



## SOR Nanocube Printable Memory Presentation

WESTERN AUSTRALIA, Perth, Jan. 31, 2020 – The Company is pleased to distribute a presentation made to “PRINSE 2020” held at the centre of global Printed Electronics innovation in Oulu, Finland. The international event hosts 300 leading industry participants from around the world, while offering an excellent setting for networking and matchmaking. Approximately 50 industrial companies present with the goal to facilitate collaboration with printed electronics experts from global industry leaders.

The Nanocube technology is being developed with the University of New South Wales, Product Engineers based in Sydney and experts based in VTT Finland. The data storage technology is physically printed onto surfaces (glass, plastics) introducing electronic memory to materials where industry standard silicon chip technology cannot go.

The Company has received encouraging early stage feedback on potential co-development options from the attached presentation and will focus on progressing these discussions and the goals outlined within the presentation itself.

**PLEASE SCROLL DOWN TO VIEW  
THE ATTACHED PRESENTATION**

### Strategic Elements

The Australian Federal Government has registered Strategic Elements as a Pooled Development Fund with a mandate to back Australian innovation. Strategic Elements operates as a ‘venture builder’ where it generates high risk-high reward ventures and projects from combining teams of leading scientists or innovators in the technology or resources sectors. Most investors in SOR pay no tax on capital gains from selling their SOR shares as the Company operates under a Federal Government program setup to encourage investment into innovation. The Company is listed on the ASX under the code “SOR”. More information on the Pooled Development Program should be read on the Company’s website at [www.strategicelements.com.au](http://www.strategicelements.com.au)

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# Nanocube Ink Nanomaterial

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Australian Advanced Materials

30 Jan 2020 : PRINSE '20 : Finland

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## Forward Looking Statements

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30/01/2020.





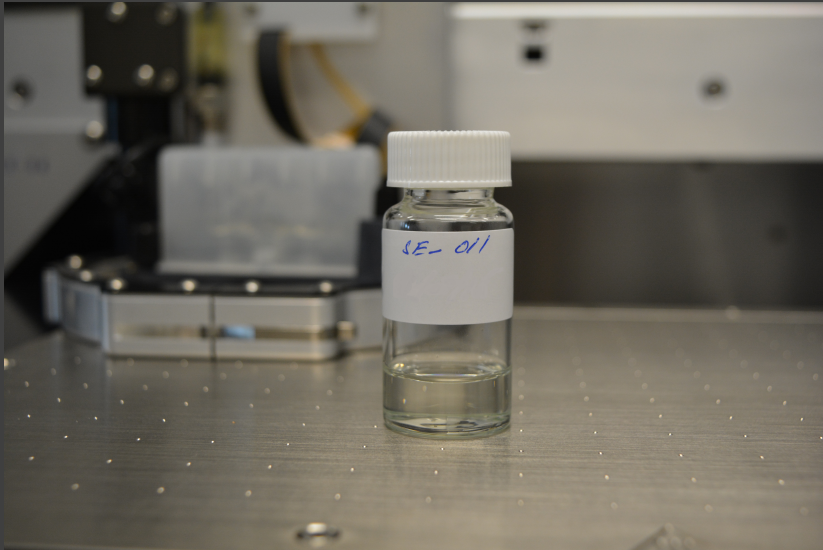
# Australian Advanced Materials

## Team Behind The Technology

- AAM was established to develop and commercialise revolutionary materials technology being developed in Australia. 100% owned by Strategic Elements Ltd.
- AAM licenced the underlying Nanocube Ink technology from the University of New South Wales. Multiple application potential, however most development to date focused on memory/data storage aspects of the technology.
- UNSW is globally recognised as a leading research institution in Materials Science and Engineering. Dr Chu, co-inventor, is recognised for his contribution to oxide nanoelectronics, including RRAM and TFT.
- Research and development work has also been progressed with teams from VTT Finland and the CSIRO Australia. AAM is also a member of PrintoCent in Oulu, Finland.



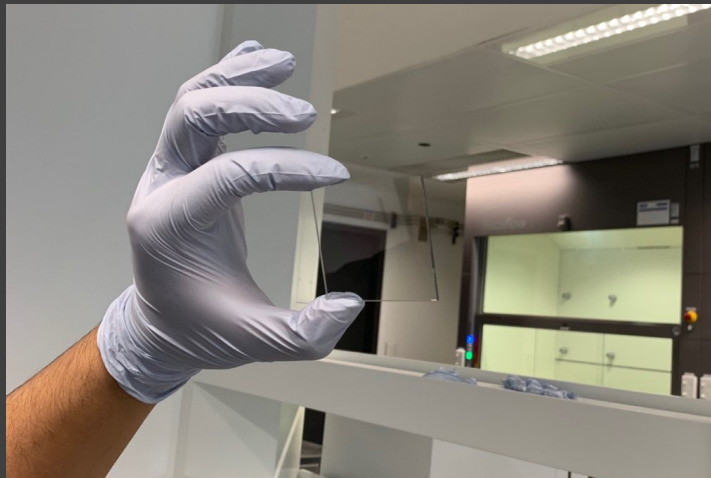
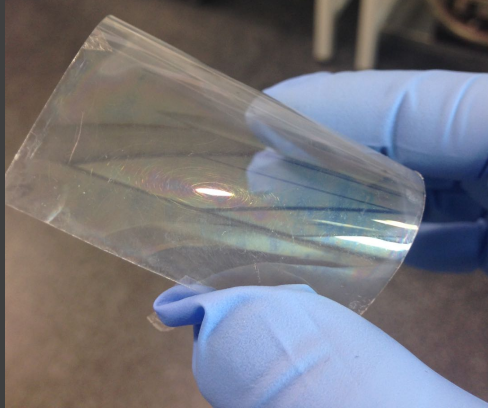
# Nanocube Memory Ink



- The Nanocube Ink technology has **multiple application potential**.
- The first application being developed is a RRAM technology for storage and memory, the **Nanocube Memory Ink**.
- The Nanocube Memory Ink is a transparent ink containing billions of nanometre scale particles. When printed onto a surface and assembled with electrodes they operate as computer memory.
- Current memory technology is restricted to RF sputtering onto more rigid silicon materials in semiconductor fabs. Whereas this technology is a fully printed, transparent memory technology fabricated at room temperature onto non-silicon materials.
- Favourable properties for Printed Electronics applications, particular those that benefit from locally stored data.
- US Patent granted in January 2020 related to RRAM memory and methods of manufacture. Pending patent applications related to further aspects of this technology.



# Nanocube Memory Ink



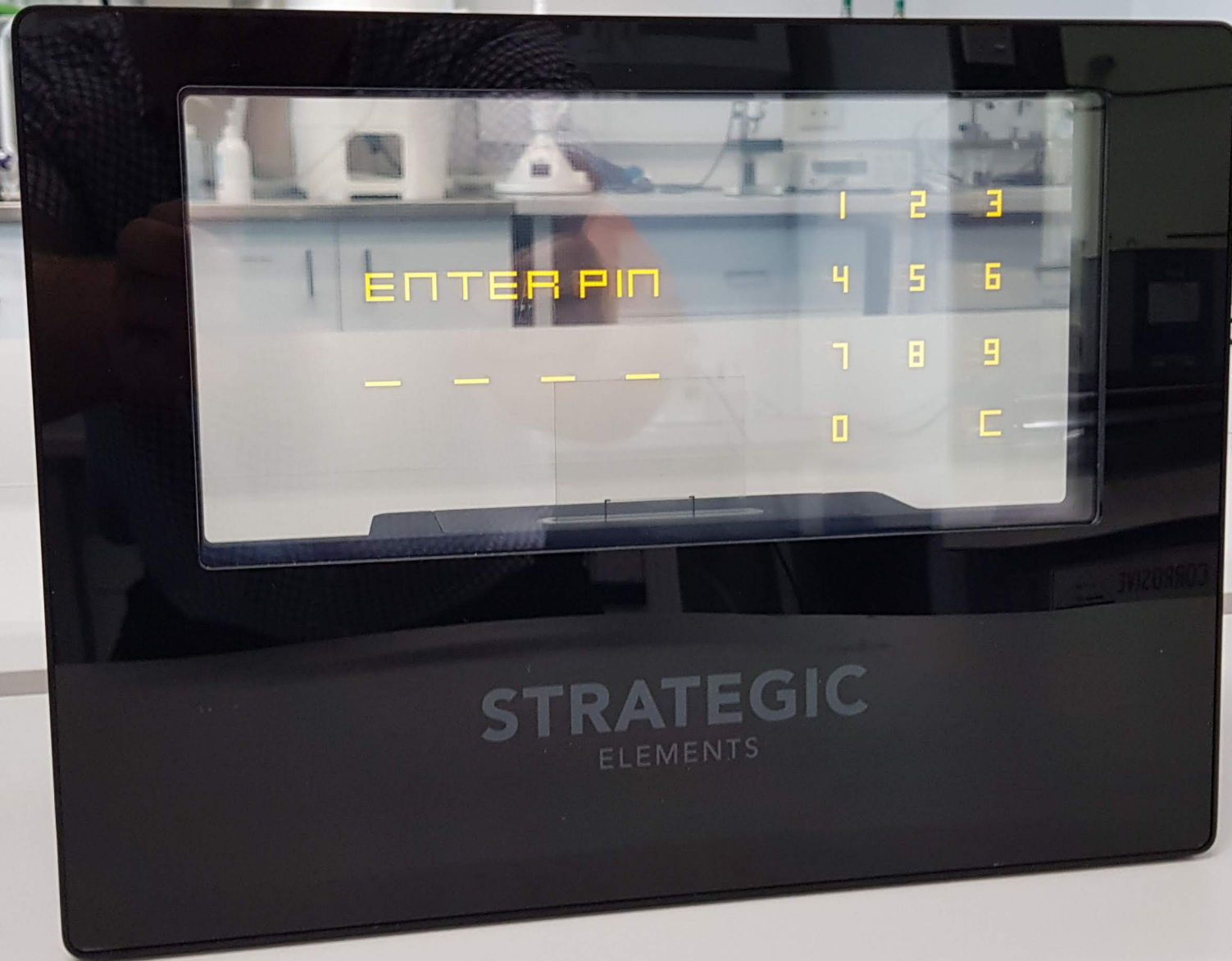
- Key milestones achieved to date across a **range of prototypes** include:
  - Successful scale up for synthesis process to produce large volumes of Nanocube Ink;
  - Stable yield of operating storage cells across printed devices;
  - Uniform electrical behaviour across devices;
  - 1000+ endurance cycle results;
  - Results on glass and plastic substrates
  - Slot-die / ink-jet printable;
  - > 80% optical transparency;
  - Promising early flexibility testing;
  - Ultra thin film;

# Transparent Glass Demonstrator



- Fabricated an access control system with UNSW and VTT Finland to highlight the **transparent, printable** characteristics of the Nanocube Memory Ink.
- The role of the Nanocube Memory is to store authentication data for use as part of a Transparent Security Access System.
- Third party transparent display and touch sensor component was integrated with the transparent Nanocube Memory Ink and custom application logic developed by the team.
- The initial version showcases the transparent nature of the Nanocube Memory and the ability to print functional memory onto glass. A writable device was demonstrated utilizing ITO. Further performance enhancements expected.
- Subsequent versions with different functions to security. Could store a range of information or images **directly** on a glass display or window. Could be combined with sensors and other computer vision technologies.

# Transparent Glass Demonstrator – Access Control System



[CLICK FOR VIDEO](#)



# The Opportunity

- Dramatic expansion in storage requirements.
- Expanding Printed Electronics applications.
- Enhanced Security.
- Edge applications requiring compute and data storage as a result of more processing at the edge.
- Delivering storage on glass and plastic for transparent, structural and/or flexible electronics (**freedom of design forces a re-think of new product applications and categories**).

*Memory is at the heart of transparent and flexible electronics and the development of a printed, transparent memory component could dramatically increase the ability for new applications to be developed globally.*



# Part of the Roadmap 2020

- Seeking research and development partners with advanced printing capabilities, suppliers of innovative glass, plastic substrates or materials for patterning of substrates.
- Deliver a prototype Nanocube **selector** technology with capacity to **dramatically increase printable memory storage density**.
- Expand development on plastic and deformable substrates.
- Fabricate a Nanocube Memory **demonstrator device with 2D storage array on a flexible material**.
- Showcase proof of concept for **alternative applications** of the Nanocube Nanomaterial.
- Seek potential **licensing** partner or **strategic funding** partner for the Nanocube Nanomaterial.
- Secure an additional funding grant from the Australian Government.

Thank you

