

Minutes of the Paris Meeting of RILEM TC-246 TDC

Time	14:00 -17:00, Tuesday, Sept. 3 rd , 2013
Venue	Mines Paris Tech (Ecole des Mines)60, Boulevard Saint Michel, PARIS
Main Subjects	1) Opening of the meeting and welcome to all participants; 2) Brief introduction on progress of RILEM TC-246 TDC during this year; 3) Presentation and discussion of the minutes of the Second Plenary Meeting of TC-TDC (Qingdao Meeting); 4) Actual state of the comparative test method; 5) Discussion on details of how to run the tests, how to evaluate the result and how to write the report containing the main results; 6) Closure of the meeting.
Participants	9 committee members attended the meeting: Dr. Eguez Hugo, Prof. Erik Schlangen, Dr. Erika Holt, Prof. F. H. Wittmann, Dr. Juan Li, Prof. Ling Wang, Prof. Max J. Setzer , Prof. Nele De Belie, Dr. Zhendi Wang.
Moderator	Dr. Juan Li
<p>1. Opening of the meeting</p> <p>Dr. Juan Li, the Secretary of Group B of RILEM TC-246 TDC, presented first the agenda of this meeting. On behalf of the chairlady, Prof. Yao Yan, who was unable to attend this meeting because of other urgent commitments, she welcomed all the participants of the TC meeting. Then all participants introduced themselves and presented briefly their affiliation, indicating major research interests.</p> <p>2. Brief overview on the progress of RILEM TC-246 TDC during this year</p> <p>Prof. Ling Wang, the Secretary of RILEM TC-246-TDC, underlined again that RILEM TC-246 TDC mainly focuses on two types of tests to study durability under combined actions. One test shall be determination of the chloride diffusion coefficient of concrete exposed to chloride containing water, such as seawater or water containing deicing salt, combined with an applied tensile or compressive load, and the other shall be determination of the rate of carbonation if the diffusive process is combined with tensile or compressive load. Then she presented a short review on decisions, which had been made during the previous TC meetings. These decisions included details on the publication of the Annotated Bibliography, and the list of laboratories which agreed to participate in the comparative test series. Finally, she presented a proposal for the planned meetings during the year to come, which was accepted after short discussion.</p> <p>3. Review of the minutes of the Second Plenary Meeting of TC-246 TDC</p> <p>Dr. Li Juan drew the attention of the participants to the minutes of the Second</p>	

Plenary Meeting of RILEM TC-246 TDC and outlined what follows from the minutes for the next steps.

Working group A, had the task to prepare an Annotated Bibliography containing titles, authors and abstracts of all collected publications on durability under combined actions. A draft of the printed version could be distributed during the meeting. After discussion it was decided to publish this book after minor amendments. Further it is planned to produce a CD with the full length papers. In this case approval by the publishing companies, which own the copyright, has to be obtained.

Working group B decided to concentrate on two types of combinations, selected from the huge number of possible combinations of actions, namely, chloride penetration under simultaneously acting tensile or compressive load and carbonation under simultaneously acting tensile or compressive load. Details of the test methods were discussed in detail during this meeting. At least 6 laboratories, namely, CBMA, Delft Univ., Ghent Univ., Polish Academy of Sciences, Qingdao Tech., and Shenzhen Univ., have confirmed their participation in the comparative test series (round robins). It is hoped and expected that preliminary test results can be obtained before and discussed during the next meeting.

It was decided that with the publication of the Annotated Bibliography working groups A and B have finalized their work. TC-246 TDC will continue the work on the comparative testing and the preparation of recommendations as a whole.

4. Further discussion on comparative test method

Dr. Zhendi Wang, the Secretary of Group A, made a presentation on the current state of comparative tests and preliminary test results. Participants discussed the dimension of the specimens and details of the test rigs. Experiences and opinions of a number of members were presented. After discussion, the following key points were fixed.

- The shape and dimensions of the specimens to be produced for tension tests as agreed upon during the meeting are shown in Figure 1.
- In the center part of the specimens a tank, which can be filled with seawater or salt solutions, shall be fixed on one surface of the specimen.
- This tank should have two openings on top and at the bottom to allow the chloride solution to be permanently recycled and exchanged with a bigger external tank. It was also suggested that the volume of the tank should be fixed.
- Prof. F. H. Wittmann, Chairman of Group A, underlined the fact that the aim of our TC is to prepare and publish finally RILEM recommendations for testing durability under combined actions. These recommendations shall be based on the results and experiences gained in all participating laboratories during the tests series. The recommendations will be accepted and applied in practice only if they are easy enough to be followed and performed in ordinary laboratories for testing building materials. We must not end up with a most sophisticated research test. Further we must also remain flexible and prepared to modify details of the shape and size of the test specimens and details of the testing procedure during the comparative

test series. Consequently, the final RILEM recommendation will be based on what we have learned during the preparations and the execution of the comparative tests. The recommended test finally must not be too complex but reliable and meaningful for practical applications.

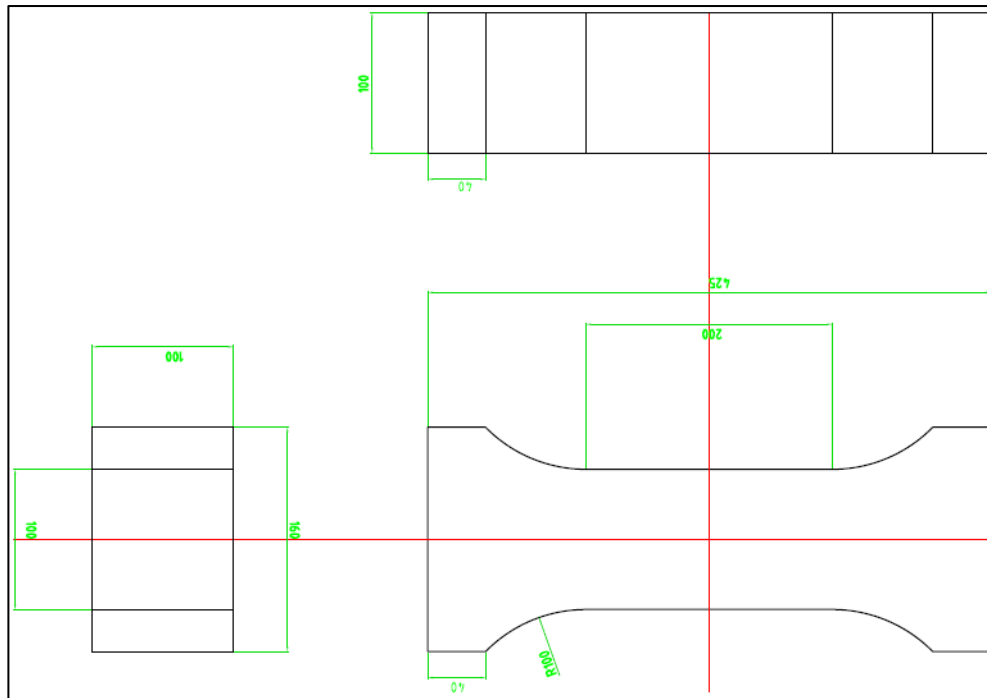


Figure 1. Shape and dimensions of the specimens designed for direct tension tests (unit: mm)

5. Conclusion of group A and group B and next meeting

The main points of this meeting were concluded as follows:

For group A

All colleagues were invited to check the annotated bibliography. If you find any error or something to be revised or extended, please send your suggestions to the secretary of the RILEM TC by the end of September 2013.

For group B

- All tests should be run at least in duplicate tests to increase significance and reliability, and the temperature range of tests should be 20 ± 3 °C.
- It is suggested that vacuum saturation is needed for all specimens before running the chloride penetration test. Then diffusion will be the dominant migration mechanism.
- In parallel test can be run on samples, which are dried in a ventilated oven at 60 °C until constant weight. In this case capillary absorption will be the dominant migration mechanism.

- A prototype of test rigs will be prepared by CBMA and distributed to the laboratories which will participate in the comparative test series.
- Tests shall be run in three steps.
 - The first step shall be the determination of chloride penetration into a standard concrete (composition to be decided by correspondence) without applied load. Once the composition is fixed, tests can be run in all participating laboratories.
 - As a second step, tests under applied compressive stress shall be run in all laboratories, which are already equipped with test rigs, which allow application of a compressive load. In this case chloride penetration shall be determined under 30 %, 60 % and 80 % of the compressive strength.
 - The third step shall be determination of chloride penetration into concrete under applied tensile load. Laboratories which have the necessary equipment already are invited to run first tests as soon as possible. Those who need the test rigs as prepared by CBMA please inform the secretary of the TC as soon as possible.
- It was decided after discussion that the next plenary meeting will be held in Delft Univ., The Netherlands at April 28th and 29th, 2014.
- During the next meeting other load combinations than mechanical load and chloride penetration or mechanical load and carbonation shall be discussed. The aim shall be to identify load combinations with particular high relevance for durability and service life of existing structures and for design of new structures. This discussion shall initiate proposals for new RILEM TCs dealing with influence of combined loads on service life.
- Everybody who runs tests according to the rules fixed by this TC is invited to make detailed notes of all the weak points of the test procedure with the aim to improve the final RILEM recommendation.

6. Closing remarks

Dr. Li Juan wrapped up the different presentations and intense discussions. She summarized the main points briefly and expressed her sincere thanks to all the experts who are involved in the activities of this TC on behalf of Prof. Yao Yan. She expressed her special thanks to the participants for their hard work and commitment to make this meeting meaningful and successful.

The meeting was closed at 17:00.