

## CASE STUDY

# FLOTATION HYDRODYNAMICS – Frother Application

*Control of Gas Hold Up and Froth Stability in solutions of varying salinity*

### Abstract

Kemtec Mineral Processing Pty Ltd (part of the Sinoz Group) was asked by a customer to develop a product that allowed for: 1) stable control of the flotation plant, and 2) utilisation of flotation hydrodynamics to influence flotation performance and maximise return across a range of process water chemistries. The case study describes the laboratory and plant test work conducted by Kemtec, as we strive to make a difference.



### Introduction

Kemtec Mineral Processing Pty Ltd (part of the Sinoz Group) is a company that assists Sinoz Group companies to make the most out of Sinoz Group’s quality reagents. The Sinoz Group includes Sinoz Chemicals and Commodities Pty Ltd, Kanins International Pty Ltd and Kemtec.

Our customer for this work produces a zinc concentrate and often experiences seasonal variation in process water chemistry. The customer was interested in a frother that it could use economically and further manipulate to achieve specified hydrodynamic performance, regardless of the prevailing water chemistry.

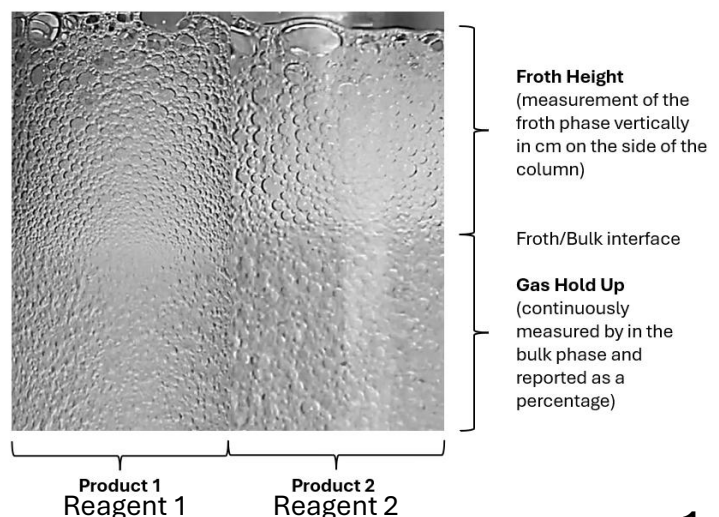
The work involved the formulation of a customer specific reagent. Initial laboratory product development test work was performed at Kemtec’s facilities in Melbourne, using site and synthetic water samples. Subsequent on-site trials were used to optimise the final reagent.

The combination of off/on site work offered the most economical method to develop and test reagents to find a better way.

### Results

Figure 1 shows side-by-side comparison of two reagent formulations at the bulk/froth phase boundary. This work was conducted in the laboratory to screen potential reagent components. The photos in Figure 1 were backed up by discrete measurements that allowed comparison between site and laboratory conditions.

Figure 1: Laboratory work



In Figures 2a and b, the impact of various reagent formulation components on froth height and gas hold up can be seen. Across a range of doses, the impacts on Gas Hold Up and Frother Strength of various reagent formations were measured.

Figure 2a: Gas Hold Up as a function of reagents (6) and dose.

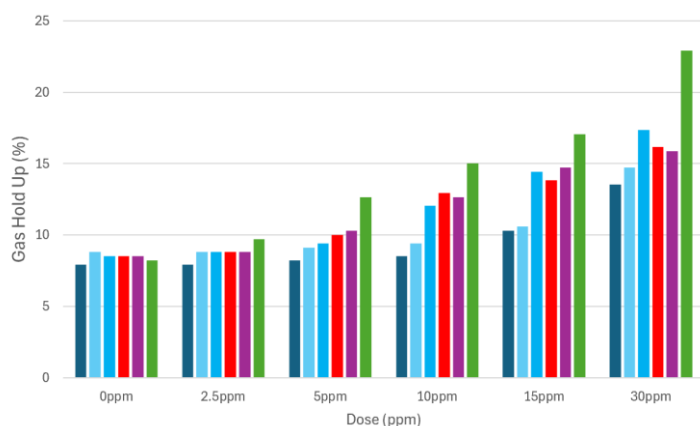
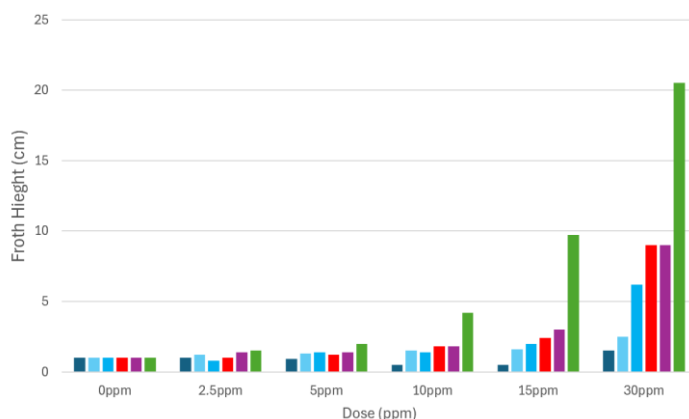


Figure 2b: Froth Height as a function of reagents (6) and dose.



Following the initial laboratory stage, blends of reagents were trialled at the customer processing facility during extensive site trials. Kemtec provided a suitable quantities of reagent for full scale trials, on-site support to mitigate risk and provide technical support to assist the site team in safely conduct the trial.

## Conclusion

Kemtec were able to develop a reagent formulation for this specific customer (i.e. a blend of those shown in Figure 2). The formulation and the ability to manipulate it in the future, allows the site to manipulate flotation hydrodynamics in response to process water (and other process) variation.

Control of flotation hydrodynamics also assisted

the site in subsequently optimising flotation reagent addition points to operate sustainably.

If you have any questions or if you would like to understand more about Kemtec and the Sinoz Group, please reach out on the numbers/emails below.

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