELIX** EXPLAINS.

It's a sound we could all go without; the funnelling of wastewater rushing through pipes in our walls. As the water passes through, noise reverberates out into the habitable space and fills the room. You curse the person who instigated the water being passed through as it knocks you out of the slumber you gently fell into after hours of restlessness.

It doesn't have to be this way though, for you or your clients.

You may recall that in the winter edition of 2014, Plumbing Connection looked at three systems that aimed to make plumbing a whole lot quieter while making lagging a thing of the past. By using advanced materials in their acoustically sound piping systems, the Silere and Triplus from Valsir, RAUPIANO PLUS and Wavin AS systems all removed the need for external lagging of the pipe work.

Basically speaking, all three systems comprised of self-sufficient pipes, each of which has started to make their name known among Aussie specifiers and installers.

With this being said though, the vast majority are still putting their faith in the traditional approach, being lagging. This is where we focus our attention this time around.

## NOISE POLLUTION

Waste systems are generally taken for granted. They're a mere afterthought in the minds of residents. That is until they can hear them and become affected by the constant noise generated inside the pipelines.

Plumbing noise is one of the most intrusive and difficult sounds to mitigate. In many people's eyes, varying levels of plumbing noise are expected and tolerated without complaint. Most often, the noise generated within a tenant's own space and resulting from one's own use of plumbing fixtures isn't given much thought. On the other hand, when plumbing noise is a result of an adjoining space and results in sleep disturbance or interruption of peace and quiet, it quickly becomes an annoyance.

Unfortunately, pipework can operate as a major conduit for noise to travel from one part of a building to another. Most of the generated noise spreads inside the pipe (air-borne noise) but the vibrations caused are then transmitted from the walls of the pipe to the surrounding area and bracketing systems. This in turn transmits to the building structure (structure-borne noise).



Noise pollution is certainly one we could do without in our homes. Pipe lagging can help to turn down the volume.

To minimise noise levels in waste and drainage systems, not only should the system be designed properly and the waste circuit mounted correctly, it is also important to choose a system with an elevated soundproofing performance. Acoustic plumbing aims to combat the issue of internal noise pollution and a number of companies have developed products to tackle the problem head on.

The thing to remember is, it does not have to be difficult or expensive. Recent advancements regarding the availability of products and support services now make the reduction of plumbing system noise easier, more effective and more affordable than ever before.

"On average, lagging costs around \$20pm2. I'm sure plumbers like the idea of not having to lag pipes and would prefer to use pipes that are self-sufficient but lagging has proven itself as effective for decades. At the moment acoustic consultants are still specifying lagging over the newer technologies – especially in residential developments. Lagging is a critical part of residential buildings and at the moment we aren't designing any without it," says Olivier Gaussen, Principal, National Acoustics Coordinator, Wood & Grieve Engineers.

"There is no compulsory NCC requirement for plumbing acoustics for commercial buildings. The performance of pipes, lagging and silent pipes as far as acoustics are concerned in hydraulic systems, is only relevant to residential and aged care facilities."

In other buildings, the driver for minimising noise output from pipes comes down to developers wanting to please the actual end users.

Olivier explains that in days gone by, people were happy for downpipes to run externally, down the walls of their homes. Now the architects are under increasing pressure to hide all services so the facade has a particular

look. They must be aesthetically appealing.

"They have to conceal all the pipes within the building which creates challenges when it comes to keeping noise pollution to a minimum."

Plumbing acoustics is a bit of a tricky area because it's hard to demonstrate compliance or non-compliance as far as acoustics are concerned.

"The performance that the NCC nominates in residential and aged care facilities is an attenuation between the pipe and the middle into which the pipe will radiate noise i.e. a riser that is common to two apartments. This riser, including any lagging, will need to achieve a particular performance.

"From a wet area to a habitable area the code requires a greater performance than a wet area to wet area for instance. If you have a pipe in a ceiling cavity of a bedroom underneath a bathroom, the requirement is higher than if the space below a bathroom is another bathroom.

"The tricky part comes from the code saying that you need to attenuate the noise by a certain performance. The problem then occurs once it is installed as there is no physical way to test it. We can test the performance of the walls quite easily by putting a big speaker in one room ➤



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Acoustica GreenLAG uses 15mm foam rather than 25mm. They claim that the soft cellular structure helps to achieve a greater Sound Transmission Loss than other products.

## NCC 2011 REQUIREMENTS: F5.6

Sound Insulation rating of services a) If a duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, serves or passes through more than one sole-occupancy unit, the duct or pipe must be separated from the rooms of any sole-occupancy unit by construction with an  $R_w + C_{tr}$  (airborne) not less than - i) 40 if the adjacent room is a habitable room (other than a kitchen); or ii) 25 if the adjacent room is a kitchen or non-habitable room.

b) If a storm water pipe passes through a sole-occupancy unit it must be separated in accordance with a) i) and ii).

with a device to calculate the sound coming through on the other side. We can't put a speaker in a pipe though."

Acoustic lagging comprises a noise barrier to contain pipe-wall vibrating noise. There are several types of materials used for this purpose, including loaded vinyl and convoluted foam. Each material will have a U-Factor, which is a performance rating that measures how well a given material prevents heat from escaping.

Let's look at available products from three reputable Australian suppliers.

## ACOUSTICA GREENLAG

GreenLAG® pipe lagging was developed to contain the intrusive noise generated by the turbulent flow of wastewater through pipes, fittings and general noise break-out from ductwork, fan housings and the like in residential, commercial and industrial buildings.

Philippe Doneux, Engineer at Acoustica describes some of the benefits of its product.

"GreenLAG uses a soft and cellular structure which increases vibration dampening. This allows for us to use 15mm foam as opposed to 25mm which most others use. It also means that for a given weight and thickness, GreenLAG will achieve a better STL [Sound Transmission Loss] than other products in the market."

Acoustica also claim that another direct consequence of reducing material thickness is the reduction of the vibrations radiating surface, when lagged over pipe.

Pipe lagging has traditionally known to be laborious and time consuming; however Philippe believes this is changing thanks to experience and advanced skill sets.

"The professionals lag quite quickly now and teams of people exist who specialise in the field. These guys don't need to take patterns to cut for different junctions and the like - they can do it all by eye now. It's a bit like the old metal workers who could cut metal the right way."

Keeping the installers happy by working into their regimes makes it all the more straight forward too.

"Depending on how the ladders like to have the material, we supply it in different lengths. There is a company in SA that uses women to do the lagging so they ask that the rolls of lagging are not overly heavy. We provide them with 3m lengths by 1.3m wide. We can supply in longer rolls up to 5m by 1.3m wide as well. We've definitely noticed a shift to shorter rolls though. It makes for easier navigation through stairwells and other tight spaces."

When it comes to installation, Philippe assures that working with GreenLAG is simple and straightforward.

"It's very easy to cut with a knife or scissors, particularly with the thinner material being employed. We suggest to installers that they always overlap by about 50mm rather than butt joining the material. We also suggest they use a longitudinal reinforced aluminium tape that goes over the ➤



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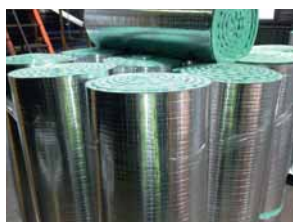
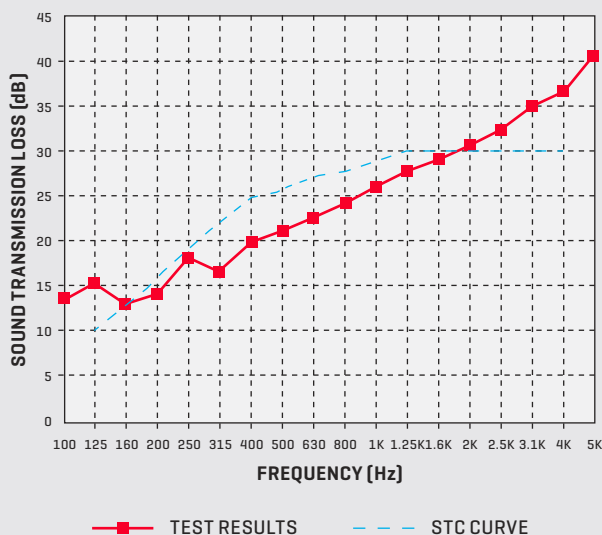
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### THERMOTEC NUWRAP 5 6KG TESTED AS A FREE HANGING BARRIER



Thermotec NuWrap 5 is classed as a 'one solution' product that can be used either inside or out. A reinforced aluminium foil provides additional strength and fire resistance.

seam every 350-400mm. It's important that they wrap tape all around the pipe and back over itself because the memory of the material means it tends to want to roll flat again. The more tape, the better because once the ceiling is fitted you can't see if it's unravelled or not and by then it's generally too late."

### THERMOTEC NUWRAP 5

Thermotec has been manufacturing both thermal and acoustic products in Australia since 1987 and have garnered a reputation for supplying a competitive world class range of products.

One such product is NuWrap 5 which is trusted to exceed performance expectations, and designed to meet or exceed the Building Codes of the countries, states, provinces or industry categories where they are specified and installed.

Thermotec NuWrap 5 acoustic pipe and duct lagging is classed as a 'one solution' product that can be used either indoors or manufactured for use outdoors. Performance is the result of using a special density convoluted foam in conjunction with a barium loaded, high mass, [5kg/m<sup>2</sup>] limp polymer material that is faced with a reinforced aluminium foil that gives the product additional strength as well as outstanding fire resistance characteristics.

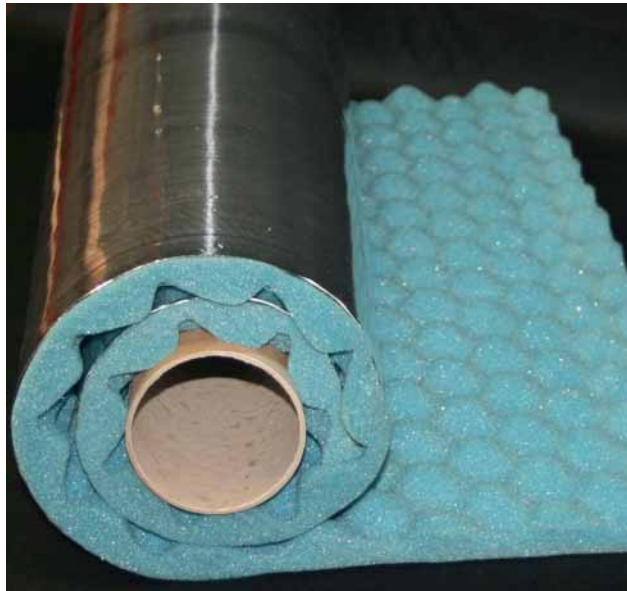
When installing, the following steps should be taken:

- Cut insulation to suit either bends or straight lengths.
- Ensure that the outer pipe surface is clean and free of dust.
- Wrap insulation in place and ensure no gaps and that butt joints are well sealed. For straight lengths use a minimum 50mm overlap.
- Use 72mm wide foil face self-adhesive tape ensuring that surface to be taped is clean and dust free.
- On straight runs, foil tape should be used as a band, wrapped around the insulation as well as along longitudinal joints. Joints should be facing downwards to avoid unnecessary weight and strain on the tape.
- Check and double check there are absolutely no gaps in the joints.

### PYROTEK NC SOUNDLAG4525C

A division of Pyrotek, Pyrotek Noise Control are continually working on new ways of tackling the problem of noisy environments. It is their ongoing goal to create advanced materials and innovative products which anticipate changing customer needs.

Soundlag 4525C is a pipe wrap comprising of 5kg flexible acoustic barrier bonded to 25mm thick flexible convoluted foam. The foam acts to provide acoustic decoupling between the pipe's noise energy and the flexible acoustic barrier external wrap. The external face of the barrier is bonded to an aluminium foil providing a fire resistant covering.



Soundlag 4525C is an acoustic barrier comprised of 25mm thick flexible convoluted foam.

The specialist fillers create a heavy flexible mass barrier, maximising noise reduction. Soundlag's uniquely flexible and naturally inert nature allows effective, easy installation, essential in achieving a noise-tight seal.

Pyrotek claim the flexibility of the polymer-based noise barrier provides superior performance and allows even the smallest pipes to be lagged effectively. It's independently tested in laboratory conditions and on site to give proven consistent performance. Low maintenance with a long service life, the aluminium foil facing provides a robust lifetime by protecting external elements.

Pyrotek can provide pre-cut pieces for bends, junctions and floor waste gullies from templates upon request.

It's time to turn down the volume. ■

#### Acoustica

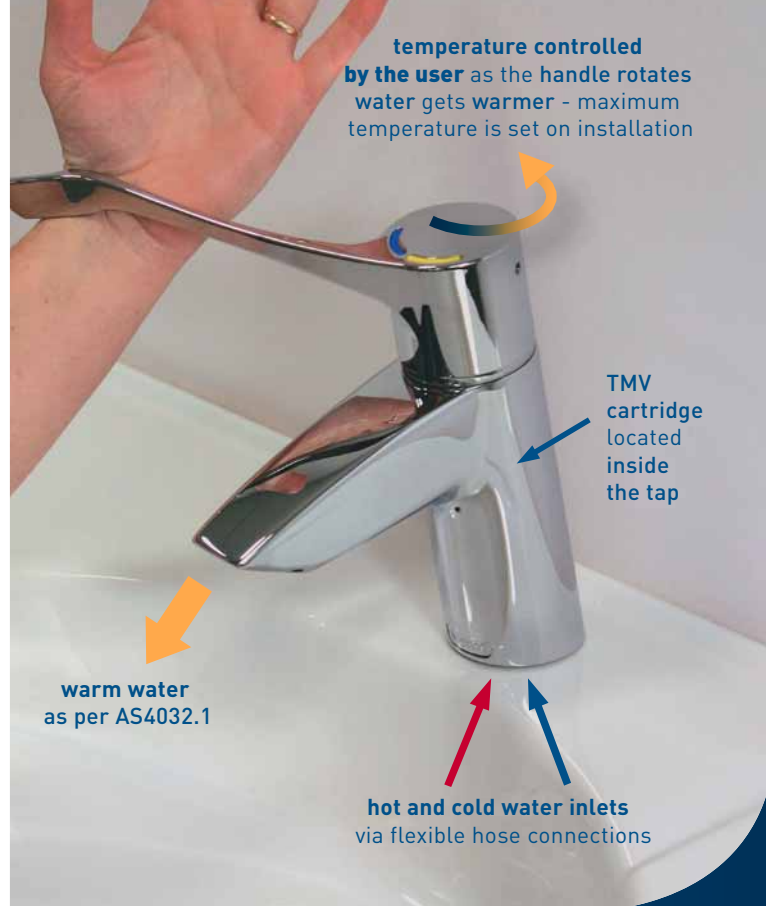
[www.acoustica.com.au](http://www.acoustica.com.au)

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#### Pyrotek Noise Control

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# KEEPING UP TO DATE WITH STANDARDS

STANDARDS AUSTRALIA IS THE NATION'S PEAK NON-GOVERNMENT STANDARDS ORGANISATION. **JENNIFER HARWOOD**, SENIOR NATIONAL SECTOR MANAGER FOR BUILDING AND CONSTRUCTION, PROVIDES US WITH AN UPDATE ON WHAT'S HAPPENING IN THE STANDARDS WORLD.

## WHAT'S IN A TECHNICAL COMMITTEE?

We often get questions about the role of Standards Australia and who we really are.

The short answer is we are a developer of Standards; we do not enforce, regulate or certify compliance with these Standards. What we do is to form technical committees on plumbing by bringing together relevant stakeholders into the same room.

We work closely with the Australian Building Codes Board [ABCB] and stakeholders on the National Building and Plumbing Code Boards. Through a process of consensus, our technical committees develop standards and technical documents for Australia's net benefit.

One key technical committee is WS-014 Plumbing and Drainage, which comprises stakeholders from government, industry, the community and interest groups. Its chairperson is Dr Alan Law. We asked Alan to share his views on plumbing standards and the standards development process.

## INTRODUCING DR ALAN LAW, CHAIR OF TECHNICAL COMMITTEE WS-014

### ALAN'S BACKGROUND

Alan is a professional with a background in hot water services. His company is part of the Gas Appliance Manufacturers Association of Australia. He has nearly 20 years' service on Standards Australia's technical committees with 10 of those years as Chair of WS-014 Plumbing and Drainage.

### WHY WORK IN PLUMBING STANDARDS DEVELOPMENT?

Alan decided to join Standards committees to contribute to the development of documented technical solutions for the benefit of the community and various industry stakeholders.

Alan enjoys his role in WS-014 for the many intellectual and real-world challenges it brings him. Often, in finding solutions to real issues, the debates within the committee are robust and achieving consensus can be challenging. While his background is in heated water services, he says he has learnt a lot from being in a roomful of people with expertise in many different areas. As the Chair, he relishes the opportunity to hear new ideas and concepts and to achieve results in line with the committee's key objectives.

Alan comments that it can be a very humbling experience, especially when people are "more right than you". It is also no small task to document this expertise into concise language



Dr Alan Law with Standards CEO Dr Bronwyn Evans and former Chairman Dr Alan Morrison.

that is accessible for readers all across Australia.

When asked if he would recommend people to join in developing plumbing standards, Alan quipped that the process was most suited for people who were 'detail-oriented' and enjoyed 'technical writing'. But the results are often rewarding when the standards developed by the committee bring benefit to the community. On a personal level, he finds that he has gained plenty of technical expertise in different subjects and has benefited from the opportunities to develop professional networks.

## UPDATED AS/NZS 3500.3 ON STORMWATER DRAINAGE

The technical committee WS-014 has certainly been busy. In Feb 2015, they were responsible for publishing an



update to AS/NZS 3500.3, Plumbing and drainage - Part 3: Stormwater drainage. The revised Standard, which replaces the 2003 version, sets out requirements for materials, design, installation and testing of roof drainage systems, surface and subsoil drainage systems. The main updates in this revision are to take into account new materials, equipment and methods. Further work on this Standard is ongoing, and WS-014 is now working to address issues related to drains in unstable soils.

#### WHAT ELSE IS ON THE COMMITTEE'S PLATE THIS YEAR?

Having just completed an update to AS/NZS 3500 Part 3, WS-014 is now working on Parts 1, 2 and 4 of AS/NZS 3500 to bring them in line with the ABCB's requirements for the National Construction Code.

For AS/NZS 3500, Part 4, Heated water services, the committee is working on a substantial revision of the solar water heater installation requirements while reviewing the maximum water velocity for circulatory pipework. On AS/NZS 3500, Part 2, Sanitary drainage and plumbing, the committee is working on requirements for vacuum drainage systems and clarifying types of junctions permitted in drains.

“WORLD PLUMBING DAY IS CELEBRATED TO APPLAUD PLUMBERS ALL OVER THE WORLD FOR PROVIDING ESSENTIAL WATER AND PUBLIC HEALTH SERVICES.”

#### WORLD PLUMBING DAY

World Plumbing Day is observed on 11 March each year. This year, Standards Australia joined the celebration with industry professionals at the Plumbing Industry Climate Action Centre in Victoria, where the keynote speaker was the Hon. Steven Herbert, Minister for Training and Skills.

World Plumbing Day is celebrated to applaud plumbers all over the world for providing essential water and public health services. With Australian standards referenced in the National Construction Code and the Plumbing Code, Standards Australia is proud to assist plumbers in Australia in delivering these vital services to the community.

We created a video on why standards matter in plumbing, featuring an interview with Mr Paul Naylor, CEO of the Master Plumbers Association in NSW. You can find this video on Standards Australia's YouTube channel [search for 'Standards Australia' on [www.youtube.com](http://www.youtube.com)]. ■

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# FAIR SUCK OF THE SAUCE BOTTLE

YOU MIGHT ASK WHAT TOMATO SAUCE HAS TO DO WITH METAL ROOFING, WELL IN THIS CASE, QUITE A LOT WHEN WE TELL YOU THE EFFORT WE GO TO IN BRINGING YOU USEFUL INFORMATION YOU WON'T STUMBLE UPON ELSEWHERE. PLUMBING CONNECTION PUBLISHER **JEFF PATCHELL** EXPLAINS.

**I**gnorance continues to run amok across the building industry in terms of useful knowledge that can be shared and applied to all building and construction work.

Unfortunately, as you will read later, this pits our small family publishing business hard up against a billion dollar public company which couldn't care less about you or your businesses' welfare. It's a sad fact.

But let me get back to important things you should know about the next metal roof you install or repair.

## DON'T GET SCREWED OVER

If there was ever a faith product, it is metal roof screws. They are the most weather-exposed part of any building and first to fail if the products' corrosion resistance coating is not fit for the purpose.

Rusty roofs have brought many a roof installers business to its knees. In more aggressive atmospheric environments it doesn't take long for rust to show up on the fixings – well before any 6-year builder's warranty sunsets. And with BlueScope® now offering very long warranties on their roof sheet, your fixings and standard of installation work needs to align with those.

Unfortunately with a naked eye inspection it is impossible to tell if a screw has 5 or 55 microns of Zinc/Tin alloy coating – so you have to trust your supplier and buying by price may not even be a true marker.

Until recently you'd ask your supplier for a Class 3 or Class 4 fastener conforming to AS3566.2-2002 but as Standards Australia advises, that Standard is no longer relevant, which could open up the industry to cowboys, so don't get caught in the crossfire.

For an independent view on this important issue we contacted BlueScope Steel, which is in the process of updating its Technical Bulletin Number 16 (TB16) to take into effect the knowledge gap in this Standards writing area. BlueScope's view is that AS3566.2-2002 is now obsolete as opposed to withdrawn. That status will remain until a Standards committee can be formed and agrees on a common testing regime – but you may be waiting a while.

Presumably different suppliers have their own views about product testing standards. Even though it is around 12 months since the Standard was deemed obsolete, there may still be some Class 3 and Class 4 stock around and it is quite legal for suppliers to sell down this existing stock.

In the interim, until the fully updated Technical Bulletin



Metal roof screws are the first parts to fail if the products' corrosion resistance coating is not fit for purpose.

from BlueScope is available they have supplied this summarised statement:

"In order to recommend fastener's that are appropriate to the material, environment & application etc... builders, plumbers, installers and specifiers should be requesting and using fastener's that are suitable for the relevant ISO 9223 category. Many fastener companies already reference this, especially when promoting their new fasteners that are superior to Class 4. Remember to also ask for a fastener that is suitable for the product being used i.e. Galvanised screws for COLORBOND® steel & COLORBOND® Ultra steel. The Bluescope technical bulletin TB-16 is currently being reviewed to reflect the industry move away from AS3566 reference, and to reference and provide assistance via more detailed commentary around ISO 9223."

With any product you are installing, check the product warranty claims and if you are unsure, ask to see test inspection reports, after all, it is your neck that is on the line.

As there appear to be some new products coming through in this category that claim to offer improved coatings, it is a subject we will revisit in the near future. ➤

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\*Refer to AS/NZS 3500.4, local requirements and installation instructions to determine if additional delivery temperature control is required.

DEL AU 3 PHASE ELECTRIC INSTANTANEOUS WATER HEATER



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Technik zum Wohlfühlen

### INDUSTRY HANDBOOK GETS A TIMELY UPDATE

Our thanks go to Matt Wilson of the Victorian Building Authority who is a member of the Standards committee that reviewed and updated the popular handbook *HB 39 – 2015* edition, the *Installation Code for Metal Roofing and Walling*. Matt supplied us with this overview of some points that have changed with this new edition.

The handbook has been updated to introduce emerging coating technologies and to reinforce appropriate installation practices that when utilised will ensure the installation of the roof coverings and flashings are watertight.

If you've not previously had a copy of this reference, the intention of the handbook is to provide basic installation guidelines and acceptable standards of good practice for use by metal roofing installation contractors as well as training providers in any State or Territory. The general design and sizing principles of roof drainage systems indicated in HB 39—2015 may also be utilised when installing drainage outlets, downpipes and overflow provision in above-ground external areas of buildings such as drains from balconies, patios and the like.

The revised version was prepared by a steering committee and peer reviewed by industry participants and is intended to supersede HB 39—1997 *Installation code for metal roof and wall cladding*.

The revised version takes into account the existence of the latest steel coating technologies in the market.

Here are a few points that the revision covers and as you will read, you'll be well advised to get your hands on a copy and study it in detail.

#### • 1 IN 100 YEAR RISK

With more frequent and heavier storm weather; you need to ensure you fully understand the latest guidelines for the

design of eaves and box gutters as well as roof drainage, flashings and cappings. They're in this handbook and it must be referenced back to the relevant parts of your copy of AS 3500. You'll also find some handy box gutter recommended design examples for commercial, industrial and residential projects.

#### • BOX GUTTER PRINCIPALS

The revision reminds roof installers of basic design principles for box gutters so that gutters are designed to have a constant width base [sole] with vertical sides and where appropriate constructed with a constant width base [sole], single vertical side with lea, double vertical side with lea or single or double lea extending under the roof coverings provided the effective area of the gutter is appropriately sized for the roof catchment area.

#### • STRAIGHTENING THINGS OUT ABOUT GUTTERS

There is advice that box gutters are to be constructed so to be straight [without any change of direction] and are to discharge at the downstream end without any change of direction [i.e. not to the side] and that V-shaped gutters are not to be used.

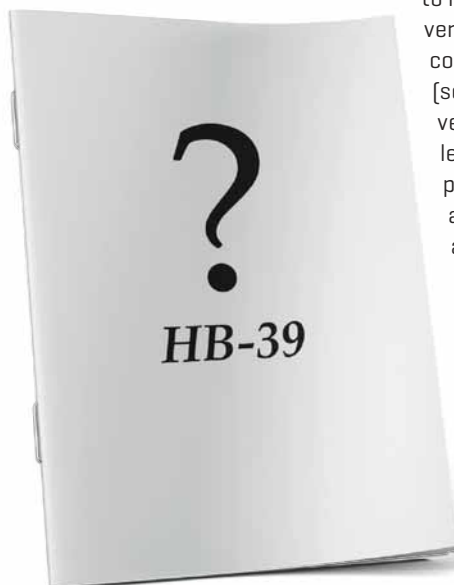
Soaker gutters of adequate strength appropriately sized for the roof catchment area above penetrations are to be installed so that all roof water is collected and drained into two or more full trays at the sides of the penetration with waterways upstream of any penetration to be not less than 100mm.

Eaves gutters with higher fronts than backs and eaves gutters that could potentially discharge overflow into any building are to be provided with fixed overflows calculated in accordance with AS/NZS 3500.3.

Spreaders may be used to drain rainwater from higher roof surfaces with catchment areas not exceeding 15m<sup>2</sup> and may only exceed 15m<sup>2</sup> provided the additional upper roof discharge does not exceed the lower roof profile manufacturer's design carrying capacity.

#### • MENTION OF INSULATED ROOF PANELS

A typical description of an insulated panel [sandwich panel or composite panel] is given that refers to building cladding panels having metal facings to both surfaces, with an insulation core completely filling the space between the two facings permanently bonded to them both. Installers are to refer to manufacturer's specifications when selecting, installing and working safely with these products.



“

**THE REVISED VERSION TAKES INTO ACCOUNT THE EXISTENCE OF THE LATEST STEEL COATING TECHNOLOGIES IN THE MARKET.**

”



- **ACCEPTANCE OF PRESSURE FLASHINGS**

Pressure flashings may be used in lieu of cutting grooves into walls, provided they are used only with smooth surface finished walls, e.g. smooth finished concrete or smooth finished brickwork with flush pointed mortar courses. It is also noted that collar or penetration flashings are to be constructed with up-stands of not less than 100 mm with baseplates appropriately fastened and sealed to roof surfaces.

- **SLIP, SLOP, SLAP – AND BE CAREFUL**

It has been found that certain sunscreens containing semi-conducting metal oxides such as titanium dioxide (TiO<sub>2</sub>) and zinc oxide (ZnO) and these can accelerate the degradation of organic materials, including paint systems and care should be taken with their use. Lookout for a Zinalume 'friendly' sunscreen at your supplier store, it's not a gimmick.

We recommend you get hold of a copy of HB 39, it's a worthy reference. ■



**FAIR SUCK OF THE SAUCE BOTTLE SAI GLOBAL!**

Normally in a space like this we'd publish the cover of the document we are referring to and perhaps a page or two from inside – to give readers an idea of the document layout and encourage them to consider buying the document.

However, as SAI Global has the marketing rights to HB-39 (the end result of a lot of industry people putting their own time into the document) and all other Standards documents, they want to charge us a fee for using those pages – even in a thumbnail [illegible] size.

Thanks but no thanks SAI Global – on principal we refuse to pay for the publishing 'privilege'.

And isn't it lovely for them to say thank you to us for doing their marketing... the world has to change and commonsense restored.

# INTRODUCING **HOT DEVIL** **OXY KIT**

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# CHARGED BY THE METER

WATER METERS PLAY AN IMPORTANT ROLE IN DETERMINING HOW MUCH WATER IS USED BY INDIVIDUAL HOUSEHOLDS; HOWEVER, THEY CAN ONLY DO SO IF FUNCTIONING CORRECTLY. **ANTHONY BAUDUCCIO** OF PROVE STANDARDS & ENGINEERING EXPLAINS.

**W**ater is a precious commodity; however, due to its accessibility in most areas, it is often taken for granted. Water meters are accountable for how much water we use and its indication determines our usage and how we are charged. Perhaps this explains why meters are known as the cash registers of the industry...

The concept of the water meter is to only pay for how much water households actually use. The question is: how do consumers know that these meters are accurately measuring their water consumption? The thing is, not a lot of people consider their water meter to be reading incorrectly. In contrast, if water prices fluctuated like that of petrol, consumers would definitely want to know if they were being over-charged.

There are national standards and procedures in place for the compliance and testing of water meters, as well as all measurement devices intended for trade purposes (E.g.: petrol bowsers, supermarket food scales, etc.) The National Measurement Institute of Australia (NMI) appoint Utility Meter Verifiers on their behalf to verify/re-verify all water meters intended for billing purposes and use in Australia.

The regulators in each state and territory are responsible to ensure the water authorities maintain acceptable levels of accuracy for water

meters. To ensure ongoing compliance, water meters need to be routinely tested by an accredited laboratory which has been deemed competent to perform the testing by the National Association of Testing Authority, Australia [NATA]. It is important for water meters to maintain their accuracy over their life span, for the benefit of not only the consumer but also for the water authority, as accountability of water is also

0 0 1 2 6 4 8 7

vital for our future needs. Future growth planning for large cities and towns rely on correct water distribution of their networks for investing into new large capital projects.

Home water meters can be used if your customer suspects a leak in their premises. A simple suggestion asks that they take a meter reading before they go to sleep,

ensuring that no water will be used by any of their appliances (including their toilet). In the morning they should take the reading once again. Any change of the reading on the water meter can mean that they may have a leak which you can rectify once the leak has been found.

“

**THE REGULATORS  
IN EACH STATE AND  
TERRITORY ARE  
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ACCURACY FOR WATER  
METERS**

”

## READING WATER METERS

Most common domestic meters have two distinguishing colours on the indicating dial typically split between black and red. The black numbers denote kilolitres [kL] 1 kL = 1000 litres and the red numbers represent litres. The diagram above shows an indication of 126 kilolitres

and 487 litres. This is the amount of water that has passed through the water meter. The kilolitre dials [black] are only read for billing purposes and there is no rounding up or down involved, so the usage would be based on 126kL assuming the meter at the previous reading interval (last billing cycle) was an indication of zero.

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# AN EXCITING ACQUISITION

RINNAI'S RECENT ACQUISITION OF BRIVIS SIGNALS GOOD TIMES AHEAD. JUSTIN FELIX EXPLAINS.

**W**hen two reputable brands come together and integrate with a clear vision in mind, there's usually something exciting around the corner. That was the sentiment that encouraged Greg Ellis, Managing Director of Rinnai Australia, to pursue the acquisition of Brivis by Rinnai Australia earlier this year.

Rinnai and Brivis each boast rich histories that have ensured their brands are etched into the minds of the market in Australia, and in the case of Rinnai, on the global stage.

Rinnai Australia was incorporated in Australia in 1971. It is a fully owned subsidiary of the global Rinnai Corporation based in Nagoya in Japan.

Rinnai began life on our shores as a small gas heater manufacturer and supplier before diversifying into hot water appliances in the late-80s and early-90s when it introduced the revolutionary continuous flow, instantaneous demand gas water heater branded the Rinnai "Infinity". That iconic product changed the game in terms of domestic and commercial water heating processes in Australia. With strong marketing initiatives and a quality product, the "Infinity" has become a household brand that revolutionised water heating forever in Australia and across the world.

Brivis [O'BRIen and DaVIS - original partners' names], on the other hand, started importing oil heaters for the Australian market in the 1950s before manufacturing ducted gas heaters soon after. In 1999 they were acquired by Carrier and then by GWA in 2010.

Last year signalled a new frontier on the horizon.

"In 2014 we had the opportunity to talk with GWA," Greg continues. "GWA's decision to divest the Brivis business was predicated around their strategy rethink. That culminated in their divestment of Dux and Brivis. We acquired the Brivis business while Dux also found new owners."

Brivis is coincidentally located some one hundred metres from Rinnai's previous head office in the south east of Melbourne, and only 8 km from Rinnai's head office in Keysborough, making the collaboration between the companies extremely convenient.

"The decision for us to acquire Brivis was met with positive feedback all-round," Greg advises. "Our Board of Directors was immediately impressed



The name Brivis has been synonymous with evaporative cooling for decades now. Iconic products such as this one really brought the name to the fore in this country.

with the flow-on strategic opportunities that Brivis brought to Rinnai. The staff of Brivis were also delighted because they could see Brivis becoming a respected part of the Rinnai organisation with an innovation, investment and growth culture, not unlike their beginnings under the O'Brien era. Finally, there was delight from the Rinnai staff who had long appreciated the synergies between ducted, space and refrigerated competencies."

Rinnai Australia, with full backing from its board, has sizeable expansion plans for the Brivis business.

"We have identified a range of new products and technologies ripe for investment, and the plan moving forward is to rework a lot of the current unit operations and manufacturing cells at Brivis and Rinnai to align them more closely to this end," Greg says.

"There is no need to rush our approach though. We are building project teams as we speak and have identified clear opportunities for integration and bringing some of the world class technologies from Rinnai Japan to Australia.

"Pleasingly, the Brivis and Rinnai cultures are very similar. Both companies have come from a family background, ➤





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with strong ethical, quality and consumer orientations. That cultural similarity bodes so well for our future integration and expansion.”

“Also fortunate is the considerable technical skill and capability injected into Brivis during the Carrier years. These inherent skill-sets were an important determinant in our decision to pursue this acquisition.”

Greg admits to often fielding questions regarding why Rinnai would pursue a business such as Brivis, given a heater market perceived to be fundamentally limited to Victoria and the ACT, and whose longer term future may appear to some as bleak in respect of adversely changing weather patterns in the south of Australia and rapidly escalating gas prices to consumers. To those with such questions, he responds with gusto.

“Sometimes I feel that we are in the business of resolving misery and discomfort, and that is exactly where Rinnai and Brivis excel. We do this by providing quality experiences and solutions with comfortable lifestyle enhancers that harmonise with the environment. That philosophy is not limited to product categories or to yesterday’s technologies. While we cannot control the weather, we can control how we adapt, evolve and innovate our products and solution offerings to market.

“We know what we can do with an integration of Rinnai and Brivis’ technology, and what we can achieve with Japan Board support. We also run an \$80 million manufacturing business in Adelaide, which will benefit enormously from Brivis’ manufacturing capabilities in terms of in-house manufacture of many currently imported components. We have also been very successful in developing export of products from our Adelaide factory which will increase with the lowering of the foreign exchange rate. Hence there is a real buzz of optimism and expectancy within our business for the near and long term future of the company.”

Expansion and capital investment is on the table in the coming year. And without doubt, it’s an exciting time for Rinnai and Brivis.

In Japan, Rinnai has an R&D Group of over 600 engineers which is quite an impressive number on its own. Couple that with the fact that Rinnai injects US\$95 million a year into R&D, with operations in 17 countries and over 34 manufacturing facilities globally, and you start to realise just how successful the Rinnai international entity has become.

“Now that we have an efficient manufacturing business of scale here in Australia – and the board is very supportive of what we intend to do – future prospects are quite exciting. We will be able to call on plenty of intellectual property from our domestic operations as well as our Japanese parent too.”

It’s not only a good news story for Rinnai and Brivis, and the careers and employment opportunities for their valued staff, but it’s also a shot in the arm for manufacturing in



**IMAGE 1:** An aerial view of Rinnai’s Seto factory in Japan.

**IMAGE 2:** Brivis Melbourne’s manufacturing facility.

Australia and Victoria, and one that governments will be keen to support.

“We’ve always looked at this type of opportunity with hunger at Rinnai Australia but we’ve never had a baseline protocol to really drive activity from within. On top of that, our markets here have often lacked the scale that attracts specific investment in Japan.

“Now that we have serious scale and manufacturing capability here, many opportunities will open up, and our destiny is now very clearly, not only in our quality and technology, but in our ability to innovate and make it happen in Australia.” ■

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# THE BACTERIA PUZZLE

LEGIONELLA AND PSEUDOMONAS BACTERIA HAVE A PRESENCE IN HOSPITALS AND AGED CARE FACILITIES AROUND THE WORLD. **KATE JORDAN** LOOKS AT WHAT NEEDS TO BE DONE TO CONTROL AND PREVENT FURTHER INFECTIONS.

**B**acteria are an inevitable part of life. Many are benign or even beneficial to humans, but pathogenic bacteria are harmful and even deadly. Most healthy humans can easily fight these off, but people with compromised immune systems – those who are elderly, ill, or injured – are susceptible to bacterial infections that can prove fatal. Two of the most common pathogenic bacteria – legionella and pseudomonas – gain access and spread through hospitals and aged care facilities via the water system.

Legionella and pseudomonas are a worldwide problem and yet there is a marked difference in the level of defences throughout the world. Leading the charge is certainly the UK and Europe. The UK has a standard in place for legionella control in health and aged care facilities and is possibly the largest market for temperature controlled outlets.

One of the largest producers of these outlets is Australian – Reliance Worldwide supplies about a third of the British demand – and yet Australia is much less advanced in defending against bacterial infections in water supplies. Peter Flynn, Export Manager for Reliance Worldwide, estimates we're about 10 years behind the UK.

"In the UK, the standard used to allow six metres of tepid water. Then it went to one metre, then it went to 'we prefer you to put the thermostatic in the tap'," Peter recalls. "I don't even think we have a distance in our plumbing code, you can do anything you like."

There is hope though.

"If you'd asked me twelve months ago, I would've said the United States was not all that interested in legionella," Peter says. "Since about November last year, it's now a hot topic."

[For more discussion on Legionnaires control in the States, read Matthew Freije's article on page 42].

Reliance Worldwide is now seeing increased demand from the United States for thermostatic controls. When they'll see demand from their home country is hard to tell.

## JUST ONE PART OF THE PUZZLE

One of the reasons there is a lack of movement on infection control is the sheer complexity of the solution. There is no one way to tackle bacterial infections; instead a myriad of tactics must be employed.

To explore the problem and the various solutions, we spoke to four experts in water supply. The first was Peter, mentioned above; next were Steve Gamble and Kevin Peel, Senior Product Manager and Associate Director of New



## THE EFFECT OF TEMPERATURE ON LEGIONELLA

Temperature Range	Effect on Legionella
70-80	Disinfection range
66	Legionella will die in 2 minutes
60	Legionella will die in 32 minutes
55	Legionella will die in 5-6 hours
50-55	Legionella can survive but do not multiply
20-50	Legionella growth range
Below 20	Legionella can survive but are dormant

Product Development respectively, from Rada Controls. Lastly, we spoke to hydraulic project engineer Antonio Lo Monte from Wood & Grieve Engineers.

## THE PROBLEM

Before we can look at a solution, however, we must identify the problem: legionella and pseudomonas. Through Rada's research into developing new, low infection-risk outlets, Steve and Kevin became very familiar with both bacteria –



although they're quick to say they're not microbiologists. They gave us the run down on these pathogens.

Legionella bacteria cause Legionnaires Disease, a pneumonia-like illness treatable with antibiotics, but deadly to people with compromised health. It reproduces at temperatures between 20-45°C and is present in water around the world. Numerous studies can be found, which indicate Legionella bacteria can be detected in up to 30% of water systems. The Rada team carried out their own investigation and found the presence of Legionella bacteria in 9 out of 97 domestic houses tested.

In Australia, Legionnaires outbreaks are fairly frequent. While the most common source of infection is cooling towers, people have also been infected via internal water systems. One of Australia's first recorded outbreaks in 1979 was traced back to showers in a psychiatric hospital, in 2013, two patients at Wesley Hospital died from Legionnaires Disease contracted from the water system and as recently as April 2015, a patient died at Hervey Bay hospital.

Pseudomonas are a more recent development.

"Pseudomonas is the name given to a diverse range of many varied species, but it is pseudomonas aeruginosa

in particular, which presents the highest risk to humans," Steve says. "If you're healthy with a strong immune system, not frail or elderly, then you are really unlikely to have a problem with pseudomonas aeruginosa."

Pseudomonas aeruginosa is, therefore, only really a problem in hospitals and aged care facilities – but that in and of itself is a problem. As people with weaker immune systems provide a host for the bacteria to multiply, they're treated with antibiotics – and while the infection is ultimately defeated, some of the bacteria develop a resistance to the drugs.

"In hospitals, it's now possible to have micro organisms that are multi-drug resistant. And they're the ones that will become nasty and problematic," Steve explains. "That's why, I think, it's escalated and will probably continue to escalate, and why it's now such a hot topic."

Pseudomonas are currently present in many Australian hospitals.

Legionella and pseudomonas – like many other bacteria – gain a foothold through biofilm. Some bacteria will land inside a fitting or pipe, form a biofilm and offer a foothold for other bacteria. As the biofilm strengthens, larger microorganisms – like amoebas and protozoans – arrive ➤

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## INFECTION CONTROL

and feed off the bacteria. Legionella take advantage of these larger organisms. Once ingested, they live inside and breed, bursting free when the larger organism dies.

"That's one of the reasons why legionella is quite difficult to treat," Steve says. "In spite of the high sterilisation temperatures used during thermal disinfection routines, the biofilm offers the legionella bacteria a degree of protection from the thermal shock."

Given legionella and pseudomonas' ability to spread quickly, become multi-drug resistant, and kill the elderly and ill, it's important that bacteria control is addressed in hospitals and aged care facilities. As mentioned earlier, a multi-pronged attack is needed, covering the following four areas:

- Keep hot water hot
- Keep cold water cold
- Keep it moving
- Keep it clean

### KEEP HOT WATER HOT

"The first parameter to consider is storage temperature – this needs to be maintained above the 60°C range to ensure the hot water storage vessels and calorifiers can't become a breeding ground for legionella," says Antonio, an hydraulic project engineer from Wood & Grieve Engineers.

This temperature requirement includes water in storage and in circulation. Antonio gives the example of poor design work in hospitals where the hot water pipes have long dead legs and reticulation doesn't pass close enough to isolated fixtures. These flaws can increase the surface area of the hot water and the time water spends in the line, cooling it to a dangerous temperature.

For many years, internal water systems in Australia have not been designed with these factors in mind. Peter explains, "In Australia, we've had things like warm water systems installed which will deliberately send warm water through the whole system, on the basis that you had to maintain the temperature at one point – in the basement – and you didn't have to maintain it anywhere else. Which is great, but then you've created an entire legionella risk through your whole system."

Once these 'warm water systems' are addressed, the mixing of hot and cold water needs to be taken as close to the source as possible. One way of doing so is to employ thermostatic mixing valves [TMVs]. By mixing the hot water at the point of use, TMVs ensure the water can be kept hot for as long as possible, without the risk of scalding.

### KEEP COLD WATER COLD

On the flipside, it's important to keep cold water cold – below 20°C. As with keeping hot water hot, a step towards achieving this is keeping cold and hot water separate; there is, however, an additional problem. The increasing use and

efficiency of insulation is inadvertently warming the water in the cold water system to a dangerous level.

"In parts of the UK, especially Ireland, they're fighting with the increasing insulation on modern buildings, especially when the cold water is getting sufficiently warm to be a legionella risk," Peter says. "I visited a couple of sites, one in Northern Ireland, where they were installing chillers on the cold water system to keep the water cold."

Chilling cold water – particularly in a cooler country like Ireland – is counterproductive to the cost-saving intentions of insulation, so building designers and hydraulic engineers are now looking to relocate the cold water supply.

"In some of these newer designs, they've relocated the pipework away from the central shaft into a separate area, where it is not heated," Peter states.

#### KEEP IT MOVING

Stagnant water gives bacteria a chance to settle and create biofilm. Ensuring there are no dead or slow spots in the system or fittings reduces the ability of bacteria to colonise.

Rada have kept this in mind when designing their new

range of taps, which will be launched in Australia next year. As Kevin explains, the new designs are "Keeping the internal geometry of the product very, very simple, so you don't have any areas where water is trapped, where it never really flushes out properly."

They've also reduced the volume and increased the flow to keep the water moving by shrinking the size of the tap internally and externally.

While part of the equation is the physiognomy of the taps, there's a new element in hydraulic design: automation.

The Rada product series has built-in motors that can automatically flush either the tap or shower that hasn't been used recently. Controlled by an app on a tablet, the taps can be set for a duty flush at a regular time – down to once an hour – and to skip this flush if they have been used recently.

In addition to helping keep the water moving, the duty flush can assist with maintaining the temperature of the water – either hot or cold – in the lines.

As well as flushing, water can be reticulated within the system.

"Reticulation is another main component," Antonio says. "It is required here in NSW by NSW health that dead legs ➤

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in the hot water reticulation system are maintained to an absolute minimum, the DOH nominates a minimum of 10 lineal meters or 2 litres of draw off. In our hydraulic designs engineers normally aim to have even less draw off than this.”

### KEEP IT CLEAN

The last tactic in the fight against biofilm is keeping the water system clean. This can begin even before the water has entered the building.

“Site filtration, UV disinfection and chlorination are used and advised methods for incoming cold water supplies to reduce the risk of breeding legionella and pseudomonas,” Antonio states.

Once the system is installed, regular maintenance is needed.

“Storage tanks should be inspected regularly and cleaned and disinfected annually,” advises Antonio. “A close eye also needs to be kept on automatic backwash filters and bag filtration systems.”

The right materials can help keep the inside surfaces of the plumbing fittings clean. Rada aims to eliminate plastics and reduce the use of elastomers in their new range, as both of these materials give bacteria a place to live and often provide a food source.

“If you can optimise the product to make it entirely of metal, you’d be doing a good job,” Kevin says. “Brass and copper are the favoured materials because they have antimicrobial properties.”

Copper and brass are more expensive, but with the shrinking of the taps mentioned above, the amount of materials needed (and the cost) is also reduced.

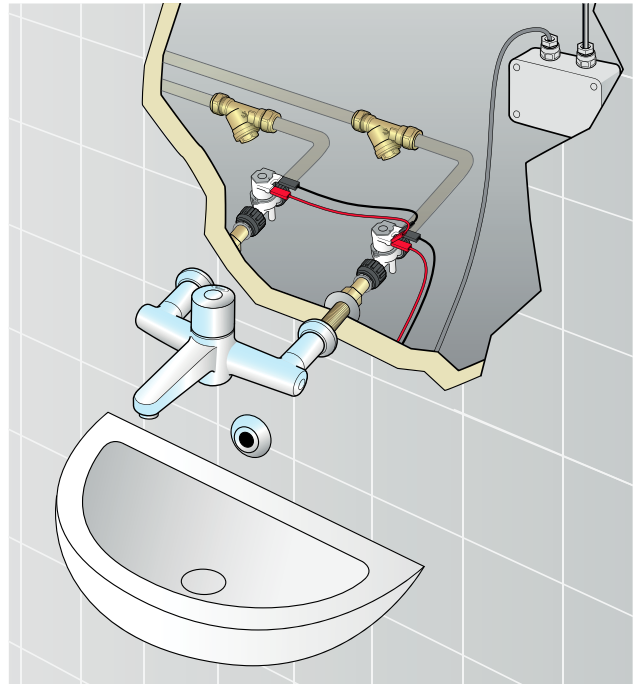
Perhaps the most challenging and labour intensive method of keeping it clean is thermal disinfection. Even with a thorough treatment system, legionella and pseudomonas can make their way into a building’s water system – thermal disinfection is one method of killing these invaders.

The first challenge is keeping the water hot enough to kill bacteria. As discussed above, many of Australia’s hot water systems are actually warm water systems and not capable of maintaining the temperature required: at least 60°C, but preferably above 70°C.

The second challenge is to avoid scalding anyone during the process.

“At the moment, it seems like a very manual process,” Peter explains. “Maintenance staff stand in front of the shower and physically flush the system.”

There are moves to automate the system and have it running when it’s unlikely anyone will be using those outlets – for example, in the early hours of the morning. But in many of these facilities, it’s impossible to ensure no one will be using the outlet. Peter gives the example of an older lady with dementia who might decide to have a shower at two o’clock in the morning.



A TMV installation depicting the hot and cold water inlets.

The Rada range has been designed to offer automated duty flushing, but the risks presented by thermal disinfection require a maintenance engineer to be present. Should they leave the tap unattended before the cycle has finished, a safety feature will terminate the disinfection cycle, if the tap’s sensor senses a person’s hands approaching. But this is high-end technology which will retrofit into most situations as long as a power cable can be located near to the tap or shower.

### THE ONGOING PUZZLE

The battle against bacteria is certainly an ongoing one. As bacteria develop resistance to different antibiotics and adapt to new environments, we will need to change our defences to match. Plumbers and hydraulic engineers have many weapons at their disposal; it’s a matter of finding the right ones for the situation. As Antonio states, “It is crucial that pre-filtration and treatment systems that are selected suit the end users’ needs and methods, otherwise they just don’t get used.”

The same could certainly be said for the water distribution systems and other end use products. The tactics used must suit each individual battleground. ■

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# LEGIONELLA: WHERE THE USA IS AT



FOR A 30-DAY PERIOD, THE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE) TOOK COMMENTS ON CHANGES MADE IN THE FIFTH DRAFT OF ITS PENDING STANDARD 188P, LEGIONELLOSIS: RISK MANAGEMENT FOR BUILDING WATER SYSTEMS, WHICH COULD AFFECT CHANGE HERE. MATTHEW FREIJE, A WORLD LEADING LEGIONELLA EXPERT, EXPLAINS.

**S**hould the 188P committee decide the comments received are not substantive enough to warrant a sixth draft, then the standard could be finalised as early as July.

The Legionella risk reduction strategy set forth in 188P is to implement a plan for managing building water systems including cooling towers, evaporative condensers, whirlpool spas, ornamental fountains, misters, atomizers, air washers, humidifiers, and other devices that release water droplets.

A management plan would be required for potable plumbing systems only in buildings that have any of the following: [a] multiple housing units with a centralised hot water system; [b] more than 10 stories; [c] housing for occupants over the age of 65; [d] healthcare for patients staying longer than 24 hours; or [e] an area housing or treating persons at especially high risk of contracting Legionnaires' disease.

The required components of ASHRAE's proposed water management plan are essentially identical to what the World Health Organisation recommended in its 2007 publication Legionella and the Prevention of Legionellosis:

- **A list of the water management plan team members:** Teams typically consist of 10 or fewer individuals who oversee the program and make decisions about it. Many others are needed to implement it.
- **A brief description of the building water systems, with flow diagrams:** Salient information should be included for all of the building water systems, not just the ones prone to Legionella growth and transmission. Simple line diagrams should show where water is received, processed and used. For most facilities, at least two diagrams should be included, one for domestic [potable] water systems and another for utility [non-potable] systems.

Flow diagrams should be simple. Cluttering them with unnecessary details will only hinder their primary purpose.

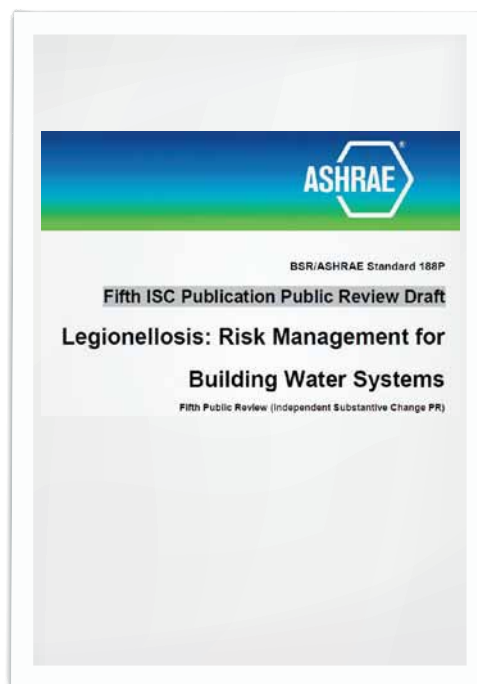
- **Analysis of the building water systems:** Commonly referred to as hazard analysis, this is a brief explanation as to why each water system does or does not present a significant potential for Legionella growth and transmission and, for those that do, whether it is a location at which Legionella control measures can be applied.
- **Control measures:** Only what is actually done to water systems will reduce Legionnaires' disease, so control

measures are the most important part of any Legionella water management plan. The team must come up with a specific list of control measures for each building water system. ASHRAE gives a framework for the team to fill in, stating that procedures must be included, as applicable, for new construction, equipment siting, start-up and shutdown, inspections, maintenance, cleaning, disinfection, monitoring [e.g., temperatures; disinfectant levels] and water treatment. The team must also write out steps for responding to Legionnaires' disease should a case occur despite the prevention efforts.

- **Each control measure must be monitored to determine whether it is performed to the standard – called a control limit – designated in the plan:** If the control limit is

not met, then corrective action must be implemented. The monitoring procedure, monitoring frequency, control limit and corrective action must be listed for each control measure.

- **Documentation and communication procedures:** Draft number five of 188P instructs the team to "establish documentation and communication procedures for all activities of the program."
- **Verification procedures:** The team, or a designated



“verification person,” must review documentation to ensure the plan is being implemented.

- **Validation:** The effectiveness of the plan in controlling Legionella must be validated. Testing water systems for Legionella provides the most direct feedback on Legionella control. Legionella testing is discussed as a validation option in 188P but is not required.

For new construction or renovations, designers and contractors have responsibilities as well. For water systems deemed to require Legionella control measures, designers must provide documentation, diagrams, or instructions as needed for monitoring and control, code compliance, operation and maintenance, control system operation, calibration, installation and start-up, commissioning (including procedures for flushing and disinfection), filling and draining, equipment sizes, piping layout, system materials, pipe sizes, design flow rates, design temperatures, and the impact of heat loss or heat gain.

Designers must also note locations of equipment access (or note inadequate access), filling and draining, flushing, sampling, temperature monitoring, treatment, no flow and low flow areas, possible cross connections between potable

and non-potable systems and outside air intakes.

Plumbing contractors must properly balance the systems. They may also be responsible for disinfecting the system which according to ASHRAE 188P must be performed no more than three weeks before any part of the building is occupied for its intended purpose.

If 188P becomes a standard, it could be adopted as law by government agencies in the United States [e.g., state health departments]. It has already been proposed for adoption into the International Plumbing Code and the International Mechanical Code. Its ultimate impact in Australia is uncertain but we should always look to learn from abroad. ■

*Matt Freije has specialised in Legionella prevention since founding HC Info [hcinfo.com] in 1995. He has written two books, developed water management plan templates, taught seminars in five countries, and written and narrated nine e-learning courses including the new course “How to Survey a Building for a Legionella Water Management Plan.” His first book, Legionellae Control in Health Care Facilities: A Guide for Minimizing Risk, has been distributed in more than 30 countries, including Australia.*

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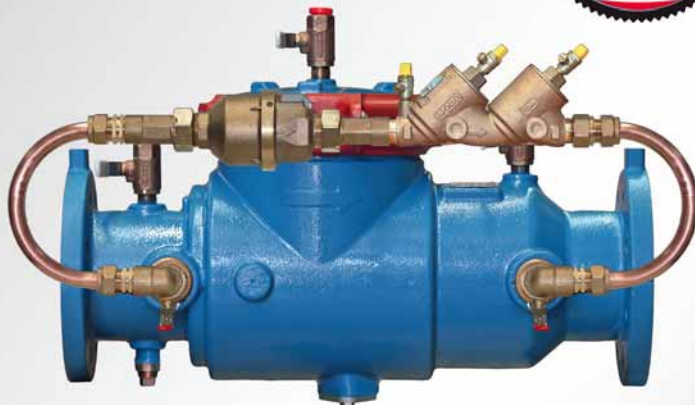
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# CONTINUING EDUCATION IN THE PLUMBING INDUSTRY

**PETER MCLENNAN** URGES MORE PLUMBERS TO FURTHER THEIR EDUCATION AND CONTINUE TO GAIN KNOWLEDGE LONG AFTER THEIR APPRENTICESHIP IS DONE AND DUSTED.

Oscar Wilde once said, “You can never be overdressed or overeducated,” and if you think about it, it makes good sense.

Why is it then, that we regularly see, not all, but many, scruffy unkempt plumbers and plumbers who once they complete their apprenticeship, ‘throw away the books’ and adamantly refuse to entertain further education?

In this article I want to cover further education so I will leave the sartorial elegance topic to another time maybe.

The apprenticeship model, and in this case the plumbing apprenticeship, produces a highly skilled professional tradesperson up to date with all modern aspects relating to their trade. The general public can have full confidence that the job done by this tradesperson will utilise current technologies and current best practice workmanship.

But, what happens after the tradesperson has been in the field for 10 years? 15 years? 20 years? They may have perfected their skills and proficiencies but can we be sure that the work performed still ensures that modern technology is utilised and that the work is best practice? Without a formal skills development or continuing education

programme, the answer is unfortunately, no.

Let’s focus on backflow prevention.

It is a requirement across most of Australia and for that matter the world where backflow prevention is concerned, that a plumber takes extra study over and above the apprenticeship to become an accredited backflow tester. It is not something every plumber is trained to do, due to the sophistication of the devices and the level of safety the device provides. Some jurisdictions require that the license holder resits a re-fresher course to recertify they are abreast of changes to Standards and product development every 3 or 5 years. Others do not require this recertification, which then puts us back in the situation of a diminishing skills base as time passes. Surely if we are going to have this requirement in some States, we should insist it is standard across the country.

The concept of backflow prevention is a very simple concept, but to truly understand it in the context of cross connection control and have the knowledge and skill to test a device, maintain and repair it needs a high level of ongoing training.



In the past, the 'backflow tester course' covered aspects of hazard levels, risk awareness, Standards, testing, maintenance, repair, troubleshooting as well as touching on auditing and surveying a premise for risk of backflow. That is until the bureaucrats became involved and reduced the hours available to train the person which has resulted in the emphasis being on the testing of the device for operational effectiveness and not much else. This leaves, troubleshooting, device repair, understanding of hazard ratings etc. all untouched resulting in an accredited person devoid of the knowledge needed to do the complete job.

A backflow preventer is designed to protect the water supply from a cross connection that has the potential to cause serious injury or death to the consumers of the water. Why have we allowed such an important aspect of the plumbing industry to be come at risk?

I am sure that you have seen over the years comments of the order that plumbers save more lives than doctors but if as an industry we continue to resist continuing professional development and further education, we are just paying lip service to the thought and obviously don't believe it as important.

That is why; we at the Backflow Prevention Association of Australia provide conferences, technical workshops and seminars in an effort to keep the plumber's skills fresh.

As well we are currently developing a CPD curriculum that specifically covers backflow prevention and the aspects related to it.

We see the backflow plumber as a professional, responsible for maintaining the integrity and public safety just as a specialist doctor who needs ongoing training to maintain their license. This is no different.

And as the great Peanuts cartoonist said, "Try not to have a good time...this is supposed to be educational." ■

*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.bpaq.org.au](http://www.bpaq.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.*

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# ISH 2015 TRADE FAIR REPORT

**JEFF PATCHELL** WALKED THE HARD YARDS FOR READERS ONCE AGAIN WITH A LOOK AROUND THIS YEAR'S ISH EXHIBITION IN FRANKFURT. HE EVEN SCORED A SEAT ON THE MOST OUTLANDISH TOILET THRONE KNOWN TO MAN – A LITTLE MORE ON THAT LATER...



ISH was once again quite an event and attracted its usual ~200,000 visitors, with around a third of them coming from outside of Germany. And the Australian's and Kiwis were there in ever increasing numbers.

Sustainability is a key issue for all of us but Europe has been more driven when it comes to energy efficiency (due to critical energy supply issues), which has for a long time been strongly reflected in the energy and air-conditioning parts of ISH. Australasia on the other hand has been ahead of Europe over the past decade or two when it comes to water efficiency, but the Europeans are now taking water efficiency more seriously.

One of the most important bathroom trends happening globally is the move towards barrier-free or 'access' solutions; a direct result of the fast changing demographics in most Western countries and the commitment to making life easier for the disabled.

The German plumbing contractors association (ZVSHK) claims that of the 495,000 bathrooms their members have installed over the past 12-months, a third of them were barrier-free. That's not a trend but a giant movement in product supply, installation expertise and business opportunity. We've yet to fully embrace the barrier-free movement to that degree in our local markets.

This product review focuses mostly on new products and technologies for the bathroom sector, where there were some significant ideas worthy of a second look. The degree of change in the piping, valves and boiler/hot water sectors was not quite as noticeable but no doubt there will be new fine-tuned products from those sectors launched here over the next year or so.

Following this ISH report I have a dedicated story on rimless toilets which were being discussed in depth on most of the sanitary-ware stands. Go to page 52 for that article. ➤

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AP902	Reduces sediment*
AP903	Reduces sediment* and Chlorine,* improves taste* & odour
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<sup>#</sup> Based on comparison of equivalent products in the market.

\* Tested in accordance to manufacturer's internal laboratory standard.

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## GETTING A SECOND BITE AT LOST SHOWER ENERGY



Over the past couple of years Plumbing Connection has featured a number of products that have aimed to re-use the heat lost from shower water, to preheat the incoming cold water before it reaches the mixing valve. The attractions in terms of saving energy/money are obvious but making the pay-back work and the installation simple have been the challenges.

We spied two interesting new solutions, one for OEMs [original equipment manufacturers] and the other a bolt-on solution. Both claim to be able to lift the incoming cold water temperature from 10°C to around 25°C.

The first one called the Joulia-Inline claims to be able to save more than 50% of the energy normally lost in the flushed shower water. The Swiss manufacturer is looking to sell the technology to companies all over the world who make shower trays and drains. The compact Joulia unit is invisible in the shower floor and has no moving parts that require maintenance. This heat-exchange unit is a simple idea – which means it has a high chance of success. In talking with Reto Schmid, the Joulia CEO/Co-founder at his ISH stand, he was very satisfied with the interest shown in the product from around the world, including Australia and New Zealand. Laufen, one of Europe's most respected shower unit suppliers, has already integrated the Joulia into some of its products.

Another take along the same theme came from a Portuguese company with a product called the Zypko. This product can be integrated into a new-build specification or where there is sufficient room and access below the shower base, so it can be retrofitted into the existing plumbing system.

The Zypko is not meant to be removed [the Joulia can be more easily accessed] once it is installed but through the waste outlet you can access a filter and trap to remove any hair or other blockages.

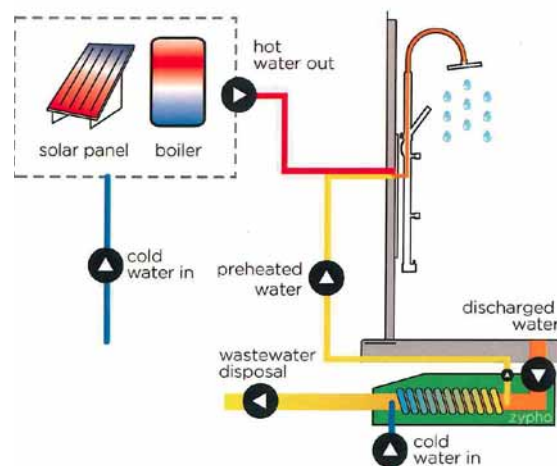
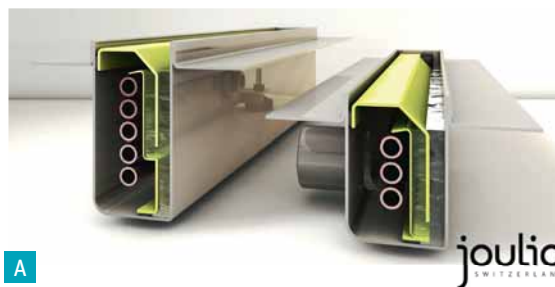
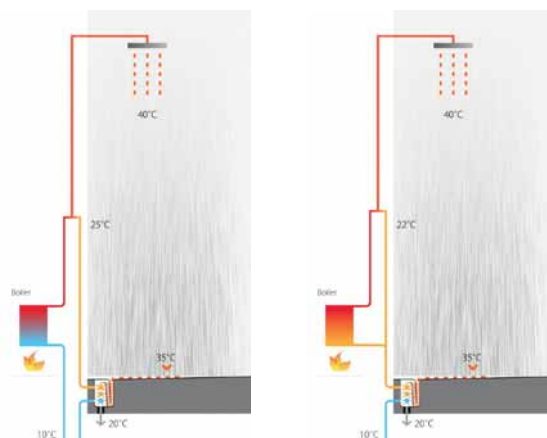
The real test for these drain water heat recovery units will come in the form of meeting our WaterMark requirements and satisfying potential specifiers, with energy-savings and payback performance data, confirmed by independent third parties.

**ABOVE:** Reto Schmid, Joulia CEO & Co-Founder.

**A:** The Joulia-Inline is an exciting proposition.

**B:** The Zypko can be retrofitted into existing systems.

[www.joulia.com](http://www.joulia.com)  
[www.zypko.eu](http://www.zypko.eu)





### SO, A BIT OF FUN TO START WITH

Yes this is me daring to be pictured while sitting in this ridiculous piece of bathroom furniture that at first had me believe it had been put together as an attention-getter for the stand. But



no, they claim it is for real and they will have it on the market later this year. It's obviously a toilet for the man who can't afford to get away from his office for too long. There's a slide-away shelf for your laptop and other storage bins for items you might deem necessary when nature calls.

It's from Forsan Ceramics, a growing Middle-East supplier from Saudi Arabia and they can supply one for your man who has [nearly] everything.

[www.forsan-ceramics.com](http://www.forsan-ceramics.com)



### HOW ABOUT A 360 IN THE SHOWER!

Now this is exotic – well, at least the demonstrator was.

If you want to make it in Bollywood you have to start somewhere and this lovely Indian lass was making every post a winner with her demonstration on the hour of the Jaquar JoyRing shower unit. And surprise,

surprise, she was attracting quite an audience.

The ring is punctuated with shower jets that surround you with water as the ring climbs vertically up and down and back into a recess in the floor of the shower at the end of the experience. You can pre-set the unit to go as high as you like and for a pre-determined time. There is even some LED mood lighting above to add to the atmosphere. As the brochure says, 'luxury and aqua-pressure therapy melded to create a glorious spa! experience'.

Jaquar is a formidable supplier of taps and shower systems from India.

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



Refrigerated



Bubblers



Accessible



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### BRING ON THE AUSSIES

RMC has flown the flag for Australia for many years and had a stand at ISH to chiefly support its European business but at most ISH's there have also been a couple of other Aussie stands from smaller start-up companies. This time I was walking the aisles when I heard an Australian accent and spotted the guys from Bounty Brassware who hail from Sydney. They were launching their recently released Pop Down Waste™ for basins and it was attracting quite a crowd. Their product works in reverse to pop-up wastes and is far more elegant for upmarket basins and baths. They are now busy evaluating the interest from suppliers which is the advantage of ISH as it brings all the major players to your door. The boys didn't waste too much effort on their stand either. The word is that the daffodils may have blown the budget! Top marks for giving it a go fellas.



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

### BYE, BYE BATH TOWEL

The Valiryo Body Dryer aims to replace bath towels and improve the drying experience. At first you might think this is a bit of overkill but for facilities like hotels, gyms and wellness centres it starts to make sense. There are also uses in the home, particularly for the ageing population who may be finding it harder to dry feet, legs and backs. The elegantly styled unit from the Spanish manufacturer features 23 air vents that reach top to toe at a drying temperature up to 21°C. The control panel features 16 operating combinations and will memorise your preferences for your next use. Drying time is approximately three minutes. The unit can be housed in the shower cubicle or outside of it.



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

### BARRIER-FREE SHOWER/BATH COMBINATION

We have featured similar products to this unit in past ISH reviews but they have been very luxurious and expensive. It now looks like the concept is trickling down to a mid-market level which is hopefully more affordable. For our domestic access market, such a product would be welcomed from both practical and space saving aspects.



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

### SMART HEAD



The Kott-Smart is an innovative device that fits between a shower hose and the shower head. The device is a self-powered water meter which requires no battery to operate. It captures water and energy consumption, temperature and flow rate of each shower. By alerting users to the amount of water

and energy they are using, the inventors claim that in a typical domestic home, the product can save 440kWh of energy and 8500 litres of water. It can link to home automation systems via a Bluetooth interface.

[www.kottmann.eu](http://www.kottmann.eu)

### SOFT TOUCH SHOWER TRAY

This is an interesting variation on the standard shower tray base which is generally cold to touch and slippery at times. This Soft Tray can be manufactured in any shape from 30mm thick soft polyurethane sheet that has been anti-bacterially treated. The waste outlet and grate can be cut into place onsite.



[www.banos10.com](http://www.banos10.com)



### NOT QUITE RIMLESS

As mentioned earlier, we have a detailed story on rimless toilets later on.

However, there's always someone with a different option and Ideal Standard demonstrated a soon-to-be-released toilet flushing technology called AquaBlade™.

This system uses a reduced overhang rim which is fed with flushing water from the back of the bowl along the channels on both sides, from where it cascades through a series of micro-slots to wash down the pan. Ideal claim this technology means that 100% of the bowl surface is scoured, whereas 20% of a normal rimmed pan is under-washed. Other benefits claimed are less splash and from an aesthetic viewpoint, when the seat is down, the reduced rim is virtually invisible.

[www.ideal-standard.co.uk](http://www.ideal-standard.co.uk)

### BARRIER-FREE LEADERSHIP

Innovation often comes from unexpected quarters and Samsung clearly demonstrated they are thought leaders beyond the electronics that we best know them for. For ISH, Samsung Chemical Europe created a hotel wellness bathroom using its Staron® brand of thermoplastic material as the base material for all surfaces (walls, floors, bath, basin/bench etc.). Samsung sees opportunity in the ever-growing travellers' mobility market, which is in need of barrier-free facilities. Under the direction of Ursula Fuss, a well-respected German architect who specialises in practical barrier-free concepts and uses a wheelchair herself, Samsung created an inspiring concept that challenges the current boring monotony of hotel architecture, in order to cater for ageing/wheelchair bound guests. Normally such public facilities use interrupted elements such as ramps, sloping pools, inclined planes and the like, to cater for the needs of this segment of travellers. Well done Samsung, a great initiative.



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# RIMLESS TOILETS – KNOW THE FACTS

WHEN IT COMES TO ACHIEVING PERFECTION, THE GERMANS LEAVE NOTHING UNTURNED. **JEFF PATCHELL** EXAMINES SOME OF THE LATEST RESEARCH UNDERTAKEN ON RIMLESS TOILETS AND EXPLAINS WHAT IT MEANS FOR THE ADOPTION OF THE TECHNOLOGY IN AUSTRALIA.

ISH is a remarkable event that often showcases interesting concept products that don't always make their way to commercialisation. Depending on buyer reaction at ISH, some ideas are simply scrapped or at best reworked for the next ISH.

If you refer to my report on the 2013 ISH (Plumbing Connection Winter edition 2013), one of the more interesting new product introductions I noted was the rimless toilet, which promised easier cleaning as well as some sleek new designs.

That was an idea that had instant appeal for hotels, hospitals and the residential market. Not to mention all of the housewives and cleaners who would love to throw away the Toilet Duck dispenser.

Toto claim to have been playing around with rimless toilet technology/design since 2002 and we'd believe that, as the Japanese consumer is pretty fussy about cleanliness.

At the 2013 ISH event there were a couple of rimless models from well-known European brands, so it was not surprising that virtually all major brands at this year's ISH had rimless models on their sanitary-ware cat-walk parade.

However, evidently there have been some questions raised on the performance of these new designs that is not as straight forward as it may seem. It isn't just a pretty design initiative.

The effect on bowl flushing performance [at different volumes of flush] and the control of over-spray are clearly critical issues, particularly if you happen to get them wrong.

Alert to the confusion in the plumbing market about these new products drove SBZ magazine [a German plumbing industry trade magazine similar to Plumbing Connection] to team up with Esslingen University of Applied Sciences, near Stuttgart, to create an independent test program which put the various brands through a series of rated tests, to confirm their functional and hygienic performance.

All in all, 32 models from 9 of the major brands were reviewed and SBZ hosted a major technical working stand at this year's ISH, demonstrating how the testing was implemented and the results achieved.

We don't have room here to re-publish the whole testing story in English and at best we've relied on the translation services of Mr



A laboratory-style working stand staffed with lab technicians explained the various Esslingen test procedures to interested ISH visitors.

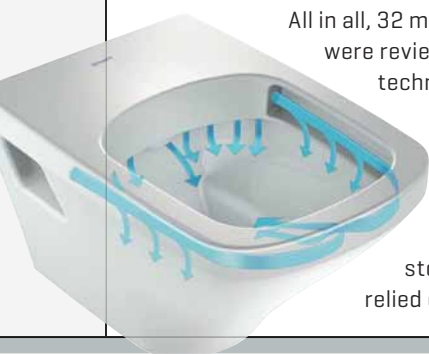
Google from German text to English [which also brings up some funny translations].

However, for those interested in more detail, go to our website at [www.plumbingconnection.com.au](http://www.plumbingconnection.com.au) where we have detailed the English translation and a direct link to the original story in SBZ, which features all the test pictures and performance charts.

Overall, from what I could determine, the testing program highlights the importance of good product Standards, particularly when it comes to new technology/design that is going to be picked up by a number of manufacturers in a market.

As per usual, there are far more factors to consider than what might first appear on the surface.

There is currently no DIN Standard written specifically for





rimless toilets [DIN is the name of European Standards – we call our local ones Australian Standards], though there is consideration of changes in Germany. The test work for this project was carried out in consideration of the nearest Standard DIN EN 997, even though the rules around this Standard were originally designed for toilets with a flushing rim. Thus the Esslingen Flushing Test was created and this extensive program featured 13 different test criteria.

As Central Europe is not so concerned about water conservation as Australia or North America, the testing was carried out using a 6 litre flush; however it is fair to expect that even more issues could arise with this technology at lower flush levels like 4.5/3 litre.

The flow rate from the cistern was a particular issue that had to be considered and to achieve the DIN EN 997 requirement it was choked back on all models to the allowable tolerances. This is where some of these product tests get interesting.

Overspray is the result of so-called impact force which is released during flushing and can ultimately end up on the floor. Rimless toilets are sensitive to this flushing impact force and as an installer you are unable to test it accurately

until the toilet is installed. Even then you will need an adjustable cistern that you can throttle back, if need be, or you will have some unhappy customers.

Washing down the pan is one thing; the DIN Standard also factors in the volume of trailing water to flush the faeces. According to the translation, around 1 litre is required for the rinsing and the ~5 litre trailing balance of water is used to remove the solids through the pelvic outlet [that's what the translation said] and into the drainage line and beyond. As indicated earlier, this testing program used 6 litre toilets, the Germans also manufacture 4.5/3 litre units, so the flush and trailing balance of water would be less for those products.

With the current drain-line carry issues in the Australasian market; this is an issue of consideration, particularly considering our flush levels are lower than those used in Europe.

The Esslingen test program for each product covered a number of interesting challenges: There's the surface flush with sawdust, rinse out of 50 plastic balls, toilet paper flushing [naturally], the spulrandtest with blue food colouring, the ausspultest with dumplings and paper. Oh, ➤



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Testing procedures were varied and many at Esslingen University. Tests included recording splash points of various brands and flushing all manner of test media.

and of course the smear with ketchup test. See, visiting ISH can be fun!

While rimless toilets look to be a natural design progression for sanitary ware suppliers, the technology required to actually make the product work perfectly is quite a challenge.

Some of these European models are slowly making their way into our local market but until the technology becomes widely available in Australia, the local market will likely treat the rimless technology with some caution, particularly with the questions raised in Europe when it comes to performance and the fact that we are using lower flush levels than what this testing program was based on.

Until then, the Toilet Duck can live in peace... ■



*This story has been compiled from story notes of 06.2015 edition of SBZ magazine. Our appreciation to SBZ magazine and its publisher Mr Erwin Fedelis Reisch, the CEO of Alfons W. Gentner Verlag – Germany, for allowing us to edit and re-publish this story*

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# UNDERSTANDING PUMP CURVES

## #6: MINIMUM FLOW – PART TWO

IN HIS LAST DISCUSSION, **RON ASTALL** LOOKED AT WHAT HAPPENS WHEN A PUMP IS OPERATED IN AN OFF DESIGN CONDITION, IN PARTICULAR, LOW FLOWS. HERE HE ELABORATES ON THE SUBJECT.

**T**o recap, Fig 1 is generalised but provides a convenient overview of the symptoms associated with low flow operation issues such as:

- Increased internal turbulence
- Recirculation
- Increased pressure fluctuations
- Increased vibration due to the above
- Increased axial thrust – depending on pump hydraulic balance method
- Increased radial thrust; particularly with single volute casings
- Temperature rise due to high internal energy loss

In this article we will look at the parameter “Suction Specific Speed” (NSS) and how it influences low flow stability in a centrifugal pump.

### FLOW REVERSAL AND VORTEXING AT LOW FLOW

Again, from our last discussion, Fig 2 shows a simplified representation of smooth flow at BEP versus the sort of flow disturbances that occur at reduced flow.

The degree of turbulence and associated vibration and buffeting depends on the hydraulic design and on the energy levels in the pump. The effects are generally worse for impellers with relatively large entry diameters. In larger higher energy pumps, vortexing (recirculation) can be so severe that cavitation like effects ensue.

“Suction Specific Speed” (NSS) is a design parameter that can be used to predict how susceptible a pump may be to recirculation and instability at low flows and also at high flows.

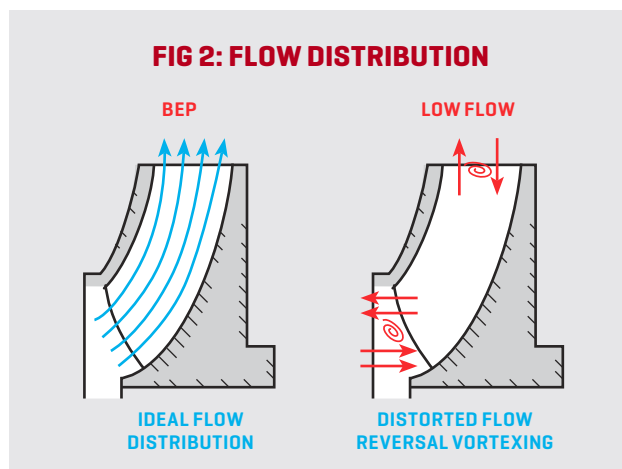
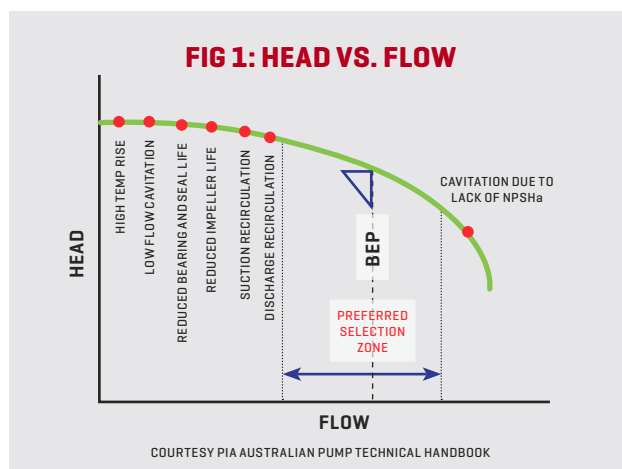
NSS gives an indication of the priority given to suction performance for a given impeller.

It is calculated as follows :

- Where N is the running speed in rpm, Q is the flow per impeller eye at best efficiency and using the NPSHR at best efficiency flow.

### PUMPS DESIGNED FOR VERY LOW NPSH

For a given flow, a higher value of NSS denotes improved suction performance [low NPSHR]. Fig 3 shows the typical variation between a low NSS impeller and a high NSS impeller. The high NSS impeller has a much larger eye diameter, which reduces velocities and thus entry losses for improved NPSHR.



### TRADE OFFS

Unfortunately, by virtue of this larger eye diameter, this type of impeller is much more prone to flow instability and recirculation when operating at flows away from best efficiency. Considerable research has shown that the range of stable operation is dramatically reduced at higher values of NSS. This is shown graphically in the hydraulic stability guidelines in Fig. 4 [US units].

The primary problem created is recirculation which can occur at the pump inlet and at the outlet of the impeller at partial flows and, less frequently, at high flows. ➤

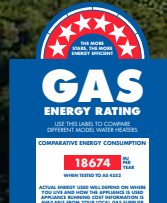


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This recirculation can produce high vibration levels, surging, axial shuttling of the shaft and mechanical damage to the impeller and casing. When severe at low flows, recirculation cavitation like damage will be evident on the pressure (non visible) side of the impeller eye vanes.

This should not be confused with classic cavitation damage due to inadequate NPSHA which will appear on the visible low pressure side of the impeller vanes. The noise from recirculation will be similar to cavitation noise but is more random in character. Typically, recirculation noise will reduce as the flow is increased, whilst classic cavitation noise will normally increase with higher flows. These problems will impact on other areas of the pump affecting the reliability of seals and bearings in particular.

**“ IT IS ALSO IMPORTANT TO REMEMBER THAT A WELL SELECTED PUMP WITH A HIGHER VALUE OF NSS WILL STILL BE A BETTER PROPOSITION THAN A PUMP WITH LOW NSS SELECTED NEAR MINIMUM FLOW. ”**

Research by J. L. Hallam, studying 480 pumps and 1881 failures over a five year period in the refining industry concluded that pumps with high values of NSS (above 12,800 in metric units or 11,000 in US units) had a failure rate approximately double that of lower NSS pumps.

This has resulted in many Oil Industry specifications applying arbitrary limits on NSS.

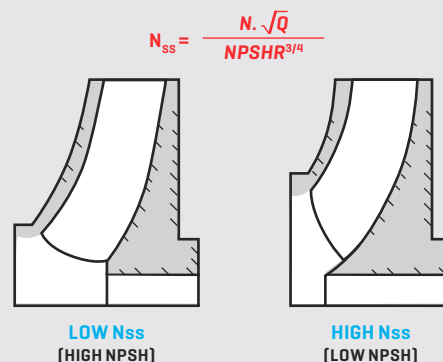
Overall, this is not a bad thing, but it is important to remember that it was a statistical survey and such an arbitrary approach may reject a few perfectly good pumps that have tested out as smooth units despite having a high NSS. It is also important to remember that a well selected pump with a higher value of NSS will still be a better proposition than a pump with low NSS selected near minimum flow.

The benefit of this knowledge is as a tool to predict the likely NSS requirement for the pumps at the system design stage. This gives the designer the option to raise vessels etc. if it looks like the original system NPSHA will result in the need for pumps with a narrow hydraulic stability range.

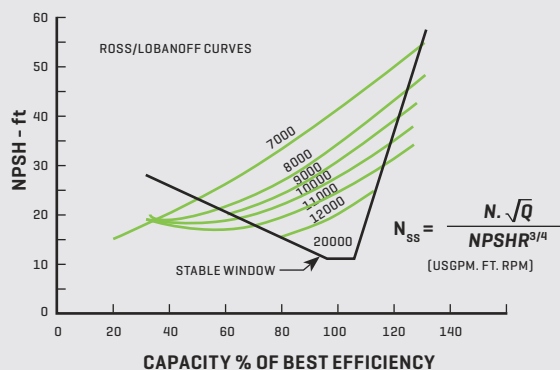
#### IMPACT ON MINIMUM FLOW

Most commercially available pumps now comply with the upper limit of NSS as a matter of routine, but there may be some pumps in the field with high numbers for this parameter due to suction constraints. Pumps with a High

**FIG 3: SUCTION SPECIFIC SPEED**



**FIG 4: STABLE OPERATING WINDOW VS SUCTION SPECIFIC SPEED**



value of NSS will probably be much more sensitive to low flow operation and additional care will be required, such as setting higher minimum flow values for these units. ■

*\*This article originally appeared in Pump Industry magazine. For a limited time, readers of Plumbing Connection can subscribe for free to Pump Industry magazine. Go to [www.pumpindustry.com.au/pc/](http://www.pumpindustry.com.au/pc/) now to take up this offer and get more information on pumps.*

Ron Astall is a Mechanical Engineer with extensive pump industry experience including Engineering, Contract Management, Applications, Sales, Marketing and Quality Assurance; particularly in the Process and Petrochemical Industries in his role at United Pumps Australia.

With his consultancy, Astech Pumping Services and through Strategic Achievement, he has also been an active provider of pump industry training. Ron is the current President of Pump Industry Australia [PIA] and Contracts Manager at United Pumps Australia. [www.strategicachievement.com.au](http://www.strategicachievement.com.au)



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# ARE YOU EXPERIENCED?

GOVERNMENTS, INSURERS AND LAWYERS ARE OFTEN LOOKING FOR CONSTRUCTION EXPERTS WHO CAN WEIGH IN WHERE THEY'RE NEEDED. **DARCY WILSON** EXPLAINS HOW TO PUT YOUR EXPERIENCE AND QUALIFICATIONS UP FOR CONSIDERATION FOR THESE KINDS OF JOBS.

If you've spent a good chunk of your life working (and learning) in construction or a related field, chances are that you've got a lot of runs on the board in terms of training, experience and qualifications – and a strong, natural understanding of all of the regulations, standards and practices that matter in that field.

If that is the case – even if you're humble enough to have never thought of yourself in those terms – you're possibly what most people would consider an 'expert'.

As it happens, there's a solid and constant demand for experts from construction and related fields – particularly for testimony and advice in insurance and legal matters. If you're able to establish your credentials as an expert, there are excellent prospects for well-paid consultation work.

## A MARKETPLACE FOR EXPERTS

Expert Experts is one service in particular that's on the lookout for professionals with a strong track record in their field.

According to Bruce Smith, CEO of Expert Experts and former barrister, the company "acts as a marketplace – or 'market maker' – to help people who are looking for experts to use in claims management or litigation, to find people with the appropriate expertise who are interested in doing expert witness work."

Experts for this kind of work can either provide occasional services on an ad-hoc basis, or – where the demand's there – as a dedicated expert witness.

"We have different relationships with different experts, so it depends what the person wants," Bruce explains.



Expert witness work can be very rewarding for experienced professionals.

"Some people don't want that much work. They're happy to do bits of work from time to time, but other people are interested in actively looking for the work.

"If we've got a good expert who we know can do the work easily, then we'll go to our contacts at the different insurers and law firms and actively promote them – but obviously that's something we don't do until we've worked with someone for a period of time, and we're confident they can deliver because our reputation's on the line," Bruce says.

## WHAT KINDS OF PEOPLE ARE IN DEMAND FOR EXPERT WITNESS WORK?

As you'd expect, legal and insurance cases require professional advice

from expert witnesses across a broad variety of specialisations.

"We work across a whole range of areas," Bruce continues. "We have civil engineers, mechanical engineers, we've got metallurgists, as well as building inspectors, surveyors, residential and commercial builders – depends on the market."

Expert Experts deals in hundreds of specialisations that are in demand across construction-related fields, including things like Australian Standards Compliance, electroplating, subsidence engineering, acoustics and heritage issues. Outside of construction, areas of expertise span from everything from Aboriginal art to vulcanology.

Bruce also explains that there's currently a demand for knowledgeable



registered building inspectors and surveyors in particular.

### BEYOND THE BASICS

Being a valuable expert for the purpose of providing expert testimony does involve more than just a depth of knowledge and experience. To be considered for expert testimonial work, you'll also need to be the kind of person that's up to that particular task as well.

"It's a very particular thing to have not only someone who's got the expertise, but who has a range of other written skills, oral skills and analytical skills," Bruce says.

"[They need] to be able to take their knowledge about what they do as a builder, and then to look at what's happened in a particular set of circumstances and apply a forensic approach, and also to do it in a way that would be acceptable to a court. That's where we help people.

"A confident demeanour also helps," Bruce explains.

"The reality is that most cases settle. People get expert opinions, they look at them, they discuss them - but every so often someone may have to go to court, so they need to be able to articulate their opinion. Someone who gets tongue-tied easily isn't going to be a good expert witness."

### HOW MUCH CAN I MAKE?

For most subject matter experts, this kind of expert testimonial work is commissioned on an ad-hoc basis, and is something they'll do from time to time - but there are some people who make the bulk of their income working as professional 'experts'.

As you'd expect, experts are paid very well for the advice they provide in legal and insurance matters. How much you'll make from expert witness work over the long term depends on several things though, including:

- how much of a demand there is for your specific blend of qualifications and experience

- how well-developed your written, oral and analytical skills are, and
- how effectively you've demonstrated your aptitude as an expert witness.

### AM I 'EXPERT' ENOUGH?

What makes someone an expert - for the purposes of legal or insurance work, at least - is an adequate blend of three particular attributes: training, study and experience. For most people in fields related to building, it's also expected that you'll be registered or licensed in your field of expertise too.

As you'd imagine, experience is non-negotiable.

"Usually the courts will prefer someone who's had a fair bit of time in the field. If you've only started practicing last year it's going to be very difficult to show the court that they should give your opinion a lot of weight," says Bruce.

In terms of required experience, you'll probably need at least ten years in your field by which stage "you should be pretty confident you know what you're talking about. Obviously a lot of the people who do it are people who've practiced for longer than that.

"We do get a lot of people who may have had an entire career and are winding down - [people who are] quite happy to provide the benefit of their experience to a court, and to insurers and others."

### HOW CAN I GET LISTED?

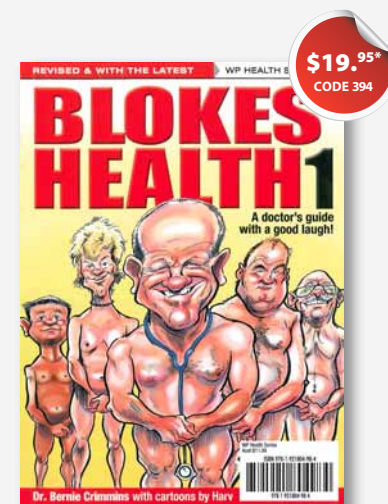
The first step is normally to send an email to Expert Experts - or to give them a call to discuss your prospects.

As you'd expect, there is a strict vetting process for prospective experts. Potential candidates are typically required to submit evidence of technical qualifications, samples of written work and some professional references - and will likely be interviewed if things progress from there. ■

### Contact

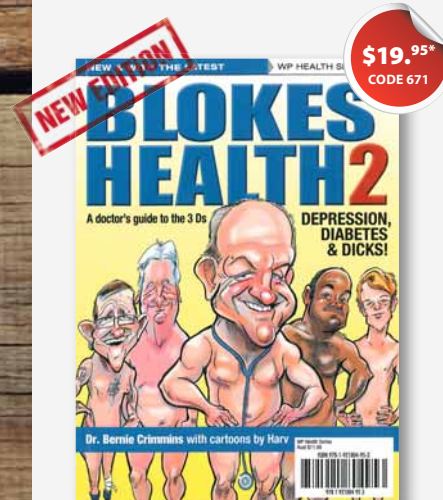
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# LET'S VENT A CONCERN

THE SAFETY AND EFFICIENCY OF GAS APPLIANCES ARE BEING COMPROMISED BY AN ANOMALY IN THE STANDARD. **ROBERT LAMBIE** SPELS IT OUT.

**T**he gas installation Standard for the safe and efficient operation of Type A appliances and equipment is AS/NZS 5601-2013.

This Standard, which applies in Australia and New Zealand, is in two documents that are sold separately or as a set.

Individuals or companies carrying out gas installation work need buy only the document relevant to their activities:

- Part 1 [General Installations]; or
- Part 2 [LP Gas Installations in Caravans and Boats for Non-propulsive Purposes].

The problem here is that some requirements relating to safety and efficient operation of a gas appliance appear to differ between the two documents.

One area of concern is the requirement for vents to provide air for complete combustion, appliance cooling and prevention of carbon monoxide build-up [CO].

## NATURAL VENTILATION

Until 2014, Victoria and NSW were using AS 5601-2004, as they did not adopt AS/NZS 5601-2010 when it was introduced due to a number of concerns with it.

AS/NZS 5601-2010 [and now 2013] have introduced new requirements in sizing ventilation openings.

However, aspects have remained from AS 5601-2004 and prior editions.

The ventilation provided is to be free flowing – not as determined by the overall size of the vent itself that would include louvres. There must be unrestricted ventilation openings as sized by the example calculations in Part 1 and provided by the vent openings described in the Standard: “The minimum dimension of any free ventilation opening shall be 6mm to minimise linting.”

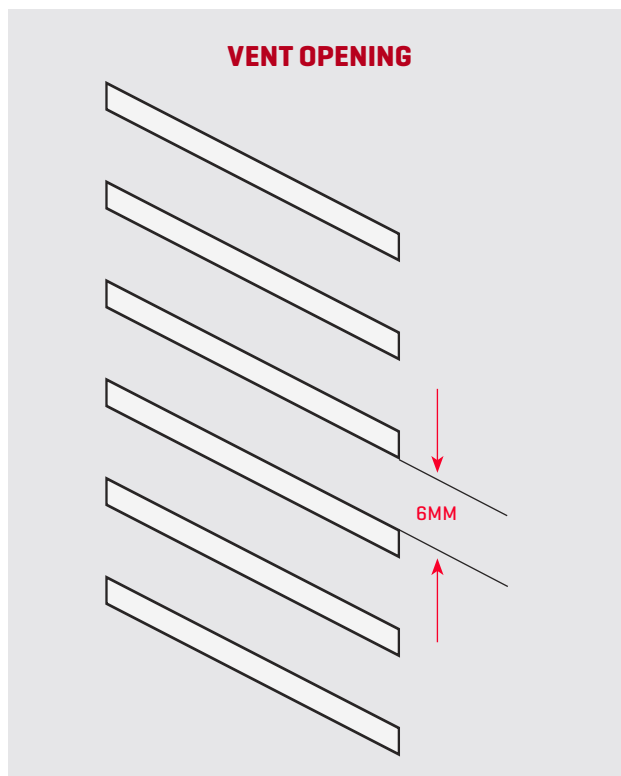
Vents should have a minimum 6mm opening to prevent linting, and when sizing the vent it must equal the free space as provided by the 6mm openings, not the overall vent size.

Part 2 of the Standard relating to LP gas installations in caravans and boats is different in one area, yet ventilation in normal circumstances is classed as natural gas installation.

As required in Part 1, the ventilation required in a caravan or boat must have free, unrestricted ventilation openings as sized by the example calculation detailed in Part 2.

What is not detailed in Part 2 Clause 7.3.1 in relation to ventilation is the requirement of the free ventilation openings to be a minimum of 6mm to resisting linting.

From my memory of working with past editions of the Standard, no reference was ever made to having 6mm free



**Vents to have a minimum 6mm opening to prevent linting and when sizing the vent it is to equal the free space as provided by the 6mm openings not the overall vent size.**

and unrestricted ventilation openings in caravans or boats. At times, this caused quite a bit of conjecture.

Without the minimum 6mm openings in the vent, there is potential for linting and restricting the free flow of air necessary for safety and efficiency, thereby compromising the Standard.

For reasons only members of the committee that compiled AS/NZS 5601 2010-2013 can explain, the example calculation for Clause 7.3.1 comes out of left field in relation to what has been a safety requirement for decades – free air flow for ventilation openings.

The example calculation is quite bizarre in that it states: “The use of louvres and/or mesh screens will reduce the free area of an opening.”

Then quite innocuously the last sentence reads “where mesh is used, the area should be doubled”.





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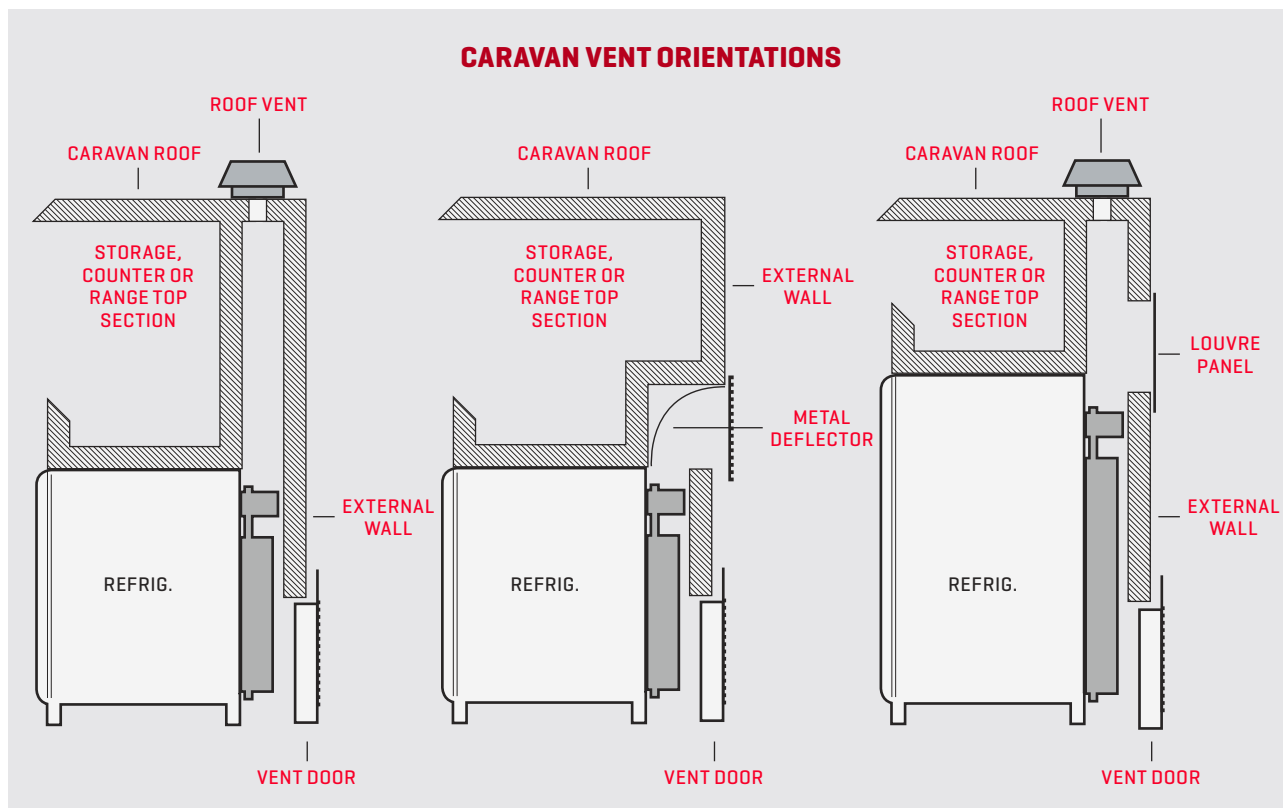


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In all three examples above both vents are to atmosphere and the top vent was always higher than the condenser/absorption fins of the refrigerator for maximum efficiency of operation as it is now shown and required in AS/NZS 5601.

One can only assume that this refers to using mesh over a ventilation opening, and that by doubling the size of the vent area it should be suitable.

‘Should be’ says it all. Has the AS/NZS 5601 committee just made assumptions that this will work as efficiently as an opening of the right size, as determined in Clause 7.3.1, with no mesh fitted?

Has this being tested in practice or is it theory?

The build-up of dust and dirt on a vent fitted with fly wire is even, and there is no minimum mesh size in the Standard.

Who will be responsible should an incident occur with mesh over a ventilation opening? This is not a requirement of Clause 7.3.1 in Part 2, rather a few throw-away lines in an example calculation. Will the committee accept any responsibility or will it all fall on the plumber/gasfitter who fits the mesh?

Fitting mesh over a vent is not a new concept. When I worked for the Victorian Gas & Fuel Corporation the idea was looked at, but it was soon realised that linting takes place at the same rate over the whole mesh – regardless of mesh area.

Wall vents with fly wire over them were common in dwellings years ago. They became blocked with dust and dirt and in many cases were painted over.

This recent idea of having mesh over a vent has come about only since AS/NZS 5601-2010 was written. Coincidentally, that was when the Standard became a combined Australian and New Zealand document and New Zealand regulators became involved in writing it.

Australia is a much drier land, so why are Australian authorities prepared to roll the dice when it comes to protecting the public.

#### CLARIFICATION

Clause 7.3 of Part 2, Ventilation Openings – Caravans and Boats, is a general description of what is required and the example calculation allows for mesh to be placed over ventilation openings as detailed in Clause 7.3.1.

So, is mesh to be placed over ventilation openings that may serve a refrigerator, space heater or ducted heater when all of these are to be installed in sealed compartments?

The proposal to fix a label next to vents, warning that they must be kept open and clean to provide air flow when gas appliances are in use, is no more than cosmetic.

Given the minimum type height of 4mm, one would have to kneel on a caravan floor or stretch up to read labels next to vents that are to be no more than 150mm from the floor or ceiling.



Similar calisthenics would be required when inspecting vents to ensure they are clean would physically tax some owners and operators.

Even if a caravan has a vented range hood/extractor no lower than 400mm from the ceiling, a floor vent is still required to provide free flowing air throughout the caravan or any compartments that can be temporarily isolated by a door or curtain.

Caravans could be subjected to days or weeks of travel in Australian conditions, and fixed-mesh vents would become clogged and ineffective.

The reason given for fitting mesh over a vent is to keep out insects like mosquitoes that may be harmful to humans. Yet caravan enthusiasts like to sit outside and enjoy a camp fire or the star-filled sky – just where insects can get to them.

Natural ventilation in a residence, caravan or a boat relies on free flowing air through a minimum of two vents, preferably one upper and the other lower as described in the Standard.

Should one of these vents become even partly blocked, then the natural ventilation required for the safety and efficiency of gas appliances will cease or at least be diminished. ➤



The build up of dust and dirt on the vent with fly wire is even. There is no minimum mesh size in the standard.

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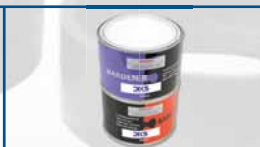
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The fitting of mesh as prescribed in the example calculation compromises all other clauses on ventilation in both parts of the Standard. It also compromises what has been a safety requirement for decades – a clear 6mm opening.

### **GAS REFRIGERATORS**

The requirements for installing a gas refrigerator has changed rather dramatically since the inception of AS/NZS 5601-2010 and 2013.

Not everyone will realise that what is required now in AS/NZS 5601-2010 and 2013 Part 2 was in fact the normal, safe and most efficient installation of a refrigerator in a caravan or boat.

In all three examples shown, both vents were to atmosphere and the top vent was always higher than the condenser/absorption fins of the refrigerator for maximum efficiency, as it is now shown and required in AS/NZS 5601-2013.

This type of installation was not obligatory for some years, and caravan design changed. The upper vent of the refrigerator compartment was lowered and was not higher than the condenser/absorption fins depicted above (and as now required) but very close to the same height. So the free flow of air from outside was limited.

To prevent overheating of the refrigerator, ventilation in some cases was introduced via bench tops over the refrigerator compartment, or in side panels of these supposedly sealed spaces.

There were reports of such ventilation openings allowing combustion products (potentially including CO) into the caravan or boat. Whether a gas refrigerator is small, medium or large the burner usually consumes 2Mj/hr.

In one incident where flue products from a refrigerator were spilling into an area, the CO reading was 11,000ppm, a highly dangerous situation.

In some cases manufacturers of gas refrigerators have recommended servicing twice yearly due to dust and dirt build-up on the burner.

What action is required of a plumber/gasfitter who comes across a caravan or boat refrigerator with a vent in the bench above the compartment or in a side panel?

With the amount of information now available on the dangers of CO, the technical regulators and educational centres such as TAFE colleges need to provide plumbers/gasfitters with some direction – even if it means disconnecting the gas supply for safety.

### **SIGNIFICANT ANOMALY**

The splitting of AS/NZS 5601-2013 into two parts has resulted in Part 2 not having an Appendix R as does Part 1.

Both parts include an appendix that refers to “Guidelines for gas appliance commissioning”, and both appendices are very similar in wording.



In some cases, to prevent overheating, ventilation was introduced via bench tops over the refrigerator.

However, a caravan can have more than one gas appliance – oven, hotplate, space heater and even ducted heater – and Appendix I of Part 2 does not call for all appliances to be operating when a pressure check is being conducted.

Appendix R requires that all flued gas appliances (open flue, power flue or balanced flue) to be operating at the same time as all extraction fans are on.

A caravan or similar is basically a house on wheels and, as indicated in Part 2 of the Standard's Clause 7.4.2, it can include a stove range-hood extractor. Let's not forget that some caravans can also have exhaust fans in toilets and/or bathroom areas, let alone cooling systems with fans.

It seems that none of these additional appliances were taken into consideration when compiling Part 2. One has to wonder if testing has been done with all fans and appliances operating, and with ventilation openings restricted by mesh.

We can think about what this means for plumber/gasfitters who sign off an installation to the requirements of AS/NZS 5601-2013 Part 2, and an incident occurs.

They would be plagued by self-recrimination for the rest of their lives ... and how much support would they get? ■

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# HOT WATER INSTALLATION CHECKS

**JON PALFREY** LISTS THREE POINTS OF RELEVANCE WHEN CONSIDERING THE INSTALLATION REQUIREMENTS OF THE NEXT WATER HEATING SYSTEM YOU SELECT AND INSTALL.

## POINT 1

The current water heating market is blessed with numerous choices and solutions available for the consumer's hot water needs and expectations.

The end result of water heating system options all relate to heat exchange in one way or another. For example, heat exchange through a primary flue baffle of a mains pressure gas storage system or the same process through a continuous flow gas model.

Listed are significant water temperatures via the Rheem Hot Water Manual that relate to the delivery of heated water and the variations that need to be considered when recommending a water heating solution for your next job.

## POINT 2: PRESSURE LIMITING/REDUCTION

Where water supply pressures exceed the maximum indicated allowances, a means of reducing line pressure is an essential part of the correct installation of a gas, solar or electric water heating system.

This may be achieved by means of either a pressure limiting valve or a pressure reduction valve.

Whichever valve is used, it should be placed on the cold water supply to the whole house in order to maintain equal cold and hot water pressures. This requirement is also necessary for the adequate performance of most tempering valves and thermostatic mixing valves.

In such cases, however, a larger valve is needed than when connected only to the water heater cold supply connection.

A description of the two types of valves is as follows...

### LIMITING VALVE

The pressure limiting valve remains open until the upstream pressure approaches the valve pressure setting. With inlet pressures above this, the valve acts as a reducing valve to keep the outlet pressure around this level.

Pressure limiting valves are made in a range of sizes, the most common being 15mm, 20mm and 25mm.

For continuous flow water heaters, it is recommended to use an RMC PSL type pressure limiting valve, as this model valve does not display non-return characteristics typical in PS type valves.

### INSTALLATION OF LIMITING VALVES

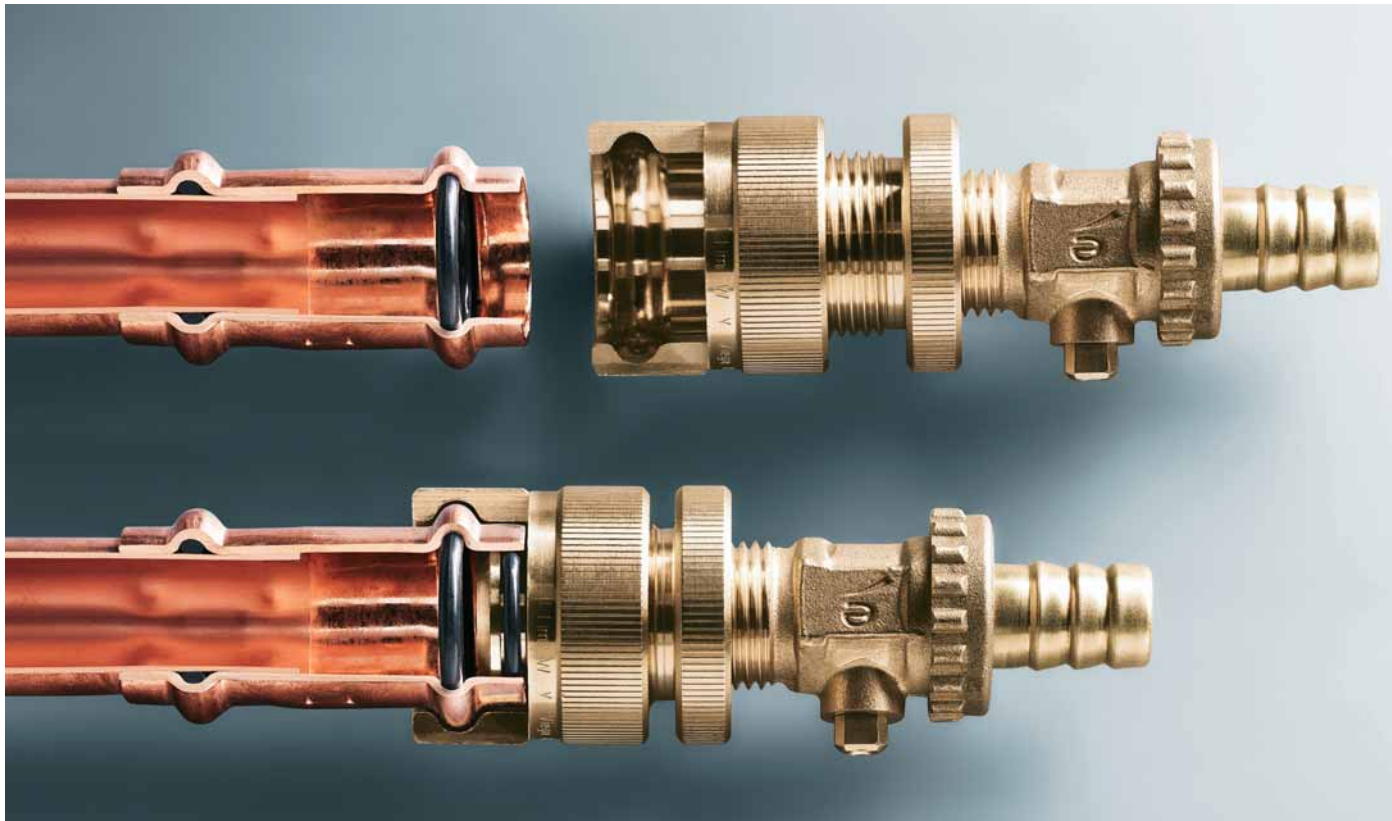
The following needs to be applied:

- Where approved by local water supply authorities, the pressure limiting valve may be placed on the cold water ➤

**TABLE 17.11: SIGNIFICANT WATER TEMPERATURES**

Temperature	Event
0°C	Freezing point of water at sea-level
4°C	Temperature below which water reduces its density [weight]
8°C	Approximate minimum ambient water temperature in Australia [Melbourne - winter, used in sizing water heaters for Victoria]
13°C	1. Approximate average water temperature in Melbourne 2. Approximate minimum water temperature in Sydney
20°C - 45°C	Temperature range in which Legionella bacteria flourish
24°C	Approximate maximum ambient water temperature in Australia
38°C - 40.5°C	Bathing temperature for children and infants
40°C - 43°C	Bathing temperature for adults
50°C	Maximum supply temperature to bathrooms and Ensuites for new installations in Australia
55°C and above	Temperature range in which Legionella bacteria cannot survive
55°C - 60°C	Washing up temperature
60°C	Thermostat setting for booster elements in Rheem Solar, Heat Pump and Dual Element water heaters
60°C	Normal setting for domestic gas water heaters
65°C	Maximum setting for Rheem domestic gas thermostats
70°C	Maximum setting for Rheemglas electric thermostats
75°C	1. Factory setting for Rheem Heavy Duty electric water heater thermostats 2. Maximum setting for Optima electric thermostats
77°C	Temperature required in the sink for sanitising purposes
82°C	Maximum thermostat setting for thermostats in Rheem Heavy Duty water heaters
82°C - 92°C	Temperature at which the energy cut-off device will operate on fixed setting thermostats
87°C - 90°C	High limit thermostat setting on Rheem 621,631265 and 621,631275 water heaters
87°C - 95°C	Temperature at which the energy cut-off device will operate on adjustable thermostats
93°C - 95°C	Temperature at which a TPR valve subjected to normal working pressure will start to discharge
98.5°C	Nominal thermostat setting for Rheem Lazer boiling water units
100°C	Boiling point of water at sea-level





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Viega test plugs: When it comes to carrying out a pressure test in unfinished installations, a partial installation can be sealed off using the pressure test plug. In addition, it also allows a partial installation to be put into operation for a limited period of time.

### Pressure test plugs

Quick leakage checks made easy: the pressure test plugs from Viega help to check sections of pipe-work effortlessly – and being reusable, they are a highly effective and cost efficient solution. The alternative would be to use permanent end caps which would be cut out and thrown away after testing. That's both time consuming and expensive. The bronze test plugs from Viega can be reused thousands of times. They come in a range of dimensions from DN15 to DN50 and have a pressure rating of 1600 kPa max. They also have an integrated valve for bleeding lines. The test plugs can be used with all Viega Propress fittings. They are designed to be inserted into an un-pressed Propress fitting end for pressure testing and can then be removed after testing, leaving the Propress end usable for a final press connection.

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supply to the whole house and thus maintain balanced cold and hot water pressures.

- To provide adequate flow capacity, a 20mm or 25mm valve should be used.
- Where not approved for cold water supply, the limiting valve is connected to the inlet line to the water heater between the stopcock and the water heater. It can be placed before or after the non-return valve.
- The valve should be accessible for service.

#### **REDUCTION VALVE (WATER PRESSURE REDUCING VALVE)**

This type of valve may be used as a substitute for a pressure limiting valve where the line pressure exceeds the maximum recommended line pressure for which the water heater is designed to correctly operate.

However, pressure limiting valves are preferred because of their greater flow rate provision in proportion to the valve size.

Reduction valves are usually spring loaded diaphragm valves of conventional design and are intended to control the downstream pressure to a predetermined level no matter what upstream pressure is experienced.

In practice, there is usually some variation in static downstream pressure as upstream pressure increases, and there is always a drop in downstream pressure as flow increases.

#### **INSTALLATION OF REDUCTION VALVES**

The following needs to be noted:

- Where approved by the local water authorities and where the flow capacities are large enough, the reduction valve may be placed on the cold water supply to the whole household and thus maintain equal cold and hot water pressures. A larger valve is needed in this instance.
- Provision of unions on either side of the reduction valve will allow for easier servicing.
- When connected to the water heater only, the reduction valve should be connected between the stopcock and the water heater after the non-return valve.

#### **POINT 3: HOT WATER PLUMBING**

Correct sizing, design and installation of the hot water plumbing leads to improved system performance. For full details of the correct procedures to be used, refer to AS/NZS 3500.4. The following highlights important points to be considered.

#### **PIPE SIZING**

Rheem water heaters for domestic use are manufactured with RP $\frac{3}{4}$ /20 inlet and outlet water supply connections. The commercial range provides RP1 $\frac{1}{4}$ /32 or RP2/50 outlet connections.

It is up to the hydraulic consultant or the installing

plumber involved in the project to determine what size pipe should be used for the hot water plumbing to provide sufficient flow at the draw off points when the normal draw off pattern is applied.

Factors affecting this decision are the number of branch joints, number of draw off points, length of runs and the type and usage of the hot water fixture outlets for example the kitchen sink.

AS/NZS 3500.4 recommends for domestic dwellings the hot water pipe should start at DN18 [18mm diameter]. As this size is not always available, therefore the plumber may need to decide between DN20 [20mm] and DN15 [15mm] according to the installation.

The determined size should be used to at least the first branch, after which the size may be reduced.

Pipe lengths longer than necessary or diameters larger than necessary increase running costs by retaining excessive amounts of hot water at the end of each draw off. This water eventually cools and the heat and subsequent dead water is wasted.

#### **EXAMPLE**

A 3m length of DN20 [20mm diameter] copper pipe that could have been adequately sized for flow rate at DN15 [15 mm diameter] wastes an additional 0.4L of hot water each time hot water flows through and then is left to cool.

If this length of pipe was the first length of the hot water plumbing, the pipe could fill with hot water and cool approximately 20 times each day leading to a hot water wastage of 2920L per annum. ■

*\*Source - Rheem Hot Water Manual*

*Jon Palfrey is Rheem Australia's Training Manager. He conducts training to plumbers and specifiers across the southern states, covering the latest water heater technology and key water heating issues facing plumbers.*

#### **DID YOU KNOW?**

Rheem is currently manufacturing a range of electric mains pressure storage systems with a stainless steel cylinder construction which allows for easier handling and transportation of the system due to no sacrificial anodes being needed for galvanic action. This allows for the system to be transported horizontally.

As a mains pressure storage cylinder material, Stainless Steel provides a significant reduction in weight and the option of a cylinder type that meets the customers' water heating delivery needs and expectations.

Rheem can provide the stainless steel solution option when next recommending and installing a water heating system that's manufactured here in Australia.

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# THE EBB AND FLOW OF RESEARCH

RESEARCH IS CRITICAL IN ANY INDUSTRY, AND PLUMBING IS NO EXCEPTION. JUSTIN FELIX CATCHES UP WITH ASFLOW CHAIRMAN STEVE CUMMINS TO FIND OUT WHAT THE RESEARCH TEAM HAS BEEN UP TO AND WHAT PROJECTS ARE TABLED FOR THE FUTURE.

**T**he name ASFlow is one you might remember from a story we ran a number of years ago – circa 2009 – when the National Plumbing Regulators Forum (NPRF) for Australia and New Zealand formed the Australasian Scientific Review of Reduction of Flows on Plumbing and Drainage Systems (ASFlow) committee to conduct research into the effects reduced flows were having on drainage systems.

The NPRF ASFlow project committee conducted a number of laboratory and field tests which identified the potential for fitting and drainline blockages from struvite (magnesium ammonium phosphate or urine).

The trials demonstrated that added flows to main pipes servicing waterless urinals will prevent rapid build-up of struvite, but highlighted the need for ongoing maintenance of the urinal's outlet pipe at regular intervals to control the build-up of struvite.

The team has been relatively quiet since; however, as can often be the case with industry groups or bodies, the wheels have been turning in the background. So long as the fire in the belly remains, results will come and goals will be met. Such is the mantra of ASFlow, a not-for-profit research committee whose work intends to benefit the industry as a whole.

As mentioned above, the ASFlow project was formerly endorsed by the NPRF. This relationship has since discontinued and ASFlow has moved away from their former linkages.

"ASFlow made some progress in the area of waterless urinals. As a result, other projects have risen to the surface. They aren't large scale projects at this stage but they're still important nonetheless," Dr Steve Cummins, ASFlow Chairman says.

"We continued doing the work in the background and regularly met as a group to discuss future projects. It was agreed by all members to keep the research group going."

Speaking of which, all members are volunteers and experts in their respective fields. The team is comprised of members around the country as well as one from New Zealand. While still on the path it originally set out, it is looking to broaden the scope.

"We're looking for other partners to assist in any number of ways. It has been difficult to get financial support and assistance in what is an important field – research that aims to make plumbing better in this country. It would appear as though water boards, government and others are just not that interested or supportive of research. No one has been willing to provide pro bono support either.

## ASFLOW STEERING COMMITTEE

### Dr Steve Cummins (Chairman)

Research and Development Manager at GWA Bathrooms and Kitchens, Member of Standards Australia Technical Committees

### Stephen Movley (Secretary)

Secretary of the Institute of Plumbing Australia, IPA Representative and Member of Standards Australia Technical Committees

### Les Barnard (Retired)

Previously Government Policy Advisor; Senior Technical Officer with Sydney Water

### Donald Boynton

Hydraulic Services Consultant, MEP Service Group Manager at GHD currently working in Qatar

### Dr Heri Bustamante

Principal Scientist Treatment at Sydney Water

### Jeff Clark

Operations Manager Plumbing Technical Regulator, South Australia, Member of Standards Australia Technical Committees

### Mark Frazer

Manager Plumbing and Gas Inspectorate, ACT Government

### Peter Hadfield

Senior Technical Officer Plumbers and Drainers Licensing Board Northern Territory

### Stuart Henry

Principal Consultant at Aqua Global Consultants, Secretariat World Plumbing Council and Secretariat PPIG

### Bruce Klein

Team Leader Compliance Solutions, Building System Controls Ministry of Business, Innovation and Employment New Zealand

### Jeff Patchell

Managing Director of Connection Magazines, leading publisher of technical publications including Plumbing Connection.

### Mike Read

Senior Technical Officer with the Western Australian Plumbing Regulator, Member of Standards Australia Technical Committees.

### Matt Wilson

Senior Technical Advisor Victorian Building Authority

### David Wood

Director Liquid Hydraulics Pty Ltd, AHSCA Representative and Member of Standards Australia Technical Committees.

### Colin Fox

Public Health Engineer, England UK.



ASFlow members all agree that the more expert opinion it can bring together, the better it will be for the industry as a whole.

"At the end of the day it's a contribution to the industry. We are here to make plumbing better in Australia via research. Our work is for the good of the entire industry, not just one individual or company. This is reflected in the projects we take on. No one has had to change their product as a result of our work; we have simply identified more effective connections of fittings."

Its work has had impacts on the Plumbing Code here in Australia and gain international recognition too.

"The work we did on waterless urinals was taken up on the Green Plumbing Code in the United States. Plumbing Efficiency Research Coalition (PERC), based in the US, has also been really supportive of what we are doing.

"There is interest from European researchers too so opportunity exists to broaden our horizons there. That is exciting because we will be able to draw on expert opinion from knowledge leaders over there," Steve says.

## FUTURE PROJECTS

With a number of projects and ideas on the horizon, ASFlow have chosen to focus their attention on a project which will see them work closely with Tonsley Park TAFE in South Australia.

It is currently in the process of setting up some drainage at the TAFE with two objectives in mind:

1. To resolve multiple branches using drainage principles on the uppermost floors can discharge to a stack without any detrimental effects [siphoning fixtures].
2. To verify if the existing restriction area for offsets in stacks can be reduced from 2.5m to 500mm for a maximum of 3 floors above the offset.

Research will include laboratory tests in accordance with AS/NZS 3500.2 Clause 9.12.3 in particular "branches serving the uppermost floor only where connected to a discharge stack". We will keep you up to date with this research project as more progress is made down the track.

"Another issue we plan to look at in the future is toilet paper and other flushed items with a particular focus on their effects and influences on various waste systems," Steve says.

As part of its re-emergence, ASFlow has found an 'administrative home' in the Institute of Plumbing Australia (IPA) which they identified as a good fit due its independence, supportiveness of research and reputation in the industry.

To accompany its new home and fresh new outlook, ASFlow has developed a new logo for you to keep your eye out for; in conjunction with the important research findings they will no doubt discover and share with the industry. ■

## PLUMBING CONNECTION



### EQFY Resolutions

The promise of a new financial year is the best time of year to come up with resolutions, especially for small to medium sized enterprises. "Way too many SMEs are in set and forget mode when it comes to cash flow management," says David Henderson chief executive of accountancy group ROCG Asia Pacific and founder [...]

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### Avoiding Mistakes & Oversights

Brad Fallon knows all too well that oversights, unexpected discoveries and rookie mistakes can be made on any given day while on the job site. He provides some advice to ensure they occur less frequently, or better yet, not at all. Over the last 24 years, I've dealt with or heard about many plumbing situations [...]

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#### Axor Starck V: Classic Glass Cuts Grace

Hansgrohe's revolutionary washbasin mixer Axor Starck V is now also available with a classic touch. From September on, the design brand of the mixer and shower specialist Hansgrohe SE will offer two new versions of the glass spout – diamond and bevel cut. Alternatively, the removable spout will also be available in porcelain. The assortment [...]

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# 8 WAYS TO GET MEDIA COVERAGE

THERE'S NO SUCH THING AS BAD PUBLICITY (OR SO THEY SAY). EVEN IF THAT'S NOT THE CASE, SOME POSITIVE PRESS CAN MAKE A HUGE DIFFERENCE TO YOUR BUSINESS. **CECELIA HADDAD** EXPLAINS HOW TO GET NOTICED.

**Y**ou want to promote your business. You want to highlight your latest project. Journalists want a good story. Newspapers have to sell, radios have to rate. Journalists want to get their stories quickly and simply. So how does it all fuse cohesively to result in a win-win for both parties?

Media coverage highlighting your latest venture, promoting a new project or announcing business changes is an ideal channel to get a valuable message to your target audience - and while the processes to attract media coverage aren't rocket science, there are certain elements that require skill, patience and research.

## 01 WHAT'S YOUR MESSAGE?

Be clear about what it is you want to say. Work out your top three key messages. If you were only given 30 seconds, what would you say about your business or latest project? Would you highlight a recent award for a design? Feature your company as the first company to use a new plumbing product to the market?

Stand back and take a look at your business and its latest projects. Pick the new; the unique, interesting facts that you know your friends and suppliers are interested in and practise writing or talking about these key points before approaching media.

## 02 WHO ARE YOU TALKING TO?

Where are your current customers and your potential customers? What are they reading, listening to or watching? Find the media that will reach this audience



An eye-catching photo to accompany the story is critical. If you need, hire a photographer for a day. A smart phone photo won't be print worthy.

and, at the same time, highlight your messages effectively.

## 03 KNOW THE MEDIA

How do you determine the type of media that's best suited to your story? Print media is the ideal medium if you want to provide an extended message to your audience. It provides the canvas for a story to build momentum, as well as the opportunity to showcase several images and designs. Radio is great for

short stories and talk back if you have something interesting that works well as a discussion point, not just a one way message.

Research the media before you pick up that phone or type that email and make a pitch. Get familiar with the media outlet you're aiming for. It may seem like all magazines on the stand in the newsagency all start to blend together. Take a closer look. Architectural magazines for instance, showcase different details, styles and



themes, style of images, using case studies to blend into a general feeling about the impact of the magazine. They have their own personality and of course, their own particular audience. Study and work out which publication best suits your business.

Newspapers are all about news, current, topical and pertinent. The key ingredient to a news story for newspapers is determining what is relevant to the readers. Consider how your story affects the local community. Look at the front pages and the types of stories they carry inside.

Head to the supplements – the pull out sections of major newspapers, in particular the home or real estate sections. Many newspapers feature an architecturally significant or especially sustainable home each week, highlighting its different or unique features and covering the process from the initial brief, through to the design, draw and build.

The story might also cover various people including the plumber, the builder or designer and the owner. Interviewing these parties can make for a fascinating read.

## 04 A GREAT PHOTO WILL STOP TRAFFIC

An eye-catching photo to accompany the story is critical. Whether it's an image of the person being quoted in the article or a situation that relates to the story, a picture of the completed project, an award winning design, a professional photo or a series of photos to give the reader the sense of the design or project, this is non-negotiable.

Consider engaging a professional photographer to capture the house or building at different times of the day to ensure the light highlights the workmanship.

## 05 WHAT'S YOUR ANGLE?

If you ever read your local paper you'll notice it highlights what the local school,

church, hospital and shopping centres are doing – all relevant to people in the local area. Connect with your local paper and highlight your local projects or case studies. Provide newsworthy and interesting details and of course, a great photo.

## 06 TIMING IS EVERYTHING

Is your company teaming up with a local charity organisation? Have you mentored some young students as apprentices who are graduating as the next generation of trades? Is the company changing its core

“  
**CONSIDER ENGAGING A PROFESSIONAL PHOTOGRAPHER TO CAPTURE THE HOUSE OR BUILDING AT DIFFERENT TIMES OF THE DAY TO ENSURE THE LIGHT HIGHLIGHTS THE WORKMANSHIP.**  
”

business – and will that affect the local community? Think outside the box about the different pieces of news in your company that are new, fresh or exciting.

Major stories make news – that might include partnering with a well-known building material supplier on a special project, winning a national building award or creating a home completely run on solar.

## 07 HUMAN INTEREST

Human interest stories, personal or professional, bring a face to your business. Has your business helped a client during a difficult time? Do you have staff

members or contractors who've reached milestones in their career – for example, built their 1000th home? Do you have a solid link with a local organisation you help professionally due to a personal interest?

It can be a pleasant distraction in the fast paced life we all lead to highlight the stories that have meaning in this sense.

## 08 DOES IT PASS THE “SO WHAT” TEST?

Do you have a home or project you've designed or built that everyone is talking about? Got photos on your phone that you're proud to show your mates or a project that holds their attention and leaves them wanting to know more? This is the story worth talking about that the media will love.

Gather up the architect, the designer, the builder the contractors and owner and paint the whole project to the media from start to finish, highlighted with stunning images.

To ensure ongoing media coverage and to make it easier each time you have a story you want to 'pitch', keep a constant eye on your target publications.

Take notice of the types of projects they highlight and the information they publish, and touch base with the specific journalist who normally does this work. Building a relationship with them will ultimately be mutually beneficial to both parties.

And a final piece of advice: If at first you don't succeed... try again. One knock back isn't the end of the world, and it doesn't always mean your story's not worthy (sometime's it's just a matter of timing).

Learn from it and try again. ■

*Cecelia Haddad is the director of Marketing Elements, which specialises in public relations for the building and environmental sectors.*



**JERRY TYRELL** HAS RECENTLY INTRODUCED 'THE RULES PROJECT' THAT, IN CONJUNCTION WITH CONNECTION MAGAZINES, IS BEING PREPARED IN PART AS A VALID ALTERNATIVE TO THE SOMETIMES HARD TO DETERMINE AUSTRALIAN STANDARDS. JERRY IS CONFIDENT THAT IT'S ONLY A MATTER OF TIME BEFORE THIS CLEAR AND CONCISE OPTION WILL BECOME THE DEFAULT METHOD FOR EVERYONE TO ACCESS BUILDING KNOWLEDGE IN AUSTRALIA.

**F**or those that don't know, I'm a critic of unillustrated wordiness. But even I was unprepared for what I found when I started looking at all the literature about access into our buildings. If a ramp is access for all, and a stair is access for most, then I reckon the tangle of different Standards and sections of Building Acts is as accessible as a vertical wall sprayed with oil.

Wait for it... there is NO requirement for accessibility in Volume 2 of the National Construction Code (NCC) – the one that deals with Class 1 buildings (houses). The Premises Code is an exercise in distraction, using fanfare and repackaging – it simply restates that we should make our buildings accessible to all.

The NCC Vol. 1, table D3.1 makes a pretty good fist of explaining what it all means – but it leaves out standalone houses, which are our bread and butter jobs. I think everyone

should be able to use our buildings – access should be a basic human right. Even before I had two sets of twins, had to wheel around my 5 year old son with cancer or had to watch my grandmother shuffle around with a broken hip I avoided steps by using set downs or ramps, and planning floor finishes really carefully. Prior to landscaping, I'd also spend time with a machine finely shaping the site to achieve flowing paths and surfaces... without unnecessary stairs.

Even if you don't empathise much, you plumbers can make a major difference. Access is an investment by everyone to give benefits to future users of our buildings. It shows our love of children, older relatives and friends and those who, through no fault of their own, can't 'jump puddles' or other little obstacles. Ironically, this also means our buildings are usable to more people, and are cheaper to own because they don't require expensive modification for things that ➤

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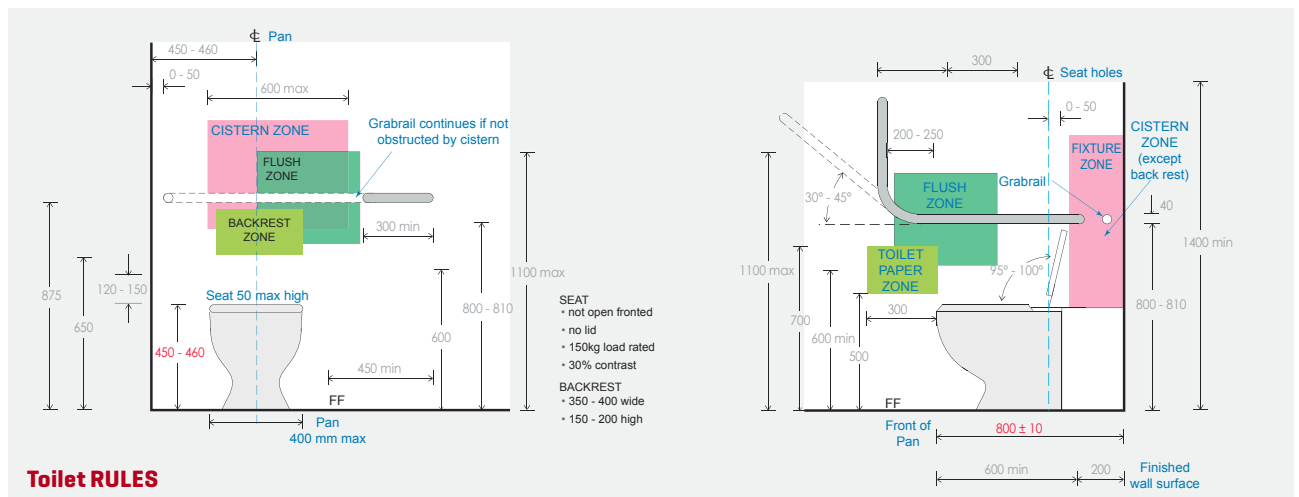
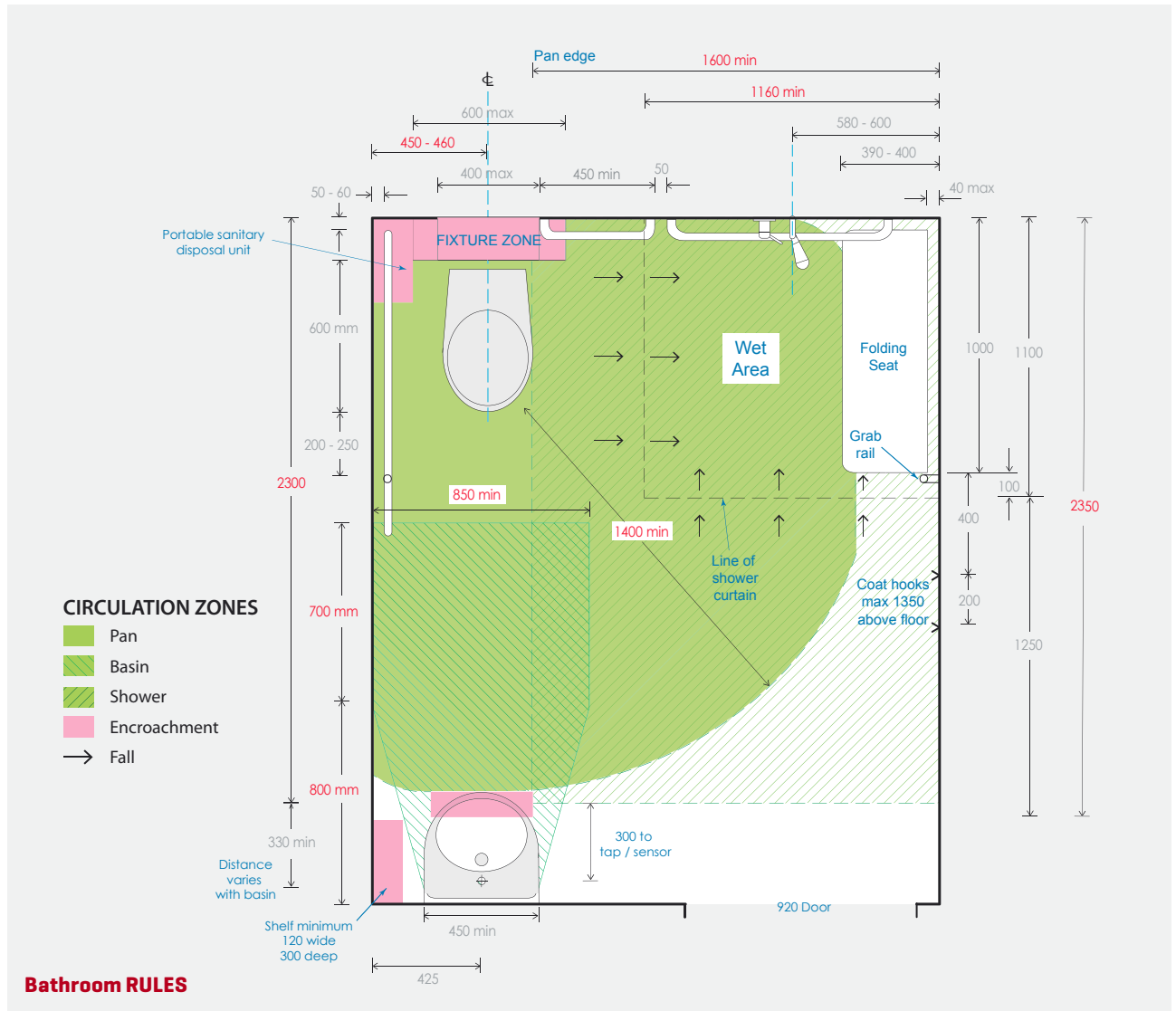


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\*Tested in accordance with Australian Standard AS4552-2005.

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should always be done when a house is first built.

In Part 1 of the Access Rules we came to realise that there are bleeding obvious rules in place to get us to the front door of any building. Society is slowly realising that the term 'access' is not just about moving around. Access encompasses finding, seeing, feeling, hearing, reaching and holding things as well. If you don't think making your buildings accessible is important, grab a walking frame, sit in a wheelchair, put dark glasses on and try to edge onto your toilet seat from a chair without using your legs.

So now that you're inside the building and want to use specific areas and rooms. AS 1428.1 is generally helpful about the dimensions around some furniture, appliances and fittings. Trouble is, the essential information is only partly contained inside its 112 confusing pages. You have to look to AS 1428.2 and AS 4299 to find the missing bits. Sick of ASses? So am I, because around Christmas time I spent around 10 hours reading everything in detail.

I realised how difficult it was to use AS 1428.1, AS 1428.2 and AS 4299 because:

- All 3 should be combined into the one Standard
- Diagrams are duplicated, amateurish, not to scale or adjacent to text
- Information is inconsistent, and
- Tolerances are unreasonable.

## THE SOURCE DOCOS

280 pages which should **be reduced to 12** and be contained in a single NCC.

NCC [National Construction Code] Volume 1 [22 pages]

NCC [National Construction Code] Volume 2 [NONE]

Premises Standard [51 pages]

AS 1428.1 – 2009 - Design for access and mobility [112 pages]

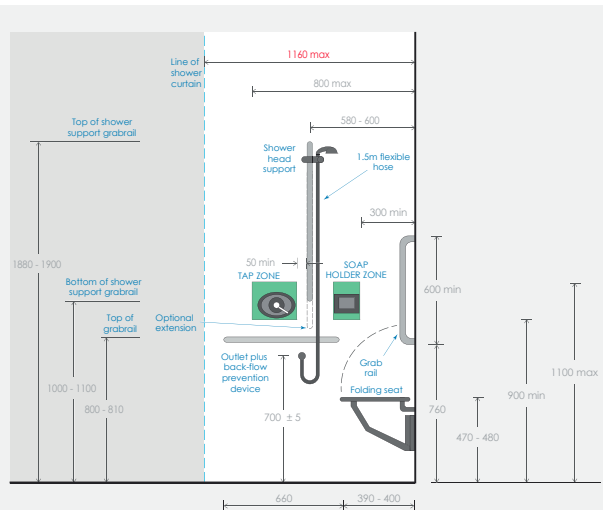
AS 1428.2 – 1992 - Design for access and mobility. Part 2: Enhanced and additional requirements – Buildings and facilities [52 pages]

AS 4299 – 1995 - Adaptable housing [43 pages]

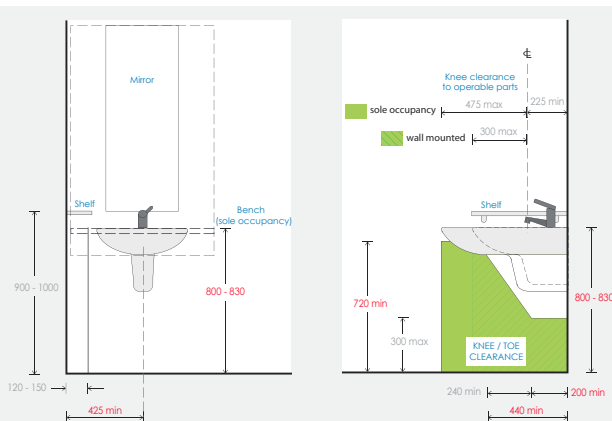
## DEFINITIONS

All Access RULES are developed from good science.

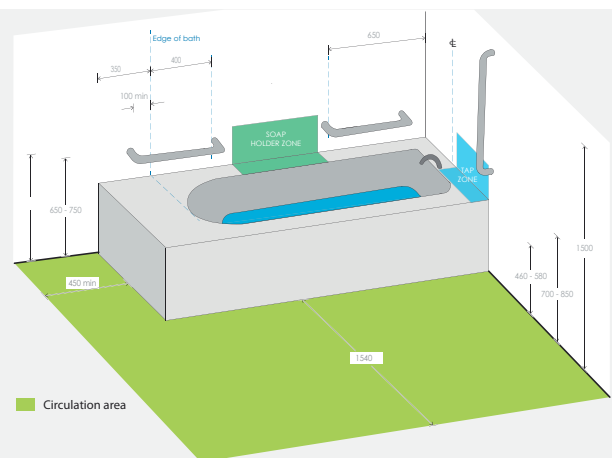
- **Anthropometrics** is the study of human measurements and movement.
- **Ergonomics** is the science of optimising human well-being and performance using design and anthropometric data.
- **Equity** is the principle that every person should be treated fairly.
- **Unkind** are those contractors who do not achieve access to all aspects of their work.



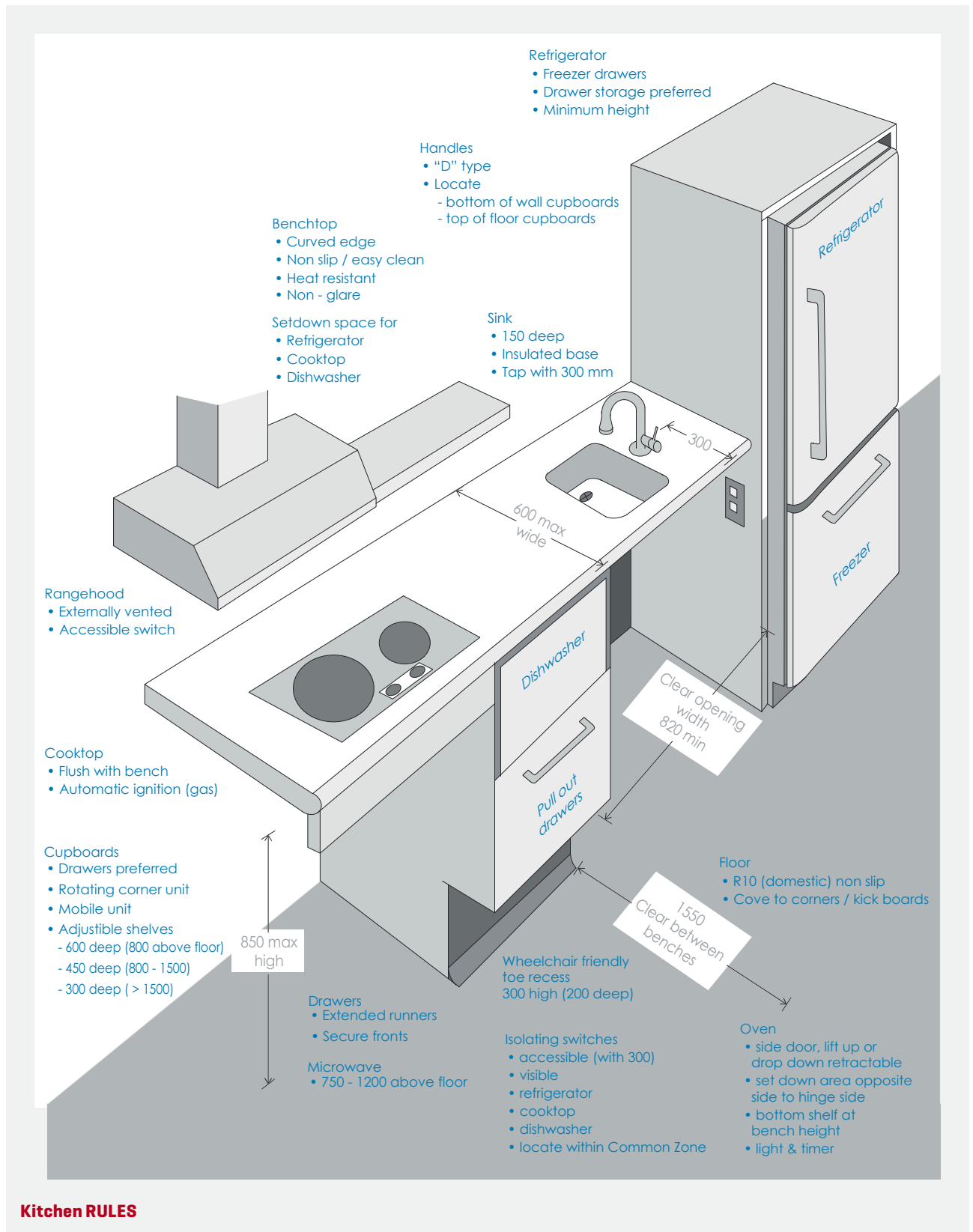
**Shower RULES**



**Basin RULES**



**Bath RULES**





### WHAT PLUMBERS CAN DO

- Use taps / mixers with indestructible lever handles [n.b. - avoid using lever handles with sharp ends on shower walls].
- Encourage manufacturers to ensure that people with vision impairments can recognise hot taps.
- Ensure that water at fixtures does not exceed 50°C.
- Install taps within 300mm of bench edges where possible.
- Install showers with a hand-held hose option.
- Locate shower and bath taps on the access side [i.e. so user doesn't need to reach under the shower rose or across the bath].
- Use 150mm deep sinks with insulated bases.
- Use flexible connections to all sinks and basins which may require lowering in future to meet the access needs of the building's occupants.
- Use P traps - again, so fixtures can be more easily lowered.
- Set pan out a minimum of 450mm from the finished surfaces of side walls.
- Use ceramic or Hydroseal-type washers.
- Install gas hotplates with auto ignition and easily reached controls.



### THE RULES

I have divided my illustrations into Bathroom and Kitchen RULES. I hope you and your staff make good use of them.

Access should not be an afterthought - something that you grudgingly do or fix if you have to. Or course, it's uneconomical to widen an existing front door in a Victorian terrace home to 920mm wide. However, with your future buildings, every door should be 920mm wide - it doesn't cost much to provide access for the lifetime of every building occupant. Ensuring proper access is like DPCs in masonry, termite resistant timber, and stainless steel fixings - cheaper in the long run and better for every user and owner. ■

*Jerry is founder of the Institute of Building Consultants and co-founder of Tyrrells Property Inspections. He has more than 43 years' experience as a labourer, tradesman, contractor, architect, mediator, building consultant and author. Jerry welcomes reader feedback, thoughts and experiences. He can be contacted at [jwtyrrell@tyrrells.com](mailto:jwtyrrell@tyrrells.com).*



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# A COMPACT PUMP-UP SOLUTION

SANIFLO HAS DEVELOPED A COMPACT TOILET SOLUTION THAT IS NOT ONLY AESTHETICALLY APPEALING AND EASY TO INSTALL BUT COST EFFECTIVE TOO. **JUSTIN FELIX** REPORTS.

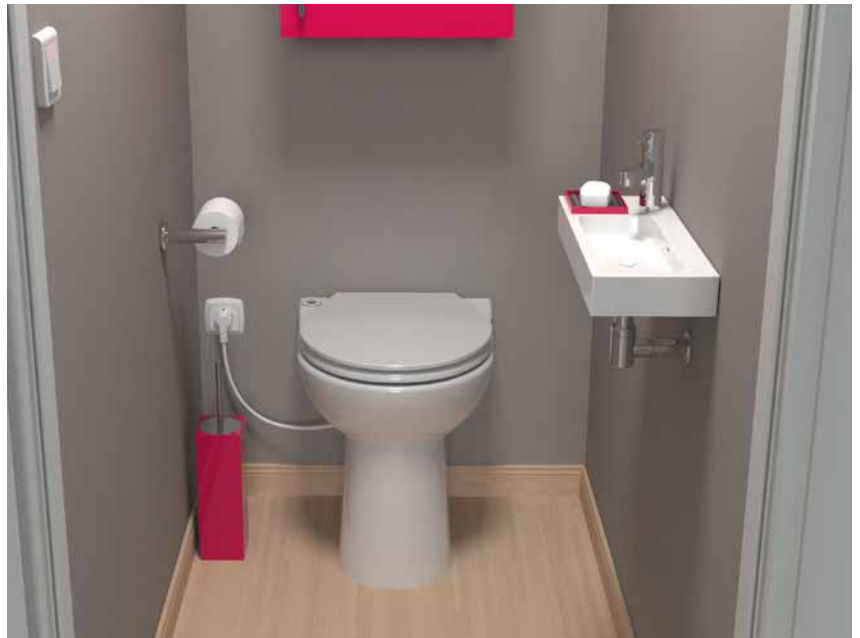
It's fairly easy to take the humble old toilet for granted. When purchasing properties, it isn't something potential buyers consider a make or break deal. So long as it does what it's supposed to do and does so without being a total eyesore, it stands a good chance of surviving the renovation process. It does become a talking point when another bathroom is required though, or similarly, when it's decided that an underutilised space would be better suited to housing a toilet and wash basin. Large cupboards and old laundry spaces are good examples. Toilets also become a talking point when considering amenity options for granny flats or man caves located in the backyard.

So when your customer calls you in for a quote and to discuss the various options for installing their new toilet before gasping for air once you inform them of the process required and costs involved, there is another option.

The Sanicompact C43 from Saniflo is a self contained system that removes the need to dig trenches or cut concrete when relocating sewer pipes to install a toilet. The unobtrusive system does this by pumping the waste water out through a small 25mm discharge pipe which can be concealed behind walls or under the floor.

"The system is ideal for various domestic situations, particularly in tight spaces where a regular toilet simply wouldn't fit," David Rundle of Saniflo says.

"The Sanicompact C43 is also a popular option when an extra toilet facility is required for someone who is physically impaired in on the granny flat or spare room. With an aging population we envisage more and more people will need to look at installing



The Sanicompact C43s flushing, macerating and pumping processes takes around 10-15 seconds from start to finish.

toilets within close proximity to bedrooms.

"The beauty of the system being installed in granny flats is that it can be pumped back to the main sewer connection of the house."

Toilets with in-built macerators have been commonly associated with loud noises when flushing. Saniflo have ensured this wasn't the case with the Sanicompact C43 which boasts a quiet flush of 60db compared to average

cistern flushes of 70db.

It has the ability to pump 3m vertically or 30m horizontally and is provided as a dual flush with either a 1.8L or 3.8L flush available, which according to Saniflo can save the average household some 13,000L of water per year. This is sure to pique the interest of prospective clients looking to renovate or add to the house while still being conscious of their hip pocket.

"A lot of money can be saved by clients both in the long run and during the initial purchase and installation. The system retails around the \$1500 mark with only the plumbers labour on top of that. The alternative method would involve the cutting of concrete, pipework, the toilet suite itself and the plumbers labour. It's an expensive exercise."

So long as a water supply and electrical outlet is located nearby the desired location, it's a fairly straightforward install for plumbers.

"The Sanicompact is mounted to the floor using the provided mounting hardware before plumbers connect the mains water to the back of the pump's discharge pipe which goes up vertically and connects to existing sewer pipes. It's a lot easier than putting 100mm pipes through the wall and having to

dig trenches," David explains.

It also accepts waste water from a wash basin that can be installed nearby to create a half bathroom. The Sanicompact C43's motor automatically activates when water enters from the basin.

The Sanicompact C43 does not use a cistern, instead, a button activates the flush which opens the solenoid valve and releases water from the mains connection into the bowl. The increased water level then activates the macerating and pumping actions which discharge the waste. The whole process takes 10-15 seconds [5 secs solenoid valve/5 secs macerating/pumping] and the timer programs the refill of the bowl with fresh water.

Next, waste water is sent through a 25mm discharge pipe which is concealed behind the wall or under the

floor and then connected back to the existing sewer pipes.

With a growing desire to keep things minimal when it comes to design, the Sanicompact C43 is a big winner with clients looking to streamline their homes.

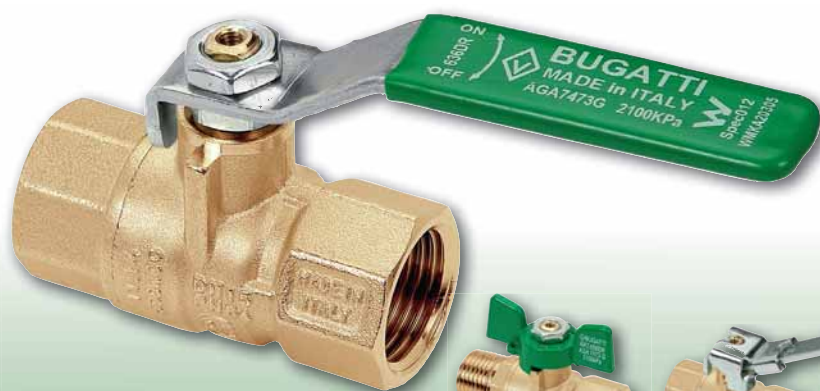
"Aesthetically speaking, a lot of people don't like the look of a big bulky pump behind the toilet," David says.

And it truly lives up to its name with all dimensions – height, width and depth – coming in below 500mm.

Next time your client is looking for a bathroom solution that involves minimal structural work, consider the Sanicompact C43. You'll both end up winning. ■

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# SOLAR CONTROLLERS

**MATHEW BRIGGS** TAKES AN IN-DEPTH LOOK AT A COUPLE OF SOLAR HOT WATER CONTROLLERS THAT ARE COMMONLY USED IN SOLAR HOT WATER AFTERMARKET REPAIRS.

**T**here is a wide range of solar hot water controllers that can be found when you go looking for them and choosing the best one for the job is easy if you know your products. Read the controller's manual, plug it in and learn how to use it before you go to the job. Understand the controller's basic functions and read the controller's specifications. These are really important factors to consider before the installation process begins.

The two controllers that seem to be most commonly found and used in solar hot water aftermarket repairs are the RESOL and Senztek brands.

RESOL DeltaSol BS/4 has become popular with some manufactures over the last few years and can be purchased at most major plumbing suppliers. The RESOL is German designed and boasts a large number of extra features and settings. One of the stand outs on these controllers is the high quality grey Silicone sensor cable with high temp roof sensor. It also has a replaceable fuse which is ideal for areas that suffer from power surges. The controllers also feature a digital display on which you are able to observe roof and tank temperature differentials. This is perfect for solar repairs.

Included in their offering is the standard Arr1 controller layout, but two more mode settings exist.

The Arr2 setting enables the function of the second relay in this unit. This can be used for element boost via an auxiliary relay and controlled by the third sensor. Arr2 mode can also be used to control a gas booster or basic



The Senztek controller has become popular with plumbers for solar hot water aftermarket repairs.

hydronic heating. Other functions include adjustable pump speeds and holiday mode. The list goes on. There is also a VBus terminal which allows for extras like the SD3 smart display, dataloggers, alarm modules and USB connections to be added.

One thing you really need to take into consideration with this product is its IP rating of IP20. The rating makes it perfect for inside but if you're installing it externally by itself, meaning not in a pump station of some description, then you need to make sure it has suitable protection. This is commonly missed. RESOL do

make an IP54 moisture proof vented enclosure for THEIRcontroller but it does not come standard with the BS/4 off the shelf. It is one of the many exceptional products from the RESOL range and if you get the chance check out [www.resol.com](http://www.resol.com) to see what else they have to offer.

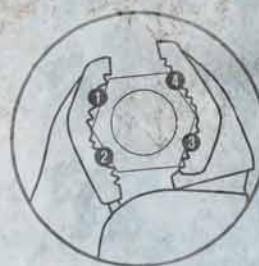
Senztek controllers have been around for a fair length of time and have proven to be an easy to use pre-programmed controller. Walk in, plug and play and then walk away best describes the controller.

They have the basic functions needed for solar hot water repairs ➤





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## SOLAR HOT WATER SYSTEM REVIVAL

For this edition we have put together a solar hot water revival on an old Saxon split solar hot water system, also known as the SP4002 split water heater.

I was unable to tell how long it was since this system had actually worked so the owner had the plumber install a pump station designed for this model and it was very successful. To make this work he has had an electrician install an external power point for the new pump station. At the same time the electrician has disconnected the original controller and pump from the circuit used to power the element.

The Viking pump has been replaced with the upgraded option, the Grundfos 15 65 B, a flow meter and non return valve has been installed. Both sensors have been replaced with the new controller; the tank inlet immersion sleeve has also been replaced. While replacing the roof sensor the air admittance valve was replaced with an AEHT-10. Once everything was installed the time consuming part was to bleed the air from the collector and tank again. This may need to be done a few times.

You will most commonly find these systems in large housing estates. The system was not your typical open loop solar hot water system that some plumbers mistake it for. It is basically a low-pressure closed loop system, which means it needs a slightly different pump to your normal closed loop system. They originally used an imported cheaper Viking pump and towards the end of manufacture this was replaced by the Grundfos 15 65B. The Grundfos 15 65 B can still be bought for this model it is a less expensive option of the Grundfos 20 60N but both pumps work fine. The controller is commonly a PCB board in the side of the tank, but there are some variations of this system when it comes to how the system was set up. Sensors can still be bought for these systems. Some variations of this system have the element and controller powered off the same circuit. Because of this set up most people do not know the solar part of their system has not worked for years!



**LEFT:** Incorrect sensor installations are common as seen here where it was wedged between the flow pipe and insulation. **RIGHT:** A Senztek s3 replacement sensor.



including digital display and adjustable temperature differentials (for most models). They also quote to have an IP rating of IP54. These controllers were made to suit the manufactures' requirements when produced and you may come across several branded versions of this controller that work the same. Replacement boards are still available.

Older model roof sensors had the white Teflon coating for higher temperature rating. This has changed. The new roof sensor cable still has the Teflon but it is encased by a black silicon cable. The problem is that they now look similar to the tank sensor which means people occasionally think they can use the tank sensor on the roof because it works out cheaper. Don't though. They have different sensor ratings.

### TANK SENSOR

Tank sensor positioning on some of the older models is really worth looking at when you go out to repair a system. Check where they have been installed. They could be anywhere. A couple of examples include taped to a pipe or pushed between the flow pipe and the pipe insulation. Some of the older and bigger 315L to 400L tanks had an inlet Tee's with the tank sensor and solar flow all in one. Some of these sensor ports only went into the tank as little as 50 mm. The tank sensor needs to be positioned differently so it is more

accurate and the system becomes a little more efficient.

Sensor ports can be extended but sometimes you are best to try to move the sensor up the tank a couple hundred millimeters' depending on the system and the return line positioning. This takes the tank sensor away from the cold water inlet and solar return line. It can create a more accurate reading which can help the pump and internals of the tank to last longer.

The S3 sensor by Senztek is probably one of the more handy options you may come across but it depends on the system you're working on. It only works with the Senztek controller but it can be retrofitted into the outer casing of the tank in any position.

One thing to check before using a product like this is the effect it may have on the warranty of the tank. It is then important to explain the findings to the customer before installation. These types of sensor are more commonly used in some of the original evacuated tube type systems but can also be used with split systems with flat panels. ■

*Mathew Briggs is a commercial plumber and director of [www.solarhotwaterparts.com.au](http://www.solarhotwaterparts.com.au) - specialising in solar hot water replacement parts for all systems.*

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# PLUMBING GOES TO BOLLYWOOD

INDIA'S ECONOMY WILL OUTPACE CHINA'S THIS YEAR AND COULD ONE DAY BE THE WORLD'S LARGEST, SO MAYBE WE SHOULD BE TAKING MORE THAN A PASSING INTEREST IN WHAT'S HAPPENING ON THE SUB-CONTINENT FROM A PLUMBING SECTOR POINT OF VIEW. **JEFF PATCHELL** RECENTLY VISITED NEW DELHI ON HIS WAY HOME FROM THE ISH TRADE FAIR IN FRANKFURT.

**F**or many visitors, India is a confronting destination with its huge [1.3 billion] population and in-your-face poverty, mixed with a rapidly growing middle class that is embracing all the luxuries of the west.

In reality most Australians know little about Indian culture and history but too quickly share populist views about Indian-based call centres and Melbourne's Indian- student taxi drivers, while taking a liking for a serve of Rogan Josh, rice and pappadums at their local suburban Indian take-away.

India has a fledging plumbing industry that has taken great strides over the past decade, but it still has a long way to go to resemble what we think is the norm.

Having attended a number of World Plumbing Council meetings over the years, I have had the pleasure to meet some enthusiastic Indian representatives, some of who hold positions on the WPC executive board, in fact the current chairman Mr Sudhakaran Nair, is a plumbing engineer who hails from Bengaluru.

Another regular attendee at those meetings has been a man who commands attention. The first time I met Rajendra Somany I quickly surmised he was the face of the new emerging India, a classic industrialist with a can-do attitude and a great listener who was keen to take back ideas from the more developed countries.

As the head and major shareholder



Artisan finishing of ceramic goods is a skilled and highly prized job in India.

of the large publicly listed HSIL [they market their goods under the Hindware label], India's largest manufacturer of sanitary ware and bathroom fittings, it was extraordinary to see this man sharing his time at such not-for-profits events. These days you are hard pressed to get a mid-level plumbing sector executive out of their office bunkers in Sydney, Melbourne or Brisbane to attend virtually any industry event. R K Somany is different though and so is India's need at this time in its history.

Some say that the Indian economy is at or about the point where China was 10-15 years ago. I'd suggest its middle class is already ahead of that and its manufacturing sector is more mature in some ways.

India has a number of distinct trading advantages such as English being spoken more broadly, a fundamental legal system thanks to the British, a comparatively large semi-skilled workforce and elite universities producing some of the most skilled engineers on the planet.



India today lacks infrastructure and has serious internal transport issues. Just getting its trading goods from the likes of Delhi to a port is relatively difficult and there are no internal shipping canals like the Chinese have had for hundreds of years. The new Government of Narendra Modi is acutely aware of the infrastructure issue though and as part of its new mantra 'Make in India', is setting out to do something about it; against incredible odds.

The ride forward isn't going to be easy but it certainly will be exciting for India and the rest of the world, as India's growing economy aims to outstrip China.

At the invitation of Rajendra Somany I took up the opportunity to view first hand Hindware's major manufacturing facilities as well as talk to him about the rapidly developing plumbing sector.

Hindware first came about 55 years ago when the Somany family collaborated with Twyford's of the UK to introduce vitreous china sanitary ware production to India.

I visited the Bahadurgarh sanitary ware plant, a decent drive into the suburbs from the centre of Delhi. Set on some 50 acres of land, this plant



**LEFT: L to R:** Mr. R P Srivastava - Vice President, Quality Assurance; Jeff Patchell - Publisher Connection Magazines; Mr. T K Raha-Senior General Manager, Research and Development; Mr. R B Kabra- President, Building Product Division. **RIGHT:** Jeff Patchell with Rajendra Somany, chairman and managing director of HSIL.

has been in operation for more than 50 years and produces close to two million pieces of sanitary ware a year. By its very nature, china production involves a lot of manual finishing and while there is plenty of labour on hand, it obviously relies on good training and supervision.

A job at a factory like this is a privileged position. The quality of product produced is excellent with quality checking at every stage of process. Virtually all production is sold locally but the Indian consumer is fussy about quality and also desires

the latest designs coming out of Europe. One of the great benefits the plant offers is the ability to produce small-runs of a product and move quickly onto the next order. They have a massive amount of range options at hand.

The 50 acres is not all plant and it is shared with peacocks that roam the gardens as well as housing for staff (around 60 managers and families) that live onsite. There also worship facilities too, as well as a medical centre (the doctor is available all six days of the week) and a ➤

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school. Coming from the Australian environment of OHS madness, the conditions in the factory can be confronting but the company is gradually improving the life of the worker. Changing the worker culture to readily accept wearing safety gear is as much the issue as anything. The Indian Cricket team may have to wear fluorescent safety vests before you'll see them popular in this part of the world.

India is a low-cost producer and with an average worker salary in this Hindware plant of ~\$2,500 a year, there is no rush to automate tasks that are better handled with a skilled potters care and understanding. However, with the size of production runs growing, the company will in the future consider more modern casting facilities and robotics. The challenge for business in these older parts of the city is the erratic power supply which can go offline 8-10 times a day. Thus, triple backup of generators is necessary.

My hosts, the plant CEO and managers were most hospitable on the day and very proud of their company and its achievements.

The next day I took a similar ride into the suburbs in another direction to visit the Hindware tapware facility at Bhiwadi. Hindware has been making taps for many years but are looking to significantly grow the business towards 10 million units in coming years. This was a new green-field site in a commercial zone that has improved infrastructure – gas, electricity and water, though there is still some-way to go with roads. The tapware plant is only partly built out at this stage. Current production is running on one floor but there are plans to expand to three other floors as the market grows.

Well aware that it needs modern environmental practices, the new India is building such plants to ensure it maintains a healthy position with global competitors.

The management team was highly educated and use modern western



**TOP:** Hand polishing is labour intensive, no matter where in the world tapware is manufactured. **LEFT:** In the foundry, molten brass is ladled out and poured into ingots. **RIGHT:** L to R: Mr. Rakesh Yadav-Assistant Manager, Industrial Engineering; Jeff Patchell; Mr. Ajay Jain- Vice President, Administration; Mr. Narendra Kumar Gautam-Deputy Manager, Quality Assurance.

techniques to continuously improve quality and output. Though a western visitor might think the factory looks only partly finished, the culture of India is to get in and start producing as that will create employment. There's no need to wait for the niceties. Because of the access to relatively low-cost labour, the one thing you do notice is the lack of materials handling equipment. There are plenty of available arms and hands and

there's no danger of a fork lift running employees down from behind!

In talking later with Rajendra Somany, I got the idea that Indian business was confidently moving forward under their business-centric Prime Minister Modi's agenda.

Hindware has plans afoot to take its brand to global customers, including this region. Some Hindware product was sold in Australia a number of years back under an import arrangement,

which has fallen by the wayside.

In talking to Rajendra about his plant facilities, I learned that public companies in India have to put aside 2% of their net profit after tax for Corporate Social Responsibility (CSR) activities. In Hindware's case, they use this to support their onsite schools program, medical support services and prayer temples for employees. There is a strong bond between employees and management and you get the idea that a job at Hindware is a prized possession.

In his early years Rajendra learnt to do most of the jobs in the kiln and pottery casting area of the TYWFORDS UK factory, so as to appreciate the various processes. He learnt a saying that supervision is your profit – but to supervise you need to fully understand the tasks.

HSIL is a vertically integrated business and over the years the company has developed the skills to make its own clay mixes, plaster-of-Paris, setting/compounds processes and various other materials and skills that go into china making. As there were few retail hardware outlets at the time, Hindware launched its own bathroom showrooms out of which the majority of product is sold, though new sales channels are developing.

I mentioned that India lacked the usual structures that we are used to, that is no more evident than in the fact there are no Indian trained and certified plumbers but that is about to change.

It is estimated there are around 800,000 employed in the construction sector [33 million workers in total] that do 'plumbing work' – but more than

90% have no professional training. Thus, a number of like-minded people like Rajendra are now running the Indian Plumbing Skills Council, of which he is the chairman.

The aim is to train up 1.2 million plumbers by 2022 as well as have 12,000 trainers on hand to keep the industry rolling. That's some challenge but with someone like Chairman Somany heading the organisation, you can be confident of them reaching their goals. There might even be an opportunity for Australian training organisations to export some of their expertise in this area – watch this space.

For me that was the end of a couple of eye-popping days.

India is gradually gaining its lost dynamism; and the rest of the world needs to stand back and take note. ■



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# INDIA'S TOILET REVOLUTION

AT THIS MOMENT, GOVERNMENT INSPECTORS ARE COMBING THE INDIAN COUNTRYSIDE. THEIR QUARRY BEING THE MANY TOILET-LESS HOMES STILL FOUND DOTTING THE SUBCONTINENT. THIS ARTICLE ORIGINALLY APPEARED ON GLOBALPOST.

India's Prime Minister Narendra Modi has introduced the initiative as part of the Clean India Campaign and has pledged that every Indian home will have a toilet by 2019.

Unfortunately, ingrained habits, customs and corruption continue to stifle these efforts.

"We have had a huge problem in the past with what we call 'ghost toilets'," said Sandhya Singh, an official at the Ministry of Drinking Water and Sanitation.

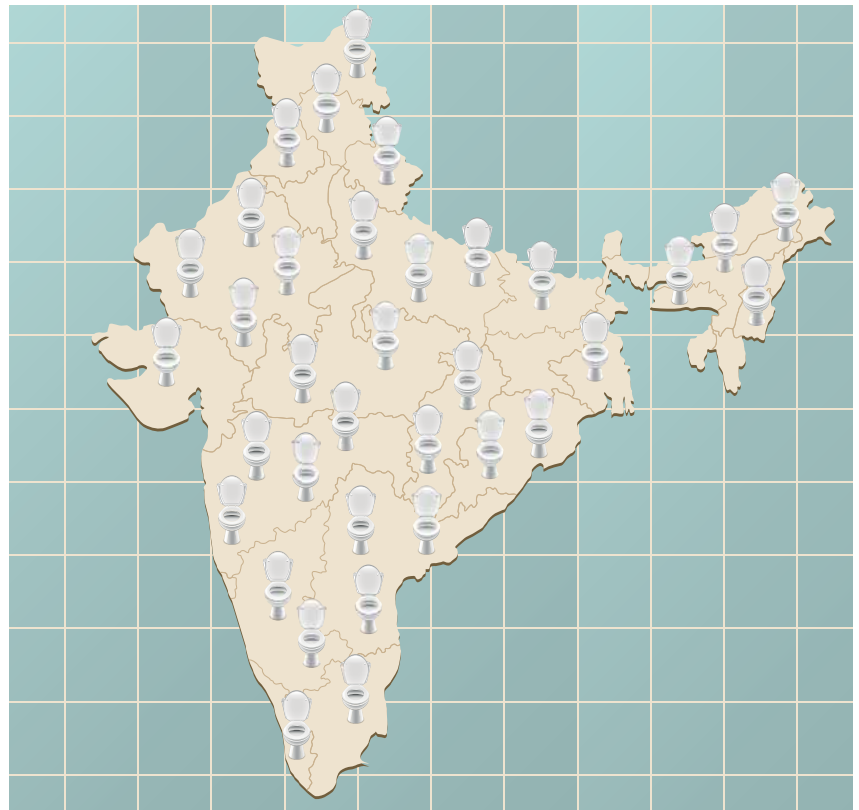
"The government has given money to build latrines, but we remain unsure whether they have been built at all or are reported as being built," Singh said. "We have also sunk funds into toilets that are not functional anymore."

Singh and other ministry bureaucrats are undertaking the gargantuan task of recording and photographing the locations of latrines around the country to establish whether they are being used regularly and are in a reasonable working condition.

"We have set up a database where volunteers and officials can update all the information in real time," Singh said. "We are insisting on photographs to ensure no facility is reported twice. So far, the database already has information about 100,000 shared-use rural toilets."

Toilets seldom rank among the top priorities of world leaders, but Modi sees this process as an important step towards his ultimate goal to strengthen India's economic position and raise it to a level befitting the second-most populous nation on Earth.

A recent World Bank Report found that a lack of working toilets was responsible for about \$53.8 billion



The Indian government is on a mission to ensure every home in India has a toilet by 2019.

in lost economic activity in India in 2006 due to poor hygiene: equivalent to about 6.8% of the country's gross domestic product for the year.

Increases in the number of [at times fatal] parasitic worm infections and diarrheal illnesses can be directly attributed to the lack of appropriate sanitation facilities.

With the World Bank reporting almost 70% of rural Indian households were still without a toilet in 2011, the Prime Minister's task is certainly immense. In 2013 the World Health Organization and United Nations jointly

estimated that 620 million people (about half the country's population) regularly defecated outdoors.

But building more toilets is only half the battle.

The Mumbai-based Economic and Political Weekly, recently published a study that found nearly 40% those defecating outdoors claimed it was their preference to do so. The survey focused on 3235 households in rural India.

"Our data predict that if the government were to build a latrine for every rural household that lacks



one, without changing sanitation preferences, most people in our sample in these states would nevertheless defecate in the open," the study found.

Many of the survey's subjects said they found defecating in the open more "comfortable and convenient" than using a commode. "Many respondents told us that defecating in the open provides them an opportunity to take a morning walk, see their fields and take in the fresh air," the study's authors wrote. "Many people regard open defecation as part of a wholesome, healthy, virtuous life."

Bindeshwar Pathak, who is often referred to as the "toilet guru" of India, has built thousands of toilets in India and runs Sulabh International, the largest sanitation charity in India. He agrees with the study's findings, and said Modi's vision is laudable but

requires a large-scale awareness campaign to succeed.

"Who will implement this toilet scheme? Who will educate and motivate?" he asked. "We need an army of volunteers who will go from house to house and talk to people about hygiene, and educate them about the health benefits of using toilets."

Pathak noted that similar efforts have worked on other sensitive subjects. "It's not an easy task in conservative India to talk to women about menstrual hygiene, so we will have to train people and also compensate them," he said.

The Clean India Campaign does intend to incorporate a vigorous public education component.

"Community action and generation of peer pressure on the outliers are the key," according to campaign literature.

"Open-defecation-free villages cannot be achieved without all the households and individuals conforming to the desired behaviour of toilet use, every day and every time. An army of 'foot soldiers' or 'Swachhata Doots' on sanitation could be developed and activated."

Pathak says the foot soldiers will need to spend considerable time on the ground working in the villages. They can't just breeze through and expect people to change their toileting habits overnight.

"We can definitely achieve the target to be a 100% open-defecation-free country by 2019, provided we arm people with knowledge," he said. "The government usually just stops after building toilets, but they will have to be more realistic and look into monitoring and maintenance." ■



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# IS PLUMBING THE RIGHT CAREER FOR YOU?

**BRAD FALLON** DISCUSSES THE IMPORTANCE OF KNOWING WHETHER PLUMBING IS REALLY THE RIGHT CAREER CHOICE FOR YOU OR YOUR EMPLOYEES.

**T**hese days, the pressure is really on for everyone to get a university education, yet statistics are starting to show that a lot of university graduates are unable to secure work in industries due to oversupply. Meanwhile, the trade industry, and plumbing in particular, is experiencing a shortage – to the point where the Australian Government is issuing special work visas to immigrants with plumbing qualifications. Even traditional tradie families often try to steer their children away from the ‘tools’ to a white collar career but is this really the right thing for the future of our industry and the younger generation?

I grew up surrounded by generations of plumbers – my grandfather, great uncle, my father and another two uncles were all plumbers, so by the time I reached year 10 it was the obvious choice for me to leave school and follow in their footsteps. Am I suited to plumbing or should I have done something else instead? Well after 25 years, I can honestly say yes, I made the right choice, but is it going to be the ‘right’ choice for my son? In the same vein, is it the right choice for you, and all the bright-eyed apprentices who walk through the door, hoping for an opportunity to work in the plumbing industry?

## THE RIGHT ‘KIND’ OF PLUMBER

This article is designed to help highlight the key traits and characteristics plumbers need to enjoy plumbing as a long-term career. If you are an employer, it could help you to work out which potential employees



It is important that, to become a plumber, and be happy to remain one for many years, that you possess some key traits and characteristics.

have the right personality and drive for plumbing and which ones are going to ‘call in sick every Monday’. It might even help you understand why you should encourage younger generations of family and friends, of the ‘right personality’ to consider plumbing as a solid career choice, instead of going to university.

The Australian government has a very good website (<http://joboutlook.gov.au>) that breaks down the prospects and potential for many different careers, including those for plumbers in Australia. I wish I had found this when looking for new employees because it really helps you

to think about why you are a plumber, and what you are looking for when recommending plumbing as a career, or when employing staff. In future, I will use the information gained from this site to help me develop interview questions for when I employ staff. While I’ve been lucky in the staff choices I’ve made, I’ve now realised that there is a science to finding the right plumber.

The relative importance of different skills, knowledge, abilities, work values and daily activities for plumbers is what makes plumbing, as a career choice, a unique fit to each individual. I have taken some of the key

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attributes, as mentioned above, and discussed them in more detail below.

The good news for us, as plumbers, is that for the medium to long term, the demand for plumbers in Australia will continue to outgrow supply, with unemployment consistently sitting below unemployment figures across all trade occupations. With that in mind – as a career choice – plumbing doesn't get more secure. This is great news, especially at a time when Australia has too many IT experts, qualified teachers on waitlists and far too many lawyers. It is also considered to be a 100% 'realistic' career, meaning it is hands on and practical.

The bad news or the 'misconception' out there is that plumbing is something you choose to do, if you don't like studying. The reality is, the coursework for plumbing takes at least three years full-time, which is the equivalent to doing a university degree. The Australian government refers to this, as a 'long lead time' profession, where entry into plumbing requires a substantial commitment. More than 67.3% of apprentices take more than three years to complete their qualifications because they need to combine earning a salary with studying. So, to be a plumber is not a short-cut career choice for people who can't commit to study. My first apprentice started eight years ago, and proudly got his plumbing licence issued last month. He worked really hard that whole time to balance work and study in order to achieve this goal.

When I looked at the importance given to different skills [on the above-mentioned website] it pointed out some things that probably should have been obvious to me: customer service, active listening, complex problem solving, communication and the ability to teach all ranked as important (more than 60% and higher).

What does that mean for me? I have to like helping people, teaching staff and solving 'complex' problems. Wow, and I thought those were all traits that only nurses and doctors required. Upon reflection though, of course it's true for plumbers. For me, next time I interview people, I will be looking far more closely at how they communicate and interact with other people. I might even throw a complex problem in there to see how well they approach the task.



In terms of required knowledge areas, mechanical, building and construction knowledge score very high in terms of importance (more than 85%), which isn't too surprising but when combined with a high importance for knowledge of mathematics and physics (use of chemicals etc.), plumbing really starts to become a career choice, based on exacting science. Better to understand this reality earlier rather than later.

When it comes to key abilities, there are the obvious such as arm-hand steadiness and control precision but the website also includes two highly ranked abilities that when thought about in detail are necessities when looking to employ new staff. One is 'problem sensitivity' which is the ability to tell when something is wrong or is likely to go wrong and the other

is 'visualisation' which is the ability to imagine how something will look after it is moved around or when its parts are moved or rearranged. They both rank higher than 65% in terms of relative importance.

There are plenty of other categories that are analysed on the website, but I wanted to finish with the relative importance of daily work activities for plumbers. Receiving information [i.e. listening, comprehending, responding appropriately etc.], handling and moving objects, making decisions, problem solving, performing physical work and keeping up to date with relevant knowledge all score very highly in terms of relevance, as opposed to other 'office based' professions, where activities such as writing score very high. Really, what the high importance attributed to these activities confirms is this: if you don't like to solve problems, don't want to talk to clients and staff on a daily basis, and don't commit to maintain a good level of health and fitness, then plumbing is never going to work for you long-term.

So, do yourself a favour and whether it's to get a better understanding of why you've chosen to become a plumber, are looking to employ an apprentice, or you're asked to give career advice on life as a plumber; use your own experiences first and foremost but also take a look at all the information now readily available online, to ensure that whatever the scenario, you make better decisions. I know I will be from now on. ■

**Please visit:** <http://joboutlook.gov.au/occupation.aspx?search=alpha&code=3341>

**Contact:**

Brad Fallon is the Director of Ivy St Plumbing – specialists in the strata management trade: [www.ivystreetplumbing.com.au](http://www.ivystreetplumbing.com.au)

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# WHAT'S HOT IN HOT WATER

PLUMBING CONNECTION TAKES A LOOK AT WHAT IS CURRENTLY MAKING NEWS IN THE EVER CHANGING HOT WATER SECTOR.

## MAKING A REAL DIFFERENCE

Over a year in the making; the new-look electric hot water systems from Rheem have been unveiled. These products have a range of new features which extend their life, and they're now backed by a 10-year cylinder warranty.

"They come in 250L, 315L and 400L capacities, and have undergone substantial re-engineering and redesign to withstand more than 10 years of operation," says Ben Murphy, Rheem's Group Product Manager – Electric.

"Our research shows that warranty is very important to consumers, and we have focused on creating a warranty that is true to its word. We're calling this the REAL difference for good reason, as it encapsulates the new and enhanced features of these products."

REAL, a snapshot: **R** – Rheem RELIABILITY, **E** – Superior ENAMEL, **A** – Larger ANODE, **L** – LOCALLY made.

In extending the warranted life of the products, Rheem has incorporated a range of new and enhanced features including:

- Redesigned cylinder dome top: This has been re-profiled, resulting in an even stronger, more robust design.
- Large anode: Rheem has introduced larger sacrificial anodes to support the new electric range of products. The diameter of the standard black anode has been increased from 21mm to 27mm, providing physically more material to help protect and prolong the life of the cylinder.
- Enamel specification: The new range will feature a commercial grade, proprietary blend Class Y enamel.
- Rheem's 250L, 315L and 400L electric water heaters are made in Australia, at Rheem's Rydalmere NSW manufacturing facility.

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## THE NEXT STEP FOR STIEBEL ELTRON

Unveiled at ISH 2015 were the latest three phase electric instantaneous water heaters from STIEBEL ELTRON. The DHE Connect, set to be released in Germany, are the next step in the evolution of instantaneous water heaters from STIEBEL ELTRON.

The flagship of the hot water range reaches new heights in the evolution of instantaneous water heaters. Connected to the home network via WLAN, the next-generation instantaneous hot water heater offers completely new, enhanced convenience functions: for instance, playing music or listening to Internet radio or displaying the current and upcoming weather conditions on the colour touch screen.

Not only can a connection be established to the Internet via the home network, but the DHE Connect can also be connected via Bluetooth.

The programming unit of the appliance can also be used in a separate room away from the instantaneous water heater – whether next to the bathroom mirror, on the kitchen work top or somewhere else.

The new DHE also offers the usual high-quality convenience features which customers have come to expect from the STIEBEL ELTRON brand. Full electronic output control using 4i-technology has been integrated for maximum energy efficiency and accurate temperature delivery. Operation has been further optimised too. Exceptional convenience for instance is provided by the 12 personalised temperature memory keys. The adjustable Eco mode is perfect for particularly energy-saving operation.

This product is not yet available in Australia. Keep an eye on STIEBEL ELTRON's website for Australian release details.

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





### A TOUCH OF GENIUS FROM RINNAI

Rinnai has just introduced a unit incorporating innovative fingertip wireless temperature control technology – the Rinnai Infinity 26 Touch.

Featuring a showerproof, wireless controller and pre-connected transceiver, Rinnai claims it has now made temperature control easier than ever before.

Installers only need to mount the weather-proof 'quick connect' transceiver under or near the unit during installation [it requires no electrical certification] and hand the controller to the end user – it's that simple.

The new 6-star energy efficient Infinity 26 Touch comes packed with features that both plumbers and customers will love!

Wireless control technology and components are supplied with the unit, which also features inbuilt Puretemp temperature stability technology and a status operation monitor. High quality internal components are built by Rinnai, and backed by a leading 12-year heat exchanger warranty.

Customers will appreciate the wireless temperature control as technology in the home continues to become more automated. Imagine no longer needing to mess around mixing hot and cold water to set the perfect temperature.

Being able to accurately set hot water temperature helps reduce wastage and save on energy costs, as well as set safe temperatures for children. One controller is supplied with the unit and additional controllers can be purchased for added convenience.

To find out more about Rinnai's latest hot water system and how it's changing everything they thought about temperature controlled hot water; visit the Rinnai Institute of Comfort at its website.

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



### OPTIMUM FLOW

Bosch has released the latest addition to its gas powered continuous flow product range, the Bosch 4000S. The range includes three internal room-sealed appliances [12L, 16L and 20L]. This capacity range is unique within the AU/NZ market, and is ideal for the rapidly growing medium and high density building sectors. The range also includes one external model [12L]. This unit shares common plumbing connections to the Bosch Pilot and Hydropower continuous flow water heaters, and is therefore an ideal replacement alternative when changing to an electric ignition model. Each model is available in Natural and LP gas models, and 50C temperature locked models are also available.

The internal appliances have a built-in temperature controller. An additional main [kitchen] controller can be purchased separately and can be attached to both the internal and external models. The controllers allow accurate temperature selection and will allow consumers to preset their most commonly used temperature. The controllers also serve as a diagnostic tool for the servicing plumber.

The 4000S appliances have the Bosch OptiFlow system fitted as standard. OptiFlow is a patented algorithm built into the appliance to adjust the fan speed during operation to ensure optimum performance. This means no adjustment to the fan speed is required at installation, and any change of airflow to the appliance can be offset automatically by the OptiFlow system.

Bosch supply the proprietary coaxial flue system for the internal appliances. To make ordering the flue system easy, each flue application is supplied in kit form. Adaptors to the appliance, fixings, and terminals, are supplied as part of these kits, and additional flue extensions and bends are available as separate part numbers.



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



# FINDING THE RIGHT BALANCE

PLUMBING ANY SORT OF BUILDING IS A COMPLEX PROCESS AND COST IS JUST ONE OF THE FACTORS, BUT A NEW STUDY SHEDS SOME LIGHT ON BEST PRACTICE SAYS COPPER ALLIANCE AUSTRALIA'S **JOHN FENNELL**.

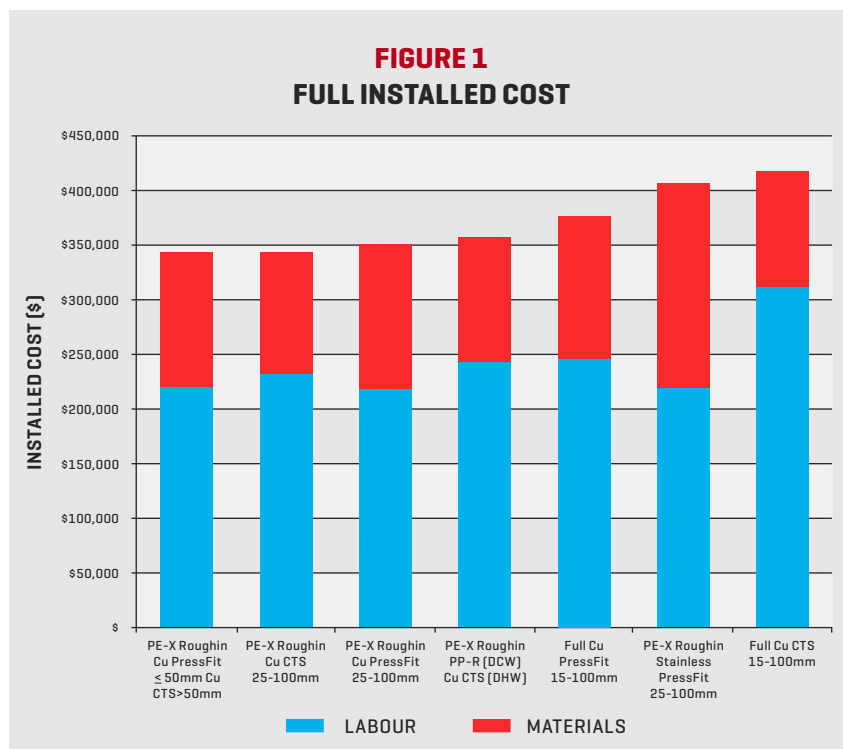
**P**lumbing is no longer a straightforward process. Rapid changes in plumbing materials and fittings' means that using just one system may not provide added advantages in terms of cost, time and ease of installation. In fact a new study suggests that mixing plumbing systems is by far the best approach.

The Copper Alliance Australia commissioned one of the most highly regarded, independent plumbing system estimators in the business, Mr Nigel Essex of SX Estimates from Sydney, to compare the costs of different plumbing systems for a medium size commercial building. The estimates were based on a typical 10 story hotel building and included the costs of both labour and materials based on average commercial market material purchase and labour cost rates. A hotel includes a large amount of hydraulic services due to there being a bathroom within every room.

The building consisted of 175 typical hotel rooms and main distribution pipework with the DCW (domestic cold water) being measured from the outlet of the property's water meter and include the basement level fire hose reel. DHWF (domestic hot water flow) & DHWR (domestic hot water return) has been measured from the roof plant room heaters. For the exercise non-typical areas have not been measured.

## DIGGING DOWN

The estimate used was compiled in accordance with the Australian Standard Method of Measurement and for the purpose of this study only pipework and fittings have been considered. Other components such as plant, valves etc. have not been measured as the repetitious costs are



the same for all estimates.

Estimating rates were based on net material for fittings, net cost for pipe and tube with 5% allowance for cutting and waste, a base labour rate of \$80 per/hour and average costs for brackets, fixings and sundries. Project specific preliminary costs have not been included in the estimate.

The comparison was conducted on one or a combination of the following pipe systems:

- Copper incorporating silver brazed fittings [CTS fittings]
- Copper with Press-Fit fittings [both full range and ≤ 50mm]
- PE-X
- PP-R
- Stainless Steel with Press-Fit fittings

As each of the plumbing systems

have advantages in a particular size range and application, the estimate was broken down into three sections being:

1. Roughins (Small diameter 15-20mm mainly to plumbing outlets)
2. DCW - Domestic Cold Water [≥25mm-100mm diameter cold water plumbing]
3. DHW - Domestic Hot Water [≥25mm-to 100mm hot water plumbing]

## TOTAL INSTALLATION COST

Various combinations of systems were assessed with some interesting outcomes for the most cost effective solutions. Figure 1 shows the results for the comparison of the best options, separating the cost elements by labour and materials.



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It was clear that PE-X provided the most cost effective solution for the small diameter roughin. Copper Press-Fit provided the cheapest option for use in DCW and DHW in the DN15-50 sizes. Using brazed copper plumbing fittings for diameters greater than DN50 whilst slower than using press-fittings was found to be the most cost effective due to their lower material cost used in this estimate.

### TIME IS MONEY

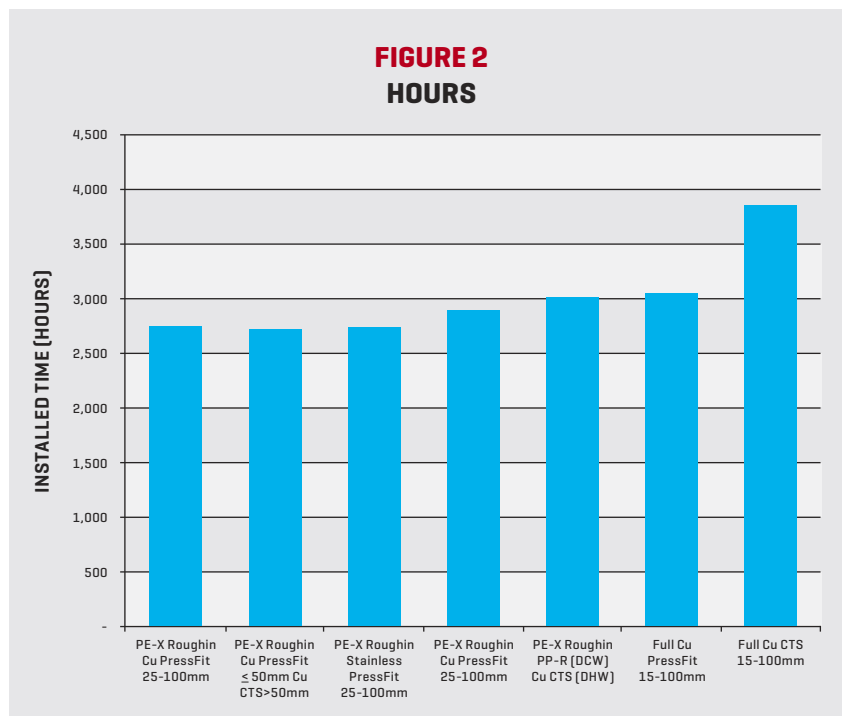
Many installations have time constraints; however the ability to allocate labour resources on to the next project as quickly as possible should also be a key consideration in piping system selection. Figure 2 shows the installation time required for a number of piping system combinations.

The SX Estimate comparison study found that the combination of using PE-X for the rough in and Copper Press-Fit for all sizes in DCW and DHW plumbing provides the fastest installation. In this estimate Copper press-fit was found to be 14% faster than using copper CTS fittings and anecdotal market feedback is that copper press-fit installations have been found to be up to 30% faster than CTS fittings.

### SCOPING IT OUT

Cost is not the only factor when selecting piping materials and care needs to be taken to choose the most appropriate material for the environment where the plumbing system is installed. Some things that need to be considered include:

- The products you use should comply with Australian Standards and ideally be manufactured by a quality endorsed manufacturer
- Use a reputable, proven quality product with local support and expertise.
- The correct tools for the job-many systems require proprietary tools to make a joint and these can add costs



or require new skills

- Solar hot water systems are becoming more common with the high temperatures experienced within the industry and metallic pipe systems are required in accordance with AS3500.4. Pipe jointing methods should be selected for the temperature ratings of the fittings.
- Historic or sensitive buildings may require flame free installations.
- UV stabilised materials should be used when installed in areas of direct sunlight & this can impact choice between metallic pipes and plastic pipes.
- Multi story buildings require higher water pressures to get the water to the top of the building and to increase the pressure zones with a building. The piping material/pressure ratings are critical when selecting a pipe system.
- Flow velocity within a pipe will determine the pipe size to ensure material longevity and prevent system noise.
- Heated water circulating systems require the pipe system material to

withstand the constant temperature of the water without risk of failure.

The cost of plumbing is a significant component of any building and this analysis has shown that one piping/fitting system may not be the best selection for the specific sites requirements.

As a summary the following pipe systems will provide the most cost effective total installation cost to the plumber while ensuring a reliable and proven installation.

1. Rough ins - PE-X
2. Domestic Cold Water - Copper Press-Fit <50mm & CTS for >65mm pipe sizes or Full CTS
3. Domestic Hot Water - Copper Press-Fit <50mm & CTS for >65mm pipe sizes or Full CTS ■

For further information on hydraulic piping design considerations refer to the recently published *Hydraulic Services Design Guide* which is downloadable free of charge at [www.copper.com.au](http://www.copper.com.au). This is a 200 page manual for use by hydraulic designers and contractors.



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We run your call centre, ensuring that every customer gets to speak to someone straight away so you don't have to keep putting tools down to answer the phone and take details - or worse still, letting a customer's call go unanswered! Our philosophy works, and we have proven systems that make it work. As well as ongoing training and mentoring, a proactive franchisee can work towards a goal of laying down the tools and moving into a full-time managerial role in their business. Marketing and advertising is also taken care of for you, leaving you to do what you do best - Plumbing! You will have every opportunity to operate a successful business and reap the rewards in your journey towards building PlumbCall into a national household name. Get in touch to find out more!

PlumbCall Franchise Systems P/L  
Franchise Development  
Robert Mackay  
07 4926 7658

franchise.systems@plumbcall.com.au  
[www.dcstrategy.com/franchise/plumbcall](http://www.dcstrategy.com/franchise/plumbcall)



**SOFT TOUCH**

Sometimes for the very young or the elderly, the pressure required to operate a time flow tap can be difficult to achieve. The new TempoSoft 2 range requires two times less pressure to operate compared to a traditional mixer. An ideal solution for early childhood centres, schools, aged care facilities and public washrooms. Not only is it easy to use, but this new design combines a timeless design with simplicity and elegance, as well as offers excellent water and energy efficiency, with WELS 6 Star rating combined with a set 7 second flow.



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

**CONCEALED CISTERNS**

Viega's new range of concealed cisterns focus on providing a slim-line, dual-flush cistern that's easy to install and use. The Mono Tec and Mono Slim cisterns can be fitted with a comprehensive range of architectural flush plates from Viega. The Mono system has a WELS 4-star rating based on a 3 and 4.5 litre flush.



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

**THE BUILDERS COMBO**

The Builders Combo is the ultimate portable buildings solution for builders on small domestic and commercial sites. The converted 10x8 ft shipping container has been creatively transformed to deliver a unit which houses a toilet, storage and work space and is ideal for tight spaces and construction sites, with up to ten workers.

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

**FLAME-FREE REFRIGERATION CONNECTIONS**

Recently released and approved for use in the USA is the RLS System for high pressure copper refrigeration connections. It is approved for use with R125, R32, R134a, R404A, R410A, R507, R407A, R407C and R407F. The supplier claims the system is 77% faster than brazing in independent testing. The company expects to release metric sizes in the coming months to mirror the existing range of 1/4" to 1 1/8".

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

**DISHWASHER SAFE**

Pestblock's one of those simple devices that's likely to strike a chord with builders, plumbers and exterminators everywhere. In short, it's a universal cover for dishwasher hoses, which seals off the area around hoses when they're plumbed into the sink cabinet. The idea is to incorporate Pestblock when a dishwasher's being installed, to help prevent cockroaches and rodents from nesting and spreading germs through cabinets and kicker cavities. As an added advantage, it provides a very nice 'finished' look to the installation.



The Pestblock can be applied both in domestic settings, and in larger commercial apartment builds.

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

**LOCKED TIGHT**

LOCTITE® 577 Thread Sealant is a medium strength, service-removable sealant for coarse threaded metal fittings. Once this yellow-coloured, solvent free thread sealant is cured, it fills the mating threads, unitising the joint to resist loosening due to vibration, shock, bending, and thermal-cycling.



[www.loctite.com.a](http://www.loctite.com.a)



# ATT

ACROSS THE TRADES

WINTER 2015

INSIDE:  
TOOLS, TIPS & TRANSPORT

## FARMING OUT APPRENTICES





TIPS

# LIGHTNING STRIKES TWICE



Left: NECA apprentices James Brown and Aaron Abela (right) work together at Lightning Ridge. Photo courtesy of Outback Links youth ambassador Samantha Pursehouse.

In the middle of the Australian outback, groups of dedicated tradies are volunteering their time and skills to deliver much needed support to drought stricken farming communities. **Jacob Harris** reports.

**L**ightning Ridge is a small town that sits in far North-West NSW, between Burke and Goondiwindi. Best known as the only place in the world where black opals are mined, in recent years the area has suffered the ravages of an unrelenting drought.

After three years of very little

rainfall, the soil has turned to dust and can no longer support crops. Due to financial strain and the ever-increasing hardship of working such arid land, many farmers in the area are unable to maintain the basic infrastructure and equipment needed to continue their day-to-day operations.

Enter Outback Links, which for the past 10 years has been sending volunteers to remote areas in need of assistance.

Outback Links was founded by Frontier Services: a charity organisation that has been helping those in rural communities for over 100 years. Frontier Services was the brainchild of John Flynn, who also founded the Royal Flying Doctor Service and who showed an

endless commitment to helping those living in outback Australia.

Originating in Charleville, Queensland, the Outback Links program built on informal networks of volunteers that already existed in rural Australia. In the past it has included a wide spectrum of different volunteers such as bush nurses and early childhood educators who would conduct kindergarten services out of the back of Land Rovers.

Working in partnership with Buy-A-Bale, a service that makes hay drops to the area and has delivered thousands of bales of hay to drought affected areas all around Australia, the team at Outback Links were able to identify the geographical areas most in need of assistance, and Lightning Ridge came in high on the list.

Last November, the program put together a 'Tradie Trip' in which 30 volunteer tradespeople including electricians, mechanics, plumbers and carpenters got on a bus and headed out to Lightning Ridge to see how they could help. The program was a

runaway success, and so another trip was organised in April, this time with 10 apprentices in tow.

Prior to these trips, the Outback Links program was predominantly made up of retirees or 'grey nomads' with generalist skills who wanted to make connections and give something back as they travelled around the country. Outback Links currently has about 1,500 volunteers registered with them. Still, a dire need for skilled workers prevailed, as did Frontier Services' desire to inject some young blood into the program.

Frontier Services national volunteer program manager Kate Parsons says: "Our generalist volunteers provide a great service, but we felt we needed to put a succession plan in place and also bring in some volunteers with specialist skills to provide more comprehensive assistance.

"For example, one property had a broken down tractor that had been sitting in the middle of a field for around two years. We'd sent numerous generalist volunteers to the property, and while they provided invaluable help in other areas, they were unable to fix the tractor. On our April trip an NRMA mechanic was able to get it running in around 25 minutes."

Having operational utes and farming machinery makes a significant difference to the lives of the farmers. Kate tells of one farmer who, with only one working vehicle, had to work during the night so his wife could use the ute to drive the children to school during the day.

The apprentices who signed up for the program were supervised on site at all times and with an overwhelming show of support from organisations such as National Electrical and Communications Association (NECA, who provided one supervisor and three apprentices), NRMA, Supporting And Linking Tradeswomen (SALT), TAFE Western and others - there was no shortage of supervisors to oversee the work.

Although the tradies and apprentices would work in trade teams and move from property to property as needed, Outback Links wanted to ensure meaningful connections were established between the tradies and farmers, so each team would set up

camp on one property and use that as a base for the duration of the program.

With approximately 20 farmers in Lightning Ridge putting their hand up for help on the next Tradie Trip, it would seem Outback Links is breaking down the old stereotypes of hardened farmers who, while in desperate need, feel too embarrassed or proud to ask for help.

"Sometimes up to the very moment we walked through the front door we needed ways of dealing with that problem," Kate says.

"After the November trip, we had a local coordinator from a nearby property who put up her hand to talk to the farmers. She reassured them and helped them work out wish lists. They are so resilient and capable that it does feel really strange for them to ask for

help, so it was really important to have a local person on board."

Plans to continue the program look promising with the solidification of the team of sponsors such as NECA, NRMA, SALT and others.

"We've got a few grants in the pipeline for Queensland so our fingers are crossed," says Kate.

"We want to continue our work in NSW, but because Frontier Services is a national organisation, we want to focus help other areas of Australia too."

The volunteers on the Tradie Trip have all found the experience really rewarding and said they'd love to come back and do it again - hopefully they'll get the chance to do that soon. ▲

**Outback Links**  
**[www.outbacklinks.com.au](http://www.outbacklinks.com.au)**



**Electrician Gary Johnson, from Laser Electrical Orange, and three apprentices getting briefed by Wyoming farmer Marianne Spooner.**





# THE 5 TOOLS YOU NEED TO BIN



Your old tools could be holding you back, says **Hilti**. Here are five suggestions on how to get the most out of your power tools and how to identify the tools you no longer need.

**A**s a tradie, your tools are the lifeblood of your business. So you want to get the most out of them, right? While persisting to use older style tools because they still work might seem like it's saving you money, the reality is it's probably costing you more in the time it takes to finish each job.

The newer technologies available can help you work faster, safer and improve the quality of the end result. So choosing to invest in a leading-edge kit of tools is a decision that will pay off in time saved on a daily basis. After

all, in this business - time is money.

Here are the top five tools you need to bin and the new technologies that replace them.

## 1. CUT THE CORD

Bin your old electric drills, saws and grinders, and replace them with battery powered alternatives. Think of the time and hassle saved as you'll no longer need to find mains power supply on the job site and won't be battling with power cords any more.

The test and tag process also becomes simplified, as you'll only need to do that on the chargers, leaving your tools available for use at all times.

If you think cordless tools aren't powerful enough to perform heavy-duty tasks, think again. The Hilti TE 30-A36 cordless combihammer, for example, drills large diameter holes with the speed of a corded tool two classes higher.

## #2. ELIMINATE DUSTY GRINDERS

Old school cutters and grinders are causing a lot of havoc with the dust and debris they throw around the jobsite. Not only are they a health hazard, related to problems like asthma, ear, eye and throat infections and in severe cases silicosis and cancer, but they are creating a lot of extra work because you have to clean up the mess afterwards.

Switch to models with a built-in dust extraction hood that connects to a vacuum cleaner. The dust is collected while you work saving you time from having to clean up and keeping you safe from serious illness. You'll also benefit from smoother cutting progress because you won't have particles getting in the way of the blade.

## #3. DITCH VIBRATING DRILLS

A common complaint with traditional hammer drills is the vibrations they generate which cause workers to tire quickly. They also carry the

potential risk of white knuckle syndrome, a disease affecting the nerves, joints, blood vessels and muscles in the hands and arms caused by long-term exposure to vibrating hand-held machinery.

Upgrading your old model drills to the latest low vibration models will extend the time that operators can work continuously without needing a break.

#### # 4. LIMITING MEASURERS

The trusty tape measure has long had pride of a place in every tradie's tool box but what happens when you need to measure long distances or heights?

With a laser range meter you can measure lengths up to 200m with an accuracy of within 1mm. They can also perform calculations and digitally record the results, so you don't even

need to carry a calculator or pen and pad for that matter. And if you're still using a tape measure and spirit level for levelling and alignment, consider investing in a multi-line laser to get the job done single-handedly and far more accurately.

#### #5. TIME-CONSUMING FASTENINGS

The conventional method of light-duty fastening involves a two-step process whereby you first have to drill the hole, then set the anchor. This can be cut down to a single step by implementing gas or powder-actuated fastening technology. These clever tools allow speedy fastening because you simply attach the fixing to the tool and shoot it directly into the surface. They can also be installed with a magazine option so you can complete many fixings in a line and get the job done even faster.

So if you're still using conventional tools to do your work, there's a good chance there is time to be gained and money to be saved every day. Have a look at the latest technologies available and consider the ways they can help to improve your daily productivity and ultimately your bottom line. ▲

*Hilti is a manufacturer and supplier of quality and specialised tools and fastening systems for the professional user. Hilti covers the areas of powder actuated fastening, drilling and demolition, diamond coring and cutting, measuring, firestopping, screw fastening, adhesive and mechanical anchoring and measuring systems. For more information visit [www.hilti.com.au](http://www.hilti.com.au).*



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## TOOLS

### WELDING MACHINE

**Welding Industries of Australia**  
[www.welding.com.au](http://www.welding.com.au)



WIA has announced the release of the new Weldmatic 200i MIG welder, which also offers stick and TIG welding capabilities.

Versatile and portable, the Weldmatic 200i weighs just 13kg, making it suitable for onsite maintenance.

Able to operate with or without shielding gas, the Weldmatic 200i MIG welder suits both gas shielded and gasless flux cored wires.

Users are able to choose between using a shielding gas or the gasless (flux-cored) wires, meaning there is no need for the user to have a shielding gas bottle.

Easy to set-up and adjust, the Weldmatic 200i's control panel allows for the easy selection of gas and wire type, with infinitely variable voltage and wire speed.

### HOLE SAW

**Malco Products**  
[www.malcotools.com](http://www.malcotools.com)

Malco Quick Action hole saws make short work of cutting large or small holes in thick or layered building materials.

Aggressive-cutting, carbide tipped teeth with deep, self-cleaning gullets on a generous 57mm deep saw cup speed through wood framing, wall tile, fibreglass, plastics, tough fibre cement and more.

The full selection of Quick Action hole saws (19 sizes in total) share a unique 'quick connect' arbor design that is compatible with industry standard hole saw threads.



### MEASURING TAPE

**Apex Tools**  
[www.apextoolgroup.com.au](http://www.apextoolgroup.com.au)

Lufkin's Multiread Tapes provide a compact design allowing for smooth, easy retraction with just the touch of a finger. The handy wide ended

hooks are a tradie's best friend, making holding and precision marking easier than ever before.

When it comes to serious construction jobs, there's no substitute for a dependable measuring tape. Lufkin Tapes are 100% inspected for accuracy and comfortably exceeds the Australian Standard to ensure the highest quality products are delivered time after time.

The Multiread Tapes are available in 6m or 9m metric.



### CHARGER

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



Milwaukee Power Tools' M12 Four Bay Sequential Charger allows the user to leave up to four M12 battery packs to sequentially charge, spending more time on the jobsite, less time swapping batteries and confident that they will be ready for the next job.

The new unit is designed to charge M12 compact batteries in 30 minutes and extended capacity batteries in 60 minutes. Featuring REDLINK Intelligence, it communicates directly with the battery to monitor cell voltage, temperature and charge status to optimise the performance and extend the life of the battery pack.

### EAR-DEFENDER APP

**WorkSonics!**  
[www.essency.co.uk](http://www.essency.co.uk)



WorkSonics! turns your ear defenders into advanced electronic hearing protectors. Using standard iPhone-compatible earphones with a microphone, WorkSonics! lets you talk and hear while wearing serious ear defenders.

With WorkSonics!, dangerously loud sounds that can cause noise-induced hearing loss like machinery, tools, chainsaws, jackhammers and amplified music are reduced to safe listening levels.

Used with noise isolating earphones and any over-the-head ear defenders/protectors, WorkSonics! provides up to 36NRR hearing protection.

WorkSonics! is available on iOS only.



## MODULAR CLAMP

**Apex Tools**

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

The Connect modular clamp system from Crescent Tools offers over 227kg of clamping force.

The real power of the Connect Clamp is its integrated connection system that lets you interconnect and rotate multiple clamps to achieve almost any position. Even odd angles and difficult corners like those found on cabinets and furniture are securely held in position. These clamps can also be connected to function as a portable, take anywhere vice for when you're away from the workshop.



## TOOL BELT

**Buckaroo Leather**

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



Buckaroo Leatherworks' Tradesman Back Support Tool Belt offers the perfect combination of safety, comfort and versatility on the jobsite.

Fully adjustable and customisable, the Tradesman allows users to interchange what they're packing to suit the job at hand.

The broad range of attachments for the Tradesman includes, but is not limited to; smart phone pouches, tape frogs, a drill pouch, a multi tool pouch, a chisel holder and a tin snips pouch.

## SUBMERSIBLE DRILL

**SECA**

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

Initially developed for the Israeli Army, the Nemo is the world's first submersible drill (up to 50m).

The Nemo submersible electric drill operates at the same capacity as its dry-land counterparts, but allows you to do jobs around and under the water. This waterproof cordless drill uses a simpler drive train than pneumatic or hydraulic drills, making it a fraction of the price and easier to manoeuvre since there are no pumps, compressors or link to the surface. It's an all-weather power tool, perfect for the mining, trenchless, emergency industries and armed forces for use in any wet and corrosive environments.

The Nemo submersible electric drill can be purchased direct from SECA and comes with a 12 month warranty.



## IMPACT DRILL

**Bosch Blue**

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

Tackle all heavy duty jobs, even dry diamond drilling, with Bosch Blue's new versatile impact drill – the GSB 162-2 RE.

Bosch's GSB Impact Drill is 15% faster compared to its predecessor and effortlessly completes even tough jobs on the construction site due to its high performance 1,500W motor and high overload capability. Combined with its low vibration output for comfortable working, this new impact drill delivers much higher work efficiency under all heavy duty applications.



## TOOL BAGS

**GearWrench**

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

GearWrench has produced a range of super-tough tool bags to suit any trade profession. Available in seven different styles, these tool bags come in a wide range of shapes and sizes including; tote bags, medium and large general tool bags and bucket style sling bags.

Featuring a minimum of 600 denier rip-stop nylon, GearWrench's tool bags have been manufactured to withstand the test of time.





## TIPS

# IN SAFE HANDS

Sometimes accidents happen and if they are serious enough, you could find yourself being interviewed by a workplace safety inspector. **Emma Bentton** explains what is expected of you in the event of an emergency.

In the event of an emergency incident, it's likely you will find workplace safety inspectors at your place of business.

The most important part to remember about this is that inspectors have legislated powers. This gives them broad powers of inquiry including coercive powers, whereby people can be compelled to provide information, answers to questions and documentation to inspectors.

Inspectors have the authority to require access to people and information at your workplace, including:

- Names and addresses.
- Conducting interviews and making enquiries.
- Taking photographs, recordings and measurements.
- Taking possession of items for examination, testing or for use as evidence.
- Taking samples of substances or objects.
- Requiring documents to be produced for examination and copying.
- Calling in other people to assist them, including technical or scientific experts, interpreters or police officers.

Put simply, unless a person has a reasonable excuse, they must answer questions or provide documents and cannot rely on the privilege against self-incrimination as an excuse not to do so.

Think of the time following a fatal incident at a workplace. Inspectors are on-site swiftly, asking questions. That is their role. But for employees, it is often not the best time to be answering

questions, suffering as they may be from personal shock and stress.

### 1) HAVE SOMEONE PRESENT

As an employer, you are within your rights to have a third-party present at interviews. This may be legal counsel. If you dispute an inspector's findings, you can also request a review of their decision.

For example, an inspector may form an opinion that an activity in a workplace involves a risk to health and safety and issue an improvement notice. The employer may wish to contest the decision and ask for an independent internal review because they believe the activity is safe.

Alternatively, an inspector may form an opinion that an activity is safe and take no action. An employee affected by the decision (and in some cases a health and safety representative) may wish to contest the decision and ask for an independent internal review because they believe the activity to be unsafe.

The review process is designed to be speedy and transparent. Most internal review decisions have to be made within 14 days; some have to be made within seven days after the application is made or in the case of a stay of an inspector's decision, within 24 hours.

### 2) SHOWCASE DUE DILIGENCE

Workplace safety inspectors respect good systems. Ensure you can demonstrate due diligence. A mining company, after an incident involving a third party transport supplier, welcomed the inspectors on-site for interviews. Before they were allowed onto the mine site, both inspectors were taken through the rigorous induction process (over an hour) and written test. Due diligence at its finest.

Know what inspectors look for. Government websites offer great advice on actions that can be taken to improve safety, including this video (<http://www.vwa.vic.gov.au/safety-and-prevention/workplace-inspections/what-happens-during-an-inspection>) from the Victorian Workcover Authority that interviews safety inspectors.

### 3) CLEARLY OUTLINE YOUR EMERGENCY RESPONSE

An emergency plan is a written set of instructions that outlines what workers and others at the workplace should do in an emergency.

The types of emergencies to plan for may include fire, explosion, medical emergency, rescues, incidents with hazardous chemicals, bomb threats, armed confrontations and natural disasters. The emergency plan should be based on a practical assessment of hazards associated with the work activity or workplace, and the possible consequences of an emergency occurring as a result of those hazards. External hazards should also be considered in preparing an emergency plan, for example a chemical storage facility across the road.

Emergency plans do not necessarily have to be lengthy or complex. They should be easy to understand and tailored to the specific workplace where they apply.

It may include practical information for workers such as:

- Emergency contact details for key personnel who have specific roles or responsibilities under the emergency plan, for example fire wardens, floor wardens and first aid officers.
- Contact details for local emergency services, for example police, fire brigade and poison information centre.
- A description of the mechanisms for alerting people at the workplace to an emergency or possible emergency, for example siren or bell alarm.
- Evacuation procedures including arrangements for assisting any hearing, vision or mobility-impaired people.

- A map of the workplace illustrating the location of fire protection equipment, emergency exits and assembly points.
- Triggers and processes for advising neighbouring businesses about emergencies.

The post-incident follow-up process, for example notifying the regulator, organising trauma counselling or medical treatment.

Procedures for testing the emergency plan, including the frequency of testing, must be included.

#### 4) PRACTICE YOUR EMERGENCY RESPONSE

Can you imagine a group of actors performing a play with no previous script review or rehearsal? Yet, in the event of a business disruption or disaster, many businesses expect their employees to perform under pressure without ever practising

their roles or testing the overall plan.

Without testing, you will never know if your plan will work when you need it most, and without exercising your staff, you will never know if they understand their roles and responsibilities and are able to perform them. In addition, testing various scenarios will teach staff what to do if some resources are unavailable.

You can test using a walk-through exercise, a conference room exercise, or a full scale/live exercise. After the test, drill or exercise, you should document what worked well, what areas needed improvement and any action items. Based on these findings, your emergency response plan should be modified to include the recommended improvements.

#### 5) LEARN FROM YOUR INCIDENTS

There are opportunities for program improvement following an actual incident. A critique should be conducted to assess

the response to the incident. Nor do you have to wait for an incident to happen at your place of work to learn from! Lessons can be learned from incidents that occur within the community, within the industry or nationally.

Best practices and instructional guidance published by trade associations, professional societies, newsletters and government websites are all great resources to evaluate and improve your programs. ▲

*Emma Bentton is the founder of Systems on a Shoestring (SOAS), a set of easy-to-build safety systems for small business that you construct using mobile, downloadable apps. Emma holds formal qualifications across health, safety and the environment, with over 20 incident-free years working with small and large contractors in high-risk industries. [www.soas.net.au](http://www.soas.net.au).*



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the anvils

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provide greater leverage



# GO WITH THE FLOW

Cash flow is a whole of business system, not just an invoice and collect system.

**John Corias** explains.

In recent times, the number of articles and blogs in business circles written about the topic of small business debtors and the ability to get paid on time, if printed, would probably be enough to cover the entire country in paper.

I certainly know that I have covered this topic in the past and yet the issue of not being paid on time is still one of the biggest hurdles for small businesses to overcome.

The cost of not getting paid on time and the resulting impact on a small businesses cash flow can be catastrophic.

The costs of poor debtor management and cash flow can be measured in the following ways:

- Straight up bank interest on overdrafts, credit cards and lines of credit that need to be used in place of real paid cash.
- The cost of supplier penalties for late payment due to a lack of cash. Especially the ATO which currently charges 9.36% on unpaid debts.
- The missed opportunity of not being able to take advantage of supplier discounts for early payments.
- The pure cost of having a staff member or accountant chasing debtors, spending time on the phone and so forth.
- The missed opportunity to earn bank interest or other investment income on surplus cash flow.

For even the smallest of businesses the costs we've mentioned have the ability to represent a significant and tangible amount of money. This, of course, has the potential to create an out of control spiral as the above factors then affect the next period's cash flow and so on, until businesses are unable to pay their debts and eventually close.

It doesn't need to be this way. I don't intend on repeating the many articles on practical cash management tips, I wrote a similar article on the topic just over 12 months ago. The focus here is to emphasise the absolute must of a business to make sure every client or customer is fully aware of exactly what they are getting for their money. In doing so, you prevent angst and frustration on the other side of the fence. This frustration with receiving unexpected bills and deadlines for payments can and does lead to longer payment times.

Remember, you may be invoicing business to business, but there are real people at the other end of the process and their emotions can and will affect how quickly you get paid.

The key is to follow these five pointers to maximise the ability of your customers to be willing to pay you on time:

1. Should a client engage you to provide a quote, do so promptly and always specify an expiry date on the quote so you aren't left short by supplier/material price rises. The initial quote should demonstrate a timeline of expected progress payments or at least an anticipated deadline for the work involved with a short payment term at the end of the project.
2. Where large quantities of materials are needed to satisfy a client's work, always get an upfront deposit. If you need to purchase \$10,000 worth of materials on a 30 day account and a job takes two months to finish, and then 30 days after that to get paid (if you're lucky), your business is effectively cash negative to the amount of \$10,000 for a full two months. Refer to my original point above on what this is going to cost you!
3. Documented payment terms must be attached to the engagement document, whether that be a quote, an upfront invoice or any other form of agreement to provide services. If you don't have documented legal payment terms, speak to your solicitor. It's a short term cost that can save you

thousands in the long run.

4. Be aware of what accountants refer to as "scope creep". This is where you quote for an agreed service at a fixed price. Subsequent to this the client expects more and more of you and of course you comply with their requests to keep them happy and to keep the job progressing towards its completion. Any and all additional work needs to be invoiced as per the terms of your agreement; see why you need one?
5. The previous point reinforces the need for a detailed quote or engagement letter so both parties know what is and isn't covered. By protecting yourself you also inform the client. An informed client cannot then get upset with an additional invoice for extra work, especially when they initiated the work. Always do as best you can to issue a new quote for any extra works that can be treated as a signed legal document in the event of a dispute.

Cash flow is the lifeblood of all small business, without a steady stream of cash flowing into your bank account, you are hampering your businesses ability to not just grow, but survive.

The costs and missed opportunities of absent cash are real and measurable. Take a look at our list of potential costs, if you have a large amount of interest expenses in your profit and loss, are always scratching around or calling clients at the last possible minute begging for them to pay you then it is our sincere hope that these pointers has prompted you to take a look at your business procedures from top to bottom.

The way you quote, communicate, work with and follow up with your clients all has a direct impact on your bank account balance. Remember it is your money and if you go about it in the right way, your money will be yours sooner. ▲

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# RISKY ADVICE

Professional Indemnity insurance is essential to protect tradies' businesses and livelihoods. GIO Insurance commercial portfolio senior leader **Leigh Smith** explains.

**M**ost tradies are familiar with Public and Products Liability insurance. They are often required to have it when they take on a contract.

However, many tradies are less familiar with Professional Indemnity insurance and how critical it is to protect their business.

This is because it is not typically included in business insurance packages and it has traditionally been associated with professions such as lawyers and accountants.

As a result many tradies are leaving themselves exposed to costs that could cripple their business.

## WHAT'S THE DIFFERENCE?

Public and Products Liability covers your legal liability for injuries or

damage that you, your employees or your business cause to other people or their property.

For instance, Public and Products Liability insurance can cover your legal costs if faulty electrical work electrocutes someone or causes a fire.

It can also come into play if you are found legally liable for damage or injury caused by a product you make or supply that causes something, for example, a leaky pipe or loose fitting, which in turn causes water damage.

Professional Indemnity, on the other hand, covers your legal costs if you are alleged to have breached your 'professional duty'.

As a specialist in your trade, you are expected to provide expert and accurate advice and services, backed by experience and training, to your clients. This is your professional duty.

So this policy is designed to cover you if you have unintentionally given inaccurate or incomplete advice, or if you are responsible for an honest mistake that causes a loss to your customers.

Unlike Public and Products Liability, an injury or damage need not have occurred to trigger the insurance.

## HOW DOES IT WORK?

Here are two examples of how Professional Indemnity could cover your trade business.

Imagine you are a carpenter hired to design and build a pergola. You advise your customer that pergolas under a certain size do not require a building permit in their local area.

They agree to your design, so you build the pergola according to the specifications you provided; however, after it is built the council tells the customer that the pergola is above the permitted size and it will have to be taken down and rebuilt.

In this case, Professional Indemnity insurance would typically cover the costs associated with deconstructing and rebuilding the pergola for the customer, which resulted from your failure to give accurate and complete advice. It can also cover any legal costs if your customer takes you to court. That said, it does not normally cover any fines for building without permits.

Now, imagine you are a tiler who has subcontracted a builder to tile a customer's bathroom. You come to inspect the bathroom and find that the wrong tiles have been installed.

This is a breach of your contractual liability, because you are responsible to ensure the work is carried out correctly as set out in the contract arrangements.

Professional Indemnity could then cover you for the cost of replacing the tiles with the correct ones.

Honest mistakes can happen. But making up for these mistakes can be extremely costly.

Professional Indemnity insurance can help you fix these mistakes while minimising the financial stress it places on your business.

Fortunately, many insurers are now making the policy more easily available in their business packages, such as GIO's Mobile Business Protect pack.

This will make it more accessible for tradies looking to protect their businesses from crippling costs. ▲





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# LOCAL DOMAIN NAMES FOR LOCAL TRADIES

Tradies from Victoria and NSW can now have localised web domains ending in .melbourne or .sydney. **Paul Skelton** reports.

**T**he days of the phone book really are behind us. Now when people are looking for a plumber, an electrician or any other type of tradie, the most common course of action is an online search.

And for everyone who turns to the web to find a tradie, they'll be searching by location for someone local.

The challenge for those offering trades and services is that this increases your potential competition – you now need to get your website noticed among all the tradies on the internet, not just those in your home town.

How can tradies cut through the guff and get a competitive advantage online?

One way tradespeople in Victoria and NSW can stand out from the crowd is with a .melbourne or .sydney domain name. These domain names have launched recently as local alternatives to the likes of .com or .net.

Domain names in .melbourne and .sydney are an easy way for customers to see straight away that you're a local business located in their city – making their search easier and increasing your chances of being found online.

"If you're a Victorian business, individual or interstate business with Victorian interests you can apply for a .melbourne domain name. The same applies for .sydney," ARI Registry Services general manager of naming services George Pongas says.

ARI Registry Services is the organisation tasked with maintaining the integrity of the .au, .melbourne and .sydney domains.

"For interstate business though, the domain name they apply for must closely relate to the product or service they

are assigning to it. Individuals and local businesses can register any domain they like," George says.

The .melbourne name space launched late last year and a number of tradies and service providers are already using the new domains to tap into their local market.

Mercury Heating and Cooling Systems in Moorabbin can be found at [www.evaporativecooling.melbourne](http://www.evaporativecooling.melbourne), Tradefix Door Services has registered [www.doorrepairs.melbourne](http://www.doorrepairs.melbourne) and Women @ Work Painters now lives at [www.womenatworkpainters.melbourne](http://www.womenatworkpainters.melbourne).

Another great advantage of local domain names is that they are still relatively new, meaning availability is currently very high. The .sydney namespace only launched in February 2015.

Great premium names and key search terms are still available and can set your business up as the definitive source for your industry. For example, [www.locksmiths.melbourne](http://www.locksmiths.melbourne) and [www.surveying.melbourne](http://www.surveying.melbourne) have both been registered by savvy businesses who now essentially 'own' their whole category online.

Aringo Polished Concrete is one such clever business. By registering a .melbourne domain name at [www.polishedconcretefloors.melbourne](http://www.polishedconcretefloors.melbourne), Aringo has been able to claim the polished concrete market vertical and align itself with its local customers all at once.

Showing himself to be a truly forward-thinking businessman, owner Jyri has also registered a number of key search terms under the newly-released .sydney domain name. These include [www.concretebenchtops.sydney](http://www.concretebenchtops.sydney), [www.polishedconcretebenchtops.sydney](http://www.polishedconcretebenchtops.sydney) and [www.polishedconcretefloors.sydney](http://www.polishedconcretefloors.sydney).

For those grieving the death of the phone book, local domain names such as .melbourne and .sydney offer the chance to target your audience and stand out amongst the cluttered marketplace.

Align yourself with your city and your customers by adding a local domain name to your small business toolkit.

## WHY HAVE A WEBSITE?

Having a presence online is one of the 'qualifying factors' customers use when choosing the right tradie for their job. If you have a website and your competitor doesn't, it may be the element that wins you the business.

Websites speak to the customers you don't otherwise hear from. If a customer prefers to email rather than call; or they called you but you were busy on a job, you can still capture their business through your website.

Getting set up online can be quick, simple and inexpensive. Creating a basic but professional website can be done at little to no cost and a domain name can return significant value for your business.

"It all comes down to your digital strategy, or how your business lives online," George says.

"A .com address simply tells people you're online and very little else. A .com.au address tells people you are somewhere in Australia. A .melbourne or .sydney address tells people that you are close by, which makes it great for small business operators.

"Melbourne and Sydney are among only 20-odd cities in the world that have applied for their top level domain name. It will be at least another five years before other cities can apply for their name."

## GETTING STARTED

If you'd like more information on how to make an online presence work for your business, email [start@get.melbourne](mailto:start@get.melbourne) (in Victoria) or [start@get.sydney](mailto:start@get.sydney) (in NSW) and ARI Registry Services will provide you with a free Domain Name Strategy – no commitments and customised to your business – to help you take the first step to getting online. ▲

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# TRANSPORT

with Terry Martin



## RENAULT MASTER

**R**enault Australia has introduced a heavily upgraded Master large van series, easily identified by its striking new looks and now loaded up with an advanced twin-turbo diesel engine and a higher level of standard equipment.

The latter includes fuel-saving automatic engine idle-stop on models with a manual transmission and a new-generation electronic stability control system, which is fitted standard across the range and incorporates hill-start assist, trailer swing assist and Renault's 'Grip Xtend' software (for enhanced traction on soft ground).

Another addition with the so-called New Brand Identity (NBI) Master series is a wide-view mirror in the passenger sun visor that reduces the left-hand blind spot and improves rearward visibility, adding to a list of beneficial equipment that already includes dual front airbags, ABS brakes with electronic brake-force distribution, double-optic headlights, cruise control (with speed limiter) and remote central locking with automatic locking above 30km/h.

'Pro' and 'Premium' option packages have also had high-grade equipment added with the latest series.

New combinations among the van, cab chassis and platform cab body styles swell the Master model range to 20 variants at last count, including a new long-wheelbase (LWB) rear-wheel-drive mid-roof van (with GVM of 4.5t and payload out to 2,207kg), a LWB front-wheel-drive (FWB) mid-roof window van and a LWB FWD platform cab suitable for body builders and converters.

For models with a manual gearbox, an advanced 2.3L 'M9T Energy dCi' four-cylinder twin-turbocharged engine family replaces the single-turbo M9T unit powering all current-generation Master van and cab chassis models since 2012.

With the first turbo delivering strong pulling power at low revs and the second kicking in at higher engine speeds, the new diesel donk comes in two states of tune: 120kW of power at 3,500rpm and 360Nm of torque from 1,500rpm for all (six-speed) manual variants bar the entry-level short-wheelbase FWD low-roof van, which has a slightly lower output of 100kW/340Nm.

Combined with Renault's 'Stop & Start' idle-stop system, the twin-turbo engines can deliver combined-cycle fuel economy as low as 6.9L/100km and CO<sub>2</sub> emissions of 180g/km. These are European-sourced figures based on the panel van and are said to be class-leading.

A regenerative braking system dubbed 'Energy Smart Management' is also now onboard with the bi-turbo diesel variants, helping charge the battery whenever the vehicle is decelerating.

Master variants paired with the optional QuickShift six-speed automated manual transmission stick with the single-turbo M9T good for 110kW/350Nm. ▲

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# HYUNDAI SANTA CRUZ

Hyundai used the Detroit motor show earlier this year to present a pick-up concept that could be a precursor to a long-awaited entrant for the South Korean brand in Australia's incredibly popular one-tonne utility segment.

More along the lines of a Ford Ranger than a hulking F-150 – which is a good sign for Hyundai's Australian subsidiary – the Santa Cruz Pickup concept shown in Motown was described as a "completely new interpretation of pick-up utility for a new generation of buyers".

Hyundai says it hasn't focused on the attributes typically found with traditional American pick-ups, concentrating more on an expressive design, fuel efficiency and manoeuvrability.

There are plenty of practical elements in the five-seater dual cab, with rear-hinged rear doors aiding access to the rear compartment, clever tie-down solutions across the vehicle and an expandable bed that can be reconfigured for longer cargo using a drawer-like sliding function.

Few technical specifications were released about the concept, although Hyundai did emphasise high mileage and low emissions with its use of a 2.0L turbo-diesel engine producing 142kW of power and 407Nm of torque, driving all four wheels through Hyundai's HTRAC all-wheel-drive system.

The Santa Cruz's dimensions are said to have been kept "purposefully compact" for an American audience more familiar with hulking pick-up trucks and SUVs, although it looks to slot in neatly with the somewhat smaller utilities favoured in Australia and other global markets.

No plans have been announced for production, but Hyundai Motor Co Australia (HMCA) stressed at the time of the concept's release that "the market opportunities for a Hyundai utility vehicle globally are very real, not least in Australia".

"We have no doubt a tough, good-looking Hyundai ute will be popular with Australians," says HMCA chief operating officer John Elsworth.

"This is a concept vehicle and we do not make decisions about which cars to bring to market – those decisions are in the hands of our parent company in Korea. However, we've made our enthusiasm for a ute very clear – it surely has enormous potential – and we look forward to seeing how things progress in the near future." ▲

Hyundai  
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## VOLKSWAGEN CADDY

**V**olkswagen has launched its fourth-generation Caddy compact van in Europe ahead of an expected Australian arrival in the final quarter of 2015.

The runaway market leader in Australia in the sub-2.5t van segment, the Caddy raises the bar with a new exterior design, fully overhauled cabin, improved load space and some of VW's latest powertrains and technology, including new driver-assistance systems and safety features.

The Australian line-up is still to be confirmed, but with petrol and diesel engines currently available, along with eco-focused BlueMotion tech and a 4Motion all-wheel-drive option at the top end, the new-generation Caddy – in regular, stretched Maxi and five-seater Maxi Crewvan body styles – is expected to continue covering all bases.

Tougher regulations have brought all-new EU6-compliant TDI turbo-diesel engines to the fore, based on a 2.0L 16-valve four-cylinder design with four power/torque output options in Europe: 55kW/225Nm, 75kW/250Nm (in both standard and BlueMotion spec), 90kW/300Nm (reserved for 4Motion variants) and 110kW/340Nm.

All come standard with a fuel-saving automatic engine idle-stop system. The 75kW BlueMotion variant consumes just 4.2L/100km on the European combined cycle, while the top-spec 110kW diesel pulls from 1,750rpm and can reach 100km/h from rest in just 9.2 seconds.

There are several TSI turbo-petrol engines in service overseas, ranging from a 62kW/160Nm 1.2L four-cylinder to an energetic 75kW/175Nm 1.0L three-cylinder and a 92kW/200Nm 1.4L four at the top of the range.

All engines are coupled with either a five- or six-speed manual gearbox, while a six- or seven-speed DSG dual-clutch automatic is available as an option.

The regular Caddy and longer Caddy Maxi retain the same

wheelbase of 2,681mm and 3,006mm respectively, and while overall width and height remain approximately the same, VW has built in some additional length (up to 470mm) that produces extra cargo space of around 1m<sup>3</sup>.

The cabin now carries up to six airbags as standard, a speed limiter is integrated into the cruise control system, and a reversing camera and heated windscreen become available along with a host of other driver-assist safety features.

The latter includes active cruise control, a 360-degree optical parking system, automatic high beam dipping, fatigue detection, and 'front assist' monitoring that works in conjunction with 'city emergency braking' to reduce stopping distances and help prevent collisions. ▲

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\*Model shown SWB Single Turbo with optional 17" alloy wheels and fog-lights. Recommended Driveaway Price \$34,290. Valid for vehicles ordered between 01/05/2015 & 30/06/2015 while stocks last. Renault reserves the right to vary, extend or withdraw this offer. Offer available to ABN holders only and excludes fleet & government buyers. <sup>†</sup>3-years/200,000km (whichever comes first) warranty applies to all new or demonstrator Traffic while stocks last. Renault reserves the right to vary, extend or withdraw this offer. Demonstrator vehicles receive balance of new vehicle warranty. Offer not available for Govt. and fleet buyers. <sup>#</sup>First 3 scheduled maintenance services capped at \$349 per service on new and demonstrator Traffic models, based on standard scheduled servicing from new and on normal operating conditions. Scheduled maintenance services required every twelve (12) months or up to 30,000km (whichever occurs first). Traffic is subject to adaptive servicing requirements, as determined by the Oil Condition System, and may require servicing prior to the standard twelve (12) months or 30,000km service interval.





## MITSUBISHI TRITON

**M**itsubishi has launched its new-generation Triton, improving key areas such as fuel economy and refinement and adding plenty of extra equipment in an effort to maintain its position as one of the leading one-tonne utes in Australia.

An all-diesel affair for the time being, the new Triton range at launch starts from \$24,490 for the 4x2 GLX single cab chassis and works its way through 'club cab' and dual cab body styles, cab chassis and pick-up trays, 4x2 and 4x4 drivelines, manual and automatic gearboxes and three trim levels – from the "tradie friendly" GLX to mid-series GLS and top-spec Exceed.

The Thai-built Triton now carries a maximum five-star crash-test rating from the Australasian New Car Assessment Program (ANCAP) and is fitted with a high level of safety equipment including seven airbags, electronic stability and traction control, hill-start assist, trailer stability assist, adjustable speed limiter, emergency stop signal function and ABS brakes with electronic brake-force distribution, brake assist and a brake override system.

Other standard features include air conditioning, cruise control, hands-free Bluetooth (with voice command and audio streaming), CD stereo with USB port, a multi-function steering wheel, tilt/telescopic steering adjustment, a trip computer, alarm and immobiliser.

Priced from \$40,990 and only available as a 4x4 double cab pick-up, the GLS adds 17" wheels (up from 16"), a reversing camera, Xenon headlights, daytime running lamps, front fog-lights, side steps, sports bar, automatic electric folding door mirrors (with side turn lamp), piano black and silver cabin trim, higher-level seat fabric, dual-zone climate-control air con, 6.1" touch screen, leather-clad steering wheel/

transmission shift lever and upgraded audio including six speakers and digital radio.

The auto-only Exceed (from \$47,490) adds steering-mounted gearshift paddles, a rear differential lock, automatic headlights/wipers, leather seat trim, driver's seat power adjustment, 'smart key', one-touch start and the Mitsubishi Multi Communication System with 7" touch screen, satellite-navigation and SD card input.

Mitsubishi claims to have increased Triton's cabin space while retaining a 3m wheelbase and offering a best-in-class 11.8m turning circle, the latter combining with a faster steering rack to bring improved manoeuvrability.

Braked towing capacity is now up to 3.1t (4x4 dual cab), while substantial tweaks to the suspension – still with a double wishbone (front) and leaf spring (rear) configuration – are said to bring better balance, weight-carrying capability and ride quality.

Powering the entire range is a 2.4L MIVEC four-cylinder turbo-diesel engine producing 133kW of power at 3,500rpm and 430Nm of torque at 2,500rpm, paired with a new six-speed manual or, where available, a five-speed automatic with sport mode. Mitsubishi claims fuel economy improves by up to 20%, depending on the variant.

GLX 4x4 variants are equipped with the 'Easy Select' 4WD system now operated via a new shift-on-the-fly selector dial, while GLS and Exceed use a new-generation Super Select II system.

A 94kW 2.4-litre four-cylinder petrol engine with five-speed manual gearbox will be available late in 2015 on a GLX 4x2 single cab variant. ▲

**Mitsubishi**

[www.mitsubishi-motors.com.au](http://www.mitsubishi-motors.com.au)

# FORD RANGER

**F**ord is preparing to release a heavily upgraded Ranger utility, keeping the Australian-developed, Thai-built workhorse fresh in the face of new-release opponents including fully redesigned versions of the Mitsubishi Triton and Nissan Navara.

The Blue Oval brand has set out to toughen up the exterior design of the new Ranger, dubbed PX Series II, while introducing extra cabin creature comforts and highly advanced infotainment and safety technology.

Full Australian details were still to be released at the time of writing, but some of the high-grade features introduced to the ute include the 'Sync2' multimedia system, adaptive cruise control, lane-departure warning, tyre pressure monitoring, a fatigue-busting 'driver impairment monitor' and a reversing camera working in conjunction with front and rear parking sensors.

The two Duratorq TDCi turbo-diesel engines currently in service – a 2.2L four-cylinder and 3.2L five-cylinder unit – have received upgrades designed to boost fuel efficiency by up to 22%, depending on the variant.

These include the addition of an automatic engine idle-stop system on both engines, an updated exhaust gas recirculation system on the 3.2L unit and the introduction of electric power-assisted steering. The latter is said to benefit low-speed manoeuvring and high-speed precision as well as economy.

The mechanical changes are also claimed to improve noise, vibration and harshness (NVH) levels – the elimination of a power steering pump used in a conventional hydraulically powered system has reduced noise, for example – and together with extra sound-deadening materials, improved insulation and revised suspension tuning for improved ride comfort and

handling, Ford says the light truck's refinement and dynamic performance are better than ever.

The Australian designers have reworked the dashboard, aiming for a more "comfortable, contemporary and car-like environment" complete with a new central 8" touch screen, dual-TFT instrument cluster and a 240V power socket.

The 3.2L engine continues to produce 147kW of power and 470Nm of torque, while the 2.2L unit now develops 118kW/385Nm (up 8kW/10Nm). Both drive either the rear or all four wheels through a six-speed manual or automatic transmission.

The 122kW/225Nm 2.5L Duratec petrol, paired only with a five-speed manual, carries over largely unchanged. ▲

**Ford**

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





# MERCEDES PICK-UP



**N**issan is extending its co-operation with alliance partner Renault to develop a medium-sized pick-up truck for Mercedes-Benz – a move that will give the prestige German brand a ticket into the highly popular one-tonne ute segment.

Mercedes-Benz Australia/Pacific has confirmed that the project, which has been on the table for several years, will include development in Australia ahead of the vehicle's global launch later this decade.

Australia has been identified by Mercedes as a primary target market, along with Europe, South Africa and Latin America. The ute will be based on Nissan's new-generation NP300-series Navara which launches here this year, and which is also underpinning an all-new ute for Renault.

At this stage, Mercedes has only confirmed that its still-to-be-named utility will be launched with a dual-cab body and that its design and engineering will be carried out in-house. It promises the vehicle will have "all of Mercedes-Benz's distinctive characteristics and features" and has confirmed it will be targeted at both private buyers and commercial customers, particularly the trades.

For markets outside North and South America, the Mercedes ute will be built at Nissan's factory in Barcelona, Spain, alongside both the new Navara and, from next year, Renault's version. The plant's capacity will be raised to about 120,000 vehicles a year by the end of the decade, when all three models are in production.

The Navara sold in Australia is built at Nissan's new plant in the Samut Prakan province in Thailand – it was previously produced alongside the Triton at Mitsubishi's factory in Laem Chabang – but there is no word at this stage on whether the plant will be tooling up for both the Renault and Mercedes utes.

Daimler AG chairman of the board of management and head of Mercedes-Benz Cars, Dieter Zetsche, described the company's move as a key step as it looks to expand global sales.

"Entering the rapidly growing segment of mid-size pick-ups is an important step in continuing our global growth path," he says.

"Thanks to our well-established partnership with the Renault-Nissan Alliance, we are able to drastically reduce the time and cost to enter this key segment."

At the initial announcement of the program a couple of weeks earlier, when an official rendering was released, Dr Zetsche also emphasises: "We will enter this segment with our distinctive brand identity and all of the vehicle attributes that are typical of the brand with regard to safety, comfort, powertrains and value." ▲

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**Mercedes Benz**

**[www.mercedes-benz.com.au](http://www.mercedes-benz.com.au)**







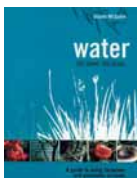
# TRADESTUFF



## 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.



**\$35.95**.....CODE 761

## 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

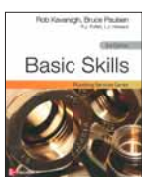
This guide explains in simple terms the general principles of the building codes and Standards for sanitary plumbing and drainage in Australia and New Zealand. It is intended as an aid for designers, builders, students and owner/builders. It also serves as a useful reference guide for plumbers, drainers and building officials. This book covers most common plumbing and drainage solutions.



**\$71.90**.....CODE 424

## Basic Skills

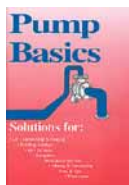
The third edition of Basic Skills has been completely updated to incorporate the wide ranging revisions that meet the requirements of CPC08. New features include a trade maths chapter for applied plumbing, chapters on sustainability, communication and OHS in the workplace, a competency grid to the Training 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

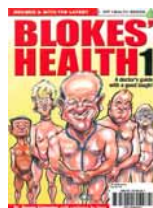
AS/NZS 3500.5:2000 Prepared to provide a suitable Standard for domestic plumbing work associated with buildings not exceeding three floors in height. The objective is to describe in a simplified way the installation requirements for hot and cold water services, sanitary plumbing and drainage and stormwater drainage. This standard is a MUST HAVE if you are involved with any domestic plumbing.



**\$131.50**.....CODE 521

## Blokes Health

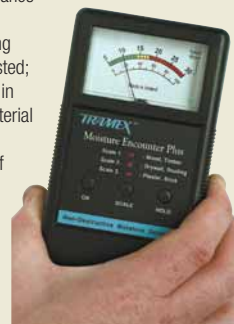
This is an absolute gem of a publication and a valuable resource for men of all ages. Written by Dr Bernie Crimmins, Blokes Health provides extremely useful health advice in a simple manner. There aren't many books you can buy that could actually SAVE YOUR LIFE!



**\$19.95**.....CODE 394

## TRAMEX Moisture Encounter Plus Non-Destructive Moisture Meter For Building Inspection.

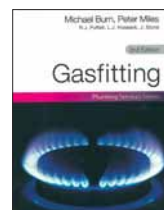
This is an upgraded version of the world's most popular and successful non-destructive moisture meter, the Moisture Encounter. It incorporates all the features and benefits found in the original Moisture Encounter such as: non-destructive moisture measurement of wood, plastic, drywall, block, brick, 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.



**\$795.00**.....CODE 696

## 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

## The New Tramex CMEXpert II

The Best Concrete Moisture Measuring Instrument just got Better! The CMEXpert II allows for instant non-destructive moisture tests of concrete. Accessories available are Wood Probes for testing wood flooring prior to installation. Relative Humidity Probes & Sleeves for in-situ and Hoods for surface RH testing of slabs.



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### Good Tiling Practice

This guide to successful ceramic tiling contains 120 pages of practical, fully illustrated advice on how to avoid tiling failures. Aimed at designers, tilers, inspectors and builders, its 15 chapters cover everything from selecting the right tiles for specific purposes, choosing substrates, adhesives and grouts, wet-area requirements, maintenance, swimming pool tiling and 'troubleshooting'.



**\$52.50** .....CODE 320

### HB 230-2008 Rainwater Tank Design and Installation Handbook

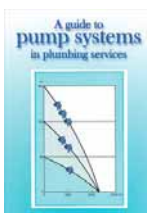
This handbook has been developed to provide practical information for the collection, storage and use of rainwater within an urban environment on private residential property. It outlines the minimum standards and performance requirements criteria for all development works associated with rainwater tank installations. It applies to new installations as well as alterations, additions, maintenance and repairs to existing installations.



**\$69.95** .....CODE 720

### A Guide to Pump Systems

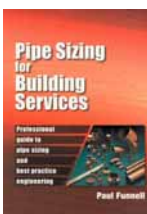
A guide to Pump Systems in Plumbing Services is an Australian first publication specifically written for plumbing designers, practitioners, consultants and specifiers of plumbing installations and equipment involving the use of pumps for all classes of buildings and construction. The content of the handbook includes information on pump systems associated with water supply, rainwater, harvesting, bush fire protection, sewage, disposal by pumping, special purpose installations and dewatering systems.



**\$29.95** .....CODE 669

### Pipe Sizing for Building Services

This is the key that unlocks the secrets to pipe sizing! Tables provided in Australian Standards are based on minimum requirements for sizing, but this book has tables and charts that will provide an optimal design solution for specifier, installer and customer. The result will be more efficient and cost-effective use of materials, faster installation and commissioning, and problem-free solutions for the customer.

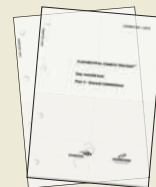


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### New Gas Installation Standard

Part 1: General installations (A)  
Part 2: LP Gas installations (B)

After six years, the building industry can breathe a little easier with the release of the updated AS/NZS 5601. It highlights minimum requirements for the design, installation and commissioning of gas installations and provides 'deemed to comply' solutions to promote uniform Standards. If you work with gas, this revised Standard is vital.

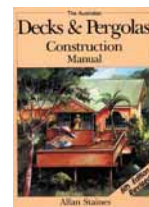


**\$218.95** .....CODE 489A

**\$150.77** .....CODE 489B

### Decks and Pergolas Construction Manual

One of our most sought-after construction manuals, this is an invaluable reference covering every aspect of decks and pergola construction. Includes designing, estimating, building, timber selection charts, fastening & anchoring recommendations, terminology, painting & finishing, and preparation of plans for councils.

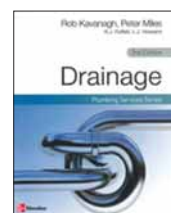


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### Drainage Plumbing Services Series

3rd Edition

Drainage Plumbing Services Series 3rd edition is an important entry into the world of drainage and sanitation history and maintenance. The text provides an overview of how to deal with the collection, treatment and disposal of waste. Common treatment methods and alternative disposal methods are explored in depth and with astute attention to principles, practices and regulations.



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### Little Red Roofing Book

Roof cuts and rafter lengths – Hancock's 10th edition is a very popular, best selling book. With calculations, diagrams and tables it will help you with plumb and side cuts for hip and rafter, down and side purlin cuts and more. Calculations for roof frames, roof cuts and rafter lengths.

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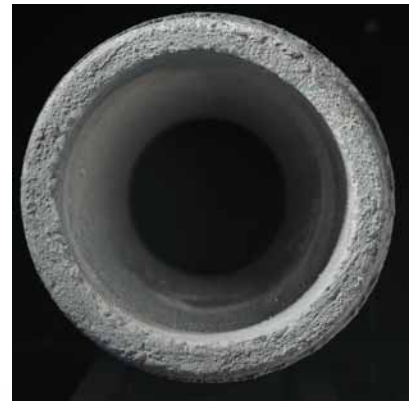
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