



# Editorial-*Materials & Structures*

John L. Provis · Sarah A. Kearney

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## 1 Introduction

It is our great pleasure to present this Editorial to update you on the status, and forward vision, for *Materials & Structures*. As the flagship journal of RILEM (*Réunion Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages* / International Union of Laboratories and Experts in Construction Materials, Systems and Structures, <https://www.rilem.net/>), the focus of *Materials & Structures* is to publish, publicise and promote the highest-quality science and engineering in areas relevant to the work of RILEM. We are proud to continue the journal's longstanding tradition of excellence, and we thank the previous Editorial teams, and past and present Deputy and Associate Editors, for the work they have committed over many years to establish the reputation and profile of the journal. We also thank the RILEM presidency and community for their loyalty and dedication to its success. RILEM is celebrating its 75th anniversary in 2021, and the journal will be marking this event with a set of special retrospective publications to appear later in the year; please keep an eye out for these when they come through.

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J. L. Provis (✉) · S. A. Kearney  
Department of Materials Science and Engineering,  
University of Sheffield, Sheffield S1 3JD, UK  
e-mail: j.provis@sheffield.ac.uk

As many of us also seek to re-establish working patterns and research programmes after the disruption of the Covid-19 pandemic, it seems timely to provide the readers of *Materials & Structures* with some insight into the decision-making process of the journal, to highlight how we hope to contribute to RILEM and the broader community as a high-quality publication venue. Our review process is highly selective, with only around 10% of submitted manuscripts proceeding to publication via assessment by our editors and expert peer reviewers. Those which are published therefore represent the “cream of the crop” in terms of papers in this field, and we celebrate this high quality as a mark of the excellent work that is being conducted by RILEM and the research community in which it operates.

## 2 Scope of the journal—what do we publish?

Our starting point here is that *Materials & Structures* is a highly selective journal whose scope is defined by the topics of RILEM and its Technical Committees (TCs). RILEM TCs are currently organised in six Clusters (<https://www.rilem.net/committees/active-tcs-by-clusters-500209>).

- A. Material Processing and Characterization
- B. Transport and Deterioration Mechanisms
- C. Structural Performance and Design



- D. Service Life and Environmental Impact Assessment
- E. Masonry, Timber and Cultural Heritage
- F. Bituminous Materials and Polymers

Within these Clusters, the majority of TCs relate to cement, mortar, concrete, masonry, bitumen/asphalt, and the reinforcement of these materials by steel, fibres, or other materials or systems. We actively welcome manuscript submissions related to these topics, particularly where authors are linking the characteristics of a material to its use in structures, or where testing methods for structural materials are being developed, analysed, and/or improved. The key characteristics of a paper published in *Materials & Structures* are:

- The topic should have a clear link to the areas of interest of RILEM: “Construction Materials, Systems and Structures” as per the name of the organisation. We are particularly interested in the intersections between these three topics: for example, materials and their use in systems or structures, or the improvements in structures (durability, design, form, functionality) that can be introduced through improvements in materials or systems.
- The research must be innovative and novel, and placed into the context of the existing literature. This is most evident when the Results and Discussion section of a paper contains reference citations and comparative discussion that connect, compare and contrast the new results with the work of others. There is an increasing trend for literature citations in published articles in many journals to be limited to the Introduction section, with the Results and Discussion section presenting only the authors’ own data in isolation from the work of others. This is not something that we are embracing in *Materials & Structures*, as we believe that a key hallmark of high quality research is the ability of the authors to use, and move clearly from, the established state of the art. Papers that do not contain references to past literature from within the Results and Discussion section would be considered (with a limited number of exceptions) to be a case study or research report, not a true research paper.
- *Materials & Structures* generally publishes full-length research papers. For other types of papers that discuss hot and/or emerging research topics, research needs, or viewpoint papers, we suggest that authors consider our sister journal RILEM Technical Letters (<https://letters.rilem.net/index.php/rilem>), a Diamond Open Access publication which welcomes proposals for short manuscripts (up to 4500 words) that may then be invited for submission. At least one co-author of papers submitted to/published in RTL should be a RILEM member.
- We particularly highlight the contributions of RILEM TCs to *Materials & Structures* in the form of RILEM Recommendations and TC Original Papers. These are key outputs from RILEM activities, and represent a large part of the archival contribution of RILEM to the technical literature as a whole.
- Graphics should appear professional in design, and be clearly legible. Important guidance on the design of graphics is given in papers including [1–5] and literature cited therein. Without recapitulating in detail the excellent advice given by those authors, two key points that must be raised are:
  - The default display settings of most data presentation software (e.g. common spreadsheet packages, various specialist software tools, materials analytical instrument software, or finite element packages) are not well suited to publication, and need to be adjusted to obtain publication-quality graphics. Graphics should be designed for visual effectiveness, taking into consideration the needs of the reader (including those with impaired colour vision). 3-dimensional effects, shadows, shading and other visual additions should be minimised if there is not a technical reason for their use.
  - As a specific and essential aspect of this, the default “rainbow” colour scales that are used by many software packages should be avoided if possible. These scales, which rely on colour hue to distinguish categories, have been shown in multiple studies to be less effective than a “heat-map” temperature scale, or another scale which uses saturation or brightness to distinguish categories, in presenting information in a visually legible format [6–8].
- Scanning electron micrographs should be collected and presented according to the guidance provided in [9]; in particular, the microscope infobox needs



to be removed from the image, and a plain scalebar (marker and annotation of its length) added. Energy dispersive X-ray (EDS or EDX) data should *never* be presented as screenshots of single-point spectra. Rather, data should be collected at multiple points and statistical information provided. If a single-point analysis is needed for some reason, this should in general be quantified numerically rather than shown as a spectrum. Spectra collected from fractured surfaces are in general less reliable than those collected from polished surfaces.

- Photographs of sample production, sets of samples, or testing equipment are only necessary where there is something particularly unique about the methodology or sample geometry, and where an annotated schematic diagram cannot show the necessary information. Photographs of standard analytical instruments are almost never needed.
- Details of the suppliers and grades of materials tested, and the manufacturers and model numbers of instruments used in testing, should be provided to the fullest extent possible to enable reproducibility.
- Data should be presented with appropriate consideration of experimental uncertainties wherever possible. In particular, physical (e.g. mechanical) property determinations using replicate samples should be displayed with error bars or uncertainty bounds. Data must be presented to a meaningful number of significant figures, representing the precision of the analytical approach used. Excessive numbers of significant figures in tabulated data are often an indication that there has not been careful thought about the limitations of experimental measurements.
- Citations to standard test methods need to be considered and presented with care. Standards that are regularly updated should be checked to ensure the currency of the version cited; where the version used to conduct experiments has been superseded by the time of publication (which often happens for standards from bodies such as ASTM International which publish revised standards very regularly), the version that was current at the time of conducting the experiments should generally be cited. Where a standard test method has been modified, e.g. applied to an innovative material, scenario, or sample geometry that is outside the

defined scope of the standard, this needs to be stated clearly.

### 3 Scope of the journal—What do we not publish?

Materials & Structures is a journal dedicated to original research and only in exceptional cases do we accept review papers. Review papers published in Materials & Structures are normally invited papers and/or the result of the work of RILEM Technical Committees.

We do not in general publish on metallic construction materials outside their use as reinforcement; in particular, analysis of structural steel is outside the scope of the journal. While RILEM did in the past have activities in this area, it is no longer the subject of any current or recent TCs. Publications on timber in *Materials & Structures* are generally focused on testing methods rather than broader considerations of material properties or use, and we generally publish only a limited number of papers in this area as it is a less active area within RILEM than other topics covered by current Technical Committees.

We welcome papers dedicated to modelling of materials and their roles in structures, particularly where the models are able to be validated against experimental data and can then be used to provide insight that would not otherwise have been available. Papers that are mainly focused on models or algorithms rather than the materials themselves (e.g. comparisons of different machine learning algorithms in describing a particular data set) are generally not accepted in *Materials & Structures*, as these provide relatively little new insight into the materials described. Such work is probably of more value if submitted to a journal that has more of a focus on the machine learning algorithms themselves.

### 4 Preparing a high quality manuscript for submission

The Guide for Authors for *Materials & Structures* is available at <https://www.springer.com/journal/11527/submission-guidelines> and we encourage all authors to follow the guidance provided there. We request that manuscripts comply with a limit of 8000 words



(excluding front matter and references list) and 15 Figures + Tables, to encourage authors to present work in a concise and comprehensible format. Electronic Supplementary Information files are welcomed as a means of providing additional information and data sets. Full details of this and other opportunities for authors are provided in the Guide for Authors.

We suggest that authors consult professional English language editing services where this is necessary to aid in preparing a high quality, clearly-written manuscript. We understand that English is not the primary language of the majority of our authors; where a manuscript is technically sound but has a level of errors in grammar or word selection which detracts from the overall presentation of the work, we will indicate this to the authors in the revision process. It is not expected that reviewers will provide detailed grammatical corrections to authors as part of the process of conducting a review. Some reviewers do prefer to do this, and their care and time is greatly appreciated (by both editors and authors), but this is not something that we generally ask of our volunteer peer reviewers.

## 5 Concluding remarks

We trust that this Editorial has provided insight into the aims and decision-making processes of *Materials & Structures*, and has clarified the expectations for authors to prepare manuscripts that we will be pleased to publish in this journal. As the flagship publication of RILEM, we are very pleased to support our parent organisation in its work to enhance the understanding

and use of the most exciting and important developments in materials, structures, and construction systems. *Materials & Structures* is a journal with a long-standing reputation for quality and relevance of the content we publish, and the current editorial team are pleased and honoured to continue this tradition.

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