Design & Testing
Activities within RILEM & Collaboration with fib

ir. Johan Vyncke, President of RILEM
Director Research & Innovation, BBRI
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Introduction
RILEM Background
RILEM Activities
fib – RILEM Synergy
RILEM Input to fib Symposium
**Cathédrale Saint-Pierre de Beauvais**

Incomplete Roman Catholic cathedral in Beauvais, northern France. In some respects, the most daring achievement of Gothic architecture. In the race to build the tallest cathedral in the 13th century, the **builders of Saint-Pierre de Beauvais pushed the technology to the limits.** Even though the structure was to be taller, the buttresses were made thinner in order to pass maximum light into the cathedral.

Work was begun in 1225, the choir was completed in 1272, in two campaigns, with an interval (1232–38) owing to a funding crisis provoked by a struggle with Louis IX. In 1284, only twelve years after completion, part of the choir vault collapsed, along with a few flying buttresses.
Palais de Justice de Bruxelles

Built between 1866 and 1883 in eclectic style by architect Joseph Poelaert. Reputed to be the largest building constructed in the 19th century.
**Eiffel Tower**

Conceived as a suitable centrepiece for the proposed 1889 Exposition Universelle in Paris, the tower is 324 metres (1,063 ft) tall, it was named after the engineer Gustave Eiffel, whose company designed and built it.

Construction started: January 28, 1887  
Opened: March 31, 1889

As claimed by Eifel “the tower would symbolise, not only the **art of the modern engineer**, but also the **century of Industry and Science** in which we are living, and for which the way was prepared by the great scientific movement of the eighteenth century and by the Revolution of 1789.”
François Coignet (1853), Joseph Monier (1877), Thaddeus Hyatt...

Before 1877 the use of concrete construction, though dating back to the Roman Empire and reintroduced in the mid to late 1800s, was not yet a proven scientific technology.


Without Hyatt's work, more dangerous trial and error methods would have largely been depended on for the advancement in the technology.

Specimens of Reinforced Concrete Beams Tested for Thaddeus Hyatt by Kirkaldy, the well-known testing engineer in London.

http://glassian.org/Prism/Hyatt/thaddeus_hyatt_bio_spofford_1913.html
Kirkaldy’s Testing & Experimenting Works

Born in 1820, David Kirkaldy was the son of a Dundee merchant and briefly entered his father’s business, but his talent for experimenting and minute detail found a more natural home in engineering. He took the chance to become an apprentice to shipbuilder Robert Napier’s Vulcan Foundry in Glasgow.

Between 1861 and 1863 David Kirkaldy designed his Universal Testing Machine, patented on 26th November 1863. Exciting new materials such as steel were being developed but their properties were not well understood.

For the Victorians, building bridges with new materials was the nanotechnology of its day but on a truly massive scale.
Magnel Laboratory, Ghent

The Magnel Laboratory was founded in 1926 by Professor Gustave Magnel (1889-1955) under the Department for State Railways in order to meet the urgent need for concrete research.

In this first period, the Laboratory was located in the buildings of the old hotel “Flandria Palace” near the railway station Sint-Pieters in Ghent. From 1926 till 1937, the Laboratory progressively expanded with increasing awareness of its important scientific task. Meanwhile, the laboratory became attached to the Ministry of Public Education in 1930 and as such obtained the status of Univeristy Laboratory.

On June 1st 1937, the Laboratory moved towards the new and more spacious rooms of the “Technicum” located on the hill of the “Blandinusberg” in the centre of Ghent.
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Introduction

RILEM Background

RILEM Activities

*fib* – RILEM Synergy

RILEM Input to *fib* Symposium


RILEM Founding Members


renew international relations & cooperation between institutions for testing and research on materials and structures

Robert L’Hermite (1910 - 1982)
Réunion Internationale des Laboratoires d’Essais et de recherches sur les Matériaux et les constructions

The International Union of Testing and Research Laboratories for Materials and Structures

aim to promote scientific cooperation in the area of construction materials and structures

1949: “RILEM CEMBUREAU” cement testing method developed by the task group “Cement and Concrete”, created in 1948 by Robert l’Hermite and Raoul Dutron
The International Union of Testing and Research Laboratories for Materials and Structures

15 Countries, 16 Institutes, 16 Experts
The International Union of Testing and Research Laboratories for Materials and Structures

63 Countries, 99 Institutes, 1173 Experts
The International Union of Testing and Research Laboratories for Materials and Structures

2 Regional Groups, 63 Countries, 99 Institutes, 1173 Experts

1 – 5 member(s)
6 – 15 members
> 15 members
The International Union of Testing and Research Laboratories for Materials and Structures

2 Regional Groups, 63 Countries, 99 Institutes, 1173 Experts

1 – 5 member(s)
6 – 15 members
> 15 members
favour and promote cooperation at international scale by general access to advanced knowledge,

stimulate new directions of research and its applications, promoting excellence in construction,

promote sustainable and safe construction, and improved performance and cost benefit for society.
Technical Exchanges

Committee meetings
Laboratory & Site visits
International workshops, seminars, conferences
PhD workshops
Annual week
Technical Committees (TCs) are the cornerstone

TC work typically results in:

Technical Exchange

State-of-the-art reports

Recommendations on test methods

More than 1100 experts are involved in RILEM

About 50% of the members are active in present 40 Technical Committees (TC)
Dissemination of information worldwide
Website
Reports
Recommendations
Proceedings

Technical Activities Committee
TAC Chair: Nicolas ROUSSEL
Material Processing and Characterization
Barzin MOBASHER

Transport and Deterioration Mechanisms
Esperanza MENENDEZ MENDEZ

Structural Performance and Design
Takafumi NOGUCHI

Service Life and Environmental Impact Assessment
Kefei LI

Masonry and Timber
Paulo LOURENCO

Bituminous Materials and Polymers
Hervé DI BENEDETTO

A total of 40 TCs are active in 6 Clusters
New TCs created in 2016

IAM - Damage Management in Consideration of Repair/ Retrofit-Recovery in Concrete and Masonry Structures by Means of Innovative NDT (Chair: Tomoki Shiotani)

HDB - Hygrothermal behaviour and Durability of Bio-aggregate based building materials (Chair: Sofiane Amziane)

TCE - Testing and characterisation of earth-based building materials and elements (Chair: Jean-Claude Morel)

DFC - Digital fabrication with cement-based materials (Chair: Nicolas Roussel)

CIM - Benchmarking Chloride Ingress Models on Real-life Case Studies: Theory and Practice (Chair: Eddie Koenders)

PIM - Phase and Interphase behaviour of bituminous materials (Chair: Emmanuel Chailleux)

SHE - Self-Healing Concrete – its efficiency and evaluation (Chair: Feng Xing)

CHA - Crack-healing of Asphalt Pavement Materials (Chair: Hassan Baaj)

ASC - Accelerated laboratory test for the assessment of the durability of materials with respect to salt crystallization (Chair: Barbara Lubelli)

9 new TCs created in March 2016
Ongoing TCs work on (some keywords)

Some TCs that have recently completed their work,...

**233-FPC:** Form pressure generated by fresh concrete *chaired by Peter BILLBERG*

**239-MCM:** On-site measurement of concrete and masonry structures by visualized NDT *chaired by Masayasu OHTSU*

**257-DHM:** Design and application of hydraulic grouts for repair and strengthening of historic masonry structures *chaired by Androniki MILTIADOU-FEZANS*

**MCT:** Multi-component transport and chemical equilibrium in cement based materials *chaired by Björn JOHANNESSON*

About 3-5 TCs complete their mission every year...
219-ACS: Petrographic Atlas: Characterisation of Aggregates regarding Potential Reactivity to Alkalis
Philip NIXON – published in March 2016


Development Advisory Committee
DAC Chair: Geert DE SCHUTTER

“"It is like for a young player to have had the opportunity to play with Pelé, Maradona or nowadays with Messi”

https://www.youtube.com/watch?v=v2ykGVK-tj0
RILEM Development Advisory Committee Members 2015

- **DAC Chair**: Prof. Dr. Geert DE SCHUTTER, Ghent University, BELGIUM
- **DAC Secretary**: Prof. Manu SANTHANAM, IIT Madras, INDIA
- **Outgoing Chair**: Dr. Roberto TORRENT, Materials Advanced Services Ltd., ARGENTINA
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  - Prof. Marco DI PRISCO, Politecnico Di Milano, ITALY
  - Prof. Doug HOOTON, University of Toronto, CANADA
  - Prof. Tian QIAN, Jiangsu Academy of Building Science, Nanjing, CHINA
- **Regional Conveners**:
  - South Sahara/Africa: Prof. Hans BEUSHAUSEN, University of Cape Town, SOUTH AFRICA
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  - Europe: Dr. Manfred N. PARTL, EMPA, SWITZERLAND
  - Middle East, North Africa & South Asia: Prof. Manu SANTHANAM, IIT Madras, INDIA
Educational Activities Committee
EAC Chair: Doug HOOTON

Young People
Recruitment of new young members
&
Mobility of researchers
RILEM Educational Activities Committee Members 2015

- **EAC Chair:** Prof. Doug HOOTON, University of Toronto, CANADA
- **Outgoing Chair:** Prof. Ole M. JENSEN, Technical University of Denmark, DENMARK
- **TAC Chair:** Dr. Nicolas ROUSSE, IFSTTAR, FRANCE
- Prof. Robert FLATT, IETH Zürich, SWITZERLAND
- Dr. Wolfram SCHMIDT, BAM, GERMANY
- Prof. Gideon VAN ZIJL, University of Stellenbosch, SOUTH AFRICA
- Prof. Jason WEISS, Oregon State University, USA
Materials and Structures

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Celebrating 46 Years in 2013!

• Provides a unique interdisciplinary forum for new research findings on the performance of construction materials
• Flagship publication of the International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM), provides a unique international and interdisciplinary forum for new research findings on the performance of construction materials.
• Materials and Structures has established a reputation for publishing high quality papers that span the entire spectrum of the field, including technical papers, applications, case studies, and commentary.
• Materials and Structures has published a wide range of topics, including:
  - Civil Engineering
  - Materials
  - Mechanics
  - Production & Process Engineering
  - Structural Engineering
  - Geotechnical Engineering
  - Environmental Engineering
  - Structural Mechanics

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Dear RILEM Member,

This is a fascinating world in which we live. I recently read a thought-provoking article on “The Third Construction Revolution”. It makes the point that, in the same way that smartphones – unthinkable 20 years ago – have revolutionised communication and human behaviour, so new construction methods that are up-and-coming will render traditional construction methods, systems and design approaches obsolete in the next decades. That is – if you believe everything about 3D printing as applied to construction!

Nevertheless, this amazing new technology of 3D printing does indeed seem to be a genuine revolution. Already, complex shapes of varying size have been produced in cement-based and other materials, from small decorative elements to full scale “concrete” elements.

[Read more]
New RILEM Open Access journal - Available online free of charge!

- short reports of major innovative research or strategic research needs in the field of construction materials and structures
- fast publishing process

letters.rilem.net
Some upcoming conferences (RILEM conferences or co-sponsored events):

27 - 29 April 2016: 6th Amazon & Pacific Green Materials Congress and Sustainable Construction Materials LAT-RILEM Conference, Cali, Colombia

15 - 18 May 2016: SCC16 - RILEM Self-Consolidating Concrete Conf., Washington DC, USA

28 May - 01 June 2016: FraMCoS 9 - 9th International Conference on Fracture Mechanics of Concrete and Concrete Structures, Berkeley, USA

06 - 09 June 2016: 8th RILEM Intnl. Conf. on Mechanisms of Cracking and Debonding in Pavements, Nantes, France

07 - 09 June 2016: Knowledge Exchange for Young Scientists (KEYS): Sustainable Cement and Concrete Construction – Improvement of Solid Waste Management, Accra, Ghana

13 - 15 June 2016: ICCS16 - Second RILEM Intnl. Conf. on Concrete Sustainability, Madrid, Spain

13 - 17 June 2016: Sustainable Built Environment Conf., Zürich, Switzerland

20 - 22 June 2016: Concrete Solutions 2016, University of Thessaloniki, Greece

23 June 2016: RILEM Conference on Microorganisms-Cementitious Materials Interactions, Delft, The Netherlands

26 - 30 June 2016: IABMAS 2016 - 8th International Conference on Bridge Maintenance, Safety and Management, Foz do Iguacu, Brazil

27 - 29 July 2016: ICSA 2016 - 3rd International Conference on Structures and Architecture, Guimaraes, Portugal

21 - 24 August 2016: 70th RILEM Annual Week & Materials, Systems and Structures in Civil Engineering, MSSCE 2016, Lyngby, Copenhagen, Denmark

12 - 14 September 2016: CONSEC 2016 - 8th International Conference on Concrete under Severe Conditions
RILEM Week 2016, Lyngby (Copenhagen), Denmark, 21-24 August

The conference and doctoral course Materials, Systems and Structures in Civil Engineering will be held in Lyngby, Denmark at the campus of the Technical University of Denmark in August 2016. The event consists of a series of parallel and consecutive conference and doctoral course segments on different topics. Each conference or doctoral course segment will function as individual events, but they will also have relations to other segments of the full event. In particular there will be thematic links between specific doctoral courses and specific conference segments. The full event is in conjunction with the 70th RILEM annual week 2016.
Fellows, Honorary Members,…

Robert L’Hermite Award
awarded to an author of less than 40 years
for written contribution of outstanding quality in Materials and Structures

Guillaume Habert, IETH Zürich
Paving the path toward sustainable concrete

Alexandra Bertron, INSA Toulouse
Microorganisms-cementitious materials interactions

John Provis, University of Sheffield
Geopolymers and other alkali activated materials
Why, how, and what?
Fellows, Honorary Members, ...

Gustavo Colonnetti Awards
awarded to an researcher of less than 35 years

Susan Bernal Lopez

Ruben Snellings

2016
RILEM 2017 Spring Meetings in conjunction with ACI Spring Convention

Driving Concrete Technology
March 26-30, Marriott Detroit at the Renaissance Center
Detroit, MI
USA
RILEM Social Media Presence

RILEM on LinkedIn: brand new page created in April 2015
- Gives exposure and visibility to the association and to the work done by RILEM members
- Ability and opportunity to showcase what RILEM does and what RILEM has to offer
https://www.linkedin.com/company/rilem-association

RILEM Facebook page:
- Allows followers to keep track of news, updates and announcements of RILEM
- Creates new relations
https://www.facebook.com/pages/RILEM-association/493181240792791

RILEM YouTube Channel: more than a dozen videos already
- Includes promotional videos, testimonies of researchers/persons playing an essential role within RILEM, presentations of Robert L’Hermite Medalists,...
https://www.youtube.com/user/RILEMChannel
Mrs. Pascale DUCORNET
General Secretary

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Secretary

Ms. Anne GRIFFOIN
Communications Assistant
TAC Secretary

sg@rilem.org
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RILEM Input to fib Symposium
... There is a need to continue to develop additional modes of operation to make our professional impact more effective, to provide more value to our current members and make ourselves more attractive to new members …

promote scientific cooperation and advance scientific knowledge related to construction materials, systems and structures, encourage transfer and application of this knowledge worldwide.
RILEM Strategic Actions

- Young people (EAC)
- Link with industry (DAC)
- OA Publication strategy (TAC / BOE)
- RILEM website (BUR / SG)
- RILEM promotion and follow up (SG)

promote scientific cooperation and advance scientific knowledge related to construction materials, systems and structures, encourage transfer and application of this knowledge worldwide.
fib - fédération internationale du béton

International Federation for Structural Concrete

All materials Testing Methods Emerging Technologies Universities & Research Institutes, Material Producers

RILEM

DRIVING INNOVATION IN CONCRETE CONSTRUCTION

CEN TC 104

CEN TC 250

Structural Concrete Design Codes Application of Research Results to Design and Practical Applications Designers, Contractors, Universities, Institutes
MoC between RILEM and the fib

On 2 September 2015, in Melbourne, Australia, a memorandum of cooperation (MoC) was signed between fib & RILEM.

One of the main goals of cooperation is the coordination of technical activities in the field of structural concrete between the two associations, which could include having members of each organization participate in committee activities of the other.
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- **TAC Chair**: Dr. Nicolas ROUSSEL, IFSTTAR, FRANCE
- **Outgoing Chair**: Dr. Ravindra GETTU, IIT Madras, INDIA
- **EAC Chair**: Prof. Doug HOOTON, University of Toronto, CANADA
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  - Cluster A: Prof. Barzin MOBASHER, Arizona State University, USA
  - Cluster B: Dr. Esperanza MENENDEZ MENDEZ, IETcc (CSIC), SPAIN
  - Cluster C: Prof. Takafumi NOGUCHI, University of Tokyo, JAPAN
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  - Cluster E: Prof. Paulo LOURENCO, University of Minho, PORTUGAL
  - Cluster F: Prof. Hervé DI BENEDETTO, ENTPE, FRANCE
- **Experts**:
  - Prof. Túlio N. BITTENCOURT, University of São Paulo, BRAZIL
  - Prof. Pietro LURA, EMPA, Dübendorf, SWITZERLAND
  - Prof. Jay SANJAYAN, Swinburne University of Technology, AUSTRALIA
  - Prof. Viktor MECHTCHERINE, Technical University of Dresden, GERMANY
  - Prof. Giovanni PLIZZARI, University of Brescia, ITALY
  - Dr. Alexandra BERTRON, INSA Toulouse, FRANCE
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RILEM Background
RILEM Activities
fib – RILEM Synergy
RILEM Input to fib Symposium
Some other active TCs,....

258-AAA: Avoiding alkali aggregate reactions in concrete - Performance based concept *chaired by Børge Johannes WIGUM*
259-ISR: Prognosis of deterioration and loss of serviceability in structures affected by alkali-silica reactions *chaired by Victor SAOUMA*
260-RSC: Recommendations for use of superabsorbent polymers in concrete construction *chaired by Viktor MECHTCHERINE*
261-CCF: Creep behavior in Cracked Sections of Fiber Reinforced Concrete *chaired by Pedro SERNA ROS*
262-SCI: Characteristics of the steel/concrete interface and their effect on initiation of chloride-induced reinforcement corrosion *chaired by Ueli ANGST*
263-EEC: Environmental evaluation of concrete structures toward sustainable construction *chaired by Amnon KATZ*

35-40 TCs are active at any time
With best regards of the whole RILEM Bureau

- **RILEM President**: Mr. Johan VYNCKE, BBRI, BELGIUM
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- **Honorary President 2016**: Prof. Ole M. JENSEN, DTU, DENMARK
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