

Conference report

BEFIB 2000: the fifth RILEM symposium on fibre reinforced concretes (FRC)

1. Context of BEFIB 2000

Fibre-reinforced concretes (FRC) have been in existence now for more than 30 years. This type of material has been the topic of many research efforts throughout the world. As we enter the 21st century, some kind of assessment of this "fibrous era" is not just welcome but required. In reflecting upon the scope of industrial applications using these materials in terms of their corresponding energy costs and inherent financial outlays, the first impression could easily be one of slight disappointment or even frustration. Yet, this impression seems to fade and give way to a more optimistic assessment when the root causes get analysed more closely and when the progress achieved over the past 10-year period alone is examined.

The primary cause behind this relatively limited use of FRC in industrial applications pertains to the imbalance in research conducted between the fundamental side and the applied side. Even though the world of civil engineering has until now been more heavily influenced by a technical and technological culture rather than any scientific culture, research trends have apparently been headed in the opposite direction. As a case in point, research projects carried out on topics like the mechanical characterisation of FRC subjected to various types of loadings, or the application of linear and non-linear fracture mechanics, or behaviour modelling of a fibre immersed in a small volume of concrete have far and away outnumbered those projects focusing on problems related to implementing FRC mix designs or on the development of better-adapted methods for designing structures with these composite materials. It turns out that tangible advances in the industrial application of FRC for real civil engineering purposes have depended entirely on these latter, applied-research orientations.

The move towards more applied research only got underway (and partially at that) at the end of the 1980s and beginning of the 1990s. During this period, a number of countries were able to devise relevant and easy-to-use methods for designing structures with FRC; moreover, methods have since become available to optimise the composition in order to produce self-com-

pecting FRC containing at least 3% metallic fibers by volume. Such progress has made it possible in the last five years to witness the use of FRC in actual structural applications. As we head into the new millennium, it is my belief and hope that this recent dynamic will only gain momentum. How it is possible to continue overlooking the virtues of a material that enables enhancing the mechanical behaviour and durability of certain structures at costs which, when evaluated from the standpoint of a systemic analysis (i.e., a global view towards costing an industrial application), would be reduced even further?

One final thought: with the recent appearance on the market of ultra-high performance FRC paving the way towards new and, as of now, boundless applications, the prospect over a medium-term of building concrete structures with no reinforcement other than fibres cannot be altogether discarded.

BEFIB 2000 is the fifth symposium held on FRC and has been organised under the aegis of the RILEM association; the first four took place in the UK under the sponsorship of Professor Swamy, to whom the field of FRC is deeply indebted and to whom I would like to pay tribute.

2. Objectives of BEFIB 2000

This symposium has been aimed at highlighting industrial applications along with what could be qualified as the technological aspects. This choice appears clearly in the organisation of the symposium and in the contents of the proceedings.

Researchers, academics, designers, practitioners, engineers, heads of construction companies and concrete industry firms, architects, and project supervisors are concerned by the topics of BEFIB 2000.

These topics are:

- mix-design and placement,
- structural and industrial applications,
- design methods and modelling,
- durability,
- physico-chemical properties,
- mechanical properties,
- high and ultra-high performances fibre reinforced cement composites.

3. Some quantitative information

Seventy-eight papers are presented during BEFIB 2000.

Every day begins with two guest lectures in plenary session (25 min for presentation and 5 min for discussion), then, oral presentations (15 min for presentation and 5 min for discussion) are made in two parallel sessions.

Nineteen countries are represented: Australia, Belgium, Brazil, Canada, China, Croatia, Denmark, France, Germany, Holland, Italy, Luxembourg, Poland, Slovenia, Spain, Sweden, Czech Republic, UK, USA.

4. Purple points of BEFIB 2000

What makes the scientific and technical interest and the specificity of BEFIB 2000 is the number and the quality of the papers devoted to:

1. the used of FRC in real structural applications as bridge deck, precast roof elements, tunnel precast segments, precast thin panels, bored piles...,
2. design methods for FRC industrial applications,

3. ultra-high performance FRC.

That means that the initial objectives of BEFIB 2000 are in a large part reached.

The Conference Proceedings can be obtained from RILEM Publications s.a.r.l., ENS-61 AV Pat Wilson, F-94235 Cachan Cedex, France.

5. Conclusion

This scientific event should be considered as a turn-of-the-century assessment of our current state of knowledge regarding FRC and an opportunity to forge strategies for further advances in the domain of industrial and structural applications, and in the development of ultra-high performance FRC which constitutes an existing challenge for the future.

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