

Compaction of crushed salt for the safe containment – Overview of the KOMPASS project

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Role of crushed salt in a possible rock salt repository:

- *Backfill* for cavities and sealing measures
- *Barrier function*: compaction state as equivalent parameter for porosity reduction
- *Porosity/permeability* relationship → input for long-term safety



KOMPASS objective:

Development of methods and strategies for the reduction of deficits in the prediction of crushed salt compaction
→ Improvement of prognosis quality

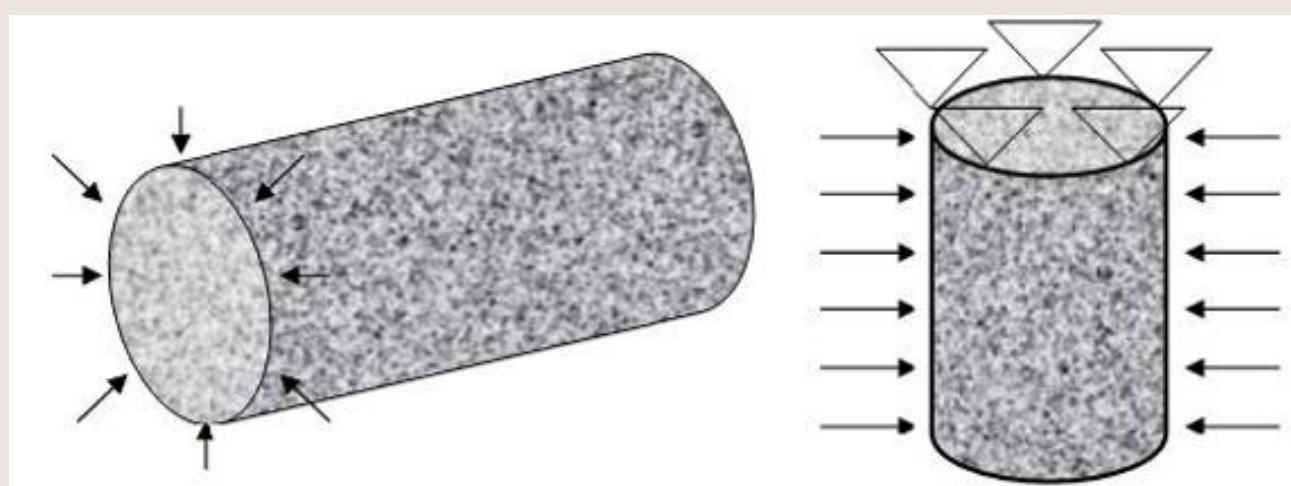
Experimental investigations:

- KOMPASS reference material
 - Easy available & permanent producible

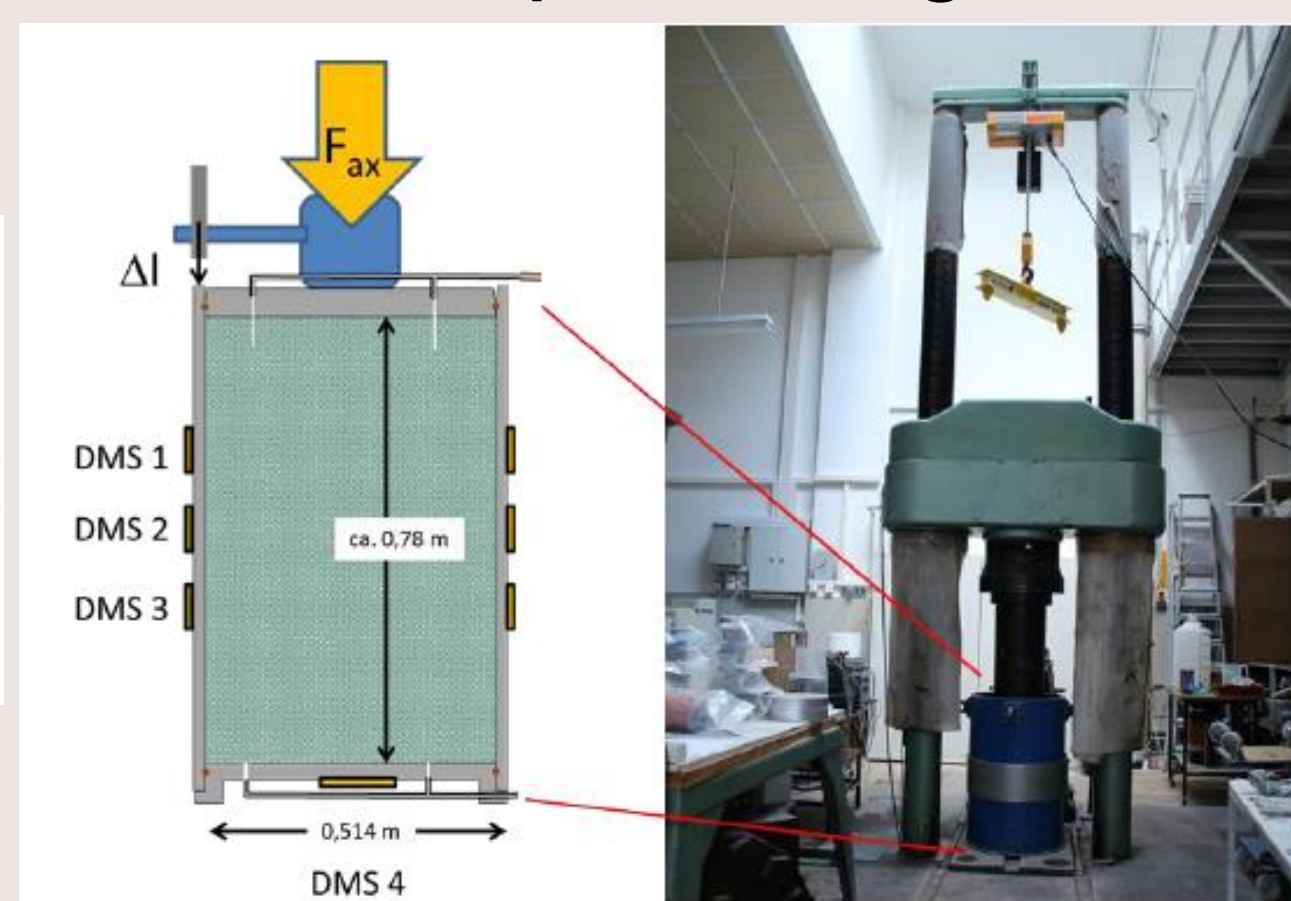


Grain sizes fractions of reference material [KOMPASS ph. 1]

- Pre-compaction
 - Producing samples with in-situ comparable grain structure



Plane-strain compaction [KOMPASS ph. 1]



Big oedometer cell [KOMPASS ph. 1]

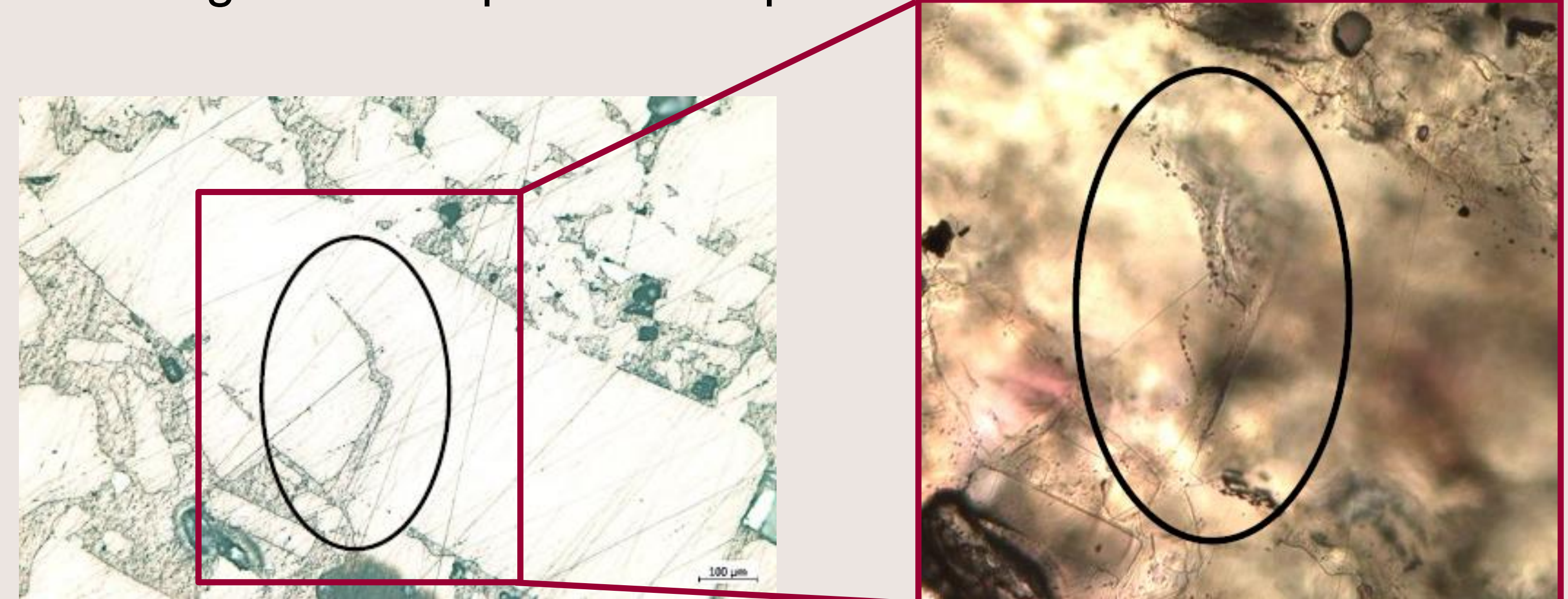
- Long-term compaction
 - Development of a systematic program
 - Isolated investigation of influencing factors

Numerical strategies:

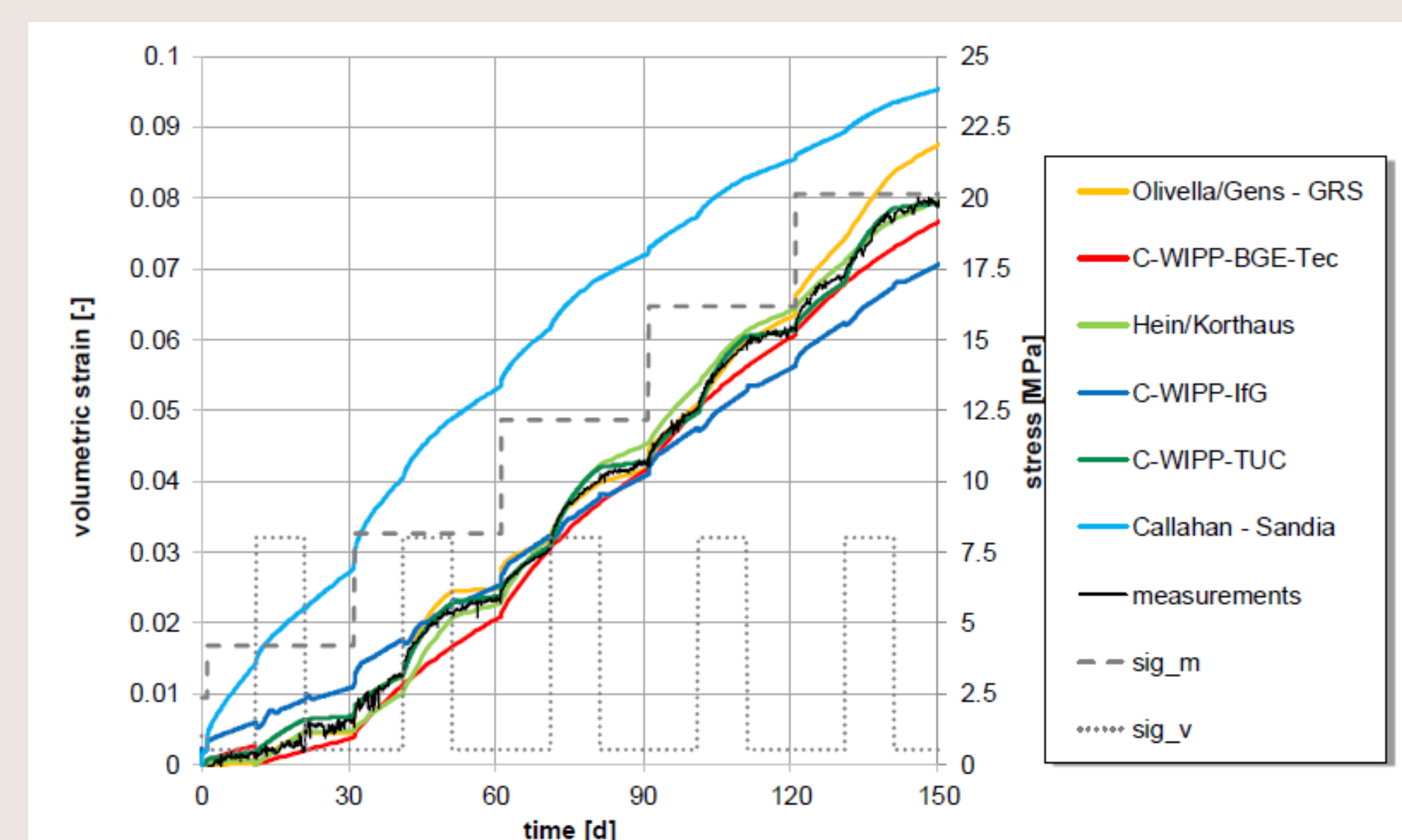
- Analysis of various constitutive models
- Benchmarking of three triaxial long-term tests
 - Results were not entirely satisfactory
 - Further validation work has to be done

Microstructural investigations:

- Enhancement of process understanding
- Association of microstructures with deformation mechanism
- Influence of humidity
- Verification of pre-compacted methods
- Investigation of loose crushed salt, pre-compacted samples & long-term compacted samples



Left: crack propagation through a grain; Right: fluid inclusions near the crack propagation [KOMPASS ph. 1]



Volumetric strain rate for triaxial test TUC-V2 [KOMPASS ph. 1]

[KOMPASS ph. 1]

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