

## Internship: Optimization of the silica/silane ratio in a tread compound

Apollo Tyres Global R&D, Enschede

### Who are we

Apollo Tyres is a tyre manufacturer of Indian origin. Apollo is an ambitious and growing company with factories in India and Europe, as well as sales offices around the world. About 170 employees work at Global R&D in Enschede to develop new (car) tyres for Apollo and Vredestein. There is also an office in Frankfurt (Raunheim) with approximately 25 employees.

Material department is one of the key groups of the R&D responsible for development of raw materials, compounds, process establishment (related to raw materials & compounds) and laboratory. Compounding group works in close cooperation with subgroups of material department, Product development (OE & Replacement), Pre-development, Testing and Plant Technology teams in EU plant locations.

### Assignment description

Silica is successfully applied as a reinforcing filler in tread compounds for passenger car tyres to obtain a good balance in grip and rolling resistance. In order to disperse the silica sufficiently into the rubber, a silane (a reactive dispersing agent), is needed. The optimization of the ratio between a silica and the silane in a specific tread compound will be beneficial for compound properties, tyre performance, compound processing, and compound costs. It is the task of the student to find the optimal ratio or conditions for a specific silica-silane system.

### Assignment objective

Determine the optimal ratio between the silica (reinforcing filler) and silane (reactive dispersing agent) in a typical tread compound used for passenger car tyres.

### Your tasks

Perform literature survey and internal investigation (R&D) and design of experiments in formulations of different tread rubber compounds. The ratio between the silane and the silica needs to be optimized without impacting the compound properties in a negative way. The efficiency of the silane can also be analysed by measuring the level of unreacted silane groups in the compound. Several selections in type of silica (with various internal surface area), the type of silane (conventional or mercaptosilane) and/or the type of tread compound (winter/ all-season or summer) can be made based on the outcome of the lab studies.

### Your profile

- Enrolled Bachelor or Master student in chemical engineer, chemistry, or other technical engineering study
- Available for 6 months or more
- Strong communication skills in English, any other language is a plus
- Entrepreneurial and business oriented
- Likes to work for rubber materials
- Some experience/ with design of experiments



### What do we offer

- A dynamic and innovative internship environment
- Colleagues from all over the world
- Own working space within the office building
- Exposure to other disciplines within our R&D environment.
- An internship allowance of 650 euros gross per month, based on a full-time position.

**Start date:** to be arranged

**Internship nature:** Full-time

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