RILEM TC HFC
High Performance Fibre Reinforced Cement-based Composites

1st Meeting, Varenna, Italy, Sept. 20, 2004

Subcommittee on Durability
- SC 2 -

Chairman in spe:
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Present Situation

• Compressive strength is the overall governing material property: HSC = HPC?
• Annual direct cost of maintenance of R/C bridges in the US: $8 billion
• 40% of the German infrastructure needs repair measures; average service life: 18 years (compare Roman bridges)
• About 50% of the total expenditures is needed for maintenance
Major topics to be dealt with

1. Durability and crack formation
2. Durability and chemical loads
3. Durability and thermal loads
4. Durability under combined loads
5. Durability, economical and ecological aspects
Aims and Work Program I

Durability and crack formation:
- Ductility as compared with imposed shrinkage strain
- Critical opening of micro-cracks during strain hardening
- Influence of width of micro-cracks on permeability and capillary suction
- Self-healing
Aims and Work Program II

Durability and chemical loads:
- Chloride penetration
- Sulfate penetration
- High alcali content
- Hydrolysis
- Ageing
Aims and Work Program III

**Durability and thermal loads:**
- Behaviour at elevated temperatures
- Thermal gradients
- Behaviour in contact with fire
- Behaviour at low temperatures
- Frost action
Aims and Work Program IV

Durability under combined loads:
- Mechanical and chemical loads
- Mechanical and thermal loads
- Mechanical, chemical, and thermal loads
Aims and Work Program V

Durability, economical and ecological aspects
- Life-cycle cost
- Recycling
- Sustainability
Deliverables

• Input for SC 1 and SC 2
• Appropriate test methods
• Final report on durability of ECC