SHARP & HOWELLS
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TEST REPORT NO.: 25 – 0313

Report Date:	30th May 2025
Client:	**Ecochem Australia Pty Ltd**
Address:	110 South Mountain Road, Upper Plenty, VIC, 3758
Attention:	Geoff Literski
By Email:	geoff@ecochem.com.au
Sample(s):	Corrosion Testing using *ESO Ultra* & *EBC* on Brass, Copper, Stainless Steel and Aluminium
Lab Number(s):	25/A/2338 – 25/A/2391
Date Requested:	21st May 2025
Project:	*Corrosion Testing*

Notes:

This laboratory was not involved with, consulted, or requested to undertake sampling of the specimens provided, and testing of those test specimens has been conducted as received in the laboratory.

Accordingly, no responsibility is taken for the integrity, authenticity, appropriateness, or representativeness, of any of the test specimens provided and this must be taken into account when reviewing, comparing or checking the test results published in this report.

Unless otherwise notified, all samples will be disposed of in three months from reporting date.

Yours faithfully,

Sharp and Howells Pty. Ltd.

Michael Wright
D.App.Sc. (App. Chem.), FRACI, C.Chem
Technical Consultant/Senior Scientist

1. INTRODUCTION:

We were requested to test the corrosion effects of Evolution Starch Off Ultra (ESO Ultra) and Evolution Bio Clean (EBC) on Brass Copper, Stainless Steel and Aluminium.

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2. METHODOLOGY:

The following items were used in the corrosion assessment.

Brass Coupons (1 x 1 cm)
Copper Coupons (1 x 1 cm)
Aluminium Coupons (1 x 1 cm)
Stainless Steel (316 Grade) (1 x 1 cm)

Evolution Starch Off Ultra (ESO Ultra) diluted 1:5 with water

The ESO Ultra sample used to prepare the 1:5 dilution was sample "ESO Ultra 7/05/25 (Lab No 25/A/2130)" previously analysed in Report No 25 – 0283
The pH of the ESO Ultra 1:5 solution was determined to be 6.36

Evolution Starch Off Ultra (ESO Ultra) diluted 1:20 with water

The ESO Ultra sample used to prepare the 1:20 dilution was sample "ESO Ultra 7/05/25 (Lab No 25/A/2130)" previously analysed in Report No 25 – 0283
The pH of the ESO Ultra 1:20 solution was determined to be 6.66

Evolution Bio Clean (EBC) diluted 1:50 with water

The EBC sample used to prepare the 1:50 dilution was sample "EBC Tank 1 26/03/25 (Lab No 25/A/1460)" previously analysed in Report No 25 – 0202.
The pH of the EBC 1:50 solution was determined to be 10.19

Testing was performed at ambient temperature 20 ^{0}C and at 40 ^{0}C
Metal coupons were exposed to these temperature for 2minutes, 4 minutes and 30 minutes.

Corrosion was assessed by two procedures:

(i) Weight Loss.
The metal coupons were weighed before and after exposure to determine if any corrosion was occurring.
Following exposure the metal coupon was removed from the liquid and allowed to sit for several minutes so that it was exposed to air. The metal was then washed with water to remove all traces of the ESO or EBC, and then dried and weighed.

(ii) Visual Examination.
The metal coupons were examined visually (and microscopically if required) for any signs of pitting or surface intrusion.

3. RESULTS OF ANALYSIS:

ESO Ultra 1:5 Dilution at Ambient Temperature – 2 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:5 Dilution at Ambient Temperature – 4 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:5 Dilution at Ambient Temperature – 30 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:5 Dilution at 40 ^{0}C Temperature – 2 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:5 Dilution at 40 ^{0}C Temperature – 4 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:5 Dilution at 40 ^{0}C Temperature – 30 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:20 Dilution at Ambient Temperature – 2 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:20 Dilution at Ambient Temperature – 4 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:20 Dilution at Ambient Temperature – 30 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1: 20 Dilution at 40 ^{0}C Temperature – 2 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:20 Dilution at 40 ^{0}C Temperature – 4 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

ESO Ultra 1:20 Dilution at 40 ^{0}C Temperature – 30 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

EBC 1:50 Dilution at Ambient Temperature – 2 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

EBC 1:50 Dilution at Ambient Temperature – 4 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

EBC 1:50 Dilution at Ambient Temperature – 30 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

EBC 1: 50 Dilution at 40 ^{0}C Temperature – 2 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

EBC 1: 50 Dilution at 40 ^{0}C Temperature – 4 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

EBC 1: 50 Dilution at 40 ^{0}C Temperature – 30 minutes exposure

Metal Type	Weight Loss	Visual Assessment of Corrosion
Brass	Nil	No Corrosion
Copper	Nil	No Corrosion
Stainless Steel	Nil	No Corrosion
Aluminium	Nil	No Corrosion

4. CONCLUSION:

No corrosion was found on coupons of Brass, Stainless Steel (316 Grade), Copper or Aluminium, after exposure to dilute solutions of Evolution Starch Off Ultra (ESO Ultra) or Evolution Bio Clean (EBC) at 20 ^{0}C and 40 ^{0}C.