

CANTY

PROCESS TECHNOLOGY

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R&D Bubble Analysis

Sizing and Shaping Bubbles in a Glass Column for UCD

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1. Introduction

The aim of this test was to investigate if bubbles in a glass column could be observed and detected by the Canty Vision Liquid Analysis software. Once refined, this testing will be used in UCD on a double layered glass column.

2. Materials

VC10990-200

Macro 10X lens

LED panel

Pyrex column with air inlet

Water

5mm spacer

Canty Vision Liquid Analysis software 2.1.2

3. Method

The optimum positioning for the light and camera were found by trial and error. The optimum set up was found when the camera was at a working distance of approximately 12cm from the glass vessel. Back lighting using an LED panel was used for the testing. In the Canty Vision Liquid Analysis software, the shutter speed was set at 10 microseconds, the gain at 45 and the perimeter detection value at 7. Air was added to the vessel through an air inlet located at the bottom of the Pyrex column. Tests were carried out at various air flow rates to ensure the optimum settings were found.

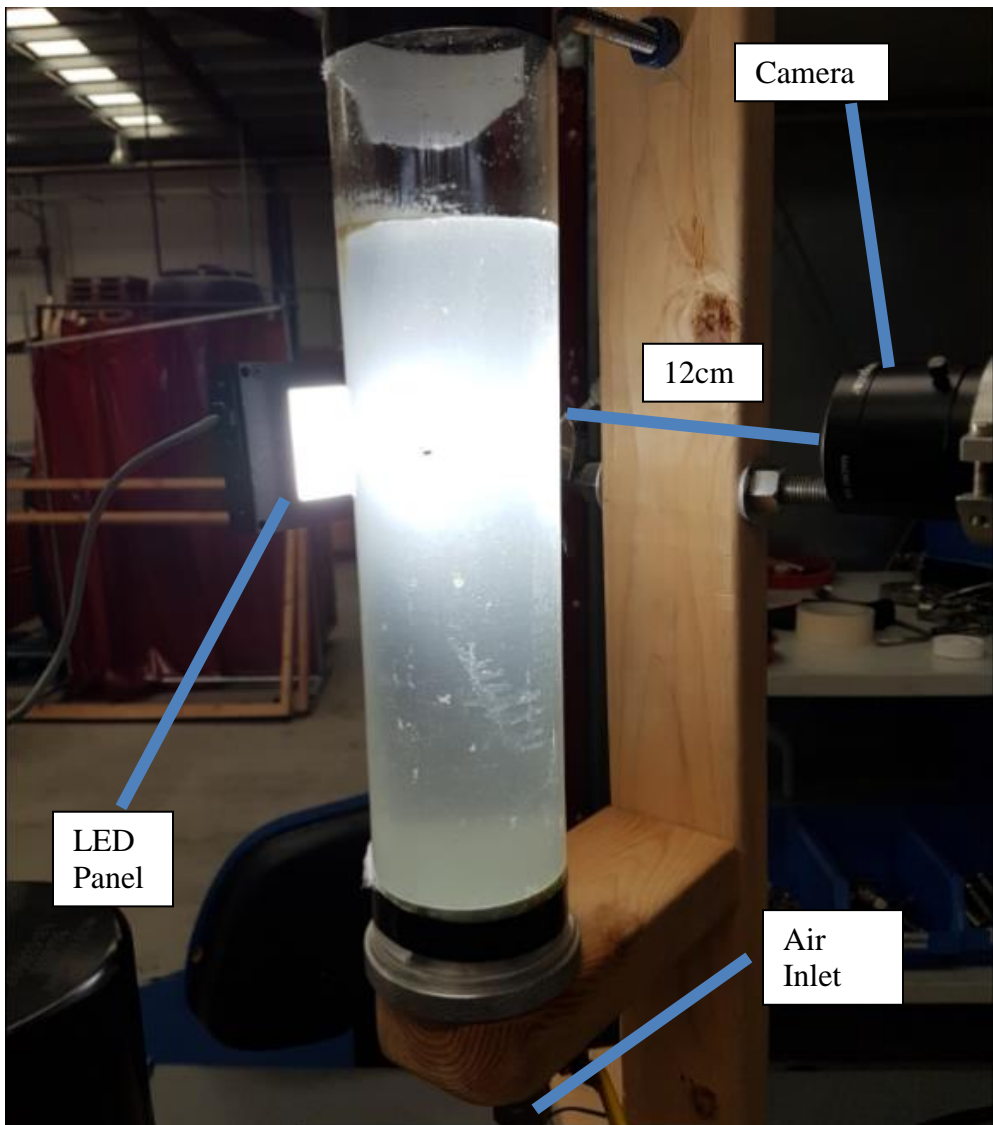


Figure 1: Image of test set-up for analysis of bubbles in glass column

4. Results

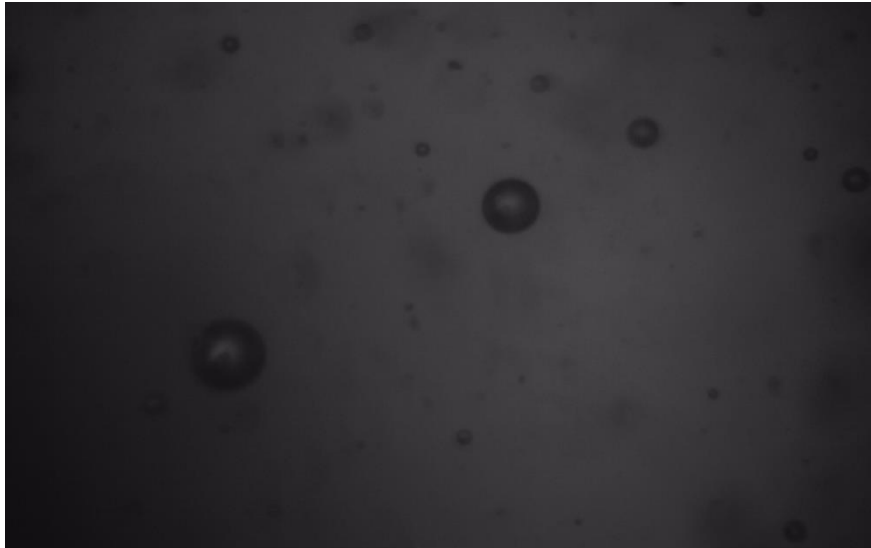


Figure 2: Image of bubbles during test

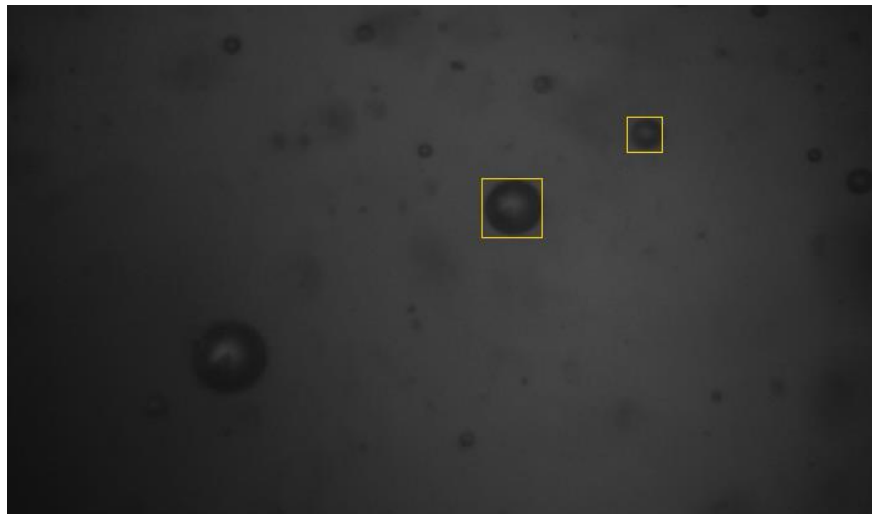


Figure 3: Image of bubbles being detected by the Canty Vision Liquid Analysis software

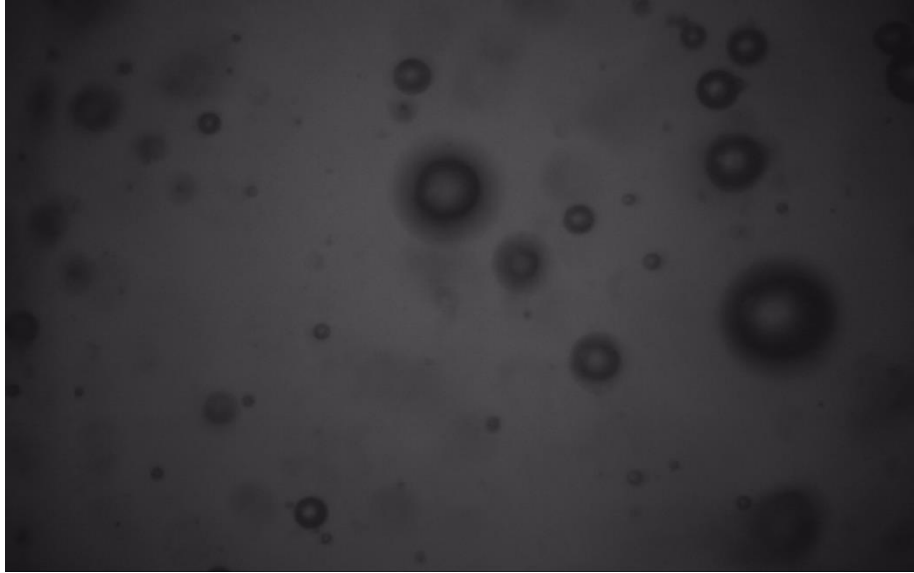


Figure 4: Image of bubbles during test

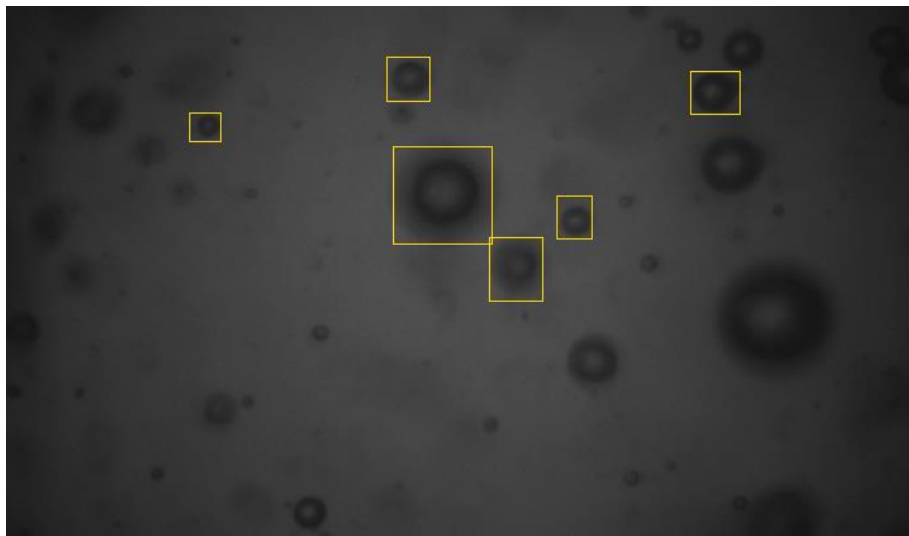


Figure 5: Image of bubbles being detected by the Cauty Vision Liquid Analysis software

5. Observations

The images appear dark due to the low shutter speed. The low shutter speed was necessary in order for the software to catch air bubbles at high air flow rates. The air flow rates are expected to be lower at UCD.

It is also important to note that during this test, Pyrex material was used for the column. In UCD, a glass column will be used which should increase levels of brightness.

6. Conclusions

This testing was successful in that bubbles could be seen and detected by the Canty Vision Liquid Analysis software.

Although the test set up is similar to what will be observed in UCD, some modifications to software settings will more than likely have to be made to adjust to slower or faster air flow rates or increased or decreased light levels.

Full video location and configuration file location:

\\jmcanty.local\shares\Lab.ie\R&D\UCD Bubble Analysis