

Testing Services for Historic Lime & Gypsum Building Materials

Trust
Quality
Progress

Kiwa CMT





- Initial Laboratory Assessment & Indicative Tests
- X-ray Diffraction & Supporting Techniques
- Chemical Analysis & Aggregate Separation
- Thin Section Petrography
- Interpretative Reporting & Consultancy
- Site Sampling

About Kiwa

Kiwa CMT Testing is part of the Kiwa group, a world top 20 leader in testing, Inspection and Certification (TIC). Kiwa are active in markets including construction materials testing, energy supply, street lighting/highway assets, mains/drinking water, agrifood and healthcare

Kiwa employs over 4,500 people in more than 100 offices in over 40 countries worldwide, mainly Europe, Asia and Latin America.

Kiwa has 6 offices/testing laboratories in the UK, the services for historic lime and gypsum materials testing operate from our Derby location.

Kiwa CMT Testing is a site and laboratory materials consultancy, testing and investigation company providing expert structural, geo-environmental, geotechnical and associated services for the construction, civil engineering and highways infrastructure sectors.

We are UKAS and CHAS accredited and HERS, HEA and Constructionline registered. Details of our UKAS Schedule can be found on the UKAS website.





Initial laboratory assessment & indicative tests

At the outset, our testing approach involves an initial visual examination in hand specimen and under low magnification, in conjunction with physical appraisal, colour assessment and indicative tests for carbonation and porosity.

The visual examination will comment on:

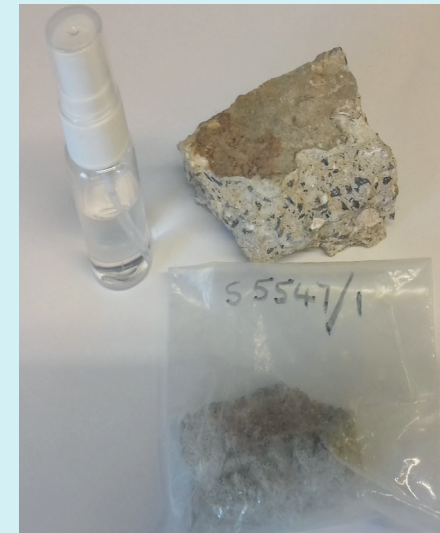
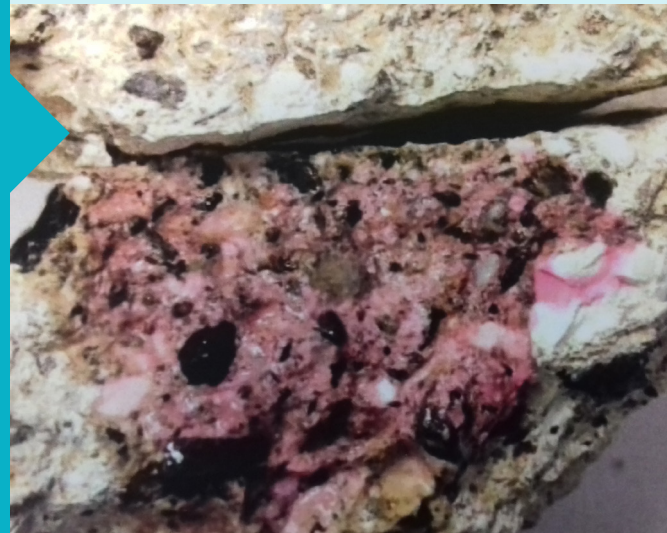
- Basic aggregate type, size and shape
- Presence of lime and other inclusions (coal/ash, shell, animal hair)
- Physical properties: texture, hardness, compaction
- Indication of binder leaching/re-deposition.

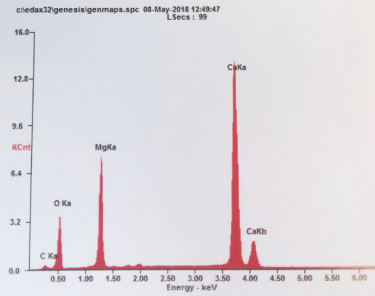
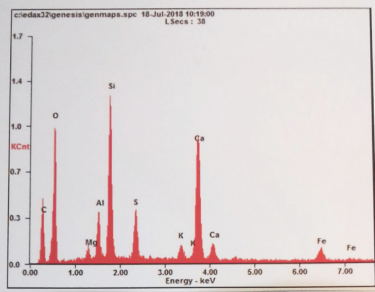
Historic mortars, renders & plasters

Conservation takes precedent when protecting the heritage vested in our historic buildings and structures. It is inevitable however, that sympathetic repair or restoration works will be needed more and more as time progresses.

Identifying and understanding historic materials present within a structure is of central importance and often calls for laboratory examination, testing and analysis of representative samples recovered via suitable methodologies

Kiwa CMT Testing provide a full range of sampling and testing services delivered by experienced Chemists, Geologists and Structural personnel in a "one stop" scenario, including added value support, advice and guidance.





X-ray diffraction (XRD) & supporting techniques

The second stage of testing involves XRD and other techniques selected depending upon the particular objectives of the testing.

Corresponding information gained includes:

- Identification of the binder type (lime or gypsum)
- Type of lime (air lime, natural hydraulic lime, lime modified with pozzolanic additions to impart chemical set properties or improve hardness of the set)
- Identification of the presence, nature and effects of contaminants or reaction products (“sulphate attack/mineral precipitation” for example)
- Quantification of crystalline components
- Further details of aggregate type/mineralogy
- Information on the microstructure of the sample fabric.

Chemical analysis & aggregate separation

Usually done in conjunction with XRD analysis via acid dissolution/disaggregation or direct chemical analysis, this enables calculation of indicative mix proportions and can provide additional information such as an indication of hydraulicity (by silica analysis).

Separation of the aggregate allows assessment of aggregate colour, confirmation of shape and size and determination of Particle Size Distribution (PSD) via sieve analysis.

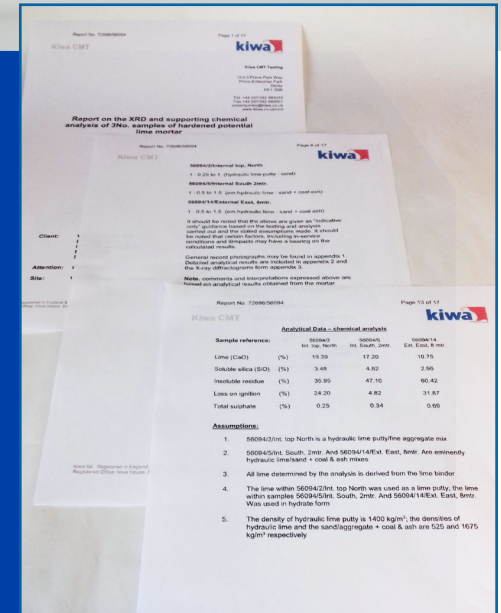
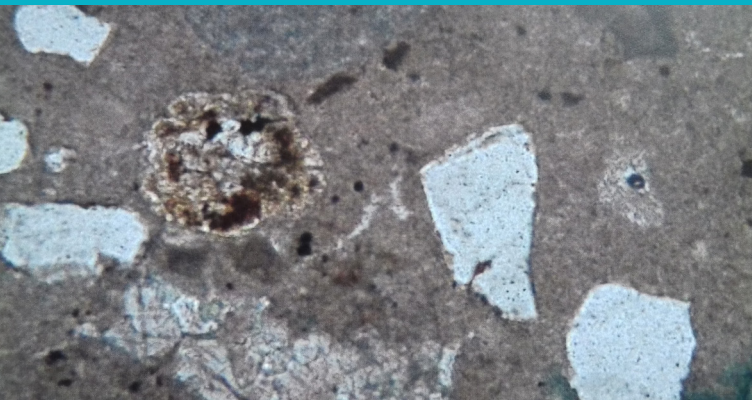


Thin section petrography

This technique is employed in situations where more in-depth information is required following initial testing. Using optical microscopy, thin section examination can confirm:

- Aggregate type(s) and composition
- Condition of the binder
- Overall condition of the mortar fabric, including effects of weathering and/or adverse chemical reactions
- Form of use of lime binders (lime putty, hot mixed mortar etc.)
- Presence and type of pozzolanic components

In addition, modal analysis (point counting) may assist with refining and adjusting the calculation of mix proportions.



Reporting & consultancy

Examination, testing and analysis culminates in a fully interpretative report addressing the principal objectives of the work undertaken.

Kiwa CMT also offers consultancy input covering each stage of the sampling and testing process. Our clients have direct access to experienced professionals who, in turn, provide prompt responses and cost-effective levels of service.

Site sampling

We are happy to provide guidance on sampling techniques, sample types and quantities and receive samples supplied to our Derby laboratory.

Alternatively, we can provide experienced technicians to carry out in situ sampling of historic building/construction materials in accordance with a sampling plan aligned, in turn, to particular objectives.

We are always happy to discuss specific details and requirements in the interests of achieving the best outcomes.



Other Services

Our services are delivered by five inter-cooperative departments: Concrete/Building Products, Chemistry, Geo-environmental, Geotechnical and Structures offering a wide spectrum of testing within these disciplines.

As a long-established testing laboratory our extensive experience enables us to supply the optimum level of service utilising the most appropriate methodologies from initial appraisals to recommendations for subsequent phases of testing and investigation.

Our range of services includes:

- Structural investigation, inspection and testing
- Building product testing, including concrete, asphalt, brick and masonry
- All phases of ground contamination site investigation
- Geotechnical site investigation
- Waste soil characterisation and classification
- Topsoil sampling, testing and assessment
- Coal tar and tarmacadam assessment.

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