fortcem
ADVANCING MATERIALS TECHNOLOGY

sCMT

sustainable Cementitious Materials Technology

PRESENTATION

EXECUTIVE SUMMARY

Fortcem Pty. Limited was incorporated in November 2017 with the main objective being to produce newly developed proprietary formulations which, when combined with fly ash, will substitute for Portland cement thereby creating a new high performance, cost effective and sustainable cementitious material.

This new formulation named "**sCMT**" (sustainable Cementitious Material Technology) will provide flexibility in its application through enhanced levels of control over setting times as well as a greater workable temperature ranges from below zero to over 50° Celsius and which will also be capable of setting underwater - be it sea or freshwater – without the addition of exotic or expensive admixtures.
Additionally, *sCMT* and the resultant cement mixtures are non-toxic in use and possess anti-corrosive properties when set. *sCMT*-based cements outperform an equivalent preparation of Portland or current 'Green' cements on all metrics.

To date Portland cement has been the world standard cement and the constant used in all construction activities and because of the prevalence and processing requirements, has contributed enormously to greenhouse gas emissions. Fly ash is an industrial waste product of the coal fired power station industry. In using fly ash together with *sCMT* a near carbon-neutral product is formed.

The inventor of *sCMT*, also a co-founder of Fortcem Pty. Limited, has spent the past 36-years in the cement industry perfecting his technology and is considered to be one of the world's foremost experts in cement and cementitious material development.

Validation and compliance tests are presently being conducted which will result in *sCMT* achieving the necessary minimum standards and required certification for use in building and construction. The Company's early results show that *sCMT* far exceeds the minimum performance characteristics prescribed by current and future International standards for cementitious materials. This new technology will use in excess of 90% fly ash, a small amount of water and *sCMT* - the proprietary compound of the company.
Fortcem has engaged patent expertise and has provisional patent protection for its initial *sCMT* formulation in the USA and Australia enabling entry into proof of concept projects and targeted supply agreements and construction programs.

These successes enable Fortcem Pty. Limited to immediately establish key markets in its current subsidiaries in the USA (Fortcem USA Inc.) and Australia (Fortcem Aust Pty. Ltd.), and in future subsidiaries in other countries to bring sCMT technology to the world.

Given the unique characteristics and adaptability of the technology, it is the strong belief of the cofounders that *sCMT* will establish its own new and unique industry applicable to all markets, be it high rise construction, civil engineering projects, commercial and residential developments, architectural elements, aviation, military, transport, aerospace, underwater and other special case uses including aesthetic bathroom and kitchen products.

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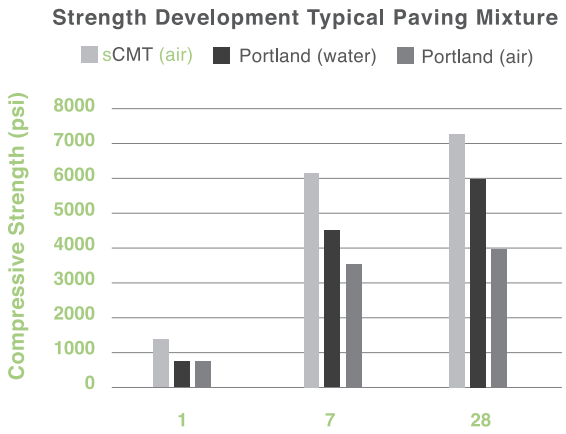
sCMT - AT A GLANCE

Fortcem Pty. Limited proprietary sCMT formulations leverages the inherent characteristics of fly ash to offer the following benefits compared to Portland cement:

- Utilises fly ash in excess of 90% - an industrial by-product of coal burning
- *sCMT* constitutes only 5% of the mortar inclusive of water requirements, relieving a significant cost associated with Portland cement
- Fly ash requires no additional processing, refinement or additives apart from *sCMT*
- *sCMT* utilises current industrial available materials which are also available in volume
- The most 'green' cementitious technology – near carbon neutral footprint or 100% carbon embodiment.

SUPERIOR STRENGTH DEVELOPMENT

- Double the strength of Portland in 24 hrs
- 50% higher strength in 7 days
- Meets 28-day design requirement in just 7 days
- Formwork removed well before Portland mixes
- Savings in: Time, Labor, Cost.



REDUCED PROJECT COSTS WHILE USING A SUPERIOR PRODUCT

- *sCMT* formulation may be customised for set times between 15 minute to 4 hours
- Compressive strength achieved in 7 days is that of Portland in 28 days, and continues to develop to double the maximum strength in 28 days
- *sCMT* is more cost effective requiring less water, less rebar, thinner precast, less man-hours and allows more efficient project design compared to Portland.

CHEMICAL CHARACTERISTICS

	sCMT	Portland
Calcium Hydroxide	No Excess	Excess
Alkali Burn Potential	No	Yes
Self Bonding	Yes	No
Chloride Penetration	Resistant	Susceptible
Alkali Silica Reactions	No	Yes
Alkali Carbonate Reactions	No	Yes
High Temperatures	Resistant	Susceptible
Anti-Corrosive	Resistant	Susceptible

DESIGNED FOR ANY APPLICATION

	sCMT	Portland
Cement types needed	Few	Some
Time to use	Designed (thixotropic)	90 mins
Set time	Designed	5-8 hours
Water demand	Low	High
Heat of Hydration	< 60 cal/g	> 60 cal/g
Ambient Temp	< 0 - 55 C	4-50 C
Sets under water	Yes	No
Max compressive strength	> 20,000 psi	~ 9,000 psi

- Lower density and lower heat of hydration – less expansion and heat dissipation during curing while maintaining strength
- sCMT anti-corrosive properties are inherent and provide protection to embedded steel reinforcements and concrete mixtures
- *sCMT* allows setting under non-standard conditions:
  - underwater, fresh or salt water environments
  - temperature ranges below 0 C and in excess of 50 C
- Allows specialised cements formulated for performance critical applications such as aviation, aero-space, military and transport
- *sCMT* surpasses all required international standards for performance, including guidance established for new low embodied carbon cements.
- Cost per tonne is competitive with Portland.
- *sCMT* is a patent protected technology wholly owned by Fortcem Pty. Limited.
- *sCMT* can be adapted to other by-products and waste materials to build a robust patent portfolio.

Global cement production
Responsible for 8% of the world's CO2 emissions

Global cement production reached its peak in 2014 with the production of 4.4 billion t. For the past three years, it has been stagnating on a level of 4.2 billion t per year. If the sector must act now if they want to fulfil the Paris agreement on climate change.

Researchers from the think tank Chatham House claim that cement is the source of 8% of the world's CO2 emissions. If the cement industry were a country, it would be the world's third-largest emitter after China and the United States. It contributes more to total CO2 emissions than aviation fuels (2.5%) and is not far behind agriculture (12%).

On the occasion of the UN climate conference COP24 in Poland, representatives of the cement industry discussed how to fulfil the requirements of the Paris Agreement with regards to climate change. This would mean to lower annual emissions caused by cement by at least 16% until 2030.
Despite well-known durability issues, cement is still the most widely used construction material.

Asia and China have been responsible for the most significant part of its growth since the 1990 ies.
Production increased more than thirty times since 1950, and almost four times since 1990. Between 2011 and 2013, China consumed more cement than the United States in the entire 20th century.
Since Chinese consumption is currently declining, expectations are that tremendous growth will shift to Southeast Asia and Africa – driven by the urbanisation and economic development there.

Research shows that the global area of erected buildings will double in the next 40 years. It is assumed that this will raise cement production by one fourth until 2030. If the sector wants to fulfil the Paris agreement, it has to deal with revising cement production and not only reduce fossil fuels.
It is the process of clinker production – the critical component of cement – which emits the largest CO2 volumes during cement production. In 2016, the global cement production amount to roughly 2.2 billion t CO2.

CORONAVIRUS IMPACT ASSESSMENT

In accordance with the present changing challenging market conditions, the report forecasts have been revised. The market situation is continually being monitored, the latest developments are being tracked, and the most recent data will be provided in the report.
The report will provide three possible scenarios of market development in accordance with how long and how deep coronavirus situation will affect the worldwide economy: optimistic, pessimistic and baseline.

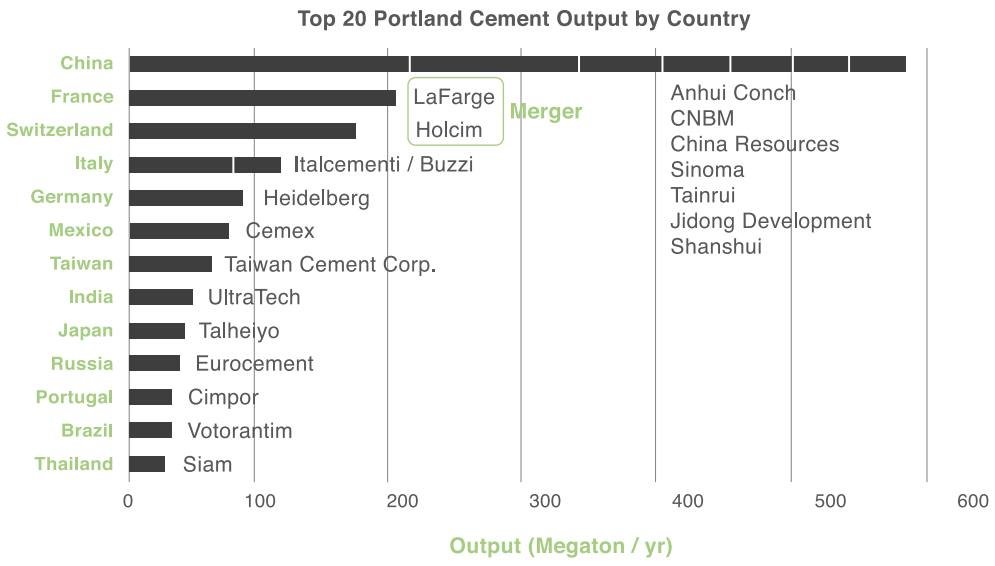
CURRENT MARKET CONSIDERATIONS

The present day worldwide sales for Portland cement exceed US $412 billion and is growing 11% per annum, with 12 major Portland manufacturers servicing the majority global market share.

GLOBAL CEMENT MARKET OVERVIEW

In 2016
4.2bn
metric tonnes produced

Largest Producers
330bn
USD revenue p/a



Government and lobbyist driven 'Green' movement policies and demands for re-purposed, sustainable and carbon reduction initiatives has led to an influx of boutique companies marketing 'green' cement blends introducing much needed competition, albeit, at a smaller scale. In turn, the major players are developing similar alternatives to maintain and expand their market share.

The UAE recently decreed that fly ash compose a minimum of 66% of existing cementitious materials in order to reduce the reliance on Portland cement to maintain an active leadership on world environmental standards. In these blends, Portland cement is supplemented with fly ash and other ash like wastes, such as steel manufacturing slag or that of incinerated municipal wastes. The proportion of these ashes is small compared to that of Portland required to maintain performance and integrity - in some cases harsh chemical additives are also required. The inclusion of ash is largely a waste reduction measure.

VOLUME MARKETS

- The first truly Green, carbon-neutral, cost-effective cement for suppliers of

  Cement blocks

  Precast panels

  Wet-batch supply *in situ*

- Every continent, every country:
  - has compatible base materials for sCMT
  - **is a target market**

sCMT exploits the inherent cementing properties of fly ash, and proportioned at > 90%, results in a superior performing and cost effective product, as a mortar or in concrete whilst being truly 'green'.

Global fly ash stores are abundant in all continents. Fly ash trading, as a coal fired power station waste management measure, ensures an ongoing base material supply for Fortcem Pty. Limited to fulfil the largest of contracts. *sCMT* is also compatible with current batching plants and cement industry infrastructure.

This enables a measured choice of market entry points and planning for future expansion unbounded by the availability of specialist materials or processes.

Initially, the first projects using *sCMT* will be of sufficient yet modest scope and size to provide an unequivocal "proof of concept". The disruptive nature of this technology will allow Fortcem Pty.
Limited to be uniquely positioned and enter into specialist contracts which only *sCMT* can fulfil, thus establishing it as the new world standard in cementitious material technology.

PATENT PROTECTION AND FUTURE TECHNOLOGY EXPANSION

Fortcem Pty. Limited recognises the increased rate of today's technological advances in all major industries. With this in mind the co-founders place a significant focus on protecting all proprietary technologies and have engaged Watermark Patent Attorneys of Melbourne, Australia for expert direction and guidance in portfolio management.

sCMT for use with fly ash is protected under provisional patent in the USA and Australia. sCMT will acquire world-wide patent protection via the global PTC system enabling Fortcem Pty. Limited to choose its market entry points and apply for full protection on a per country and/or regional basis.

Research and Development will expand the patent portfolio with additional sCMT based technologies that utilise alternate sustainable, renewable and ecologically friendly waste material sources.
With a suite of unique characteristics, sCMT as a 'design for function' material lends itself to patentable specialist and high performance applications through in-house research or third party collaborative agreements. The co-founders have sighted four such applications which will be pursued immediately following incorporating.

In the short term, Fortcem Pty. Limited will develop patentable complementary technologies in automation, remote monitoring, batching and delivery systems. These additional technologies will streamline, support and protect the sCMT core portfolio.

FINANCIAL CONSIDERATION

In the USA, Current Portland cement prices range from $90 – 130 USD per tonne in volume depending on quality. At equivalent performance, *sCMT* with fly ash will attract an estimated 30 - 35% profit margin in volume assuming a $30 USD cost of fly ash per tonne. At present, the price range of Portland cement in Australia is approximately $200 AUD per tonne with industry advising of a current shortfall of supply of as much as 1,000,000 metric tonnes per annum. Current prices for concrete in Australia are approximately $180.00 per Cubic meter.

Proof of concept projects in both the USA and Australia will determine an accurate cost base per unit and profit margin within the current market climate.

Current Portland-Ash substituted cements range from $35 - $350 USD per tonne depending on performance level requirements, the Portland/ash substitution ratio, and the additives required. At the lower cost range where up to 65% Portland is substituted for ash (GBBS – incinerated municipal waste), *sCMT* technology can match material costs and remain competitive. Premium cements, while at a smaller volume, will attract a greater revenue and profit margin as *sCMT* allows the design of superior performance characteristics not yet possible with current cements at significantly lower cost of production.

Self-sustaining revenues streams will be reliant on maintaining competitive pricing and increasing profit margins of *sCMT* by:

- Decreased base-chemical costs of sCMT with increased production over time
- Decreased fly ash costs by volume trading and securing long-term supply agreements with fly ash and base-material producers – fly ash can be obtained at no cost through some channels
- Increased profit margin by incorporating savings gained from reduced project costs into profit margins
- Increased profit margins of premium formulations of sCMT with fly ash for specialised applications

- Use of mobilised batch-process stations for deployment to the project site, where applicable
- Greater supply of *sCMT* through winning larger projects
- Supplying *sCMT* to a diverse range of markets
- Ongoing R&D to refine formulations to lower costs
- Consideration of in-house purpose built chemical production facilities or through acquisition
- Introduction of streamlined production management systems.

ABOUT FORTCEM

- Glenn Schumacher
  Chief Scientific Officer

  Mr. Schumacher has over 36 years' experience within the United States cement and structural materials industries as a developmental chemist, gaining expertise within government, private sector, and start-up based companies and projects. Mr. Schumacher is considered one of the world's foremost expert in novel hydraulic cement technologies and has successfully developed and been issued numerous patents capable of commercialisation.

  As ***CSO***, Mr. Schumacher will provide direction and insight to project strategies and direct Fortcem's R&D activities with to develop the IP portfolio of the company.

- Sergio Guerra
  Chief Executive Officer

  Mr. Guerra has amassed over 40 years' experience as a lawyer and an entrepreneur in a variety of production and import/export ventures. Mr. Guerra's breadth of legal experience includes company, contract and property law. Similarly, Mr. Guerra has leveraged his legal background to successfully establish business structures and partnerships for revenue generating ventures.

  As ***CEO***, Mr. Guerra will provide direction to Fortcem's incorporation, legal matters and business development strategies, and oversee the day to day running of company matters.

- Matteo Molinari
  Chief Financial Officer

  Mr. Molinari has worked for some of the largest and lucrative European banks and financial institutions. Mr. Molinari is highly experienced in utilising financial strategies and instruments at the global level for company investment and financial management matters.

  As ***CFO***, Mr. Molinari will provide direction to the Fortcem's financial strategy, and oversee contract negotiations, and develop external investment strategies.

- Tommaso Galli
  Chief Marketing Officer

  Mr Tommaso Galli is an electronic engineer, with 10 years of experience in the cyber security sector.
  From 2015 he began to deal with online marketing and social media communication, playing leading roles in the communication team of political groups and corporate groups.
  He is also an entrepreneur and has founded numerous companies in many sectors, including real estate, tourism, nutraceuticals, venture capital and publishing.

  As ***CMO***, Mr Galli will "provide direction" for the communication and market positioning strategy of the company and its products.

USA Corporation Inc.
1108 Barkwood Court
Linthicum Maryland 21090

fortcem.com

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