

## Hydro Kalon Internship Report

My internship this summer is with Hydro Kalon Limited under the position “Intern - Assistant Technical Engineer”. The office and production facility are in Tsing Yi Industrial Center and my working hours are from 9am – 6pm, Monday to Friday, from June 1, 2024 to July 31, 2024. My goal this summer was to find a small company so I can be more involved in their daily operations and I believe I succeeded in doing so.

Hydro Kalon produces waterborne glass coatings in various customizable colors to create an aesthetic glass design. The paint is applied on glass as a thin layer coating to turn a transparent glass into an opaque and colored one. Some places where the company applied its glass coatings include MTR stations and a portion of the Hong Kong – Zhuhai – Macau Bridge.

In this internship, my main objective is to find ways to reduce production time. There are a few things to note. The formula and production process were purchased from an Australian company. It is seldom that large scale production of up to 1500 kg/day is done so hiring a lot of full time workers is not an option. The production space is also very limited so using big machines is not viable. With these in mind, the assumptions are: the current process cannot be changed without changing the equipment, the current number of workers cannot be increased, and space should be accounted for. There are three main parts in the process: preparation, mixing, and packing. I made a proposal for all three steps by focusing on finding machines to improve speed.

For the preparation step, the use of an automatic liquid weighing and filling machine was suggested to reduce manual weighing of materials. In mixing, different proposals were given: change the impeller to improve fluid dynamics, change the mixer to a static mixer which also reduces space occupied, or change to a ribbon mixer for better fluid dynamics. For packing, the proposal was to use an automatic filling machine or use a tangential flow filter instead of the current dead end filter. In the end, due to limited budget, only the automatic liquid weighing machine for the preparation step was considered.

Some things that were not considered were: buying more of the same machines because of space limitation and making the process a continuous process because the scale is not large enough to consider changing the setup.

Moreover, mixing is the most time consuming and also the vaguest. There are 12 components to add and each component is added one by one with 10 minutes of mixing in between additions. No matter the scale, 1 kg to 50 kg, the mixing time between additions is 10 minutes but there is no quantitative quality check done. I cannot comprehend why the mixing time is the same for a small and a big batch given they use a batch mixer so the fluid mixing in terms of space and time differs depending on machine size. The only test performed is taking a sample of the mixture and

spreading it on a stainless sheet to check for any unmixed powder particles. Also, since production is rare, it was hard to observe properly.

Moving on, I learned things I did not expect to do or try in this internship. I was able to experience working in a production plant before so I am not disappointed that production here is not an everyday job. However, looking through different machines and their technical specifications is a new thing for me. In addition, it is my first time to use online shopping platforms to look for specific things. I talked to different suppliers and enquired about their products. Talking to them gave me a lot of insight on how to choose the most suitable equipment by specifying certain parameters or targets. I also learned the different properties that can be specified on a machine such as requiring explosion proofing or not. These smaller details are fun to learn and it just adds to my interest in learning about machines. The experience of talking to suppliers was beneficial because I was able to observe that some companies are more organized, prepared, and detail oriented compared to others who simply want sales.

The two months I spent with Hydro Kalon were loaded with unexpected events and learnings. I am grateful for spending my internship here because my goal was to join a small company to be more involved in different aspects of operations. Personally, my role in the company was interesting and I enjoyed looking for machines and contacting suppliers. There are no regrets during this summer internship since I believe I accomplished my goal for this summer.

On a side note, I realized I will choose a company that has more employees. In this company, there are only two employees in the production facility and it feels lonely at times. I will strive to find a company that has at least five to six or more employees just to have more life during working hours. I have a desire to work for smaller companies since there is more opportunity to be more involved. Hopefully, I just don't end up in an extremely small company. Nevertheless, this is just a small observation I picked up from this internship.