

Quantum Filtration Medium Pty Ltd

DMI65 Media Copper and Zinc Removal Investigation

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Prepared by

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Quantum Filtration Medium Pty Ltd

Copper and Zinc Removal Investigation

Background

Quantum Filtration Medium Pty Ltd investigated the removal of copper and zinc from water using DMI65 Media in a filtration unit. The investigation examined the removal of the copper and zinc from test batches of water at two different pH.

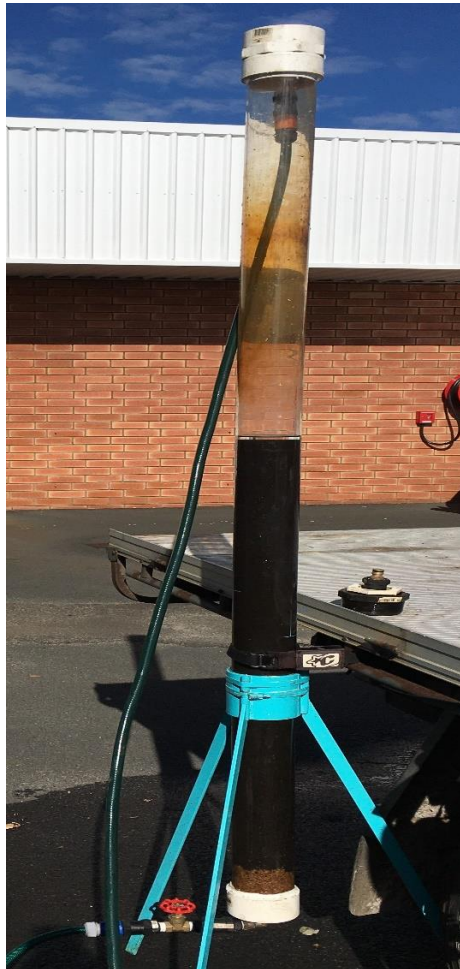
Method

Quantum Filtration Medium Pty Ltd provided a small test filtration unit containing DMI65 filtration media, which was used to treat a quantity of water, containing known concentrations of copper and zinc at two different pH (the test water). Four separate twenty litres (20 L) batches of test water were prepared:

1. Copper at 20 mg/L concentration at pH 6.0
2. Copper at 20 mg/L concentration at pH 7.5
3. Zinc at 20 mg/L concentration at pH 6.0
4. Zinc at 20 mg/L concentration at pH 7.5

The test water was poured into the top of the filtration unit and allowed to filter through the media, before collection into a bucket at the bottom of the unit (Figure 1). The test water for each batch was analysed before and after it had passed through the filter, to determine the copper and zinc concentration.

Figure 1: Filtration of the test water and filling of test filtration unit.



Results - Copper

Three samples of the test water were collected. One sample was collected prior to filtration and two samples collected after passing through the filtration unit at each pH. The first sample was collected when approximately 10L of water had passed through the unit (labelled post filter middle) and the second sample when 20L of water had passed through the filtration unit (labelled post filter end). The results of the copper analysis are shown in Table 1 and Figure 2. A comparison of the copper test water at pH 7.5 pre-filtration and post filtration is provided in Figure 3.

Table 1: Copper concentration in the test water.

Sample Name	Copper concentration (mg/L) at pH 6.0	Copper concentration (mg/L) at pH 7.5
Pre-filter	20	20
Post-filter middle	0.031	0.030
Post-filter end	0.030	0.013

Figure 2: Copper concentration after filtration. Copper concentration prior to filtration was 20 mg/L.

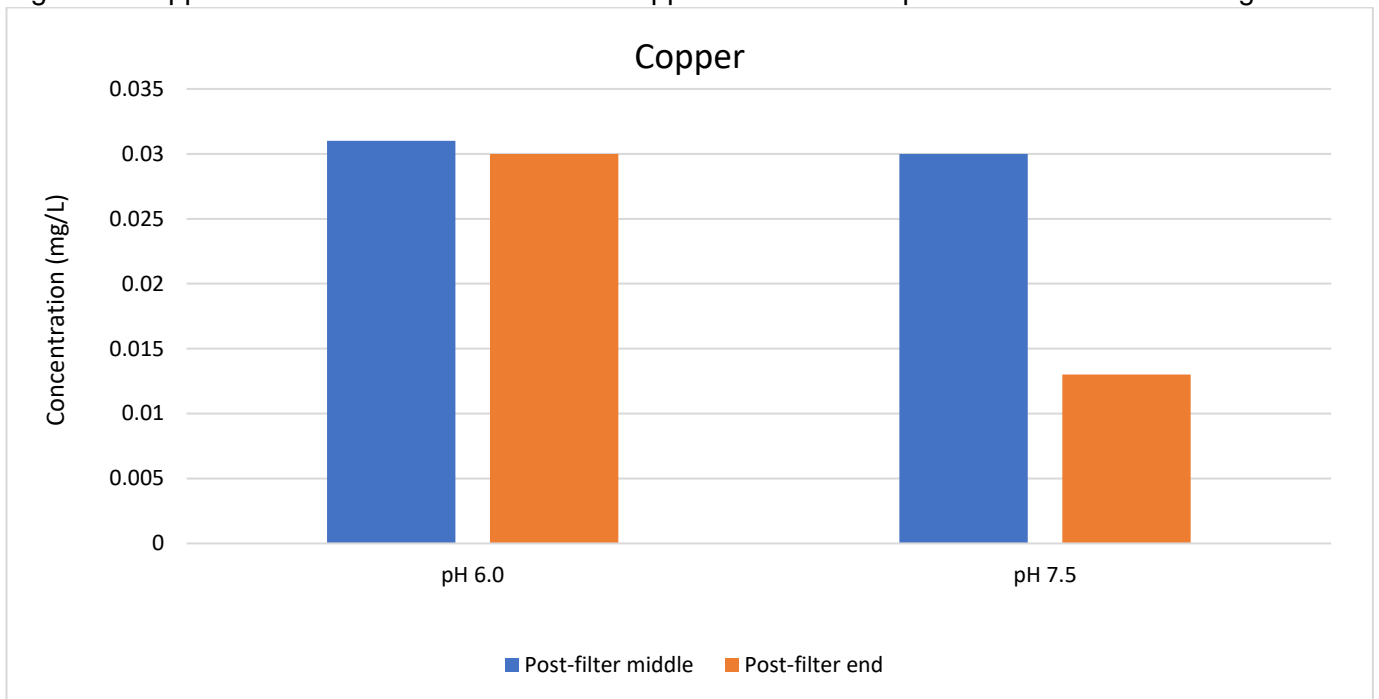
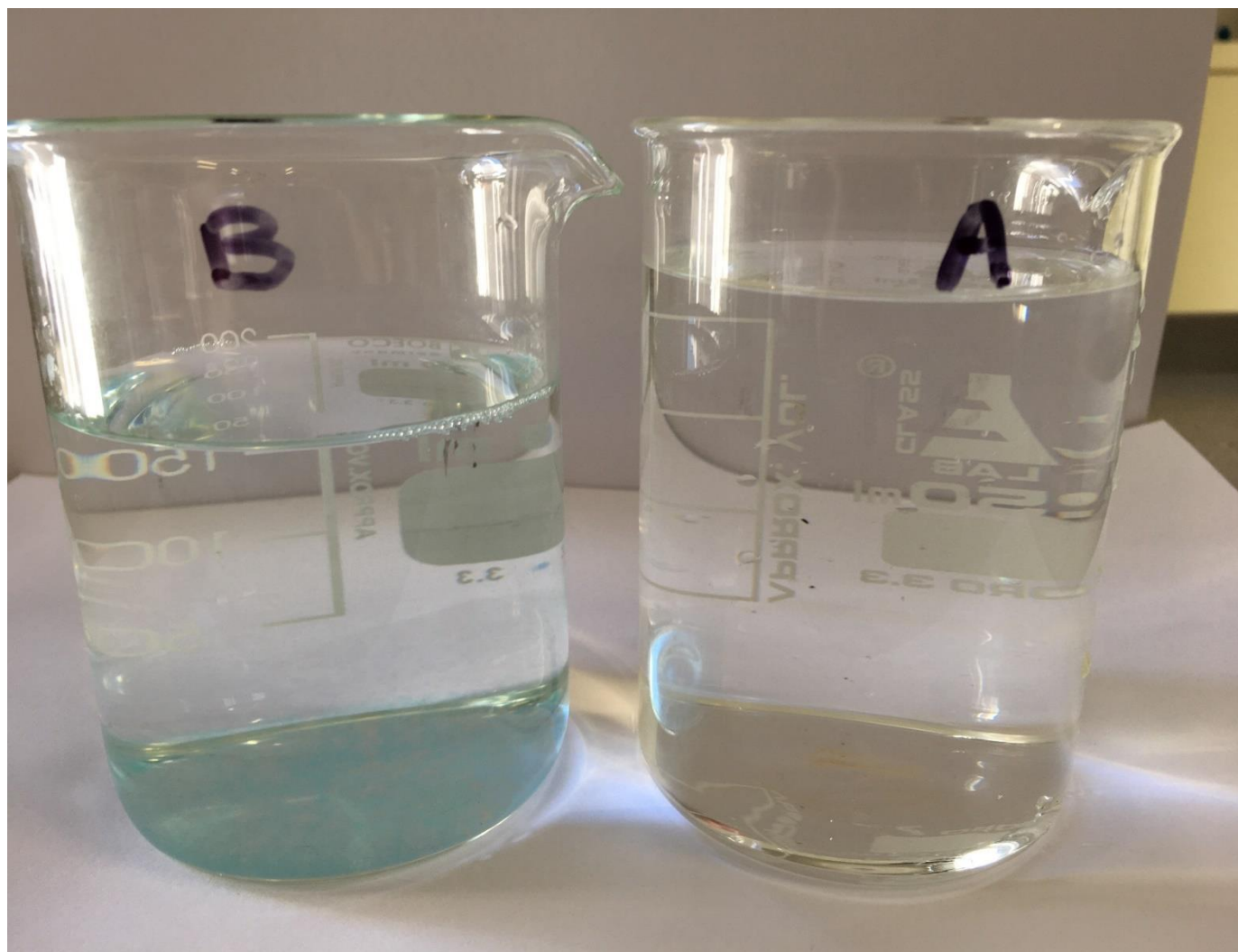


Figure 3: Water samples containing copper at pH 7.5; pre-filtration (B - left) and post filtration (A - right).



Results - Zinc

Three samples of the test water were collected. One sample was collected prior to filtration and two samples collected after passing through the filtration unit at each pH. The first sample was collected when approximately 10L of water had passed through the unit (labelled post filter middle) and the second sample when 20L of water had passed through the filtration unit (labelled post filter end). The results of the zinc analysis are shown in Table 2 and Figure 4.

Table 2: Zinc concentration in the test water.

Sample Name	Zinc concentration (mg/L) at pH 6.0	Zinc concentration (mg/L) at pH 7.5
Pre-filter	20	20
Post-filter middle	0.045	0.080
Post-filter end	0.036	0.056

Figure 4: Zinc concentration after filtration. Zinc concentration prior to filtration was 20 mg/L.



Summary

- The DMI65 filtration media removed copper and zinc from the test batches of water.
- Copper remaining in the test water at the end of filtration was less in the pH 7.5 water (0.013 mg/L), compared to the pH 6.0 water (0.030 mg/L).
- Zinc remaining in the test water at the end of filtration was greater in the pH 7.5 water (0.056 mg/L), compared to the pH 6.0 water (0.036 mg/L).