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CEMENT MANUFACTURING

Physico-Chemistry of Cement, Part 3

DURATION	CONTACT HOURS	LEVEL	FEE PER DELEGATE
5 days	30	Intermediate	US$1,500

Part three: durability. The chemical attacks that destroy hardened cement, and what resists them.

Part three takes the hydrated material from part two and asks how it fails. It covers transport through the pore structure, which governs almost everything else, then the major mechanisms in turn: carbonation and reinforcement corrosion, chloride ingress, sulphate attack, alkali aggregate reaction and freeze thaw damage. Each is treated as a chemical process with conditions and a rate, so that the mitigation discussed at the end follows from the mechanism rather than from a rule of thumb.

Available as classroom, live online, in house.

Who it is for

Laboratory and quality staff, product development engineers, concrete technologists and durability specialists, and technical staff advising on exposure classes.

What you will be able to do

- Explain transport through hardened cement paste.
- Describe the mechanism and rate controls of each attack.
- Interpret durability test results.
- Select binder composition appropriate to an exposure.
- Diagnose a deterioration from its evidence.

The outline

DAY 1

Transport

Pore structure and permeability · Diffusion, absorption and capillary suction · Why transport governs durability

DAY 2

Carbonation and corrosion

Carbonation front and pH drop · Reinforcement depassivation and corrosion · Cover, and why it is the main defence

DAY 3

Chlorides and sulphates

Chloride ingress and binding · Sulphate attack, internal and external · Thaumasite and delayed ettringite formation

DAY 4

Aggregate and physical attack

Alkali silica reaction · Freeze thaw and air entrainment · Abrasion and leaching

DAY 5

Resistance

Supplementary materials and their mechanisms · Binder selection by exposure class · Testing and service life prediction

What you leave with

- A deterioration diagnosis from a real case.
- A binder selection rationale for a stated exposure.
- A durability testing plan.

Published dates

DATES	WHERE	FEE
23 to 27 November 2026	Port Louis, Mauritius	**US$1,500**
30 November 2026 to 4 December 2026	Lagos, Nigeria	**US$1,500**
7 to 11 December 2026	Nicosia, Cyprus	**US$1,500**
14 to 18 December 2026	Nairobi, Kenya	**US$1,500**

Fees are per delegate and co
arranged by the delegate. Reg

Register or ask a question

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