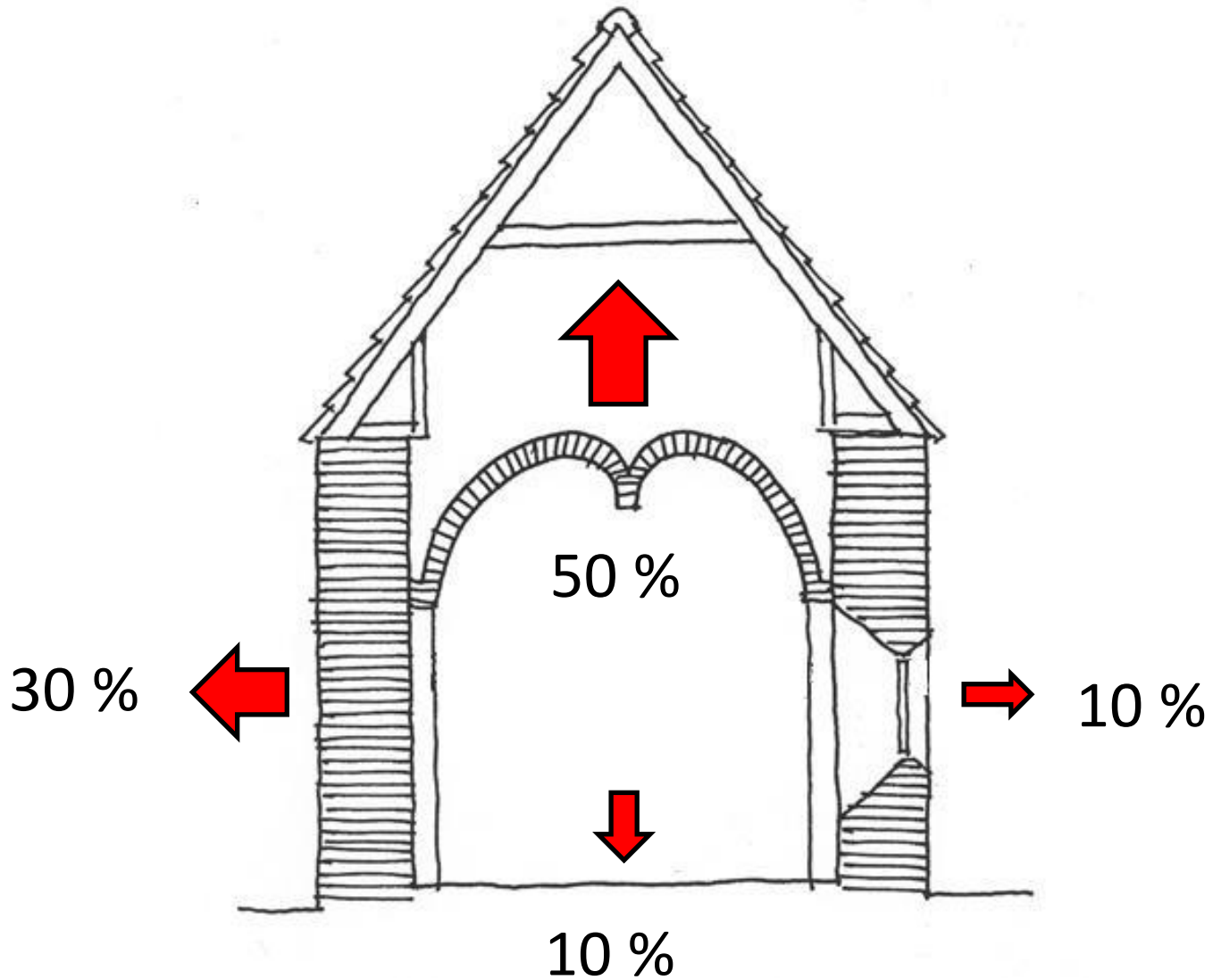


En kalkbaseret mørtel til isolering af kirkehvælv

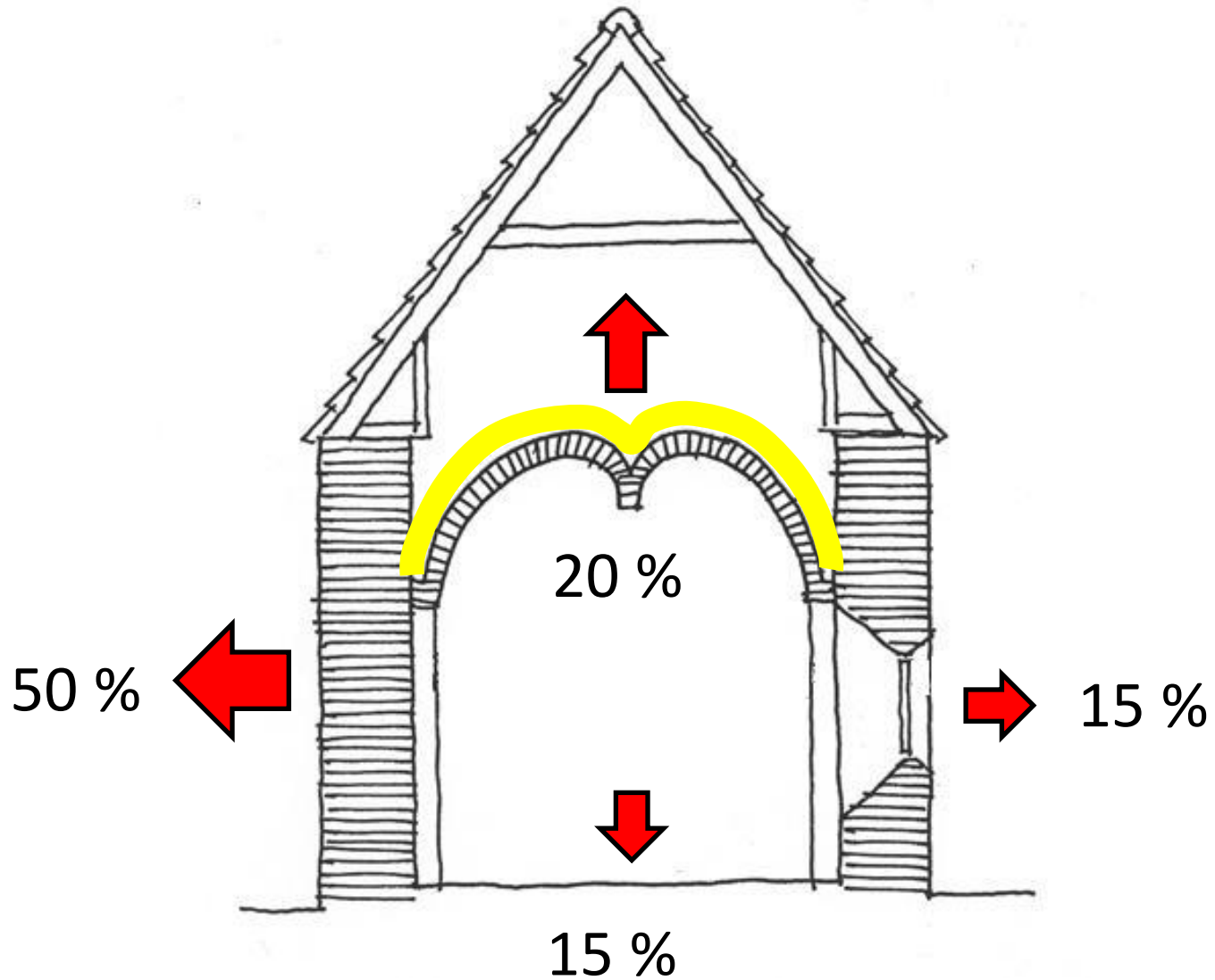
Poul Klenz Larsen, NM, Miljøarkæologi og materialeforskning

Tessa Kvist Hansen, Ph.D. studerende, DTU-BYG

Varmetab gennem hvælv: 50 % af total



Beregnet besparelse: 30 – 40 % af total



Kompliceret geometri



Dobbelt krumme overflader



Skien kirke. Foto: Margrethe Moe

Manglende isolering -> sværtning



Skien kirke. Foto: Margrethe Moe

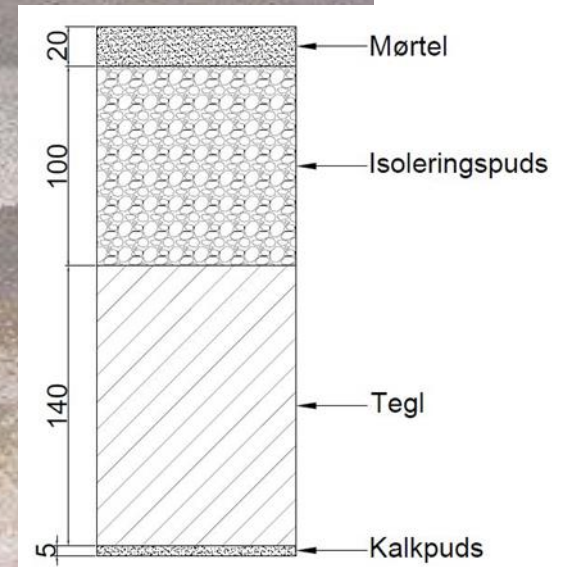
Mineralulds måtter



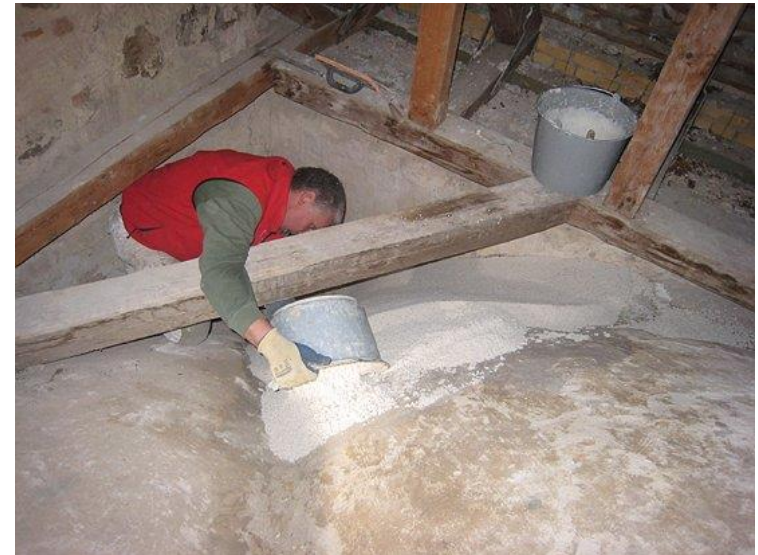
Træfiber granulat



Isolerings puds



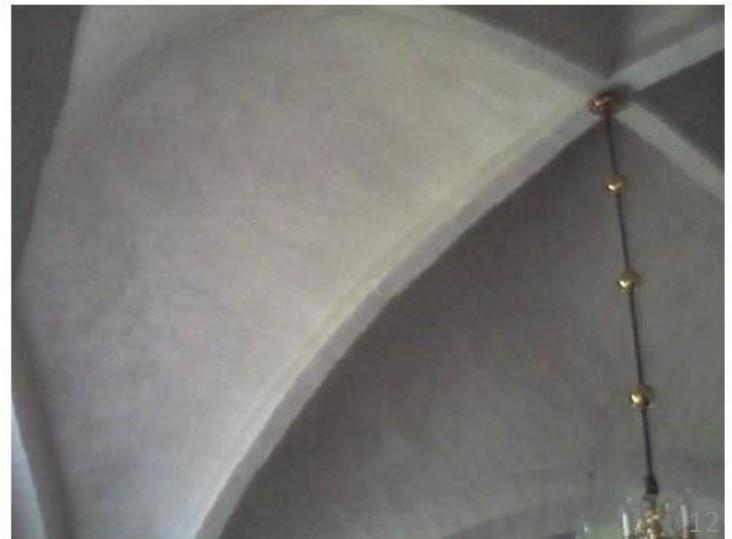
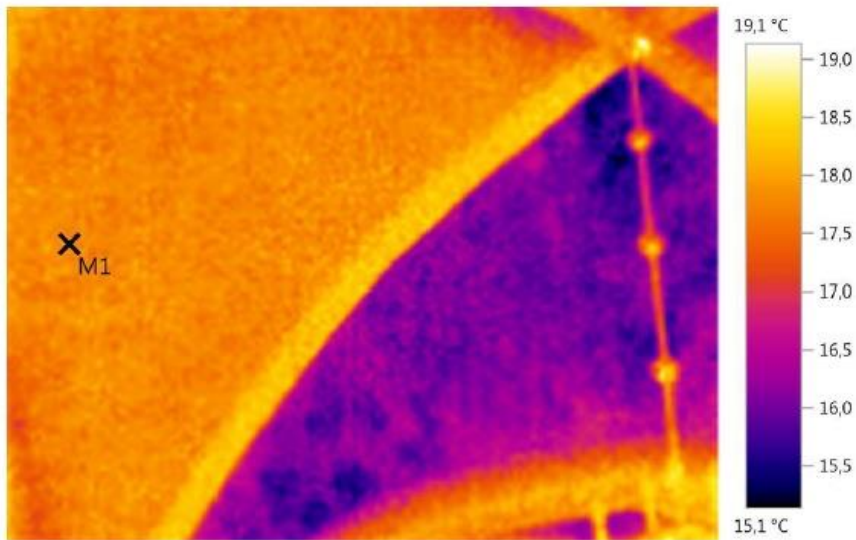
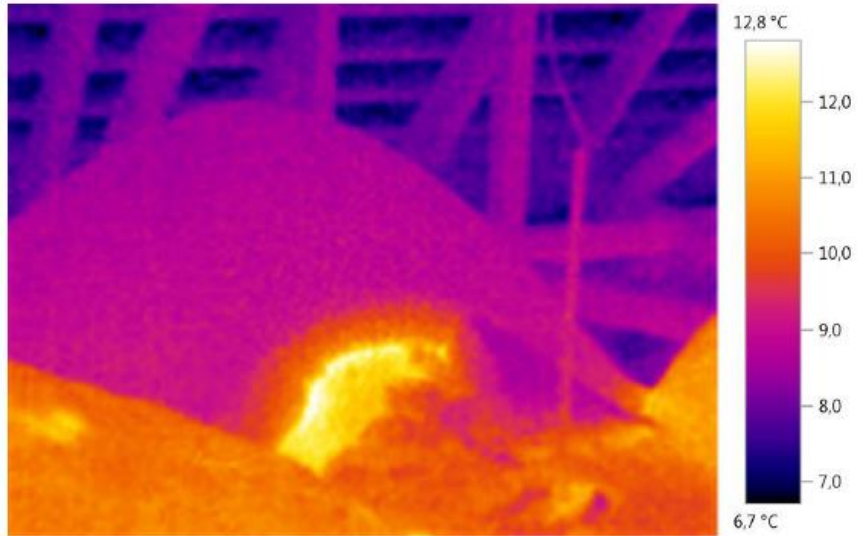
Perlite + læsket kalk = mørtel



Fuldskala forsøg i Annisse kirke

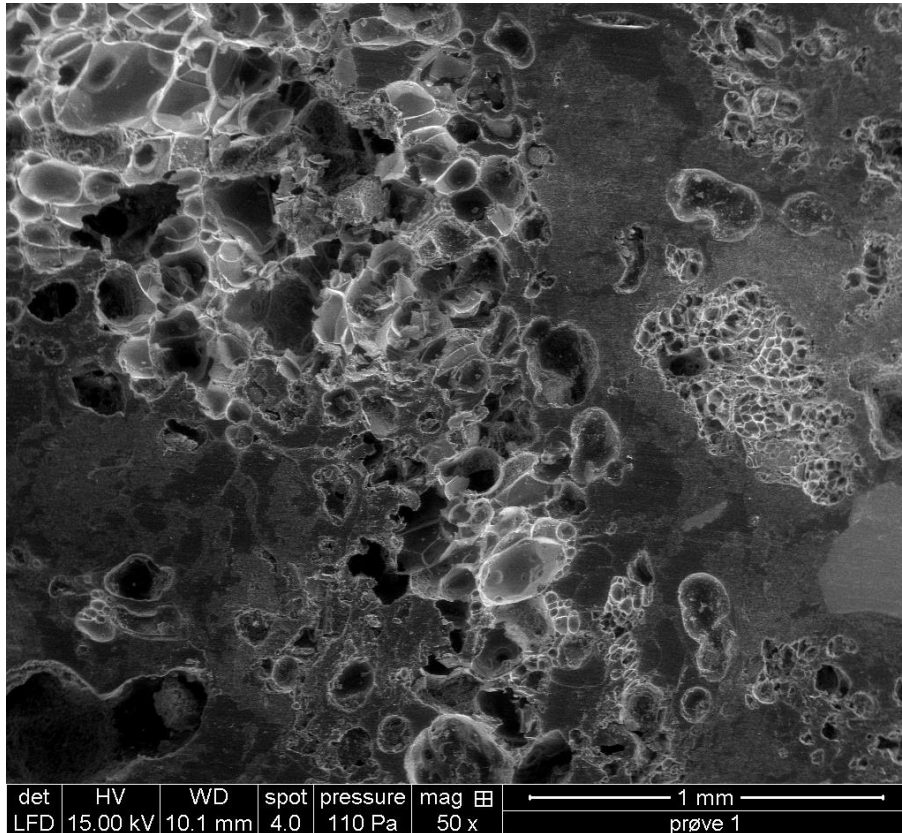


Isoleringevne: 0,08 W/m K

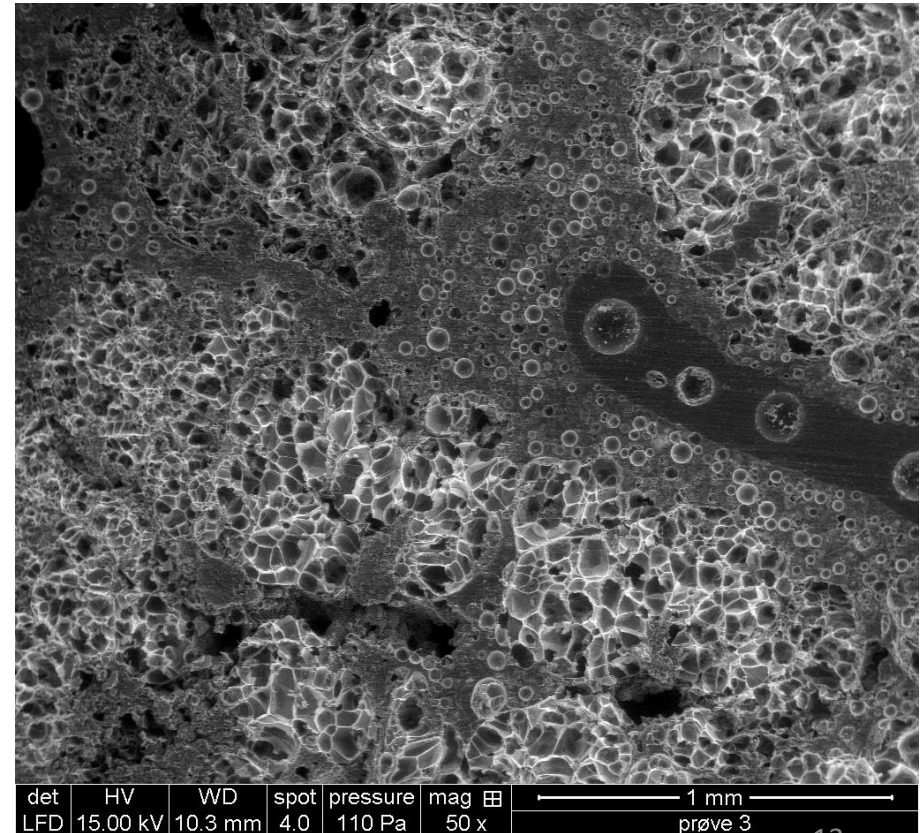


Optimeret isoleringsevne

0 % Scotchlite
 $\lambda=0,08$ W/mK



80 % Scotchlite
 $\lambda=0,06$ W/mK
(Mineraluld: $\lambda=0,04$ W/mK)

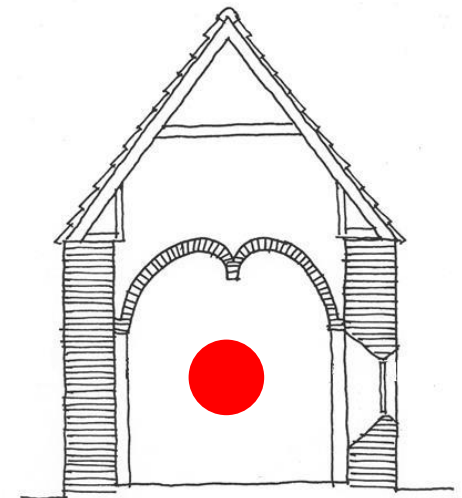
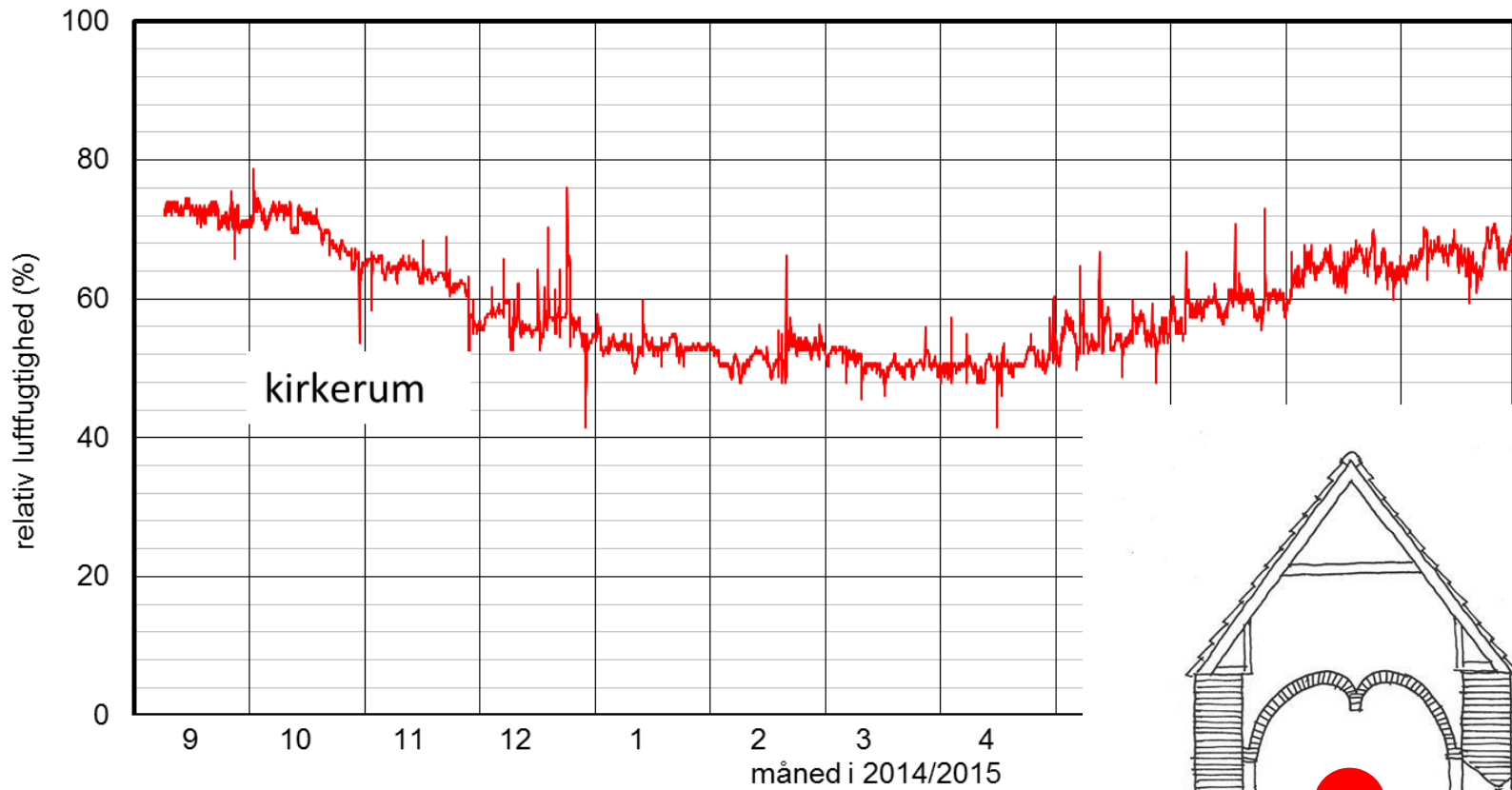


Målinger in situ i Annisse kirke

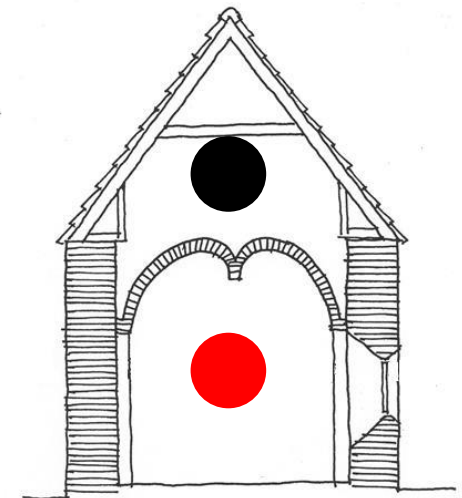
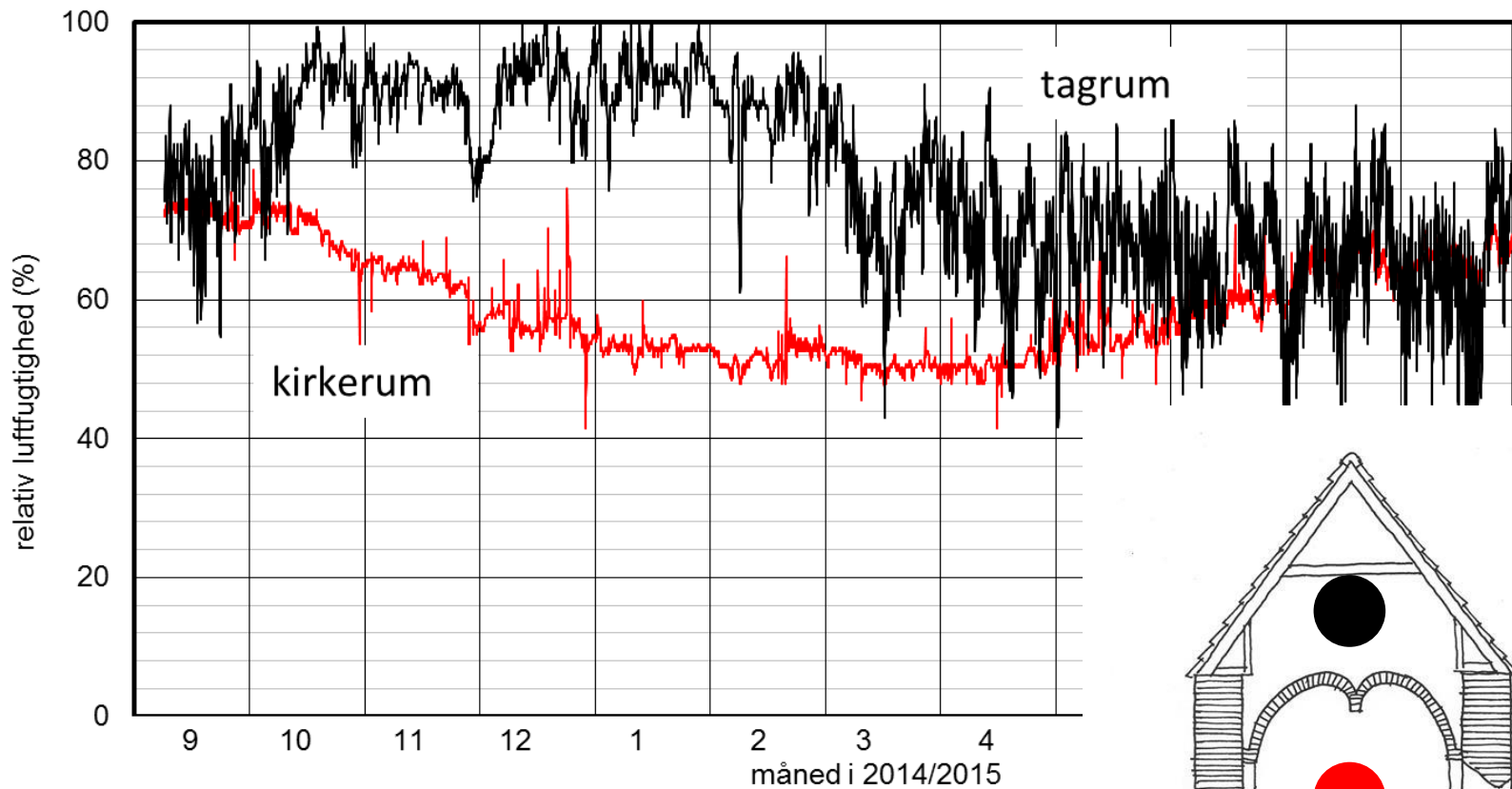
Temperatur og relativ luftfugtighed



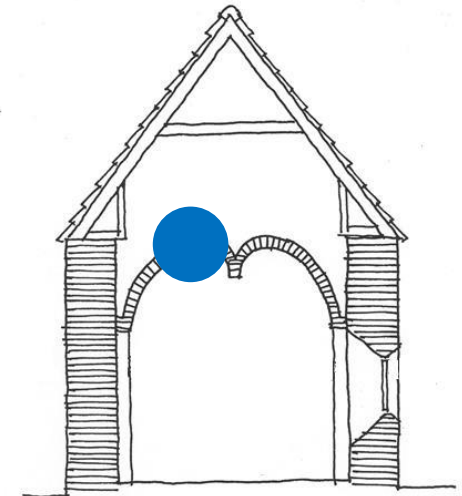
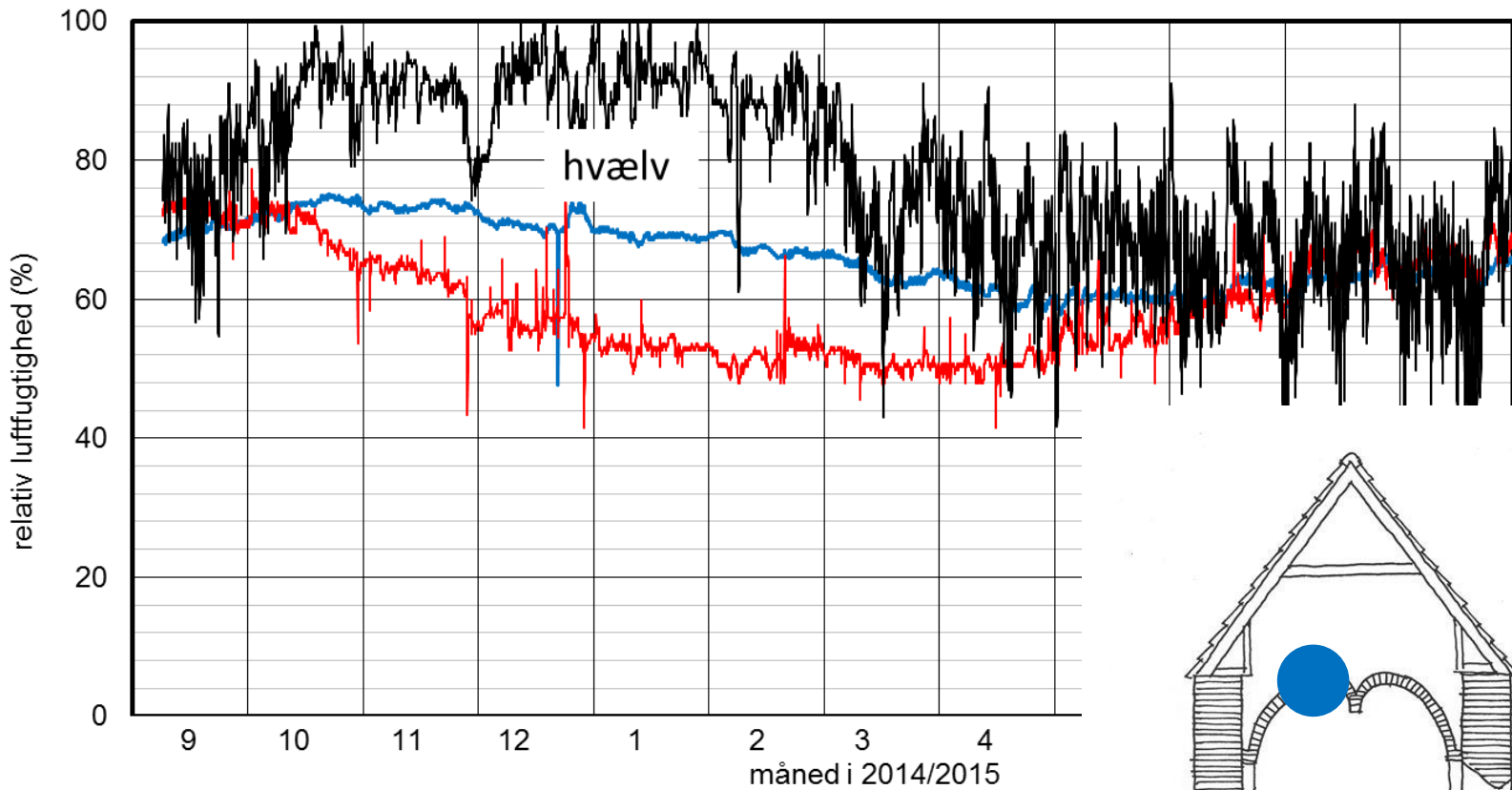
Måling af relativ luftfugtighed



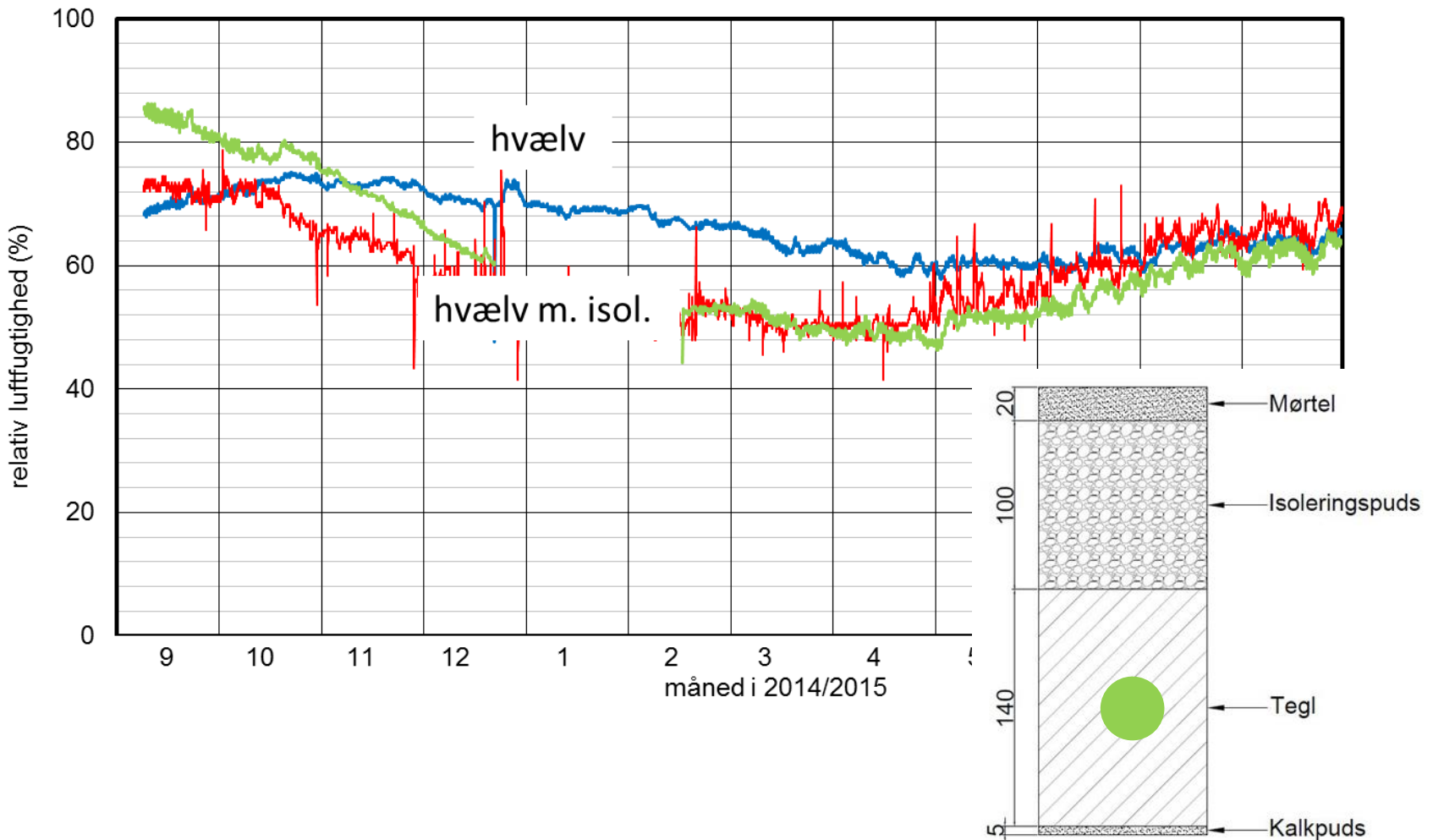
Måling af relativ luftfugtighed



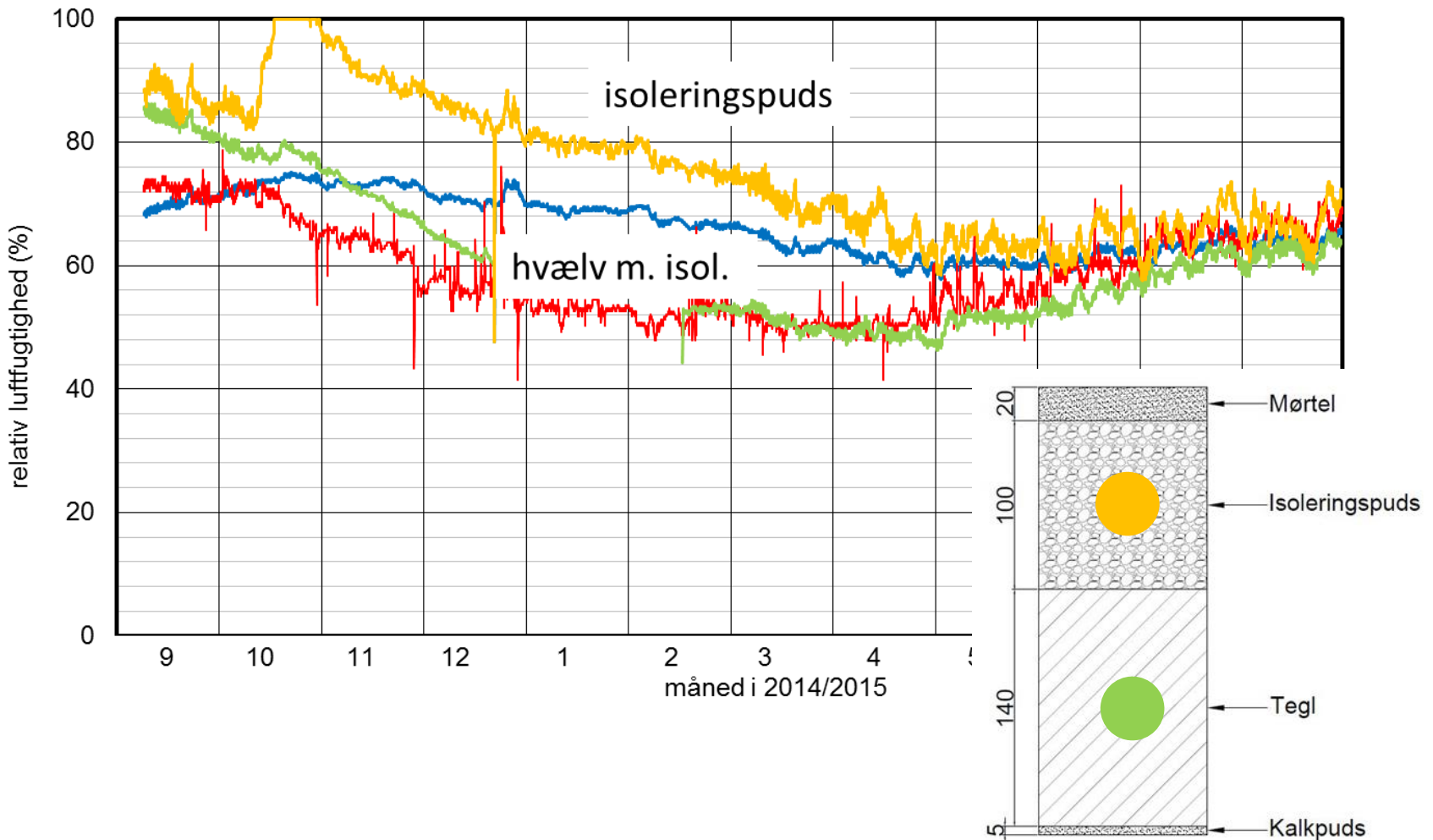
Måling af relativ luftfugtighed



Måling af relativ luftfugtighed

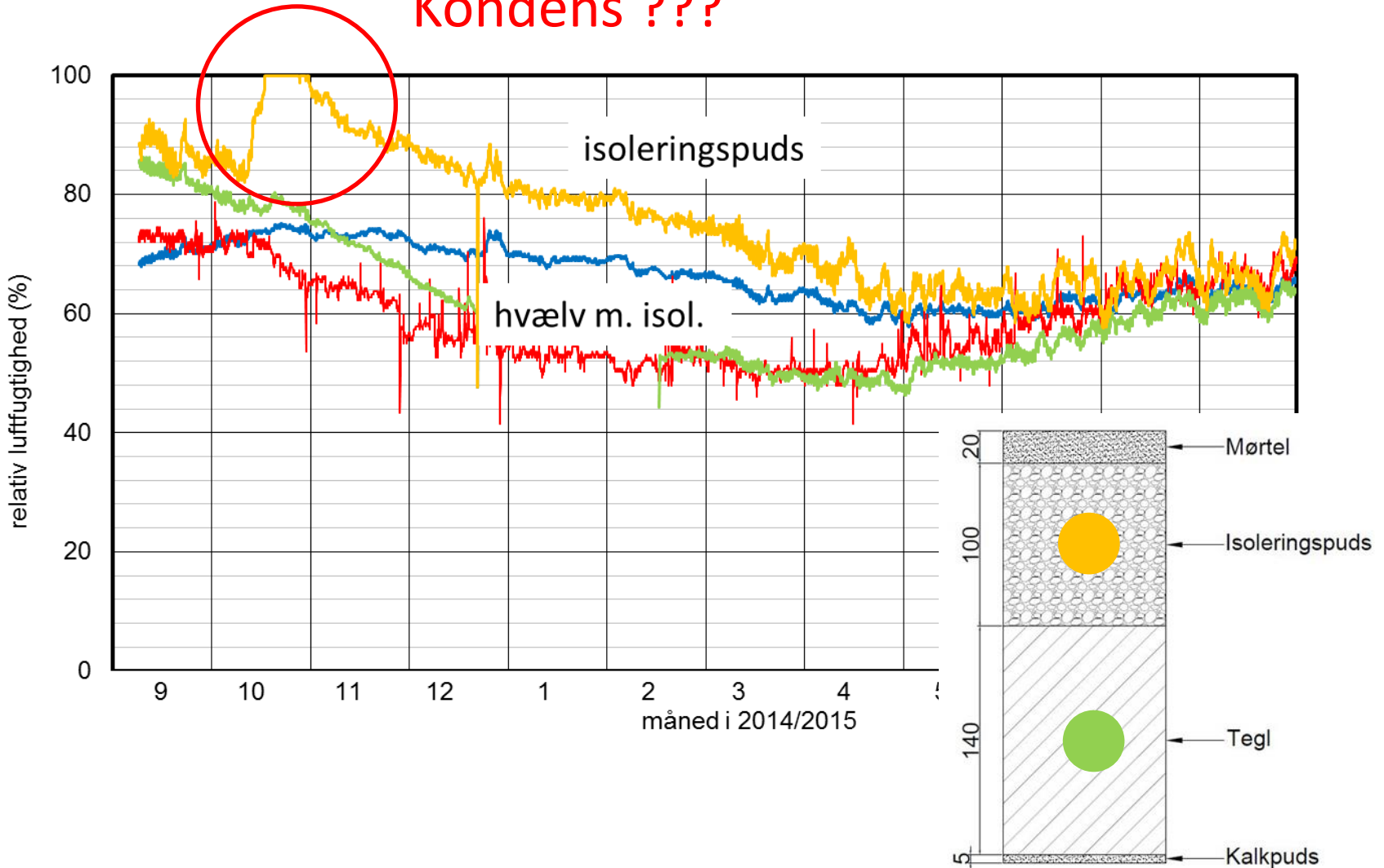


Måling af relativ luftfugtighed



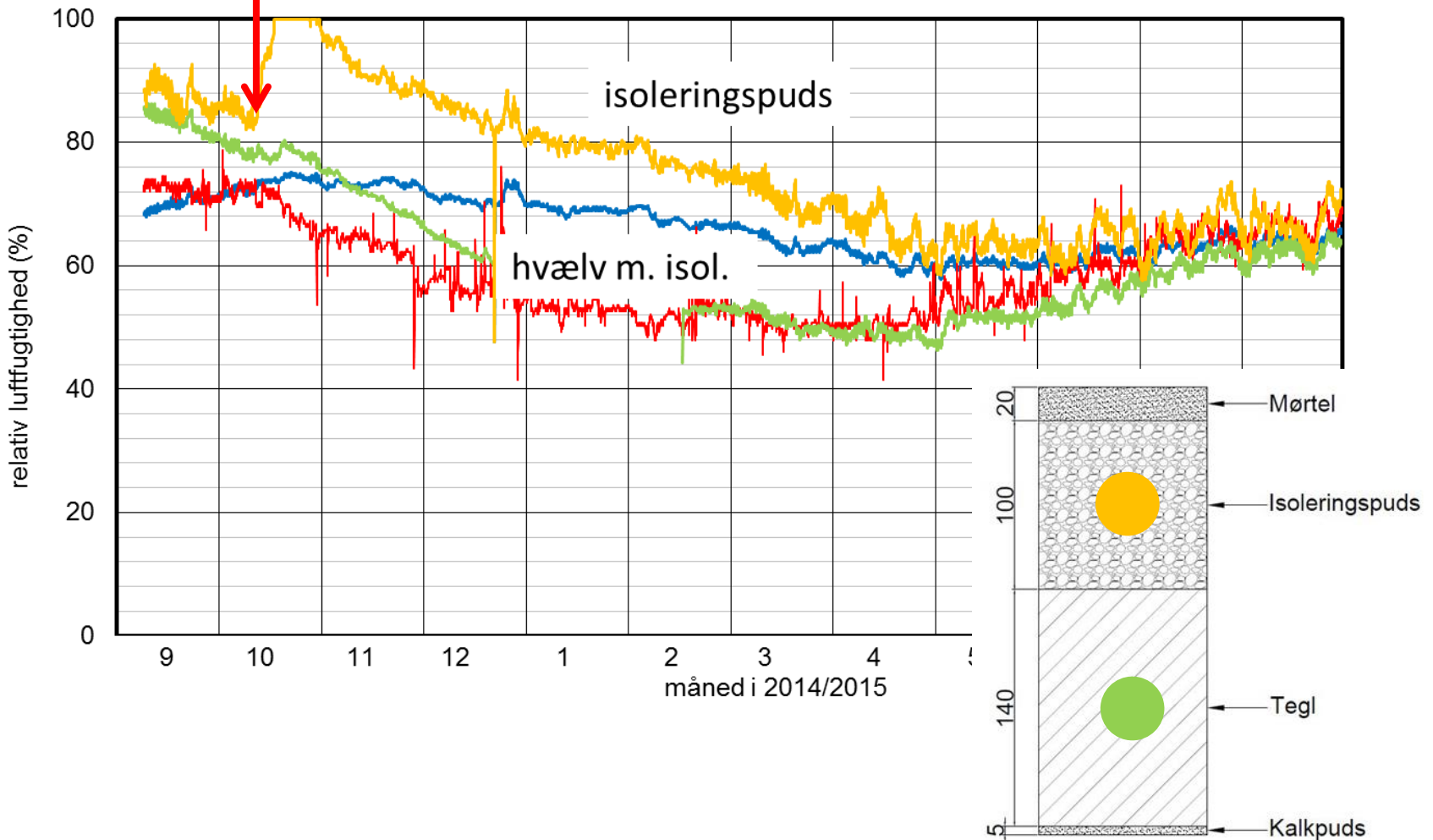
Måling af relativ luftfugtighed

Kondens ???



Måling af relativ luftfugtighed

Årsmøde Helsingør 9. – 11. oktober 2014



Årsager til høj RF i puds

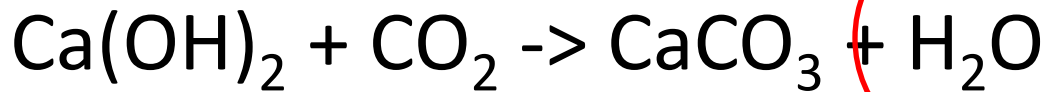
- Karsten tube forsøg –
effekten kunne ikke gentages



Årsager til høj RF i puds

- Karsten tube forsøg – effekten kunne ikke gentages

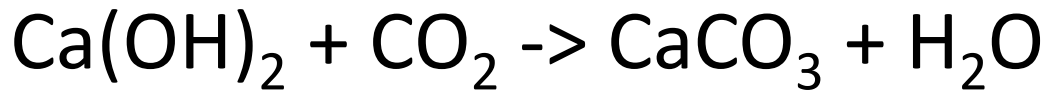
- Carbonatisering af kalk



Årsager til høj RF i puds

- Karsten tube forsøg –
effekten kunne ikke gentages

- Carbonatisering af kalk



- Nissen?

