

SAMPLE SUBMISSION FORM

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Please send this form by e-mail and attach a copy to the sample

Submitted by:	Telephone:
Affiliation and address:	E-mail:
	Invoice reference (name/project number etc):
Sample ID:	Sampling site:
Geographical coordinates:	Date collected:
Collected by:	Expected age:
Exact sample position:	Photograph ID number(s):
Character of the mortar:	Filler:
Alkalinity test: <input type="checkbox"/> Red <input type="checkbox"/> Immediately <input type="checkbox"/> Slightly red <input type="checkbox"/> After a while <input type="checkbox"/> No reaction	Inclusions in the mortar (sub-sample ID): <input type="checkbox"/> Charcoal <input type="checkbox"/> Wood <input type="checkbox"/> Other organic materials <input type="checkbox"/> Lime lumps
Additional information:	

Date received:

Signature:

Sampling instructions

Please follow the instructions carefully in order to avoid mistakes which might affect the dating result. If possible, contact a person with experience from mortar dating at the sampling stage.

Before starting a dating project, consider the following:

- Which building phase(s) do you want to date? Is the ^{14}C method relevant and precise enough for your needs? Check the calibration curve for the relevant century(ies) or consult a ^{14}C laboratory.
- Do you have the financial resources for dating? At least three samples per building phase and several measurements per sample are necessary.
- Has your site been excavated? Is there a risk that the mortars have been exposed to ground water? If so, the dating results may be biased.
- Light-colored, non-hydraulic lime mortars with sand and gravel filler are best for dating.
- Concrete-like and hard hydraulic mortars may be difficult to date, especially if they have been made hydraulic by adding crushed and ground ceramics to the mortar paste.

Before sampling, consider the following:

- Is the mortar well-preserved or is it weathered? Weathering preferentially removes the dateable material and leads to enrichment of the contaminants. Prefer sheltered places where the mortars have been dry.
- Are there cracks and fractures in the mortar where you want to take your sample? Avoid such places because leaching and re-crystallization may have occurred along the fractures.
- Are there signs of fire damage at the site? If they are evident and the mortar is clearly deteriorated it is not possible to date it. If the mortar is still hard it may be possible to date it, but it may be necessary to do some additional measurements before conclusive results can be achieved.
- Avoid mortars with drop-stone like structures and crusts on the surface.
- Ensure that the mortar is in a position where it has hardened quickly. Mortars protruding between stones and brick are usually good for dating.

When sampling:

- Take at least three samples per building phase to be dated. Ensure that the samples represent the same mortar batch or building phase.
- Determine the exact sample position by measuring its relation to a permanent construction, in order to make it easily recognizable at a later stage. Mark the position on a plan.
- Take a picture of the sampling area before sampling, preferably with the sample ID number clearly visible on the photograph.
- Clean the mortar surface by scraping it with a chisel or a knife.
- Sample only mortar from the surface of the structure. Mortar from deeper than ca 5 cm into the structure may be subject to delayed hardening.

- Sample a handful (about 100g) of mortar. Use a small hammer and a chisel and tap off the mortar pieces. Large pieces of mortar are preferable, but several smaller pieces can also be used. Put the sample in a plastic bag and seal it carefully.
- Take a picture of the sampling area and the sample, preferably with the sample ID number clearly visible on the photograph.
- Examine the mortar carefully and describe its character: Is it hard? Soft? Falls easily into pieces? What color?
- Note the kind of filler used: Sand? Gravel? Pebbles? Splinter? Limestone/marble grains? Fossils? Volcanic earth? Rock fragments? Ceramics?
- Check if the mortar is alkaline. Drop a few drops of phenolphthalein solution (2g of phenolphthalein dissolved in 100g ethanol) on a piece of mortar. If the mortar turns red immediately, reject the sample. Slightly alkaline samples can be used for dating. This test can also be done later in the laboratory.
- Look for inclusions in the sample: Pieces of charcoal, wood or other organic materials, or white lime lumps. These can be dated separately. Even very small inclusions (ca 0,5 mg) can sometimes be dated.
- Note any additional information on the mortar, the site, or the sampling situation.

Send the sample along with a copy of this form to the above address.

The large part of the samples is used for different tests: Microscopy, chemical analyses etc. Only a small fraction, usually some 200mg of the 46-75 micrometer grain-size window is used for AMS dating. Other grain-sizes are stored for possible re-dating. Any inclusions found are removed from the sample for possible separate dating.

The sample is mechanically prepared and chemically separated into several fractions according to our standards. The fractions are sent for dating to one or several of the collaborating laboratories. The laboratory best suited to your needs is chosen, based on the number of samples, possible organic inclusions, possible need of express dating, etc. A large batch of samples may entitle you to a discount. If you have any requests and/or questions about the laboratories, please contact us.