

# Why don't you try INTERNSHIP in JAPAN ??

## Special Offer from YKK Corporation, Machinery and Engineering Group !!!

### ?? What is YKK ??

YKK is widely known as famous zipper manufacturer. We have expanded our business all over the world that we have 111 subsidiaries in 71 country/region. We are not only manufacturing zippers but also researching and developing materials, production equipment, dies and mold as well as analysis and simulation. We call our manufacturing policy as "Integrated production". We do collaborative researches with University of TOYAMA.

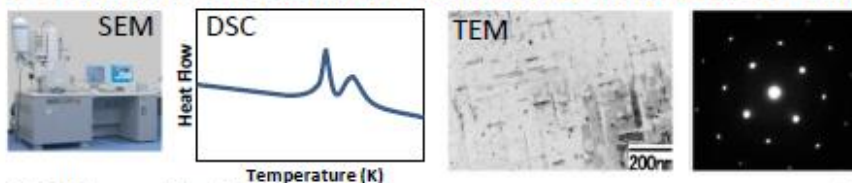


Japan, University of Toyama



### ?? What will I do during internship ??

#### Research and Development of Aluminum alloy used for YKK zippers



### ?? When will start ??

Starting **August 2017** \*Further details at interview

### ?? Conditions ??

No compensation. YKK will provide a place to stay and meals during your stay in Japan

### ?? Where will I stay ??

**Toyama prefecture, Japan**

### ?? Who can apply ??

**Master's student, Doctoral student, Post doctor of NTNU**

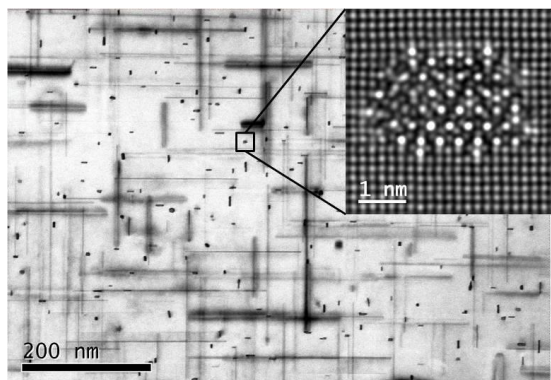
\*Interview will be scheduled

### ?? How can I apply ??

Please contact Professor Randi Holmestad : [randi.holmestad@ntnu.no](mailto:randi.holmestad@ntnu.no)



## TEM CHARACTERIZATION OF ALUMINIUM ALLOYS IN COLLABORATION WITH THE YKK COMPANY IN TOYAMA, JAPAN



### BACKGROUND:

NTNU (Departments of Physics and Materials Science and Engineering), SINTEF and Hydro Aluminium have an ongoing INTPART collaboration project with two universities and industry in Japan. Within this collaboration, we now offer specialization project/master with the Japanese zipper company YKK. The work will be to characterize and contribute in the development of new aluminium alloys for use in zippers. In studies of light metal

alloys there are challenges when it comes to establishing relations between the nano-structure and the mechanical properties, as for example strength and ductility. In these Al-Mg-Si-Cu alloys, the strength increase is due to precipitation of nanometre-sized metastable phases that form from solid solution during heat treatment, and which are studied by TEM.

### WHAT THE STUDENT WILL DO IN THE PROJECT:

The details are not decided yet, as it also depend on the student(s) interests, but the tentative plan is that 1-2 students (from Physics, Materials or Nano) go to Japan for about 1 month internship (paid by the project and YKK). This should preferable be in the autumn, where the student(s) will do some initial mechanical testing and experiments, then bring the materials back to Trondheim. The student(s) will here do experimental testing of properties (such as hardness, strength..) with different heat treatments / alloy compositions, and study the corresponding nanostructure in the TEM, supervised, and in collaboration with PhD students and SINTEF researchers (who can do more advanced microstructure characterization if needed). The student(s) will then go back to Japan in the spring (for ~a week) to present the results.

### REQUIRED FROM THE STUDENT:

Background in materials physics (solid state physics) and interest in materials science would be an advantage. We need a student interested in staying in Japan for a period, learning about Japanese (industry) culture, doing experimental work, and working independently in a larger group of scientists.

### OTHER ASPECTS:

There are many people working on aluminium alloys in the TEM group, and we have several ongoing external projects, including two Centres of innovation (CASA and SFI Manufacturing) where we work in close collaboration with SINTEF, Hydro and other companies producing aluminum products, and the students will participate in project meetings in these consortiums. Students get their own problem that fits well into the rest of the work done. Within this field, there are possibilities for continuation as a PhD student and summer job.

### CONTACT PERSONS:

Randi Holmestad ([randi.holmestad@ntnu.no](mailto:randi.holmestad@ntnu.no)), Knut Marthinsen ([knut.marthinsen@ntnu.no](mailto:knut.marthinsen@ntnu.no)), Calin Marioara ([calin.d.marioara@sintef.no](mailto:calin.d.marioara@sintef.no)), Sigurd Wenner ([sigurd.wenner@sintef.no](mailto:sigurd.wenner@sintef.no)).



Pictures taken in Toyama at the last meeting with YKK.