

# RILEM TC HFC

High Performance Fibre Reinforced Cement-based Composites

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## 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: 18years (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 alkali 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