ALFYMA INDUSTRIE
Agence Marne-la-Vallée - Val d'Europe

ZAC du Prieuré

17 avenue Christian Doppler – 77700 BAILLY ROMAINVILLIERS
www.alfyma.fr

Internship, Master 2
Numerical simulation of thermomechanical coupling in a reactor

Siège social - Bailly-Romainvilliers (77)

BECAUSE TRUST IS BUILT EVERYDAY

Forty years of experience serving the industry.

Over the decades, Alfyma engineers have been innovating, inventing, and modernizing industrial solutions for the future while adhering to environmental standards. Whether it's recycling and treating household waste, scrap metal, metals, slag, or composting, Alfyma is a key partner in reducing landfill waste and promoting waste valorization.

The acquisition of Mecatel has established Alfyma as the historical French leader in the manufacturing of pre-fermentation tubes (BRS), providing our clients with the best technology for mechanical-biological sorting. Today, Alfyma is also involved in the design and installation of trommels among the largest in Europe, capable of processing up to 25 tons of municipal waste per hour or up to 40,000 tons of PET plastic bottles per year.

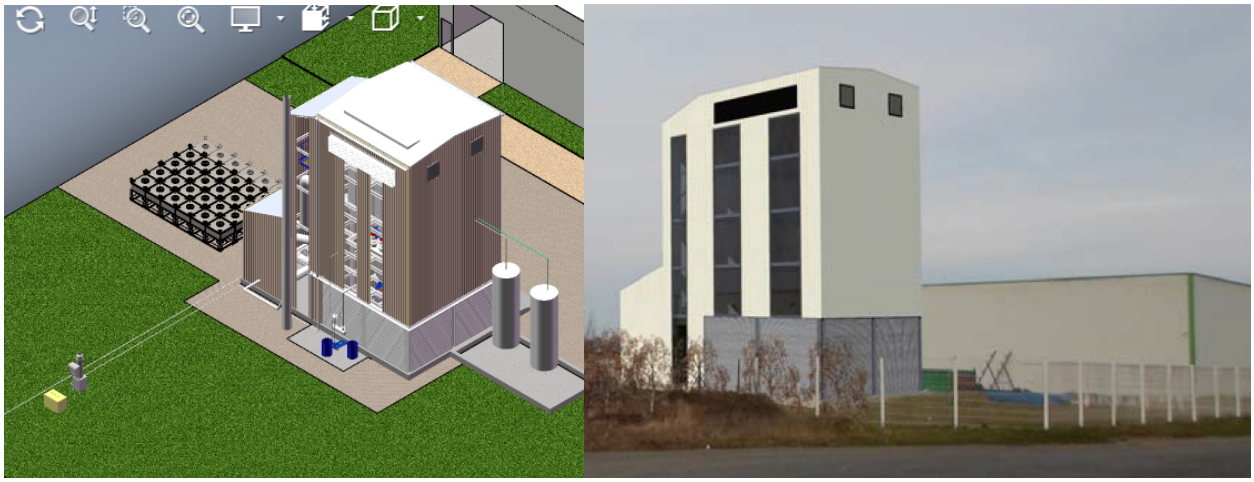
For the design and implementation of turnkey sites, for the maintenance, modernization, or emergency repair of your installations, Alfyma is a single point of contact, offering the assurance of optimal responsiveness, unique in France.

Nearly 300 employees, engineers, technicians, and installers, experienced "made-to-measure" teams, mobile throughout France and abroad, make Alfyma a key player in waste treatment and a privileged partner for major manufacturers in the recycling sector.

In the event of an emergency, Alfyma means permanent stock and the responsiveness of our technicians and installers, who intervene 24/7 in less than three hours on our customers' installations, whether we are the designers or not, and whether they are recent or older.

Because trust is built every day

Alfyma has made a name for itself in the field of innovation, providing patented waste treatment solutions worldwide. Today's challenges concern the recycling of materials for fair reuse, in particular, the recycling of used tires to extract high-value-added components, including semi-active carbon black, pyrolysis oils (diesel and fuel oil), and the gas (syngas) that supplies the process with energy.



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INTERNSHIP SUBJECT

Pyrolysis is emerging as an innovative and crucial technology in rubber recycling, offering a sustainable solution to the environmental challenges posed by rubber waste management. This thermochemical process consists of decomposing rubber components at high temperatures in the absence of oxygen, transforming used tires and other waste materials into useful products such as carbon, liquid hydrocarbons, and gases. The major advantage of pyrolysis lies in its ability to convert used rubber into valuable resources while reducing the greenhouse gas emissions associated with incineration or landfills. Not only does this approach help solve the growing problem of rubber waste, but it also supports the transition to a circular economy by reusing pyrolysis by-products in the manufacture of new products, thus promoting more responsible resource management. In short, pyrolysis is emerging as a promising pillar of rubber recycling, offering a sustainable and efficient way of transforming waste into environmental and economic opportunities.

Alfyma is working on developing a pilot plant to experimentally validate a process for recycling rubber waste using pyrolysis reactors operating continuously. Given the pressures and temperatures involved, safety around the reactor requires detailed modeling of the phenomenon. In addition, to move from a pilot to production lines, it is essential to ensure the mechanical strength of the device.

In this context, the internship aims to model the interaction between the pressurized hot gas and the mechanical structure of the reactor, to ensure its proper operation and mechanical strength. CFD-type calculations will be used to study and optimize gas flow, followed by finite element simulations to verify the mechanical strength of the reactor.

Place of work

Alfyma, 17 avenue Christian Doppler 77700 Bailly Romainvilliers, FRANCE.

Duration and expected start date

5 to 6 months, contract start February/March 20242024

Skills required

- Fluid mechanics, CFD
- Finite element simulation
- CAD

Candidate profile

Students in the second year of a Master's degree in mechanical engineering, with a good knowledge of CFD. Proficiency in STAR CCM+ software is desirable.

Contact

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