

Progressing commercial products; adding sterilisation potential

Recommendation

Speculative, Strong BUY

Price

\$4.00

Valuation

\$20

Industry

Water treatment, air purification and surface sterilisation.

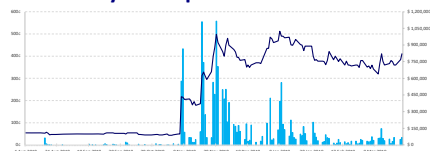
In their half year report, PO3 advised :

- The FRG unit has been further developed
 - Reduced energy consumption;
 - Smaller size; and
 - Lower cost.
- Jim Heath, after 27 years at Stryker, the last 7 as division president for instruments, has been appointed as an adviser, to leverage his deep knowledge of hospitals.
- Sales are expected from the recreational water sector late in Q3; air purification has been tested and further due diligence with other OEMs is in progress.
- Instrument sterilisation is a new market with significant potential, though PO3 still needs to develop this concept.

Snapshot

Market Cap	\$125m
Cash held	\$7.3m
	(net of payables)
Shares on Issue	31.4m
52 Week High	\$5.12
52 Week Low	38c
1 month / 6 month VWAP	\$3.72 / \$3.36

PO3 : daily share price v. value traded



PO3 has the exclusive global right to commercialise technology developed by the Detroit based research company, Somnio Global relating to the use of its Free Radical Generator (FRG).

The FRG produces a range of Reactive Oxygen Species, including the hydroxyl radical (OH.), superoxide radical (O₂⁻), oxygen radical (O.) and the ozone molecule. The ROS break open cell walls to destroy moulds, bacteria, viruses and also neutralise certain gases and Volatile Organic Compounds.

The FRG plasma agglomerates particulates, such as smoke, dust and pollen so they can be removed by a simple filter.

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FRG unit developed over last half year – smaller, lower cost, less energy

Somnio Global, the technology owner, has further developed the FRG unit

- Smaller, so that it can fit into consumer products more easily;
- Less energy, to be more attractive to Original Equipment Manufacturers and consumers; and
- Cheaper, to be able to sell more units at a better margin.

Jim Heath joins; introduced by Mr William Parfet

Bill Parfet has been a Director of Stryker Corporation, which develops and manufactures medical technologies, including orthopaedic implants, powered surgical instruments and other hospital equipment.

Jim Heath worked for Stryker for 27 years, the last 7 as president of its instruments division, growing sales from \$1.2B to \$1.8B.

Jim has agreed to be retained as an adviser to PO3, to assist PO3 to leverage of Jim’s deep and extensive network of hospital contacts, and to open up the use of the FRG for instrument sterilisation.

New potential market for instrument sterilisation

Jim Heath described to the PO3 Board the significance of sterilisation, particularly in the surgical environment and its implication on Hospital Acquired Infections. Beer & Co believes that the FRG technology has significant potential, both technically and commercially; as an indication, the market value of Nanasonics (NAN.ASX), is \$1.4B, with NPAT of \$10.6m over the last 12 months.

Beer & Co affirms our Speculative, Strong BUY recommendation on PO3

Beer & Co believes is now significant upside potential to our \$20 valuation :

- Quicker and further penetration into the valued segments due to the knowledge and experience of Bill Parfet and Jim Heath; and
- Potential for sterilisation of medical / surgical instruments.

Beer & Co will wait until for some results before factoring these into our valuation.

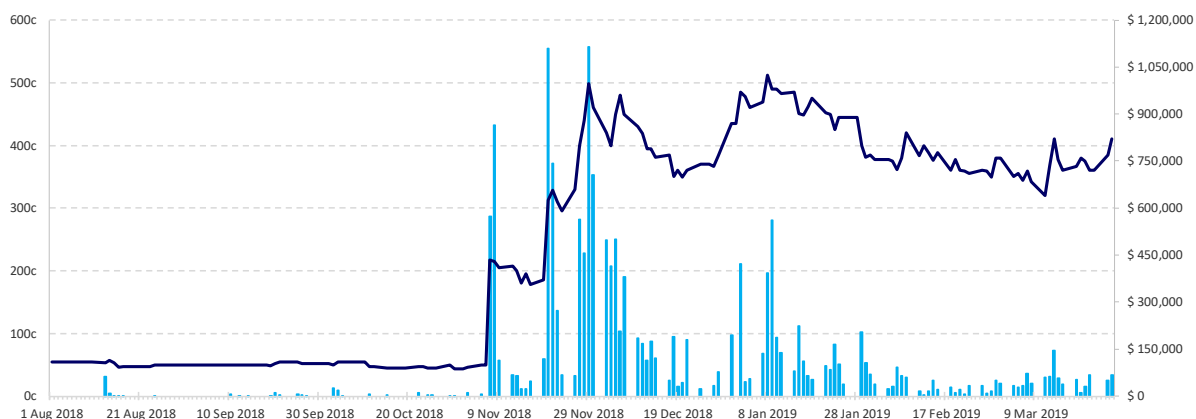
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Products developed for markets

PO3 Half Year Report

Figure 1 shows that the PO3 share price rose strongly following the placement to Bill Parfet, the Michigan billionaire who invested at nearly 5x the then share price for a 15% stake. The share price and volume have drifted since then.

Figure 1 : Purifloh share price and turn-over, last 8 months



Source : CommSec, Beer & Co

In their Half-Year report, PO3 stated that the company would announce to the ASX information that is deemed to be both material and appropriate.

In their Half Year report, PO3 updated the market on developments in the FRG technology and also its potential commercialisation

PO3's Half Year report covered :

- Outcomes from the February 2019 Board meeting in Detroit; and
- Updates on both technology and commercial developments.

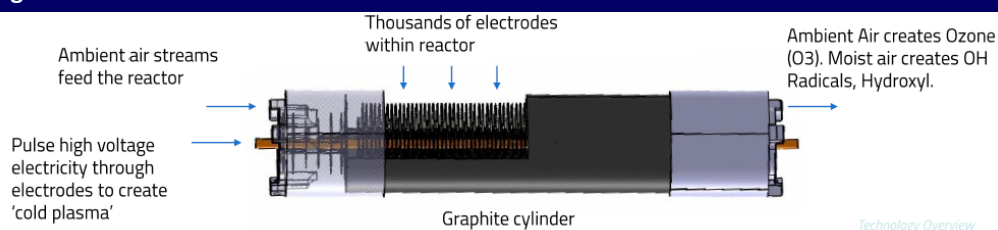
The report contained many newsworthy items but, in Beer & Co.'s view, the market missed them all due to the volume of general noise at the time of the half year report.

FRG technology enhanced

FRG unit further improved

Figure 2 shows a picture of the Free Radical Generator Unit.

Figure 2 : Free Radical Generator unit



Source : PO3 Presentation

The unit has been improved by Somnio Global to be :

The FGR unit is now smaller and uses less power

- Smaller, so that it can fit into consumer products more easily;
- Less energy, to be more attractive to Original Equipment Manufacturers and consumers; and
- Cheaper, to be able to sell more units at a better margin.

FRG technology enhanced

PO3 (or rather Somnio Global, the developer of the FRG technology) have expanded their claims for FRG technology, increasing the range of Reactive Oxygen Species (“ROS”) it is able to produce, to include

The FRG is able to destroy

- Mould, bacteria and viruses;
- Harmful gases; and
- VOCs

- the hydroxyl radical (OH.);
- superoxide radical (O₂⁻.);
- oxygen radical (O.); and
- the ozone (O₃)molecule.

As shown in Figure 3 below, these are all among the most highly oxidative species known; more than more commonly used agents, which are in grey in Figure 3.

The ROS are short-lived species due to their imbalance, seeking a further oxygen atom to become stable. In doing so, they break open the cell walls of micro-organisms such as :

- Biological – Allergens, Mould, Viruses, Bacteria;
- Harmful Gases – Carbon Monoxide, Nitrogen Dioxide, Ozone, Radon;
- Volatile Organic Compounds (VOCs) – Formaldehyde, Toluene, Pesticides, Propane, Butane.

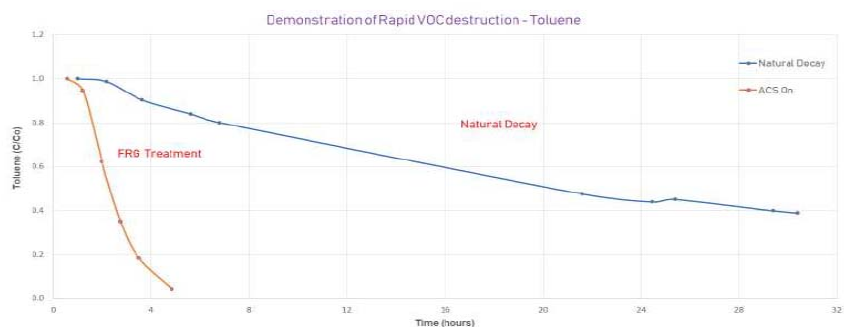
Figure 3 : Strength of ROST

Compound	Oxidation Potential (volts)
Fluorine	3.06 v
Hydroxyl radical (OH)	2.80 v
atomic Oxygen (O)	2.42 v
Ozone (O3)	2.07 v
Hydrogen Peroxide (H2O2)	1.77 v
Permanganate (KMnO4)	1.67 v
Chlorine oxide	1.50 v
Chlorine (Cl)	1.36 v
Bromine (Br)	1.09 v
Iodine (I)	0.54 v
Oxygen (O2)	0.40 v

Source : Wikipedia, Beer & Co

Figure 4 shows the FRG performance on VOCs.

Figure 4 : FRG impact on Toluene (a VOC)



Source : PO3 Half Yearly report, February 2019

The short life minimises danger to people.

The FRG system delivers a double treatment where the cold plasma created within the reactor is itself a powerful destructive force whilst also acting to agglomerate the smallest particulate matter. This enables the system to extract from the air :

- Smoke (see Figure 1 of Beer & Co.’s 13 December 2018 note for a demonstration of the FRG impact on tobacco smoke);
- Dust; and
- Pollen.

PO3 is undertaking trials of the unit in India.

The results have been delayed for a range of reasons :

- **India;**
- **Test design;**
- **Conditions in the test ward.**

Somnio Global, the technology developer, advised the PO3 Board that its testing of some competitor technologies had not generated either

- **the results claimed; or**
- **results as good as Somnio believes the FRG has been able to demonstrate.**

India

On 29 November PO3 announced it was about to start a one-month trial of the air purifier at the Government General and Chest Hospital in Hyderabad. At its AGM on 30 November, PO3 confirmed that the trial is to start in early to mid December, and results were expected about a month later.

PO3's half-year report provided the first update on this trial since the statement at the AGM.

Some of the delay is attributed to the trials taking place in India, a location remote to Somnio Global's base in Detroit, which caused greater difficulty than anticipated with the trials taking longer than expected.

The more significant delay was due to the difficulty in establishing baseline contamination. The Government Chest Hospital in Hyderabad, India, proved to have a complex environment which resulted in delays in establishing baseline contamination.

Initial results from the pilot tests showed high levels of other organisms including aspergillus (mould) and bacteria, along with the target Mycobacterium Tuberculosis.

The aspergillus mould does not necessarily cause disease, though it can be dangerous to patients with weakened immune and respiratory systems, so the FRG's likely ability to destroy the mould will be an added advantage to improving the hospital environment.

While this has caused delays in conducting the actual tests, PO3 expects that it will result in a more powerful result as PO3 expects the FRG unit to eliminate the mould as well as the TB.

After these tests, which are for one month, have been completed, a further test, expected to take 3 to 4 months, at the dedicated inpatient Tuberculosis ward at Bhaskar Medical College in Hyderabad.

Potential Competitors

In their financial report for the half-year ended December 2018, PO3 reported on a meeting of the Board held in Detroit which included presentation by Somnio Global's technical leadership group.

The development team continuously analyses competitor claims and a comparative analysis was presented to, reviewed and discussed by, the PO3 Board. The analysis indicated that some claims by potentially competing products were difficult to verify.

At the conclusion of this, the PO3 Board reported that it was convinced of its ability to present a unique and superior commercial product to the growing market.

Commercialisation Progressing

PO3 is looking to commercialise the FRG technology in 3 areas in the near to medium term :

- Recreational water;
- Air purification; and
- Surface sterilisation.

In the medium to longer term, there are other sectors that PO3 believes the FRG technology will be able to be applied, including :

- General water treatment; and
- Sterilisation of medical and dental instruments.

Recreational water

Figure 5 shows that this segment is the smallest in terms of Beer & Co.'s valuation. However, this segment has low barriers to entry, both in terms of regulation and market access, and so represents good for potential short term cashflow.

Somnio has constructed a domestic pool to demonstrate the impact of the FRG technology

The issues for product development are :

- Regulatory – ensure there is no escape of any of the ROS generated by the FRG
 - This has been achieved
- Reliable and consistent performance across differing pool sizes;
- Easy to install, maintain and use; and
- Compact size.

Field tests are to follow.

PO3 believes that it will be able to present a total solution to the recreational water market.

Somnio has installed a prefabricated 54m³ swimming pool (a very typical size; 8m by 4.25m by 1.5m average depth) in its facility and has started testwork, as a prelude to field trials which will proceed in mid-year as the warmer weather approaches in North America.

This is consistent with the projection for first sales, of 2019 Q3, given in PO3's November 2018 presentation and at Figure 1 of Beer & Co.'s 20 November 2018 research update.

PO3's Detroit based Director, Steve Annear, reports that he trialled an early stage FRG system in his own pool and was satisfied with the outcomes of the trial.

Indoor Air

Air conditioning units perform poorly at air purification and incorporating an FRG unit creates a high end range that is particularly suited to Asian cities. The FRG unit can also be incorporated into the ducts of ducted systems, as installed in commercial premises, to purify the re-circulating air.

Successful trials have been held with Original Equipment Manufacturers.

PO3 reported that a series of trials were completed with one of the US market leaders, under a Non-Disclosure Agreement (NDA) in September 2018. The FRG system performance exceeded the requirements of that customer and PO3 is in discussions with this group.

Further trials are being held.

PO3 stated, in its Half-Year report, that it plans to develop multiple options for licensing the technology into the air purification portable unit sector and due diligence activities are ongoing with some parties while PO3 continues to seek introductions and discussions with other OEMs in this sector.

Large multinational OEMs are methodical in their approach to new technology so cash generation will not happen quickly. However, they will :

- Leverage existing global markets, distribution and marketing, as well as well-known brand names, facilitating a rapid ramp up when commercial production starts;
- Ensure protection of Somnio's IP and product quality; and
- Assist design improvements in the FRG system due to their deep industry and customer insight.

Surface Sterilisation

Somnio has commenced prototype work, guided by a clear set of performance criteria which have been derived from discussions with a number of industry players. The fundamental technology in this sector is the same as that for air purification. By increasing / managing moisture levels, the unit will be able to ensure a high proportion of the more powerful hydroxyl ion.

Further Potential

Jim Heath

PO3 has retained Jim Heath as an adviser.

In its Half Year report, released to the ASX on 28 February 2019, PO3 advised that it had appointed Jim Heath to advise on and assist with the commercialisation of the FRG technology within the medical sector.

Jim Heath has concluded a 27 year career with Stryker Corp, which is about the largest supplier of hospital equipment.

Background

Mr Heath worked from Stryker Corporation for 27 years. Stryker Corporation is an NYSE listed company, based in Kalamazoo, Michigan, with a market capitalisation of US\$ 73B, which is larger than any ASX listed company, other than BHP and CBA (and RIO if the LSE listing is included).

Stryker Corp has 33,000 employees and revenue in 2018 was US\$ 12.9B for operating profit of US\$ 2.063B.

The market cap of Stryker Corp is larger than any ASX listed company, other than CBA and BHP (and RIO)

Stryker manufactures and distributes implants used in joint replacement and trauma surgeries; surgical equipment and surgical navigation systems; endoscopic and communications systems; patient handling and emergency medical equipment; neurosurgical, neurovascular and spinal devices; as well as other medical device products used in a variety of medical specialties.

Before joining Stryker, Jim Heath taught history and economics at Notre Dame High School in Detroit, from 1978 to 1981, and then followed this with a Master's Degree in Sports Administration from The Ohio State University, while serving as a member of the Ohio State University football coaching staff. He left to be an Assistant Football Coach at New Mexico State University in Las Cruces, NM and then the Head Coach in Football and Baseball at Kalamazoo College, Michigan, in 1985, while Assistant Professor of Physical Education.

Jim began with Stryker in 1988 as a sales trainer with Instruments. Throughout his career, Mr. Heath progressed through a range of sales and general management roles, culminating in his appointment as President of the Instruments division in 2008.

During his six-year tenure as President, division sales grew globally from approximately US\$ 1.2 billion to US\$ 1.8 billion.

Jim Heath spoke about the potential for instrument sterilisation.

Instrument Sterilisation Potential

Mr Heath discussed with the PO3 board sterilisation and sanitation issues within wards, operating theatres and hospitals in general. He also described the significance of the issue of sterilisation of medical equipment, particularly in the surgical environment and its implication on Hospital Acquired Infections.

In Beer & Co.'s view, the FRG technology should work well in this sector, due to the range of and strength of its Reactive Oxygen Species, as shown in Figure 3.

The FRG technology has significant potential compared with existing technologies employed.

The dominant method for cleaning instruments is by the use of an autoclave, which is basically "cooking" instruments under pressure with an elevated temperature. This has impacts on

- Where instrument sterilisation is carried out, with used instruments to be transported to usually the basement, and then back again;
- The instruments need to be made of materials that will cope with pressure and temperature;
- Instruments need to be designed to avoid little "nooks and crannies", which offer small areas that are not exposed.

Beer & Co.'s view is that, using the FRG technology, Somnio Global will be able to develop a unit that it is :

- Compact in size;
- Low cost to operate;
- Easy to operate, near where they are used, rather than in a specialised area;
- Effective on all materials, rather than just specialised materials, enabling instruments to be made of lower cost materials.

An Indication – Nanosonics (NAN.ASX)

NAN markets a unit for the sterilisation of ultra-sound units with the active component being Hydrogen Peroxide (H₂O₂), which Figure 4 shows is highly reactive, but less than the ROS generated by the FRG.

NAN report total sales to date of 19,310 units in a total market believed to be about 120,000 units. Revenue over the last 12 months was reported as \$A 71.2m, of which \$44.2m was from consumables, and NPAT over the last 12 months was reported as \$A 10.6m.

The market valuation of NAN is about \$A 1.4B.

Conclusions

Beer & Co.'s base case remains \$20/share

As shown in Figure 5, Beer & Co.'s base case valuation of PO3 remains \$20/share, which is about 5x the current share price.

Beer & Co.'s base case, risked, valuation is \$20/share.

This is more than 5x the current share price.

Beer & Co sees significant upside potential to our valuation

Figure 5 : Beer & Co valuation of PO3

discount rate = 12.0 %		30 June 2018			18-Mar-19
AUD m	risk :	100%	Product	per share	
Air Purification					
USA	35 %	266	93	\$A 2.8	\$A 3.0
Japan / Korea	25 %	287	72	\$A 2.1	\$A 2.3
Europe	25 %	65	16	\$A 0.5	\$A 0.5
Middle East / Other	10 %	78	8	\$A 0.2	\$A 0.3
Water Sanitation (Pools)					
USA	40 %	65	26	\$A 0.8	\$A 0.8
Australia	40 %	5	2	\$A 0.1	\$A 0.1
Europe	25 %	31	8	\$A 0.2	\$A 0.2
Surface Sterilisation					
USA	12 %	1,607	193	\$A 5.7	\$A 6.2
Europe	10 %	1,546	155	\$A 4.6	\$A 5.0
Japan / Korea	10 %	667	67	\$A 2.0	\$A 2.2
Corporate					
franking credits	40 %	0	0	\$A 0.0	\$A 0.0
Corporate	100 %	(7)	(7)	(\$A 0.2)	(\$A 0.2)
Equity raisings	100 %	11	11	\$A 0.3	\$A 0.2
Cash / Debt	100 %	(1)	(1)	(\$A 0.0)	(\$A 0.0)
TOTAL		4,621	642	\$A 19.1	\$A 20.6
Shares on issue		27.3m	F P O share	0.0m	Options
		6.3m	to be issued	0.0m	exercised

Source : Beer & Co projections

Significant upside potential to Beer & Co.'s valuation

There are 3 areas in which Beer & Co sees the potential for valuation upside :

- Progressive de-risking;
- Greater penetration into target markets; and
- Other segments.

Progressive de-risking

Figure 5 shows Beer & Co.'s valuation involves a significant risk factor applied to the projected cashflows. While Beer & Co is encouraged by the impact that Bill Parfet and Jim Heath are able to bring to PO3, we will wait until we see some results before mitigating the risk.

Greater penetration into target markets

Figure 6 shows Beer & Co.'s estimate of the relevant market size and Beer & Co.'s guess of the penetration achieved by the FRG technology. It shows very low assumed penetration in the larger segments, which suggests significant upside from good execution.

Figure 6a : Penetration of new units

	New Units			
	First Sale	Quarterly growth	by 2033 sales	share
<u>Air Purification</u>				
North America	October 2020	0.02 %	172,000	0.7 %
Asia	July 2021	0.05 %	279,125	1.9 %
Europe	October 2021	0.02 %	89,550	0.7 %
Other	March 2028	0.02 %	66,500	0.3 %
<u>Water Sanitisation</u>				
North America	Sept. 2019	0.30 %	64,559	16.4 %
Australia	Dec. 2019	0.50 %	5,675	28.4 %

Source : Beer & Co projections

Figure 6b : Penetration into installed units

	Installed Units			
	First Sale	Quarterly growth	by 2033 annual sales	penetration
<u>Air Purification</u>				
North America	January 2021	0.02 %	169,503	0.3 %
Asia	January 2022	0.05 %	237,250	0.8 %
Europe	January 2022	0.02 %	27,950	0.2 %
Other	June 2028	0.02 %	65,823	0.1 %
<u>Water Sanitisation</u>				
North America	June 2020	0.30 %	211,189	10 %
Australia	Mar. 2020	0.50 %	18,667	14 %
Europe	Mar. 2021	0.30 %	31,099	8 %
<u>Surface Sterilisation</u>				
North America	Sept. 2020	0.01 %	21,100	14 %
Asia	Sept. 2021	0.01 %	18,630	14 %
Europe	June 2021	0.01 %	9,750	12 %

Source : Beer & Co projections

Sterilisation Potential

Beer & Co is hopeful that the FRG technology will compete effectively against both autoclaves and other technologies that treat instruments not able to cope with the heat and pressure.

However, Beer & Co will not include any of this potential in our valuation as it is too speculative at this time given that is presently only a concept and Somnio Global has not developed a prototype at this stage.

Other

The FRG can also be applied to other areas of water sanitisation, but Beer & Co has given no value to this segment in which there are many other potential technologies.

Concluding Comments

Beer & Co affirms our Speculative Strong BUY recommendation.

Instrument sterilisation has the potential to have a value of much greater than \$1B.

Which would more than double our valuation

Beer & Co retains a Speculative Strong BUY recommendation on PO3

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The author of this report owns Purifloh shares in his SMSF.

Analyst Certification

The analyst responsible for this research report certifies that all of the views expressed reflect his personal views about the securities and the issuer.

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Beer & Co Recommendation

Beer & Co provide general recommendations only and do not consider the specific interests of the recipient of this report. Beer & Co generally provides a 2 part recommendation and both need to be considered together.

Recommendation : Beer & Co.'s investment recommendation is driven by the difference between our base case, risked valuation and the share price at the time. A Strong BUY recommendation means a very large difference (eg. over 100%), while BUY means a significant difference and Accumulate means a small, but positive difference. The recommendation is not independent of the uncertainty in Beer & Co.'s valuation; the greater the degree of uncertainty, the greater the difference between price and value required for a positive recommendation.

Risk : Risk relates to the potential, over the long run, for an investor to lose money; it is a function of both the difference between our base case valuation and the uncertainty in our valuation due to the degree of estimation and/or uncertainties about project execution. Speculative means a high chance of loss; High risk means a good chance of loss and medium means some chance of loss, given the company size.

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