

DECEMBER 2025 Volume 68 Issue 11. Online: www.corrosion.com.au



The ACA New Zealand Branch wishes all Members
a safe and happy Christmas break in 2025.

We look forward to catching up with everyone in 2026!



Taranaki's Christmas catch up

ACA NZ Taranaki has organised a Christmas celebration for all members.

Come along and join in the fun, catch up with friends and celebrate 2025 in style

Where: Rooftop Bar, at the Good Home,
21 Ariki St, New Plymouth

When: from 3:30pm, Friday 12
December 2025

Why: Nibbles provided by the ACA
Drinks sponsored by CCE Ltd
(www.cceng.com.au)

RSVP: ACANZ Secretary, Mark Sigley,
at acanz.mail@gmail.com by
the morning of 12 December



ACANZ would like to gratefully acknowledge this month's sponsor...



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The ACA's 70th Anniversary Corrosion & Prevention-25 Conference

Materials Protection for the Future



The ACA's annual conference for 2025 was held at the Marvel Stadium in Docklands Melbourne, from 9-13th November. Around 500 attendees were present at the conference and there were 70 booths in the trade exhibition area, the Expo Hall.

Some 90 papers were presented in four streams and seven forums over the busy four day event.

The final day of the conference was the Applicator Day, a special trade display with many demonstrations, which was held outside in the Marvel Stadium Square.

On Sunday evening a well-attended Welcome Reception was held at the Showtime Events Centre, South Wharf, alongside the Yarra River. A feature of this Welcoming function was an Aboriginal welcome ceremony which included a didgeridoo player.

The Opening Conference Ceremony on Monday was chaired by Marie Tetlow (outgoing ACA CEO) assisted by ACA President Raed El Sarraf. The starting of the traditional Ed Potter clock was followed by the first two plenary lectures - there were six plenaries presented over the three days.

The well-attended Asset Owner Reception was held in the Expo Hall on Monday evening.

The Women in Corrosion breakfast was held on Tuesday morning and throughout the conference there were many short presentations given in the popular Learning Centre.

Another feature of this conference was the attendance of several groups of Melbourne school children who were warmly welcomed by trade exhibitors as they collected lots of free give-aways.

The annual P F Thompson Memorial Lecture was presented on Tuesday morning by Professor Kod from Curtin University in WA. Mark Sigley from Firstgas, New Plymouth, NZ, also gave an interesting presentation in the CP session on Tuesday.

The annual Awards Dinner on Tuesday night, celebrating 70 years of ACA, was held in the grand Melbourne Town Hall. During the evening there were many awards presented to ACA Members and to ACA Foundation scholarship recipients. Dr Robert Francis of the Victorian Branch received the prestigious Corrosion Medal and Warren Green (now resident in Texas USA) was made a Life Member of ACA.

After three full-on days, the Closing Ceremony was held on Wednesday evening when outgoing ACA President Raed El Sarraf (NZ) introduced the incoming President Ramon Salazar Romero from Adelaide, South Australia.

At this ceremony it was announced that the ACA Conference in November 2026 is to be held in Christchurch, New Zealand. A Farewell Function, held in the Stadium View Room, was then enjoyed by the participants who attended the 70th Anniversary ACA Conference.



Corroding underwater structures provide vital habitats for marine life

When metal structures end up in the sea, two things can happen. The metal will corrode, then it will become biofouled. This means the underwater metal gets covered with marine slime, seaweed and marine life such as barnacles and sea squirts, attached to the metal surfaces. Biofouling and corrosion are fundamentally linked - corroded surfaces are more likely to be biofouled and biofouling worsens corrosion. That's why rich and diverse ecosystems often develop around shipwrecks and offshore renewable energy structures, such as wind turbines.



A diver inspects the biofouled wreck of the Rainbow Warrior © PADI

Seawater corrosion of metal releases metal ions into the water. In high concentrations, some ions are potentially toxic to marine life. For example, copper can prevent juvenile barnacles from developing hard shells. Fortunately, the potentially toxic components, such as heavy metals like mercury and lead, only exist in very low concentrations in most structural metals. In fact, the presence of the corroding metal structure will usually create an environmental benefit.

Underneath the organisms, the amount of oxygen starts to reduce as the organisms continue to respire (consuming food and oxygen to release energy and carbon dioxide). Because that oxygen cannot be replenished from the surrounding seawater, metal chlorides react with the hydrogen in water, producing hydrochloric acid which is very corrosive. There are also many biofouling bacteria that play a role in corroding undersea metals.

Marine life more easily attaches to the rough surfaces of corroded metal compared to smooth metal. The crevices provided by corrosion also protect biofouling organisms from surrounding seawater currents. As

corrosion develops further, the roughness provides bigger crevices for those organisms to grow in.

When marine biofouling creatures attached to corroded marine structures reproduce or spawn, their larvae are released into the seawater and carried by ocean currents. Eventually, they may settle on other marine structures, creating a web of connected habitats. The more corroded marine structures in an area, the more potential new homes for the marine larvae to attach to and grow on.

By providing suitable habitats like a patch of corroded underwater metal, these areas may enhance the survival of marine biofouling organisms, giving them a safe place to settle and grow. In turn, this provides more food for young marine creatures which feed on the biofouling organisms, thereby improving ocean health and building the resilience of the marine ecosystem.

Source: The Conversation, Phys-Org, March 2025

Q

&

A

CORNER

Older ACA NZ members have probably seen a number of situations that may never have made it to a textbook.

If you have a question you'd like clarification on, email it to the Editor at lesboultonrust@gmail.com. We'll pose it to our panel of experts who will answer it in another Bulletin, so everyone can improve their knowledge.

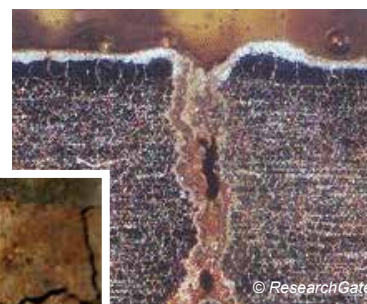
Q: *How can I distinguish between corrosion fatigue and stress corrosion cracking?*

A: *from Dr Rob Francis, Victoria Branch*

Both corrosion fatigue (CF) and stress corrosion cracking (SCC) are failures or damage due to the combined action of both stress and corrosion. In the case of CF the stress is cyclic, while it is static in the case of SCC - and this is the main difference between the two. Outside the corrosion industry, the two have been known to become confused, but corrosion textbooks will clearly distinguish between them.

The amount of corrosion tends to be somewhat greater with CF, with visible corrosion products on the fracture surface, although the 'beachmarks' typical of (ordinary metal) fatigue failure are still evident. SCC arises because of a certain metal/environment combination, but corrosion fatigue will occur in any environment corrosive to the metal under consideration. For example, steels normally only show SCC in hot hydroxyl, carbonate/bicarbonate and a few other specific environments, but can show corrosion fatigue in virtually all moist environments.

Corrosion fatigue generally shows one main fracture, while SCC typically shows distinct branching. However, 'satellite' branching from the main fracture is often observed with CF, and it is this that may cause confusion with SCC. The CF branching is usually much shorter than the main fracture. The fracture surface of a stress corrosion fracture can have the 'thumbnail' semi-circular appearance typical of fatigue or corrosion fatigue failure, but the surface texture in a fatigue fracture is quite smooth near the origin, while the surface is rough over the entire fracture surface with SCC.



Above: Corrosion fatigue



Left: Stress corrosion cracking

With fatigue in air, there is rarely more than one crack and this is useful in distinguishing between 'normal' fatigue and corrosion fatigue. Corrosion fatigue cracks are usually transgranular, but can be intergranular or even a combination of the two.

Environments that cause pitting, such as chlorides for steels or stainless steels, tend to lead to corrosion fatigue, but initiation of fatigue by pitting is not always observed. On the contrary, pitting often occurs in the cracks once they have nucleated.

To avoid corrosion fatigue, a metal immune to corrosion in the environment should be selected.

For example, titanium and nickel alloys and highly alloyed stainless steels show good resistance to corrosion fatigue in sea water. Design to lower the stress can also help. Other methods of corrosion control, such as coatings, inhibitors or cathodic protection, have generally not been successful. Normal fatigue resistance is improved by using stronger alloys, but this does not work for corrosion fatigue, unless corrosion resistance is also improved.

Built-in components for masonry construction – Wall Ties

AS 2699.1:2020, Built-in components for masonry construction – Part 1: Wall ties was republished on 24 October 2025 unchanged as AS/NZS 2699.1:2025 with no major changes from the 2020 edition.



From 2000 until 2020 this Standard was a joint Standard, and it has been agreed that the existing Standard is suitable for use in New Zealand. The joint edition is available on the Standards Australia store now and will be available from Standards New Zealand shortly.

The key changes from AS/NZS 2699.1:2000 are:

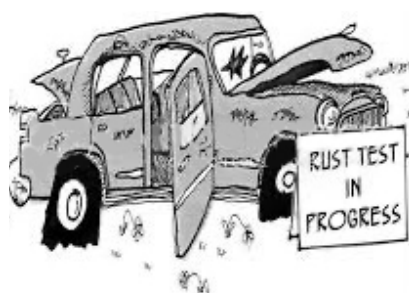
1. Complete specification for minimum specification of galvanized steel and stainless steel wall ties for each durability classification
2. The introduction of 304 stainless steel wall ties as an acceptable solution for R3 durability
3. All wall ties are to be permanently marked to identify the Standard, durability class, duty classification

and manufacturer

4. New and simple tests to confirm product conformity
5. The introduction of minimum requirements for test reports

It is likely that the republished Standard will be reviewed further in the near future to incorporate other potential changes. For those interested in wall ties, the ACA Conference has several papers relating to wall ties and Peter Golding (peter@gaa.com.au) can provide a more detailed review of the Standard on request.

from Peter Golding, CEO, Galvanizers Association of Australia



Bridge & Geotechnical Conference 2026

24-25 August 2026
NZICC, Auckland



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Technical
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The program will address practical challenges and strategic priorities — from seismic resilience and sustainability to doing more with less in asset management and new design.

Abstract submission open: November 2025

Abstract Submission Deadline: 2 February 2026

Author acceptance notification: 9 March 2026

Early bird registration deadline: 13 July 2026

Sponsorship and/or exhibitor packages are available to be booked online! <https://confer.eventsair.com/bridgegeo2026/prospectus-request/Site/Register>

Stay tuned for more details and view the official conference website — <https://confer.eventsair.com/bridgegeo2026/>

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