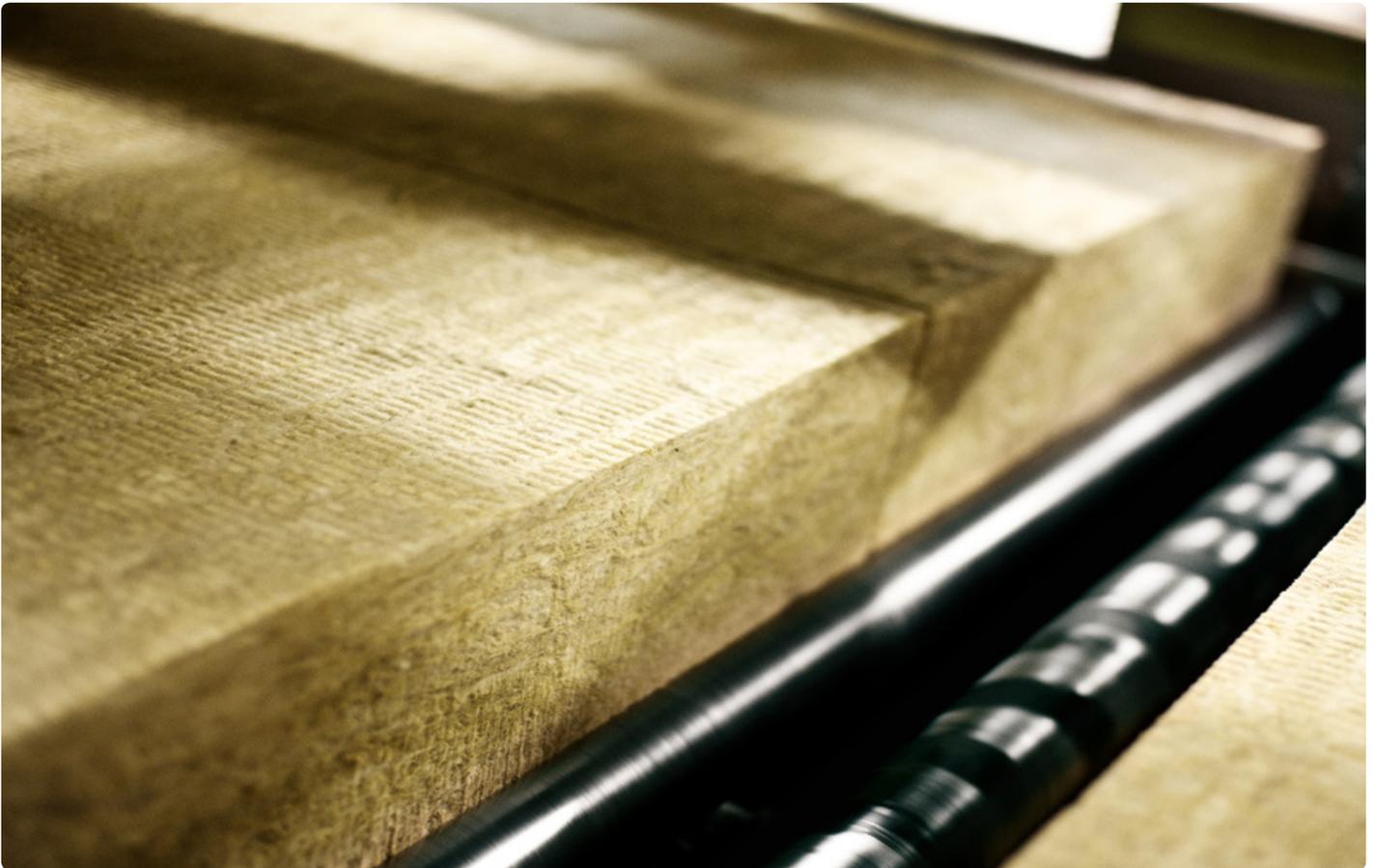# Looking deeply into the Fabric of Insulation

ROCKWOOL International

ROCKWOOL®
FIRESAFE INSULATION

To the layman, the products from ROCKWOOL International and their function may seem simple. A fabric of fine fibres made from stone frame a quantity of air, and the result is improved insulation which keeps us warm, limits heat consumption, and reduces global warming. Yet, the company is keen to apply some of the most advanced tools offered by materials science.

"We are always looking for ways to understand the 3D structure of our products better. Ultimately this knowledge will help in optimizing product design," says Dr Dorthe Lybye, Programme Manager at ROCKWOOL International.

"As indicated by the term "wool" in our name, the stone fibres filter into each other in a quite complex way. Therefore understanding the structure is not as simple as it may sound."

Keen on multi-scale investigations
The company is not only focusing on insulation value, Dorthe Lybye stresses:
"If, for instance, the product is used in façade insulation, mechanical properties are also important, as the material will respond to wind pressure and other factors. If not designed correctly, adhesion and other key features may be compromised."

The company may get valuable information by other advanced techniques such as electron microscopy, but X-ray tomography tops the list of wishes.

"The tiny sample size in electron microscopy is quite a serious limitation for us," Dorthe Lybye explains.

"We prefer to look at larger structures meaning centimetre level. This will be possible at a synchrotron like MAX IV."

Currently engaged in X-ray tomography
Currently, ROCKWOOL International is engaged in a project using X-ray tomography in cooperation with the Imaging Industry Portal at DTU. Industrial PhD Lucie Chapelle divides her time between the company and DTU.

"We will need to evaluate the project before we decide on future projects in the field, but I am confident that we may benefit from experiments in Lund," says Dorthe Lybye, while noting that the idea of using synchrotron facilities is not entirely new to ROCKWOOL International:

Looking deeply into the Fabric of Insulation

> *Compared with previous research, the MAX IV promises both greater resolution and larger sample size, which are both highly desirable factors to us. And while X-ray tomography is our prime interset just now, I will not exclude the possibility of moving into neutron investigations at a lager stage.*

Dorthe Lybye, Programme Manager, ROCKWOOL International

"We have had experiments done in Australia through previous research cooperation. Also, we did approach the Grenoble synchrotron at one point, but we were not successful in obtaining beam time. Obviously, our options will be significantly better at the facilities in Lund."

"Compared with previous research, the MAX IV promises both greater resolution and larger sample size, which are both highly de sirable factors to us. And while X-ray tomography is our prime interest just now, I will not exclude the possibility of moving into neutron investigations at a later stage."

New Horizons Are Opening to the Energy Sector

World leading facilities within neutron and X-ray scattering, the ESS and MAX IV, will open in the Oresund region over the next few years. However, there is no need to wait for these facilities to open. Scientists at Technical University of Denmark and University of Copenhagen are already in gear for X-ray and neutron scattering projects. These could either be full research projects in their own right or preliminary projects leading up to projects at existing or the coming large scale facilities. Contact the universities to learn more about what they can offer you.

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