

# SHEENLAC ecotio<sup>®</sup><sub>2</sub>

Harness natural light for a natural clean



Providing advanced nanotechnology coating solutions to your buildings and infrastructure

- ❖ Self-cleaning
- ❖ Air purifying
- ❖ Reduce life cycle costs
- ❖ Graffiti resistance
- ❖ Anti-carbonation
- ❖ Deodorising
- ❖ UV protection
- ❖ Improves sustainability
- ❖ Anti-fungal, anti-viral and anti-bacterial

**SHEENLAC**  **ecotio<sub>2</sub>**<sup>®</sup>



## WHAT IS A PHOTOCATALYST?

Photocatalysis is a chemical reaction which is accelerated by light. A photocatalyst is a substance that causes this reaction without being consumed, and therefore even small quantities can repeatedly initiate this reaction when activated by light energy.

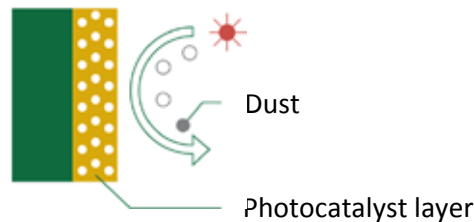
A photocatalyst coating is energised by light when in the presence of **daylight and visible light**.

This excitation of the photocatalyst causes a number of reactions at the surface of the coating that **transforms the coated surface** and **imparts multiple benefits** including **self-cleaning and air purifying**.

## HOW DOES A PHOTOCATALYST KEEP THE SURFACE CLEAN?

1

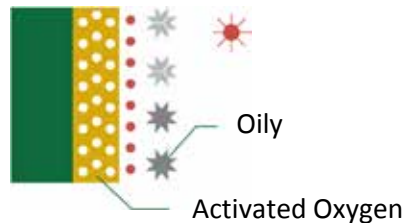
**REDUCES  
ABSORPTION  
OF DUST AND  
OTHER  
PARTICLES**



The surface carries no electric charge, therefore reducing the absorption of dust and other particles.

2

**PREVENTS DIRT  
FROM STICKING  
TO SURFACE**



Activated oxygen decomposes dirt and other organic matter clinging on the surface and helps prevent it from sticking.

3

**HARNESSING  
THE POWER OF  
WATER TO  
WASH**



The hydrophilic surface wets out evenly, meaning large water droplets are not formed and this leads to quick drying and greatly reduced dirt sticking to surfaces.

The surface acts like a 'water magnet' which allows the water to get under the dirt particles and wash them away very easily.

## HISTORY OF ECOTIO<sub>2</sub><sup>®</sup> PHOTOCATALYSTS

- ❖ Photocatalysis was discovered by Japanese scientist Prof. Fujishima in 1967, where they have been extensively utilised for 20+ years including a wide range of asset types and surfaces
- ❖ PIAJ – Photocatalyst Industry Association Japan was established to regulate and approve product quality and ensure stringent production processes
- ❖ SIAA approved products. Antimicrobial properties are tested according to ISO22196 standard



In recent years, many improvements in the technology have been achieved including;

- ❖ Thinner, more transparent films with increased photoactivity comprising finer, more active TiO<sub>2</sub> catalyst
- ❖ Catalysts that do not require sunlight, but can work in low light or even in the dark
- ❖ Tailored products with enhanced key properties such as anti-viral, anti-bacterial, anti-fungal, deodourising, hydrophobic (water repellent) for floors, increased slip resistance for floors and more.



Our **external** Photocatalyst Coatings contain water and nano-titanium dioxide, these coatings are transparent and are designed for a wide variety of surfaces including (1) **Concrete surfaces**, (2) **Brickwork and masonry**, (3) **Glass**, (4) **Painted surfaces** and (5) **Solar panels**.

Internal Photocatalyst products need to activate inside at much lower light intensities, so are 'doped' with additives for these conditions. Photocatalyst Coatings utilises market leading ion exchange technology that works in the dark!

**Internal** surfaces include (1) **Tiled floors, grout and ceramics including bathroom equipment** (2) **Tiled, uncoated concrete and/or painted walls and ceilings**, and (3) **Stone, man-made stones and benchtops**.

# ANTI-CARBONATION FOR LONG-TERM PROTECTION



It is well known that carbonation greatly reduces the life of concrete due to atmospheric carbon dioxide reacting with calcium hydroxide producing calcium carbonate. This leads to reduced alkalinity and loss of passivity, and as a direct consequence, corrosion of the steel reinforcement. For this reaction to occur there must be moisture present, preventing this reaction provides a major challenge especially when 100+ years design life is often a requirement.

Our inorganic ecotio<sub>2</sub><sup>®</sup> coating system seals the pores of the concrete, restricting the water ingress and this significantly slows the rate of carbonation.

Testing using phenolphthalein indicator solution can measure the affected depth of carbonation from the surface. The two pictures below show how the ecotio<sub>2</sub><sup>®</sup> system has sealed the surface, protecting the concrete from attack.



← LEFT: Unprotected concrete showing where the purple indicator has changed colour to white due to carbonation

RIGHT: No penetration of carbonate with ecotio<sub>2</sub><sup>®</sup> as the indicator is unaffected →



# GRAFFITI RESISTANCE - SMOOTH OFF FORM CONCRETE

Our ecotio<sub>2</sub><sup>®</sup> coating system has been tested to **APAS 1441 Appendix A** for graffiti removal. An area is tagged, allowed to dry for 96 hours and then removed using our Nawkaw specialised graffiti remover, which avoids the need to destructive high pressure washing, abrasion and aggressive cleaning chemicals. This process is repeated 3 times in the same location.





## ANTI-FUNGAL – SOLUTION FOR BLACK ALGAE



Uncoated facade with heavy black mould (6 years old)

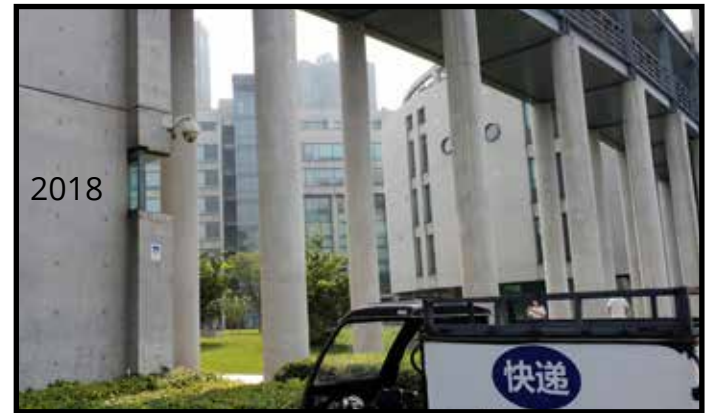
A build-up of **unsightly black algae** is a very common issue that can be even worse in damp areas that have less sunlight. With the current design trend of white and very light-coloured facades this is even more of a problem.

By utilising an ecotio<sub>2</sub><sup>®</sup> coating system, the concrete will be sealed and water resistant and the active ecotio<sub>2</sub><sup>®</sup> Photocatalyst will inhibit the growth of black algae coupled with self-cleaning, anti-carbonation and other benefits.

The **Lenova R&D Centre (Beijing)** building below, was coated with ecotio<sub>2</sub><sup>®</sup> Photocatalyst coating in 2012. After being subjected to high pollution levels and extreme weather conditions (cold, hot and humid) for over 6 years, it still looks like new due to the ecotio<sub>2</sub><sup>®</sup>!



2012

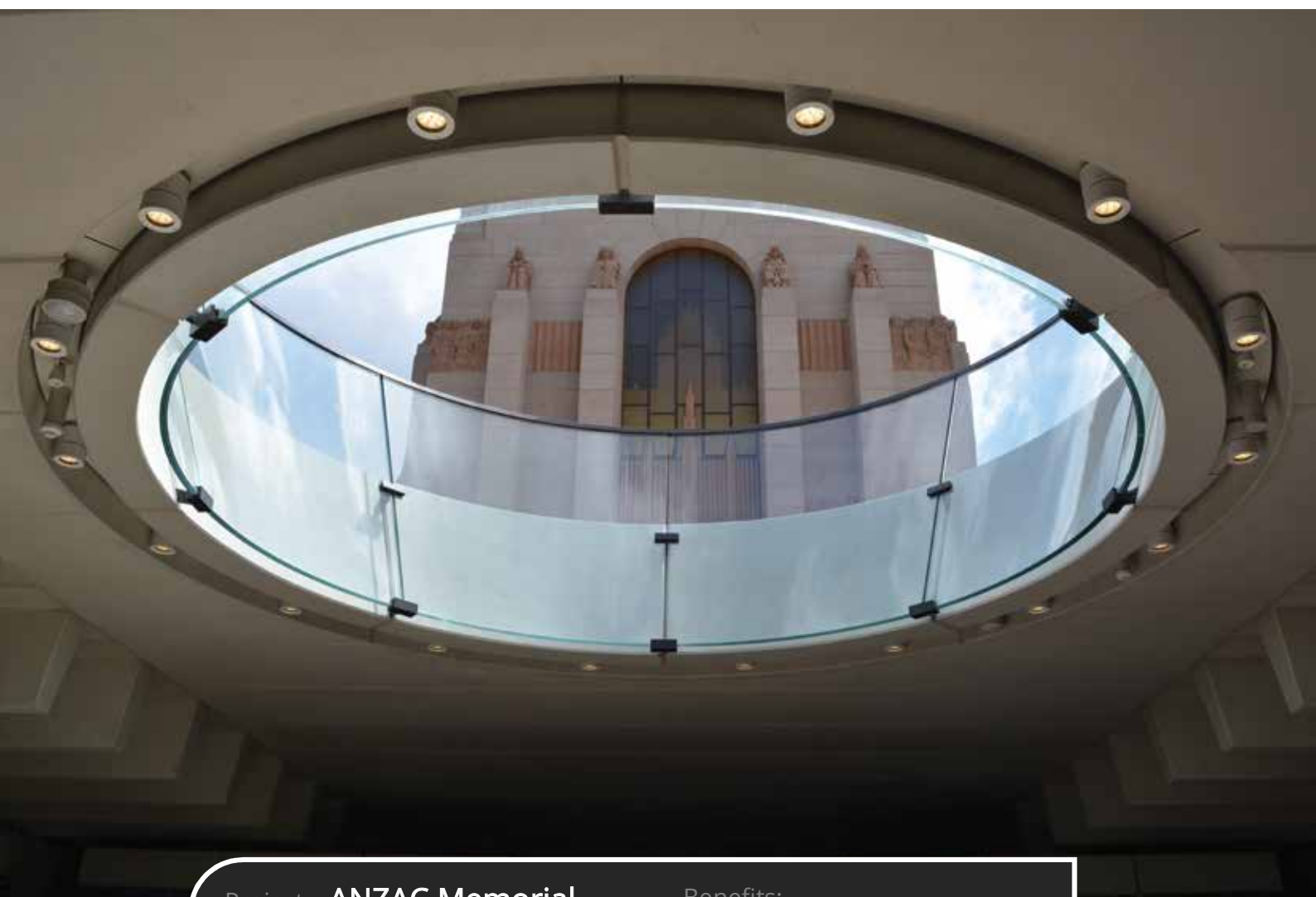


2018

The combination of properties including self-cleaning, anti-carbonation and anti-fungal mean the building looks almost as good as new.

Life cycle costs are significantly lower as any cleaning costs are greatly reduced coupled with the concrete having extended life. The air purifying activity of ecotio<sub>2</sub><sup>®</sup> Photocatalyst Coating means that the building will help reduce pollution.





Project: **ANZAC Memorial**

Date: **September 2018**

Location: **Hyde Park, Sydney**

Substrate: **Precast concrete**

Products:

- ❖ **ecotio<sub>2</sub><sup>®</sup> Sealer**
- ❖ **ecotio<sub>2</sub><sup>®</sup> Premium**

Benefits:

- ❖ **Long-term Aesthetics**
- ❖ **Self-cleaning**
- ❖ **Reduce Lifecycle costs**
- ❖ **Anti-carbonation**
- ❖ **Air Purifying**
- ❖ **Inhibits black mould**

Project: **Sky Train**  
(Sydney Metro Northwest)

Date: **September 2017**

Location: **Northwest Sydney**

Substrate: **In situ concrete**








Products:

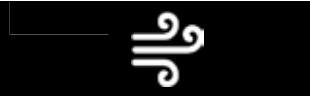
- ❖ **Nawkaw stain**
- ❖ **ecotio<sub>2</sub><sup>®</sup> Sealer**
- ❖ **ecotio<sub>2</sub><sup>®</sup> Premium**

Benefits:

- ❖ **Great aesthetics**
- ❖ **Self-cleaning**
- ❖ **Anti-carbonation**
- ❖ **Graffiti resistance**
- ❖ **Air Purifying**
- ❖ **Inhibits black mould**
- ❖ **Reduce Lifecycle costs**



Segments	Asset types	Substrates	Products
External structures and facades	<ul style="list-style-type: none"> <li>Prestigious offices</li> <li>Retail outlets and Showrooms</li> <li>Schools, Universities, TAFE's</li> <li>High end residential</li> <li>Walls</li> </ul>	<ul style="list-style-type: none"> <li>Off form, In-situ and Precast Concrete</li> <li>Brickwork and masonry</li> <li>Cladding</li> <li>Glass</li> <li>Tiled surfaces</li> <li>Painted surfaces</li> </ul>	  
Transportation and Infrastructure	<ul style="list-style-type: none"> <li>Rail and Bus stations</li> <li>Airports</li> <li>Bridges and Structures</li> <li>Road barriers</li> </ul>		
Care and Hygiene	<ul style="list-style-type: none"> <li>Aged care and Child care</li> <li>Hospitals</li> <li>Public toilets</li> <li>Food processing, food outlets and restaurants</li> <li>Reception areas – Hotel / offices</li> <li>High end residential</li> <li>Commercial buildings</li> </ul>	<ul style="list-style-type: none"> <li>Tiled surfaces</li> <li>Concrete walls and floors</li> <li>Stone</li> <li>Stainless steel</li> <li>Painted surfaces</li> <li>Engineered stone</li> </ul>	 
Solar Panels	<ul style="list-style-type: none"> <li>Solar farms</li> <li>Privately owned panels</li> <li>Commercial and educational buildings</li> </ul>	<ul style="list-style-type: none"> <li>Photovoltaics surfaces</li> </ul>	 



Icon Key:

Self-cleaning

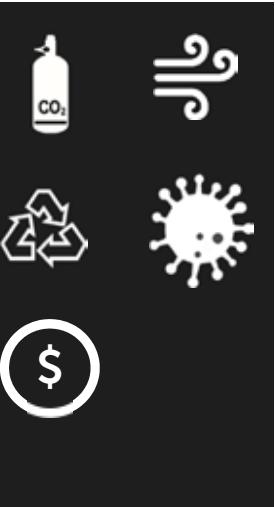
Air purifying

Reduce life cycle costs

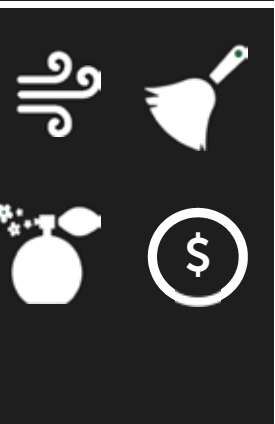
Graffiti resistance

## Product features

## Value to owner / operator



- Extended time to major maintenance / replacement → assets have extended life due to protection
- Reduced life cycle costs → protected for water / CO<sub>2</sub> ingress
- Excellent appearance / image → cleaner, no unsightly black mould and easier graffiti removal
- Much lower cleaning costs → see above
- Reduction of airborne pollution and VOC's → Greener / better sustainability
- Improved HS&E (less requirements for potentially dangerous access for cleaning)



- Save time and money
- Self-cleaning → Reduced life time cleaning costs / more in service time
- Anti-fungal, anti-viral and anti-bacterial → Cleaner /reduced chance of infections / improved HS&E / less potential illness
- Greener / better sustainability → reduces need to use harmful cleaning chemicals
- Extended time to major maintenance / replacement
- Removes foul odours / reduction of internal VOC's → Fresher and cleaner environment
- Improved image to customers, general public and employees



- Self-cleaning, anti-fungal and antistatic → panels will generate more power as more sunlight will hit the PV cells / increased revenue / decrease costs
- Greener / better sustainability → more green energy generated per m<sup>2</sup> of panels. Improved use of earth resources
- Air purifying → pollutants and VOC's that contact the surface will be broken down



Anti-carbonation



Anti-fungal, anti-viral and anti-bacterial



Deodorising



UV protection



Sustainability



Project: **Arc by Crown**

Date: **September 2018**

Location: **CBD, Sydney**

Substrate: **Concrete**

Products:

- ❖ **Nawkaw stain**
- ❖ **ecotio<sub>2</sub>® Sealer**
- ❖ **ecotio<sub>2</sub>® Premium**

Benefits:

- ❖ **Great aesthetics**
- ❖ **Self-cleaning**
- ❖ **Inhibits black mould**
- ❖ **Anti-carbonation**
- ❖ **Air purifying**
- ❖ **Reduce lifecycle costs**



**Project:** Princess Wharf

**Date:** August 2017

**Location:** Auckland, New Zealand

**Substrate:** Marble tiles and grout

**Product:**

❖ ecotio<sub>2</sub><sup>®</sup> Ultra C

**Benefits:**

- ❖ Reduced life time cleaning costs
- ❖ Water repellent sealing tiles and grout
- ❖ Anti-bacterial, anti-mould and anti-viral
- ❖ Fresher and cleaner environment
- ❖ Improved health and safety
- ❖ Enhanced long term appearance
- ❖ Deodorising



Project: **Crescent Head SLSC**

Date: **September 2015**

Location: **Crescent Head, NSW**

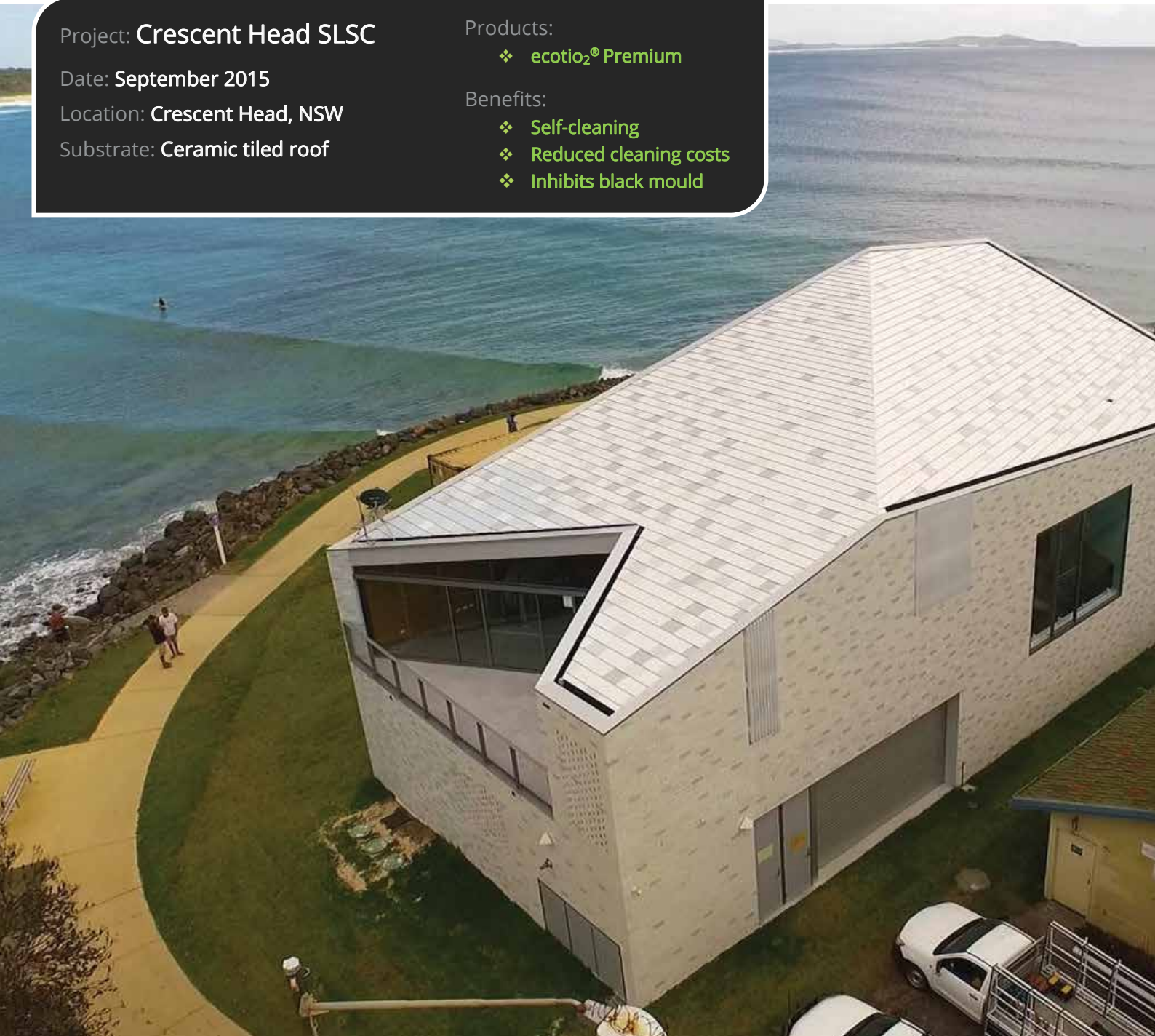
Substrate: **Ceramic tiled roof**

Products:

- ❖ **ecotio<sub>2</sub><sup>®</sup> Premium**

Benefits:

- ❖ **Self-cleaning**
- ❖ **Reduced cleaning costs**
- ❖ **Inhibits black mould**



**Project:** Various high end  
residentials

**Date:** Since 2016

**Location:** NSW

**Substrate:** Glass, brickwork and concrete

**Products:**

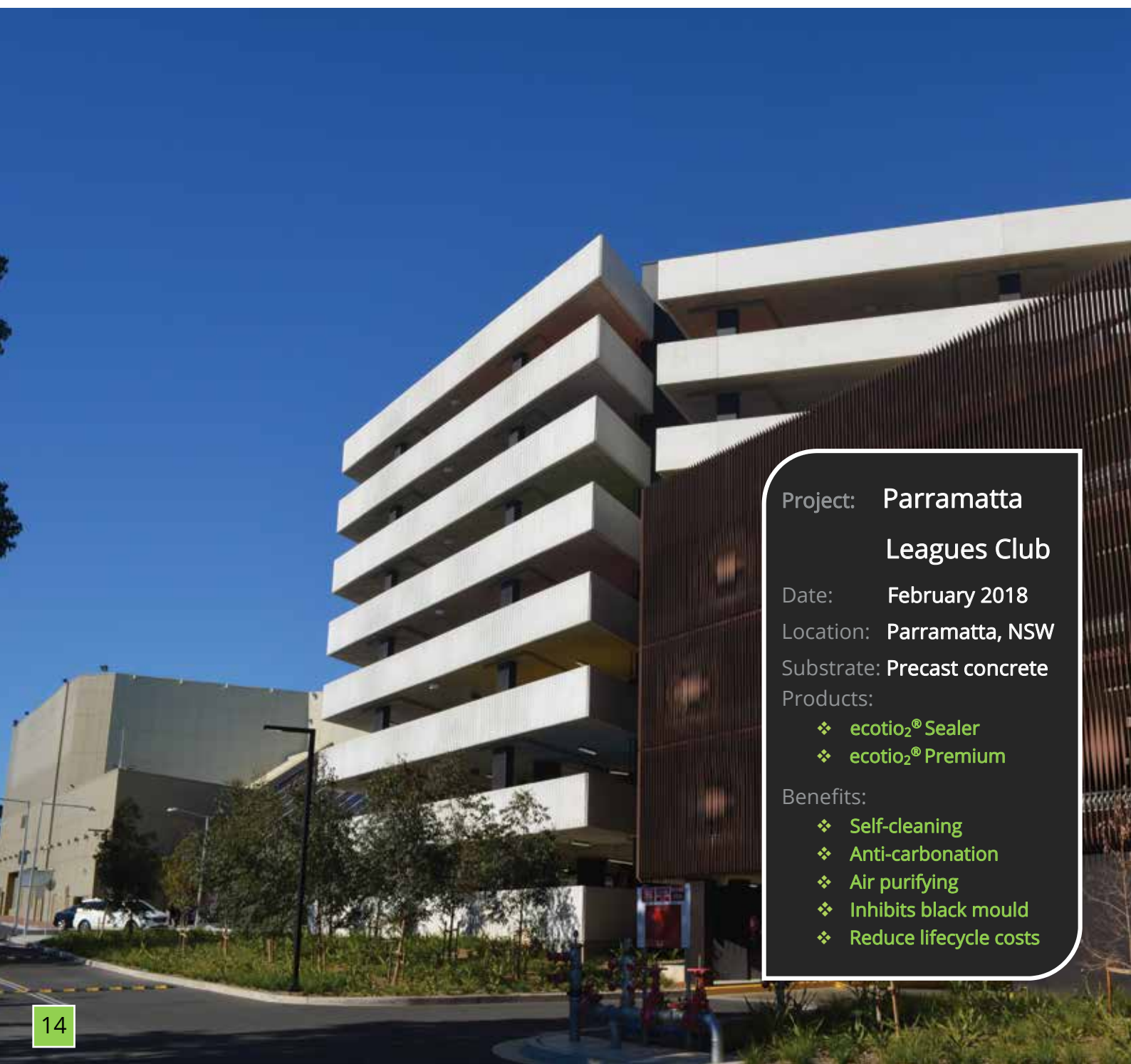
- ❖ **Nawkaw stain**
- ❖ **ecotio<sub>2</sub><sup>®</sup> Sealer**
- ❖ **ecotio<sub>2</sub><sup>®</sup> Premium**



**Benefits:**

- ❖ **Great long-term aesthetics**
- ❖ **Self-cleaning (Concrete and glass)**
- ❖ **Anti-carbonation**
- ❖ **Air purifying**
- ❖ **Inhibits black mould**
- ❖ **Reduce lifecycle costs**





**Project:** Parramatta  
**Leagues Club**

**Date:** February 2018

**Location:** Parramatta, NSW

**Substrate:** Precast concrete

**Products:**

- ❖ ecotio<sub>2</sub><sup>®</sup> Sealer
- ❖ ecotio<sub>2</sub><sup>®</sup> Premium

**Benefits:**

- ❖ Self-cleaning
- ❖ Anti-carbonation
- ❖ Air purifying
- ❖ Inhibits black mould
- ❖ Reduce lifecycle costs



**Project:** Deakin University

**Date:** April 2017

**Location:** Geelong, Vic

**Substrate:** Precast concrete

**Products:**

- ❖ ecotio<sub>2</sub><sup>®</sup> Sealer
- ❖ ecotio<sub>2</sub><sup>®</sup> Premium

**Benefits:**

- ❖ Self-cleaning
- ❖ Anti-carbonation
- ❖ Inhibits black mould
- ❖ Great long-term aesthetics
- ❖ Reduce lifecycle costs



## WE PROVIDE SOLUTIONS FOR YOUR PROJECT NEEDS



ecotio<sub>2</sub><sup>®</sup> Photocatalyst Coatings has a wide range of uses and benefits to make your **work, living or care environments** better for everyone while reducing lifecycle maintenance costs of your buildings and infrastructure.

Contact us at Photocatalyst Coatings, we would love to discuss your specific projects requirements, so we can tailor the best solution for your project including critical performance needs, budget, practical site requirements, and contractual responsibilities.

### Why ecotio<sub>2</sub><sup>®</sup>?

- Innovation with proven performance – Providing your project with a differentiated nano solution.
- Reduced lifecycle costs due to less maintenance and extended asset life. These multiple benefits are for a wide range of external and internal surfaces.
- Helps to achieve corporate sustainability goals.
- ‘Supply and apply’ option for single point responsibility and peace of mind

**SHEENLAC**  **ecotio<sub>2</sub><sup>®</sup>**

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