2020 Filter Models

ATLAS® PCT SERIES

"Backwashable"

REGENERATIVE PRECOAT FILTERS

Issue V.03 (August 2020)

Preamble

- Precoat filtration uses a **replaceable filter aid** to form a microscopic barrier capable of providing **single pass performance** with a particle retention in the order of **1 to 2 micron**.
- The history of **precoat filtration spans more than 60–years**. It was first used as an efficient and compact means to provide healthy drinking water for the USA Army. It was subsequently used to provide crystal clear pool water for Hollywood's movie industry.
- Today, **Regenerative Media Filters (RMF)** are widely used by many different industries. These filters appear in many different forms and types.
- For swimming pool use, the benefits of Regenerative Precoat Filters **are many and varied**. They are very compact filters with high surface area and **high process efficiency**. The washwater consumption of precoat filtration is lower than many other common forms of filtration. A "lower water" use also means lower "re-heat" and lower chemical costs. From a public health perspective, the ability of precoat filtration to physically remove chlorine resistant pathogens is arguably the largest single benefit.
- This short presentation is devoted to the PCT series filter, as used for **Australian swimming pools** of all sorts and sizes.

Introduction

Atlas® filters incorporate proven design principles and patented features:

Australian Patent # 884743
Australian Patent # 779548
Australian Patent # 769441
Australian PA # 2002307807

- Internationally, Atlas® PCT filters have been widely used **for more than 50-years.** Atlas® product design is **proven & long standing.** It has also been widely recognized with covered awards like the SABS Design Award, the GQM Quality Quality Award and the 9th International Technology Troughy.
- **The first Australian-made Atlas® filter** was installed in 1998 at the Esperance Aquatic Centre (WA) supplied and installed by Walter J Pratt Pty Ltd
- There are now more than **800 assorted PCT presently in service** throughout Australia. Projects include high-profiled "state" aquatic centres, "private" Learn to Swim centres, Municipal and Regional facilities, as well as many older "upgraded" facilities.
- The **conceptual product design** of Atlas® PCT filters is distinct from other filter brands that use precoat filter technology, differently.
- Atlas® PCT filters are differentiated by their **backwash method**, their **construction materials** (stainless steel) and their **place of manufacture** (Australia).
- The key attributes of Atlas® PCT product design are **high process efficiency, straight-forward installation, and operational simplicity.**

Australian-Made

A local filter purchase provides many tangible benefits for pool Owners, all levels of government, the aquatic industry, and potentially, all Australians.

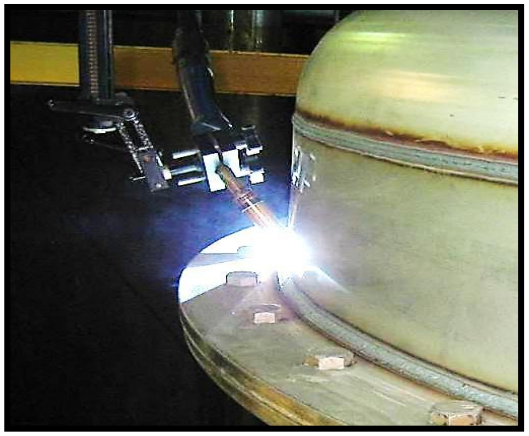
With Australian-made product, "filter delivery" is insulated from any potential risk or exposure associated with imported product.

There are many compelling reasons to favour Australian-made products. Here are just a few :-

- ✓ You will keep money, profits, and taxes **within the Australian economy.**
- ✓ You will help to **maintain a local manufacturing base** that retains much needed skills (& jobs) within Australia.
- ✓ You will be taking advantage of **home grown expertise.**
- ✓ You wont need to concern yourself with any issue related to an overseas purchase.
- ✓ You will be buying products **built to Australian Standards.**
- ✓ You will have convenient and **local access** to answers and service.

Maximum benefit applies when PCT filters are supplied and installed by accredited "mainstream" PWT contractors.

Construction Materials



- ATLAS® PCT filters are **expertly manufactured** from marine Grade 316L Stainless Steel in accordance with Australian Standards & current best practice guidelines.
- The corrosion and abrasion resistance of Gr 316L (UNS 31603) is **not reliant upon any applied coatings.**
- Historically, protected carbon steel filters are only as good as the life and the effectiveness of an **applied internal coating.** Potential issues can include uneven coating thickness, lack of surface bonding, pinholes, and erosion due to high velocity "hot-spots".
- Composite Fiberglass filters of all types and brands will **progressively "age"** over time due to factors not limited to temperature and service pressures.

Why Stainless Steel

Benefit	Fact	Comment
Longevity	A stainless steel filter will typically meet the lifetime needs of a project. The typical service life of a stainless steel filter is 50-yrs. or more. The durability and the longevity of stainless steel makes it cost effective and affordable.	Over a 50-yr period, it would be reasonable to expect that filters made from protected carbon steel and or fiberglass, would need to be replaced at least once. The cost of this equipment replacement is significant.
Recyclable & Sustainable	Stainless steel id 100% recyclable with no reduction in quality. Due to the high value of its various alloys, recycling stainless is very cost effective . Stainless steel is sustainable due it is reduced use of valuable resources.	The end-of-life recapture rate for stainless steel is extremely high *. Stainless steel filters offer the dual benefit of being cost effective and green.

* The International Stainless Steel Forum (ISSF) reports the recapture rate of stainless steel to be 92%

Green Star Capability

The **longevity and the sustainability** of stainless steel filter shells is only part of the story. The benefits of Regenerative Media Filtration (RMF) are also a means to gain valuable **Green Star** points. These submissions commonly make reference to the following:-

1. **Superior process efficiency** – RMF has a unique particle selective (1-2 um) that is up to five times greater than conventional sand filter. This high process efficiency significantly reduces the Chemical Oxidation Demand (COD).
2. **Compact filter vessels,** requiring less floor space.
3. **Smaller Balance Tank and Backwash Detention Tanks,** due to reduced washwater consumption.
4. **Reduced mains water consumption** – even with blow-down (bleed) for TDS control, the RMF process will use up to 70% or more.
5. **Lower washwater disposal costs.**
6. Substantial **energy savings,** due to reduced heat loss and lower re-heat costs.

PCT filters are cost effect and GREEN

Product Design

Industrial product design is a **complex matrix** that considers the needs and wants of various stakeholders, not limited to the Purchaser, the Operator, the Maintenance Staff, and even the filter Manufacturer.

In the words of the Dieter Rams (renowned product designer and retired academic)……

"Good design is always the simplest possible working solution"

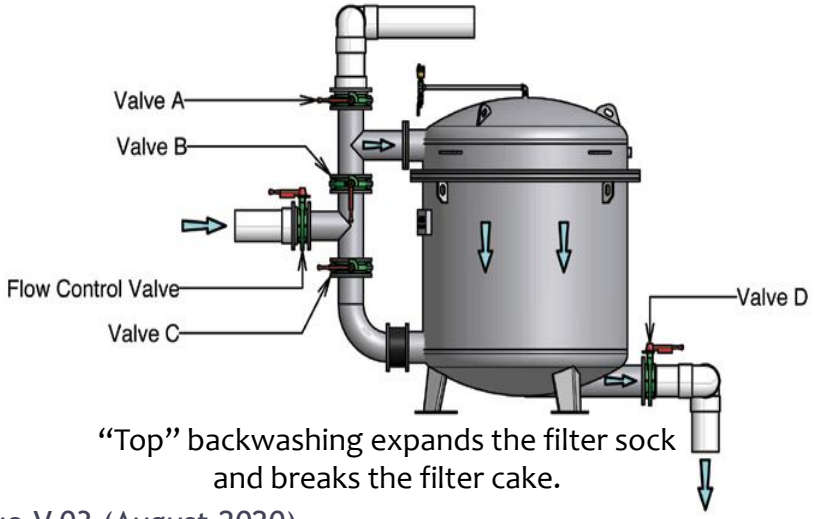
The product design for PCT filters recognizes Dieter Ram's premise by focussing on fundamental and functional requirements. The unique "pillars" supporting PCT design are:-

1. A "**backwashable**" filter, which will provide progressive dilution to help to manage TDS.
2. A **simple precoating method** that can be easily and quickly repeated by the pool Operator.
3. Large diameter**, rigid filter candles** providing "optimal" surface area.
4. "Old-School" **candle spacing** with a generous & consistent gap between adjacent filter candles
5. The ability to periodically **replace the filter socks** that retain & maintain an effective filter cake.
6. A **simple installation**, which doesn't require any complex pneumatics or sophisticated controls.

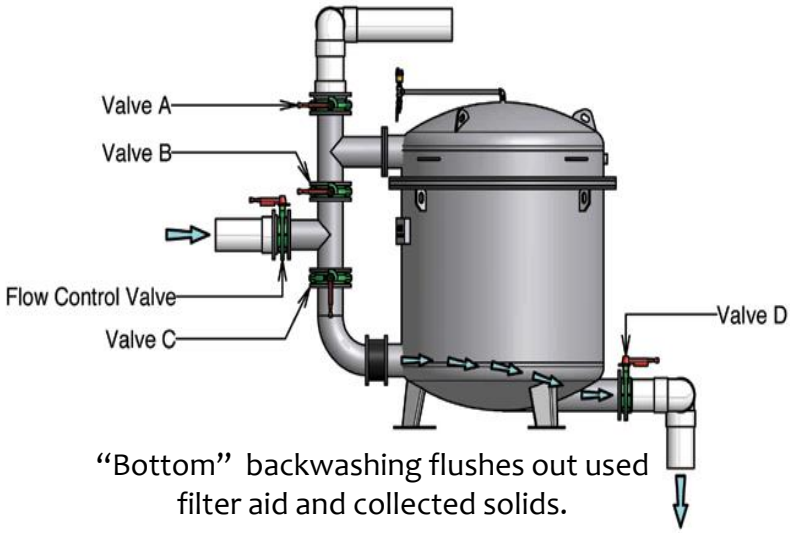
Backwashable

DESIGN ATTRIBUTE # 1

- The **lowest possible washwater consumption** is NOT a relevant or valid attribute for swimming pool use. Australian Standard (AS-3979) for example, insists upon the use of a **backwashable** filter**.**
- Water loss by periodic backwashing is a **positive attribute** that will help to contain TDS to manageable limits. High TDS levels can interfere with the basic requirements for adequate chemical oxidation.
- Even with regular "monthly" backwashing, the potential "water" savings when using PCT filters remain significant.
- PCT filters are backwashed with a very **simple and easy-to- understand BW process**….only a few valve changes are required.
- With reverse flow backwashing, you get **a cleaner filter, much faster, and a lot easier.**



"Top" backwashing expands the filter sock and breaks the filter cake.

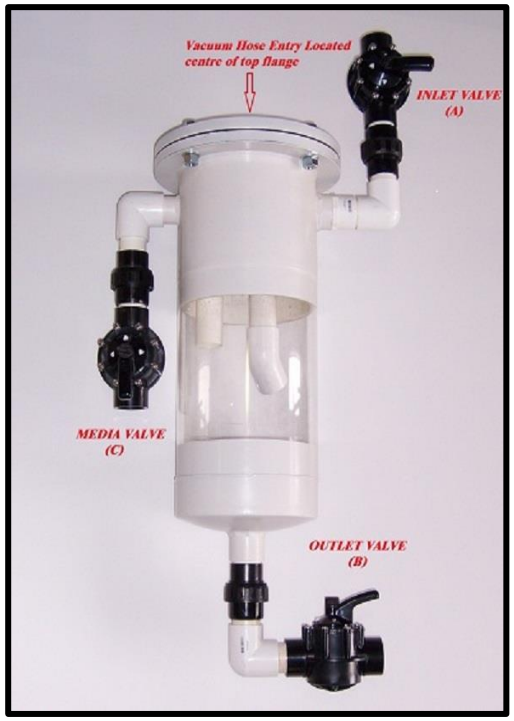


"Bottom" backwashing flushes out used filter aid and collected solids.

Precoat Method

DESIGN ATTRIBUTE # 2

"Wet-Vac" Flash Mixer

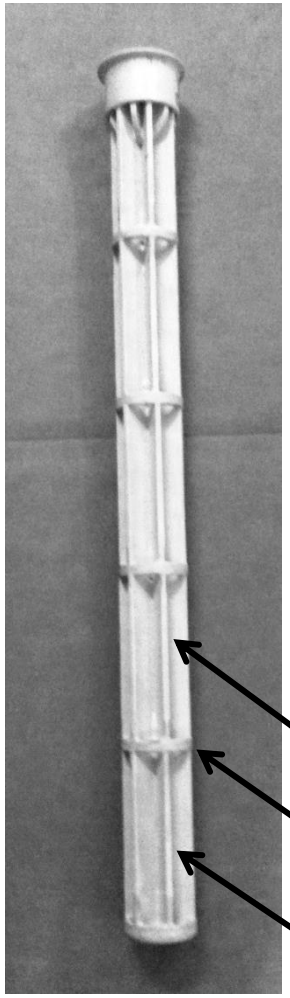


Single pass precoating with a WET-VAC system is simple and highly efficient process that saves you time and money.

- The filter candles in your PCT filter are covered with a **precision engineered** "tight weave" fabric, which is specifically designed for **single pass precoating.** (Refer to Design Attribute # 5)
- **Single Pass Precoating** is the simplest and quickest means to precoat your filter.
- With the WET-VAC system, **you don't need to drain the filter**, before starting a precoat operation. Draining the filter is not always possible and it usually takes considerable time to complete.
- The WET-VAC system is a "dustless" easy-to-use process. It also provides **high process efficiency** with the filter aid being introduced as a pre-mixed **wet slurry.**
- **WET-VAC systems** include a see-through flash mixer and a shop-vac assembly c/w suction wand.
- You could establish a PCT "filter cake" with **closed-loop precoating**, BUT the need and the effort for this alternative method would not provide any tangible, technical benefit.

Filter Candles

DESIGN ATTRIBUTE # 3

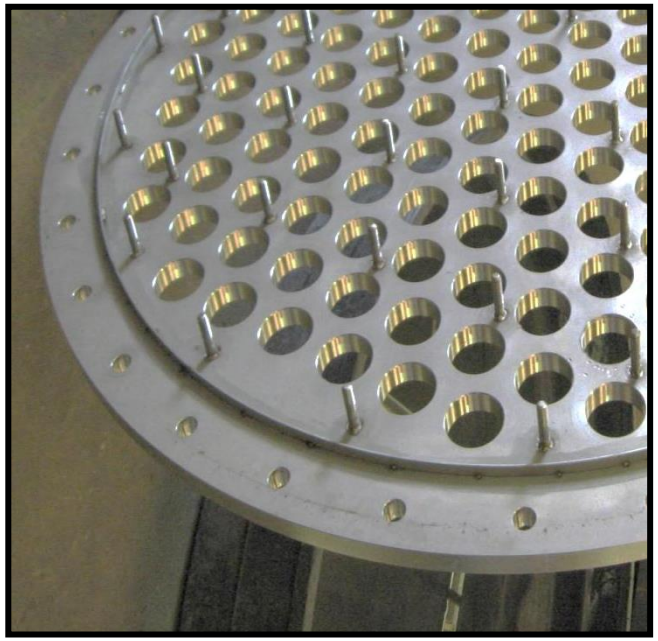


- PCT filter candles are injection moulded from heavy-wall **ABS engineering plastic.** They are strong and totally non-corrosive.
- **Rigid filter candles** are not susceptible to high water streams within the filter. They will hold their design location and not "flay" around.
- PCT filter candles are available in **different core-lengths.**
- The use of a **fewer number** of **larger diameter filter candles** provides many functional benefits.
- Other product designs, using substantially smaller diameter candles (or tubes) can have **up to 4 times more candles/tubes.** The PCT design philosophy is to use the fewest number of parts and products that are necessary for efficient operation.

PCT Filter Candles.....less is best!

Candle Spacing

DESIGN ATTRIBUTE # 4



Typical PCT TUBE PLATE with "old school" candle spacing.

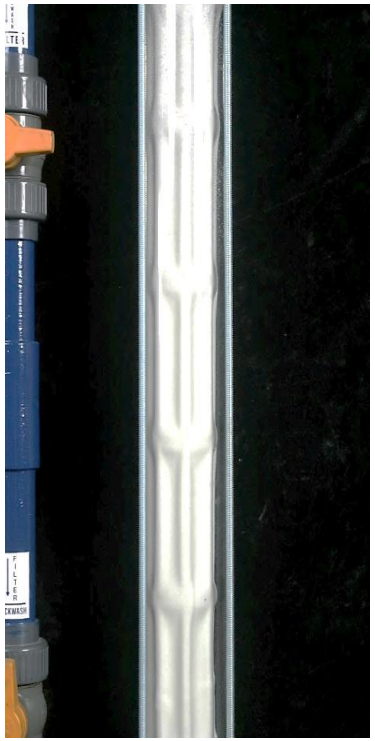
- PCT filter candles are **generously spaced** to mitigate potential "bridging" of the filter cake. When the filter cake bridges between adjacent candles, the total effective filter area is proportionately reduced.
- The PCT candle spacing provides a **balanced and more effective** media loading.
- With a triangular pitch of 82.3 mm. the **gap between individual filter candles is 32 mm approximately**!!! This is many times greater than allowed in many overseas Standards.
- Due to its low candle density, PCT filter vessels are marginally larger than other options. This is doesn't not impact on **required plant space** and or the **vessel cost.**

The "Upflow" velocity inside a PCT filter is proportionately lower than a smaller filter vessel having the same/similar filter area. The rigid PCT filter candles are also held firmly in place, whereby they are unaffected by high velocity water streams contained within the filter.

Filter Socks

DESIGN ATTRIBUTE # 5

Compressed State



When in a "filter" mode, the filter cake compresses around the rigid core moulding.

Relaxed State

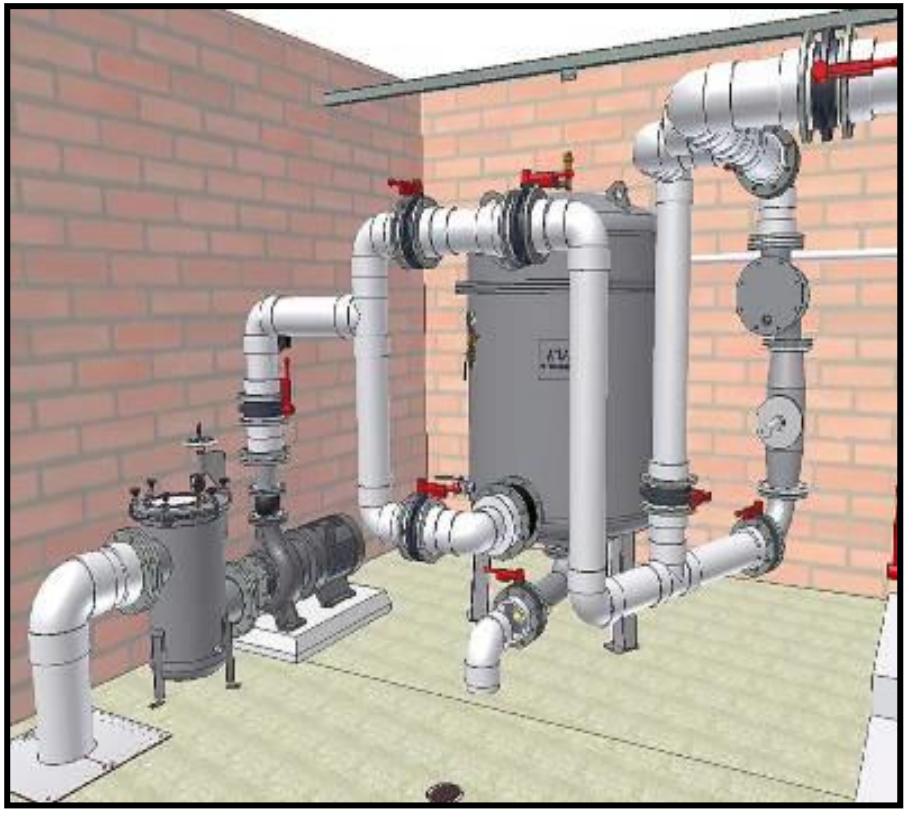
When "regenerated" the filter sock relaxes and expands. When in a "pressure backwash" mode the filter sock expands under pressure to break and expel collected solids & the used filter cake.

- Despite the many benefits of **single pass precoating,** the tight-weave fabric used for this process "works" a lot harder than the closed loop precoating method.
- Periodically PCT filters will need a "sock replacement". This is **a simple task** and a **comparatively small cost** when considered in terms of the products Life Cycle Costs. With other filter brands, you may ultimately need to replace the complete candle, not just its outer covering.
- Fitting new filter socks will effectively restore your filter to its **original as-new condition.**
- Atlas PCT filters are NOT simple "static cake" precoat filters. The filter sock that fits over the supporting candle core, works **"dynamically".**

The dynamic movement of a PCT filter sock over a rigid candle core is a different and novel method.....truly worthy of its patent!

Filter Installation

DESIGN ATTRIBUTE # 6



- ✓ The installation of an PCT filter requires comparatively **simple plumbing connections**.
- ✓ You **do not require any special expertise** with automatic control loops, complex electrics and or pneumatics.
- ✓ The **PCT design uses the fewest moving parts** necessary to achieve an efficient outcome. No air compressor and associated plant is required.
- ✓ PCT filters are comparatively **simple to operate and easy to maintain.**
- ✓ The design simplicity of PCT filters also simplifies plant operation and maintenance requirements.

A final word

- PCT product design is based on **science and proven case history**. Without compromising any of its design "pillars", PCT product design is constantly assessed and refined according to a needs vs. benefits analysis.
- Some recent product improvements like viewing panels (2010), replaceable tube plate fixings (2011) and Monofilament filter socks (2012) are obvious. Other refinements relating to the manufacturing process are less obvious, **but nevertheless equally important**.
- Whilst a water saving certificate may seem impressive, it does not seemingly recognize that swimming pool treatment is different. **Some pool water loss is essential** for the management of Total Dissolved Solids.
- With a complex operating system, the filter plant is vulnerable to possible technical glitch and even failure. PCT filter design recognizes the benefits and **the need for simple but efficient operation.**
- With some product designs, sophisticated controls and complex process steps are a necessity. These controls do not exist for any convenience or technical advantage. They exist due to the particular value judgements made by their product Designers. In some cases these designs are a carry-over from other industries, whereby a **low reject waste stream** is highly desirable. This attribute is not particular relevant to a swimming pool.

Go back to Page 6.....good design is all about "less is best" using efficient solutions, which are simple, understandable, and easily maintainable.

PCT Product Range

2020 Filter Models

Manufacturing Code	Model No	Nom Filter Area (m2)	Min Flow (m3/hr)	Max Flow (m3/hr)	BW Flow (l/sec)	Wash Water (m3)	In/Out Flanges (mm)	Nom Ceiling Height (mm)
686-900x120	PCT75	7.5	19	37	10	1.5	80	2200
686-1100x120	PCT100	10	25	49	14	2.0	100	2600
850-1100x120	PCT150	15	38	73	20	2.5	100	2700
1026-900x150	PCT200	20	50	98	27	3.5	150	2400
1026-1070x150	PCT250	25	63	122	34	4.0	150	2800
1208-1070x150 (1)	PCT300	30	75	147	41	5.0	200/150	2850
1208-1070x150 (2)	PCT350	35	88	171	48	6.0	200/150	2850
1408x1220x200	PCT450	45	113	220	61	7.7	200	3000
1470-1220x200	PCT550	55	138	269	75	9.0	200	2875
1662-1275x225	PCT650	65	163	318	88	11.0	200	2850
1662-1400x225	PCT750	75	188	367	102	12.5	200	3100
1810-1500-250	PCT900	90	225	440	122	15.0	250	3200

This standard product listing provides broad choice for almost every conceivable application. Other custom-made filter models are available upon request

Photo Gallery

- For sound reason, PCT filters are the most common and widely used precoat filter in Australia
- PCT filters have an impressive service history in Australia spanning over 20-yrs.

Close

CHADSON ENGINEERING PTY LTD was established in 1966 and has been actively involved in the design and manufacture of commercial swimming pool filters for over 50-yrs.

We are excited by the inclusion of Regenerative Precoat Pressure Filters into our existing range of granular sand filters. We are also excited by the potential to expand our current manufacturing capability to best serve the needs of the Australian pool market.

Pool filtration can be a complex topic with many options and choices. If you are designing a new system, considering a filter replacement, or just unhappy with the performance of your existing plant, contact us today. We will gladly provide case history, engineering details, and technical data, which will help you make the right choice.

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