International Union
of Laboratories and Experts
in Construction Materials,
Systems and Structures

2022

ANNUAL REPORT

About RILEM

The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM, from the name in French – Réunion Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages) was founded in June 1947 in Paris, France, with the aim of promoting scientific cooperation and to stimulate new directions for research and applications, thus promoting excellence in construction worldwide.

This mission is achieved through the collaboration of leading experts in construction science and practice, including academics, researchers, industrialists, testing laboratories, and authorities.

Become a member

If you are interested in joining RILEM, please consult our website www.rilem.net to become a member.

Membership benefits include

- Participation in RILEM Technical Committees
- Access to the private Web directories restricted to RILEM Members and online version of the RILEM Directory of Members.
- Personal access after login online to the journal *Materials and Structures*, RILEM Proceedings and Springer/ Nature proceedings
- Reduced fees for RILEM events
- 20% discount on all Springer/Nature e-books
- Opportunity to publish selected articles as free OA paper in *Materials and Structures* and in *RILEM Technical Letters*

Individual fees in 2023

Young Member	€ 25	Retired Member	€ 75
Senior Member	€ 375		

Corporate fees in 2023

Institutional Member	€ 2,205	Industrial Member	€ 4,050
Associate Member	€ 1,165		

Note that special discounts of 40% up to 60% on the membership fees apply depending on your country of residence. Please consult the website membership.rilem.net for all details.

Editorial

by RILEM President

Inclusivity in RILEM takes a very simplified form when compared to real life. Indeed, the way we interact at a professional level, and the typical collaboration between academics and industry members, have shown that what matters for us, at this stage and today, is **age**, **gender**, and **geographical diversity**. This has been and is still a choice of RILEM representatives: to focus on and to dedicate some energy to these aspects. As for any decision we take, we always try to follow up on its implementation. This year, I was happy to find in this edition of the RILEM Annual report some positive signs about the current inclusivity situation in our association.

Age

- The graph on page 15 shows the amazing growth of the RILEM young members in the last 3 years, with numbers that tripled between 2020 and 2022.
- A survey on the attendants of the EAC ROC&TOK webinars (page 27) showed that 66% of them are less than 35 years old. Initially thought to be a series of webinars to provide help to lecturers in class, this series is now a monthly appointment for PhD students and young researchers that take advantage of the Q&A live session to interact with world-wide renowned experts.
- The RILEM Youth Council (RYC), an initiative launched in 2020, is now an affirmed feature of RILEM. The members of the RYC have shown to be creative, resourceful, capable, and inventive. They have created a network of active young RILEM members and helped RILEM to achieve its mission. The Peer-to-peer webinars (page 42), launched in 2022 by the RYC, have been highly attended and they continue to attract viewers on our RILEM YouTube Channel.

Gender

- The gender ratio of RILEM members reported on page 15 shows a drastic change from the numbers of 2018 (page 15 of the document here): RILEM moved from 21-79% ratio to 30-70%! This change might reflect two potential trends: on one side, the research working environment that is changing globally; on the other side, the fact that the RILEM typical member's profile is progressively moving: although civil engineers are still predominant amongst RILEM members, RILEM research interests are moving towards new disciplines, like chemistry or architecture for instance, where gender ratio is closer to parity.

- In terms of “Honours and Awards” (pages 35-39), the numbers show that 40% of the medallists, fellows and honorary members are female and 60% are male. This suggests that we are doing fine in terms of recognition.
- In terms of TC Chairs (page 53), the ratio shows 25% female Chairs and 75% male Chairs. We are paying a lot of attention to this number to make sure that leadership in RILEM is distributed with equal opportunities for everyone.

Geographical areas

- India became the country with the highest number of members (page 17), taking away the primacy held by France for many years. It is funny to see that the competition is now between two countries whose people are commonly seen so differently!
- One of the greatest achievements of the EAC ROC&TOK webinars is the capability of reaching every corner of the world. The 2022 events (page 25) attracted in total 1704 attendees from 94 different countries!
- The ROC&TOK webinars are not only in English! Some events were offered in Spanish and Chinese too (page 26), with the aim of breaking language barriers.

As we all know, the situation around the world might be complex. Some local groups are still confronting barriers that prevent them from fully participating in political, economic, and social life. Inclusivity has been and is still a major goal for RILEM in an attempt to respect and appreciate what makes every RILEM member different. As often, improving a situation starts with demystifying and this is what we try to do here by publishing and discussing these numbers.

Contents

2022 Key Numbers

Membership

2,991 members
(2,880 individual
and 111 corporate)

95 countries

Activities

49 Technical Committees

Co-sponsorship & events

11 courses

26 events

15 webinars

Publications

1 Recommendation

2 State-of-the-Art reports

3 Proceedings

Website

153,985 viewers

208,112 page views

Social media

Facebook
@rilemassociation

1,477 followers
↗ +9.81 %

Top 3 countries
- India
- Brazil
- Mexico

LinkedIn
RILEM Association

6,365 followers
↗ +44.59 %

Top 3 countries followers
- France
- The Netherlands
- Turkey

Top 3 countries visitors
- Brazil
- India
- France

YouTube
RILEM Association

2,861 subscribers
↗ +19.70 %

Top 3 countries
- India
- USA
- Japan

Twitter
@RILEM1947

768 subscribers
↗ +40.91 %

76th RILEM Annual Week

and International Conference on Regeneration and Conservation of Structures (ICRCS 2022), Kyoto, Japan, 3-9 September 2022

The 76th RILEM Annual Week and International Conference on Regeneration and Conservation of Structures (ICRCS 2022) took place in Kyoto, Japan, from 3rd to 9th September 2022. The Chair of the 76th RILEM Annual Week organising committee and 2022 RILEM Honorary President was Prof. Takafumi Noguchi, University of Tokyo, Japan. The Chair of the ICRCS organising committee was Prof. Kei-ichi Imamoto, Tokyo University of Science, Japan.

Like all other Annual Weeks, this one also hosted the meetings of the Standing Committees TAC, DAC, EAC, BoEs, DEV, and Bureau.

TAC

The following TCs were closed:

- 273-RAC: Structural behaviour and innovation of recycled aggregate concrete
- 274-TCE: Testing and characterisation of earth-based building materials and elements
- 272-PIM: Phase and Interphase behaviour of bituminous Materials

The following TCs received a number:
302-CNC: Carbon-based nanomaterials for multifunctional cementitious matrices, chaired by Florence Sanchez and 303-PFC:

Some moments during the opening reception of ICRCS 2022
©D. Ciancio

Performance requirements and testing of fresh printable cement-based materials, chaired by Nicolas Roussel.

New RILEM TCs were approved:

- MBC: Magnesia-based binders in concrete chaired by Prof. Paivo Kinnunen
- PHC: Performance testing of hydraulic cements chaired by Prof. Karen Scrivener
- MMS: Modelling and experimental validation of moisture state in bulk cementitious materials and at the steel-concrete interface chaired by Dr Zhidong Zhang
- UMW: Upcycling powder mineral "wastes" into cement matrices chaired by Dr Antonis Kanellopoulos

TAC members nominated two new jury members for the 2023 Robert L'Hermite & Gustavo Colonnetti Medals: Josée Duchesne (Cluster B convener) and Daniel Oliveira (TAC expert). RILEM TAC Chair, Prof. Enrico Sassoni, and *Materials and Structures* Editor-in-Chief, Prof. John Provis, are ex-officio members of the jury.

DAC

DAC members nominated two new members for a 1st mandate of two years (2022 & 2023):

- The regional Convener for China: Prof. Shilang XU, Zhejiang University, replacing Prof. Kefei LI, Tsinghua University.
- The East Asia regional Convener: Dr Guoqing GENG, National University of Singapore, replacing Prof. Sungchul BAE, Hanyang University.

DAC also discussed the increasing number of RILEM members as well as the policy to attract even more young members and Industry members; an overview of the RILEM finances; the RILEM Youth Council's (RYC) numerous activities; and the future RILEM events.

EAC

The RILEM educational activities are numerous and successful, as shown by the number of participants of the past ROC&TOK and

DAC hybrid meeting ©D. Ciancio

RILEM desk with RILEM publications ©D. Ciancio

Peer-to-peer webinars (see details pages 25 and 42). The calendar of the upcoming courses and Webinars was discussed and approved. The meeting was also an opportunity to discuss the details of the EAC PhD course that took place in hybrid mode in Kyoto the week before the 76th Annual Week.

Board of Editors

Materials and Structures (MAAS): the journal is very active, receiving around 1600-1700 submissions every year, with an overall acceptance rate of ~13%.

The members welcomed the new Managing Editor, Dr Arosha Dabarera, University of Sheffield, UK.

It was decided that the TC Deputy Chairs, and not only the TC Chairs, are officially part of the Editorial Advisory Committee of MAAS.

RILEM Technical Letters (RTL): With the sponsoring of RILEM, all RTL articles are published free of charge and are available in full **open access.** The Editorial board reminded everyone that submission rules are not only upon invitation of the Editorial Board, but also upon submission proposal (abstract) by authors.

General Council (GC)

The proposals of the Standing Committees were discussed at the DEVelopment meeting (the DEV meeting allows RILEM officers to be informed of all the standing committees discussions) and at Bureau meeting and, once approved, they were voted at the General Council (GC) meeting which was held in hybrid mode.

RILEM members attending the GC elected:

- The 2023 RILEM Honorary President: Prof. Nemkumar Banthia, University of British Columbia, Vancouver, Canada.
- The new Treasurer, Prof. Sofiane Amziane, University Clermont Auvergne, France. All members acknowledged the work of former treasurer Prof. Pietro Lura, Empa, Switzerland, for his work over the past years.

Some moments of the ICRCS22 gala dinner with the RILEM Presidents and the conference organisers ©D. Ciancio

During the meeting, the 2022 RILEM Fellows and Honorary members were announced (see page 39).

The International Conference on Regeneration and Conservation of Structures (ICRCS 2022) officially kicked off on Wednesday 7 September. After the opening speeches by the 2022 RILEM Honorary President, Takafumi Noguchi, the RILEM President, Nicolas Roussel, the Japanese Concrete Institute President, Minehiro Nishiyama, and the Building Research Institute President, Takao Sawachi, there came the time for the Robert L'Hermite lecture by the 2022 medallist Prof. Susan A. Bernal Lopez. The presentation can be watched on RILEM YouTube channel.

The TCs that presented their work at the 76th RILEM Annual Week were:

- 266-MRP: Measuring Rheological Properties of Cement-based Materials, presented by Dimitri Feys, TC Deputy Chair
- 275-HDB: Hygrothermal Behaviour and Durability of Bio-aggregate based Building Materials presented by Sofiane Amziane, TC Chair
- 269-IAM: Damage Assessment in Consideration of Repair/Retrofit-Recovery in Concrete and Masonry Structures by Means of Innovative NDT presented by Tomoki Shiotani, TC Chair
- 273-RAC: Structural Behaviour and innovation of Recycled Aggregate Concrete presented by Jianzhuang Xiao, TC Chair
- 278-CHA: Crack-Healing of Asphalt Pavement Materials presented by Hassan Baaj, TC Chair

The videos of these presentations are available on RILEM YouTube channel.

The young delegates that attended the conference with a poster participated to the RILEM Best Student Poster Award. The winner was Suhas Suresh Joshi, recently granted a Ph.D. at the University of Tokyo, who presented a poster titled *"Analytical investigation of corrosion cracking factors in multi rebar concrete panels using 3D-mesoscale simulation"*. Dr Joshi received a prize of €500 from RILEM and a

Some moments of the ICRCS22 gala dinner. At the centre, RILEM President Nicolas Roussel, shaking hands with 2022 RILEM Honorary President Takafumi Noguchi
©D. Ciancio

complimentary registration to the 77th RILEM Annual Week in Vancouver, Canada, in 2023. Six additional complimentary registrations to the 77th RILEM Annual Week 2023 were also awarded by RILEM 2023 Honorary President, Prof. Banthia, to six young delegates for the quality of their posters (outstanding poster award). More info can be found here.

The RILEM banquet was held at the Sodoh Higashiyama on Wednesday, 7 September. The ICRCS 2022 gala dinner took place at the Hotel Okura Kyoto on Thursday night. On Friday, the ICRCS 2022 organisers took the delegates to two technical visits: 1) Nishi Hongwanji Temple and 2) Daitokuji Temple.

Although face masks were still compulsory indoors in Japan, the general atmosphere was very pleasant and relaxed, and COVID was a faded memory. Delegates and RILEM members were eager to meet, to chat and to shake hands. The parallel sessions of the conference were a venue to present new ideas; the coffee breaks an opportunity to discuss research topics and establish new collaborations. A highlight of this event was the extensive participation of TAC Chair, Enrico Sassoni, who connected online at 1 AM (Italian time) on Wednesday to introduce the R. L'Hermite lecture; Enrico remained connected to chair the TCs presentations and, ultimately, he attended the Bureau meeting until around 11 AM, Italian time. Thank you, Enrico! Another highlight was the presence of the youngest RILEM member: Luna. Not 4-year-old yet, Luna has already attended three RILEM events in person: the 74th Annual Week in Nanjing, China, in 2019; the Spring Convention in Guimaraes, Portugal, in 2020; and the 76th Annual Week in Kyoto, Japan. Well done, Luna!

The next (77th) Annual Week will take place in Vancouver, Canada, on 4-8 September 2023. Until then, *Mata chikaiuchini!*

RILEM President Nicolas Roussel, on the right, speaking at the RILEM Banquet ©D. Ciancio

RILEM Membership

One of the goals of RILEM regional and national convenors, as well as RILEM Youth Council , is to promote RILEM and attract new members. In 2022, as in recent years, RILEM membership has been steadily increasing, reflecting the dynamic development of the association.

Evolution of RILEM membership

RILEM is composed of corporate members and individual members, including researchers and engineers, research and testing laboratories, and companies.

Corporate Memberships

- **Associate Members** are smaller research, academic or building organisations or companies.
- **Institutional Members** are research and testing organisations of national renown, universities, international or national standards organisations.
- **Industrial Members** are large firms or associations in the materials or construction sectors.

These companies have individual staff members who can participate in Technical Committees and have membership benefits.

Individual Memberships

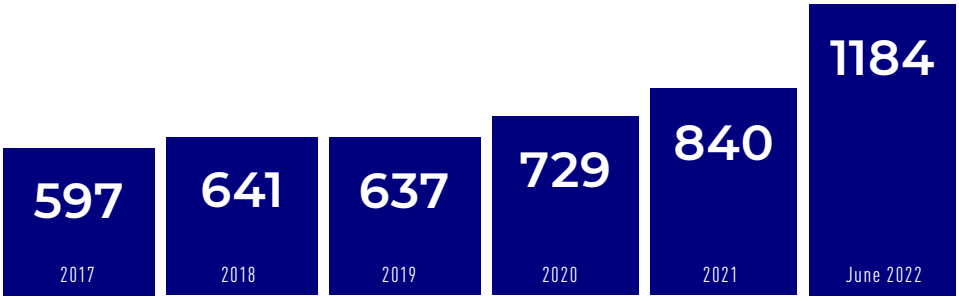
- **A Senior Member** is an experienced scientist or engineer, having reached a position of responsibility and recognised expertise in a public or private organisation or company concerned with testing or research in the field of building materials and structures.
- **A Young Member** is an under-graduated student (including PhD students) or a young research scientist or engineer who is at the early stage of his career under the age of 35 during the membership year.
- **A Retired Member**
- **An Honorary member** is a member who has been distinguished by RILEM officers, for having rendered exceptional services to the association.
- **A free membership** is offered to participants to RILEM EAC courses, Spring meetings and Annual weeks. (The graphs and numbers shown in the following pages do not include the current 240 free members.)

Although the number of corporate members has grown slowly over the past years (111 in 2022), the number of staff members affiliated to the corporate accounts has significantly increased, reaching 1184 in June 2022.

RILEM CORPORATE MEMBERS

**See Corporate members' list page 45*

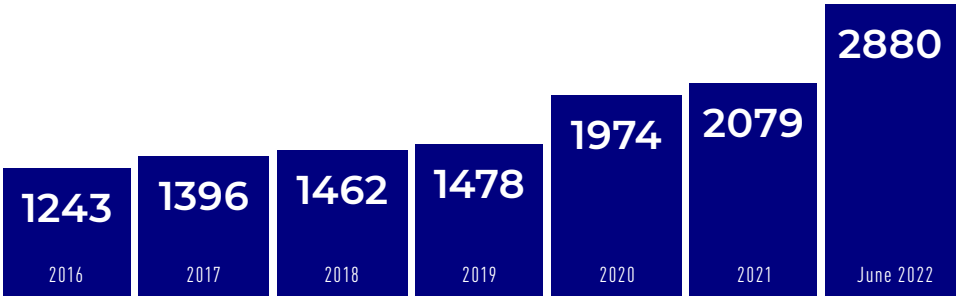
STAFF OF CORPORATE MEMBERS



In 2022, the total number of individual members and staff of corporates which represent the potential active members within the association, has reached 2880, reflecting the dynamic nature of RILEM.

RILEM INDIVIDUAL & STAFF MEMBERS

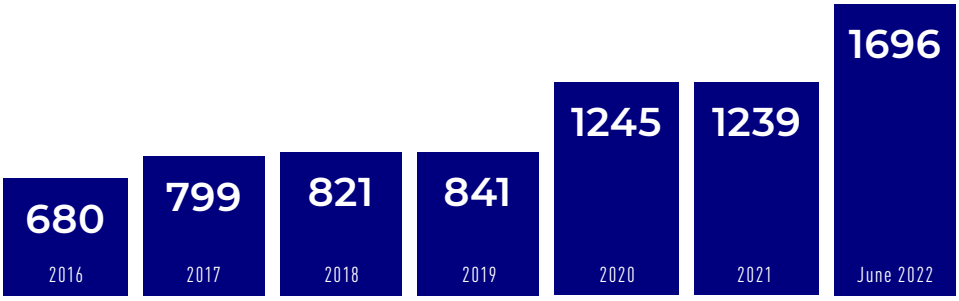
Numbers include individual and staff members and exclude free members



The number of RILEM individual members continued to increase, following the trend of the past years, from 680 members in 2016 to 1696 members in June 2022.

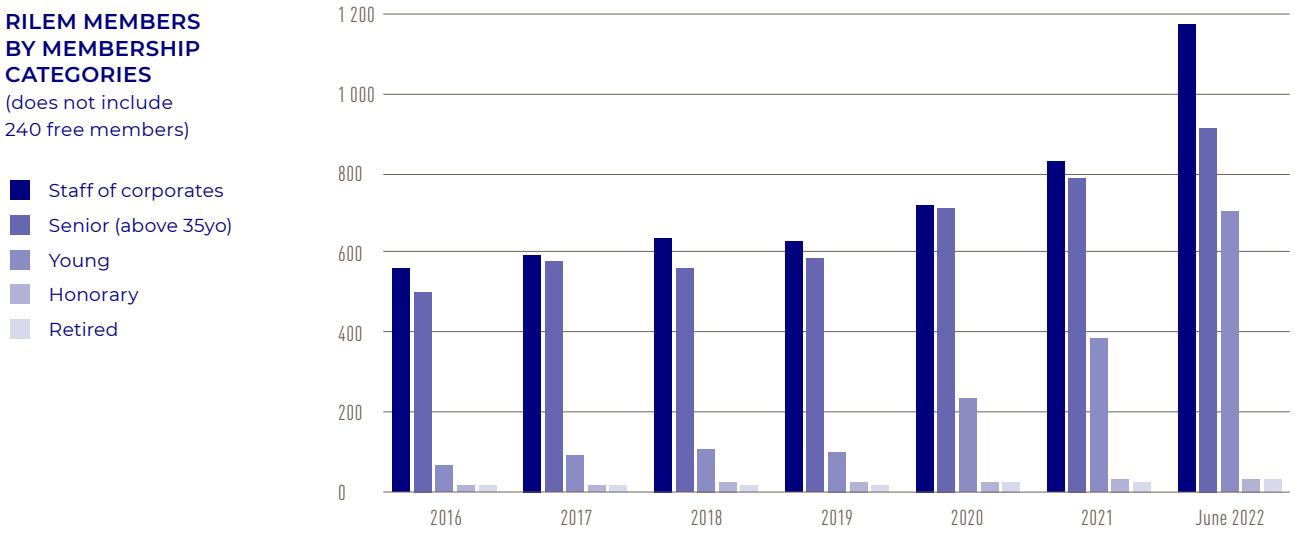
RILEM INDIVIDUAL MEMBERS ONLY

Numbers include individual members, excluding free members and staff



The analysis of the **individual membership** shows a significant increase of the young members (below 35 years of age) over the past 3 years, acknowledging the effectiveness of the policy to facilitate the integration of young members and their participation in the activities of RILEM.

RILEM MEMBERS BY MEMBERSHIP CATEGORIES
(does not include 240 free members)



Gender Balance

Over the past 4 years, the gender balance has slowly evolved in favour of a larger number of female members, representing 30% of the total membership in 2022 (21% in 2018). This is in line with the current trend in companies with similar activities, i.e. civil engineering and construction.

GENDER BALANCE
June 2022

RILEM members dissemination per region

Amongst the ten geographical areas that RILEM established some years ago, Europe keeps the highest number of members (1639). South Asia maintains the second position for the second year, with 340 members, mainly due to the growth in India (see "10 countries most represented within RILEM"). China maintains in the third position (198) and is followed closely by North America (181). The increase in Latin America is significant (134), thanks to the organisation of RILEM Annual Week in Merida, Mexico, in September 2021. Pacific and Sub-Saharan regions have doubled their membership in the period of a year. It is to be underlined that the University of Dar es Salaam became the first sub-Saharan African institutional member in 2022, facilitating the growth in this region. East Asia, Middle East and East Europe continued their growth.

In 2022, all regions have attracted new members, thanks to the activities of many RILEM members and officers and the promotional activities of the RILEM Youth Council members and the RILEM Implementation Manager.

RILEM members by region

	2016	2017	2018	2019	2020	2021	06/2022
Europe	800	871	862	898	1093	1311	1639
South Asia	17	27	30	37	116	180	340
China	84	90	122	100	140	160	198
North America & Caribbean	84	91	85	84	100	116	181
Latin America	35	36	37	41	40	77	134
East Asia	112	131	136	140	74	81	103
Pacific	11	16	16	15	26	37	98
Sub-Saharan Africa	14	15	16	16	30	41	83
Middle East-North Africa	4	6	26	23	48	57	77
East Europe and Central Asia	12	22	22	20	16	19	27
TOTAL	**1173**	**1305**	**1352**	**1374**	**1683**	**2079**	**2880**

-Numbers include individual and staff members. Do not include free members.
-In 2020, it was decided to reorganize the distribution of countries between South Asia and East Asia. This explains the sudden change in numbers in these two regions.

Countries most represented within RILEM members

While until 2021, France was the country with the largest number of RILEM members, it is now surpassed by India followed by the same group of countries as in previous years. One novelty is the arrival of Australia in the top ten, with an almost threefold increase in the number of its members in just over a year.

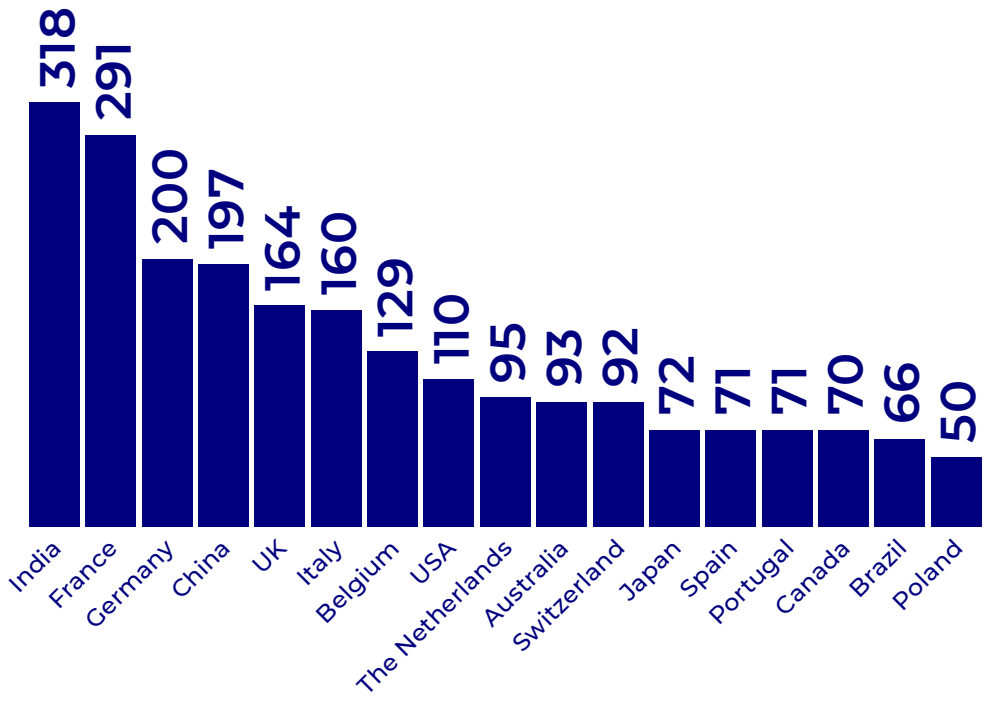
Ten countries most represented within RILEM

	2016	2017	2018	2019	2020	2021	06/2022
India	16	23	25	30	100	159	318
France	161	182	193	199	218	231	291
Germany	109	119	104	104	119	149	200
China	83	88	121	99	140	158	197
UK	38	52	56	60	91	100	164
Italy	82	82	75	75	101	130	160
Belgium	65	75	82	91	102	114	129
USA	46	50	47	51	65	77	110
The Netherlands	44	53	49	50	60	73	95
Australia	8	13	13	12	20	35	93

-Numbers include individual and staff members. Do not include free members.

In 2022, Brazil and Poland joined the group of countries with fifty or more members.

COUNTRY WITH 50 OR MORE MEMBERS
(Numbers include individual and staff members. Do not include free members)

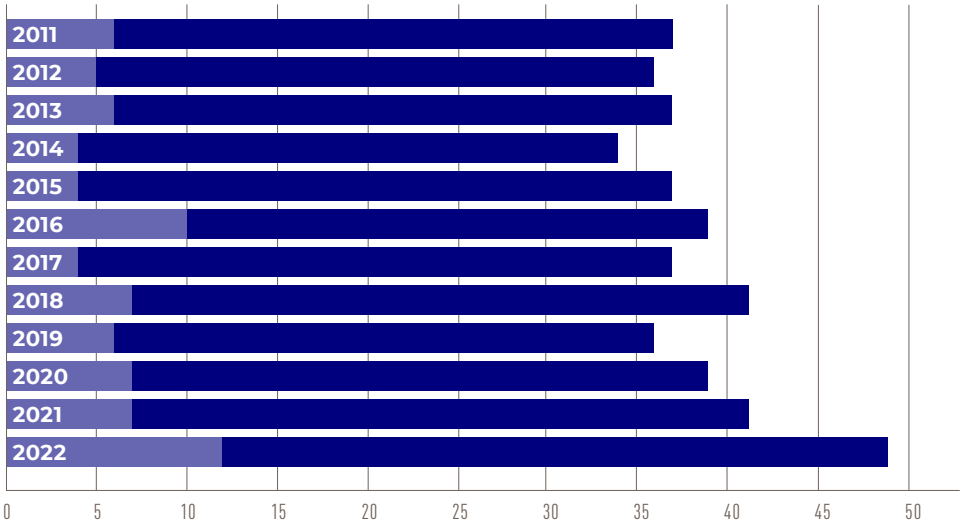


Technical Committees

Within RILEM, Technical Committees are the heart of the organisation, and the backbone of action. They are highly dynamic and have a limited functioning life of five to seven years. Every year, several technical committees are closed after successfully reaching their goals, and new TCs are launched. During the last decade, the number of active Technical Committees fluctuated around 35, and in 2022 this number reached the high number of **49** active committees.

TECHNICAL COMMITTEES

- Number of active committees
- Number of new committees per year



Every year, several new technical committees are created. The full list of active TCs and details about their work can be consulted at tc.rilem.net

The following twelve new committees were approved in 2022:

Cluster A. Material Processing and Characterization (Convener: Daman Panesar)

- MBC: Magnesia-based binders in concrete chaired by Prof. Paivo Kinnunen
- MCP: Accelerated Mineral Carbonation for the production of construction materials chaired by Dr Ruben Snellings
- PHC: Performance testing of hydraulic cements chaired by Prof. Karen Scrivener

Cluster B. Transport and Deterioration Mechanisms (Convener: Josee Duchesne)

- MMS: Modelling and experimental validation of moisture state in bulk cementitious materials and at the steel-concrete interface chaired by Dr Zhidong Zhang

Cluster C. Structural Performance and Design (Convener: Giovanni Plizzari)

- CFR: Concrete during Fire-Reassessment of the framework chaired by Dr Pierre Pimienta
- OCM: On-site Corrosion Condition Assessment, Monitoring and Prediction chaired by Dr Carmen Andrade

Cluster D. Service Life and Environmental Impact Assessment (Convener: Anya Vollpracht)

- DCS: Data-driven concrete science chaired by Prof. Sandra Nunes
- UMW: Upcycling powder mineral "wastes" into cement matrices chaired by Dr Antonis Kanellopoulos

Cluster E. Masonry, Timber and Cultural Heritage (Convener: Arun Menon)

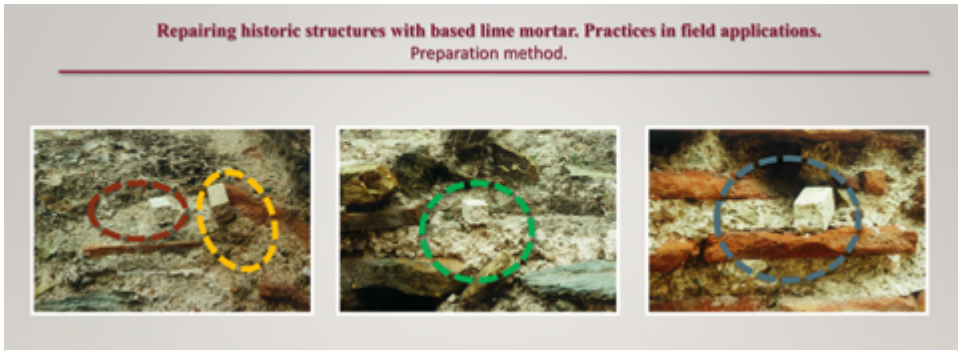
- BEC: Bio-stabilised earth-based construction: performance-approach for better resilience chaired by Dr Ana Bras
- MAE: Mechanical performance and durability assessment of earthen elements and structures chaired by Prof. Antonin Fabbri
- PEM: Processing of earth-based materials chaired by Dr Emmanuel Keita

Cluster F. Bituminous Materials and Polymers (Convener: Eshan Dave)

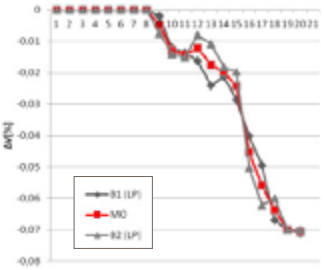
- PAR: Performance-based Asphalt Recycling chaired by Dr Gabriele Tebaldi

We closed four Technical Committees in 2022 and these TCs have successfully terminated their mission by publishing STARs or reports:

- **TC 267-TRM**
  Topical collection published in *Materials and Structures*
- **TC 272-PIM**
  TC report published in *Materials and Structures*
- **TC 273-RAC**
  STAR to be published in 2023
- **TC 274-TCE**
  STAR published in 2022

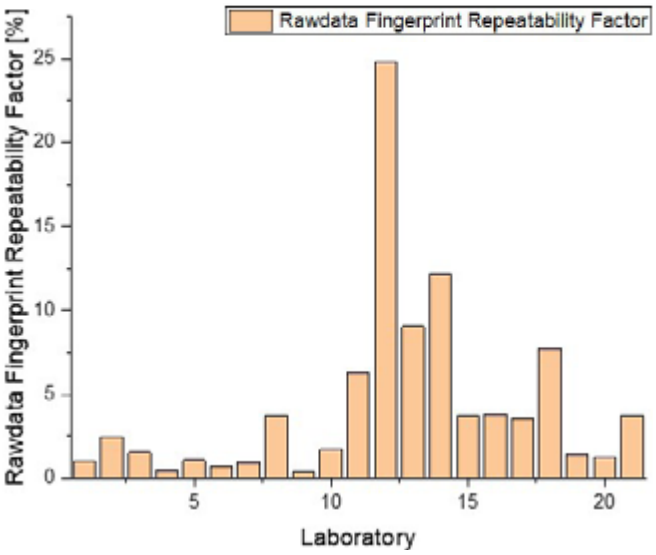


▲ Before any intervention to the monument, it was useful to produce small mortars on site in order to check the achieved color and strength. This stage was crucial in cases where small modifications were required in order to improve the results. ©Ephorate of Antiquities of Thessaloniki City



▲ Volume change of lime-pozzolan grouts ©TC 277-LHS

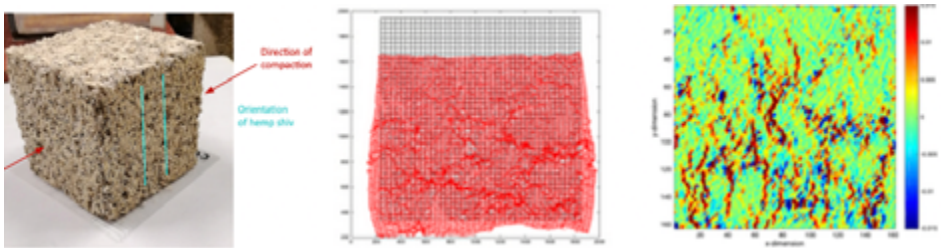
▼ Insitu testing of the shrinkage tendency of lime-based grouts (10d after manufacture) ©TC 277-LHS



▲ Sneak peek at the Round Robin samples before shipping ©Dr Johannes Mirwald, TC 295-FBB

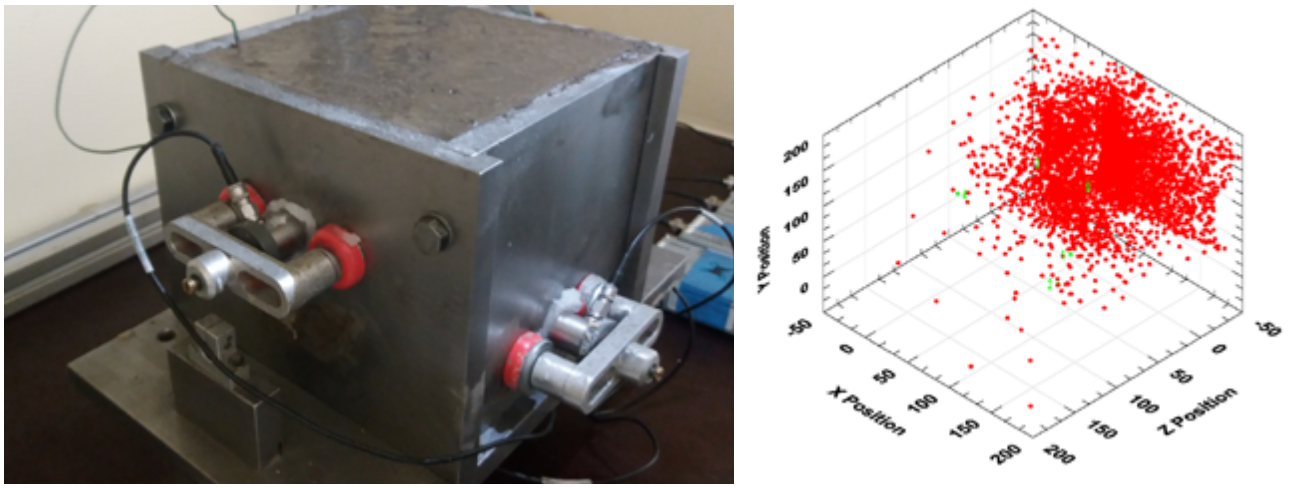
◂ First results on FTIR repeatability ©Dr Johannes Mirwald, TC 295-FBB

◂ ▲ Dam affected by ASR in Portugal, technical visit after ICAAR 2022 ©Isabel Fernandes, University of Lisbon, member of TC 300-ARM



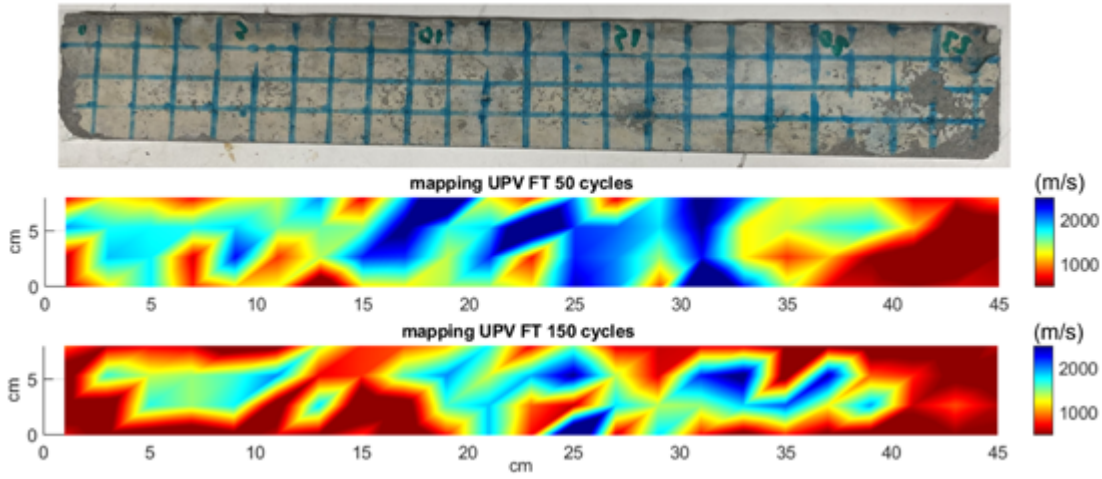
▲ Mechanical compression test of Hemp Concrete with DIC analysis (TC 275-HDB) ©Sofiane Amziane and Evelyne Toussaint (UCA)

Observing a column with corrosion ©Carmen Andrade



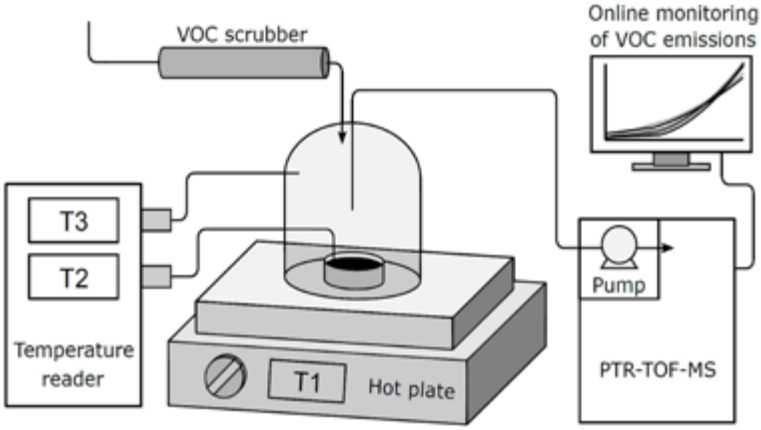
Fresh Concrete monitoring by acoustic emission sensors and real time localization of internal curing activity due to SAPs ©MEMC-Vrije Universiteit Brussel, FWO, TC 269-IAM

Mortar beam after freeze-thaw and ultrasonic mapping after different amount of cycles. Red areas correspond to more deteriorated material ©MEMC-Vrije Universiteit Brussel, FWO, TC 269-IAM



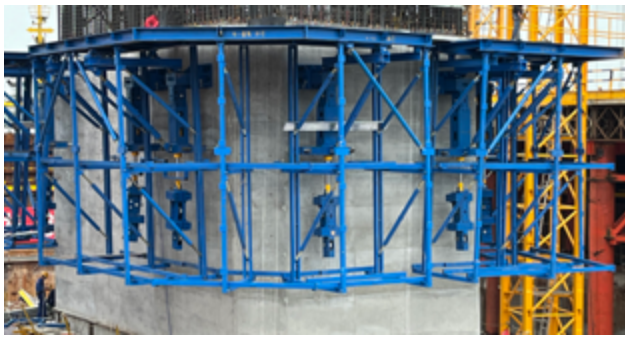
Sample ID	End of test	End of test After brushing	End of test After brushing	Type of damage or alteration Remarks	Efflorescence type	Severity	Material loss
L4				• Chromatic alteration on upper surface • Rounded edges on upper side • Loss of cohesion (chalking, sanding, bursting) • Presence of efflorescence	Crust, Powdery	High	3.43 g
L5				• Chromatic alteration on upper surface • Rounded edges on upper side • Loss of cohesion (chalking, sanding, bursting) • Presence of efflorescence	Crust, Powdery	High	4.22 g
L6				• Chromatic alteration on upper surface • Rounded edges on upper side • Loss of cohesion (chalking, sanding, bursting) • Presence of efflorescence	Crust, Powdery	High	3.54 g

Representative results of the new accelerated salt weathering test proposed by RILEM TC 271-ASC on Lympia (Cyprus) stone ©Ledra and Building Materials Laboratories, University of Cyprus



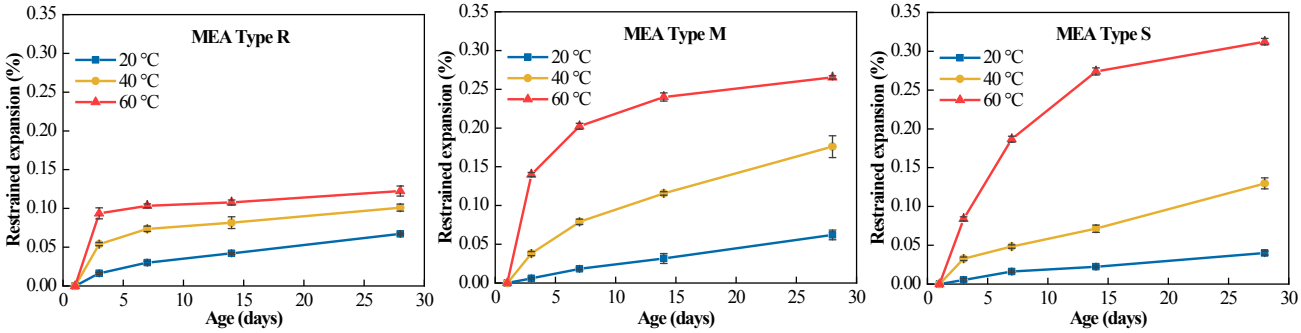
Paving during Rejuvebit project ©Road Engineering Research Section (RERS), Antwerp University

Handheld VOC Detector ©Road Engineering Research Section (RERS), Antwerp University



On-site application of concrete containing MgO and CaO-based expansive agent ©Jiangsu Sobute New Materials Co., Ltd., TC 284-CEC

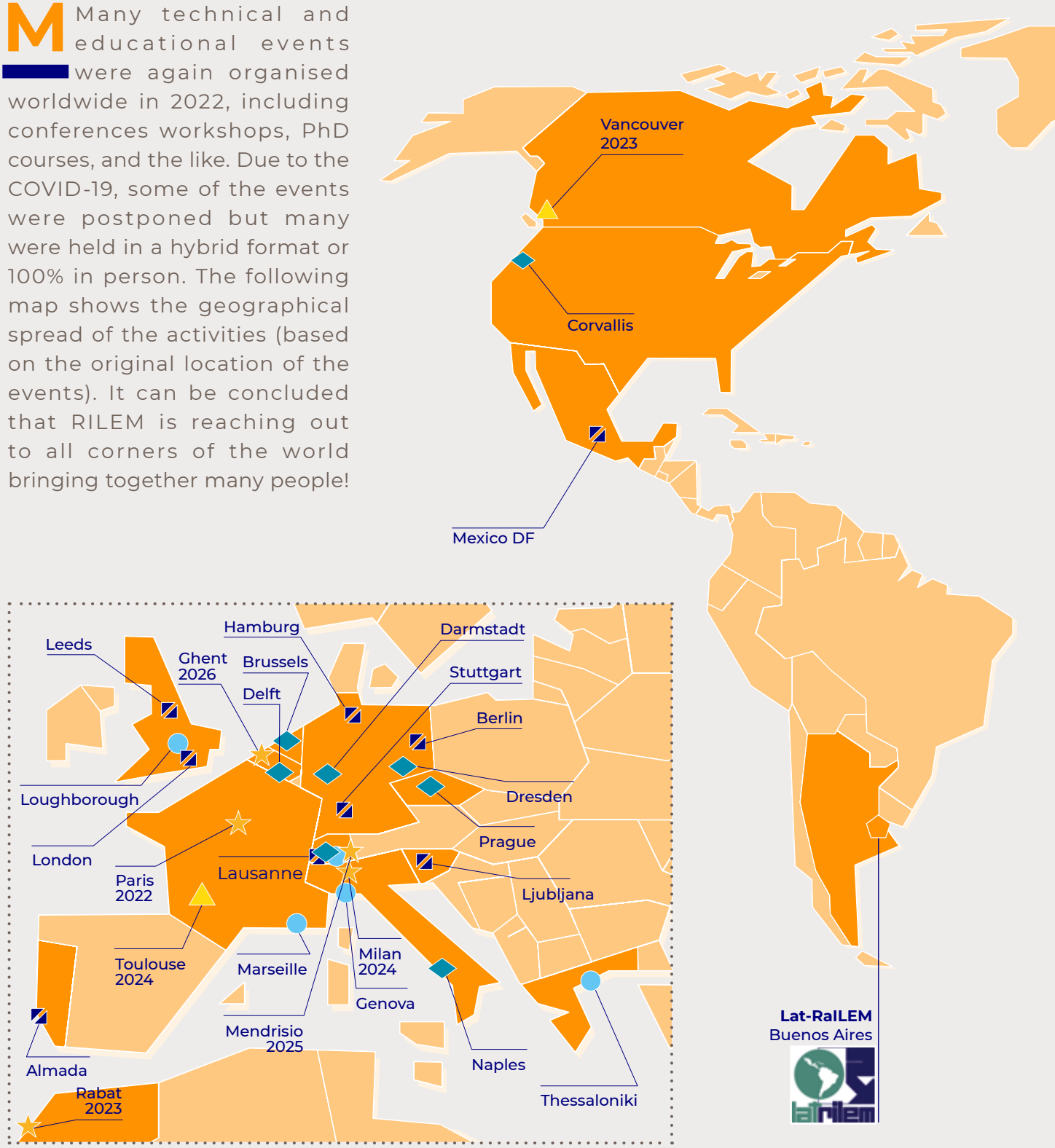
Meeting of TC 291-AMC in Dakar, Senegal, December 2022

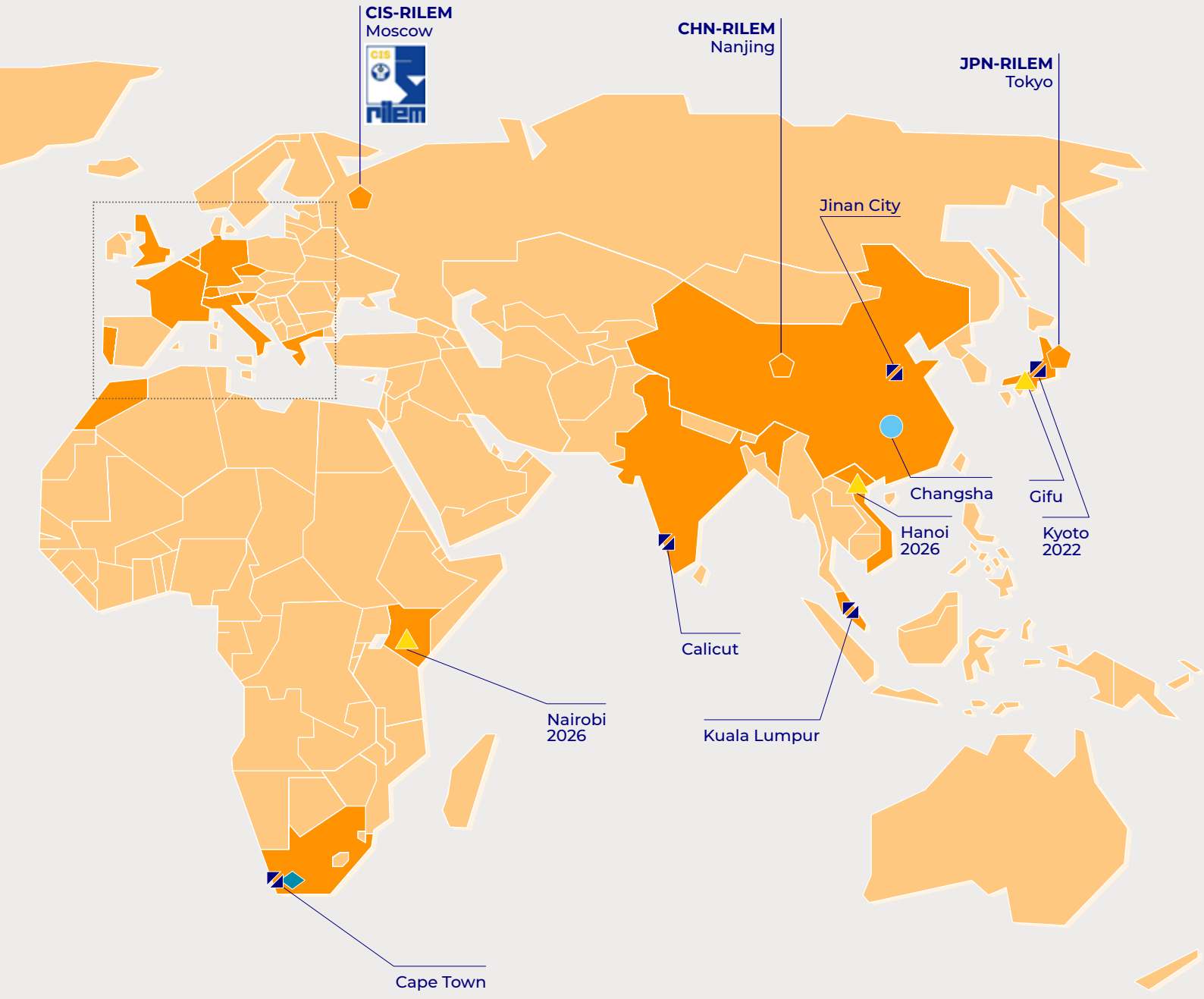


Typical test results of the restraint expansion of MEA-added mortars under different curing temperatures ©Yujiang WANG, TC 284-CEC

Technical and Educational Events

Many technical and educational events were again organised worldwide in 2022, including conferences workshops, PhD courses, and the like. Due to the COVID-19, some of the events were postponed but many were held in a hybrid format or 100% in person. The following map shows the geographical spread of the activities (based on the original location of the events). It can be concluded that RILEM is reaching out to all corners of the world bringing together many people!





RILEM Events 2022

- Co-sponsored event
- Educational activity
- RILEM event
- Regional/National Group
- Spring Convention
- RILEM Annual Week

Educational Activities

The main activities of the EAC this year have been the ROC&TOK webinars and the EAC PhD courses. Since their launch in November 2020, the ROC&TOK webinars have attracted more than **4,000 attendees** from 95 different countries covering topics such as CO_2 footprint, chloride ingress, amodern binders, and cement chemistry. The final webinar was a presentation by Prof. Karen Scrivener on the Myths of cement chemistry with a record number of attendees. Participants of these webinars can acquire CPD credits from the Institute of Concrete Technology thanks to its partnership with RILEM.

ROC&TOK Webinars in 2022

DATE	NAME	SPEAKER(S)
24/01/2022	Bottlenecks and Potentials for Sustainable Structures	**Michael Havbro Faber Karen Scrivener Wolfram Schmidt**
03/02/2022	Materials and Structures for the African framework - challenges, innovation potentials, and research requirements	**Nonkululeko Radebe Wolfram Schmidt**
03/03/2022	Research Needs for Cementitious Materials: Focus Europe	**Karen Scrivener**
14/04/2022	Reducing the CO2 Footprint of Concrete Using Existing Tools	**Douglas Hooton**
05/05/2022	A Latin American perspective on the path towards carbon neutrality in the cement and concrete industry	**Yuri Villagran**
02/06/2022	Benchmarking Chloride Ingress Models on Real-life Case Studies - Marine submerged and Road Sprayed concrete structures	**Eduardus Koenders**
06/10/2022	What's missing for 100+ years predictions on modern binders: the case of the chloride diffusion coefficient	**Fabien Georget**
03/11/2022	Chloride ingress in concrete	**Klaartje De Weerdt**
01/12/2022	Myths of cement chemistry	**Karen Scrivener**

Chinese ROC&TOK Webinars in 2022

Hosted by EAC member Dr Pan Feng, the third Chinese ROC&TOK webinar *Tricalcium Silicate Hydration and Calcium Silicate Hydrate Formation,* was presented by Prof. Zongjin Li from University of Macao to an audience of more than 500 attendees. The webinar series is expected to relaunch in summer 2023.

Spanish ROC&TOK Webinars in 2022

The EAC launched the Spanish ROC&TOK webinars with the presentation of outgoing RILEM President, Dr Ravindra Gettu in March 2022.

DATE	NAME	SPEAKER(S)
31/03/2022	Hormigón sustentable con cementos compuestos. Evaluation of concretes with composite cements regarding their sustainability and durability	**Ravindra Gettu**
29/09/2022	Efectos de cambio climático en el concreto reforzado expuesto en la costa de Yucatán, México	**Pedro Castro Borges**

EAC Courses in 2022

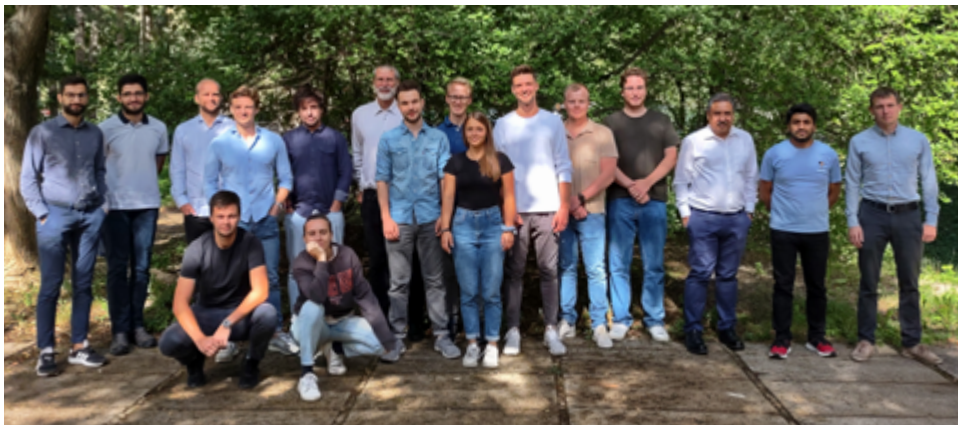
The pandemic continued to affect the organisation of the PhD course series at the beginning of the year as a couple courses were postponed.

The traditional series of PhD courses before the RILEM Annual Week was in hybrid mode for the event in Kyoto, Japan, this year. More than **80** delegates registered to the PhD Courses.

On-site courses included the course series *Advanced course on Modeling of Localised Inelastic Deformation* in Prague and *LC3 Doctoral School* in Lausanne. We were happy to continue our support of courses in Africa with one on-site co-sponsored course in Cape Town under the initiative of DAC chair, Prof. Hans Beushausen.

DATE	NAME	ATTENDANCE MODE	CITY	COUNTRY	CONTACT NAME
04/04/2022	Computational Methods for Building Physics and Construction Materials	ONLINE	Darmstadt	Germany	**Eddie Koenders**
04/04/2022	Corrosion Science & Corrosion Control for Infrastructure (CSC2I)	ON-SITE	Delft	The Netherlands	**Iris Betterham**
23/05/2022	Interact Doctoral School on alkali-activated materials, a new generation of concrete	ON-SITE	Brussels	Belgium	**Stephanie Staquet**
07/06/2022	Concrete Microscopy Course	ON-SITE	Delft	The Netherlands	**Iris Betterham**

19/06/2022	Mineral-bonded composites for enhanced structural impact safety	ON-SITE	Dresden	Germany	**Viktor Mechtcherine**
20/06/2022	Concrete fit for purpose and planet	ON-SITE	Corvallis	United States	**Jason Ideker**
29/06/2022	8th LC3 Doctoral School	ON-SITE	Lausanne	Switzerland	**Karen Scrivener**
05/09/2022	Sustainable Pavement Design and Road Materials	ON-SITE	Naples	Italy	**Francesca Russo**
05/09/2022	Advanced course on Modeling of Localised Inelastic Deformation	ON-SITE	Prague	Czech Republic	**Milan Jirasek**
26/09/2022	Repair and Rehabilitation of Concrete Structures	ON-SITE	Cape Town	South Africa	**Hans Beushausen**
03/10/2022	The RILEM Multi-scale Modelling Course for Concrete (MMC2)	ON-SITE	Delft	The Netherlands	**Iris Betterham**



▲ Participants to the Advanced course on Modeling of Localized Inelastic Deformation in Prague, Czech Republic, September 2022 ©Milan Jirasek

◀ ICT Award winner Ilhame Harbouz, awarded at the RILEM Digital Concrete 2022 event on 29 June 2022 ©Ilhame Harbouz

Objects used in Prof. Prannoy Suraneni's lab for educating middle/high school students about 'cool' concrete materials © Jose Patino, Montale Tuen and Sofiane Amroun

Publications

Of utmost importance for RILEM is the dissemination of information. This is facilitated through different channels such as the flagship publication of RILEM, the journal *Materials and Structures*, the Open Access journal *RILEM Technical Letters*, conference proceedings, STAR reports, technical reports, and RILEM Recommendations.

Materials and Structures

As the flagship journal of RILEM, *Materials and Structures* has continued to publish high quality research, supporting the parent organisation in its work to enhance the understanding of the materials and their role in structural applications. The focus of our publications is based on RILEM's key themes: Material Processing and Characterization, Transport and Deterioration Mechanisms, Structural Performance and Design, Service Life and Environmental Impact Assessment, Masonry, Timber and Cultural Heritage, and Bituminous Materials and Polymers. In 2022, a few changes in the editorial board took place. We welcomed Dr Enrico Sassoni as the new TAC chair and Deputy Editor-in-chief, as we bid farewell to Prof. Nele De Belie. We congratulate Prof. Nele De Belie for taking up the role of RILEM Vice-President. We are happy to inform that Prof. Billy Boshoff, Prof. Sergio Carmona, Dr Marijana Serdar, Dr Prannoy Suraneni and Dr Mateusz Wyrzykowski have joined as new Associate Editors as Prof. Mette Geiker, Prof. Climent Molins, and Prof. Pietro Lura have completed their terms. We would like to formally thank all the previous and current members of the editorial board for their high-quality service and immense support provided to *Materials and Structures* in many diverse fields.

The editorial team have all worked hard to keep up the high publication standards set in previous years, despite continued difficult global circumstances. Thanks to the dedicated service of the Associate Editors, more than 430 voluntary reviewers, and the whole editorial team, publication times have improved across 2022 despite the continued impact of the COVID-19 pandemic. Articles appear online in their final form on average 16 days after acceptance, and the average time from submission to the first decision is 40 days. Currently (November 2022), no pending papers are older than fourteen months.

The commemorative issue marking the RILEM's 75th anniversary in 2021, is now successfully completed. We thank the editorial board's contributions for drafting and reviewing the articles in this special issue. This issue is an excellent milestone to showcase the contributions of the most influential papers published in the journal via introductory pieces authored by a range of RILEM members. These highlighted papers are keystones to the current work being completed by RILEM technical committees as well. We hope you enjoy the highlights of *Materials and Structures* that are put into a Topical collection on our website.

Published articles and impact of the journal

Submission numbers observed across 2022 are similar to the past two years. From January to November 2022, the total number of submissions was approximately 1040, which is almost similar to the corresponding period in 2021. The number of published papers is expected to increase slightly in coming years as we seek and implement strategic opportunities to grow the number of high-quality submissions we receive and publish, aligned with the RILEM vision to use *Materials and Structures* as a venue to highlight the best work of the organisation and its members. This year, we have published nine issues in volume 55 (2022) with 235 articles as of November 2022. The number of published articles in 2022 has already exceeded the amounts published in the past two years. The acceptance rate for papers submitted in 2021 was approximately 14%, a slight increase from the rate observed in 2020.

The journal impact factor (IF) has continuously increased and reached 4.285 in 2021. It increased by 0.857 from 2020, and more importantly, the number of uncited documents has decreased. Currently, the journal ranks 42/211 in Building and Construction (80th), 66/326 in Civil and Structural Engineering (79th), 82/384 in Mechanics of Materials (78th) and 130/455 in Materials Science (71st). A slight dip in Citescore in 2021 was noted due to the relatively lower number of publications in 2019 occurred after a record peak in 2018. It is anticipated that this will stabilise in the coming years.

A platform for dissemination of the RILEM TCs work

As in previous years, *Materials and Structures* served as an important platform for the dissemination of the outcomes of RILEM Technical Committees. So far in 2022, 13 RILEM TC reports (1 from TC 243-SGM, 1 from TC 262-SCI, 3 from TC 267-TRM, 1 from TC 272-PIM, 1 from TC 277-LHS, 2 from TC 281-CCC, 3 from TC 282-CCL, 1 from TC 289-DCM) have been published, together with two original research articles (from TC 282-CCL). We anticipate further growth in this area during 2023, as there are already a number of excellent TC publications in the pipeline, and **we encourage all TC chairs and members to target *Materials and Structures* as a primary venue in which your important work can and should be published.**

To facilitate the dissemination of TCs' work, in 2021, we have introduced Topical Collections within *Materials and Structures*; these allow the grouping of the outputs from a TC in one place independent of their publication date. Up to now, we have published five topical collections: TC 258-AAA Recommendations for Avoiding Alkali Aggregate Reactions in Concrete – Performance Based Concept, TC 265-TDK Development and assessment of a RILEM Recommendation: Testing methods for determination of the double-K criterion for crack propagation in concrete, TC 282-CCL Calcined clays as supplementary cementitious materials, TC 281-CCC Carbonation of concrete with supplementary cementitious materials, and TC 267-TRM Development and validation of tests for measuring the reactivity of supplementary cementitious materials.

Outstanding Papers and Best Reviewer awards

As in previous years, the Editorial Board awarded the authors of the most scientifically interesting and innovative papers with the Outstanding Paper Award for the best papers published in 2022. Another important RILEM Award related to the journal is the Best Reviewer Award, granted annually by the Editorial Board to our best volunteer reviewers in 2022, who guarantee the high scientific quality of the published articles via a timely and rigorous review process.

Materials and Structures Best Reviewers 2022

- **Denis Jelagin**
  KTH Royal Institute of Technology, *Sweden*
- **Pietro Giovanni Gambarova**
  Politecnico di Milano, *Italy*
- **Miguel C.S. Nepomuceno**
  University of Beira Interior, *Portugal*
- **Margaritis Tonidis**
  Purdue University, *United States*
- **Flora Faleschini**
  Universita degli Studi di Padova, *Italy*
- **Johannes Mirwald**
  Institute of Transportation, TU Wien, *Austria*
- **Georgios Pipintakos**
  Universiteit Antwerpen, *Belgium*
- **Johannes Büchner**
  TU Braunschweig, *Germany*
- **Carlos Moro**
  Texas State University, *United States*
- **Fengling Zhang**
  National University of Singapore, *Singapore*

List of the Outstanding Papers 2022

- **Recommendations for handling Bitumen prior to FTIR Spectroscopy**
  Johannes Mirwald, Drilon Nura & Bernhard Hofko
- **Do chemistry and rheology follow the same laboratory ageing trends in bitumen?**
  Georgios Pipintakos, Caitlin Lommaert, Aikaterini Varveri & Wim Van den bergh
- **Dimensional stability of cement paste and concrete subject to early age carbonation curing**
  Xiangping Xian, Chad Logan & Yixin Shao
- **Measurement of the water vapour permeability of earth plasters using small-scale wind tunnels under variable air flow regimes**
  F. McGregor, T. Mauffré, M.-S. Force, E. Contraires & A. Fabbri
- **Modelling microalgae biofouling on porous buildings materials: a novel approach**
  Enrico Quagliarini, Benedetta Gregorini & Marco D'Orazio
- **Viscosity transition from dilute to concentrated cementitious suspensions: the effect of colloidal interactions and flocs percolation**
  Lizhi Zhang, Wenqiang Zuo, Tian Qian, Wen Xu, Zhenxiong Jiang & Wei She
- **Characterization of high-strength concrete under monotonic and fatigue mode II loading with actively controlled level of lateral compression**
  Henrik Becks, Mario Aguilar, Rostislav Chudoba & Martin Classen
- **Impact of leaching on chloride ingress profiles in concrete**
  Alisa Machner, Marie Bjørndal, Aljoša Šajna, Nikola Mikanovic & Klaartje De Weerdt
- **A new accelerated salt weathering test by RILEM TC 271-ASC: preliminary round robin validation**
  B. Lubelli, A. M. Aguilar, K. Beck, T. De Kock, J. Desarnaud, E. Franzoni, D. Gulotta, I. Ioannou, A. Kamat, B. Menendez, I. Rörig-Dalgaard & E. Sassoni
- **Report of RILEM TC 267-TRM phase 3: Validation of the R3 reactivity test across a wide range of materials**
  Diana Londono-Zuluaga, Asghar Gholizadeh-Vayghan, Frank Winnefeld, François Avet, Mohsen Ben Haha, Susan A. Bernal, Özlem Cizer, Martin Cyr, Sabina Dolenec, Pawel Durdzinski, Johannes Haufe, Doug Hooton, Siham Kamali-Bernard, Xuerun Li, Alastair T. M. Marsh, Milena Marroccoli, Marusa Mrak, Yeakleang Muy, Cédric Patapy, Malene Pedersen, Serge Sabio, Simone Schulze, Ruben Snellings, Antonio Telesca, Anya Vollpracht, Guang Ye, Shizhe Zhang & Karen L. Scrivener

RILEM Technical Letters

With the 7th volume published in 2022, *RILEM Technical Letters* remains one of the most impactful open access journals in the field of building and construction materials. *RILEM Technical Letters* belongs to the best quartile (Q1) according to the SCImago Journal Rank indicator in the fields of Engineering and Materials Science.

With over 1000 citations in total (counting only sources indexed in Scopus), the articles have been cited on average 9 times per article. We are also happy to see a fast-increasing trend in the citations – compare the current 1000 citations to 650 citations at the end of 2021.

The open access policy and excellent quality of the published articles translate also to a high number of downloads – in the last years the average number of downloads exceeds 3,000 per month.

At the same time, in year 2022 the application to the Web of Science database has been rejected on ground of volume/schedule of publication not in line with the standard in the field. We believe that the specific, short format of the articles is what makes our journal stand out in the field, while the small publication volume guarantees the highest scientific standard; these factors enabled the very good reception of our journal by RILEM members and the scientific community at large. We will thus continue offering *RILEM Technical Letters* as the publication outlet for most influential communications in the field. In the meantime, new application is planned in 2023.

We encourage all RILEM members to submit their interesting works to the journal free of charge and offer full open access of the articles.

The journal welcomes different contributions: short, high standard papers providing an overview of the most relevant current or emerging topics or pending research needs, syntheses/highlights from the works of RILEM Technical Committees or papers from Colonnetti Medallists. A recently launched series that gained a lot of interest from the community are papers devoted to strategic needs and research directions, with particular focus on sustainability, in different regions of the world – see e.g. the recent paper on cement and concrete production and carbon neutrality in Latin America and the Caribbean (Villagrán-Zaccardi et al. 2022). This series will continue, with new papers focusing on North Africa and Middle East (Sonebi et al.) and on Europe (Scrivener et al.) coming up shortly.

The authors are welcome to propose their prospective papers to the editor-in-chief, Prof. Alexandra Bertron, or to the members of the editorial board.

Together with the editorial team we are happy to welcome you at letters.rilem.net.

Proceedings, STARs & Recommendations

Besides the two journals, RILEM also publishes proceedings, state-of-the-art reports (STAR), and recommendations. 2022 has been a successful year in this respect, with three proceedings, two STARs and one Recommendation.

Proceedings published by RILEM Publications in 2022

- PRO 135 - Fourth International Conference on Chemically Activated Materials (CAM2021), 27-29 August 2021, Hefei, China; Eds. Caijun Shi & Xiang Hu

Proceedings published by Springer in 2022

- Third RILEM International Conference on Concrete and Digital Fabrication - Digital Concrete 2022; Eds. Richard Buswell, Ana Blanco, Sergio Cavalaro, Peter Kinnell; Vol. 37
- Numerical Modeling Strategies for Sustainable Concrete Structures - SSCS 2022; Eds. Pierre Rossi, Jean-Louis Tailhan ; Vol. 38

STARs published in 2022

- Digital fabrication with cement-based materials - State-of-the-art report of the RILEM Technical Committee 276-DFC; Edited by Nicolas Roussel, Dirk Lowke; Volume 36
- Benchmarking Chloride Ingress Models on Real-life Case Studies - Marine submerged and Road Sprayed concrete structures - Report of the RILEM Technical Committee 270-CIM; Edited by Eddie Koenders, Kei-ichi Imamoto, Anthony Soive; Volume 37

Recommendation published in 2022

- Recommendation of RILEM TC 264-RAP on the evaluation of asphalt recycling agents for hot mix asphalt, January 2022

RILEM Honours and Awards

RILEM annually awards the following recognised distinctions:

- **Robert L'Hermite Medal:**

The medal is awarded to a researcher under the age of 40, who has made an exceptional scientific contribution to the field of construction materials and structures.

- **Gustavo Colonnetti Medal:**

Up to two Gustavo Colonnetti Medals are awarded to researchers under the age of 35, who have made an outstanding scientific contribution to the field of construction materials and structures.

- **RILEM Best Student Poster Award:**

The award is presented to a PhD student at the RILEM Annual Week.

- **RILEM PhD Travel Grant:**

Implemented in 2018 for the first time, this merit-based award is given every year at the RILEM Annual Week to PhD students under the age of 35 and residing in any of the countries where a special discount of the RILEM membership fee is applicable.

RILEM 2022 Medallists

2022 Robert L'Hermite Medallist

Dr Susan A. Bernal Lopez

After being awarded her PhD in Cali (Colombia) and working in Denmark, Australia and UK, Prof. Bernal Lopez is currently Professor in Structural Materials at the University of Leeds (UK), where she is Director of the Materials & Structures Group. The Robert L'Hermite medal has been awarded to Prof. Bernal Lopez in recognition of the impact of her research activity on assessment and improvement of durability and sustainability of novel cements and concretes, as well as waste management and valorisation. The importance and the influence of her research activity on these topics is testified by the numerous highly cited scientific publications that she has published as lead author. An extensive portfolio of research grants, funded at the national and international level and sponsored by industry, further proves her leadership in this field. She has been very active in RILEM, participating in 8 TCs and serving as Deputy-Chair of one of them, as well as being Associate Editor of *RILEM Technical Letters* since 2016. She was awarded one of the RILEM Gustavo Colonnetti medals 2016 for her previous work on alkali activated materials.

You can watch her Robert L'Hermite lecture at the Annual Week on YouTube.

Short extract from the interview with Prof. Susan A. Bernal, 2022 RILEM L'Hermite Medallist *(The full interview can be read here)*

> **SUSAN:** *... In my personal case, what is really helping me, is: 1) an extraordinary support system, as I am very fortunate that my husband is extremely supportive with my career as well as my close and extended family, and 2) RILEM, as it has had a tremendous positive impact. I have really felt the support of this lovely community over the past 6 years. As evidence of that, if you look for instance at my publications track record, the majority of publications I have produced over the last 6 years, are collaborative research linked to the several RILEM technical committees I contribute to.*
>
> ...
>
> **RIM:** *... Moving on, there is something else to mention, that is the fact you set up a Technical Committee (Editor's note: 281-CCC : Carbonation of concrete with supplementary cementitious materials) in 2017, right after the year of your Colonnetti medal. Being a mother, securing a tenure position... it was a big commitment from you all at the same time!*
>
> **SUSAN:** *I think several factors contributed to give me the confidence to do this. The first one was the support of Nele (Editor's note: Nele De Belie, TC 281-CCC Chair): Nele is a very accomplished, very senior female academic, also a mother. That was a boost of confidence: we can do it together! TC 281-CCC was also somehow the natural continuation of TC 238-SCM : Hydration and microstructure of concrete with supplementary cementitious materials, that Nele chaired and of which I was a member. Some members of TC 224-AAM : Alkali activated materials also joined in, so at the beginning it was not a lot of work, as it was a group of around 40 people that pretty much knew each other.*
>
> ...
>
> **SUSAN:** *...This medal means a lot. Firstly, because it is something that I thought I was never going to accomplish; I also feel so much admiration for the people who have received this medal before me, that it is a tremendous honour to have it. Secondly, because I have always been a RILEM member, from my time as junior post-doc to professor; to get this recognition is quite special.*

2022 G. Colonnetti Medallist

Prof. Qing-Feng Liu

After receiving his PhD in Civil Engineering in the UK, Qing-feng Liu is now Associate Professor in Civil Engineering at the Shanghai Jiao Tong University (China), where he leads the "Sustainability and Durability of concrete Materials and Structures" group and serves as Deputy Head of the Department of Civil Engineering. His research on concrete durability, especially ionic transport, electrochemical rehabilitation, and service

life prediction, has earned him international visibility, as demonstrated by the high number and high quality of his scientific publications, the invited talks he has given and his activity as peer reviewer and member of the editorial boards of scientific journals. He is involved in several national and international scientific societies, and he has given significant contributions to many RILEM TCs, which has brought him to establish fruitful collaborations with renowned international experts. His maturity and independence have allowed him to secure impressive funding as Principal Investigator to carry out his research. He has also been very active in supervising postdoctoral researchers, PhD candidates and undergraduate students.

You can watch his Gustavo Colonnetti lecture at the Spring Convention on YouTube.

Short extract from the interview with Prof. Qing-feng Liu, 2022 RILEM Colonnetti Medallist *(The full interview can be read here)*

> **RIM:** *Tell me more about your experience in RILEM. Has RILEM helped your career?*
>
> **QING-FENG:** *Absolutely! As I told you, the first RILEM TC for me was MCT that I officially joined straight after finishing my PhD and returning to China. After that, although you know I have been involved in a number of more recent TCs, I focused on one TC in particular: 270-CIM Benchmarking Chloride Ingress Models on Real-life Case Studies: Theory and Practice. This TC is very important to my research as Chloride Ingress Modelling is what I have been doing throughout my career. Finding out if these models are suitable in benchmarking real-life cases by working in this TC means a lot to me. I highly appreciated the TC aims.*

2022 G. Colonnetti Medallist

Dr Ellina Bernard

Dr Ellina Bernard is currently a postdoctoral researcher at Empa, Switzerland. Her research focus is on cement and clay chemistry for the development of low embodied CO2 binders and their durability, addressed by thermodynamic modelling and experimental activity also by sophisticated techniques. Thanks to her PhD at Empa (Switzerland) and Université de Bourgogne-Franche-Comté (France), postdoctoral appointments at the University of Bern Switzerland and in UK, and internship periods in industry, she has developed a significant international experience. Such experience has earned her awards for her research activity and has allowed her to secure two prestigious grants to continue her research, which has led to a very promising publication record. She has also been active as a member of scientific societies, peer reviewer for international journals, and organizers of scientific meetings.

You can watch her Gustavo Colonnetti lecture at the Spring Convention on YouTube.

Short extract from the interview with Dr Ellina Bernard, 2022 RILEM Colonnetti Medallist *(The full interview can be read here)*

> **ELLINA:** *… I think the degradation topic is more interesting for people in RILEM as I see there are many TCs working on degradation of cement, chloride diffusion, etc… There is, since recently, some focus on the magnesium containing phases precipitating. I used and use a lot the work of these RILEM TCs. Although they were not directly focusing on magnesium, there is a huge amount of data that I find very useful.*
>
> …
>
> **RIM:** *It means that you will continue to work on this topic even though now your main research project is on earthen-based materials… … Three new TCs on earthen construction have been approved in March. Are you going to join one of them? All of them? What is the plan?*
>
> **ELLINA:** *I attended some meetings already and most likely I will be joining one or two of these TCs. I look forward to being more involved in RILEM and working with great colleagues all around the world.*

Best Student Poster Award

The winner of the Best Student Poster Award of the 2022 RILEM Annual Week is Suhas Suresh Joshi, University of Tokyo, who presented the poster "Analytical investigation of corrosion cracking factors in multi rebar concrete panels using 3D-mesoscale simulation". More info about the other poster winners can be found here.

PhD Travel Grant awards

The PhD Travel Grant awards were granted to Arthur Aviz Palma Silva, University of Brasília, Brazil, and Rohit Prajapati, Indian Institute of Technology Madras, India

Dr Suhas Suresh Joshi receiving his Best Student Poster Award ©D. Ciancio

Arthur Aviz Palma Silva in Kyoto for the RILEM Annual Week ©Arthur Aviz Palma Silva

2022 Honorary Members

Dr Peter Richner. *Empa, Switzerland*
has been nominated as RILEM Honorary member, in recognition of his exemplary leadership as RILEM President, RILEM treasurer and his work as a member of the Management Activities Committee.

Prof. Konstantin Kovler. *NBRI, Israel*
has been nominated as RILEM Honorary member, in recognition of his active participation in RILEM technical and educational committees as well as his exemplary work as Associate Editor of *Materials and Structures* and as TC chair.

Prof. Robert Douglas Hooton. *University of Toronto, Canada*
has been nominated as RILEM Honorary member, in recognition of his leadership as Educational Activity Committee chair and his active participation and contribution in numerous RILEM Technical Committees.

Mrs Pascale Ducornet. *RILEM, France*
has been nominated as RILEM Honorary member, in recognition of her dedication and leadership as RILEM Secretary General for many decades.

2022 Fellows

Prof. P.A. Muhammed Basheer. *University of Leeds, United Kingdom*
has been nominated as RILEM Fellow, in recognition of his exemplary effort to promote collaboration between RILEM and its international partner, ICT (Institute of Concrete Technology), and for his active participation in numerous RILEM technical committees.

Dr Barbara Lothenbach. *Empa, Switzerland*
has been nominated as RILEM Fellow, in recognition of her outstanding contribution to the field and her exemplary work as RILEM Technical Committee Deputy chair as well as her active participation to numerous RILEM Technical committees.

Dr Wolfram Schmidt. *BAM, Germany*
has been nominated as RILEM Fellow, in recognition of his exemplary effort as Regional convenor to promote RILEM in Sub-Saharan Africa, as well as his active participation in RILEM Bureau, development and educational committees.

RILEM Worldwide

As part of its activities, the Development Advisory Committee (DAC) develops new initiatives and new activities for continuously improving the promotion of RILEM worldwide, in cooperation with the Technical Activities Committee (TAC) and the Educational Activities Committee (EAC). The conveners of RILEM Regional and National Groups are steering these activities in their regions and assist with initiating and organising events, facilitating the exchange of information, and giving RILEM a general presence in the local and regional research and industry landscapes.

According to the region and the objectives to be achieved, their assignments may consist of:

- establishing link with scientists, institutes, or firms of their region,
- identifying the needs of their region, which RILEM can meet,
- identifying and proposing experts in the respective region for participation in RILEM Technical Committees or possibly in RILEM bodies,
- identifying subjects for the setting up of Technical Committees on specific matters of particular relevance for their region,
- disseminating information concerning RILEM publications, symposia, courses and RILEM news,
- if applicable, creating local RILEM websites for keeping up-to-date information, after explicit approval by RILEM Bureau,
- promoting RILEM at selected regional scientific events by organising a scientific session and a RILEM exhibition stand,
- recruiting new members and keeping existing members active,
- organising RILEM courses (with the support of EAC), or “RILEM days” (with the support of TAC) or Symposia,
- supporting regional sections in the RILEM Newsletters (as needed),
- establishing contacts with international partners of RILEM active in the region and developing new joint activities,
- identifying of existing and new industrial partners that would benefit from getting involved in RILEM TC work and supporting a more active cooperation between RILEM and industry.

2022 has been a very active year, with many successful activities reported from around the world. As a highlight, the organisation of the 76th Annual Week in Kyoto in September 2022 has been a great success as seen at the beginning of this report (page 8 to 12).

Europe and East Europe & Central Asia have also been very dynamic with the organisation of several conferences such as the HMC22 in Ljubljana 19-23 September 2022, and the 30th anniversary of the National Engineering Academy of the Republic of Kazakhstan in January 2022. The Sub-Saharan Africa region organised a seminar in October at the University of Lagos and at Covenant University.

In the Middle East & North Africa regions, priority was given to the organisation of the 6th RILEM Spring Convention and conference CMSS, which will take place in Morocco on 6-10 March 2023.

In the North America & Caribbean region, the focus was on strengthening the collaboration with ACI around youth activities and TCs.

RILEM Youth Council

Attracting and motivating young RILEM members

In 2020, the RILEM Youth Council (RYC) was created to attract more RILEM young members and to increase active participation of young members in RILEM activities. This Sub-committee of DAC is composed of young members (many of whom are PhD students), ten nominated by the Regional conveners and one nominated by the DAC Chair. Their mandates last for 3 + 2 years. RYC members are invited to attend DAC, TAC and EAC meetings.

The main tasks of the RYC are related to:

- Attracting, involving, and motivating young RILEM members.
- Encouraging the participation of young members in TAC and EAC activities.
- Increasing awareness on RILEM events and courses.
- Preparing young members for leadership positions in the organisation.
- Showcasing / celebrating the achievements of the RILEM Youth.
- Creating networks between emerging researchers to increase visibility of / access to RILEM.

The RYC launched the Peer-to-peer webinar series in May 2022. The series was established to showcase exemplary young researchers from all the regional groups of RILEM, foster knowledge sharing, and build a strong network of young researchers globally. The target audience is PhD students and early career researchers, but anyone is free to register to attend the webinars. The webinar takes place every 2 months and is hosted by one RILEM region. During the 1-hour webinar, two speakers from that specific region are invited to present for 20 minutes followed by a 15 min live Q&A session. The webinars are administered by the RYC with the assistance of the RILEM Secretariat. The table below is a summary of the webinars hosted in 2022.

Host region	Theme	Event date	Registrations	Attendees*
South Asia	Sustainability through durability	24/05/2022	294	115
Pacific	3D printing and nanotechnology for sustainable construction	26/07/2022	354	134
Europe	Non-conventional materials for sustainable construction, focus on earth and bio-based solutions	27/09/2022	329	152
Sub-Saharan Africa	Locally available alternative materials for sustainable construction	29/11/2022	292	114

*Indicated as unique views from the Zoom account

Thank you to the presenters of the peer-to-peer webinars namely Ms Anusha Basavaraj, Dr Prasanna Kumar Behera, Dr Shujian Chen, Dr Arun Arunothayan, Yi Du, Alessandra Ranesi, Timothy Kofi Ameefe and Dr Manette Njike for sharing their research work with the RILEM Youth Community and thereby contributing to the success of the webinar series.

Additionally in 2022, the RYC has said goodbye to Said Bouzit, Evgenii Rumiantsev and Heongwon Suh whose participation on the youth council is gratefully acknowledged and welcomed Rouba Joumblat, Aleksandr Surkov and Seongmin Cho in their stead respectively. Thank you to the new council members for taking on the commitment to serve the RILEM Youth Community.

RILEM Youth Council members

RYC Chair: Joanitta Ndawula, University of Cape Town, South Africa. Ndjwja001@myuct.ac.za

RYC Vice-Chair: Surender Singh, Indian Institute of Technology Madras (IITM), India (South Asia). surender@iitm.ac.in

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Rouba Joumblat, Beirut Arab University, Lebanon (Middle East and North Africa). rouba.joumblat@hotmail.com

Aleksandr Surkov, Research Institute of Concrete and Reinforced Concrete (NIIZHB), Russian Federation (East Europe & Central Asia). aleksandr_surkov@inbox.ru

José Vidal González Avina, Autonomous University of Nuevo Leon, Mexico (Latin America). jose.gonzalezavn@uanl.edu.mx

Marie Joshua Tapas, University of Technology Sydney, Australia (Pacific). mariejoshua.tapas@uts.edu.au

International Partnerships

During the last five years, RILEM has established several strategic partnership agreements with national and international organisations. These partnerships are very helpful for the exchange of organisational, technical, and educational information, and they promote an optimal spread of state-of-the-art information concerning construction and building materials all over the world. RILEM values its partners and the joint workshops and conferences. Some partnerships have also resulted in joint technical activities and joint publications.

In May 2022, a new partnership was signed with the African Engineering Education Association (AEEA).

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GLOBE JCGC (Press release)

Press Release from the Liaison Committee of International Associations of Civil Engineering

GLO*BE* – The Global Consensus on Sustainability in the Built Environment has a new press release on the **Decarbonisation of Construction.**

Policy advice by the joint committee on the Globe consensus

Executive summary

The contribution of construction to the total global embodied Green House Gas (GHG) emissions amounts to around 20%. Three-quarters of these emissions originate from concrete and steel alone, due to their large production volumes. Hence, immediate actions must be taken to reduce these emissions. Therefore, within the framework of the COP27, the Joint Committee on the GLOBE Consensus has launched a first policy advice document on the Decarbonisation of Construction. Decarbonisation of construction goes far beyond renewable energy transition and carbon capture technologies. The dramatic role of embodied GHGs in construction must be considered and the different players and parties of the construction sector must work closer together to drastically reduce these. Within the next 30-50 years, the global demand for housing and infrastructure poses a substantial challenge to the global community. This development will be driven especially by the Global South, where the majority of new construction will occur. Immediate action is needed to implement the best knowledge and technologies we already have today. A paradigm shift in construction to adopt better practices must be implemented at global scale.

Using less and lower embodied carbon materials must be appreciated as fundamental way towards the decarbonisation of the construction sector. Yet, key obstacles today are lack of organisation in the construction sector and inadequate regulatory frameworks, codes and standards.

All actions identified by GLOBE can be implemented already now with the support of the international, high level expert network of the associations that constitute GLOBE. This network contributes with knowledge that bridges structural design and material sciences. Moreover, GLOBE has the impact and regional outreach required to help facilitate the global implementation, through its global network of associations and experts engaged in codes and standards writing,

On the Joint Committee on the GLOBE Consensus

The Joint Committee on the GLOBE Consensus (GLOBE) is a committee dedicated to reducing Green House Gas emissions from construction. GLOBE has been brought to life by the Liaison Committee of the six associations CIB – the International Council for Research and Innovation in Building and Construction, ECCS – the European Convention for Constructional Steel Work, fib - the International Federation for Structural Concrete, IABSE – the International Association for Bridge and Structural Engineering, IASS - International Association for Shell and Spatial Structures and RILEM – the International Union of Laboratories and Experts in Construction Materials, Systems and Structures. These six associations have been active in the development of technical guidelines, standards, innovation, research and education in construction at international level for more than 50 years. They represent more than 150 nation states and 5000+ experts. Hence, the backbone of GLOBE is the knowledge represented by the associations with respect to the entire value chain of construction. This includes materials engineers, structural engineers, safety and resilience engineers, consulting engineers, contractors, owners and operators, experts in standards and codes, as well as policymakers.

Further information and contact

Further information: http://globe-consensus.com/. Link to the GLOBE Consensus in different languages: http://globe-consensus.com/globe-consensus. The full Policy Advice Document: http://globe-consensus.com/documents. Information on how to support GLOBE: http://globe-consensus.com/support-globe. For queries, please contact the President of the JCGC, Michael Havbro Faber by e-mail: mfn@build.aau.dk or by phone: +45 51537677.

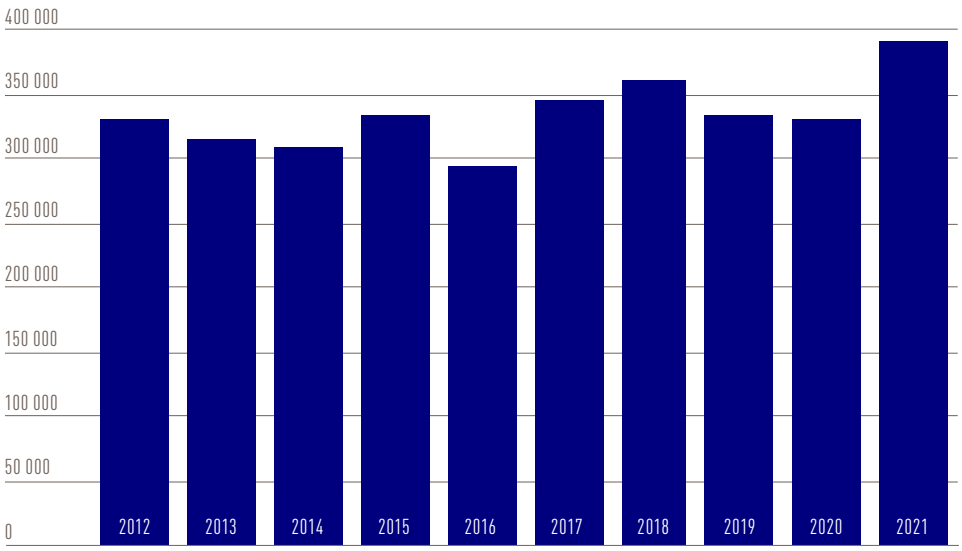
Financial statement of the year 2021

From a financial point of view, RILEM consists of two distinct entities. The first one is an association under Swiss law, but established in France, non-profit, without VAT and non-taxable, named RILEM Association. The association manages members and scientific, educational and development activities.

The second is a private company with a single shareholder (i.e., the RILEM Association), for profit, subject to VAT and profit tax, named EURL RILEM Publications. The company manages the publication activities of RILEM, in particular in its two scientific journals. *Materials and Structures*, the flagship journal of RILEM, is a hybrid international journal published by Springer Nature. *RILEM Technical Letters*, launched in 2016, is an open access journal published by RILEM. For these two journals, part of the publishing and management work is subcontracted to two third parties (the University of Sheffield and Empa).

The income for the RILEM Association comes from membership fees, both individual members and corporate members. The net invoiced fees as income from membership fees in 2021 (€391,553), instead of (€330,846 in 2019). The 2021 total income result is €417,417 in a growth of 17,4% compared to 2020. Expenses grew by 0,59% resulting in a negative total result of - €61,742 in 2021 instead of - €120,799 in 2020.

MEMBERSHIP FEES (IN €) IN THE LAST 10 YEARS



The net income for EURL RILEM Publications comes from royalties paid by Springer Nature on the revenue from the sale of *Materials and Structures*, mainly via consortia agreements. This revenue is reduced due to the cost of giving free access to *Materials and Structures* for all RILEM members. The royalties paid by Springer Nature in 2021 increased from €166,227 to €176,069 in 2020.

The costs for RILEM Association are primarily the salary and expenses for running the General Secretariat. Additional costs are due to the outsourced management of the two journals. The Association also pays the Article Processing Costs (APCs) for publishing a limited number of Open Access papers, selected by the Board of Editors, in the journal *Materials and Structures*. Since 2019, an external consultant (the RILEM Implementation Manager, RIM) has been hired to increase the visibility of RILEM, especially among young researchers and within the industry. Several actions to promote young researchers in RILEM have also been sponsored, including awards for best posters at conferences and the main RILEM awards for young researchers, the Colonnetti and L'Hermite medals. The pandemic continued into 2021 which positively impacted the results by reducing to a minimum travel expense for sponsored students and staff. For 2021, the financial result of RILEM Association was negative, - €61,742. The financial result of EURL RILEM Publications is this time positive + €11,369 compared to the negative result in 2020, - €38,983. The negative/positive combined result is of - €50,373 in 2021 compared to - €159,782 in 2020. This is a much better result than the one expected of - €148,000 presented at the General Council 2021 in Merida (Mexico). A negative result is still expected in the upcoming years as a consequence of the choice made by the RILEM Management of investing in a number of initiatives to give back to the RILEM members a part of the equity. Consequently, negative results are expected for a couple more years, with a balanced budget to be reached not before 2025. The equities of both the association and the company are currently large enough to compensate for a few years of negative results.

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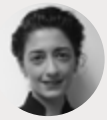

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You can download all of our publications for free on the RILEM website

Upcoming major events

in 2023 and beyond

6th RILEM Spring Convention & 4th International Congress on Materials & Structural Stability, 6-10 March 2023, Rabat, Morocco

The event will be held at the Faculty of Science, Mohammed V University in Rabat, Morocco. The RSC-CMSS23 conference is focused on the theme "Appropriate choice of environmentally eco-friendly processes and materials for expected environmental building performance".

77th RILEM Annual Week and the 1th Interdisciplinary Symposium on Smart & Sustainable Infrastructures (ISSSI 2023), 4-8 September 2023, Vancouver, Canada

The 77th RILEM Annual Week will be held in conjunction with the 1st Interdisciplinary Symposium on Smart & Sustainable Infrastructures (ISSSI 2023) on 4-8 September 2023 in Vancouver, Canada.

Future RILEM Events

YEAR	SPRING CONVENTIONS	ANNUAL WEEKS
2024	**Milano, Italy** *Liberto Ferrara*	**Toulouse, France** *Alexandra Bertron*
2025	**Mendrisio, Switzerland** *Christian Paglia*	**Hanoi, Vietnam** *Tuan Nguyen Vanand*
2026	**Ghent, Belgium** *Nele De Belie*	**Nairobi, Kenya** *Wolfram Schmidt*

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Secretariat General

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