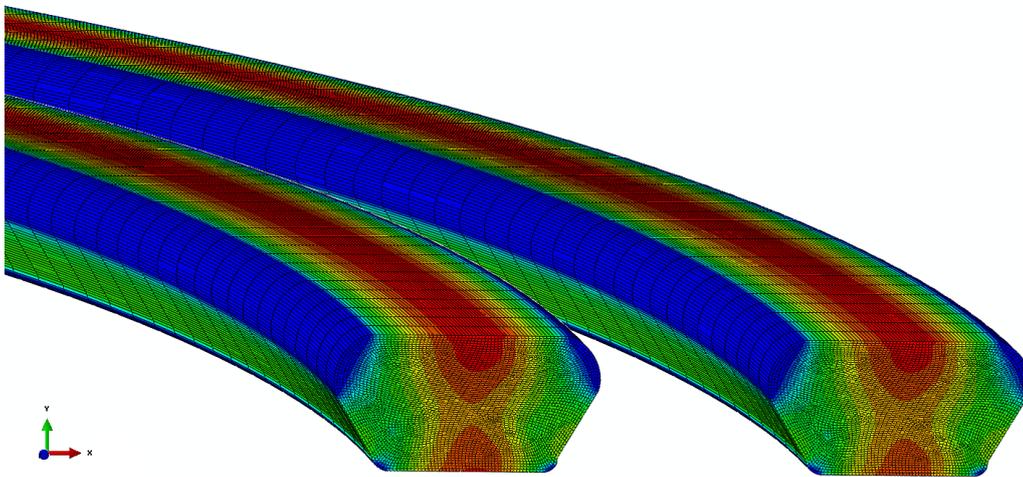


# TN International Qualification and modelling of packaging seals

TN International carries out accelerated ageing test campaigns and numerical studies in order to characterise the behaviour and service life of O-ring seals used in its radioactive material packaging.



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## OUR CUSTOMER

### Corporate name

TN International, a wholly-owned subsidiary of the Areva group.  
3 sites in France :  
Montigny-le-Bretonneux (78)  
Bagnols sur Cèze (30)  
Valognes (50).

### Activities

A comprehensive range of solutions for the transport and storage of radioactive materials throughout the nuclear fuel cycle. TN International is the world leader in its sector

### Workforce

Approximately 550 people

**W**ith its knowledge in terms of radioactive material packaging, transport and storage systems, TN International, a wholly-owned subsidiary of the Areva group, has been a significant stakeholder in the nuclear industry for more than 40 years. These radioactive materials (uranium ore, new or used fuels) are contained in fully sealed large-sized packaging containers designed to protect the environment against the radioactive elements they contain (gases, powders, liquids, etc.). The plugs and

lids of these containers are sealed with an elastomer O-ring seal compressed in a groove. The resistance of this seal must be experimentally demonstrated for a set of events corresponding to the mandatory tests in normal (CNT) and accidental (CAT) transport conditions.

### Tightness tests

Cetim teams have performed test campaigns on the seals in order to test their gas tightness and their resistance to extreme temperatures (from -40 °C to +250 °C in accidental transport conditions). The leakage flow is therefore measured on a

## Cetim's asset

Cetim offers industrial companies a comprehensive range of tests, measurements, simulation and



technical follow-up of materials and components. The expert assessments

carried out meet the requirements of sectors with a high level of safety, such as the nuclear industry.

daily basis until an interface leak is obtained. Then, a seal ageing law is deduced.

Since 2012, Cetim has also been performing modelling work on behalf of TN International for various sealing systems.

In particular, these analyses concern the deformation of the compressed seal in its groove and the forces between the seal and the groove depending on the filling rate of the groove and the rate of compression of the seal. Then, the best systems stemming from these studies are qualified.