



# "Concrete spas now have the option of interchangeable jets, contoured seat comfort and therapeutic hydro-massage."

ing in a circular pattern providing maximum relaxation.

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# Technology not so new – but improved upon

Stuart Dodin Sales Director of Spa Design Ltd in Hong Kong says that in his opinion, there has not been any technical revolution in spa jet technology in recent years, but the technology that has existed has been steadily improved upon.

"For the consumer, the aesthetics of spa jets are now more pleasing to the eye as they incorporate stainless steel and better designed plastic hoods," says Dodin. "With today's LED technology, spa jets can be backlit and provide chromatherapy – or colour therapy – that uses light in the form of colour to balance a person's energy or simply to create a dazzling light show when soaking in a tub at night."

He says that the manual rotation of spa jets allows for a precise adjustment of the water flow rate and permits the user to choose the level intensity of the massage.

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PRO GUARD



"Today's jets can be easily extracted from their housing when cleaning is required," he says. "Rotating spa jets no longer get stuck

due to the build-up of calcium deposits, and modern jets are easily interchangeable, allowing users to swap directional, rotational and pulse jets."

For spa builders, today's jets are easier to install. Dodin says

that the joints between the spa shell and the jet housings are more reliable and practical than they were in the past.

"Transparent plastics and LEDs make the spa jet a design element," he says. "Today, spa jet manufacturers offer design customi-

sation of the visible part of spa jets. This allows spa builders to match personalised spa jets to the design of their spas."

As a spa manufacturing company, Spa Design follows the recommendations of importers

regarding the choice of spa jets as they understand the requirements of their clients and distribution networks.

# "The Pulsator jet provides relief in the wrist area and reduces discomfort from carpal tunnel syndrome."





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"We use a specific spa jet design that is unique to our product and work in conjunction with two spa jet manufacturers," says Dodin. "The simple ergonomic design of our spa seats allows the user to position himself or herself freely for a fun and therapeutic massage."

For a manufacturer, Dodin says the most important factor of a spa jet is its reliability. For the user it is the precise manual adjustment of the water flow rate and the different types of jets available; directional, rotational and pulse.

# "The Jacuzzi line traces its history back to the original patent of the seven Jacuzzi brothers who immigrated to the United States from Italy around 1900."

"For swimming pools that use massaging seats, jets are built-in the seats the same way that they are in the shell of hot tubs," he says. "They are connected to the output of the filtration system. The filtration pump serves as the massage pump."

Dodin stresses that spa jets are important elements of a spa, but to be efficient, they must be installed properly and connected to a well thought-out system of pumps.

"For a massage to be enjoyable, the right number of spa jets must be adequately adapted to the design of spa seats," he says.

# From the first hot tub to a worldwide industry

Sundance Spas, Inc in Chino Hills, California, USA, is a pacesetter in spas. The company, founded in 1976, has grown to become the world's largest manufacturer and distributor of acrylic spas. The portable and in-ground hot tubs produced by Sundance Spas can be found in more than 750 retail locations in more than 60 countries worldwide.

"The Sundance Spas' story is all about performance," says Anthony Pasquarelli, communications director for Jacuzzi Hot Tubs/ Sundance, Inc. "The Fluidix technology is exclusive to Sundance. The bearing-less design means there are no moving parts, and the jets are designed to deliver tremendous therapeutic benefits, but without technical problems."

Fluidix jet technology is a patented jet design that allows users to adjust for a steady flow or an oscillating massage. From deeply relaxing to powerfully invigorating, the Sundance Spas hot tub jets offer a full range of massage types. Swirling, pulsing, streaming or penetrating, the spa jets work effectively for virtually every therapeutic technique.

The company offers four primary categories of jets: pressure point jets stimulate acupressure points; whirlpool jets provide vigorous deep-muscle massage and bold action; therapy jets provide a versatile swirling motion in rotating or stationary action; while relaxation jets deliver gentle, soothing massage with bubbling water motion.

One of the relaxation jets is the Silentair, which injects a stream of bubbles into the water. Air injection creates a gently effervescent massaging action, and the jet is used to diffuse aromatherapy throughout the water. The company's "Accu-Pressure" jet focuses on pressure points in shoulders, neck, back, calves and feet, and it provides deep-tissue massage to relieve muscle tension and joint pain.



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Fluidix Nex is the latest addition to the Fluidix series, relieving neck tension and strain. Its massage action is ideal for small muscles and sensitive nerves, and the patented technology is adjustable for high/low massage action.

The "Pulsator" jet creates a gentle pulsing massage action. It provides relief in the wrist area and reduces discomfort of carpal tunnel syndrome.

Sundance Spas claims that its "Pro-Touch II" is the ultimate in versatility and efficiency. It offers optional interchangeable nozzle for more massage variety, and allows users to refine and customise the character of their massage.

The Fluidix series includes several other jets that provide back-and-forth

massaging motion, assertive or mild massaging, flow adjustment and jet stream intensity options.

Pasquarelli says the Jacuzzi Hot Tub line delivers a different message, but one that is just as reliable and therapeutic as the Sundance Spas' line.

"Jacuzzi launched an industry with the first self-contained jetted



Jacuzzi spa jets are based on a 50-50 mix of air to water which produces high volume, low pressure massage  $\,$ 

hot tub," says Pasquarelli. "The Jacuzzi line traces its history back to the original patent of the seven Jacuzzi brothers who immigrated to the United States from Italy around 1900. It's based on a 50-50 mix of air to water which produces high volume and low pressure massage, which is the most pleasing and effective type of water therapy."

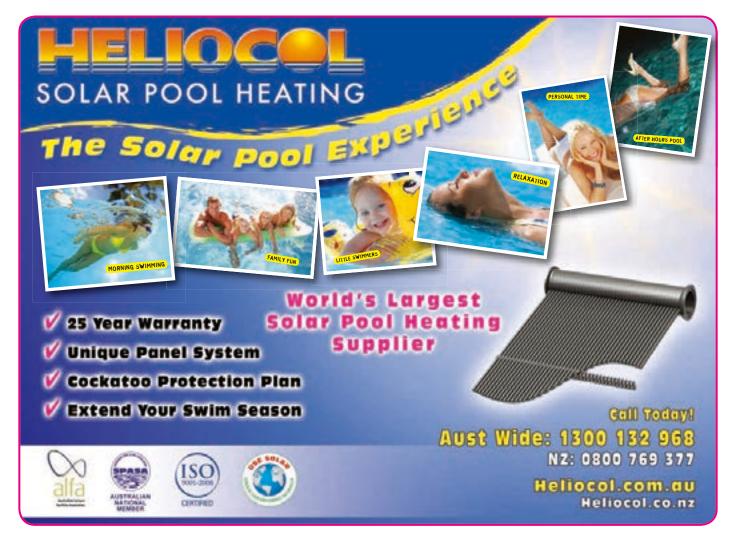
Jacuzzi combines physical hydrotherapy with aromatic and visual benefits to provide a total experience. The hot tub therapy jets are directed to pressure points in the feet that can increase circulation and promote specific joint and muscular functions.

Evaporating plant oils, including essential oils, provide psychological and physical well-being, and Jacuzzi's specific scents can have

beneficial effects on the mind and body.

Jacuzzi's chromatherapy uses various colours of light to help calm or rejuvenate the spirit. The body reacts to specific colours in positive ways, helping ease the pains and pressures of everyday life.

Today Jacuzzi offers luxury product lines of bathtubs, walk-in bathtubs, showers, sinks and hot tubs for every style and budget.



Englise dose



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26 July 2012 Gold Coast Convention Centre







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- 1. The SPLASH! Environmental Project of the Year
- 2. The SPLASH! Environmental Product of the Year

These awards will be chosen from the winners of the category awards:

- A. Residential Pool (Indoor and Outdoor)
- B. Commercial Pool or Aquatic Centre (Indoor and Outdoor)
- C. Pool Shop
- D. Product Categories
- D1. Energy Saving Award
- D2. Water Saving Award
- D3. Mechanical Product
- D4. Sanitisation Award
- D5. Spa Award

The winners will be announced at a gala evening at the Gold Coast Convention Centre on Thursday July 26, 2012, and together with the finalists and sponsors, will be featured in SPLASH! magazine, on www.splashmagazine.com.au and in a consumer PR campaign.



# Duncan Armstrong - Olympian, TV Presenter, Motivational Speaker, Charity Worker -Master of Ceremonies For 2012 SPLASH! Environmental Awards

Duncan approaches everything in life with the same zestful attitude that helped him win Olympic Gold for Australia. This approach has also motivated and inspired thousands of people to achieve their highest corporate and personal goals.

He became a household name at 20 years of age with his upset win in the 200 freestyle at the Seoul Olympics in 1988. It was Australia's

100th Olympic swimming medal. Since retiring from international swimming Duncan has enjoyed careers in television and radio, motivational speaking, endorsements and corporate partnerships. Duncan has also won a host of honours including Young Australian of the Year, a Centenary Medal and an Order of Australia Medal.

For more information and entry details please contact the SPLASH! team on +61 2 9660 2113 or visit www.splashmagazine.com.au to download an entry form

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# Introducing Queensland's NEW MAN °°

For the first time this century, SPASA Queensland has a new CEO. SPLASH! talks to Adrian Hart to find how he will meet the challenges facing the Sunshine State.

t would be daunting enough just following in the footsteps of David Close, who'd been the Swimming Pool and Spa Association of Queensland (SPASA) CEO for the past 13 years. But on top of that, Adrian Hart has arrived to head up SPASA just as Queensland faces its toughest market conditions for years.

On the positive side, he comes armed with the skills needed to tackle the job: a long history heading a somewhat similar organisation; a track record of dramatically increasing association membership and experience running a registered training organisation (RTO).

"I've spent most of my adult employed life with the Master Plumbers Association," says Hart. "I see myself as a specialist association manager."

Hart started his long tenure at Master Plumbers supported by a background in retail management, a degree in government and a graduate diploma in industrial relations.

"We had four staff when I started, and by the time I finished we were up in the twenties, and grew the membership up from about 400 to 1100 contracting members, and about 100 industry supporters.

"One of the reasons you consider staying in a position for so long is that it's always evolving, there's always new technology, industrial relations issues, government relations or standards – something's always happening to keep the position fresh. At the MPA we created a registered training organisation and by the end, we were one of the key suppliers of training to the industry outside the TAFE system."

Hart says there are definitely similarities between the MPA and SPASA, but the differences are quite stark.

"At Master Plumbers we were in an industry that was extremely regulated by the government at both levels – at a trade contractor level through the Building Ser-



vices Authority, and at a trade operative level through the Plumbing Industry Council.

"So individuals working in the industry had to have a licence to practice, and companies had to have a licence to contract to both builders and consumers. So it's more regulated than the pool and spa sector is presently, and it's a larger market segment, providing services to the construction sector and domestic maintenance and commercial maintenance sectors."

As well, there is more dealing with consumers in his SPASA role and most of his members are now builders, rather than subcontractors.

"Somewhat flippantly, another difference is that SPASA members produce something that's a lot better to look at. There's nothing too exciting about looking at a tap or a toilet seat!"

There are similarities too: in particular, the focus on consumer health and protec-

tion, through water quality and the safe construction of pools and spas.

## After the rain

Hart is under no illusions about the task ahead, and is well aware that Queensland has suffered more than most in the current difficult times

Development Application (DA) figures published in each issue of SPLASH! show a situation where far fewer Queenslanders are applying to have swimming pools built. Hart says anecdotal evidence suggests the situation might not be quite as bad as the DA numbers suggest, yet he acknowledges it is a very difficult situation.

"The industry has suffered a downturn over several years," he says. "The GFC caused financial strain in the general building industry and in specialist areas like pools and spas.

"In Queensland that was complicated further by not having a summer last year

because everyone was flooded. And we've also come into the second bounce of the GFC, so we're experiencing a continuing downturn and then we haven't really had a hot summer, so all of the factors that would normally generate sales in the sector have been depressed. And that has had an ongoing and accumulating effect on the industry to the point where everyone is feeling the pain at the moment.

"As an organisation, we can help get the message out to consumers that they should be dealing with a SPASA member, so by doing that we're generating some interest in swimming pools generally, but we're also generating interest specifically in using a SPASA member.

"Hopefully the promotion we do generally and specifically will help increase some sales in the industry."

One such promotion was held over Christmas, when a group of Association members combined to run an advertising campaign on two local radio stations.

'We chose an FM station and an AM station, from the same stable, the Australian Radio Network, so we got some good deals. It was a similar demographic, which their research and our research indicated was the target market. Both were music stations, not talk stations.

"We focussed the campaign on consumers contacting the SPASA office to request our pool and spa magazine. And we've noticed an increase, year-on-year, of about 300 per cent. So we've obviously had some interest generated through that process."

Twenty pool builders from the Brisbane area contributed to the campaign. It was done in such a way that all members got a benefit, but the 20 got additional benefits in the way the material was sent out. The consumers got a copy of the magazine, but they also got a covering letter highlighting their ability to get a pool installed during the current swimming season while showcasing the contributing members as featured pool builders. The Association subsidised the campaign by about \$10,000.

"We'll be looking in the future for ways to communicate more effectively the benefits of using SPASA members, but also the value of a swimming pool: lifestyle, leisure, fitness, health, all of those sorts of things."

# Financial health

Circumstances have conspired to make life difficult for the Queensland industry at the moment.

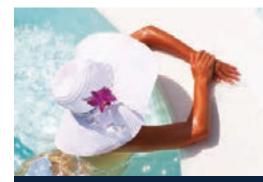
"SPASA Queensland, like its members, is suffering from a downturn in the industry," says Hart. "Some of our revenue from members is based on turnover. Where their turnover is reduced, then the revenue coming in to the Association is reduced."

The Association has experienced difficulty in recent times around that revenue stream.

"As any business would do, we're looking at ways to minimise our expenses and maximise our revenue. And to that end I'll be looking at strategies to grow the membership of the Association, both within the pool builder target market, and also in the associated segments such as pool shops, pool technicians, swim schools and public pools."

Hart believes SPASA needs to consider carefully its core mission and purpose. The Association rules stipulate they must concentrate on industry promotion, education and information.

"We have to promote and support a lot of



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our pool builder members because without building a pool, nothing else flows," he says.

"But we need to look more carefully at supporting the other segments so we can have a broader church within the membership, and that will assist us with improving our communication strategies with consumers.

"Clearly a consumer is interested in talking to a pool builder and the benefits that a SPASA member can bring to them when they're looking at getting a pool; but if they've already got a pool, they need to know which are the best pool shops to go to, which technicians are going to provide the best service, who's accredited with training, who as a swimming school or a public pool is complying with Queensland Health in terms of water quality. And these are all the things SPASA should be investigating and incorporating in our communication strategy to the consumers."

# Capitalising on the mining boom

NSPI Australia was created by SPASA Queensland as a registered training organisation (RTO) primarily to provide the development of training programs which would support licensing in Queensland. In effect, NSPI underpins the licensing structure in Queensland.

Unfortunately, the Association found that the market segment is so small in Queensland that it's difficult to sustain the ongoing costs of compliance around an RTO, which include a substantial number of standards and qualifications set by the government to maintain its registration.

Given that issue, they have had to look elsewhere to support the funding of this organisation. One of these opportunities is the mining sector.

"Everyone's heard about the two-speed economy," says Hart. "The mining sector in Queensland is expecting something like an additional 38,000 jobs between now and the end of the year. The majority of those individuals will be as they call them 'cleanskins'. They'll have to undertake initial training in general safety induction to be able to access jobs in the mines.

"We believe there's an opportunity for us in a commercial sense to tap into that in a way that will underpin the good work that NSPI does delivering training in the primary area of swimming pools and spas, and pool maintenance and technicians."

In effect, delivering general safety induction training to new workers in the mining industry can help fund the core role of NSPI in training pool and spa industry members.

### The future

Personally, Hart says that while he has no intention of "becoming a builder", he knows he must gain more technical knowledge about the pool and spa industry, so he can better carry out his job and help handle construction complaints from consumers, and assess claims under the Watertight program.

One of his main aims it to increase membership, and that may include a restructuring of the way membership fees are charged.

"From the Association perspective, we are business as usual, and we are complying with our normal 'administrivia'. We have a newly elected management committee as at the end of March, and we are undertaking a fairly comprehensive review of who we are, what we do and why we do it."

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It's never too early to start

# SUCCESSIO PLANNING

Anthony Davis of Brightwater Partnership says now is the time to start planning for that day when you finally hand over the reins of your business.

uch has been written on succession planning – but doing it successfully is harder than many articles would have you believe.

There is the Theory and then there is the Practice.

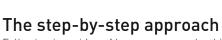
For it to work successfully for you in your desire to maximise your return for perhaps twenty or thirty years in your business, you need to start now in implementing the practical steps to getting a successful outcome. And although it's best to start early, it is never too late to begin the process.

# Get good advice

There are four forms of advice you should be seeking:

- Business Development maximising the value of the Asset you are to sell down;
- 2. Legal protecting yourself with well structured agreements;
- 3. Accounting & Taxation managing the values to minimise taxation obligations;
- 4. Financial Planning looking after your personal "nest egg". The steps you need to take are:
- 1. Planning and Business Development to ensure you have a saleable business;
- 2. The Path to Partnership that you use to initially identify the ideal candidate and then a structured process by which they earn their "Partnership Stripes";
- 3. The Rules of Engagement which are the clearly documented rules by which you agree to operate once in Partnership.

Once these three steps are in place you can begin to put your plan into practice.



Following is an idea of how you can make this process work.

The key to remember is that the longer you give yourself, the better chance you have of making it a success. It has often been said that trade-based businesses (and others) have very little value "at sale" without the original owner.

Here is a way for you to maximise the returns you get from your business. Once your successor has identified him/herself (refer to Path to Partnership), you now begin a step-by-step approach to making it work.

It has been suggested that if you are currently in your 30s (say 37) your ideal successor would be about 12 years younger (say 25). This reduces the generational (father/son) differences. If you are starting to consider this in your 50s then the age difference might not be so critical.

# Start early

If you start early you can develop a 20-year plan. If you start later you will need to develop a plan over a shorter time frame. Here is an approach you might consider.

Once the ideal candidate has worked him/herself through the Path to Partnership, you now start to "sell down" a portion of your business each year.

If you have the time, this might be five per cent each year for 10 years. If time is shorter for you, you might consider 10 per cent per year for five years. You might even "gift" the first 5 per cent to get your new partner started. You no longer have to worry about the total



# "The next generation gets to realise the value of the business if they purchase it rather than being given it."

business as even with five per cent there is "shared ownership".

If you have chosen correctly, your new partner will bring a new vitality to your business – similar to that which you brought to your business when you started it.

Each following year your new partner will use the profit from their shareholding to purchase a further five per cent. They might also have to salary sacrifice to manage the purchase for the first couple of years.

The new vitality should result in increased profitability. The maths can be quite simple. Based on a valuation of three-times net profit, by the time your new partner owns 15 per cent of the business, their profit distribution will equal their annual purchase of 5 per cent and for each year after that they get to keep part of the profit distribution.

## Your personal investment/ retirement structure

Remember also that you are the recipient of the "cash" for the purchase of your shares. What you need to have is an effective personal investment/retirement structure in which to place/invest the proceeds of your share sale.

So after 10 years you now own 50 per cent of the business and have received a fair price for your share. If time permits and your agreement with your new Partner is so established, both of you might start to sell down a further percentage so eventually after 20 years there are three owners each with one third.

Your retirement plan can now start to kick in. You can sell off your remaining 1/3 to the next successor or to the existing partners. What you will have achieved in this process is the maximisation of the value you have received for the business.

Another valuable point to remember is that this process can also work very effectively in family business as Parents start to pass the business down to the Next Generation. The Next Generation gets to realise the value of the business as they "purchase it" rather than being "given it".

For further details regarding this article or to receive your free subscription to regular business publications, email bizplan@brightwater. com.au, being sure to mention you saw the article in SPLASH!

# **Developing a Sustainable Swim School Business**

ANTHONY Davis from Brightwater will be conducting a workshop called The ABCs of Developing a Sustainable Swim School Business at the upcoming ASCTA convention at the Sofitel on the Gold Coast from April 24 to May1.

His workshop is for owners, managers and senior staff at swim schools and will be held on:

• Friday 27th April, 8.30am – 12.30pm, Sorrento Room, Sofitel Gold Coast

Davis says it will take an objective look at where your business is today and start making the changes that will result in greater wealth, freedom and excitement. Register Online at https://www.ors.net.au/ascta convention.html.





# CAPTURING THE ESSENCE OF YOUR POOL



This photo of a David Tisherman pool shows a number of important artistic elements including lighting and dressing the location with props. Also, note the use of a slower exposure to get a "misty" appearance in the spa Photo by Criss Costea: Costea Photography

With many award entries due shortly – including the SPLASH! Environmental Awards – we are reprising an article by expert pool photographer Walter Glover on how to show your pool in the best light.

ver taken a photo of one of the pools you've installed, and wondered if you could make it look better?

Well, you can. And here are a few pointers that might help.

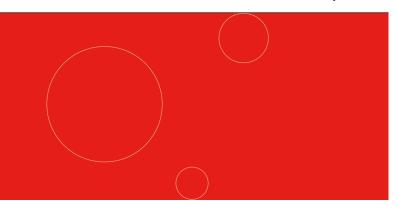
First, plan your photos. Selecting the right time to shoot a pool is fundamental to the success of a shot. And the "right time" might not be simply the right time of day but also the right time of year. Over-shadowing of your product, the pool, is unattractive in a photograph. Beyond the aesthetics, over-shadowing will obscure a sense of variations of depth and the colour of the pool interior. Select a time of day when the pool is fully lit by the sun and devoid of shadows from trees or structures. In winter, when the sun is low in the sky and shadows are longer, not only do surrounding elements cast annoying shadows; so do the internal walls of the pool itself.

Let the photos tell a story about your pool. There are only so many times you can create a powerful impact with a photo of a hole in the ground full of turquoise water. You need to include the context of the pool, to show it in its setting with other elements that present the pool as part of a lifestyle. There is more to the investment a client makes in a pool than just getting wet. It will often be a focal point of the house – from both a property value an enjoyment point of view.

Groom the pool and its surrounds. Step



## industry advice



one is to get rid of the pool cleaning device and its hose. Keep decking and coping dry and clear of leaves, debris and toys. Some small blemishes might be removable in post-processing your photos but the quickest and easiest way to do it is at the time of shooting. Once everything is neat and tidy and you are about to create your masterpiece just give the water a wave of the hand to ripple the surface. The result will be crazed streaks of sunlight in the water, making the pool look even more inviting.

Vary the viewpoint. Shooting in a plan view from a high balcony can give an attractive overview describing the way the pool is incorporated into the overall space. A ground level picture might provide excellent detail of decking features. Standing eye-height is the viewpoint most people will relate to best giving the sense of approaching that refreshing splash on a hot day. With the camera too low, the water becomes just a slither. Too high and you lose the sense of actually being there.

The kit you need will vary according to your budget and your level of application. Essentially, a digital camera with six to 10 mega pixel capture should suffice for basic needs. There are many great point-and-shoot digital cameras about now that will adequately do what you need. But a DSLR – digital single-lens reflex – is always going to be the better, but bulkier, option. A wide to medium zoom is to be preferred over a tele-zoom and irrespective of which lens you choose, all lenses perform better when a tripod is employed. Splashes, dust and condensation must be cleaned off the lens and camera and special care should be taken not to let chlorine get into the interior of the camera.

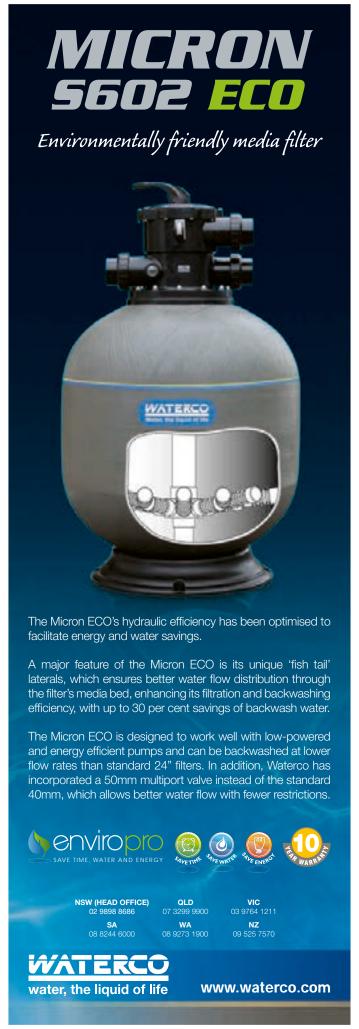
How wide should the lens be? Depending upon how big the pool is in relation to the space available your range of choice might be limited. But keep in mind that getting too close to the pool with an extremely wide-angle lens setting will distort the geometry of the pool. Add to this the fact that standing near a corner ensures that impossible angular shapes result that might begin to look too experimental for many tastes.

Night shots? Night shots are best taken at dusk with a glow still lighting the sky a little. A tripod is essential for night shots. The exposures can be quite long and hand-holding will invariably lead to shake and blurry pictures. If it is the lighting itself you wish to illustrate, make sure all the globes are working and that no lights are shining directly into the lens.

From a technical standpoint where it was once essential to engage a professional for even the most menial of photographic chores, now a lot of day-to-day pool photography can be done by you. Prints for a pitch-book or archives, PowerPoint presentations and internet promotion are all applications where low- to medium-resolution images might be adequate.

But there are limits; and just as there is a need for professionals in the pool building industry to ensure a perfect result, so too are there aspects of photography where the expertise and problem-solving skills of the professional photographer are indispensable.

Over the past 30-odd years, Walter Glover has photographed and brought out the best in hundreds of swimming pools. You can contact him in Sydney on 0438 301 665 or go to www.walterglover.com.au §





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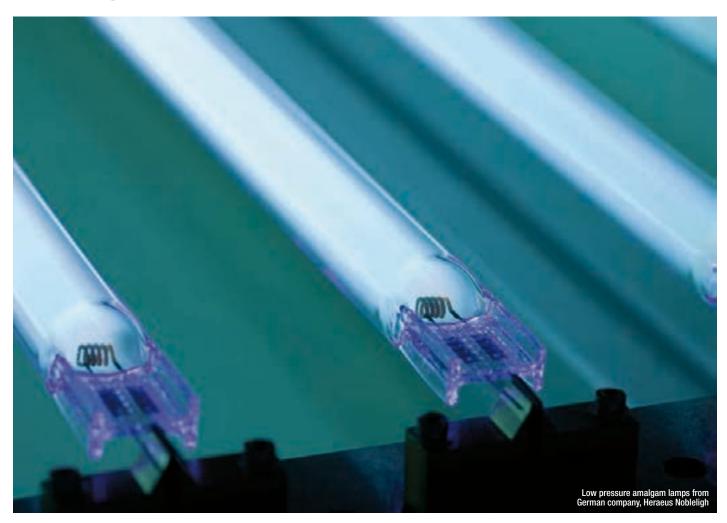
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# The power of UV

Ultra violet disinfection has become an aquatic centre mainstay. Now, it is reaching into the residential pool owners' backyard.



or many years, ultra violet (UV) disinfection has been used in public swimming pools as a form of secondary disinfection.

What it basically does is stop pathogens such as bacteria from reproducing – making it easier for the primary form of disinfection – chlorine for example – to more easily do its job.

Now, UV is starting to be used in private residential swimming pools and is even being incorporated into the water treatment systems of some portable spas. In this article we're looking at both commercial and residential pool and spas. In commercial pools, the situation is quite different, largely due to bather load and regulatory requirements. UV is proving a potent weapon in the fight against pathogens in both arenas, but is probably most effective in high bather load indoor public pools.

There have been many questions surrounding this form of treatment, and in this article we attempt to answer them. The main questions have been what does it actually target, how effective is it, and is it worth the cost of installation?

Also, independent research over the years had raised some questions about UV and the production of trihalomethanes. Latest research, however, seems to indicate that UV may not be the cause – meaning we can focus more on its effectiveness in inactivating pathogens and reducing chloramines.

For more on the latest research, go to page 72 and the report on the most recent World Aquatic Health Conference.

# A third stage

Dr Tom Lachocki is the CEO of the US organisation, the National Swimming Pool Foundation (NSPF).

The NSPF is a non-profit organisation established in 1965, dedicated to improving public health worldwide and is the leading educator of aquatic facility operators and pool and spa professionals, and the chief philanthropic research sponsor in the aquatics field. Its mission is to encourage healthier living by increasing aquatic activity through education and research.

Traditionally a supplementary form of disinfection of commercial pools, UV is now appearing on residential projects
The pool is an Aqua Technics Aquarius Crystite fibreglass pool, installed in North Beach, WA. The sanitisatior
equipment is a Delta UV E40 ultra violet unit combined with a Hurlcon RC-9 chlorine and pH dosing system



Lachocki says that the traditional public pool has relied on two components to protect users and employees: disinfection and filtration.

"The future public pool will likely have a third component," he says. "A supplemental disinfectant system that exposes the water to UV, ozone, chlorine dioxide or other emerging technologies. This is already happening, and UV is the most widely used supplemental disinfectant."

Lachocki says the data is compelling that UV improves indoor air quality by reducing chloramines. This is a good thing since chloramines are irritants.

The data that also shows UV inactivates contaminants like Cryptosporidium is very powerful.

"The chemistry associated with chlorine, UV and contaminants is pretty complex," he says. "The spectrum of chemicals that enter the water from people, the environment, cosmetics, or as treatment chemicals contribute to the complexity. We have to figure out how chlorine and UV react with that complex mixture in very low concentrations.

"Controversy remains in trying to understand if disinfection

by-products (DBPs) like trihalomethanes (THMs) increase in UV systems. The better we reduce water contaminants like urine, faeces, deck or landscape runoff, cosmetics or dead skin by showering before entering the water, the better we will reduce DBPs and risk."

Lachocki admits it is impossible to prevent contaminants from getting into the pool, but says we should implement practices to reduce contaminants.

"Then, the benefits of chlorine and UV can be achieved with less risk of any downside. Thus, the traditional 'shower before entering' signage at public pools has science behind the purpose, and more facilities should begin reminding patrons. There is science behind 'don't pee and don't poop in the pool' too."

# How UV works

Gary Rochelle is President of Trident Group USA, manufacturer of the popular Trident ultraviolet systems. He has many years experience with UV in the treatment of swimming pools.



He says that technically, UV doesn't kill or even sterilise pathogens.

"There are three types of UV light. UV-A is sunlight, UV-B produces ozone and UV-C is the one we are generally talking about for its bacteriological properties," he says.

"Each pathogen has an absorption level it can tolerate before being affected by exposure to UV-C."

This is expressed in mJ or mW/sec/cm2. As the exposure (dose) exceeds the natural protection level of the bacteria, it disrupts the DNA of the bacteria by splitting the chromosomes, which renders the bacteria (or any other micro-organism) unable to reproduce and it dies.

Rochelle points out that UV systems must be used in conjunction with a residual sanitiser.

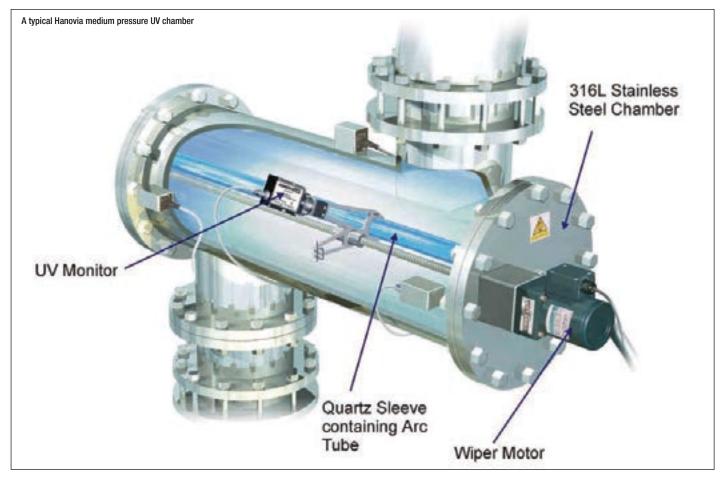
"UV imparts nothing into the pool water, but does its job through radiation inside the UV reactor. Thus, a small amount of residual sanitiser is required to maintain healthy water in the pool until such time as the bacteria in the water enters the UV reactor and is exposed to the UV-C lamps."

The UV system could be used in conjunction with a salt generator system, for example. In that case, it allows for the reduction in the salinity of the pool as less chlorine needs to be generated.

Because the salt cell output can be turned down, it makes cell cleaning easier and increases the cell's working life. Rochelle says that any halogen can be used and will result in superior water chemistry, and that it is fair to anticipate a 20 per cent chlorine reduction on average.

# **Curly questions**

As mentioned above, there have been questions about UV as a disinfection system because of some UV light's potential to act a mutagen - that is, by disrupting the DNA of organisms, are there any dangerous side-effects?





"Basically there are two different types of UV lamps: a low-pressure high-output lamp, which emits UV rays only at 254 nm; and a medium pressure lamp which emits UV rays between 200-600 nm."

There have also been questions about the presence of trihalomethanes in indoor swimming pools. This research has been inconclusive, and as mentioned above (and in the WAHC report on page 72 of this edition), latest research by Professor Blatchley tends to indicate that some of the earlier assumptions that incriminated medium pressure UV may have been flawed.

Gary Rochelle says that four years of studies are underway involving UV-C medium pressure, with no conclusion. However, UV-C low pressure systems do not have any similar concerns.

"There are so many variables involved that there is not a simple response to this question," he says. "What I do know however, as an example, is that the largest UV installation in the world is the borough of Manhattan New York, which has 56 UV reactors in its drinking water treatment plant that is treating 2200 million gallons of drinking water daily."

He adds that if it's safe to drink, he feels safe to swim in it. He also says that in the US, the Environmental Protection Agency (EPA) and the US Centers for Disease Control (CDC) all recommend UV as a secondary sanitation system used in conjunction with a residual sanitiser, and the state of New York mandates UV and chlorine disinfection on all spray pools in that state.

## The residential market

Rochelle says that UV is starting to break into the residential market but that until recently, UV systems for residential applications were cost prohibitive.

"Now, through innovative designs, component cost reductions, and substantial product volume, UV systems are within the reach of existing and new pool owners," he says.

"Domestic UV systems costs are on a par with salt systems and are sized by flow rate (pump size), not the capacity of the pool or pond."

Maintenance of the system needs to be considered. Rochelle says for residential low pressure UV systems, you'll need to clean the quartz tube every six to nine months, and replace lamps every 9000 hours or 13,000 hours, depending on which type of lamps are being used.

In Australasia, Trident UV is distributed by CSN Global who also sells the product in Europe.

Craig Nimmo from CSN says that up until recently, UV has only really been used around the world for large commercial pool sites.

"The technology has been well accepted for many, many years in this application," he says. "Particularly because of its effectiveness at killing dangerous bacteria such as Crypto and Giardia which chlorine struggles to eradicate. In the past, the high cost of UV systems pretty much made them out of the question for domestic and smaller commercial sites

"This is no longer the case with smaller, lower cost units now specifically designed for these smaller applications coming onto the market."

But Nimmo says that so far, domestic and semi-commercial takeup has been slow in Australia compared to the rest of the world. One factor, he says, is that Australia's salt market is very mature.

"UV has become a more and more popular method for treating





domestic and semi-commercial pools around the world in recent years but we sell more UV systems into Europe than we do here in Australia," he says.

"Salt and UV are very compatible. In fact it's a great combination. But salt is seen by many in Australia as a total sanitation solution on its own, with no need to consider a two-tiered approach. I personally feel a layered approach to sanitation is a great way to go and that concept certainly seems to be gaining more popularity around the world."

# Fighting chloramines

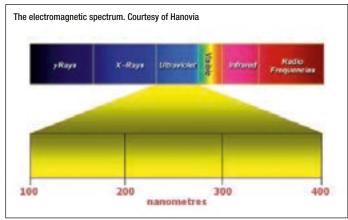
Graham Smith is the national sales manager with Fluidquip, the Australian distributor for Hanovia UV systems for commercial swimming pools.

Smith says that UV radiation is being used increasingly to destroy harmful combined chlorine (otherwise known as chloramines) and to act as an additional disinfectant barrier to complement the role played by free chlorine in swimming pools.

"Importantly, both UV and free chlorine have a role to play in the disinfection of pool water," Smith says.

"While chlorine is very effective in destroying common waterborne bacteria such as E. coli and various strains of faecal coliform, it is relatively ineffective against protozoan parasites such as Cryptosporidium and Giardia, which can readily contaminate a swimming pool via infected swimmers."

These parasites are particularly dangerous and infected swimmers can suffer serious symptoms including severe abdominal pain and diarrhoea. Although it is not common, deaths have been



reported in extreme Cryptosporidiosis cases involving either the very young or very old.

"But UV should only ever be seen as a secondary pool water disinfectant, with chlorine used as the primary disinfectant," says Smith. "This is because chlorine has a very important property which UV lacks – the ability to provide a residual level of disinfectant in the pool water. This means chlorine can remain in the pool water actively combating pathogens at the very moment they are introduced.

"UV on the other hand, can only disinfect the water as it passes through the UV chamber. Once the water has left the chamber, it is available to be re-infected by swimmers when the water returns to





the pool. It is for this reason that most public and municipal swimming pools use UV systems more as a means to destroy harmful chloramines than as a disinfectant."

Chloramines are formed by the reaction of the free chlorine with amine-based substances, most commonly urine. As could be expected, the higher the bather load, the more chloramines are formed and so it is the swim schools, public and municipal pools, hydrotherapy pools and hotel and resort pools that are most susceptible to the formation of chloramines.

"It is predominantly indoor pools that suffer the most for two reasons," he says. "First, indoor pools lack the ventilation available to outdoor pools - no matter how effective the ventilation system in an indoor pool, it is never going to rival the ventilation capacity of an outdoor pool. Second, outdoor pools have a source of UV light available to them, free of charge for many hours most days of the week during summer - it's called the sun!"

### The basics of UV

UV light is a component of sunlight. It falls in the region between visible light and X-Rays in the electromagnetic spectrum between 100nm and 400nm in wavelength.

UV light in itself can be categorised even further into four separate regions:

- Far UV (or "vacuum") 100nm 200nm
- UV-C 200nm 280nm
- UV-B 280nm 315nm
- UV-A 315nm 400nm

"UV-B and to an even greater extent, UV-C are the most important UV regions for disinfection and dechloramination," says Smith.

"These regions are however, significantly filtered out by the Earth's atmosphere so outdoor pools need to be exposed to the sun's rays for many hours a day to realise the same benefits achieved by only a few seconds exposure to UV light in a UV chamber."

The chamber is where the UV light is produced by a lamp – the water passes through and is disinfected. Smith says the most effective chambers are those that utilise "medium pressure" UV lamps.

"This is because these lamps selectively produce a broad spectrum of light in the most effective UV-B and UV-C regions of the spectrum. So called 'low pressure' lamps produce only a single wavelength at 254nm, which is relatively ineffective in destroying chloramines."

# Forget superchlorination

Smith says that one of the advantages of UV is that you can forget superchlorination by concentrating on "availability".

He says that pools with combined chlorine levels stubbornly above two or even three milligrams per litre (otherwise known as 'parts per million' or 'ppm') can reduce this to a level well below one ppm in a matter of hours after a UV system is switched on. This then means the pool no longer has to rely on superchlorination in order to bring down chloramine levels.

"No longer having to superchlorinate means chlorine usage is reduced and the pool is more available to swimmers. Some swim school owners have reported increases in patronage of up to 30 per cent once word gets around that the pool water and the air inside the pool hall is virtually free of what swimmers call the horrible chlorine smell - which of course is the chloramine smell."

It also means the pool is more available for patronage because superchlorination no longer interrupts opening times; and it also means staff members are much happier and healthier in an environment with less chloramines in the air.

"It is also important to realise that chloramines are very corrosive," says Smith. "Removing chloramines from the pool atmosphere reduces corrosion of iron and steel structures within the pool, including ventilation ducts and roof supporting girders, thereby significantly reducing long term and ongoing maintenance costs.'

Smith says that UV for commercial pools is a significant investment, but it is worth the expenditure. It will cost in the vicinity of \$15,000 dollars for a top quality UV system alone. Often installation costs (depending on the layout of the plant room) may run to \$10,000, so an investment of \$25,000 or more can be expected.

Secondly, annual electricity costs and yearly maintenance (including yearly UV lamp replacement) may run at approximately \$5000 per annum.





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However, the benefits of a healthier, cleaner environment with much less chloramines; less chlorine usage; less down-time and increased patronage makes it a worthwhile consideration.

The benefits are best experienced in indoor commercial pools with high bather loads.

# Stepless is peerless

Tim Batt from Tim Batt Water Solutions handles Seimens UV equipment for commercial swimming pools.

He says that Siemens firmly believes and has proven that 'medium pressure' UV is the best system to use for both chloramine removal and disinfection in pool water.

He says this is because with their very broad UV light spectrum, medium pressure lamps can:

- Target all forms of chloramines which require widely different light wavelengths for their most effective destruction;
- Excyst encysted organisms and parasites (like Crypto and Giardia) effectively, leaving them open to destruction by chlorine;
- Prevent photo-reactivation of the DNA of bacteria and organisms that can occur with low pressure UV light in recirculated systems;
- Be automatically varied in lamp output, according to bather demand and water quality, to save energy, prolong lamp-life and reduce chlorine consumption;
- Effectively target combined chlorine while not dramatically reducing free chlorine levels.

He also says that systems that can steplessly vary lamp output according to demand and water quality are 25 per cent to 50 per cent

"Generally, low pressure UV lamps may be better suited for residential applications while medium pressure models typically are designed for large commercial installations. The distinction can be chalked up to cost, flow requirements and the ability to destroy chloramines."

more energy efficient than systems that use manual adjustment of lamp output, while also improving chloramine removal.

Additionally, by steplessly increasing lamp output over time, as the lamp ages, the system is dramatically more efficient than systems that change output in steps or manually, therefore saving energy and prolonging lamplife further.

By automatically being able to run low output at night – or turn it off altogether without reducing lamplife – the systems will save energy and extend lamplife further. Batt says a 9000-hour lamplife expectancy can often be extended to 12,000 hours or even 15,000 hours as a result.

Batt also recommends multi-lamp chambers, as they spread the UV energy more evenly throughout the water flow for the most efficient UV penetration and best results.

Additionally, if one UV lamp fails the others will ramp up their output to compensate.



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# Improving air and water

Jeff Boynton is the Director of Sales and Marketing for Delta Ultraviolet Solutions, a division of French company Bio-UV. Delta systems are supplied by in Australia by Western Australian company Aquatic Leisure Technologies.

Boynton says that with frequent reports in the USA about recreational water illness and bacteria outbreaks, many commercial pool operations are choosing UV sanitation in order to comply with water quality testing parameters and State mandates.

"Some residential pool owners are even turning to UV water treat-



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It's not only residential pools that are benefiting from the public pool technology of UV. Now it is appearing in portable spas as well.

ment for its ease of use, reduced chemical consumption, health advantages and environmentally friendly benefits," he says.

Boynton says that more than 100 years ago, European scientists from different countries discovered the top surface of lake-water was sterile when exposed to sunlight. Investigation led to the discovery of ultra violet light and to the invention of UV bulbs.

In a UV sanitation system, the pool water circulates directly under the exposure of the UV lamp, allowing the radiation to eliminate protozoans, viruses and bacteria.

"UV has gained traction in part because of its ability to eliminate chlorine-resistant microorganisms such as Giardia and Cryptosporidium, which are common causes of multiple pool closures in the US. UV light sanitation is more prevalent in Europe where it has been successfully installed in commercial pools."

He also says there are limited means available to pool operators to reduce chloramines: superchlorination, non-chlorine shocking, ozone, adding fresh water or installing an UV system.

"But prevention and a good filter also go a great way in helping reduce chloramines."

Chloramines are also the leading cause of poor pool air quality at the surface of the pool water and around swimming pools especially in indoor facilities.



Boynton says it's important to determine the correct sizing of the UV unit for the type of pool and its use.

"Basically there are two different types of UV lamps: a low-pressure high-output lamp, which emits UV rays only at 254 nm; and a medium pressure lamp which emits UV rays between 200-600 nm.

"Generally low pressure UV lamps may be better suited for residential applications while medium pressure models typically are designed for large commercial installations. The distinction can be chalked up to cost, flow requirements and the ability to destroy chloramines."

Boynton says that due to their large light spectral (200-600 nm), medium pressure lamps more effectively reduce the health problems caused by chloramines such as nitrogen trichloride.

He says when selecting a UV unit, these are the key things to consider:

- Wattage: compare the wattage needed to attain good flow treatment. The wattage consumption between different products varies. Also, you will save more with a system that has an electric ballast which prolongs the life of the UV bulb and uses less energy.
- Spare parts/maintenance: Ask about spare parts pricing which varies by manufacturer. And be sure to ask about required maintenance costs. Consider the number of bulbs in the system. Some UV systems

may require substantial maintenance and require servicing for the warranty.

• Cost/Payback: As well as the obvious health benefits of UV water treatment using less chemical and providing a safer bathing environment, UV systems can also pay for themselves. Depending on many variables including water quality, the bather load, the facility's filter system and installation, the return on investment could be less than one year.

# Spas using UV

It's not only residential pools that are benefiting from the public pool technology of UV. Now it is appearing in portable spas as well.

Sister brands Jacuzzi and Sundance Spas are factory-installing UV systems as an optional extra to the water treatment on all of their hot tubs and portable spas.

Dubbed the Clearray system, Sundance says the addition of UV-C disinfection to the water treatment means spa owners may end up using only half the amount of spa sanitising chemicals, leading to less skin and eye irritation for bathers from chlorine- or bromine-based products.

For supplier information go to www.splashmagazine.com. au and check the Water Treatment section of the Blue Pages online trade directory.

A Delta-E40-300 unit



Delta UV L



# The Master of the Road

Renault's latest redesign of its Master van range is set to sell big in Australia, and Diesel editor, Paul Matthei finds it could be a good option for pool shops, pool techs and some tradies.

Renault has seemingly left no stone unturned during the latest redesign of its Master van range, of which 100,000 units have been sold in Europe in its first 13 months on sale. I attended the local launch and found the company's Australian arm brimming with confidence that the product will have a similar impact in this country. On first impressions, it seems entirely plausible.

The 2012 Master van range for Australia comprises four models: medium and long wheelbase bodies with the same mid-height roof, powered by a 2.3 litre four-cylinder diesel engine coupled with either a six-speed manual or Quickshift automated transmission. Both transmissions are essentially the same apart from the robotised clutch and gearshifting equipment on the latter.

The new Euro 5 compliant 2.3 dCi engine features a variable geometry turbocharger which aids in the delivery of 107 kW of power at 3500 rpm and 350 Nm of torque between 1550 and 2750 rpm, representing gains of 19 kW and 50 Nm respectively over the previous Master. The transversely mounted engine drives the front wheels through a standard six-speed manual or optional Quickshift automated transmission which has the same number of ratios.

In the combined cycle fuel economy stakes, Renault claims Quickshift equipped versions use 8.5 litres/100 km while their manual counterparts consume 9.0 litres/100 km. This equates to respective CO2 emissions of 226 and 238 g/km.

Both versions are fitted with a gearshift indicator to help drivers maximise fuel economy. Having a prodigious fuel tank capacity of 105 litres endows the manual version with a range of over 1150 km while



Quickshift units can cover more than 1230 km on a tankful.

As part of a strategy to reduce operating costs for its customers, Renault has adopted more long life and maintenance free components in the new Master range. For example, there is a fitted-for-life timing chain, longer lasting coolant (now 60,000 km or four years), 20 percent increased thickness in brake pads and clutch linings and a zero-maintenance particulate filter for the exhaust system.

Turning to suspension, at the rear are single-leaf springs backed by long polyure-thane bump stops that are designed to aid ride comfort when heavy loads are being carried. The front suspension features MacPherson struts with an anti-roll bar as standard to counteract body roll.

Steering is accomplished by a rack and pinion arrangement providing 3.76 turns lock-to-lock and a kerb-to-kerb turning circle of 13.6 metres for mid (3682 mm) and 15.7 metres for long (4332 mm) wheelbase variants.

As for external dimensions, respective overall lengths are 5.5 and 6.2 metres, while other measurements including overall height of 2.5 metres and width between mirror tips of 2.47 metres are common to both.

Riding on 6.5 J16 rims shod with 225/65 R16 tyres, all variants have a gross mass of 3.5 tonnes comprising a tare weight of 1.9 tonnes and a payload capacity of 1.6 tonnes. Maximum front and rear axle loadings are



1.8 and 2.1 tonnes respectively and the braked trailer weight limit is 2.5 tonnes.

### In the hold

Cavernous is the best word to describe the new Master cargo hold with medium and long wheelbase versions sporting 10.3 and 12.5 cubic metres of room respectively. The rear barn doors – available either glazed or unglazed – open through 270 degrees for easy forklift loading and a glazed steel bulkhead incorporating an Australian Standards compliant cargo barrier is standard kit. The rear door opening measures 1.6 metres in width and 1.8 metres in height.

A width of 1380 mm between wheel arches provides ample room for a standard Australian pallet, of which the MWB can accommodate two and the LWB three due to their load floor lengths of 3.0 and 3.7 metres respectively. Other cargo box dimensions include a width of 1.7 metres, height of 1.9 metres and a loading sill height of 550 mm.

Both vehicles can take a standard pallet









through the sliding side door aperture which is 1.2 metres wide and 1.8 metres high. All variants come with a near side sliding door as standard while an offside sliding door – again either glazed or unglazed – is optionally available direct from the factory.

Renault says that relocating the spare wheel underneath the vehicle has increased the amount of space available, and that the doors and access to the cargo area have been improved.

On the safety front, new Master features the latest technology ABS with EBD (emergency brake-force distribution), ESP stability programme and ASR traction control, the latter two ensuring sure-footed stability when braking or cornering and minimal wheel slip under hard acceleration when heavily laden. Also worthy of note are twin airbags, cruise control with speed limiter, multi-function trip computer and rear parking sensors. Optionally available is a reversing camera with the screen niftily grafted into the driver's sunvisor.

A driver's head and thorax airbag is also an option.

Drivers will notice 'snowflake' and 'kg' buttons on the dash of Quickshift models. When selected, the snowflake switch prompts engagement of second gear for improved take-off in slippery conditions while the kg button optimises clutch actuation mapping for smoother progress through the gears when fully loaded.

### Interior

New Master features a car-like driving position with increased space behind the compact vertically set steering wheel which is adjustable for height but not reach.

Manual air conditioning is standard, with automatic climate control available as an option.

The cab sports an extra 57 mm in length over previous versions, much of which provides greater legroom for the driver and passengers.

The driver's seat has a wider and longer cushion and comes standard with a left armrest. A fully adjustable suspension seat is available as an option. Ideal for drivers who cover long distances, it can be adjusted to suit the driver's weight (from 40 to 130 kg), offers a choice of cushion angles, and comes with pneumatic lumbar adjustment and an adjustable headrest.

Careful attention has been paid to cab soundproofing to enhance the driving experience. According to Renault, the bulkhead and twin mass-damping flywheel on the engine both help to keep unwanted vibration from entering the cab interior, particularly at low engine speeds.

When it comes to in-cab stowage locations, the new Master has a veritable plethora including:

- Full-width parcel shelf above the windscreen;
- Upper dashboard compartment to hold a laptop and/or A4-sized documents;
- Large oddments tray above the glove box;
- Mobile phone holder with 12 volt socket for charging, coin holder and holder for business cards and car park tickets, all within easy reach of a seated driver;
- MP3 player holder close to a second 12 volt socket, with audio connectivity;
- Four drink holders and a removable ashtray;
- A 7.6 litre cooled glove box with optional climate control that holds two 1.5 litre bottles;
- Capacious door bins with internal dividers and space for a 1.5 litre bottle;
- Numerous trays for items such as keys, gloves, etc.

And if all that still isn't enough, an optional Convenience Pack provides a large storage compartment under the double passenger seat, a 12-volt socket in the rear load area, additional driver and passenger door storage, sunglasses holder above driver's door and a lid for the upper dashboard storage tray to hide the laptop from prying eyes.

Another innovative feature is the swivelling tabletop which pivots round to face the driver mounted on the fold down centre seat back. It includes an adjustable tray specially designed for a laptop computer. The table can be also used as a writing desk and incorporates two cupholders and space to store stationery.

An optional satellite navigation system by TomTom is located above the rear view mirror in order to minimise dash clutter. It features a large adjustable 5.8 inch colour screen and is controlled via a portable remote control with a dashboard clip. TomTom functions include guidance, speed-camera locations, speed limits, over speed warning signal, alternate route guidance and web updates via an SD card.

Renault claims clinical tests provided very positive results in terms of the satellite navigation screen's visibility in this new, elevated position. The screen can be swivelled so it is visible to all occupants.

Pricing for the new Master starts at \$43,990 for the mid-wheelbase manual through to \$47,490 for the Quickshift-equipped long wheelbase variant. Metallic paint is a \$1000 option.

The vehicles come with a three-year/200,000 km warranty – which includes 24 hour roadside assistance – and have a service interval of 15,000km/12 months, whichever occurs first.



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