

Master Thesis / Internship

Identifying and Developing CO₂ Treatment Techniques for an Air Filtration Module in HVAC Units: Developing and Simulating Optimal and Cost-Efficient Solutions in Commercial Buildings

Category: Energy, Materials Engineering, Chemical Engineering

Application Deadline: 30th of November, 2018

Position: Unpaid thesis / internship

Starting Date: 15th of January, 2019

Duration: 6 months

Location: Västerås, Sweden

Sally R: Ventilation meets aerospace

Sally R develops a new technology for climate control in buildings that save energy and improve the indoor air quality. The solution is based on the system used for climate management in real estate on earth, combined with the technology deployed in space on the International Space Station (ISS). The company is part of the European Space Agency's business incubator, has been awarded as the Best B2B Startup during Sweden's Demo Day and was one of the world's 500 hottest tech startups featured during Hello Tomorrow in Paris. The recently awarded prize was the innovator of the year at Guldstänk in Västerås. The name Sally R is a tribute to the first American woman exploring space, Sally Ride.

Vision

All people should breathe good air. Today, 92% of the world population live in places where air pollution exceeds World Health Organization (WHO) limits. An estimated 6.5 million premature deaths related to air pollution occur annually. At the same time, our buildings contribute to third of the total global energy consumption. Approximately 40% of this is due to climate management in real estate. The problem is that there is a trade-off between indoor air quality and energy conservation. To improve the quality of indoor air, energy comes at a cost due to further filtration and treatment. Saving energy on climate management might lead to a bad indoor air quality. This is the problem that we solve at Sally R. We develop solutions that improve air quality while reducing energy consumption in buildings.

Main Product Lines

At the moment, we are selling one product, while developing another. The first is an algorithm that can be deployed in current ventilation systems that guarantees an acceptable indoor air quality while saving energy consumption. It takes into account the outdoor and indoor climates as well as the number of people present in the building. For example, if the air outside is too hot, polluted and humid, and if there are not too many people inside, then the air can be recirculated up to a certain extent to save the cleaning, dehumidification and cooling expenses.

Our second product line is a cleaning module that can be retrofitted on current HVAC systems; it includes a recirculation function and a cleaning technique to filter harmful gases, such as volatile organic compounds (like formaldehyde, hydrocarbons, etc). With this product's innovative design, we are able to clean the air efficiently through the algorithm while saving the ventilation system a high energy expenditure. Nevertheless, out of this process, CO₂ and H₂O are formed as byproducts, with the former being unfriendly to the environment.

Role

As a master thesis student / intern, you will be working mainly on the cleaning module to identify a way of treating the CO₂; for example, either by converting it into something else (less harmful) or harnessing it as a resource for other products (such as a fertilizer), etc. However, we are looking for a solution that is cost-effective and economic to design, manufacture, maintain and sell. In space, and for astronauts to go deeper distances, special filters are used for CO₂ treatment. However, these filters might be expensive to deploy in commercial buildings. If we are able to figure out a way for CO₂ treatment, then our product becomes one of the first products on the market to be VOC and CO₂ negative, which is amazing news for both the customers and the environment!

We have already designed and manufactured our prototype of the cleaning module that removes VOCs. You will be responsible for identifying several treatment techniques, developing one of these techniques further via utilizing materials knowledge, 2D/3D sketching and some simulation skills to identify how cost-effective the technique is. You are expected to contact potential suppliers and partners who would help us deploy your technique if proven to be feasible.

You will be working closely with our product developers and starting from the head office in Västerås, Sweden. Your goal is to develop this innovative technique and contribute to the products' and the company's future success.

Your skills and Profile

We expect our applicants to have a background in materials science, engineering physics, chemical engineering or similar with a **distinguished** academic performance. It is an advantage if you have experience in ventilation or energy-saving projects. We prefer that you are flexible and ready to take on a broad role.

Your colleagues are all very determined and ambitious, so you are energetic and motivated. Even if the role involves product development, we want to emphasize that it is important that you are a team player who adds energy to the team.

We put great focus on how you are as a person and what you want to achieve with us. You should have the ability to persuade and a habit of being able to explain complex things in an understandable way.

Some additional requirements:

- Positive, humble, self-motivated and outgoing
- A habit of 2D/3D sketching
- Fluency in Swedish is a plus

As we work for gender balance, we encourage female applicants.

Application

Applicants are screened as soon as possible, and interviews are ongoing. Apply to this ad and **do not forget** to attach your CV, academic transcript and a personal presentation of who you are and why you are suited to the role.

If you have questions or concerns about the position, please contact our Product Developer Mohamad Mansour via email mohamad.mansour@sally-r.com Hope to see you!