Notation

Latin Letters

A	aggregate-content in concrete volume (kg/m^3)
A/C	aggregate-to-cement ratio, by weight
c	concrete cover: distance of reinforcement from the outer surface of concrete (mm)
C	initial cement-content in concrete volume (kg/m^3)
CH	calcium hydroxide content in concrete volume (kg/m^3)
$[Cl^-(aq)]$	concentration of Cl^- in the aqueous phase of concrete (kg/m^3 pore solution)
[Cl(aq)]0	concentration of Cl^- at the concrete surface (kg/m^3 aqueous solution)
[Cl(aq)]in	initial (at t=0) concentration of Cl^- (kg/m^3 aqueous solution)
$[Cl^-(s)]$	concentration of Cl^- in the solid phase of concrete (kg/m^3 concrete)
[Cl(s)]sat	saturation concentration of Cl^- in the solid phase (kg/m^3 concrete)
[Cl(tot)]cr	critical total concentration of Cl^- for steel corrosion (kg/m^3 concrete)
CO2	carbon dioxide content in the ambient air at the concrete surface (%)
CS	calcium sulphate content in concrete (kg/m^3 of concrete)
CSH	calcium silicate hydrate content in concrete volume (kg/m^3)
d	thickness of mortar coating (mm)
D	total admixture-content (solids) in concrete volume (kg/m^3)
DA	aggregate density (kg/m^3)
DC	cement density (kg/m^3)
DCON	fresh concrete density (kg/m^3)
DD	admixture (solids) density (kg/m^3)
DeCl	intrinsic effective diffusivity of Cl^- in concrete (m^2/s)
DeCO2	effective diffusivity of CO_2 in carbonated concrete (m^2/s)
DF	fly ash density (kg/m^3)
DL	lime density (kg/m^3)
DMAX	maximum nominal upper aggregate size (mm)
DS	silica fume density (kg/m^3)
DT	the timestep in the numerical solution (s)

DTI	Type I addition's density (kg/m^3)
DTOT	total admixture-content (solids and water, as supplied) in concrete volume (kg/m^3)
DW	water density (kg/m^3)
DX	the spacestep in the numerical solution, M/N (mm)
EAIR	volume of entrained or entrapped air per concrete volume (%, m^3/m^3)
ENT	volume of entrained air per concrete volume (%, m^3/m^3)
ETR	volume of entrapped air per concrete volume (%, m^3/m^3)
$f_{ck,cube}$	characteristic compressive strength of concrete determined by testing cubes (MPa)
$f_{ck,cyl}$	characteristic compressive strength of concrete determined by testing cylinders (MPa)
fcm	mean compressive strength of concrete (at 28 days, MPa)
fcm2	mean compressive strength of concrete at 2 days (MPa)
fcm28	mean compressive strength of concrete at 28 days(MPa)
F	fly ash content in concrete volume (kg/m^3)
FACT	maximum part of fly ash that may participate in the pozzolanic reactions
H	chemically-bound water content in concrete volume (kg/m^3)
k	efficiency factor of SCM comparing to portland cement
kF	efficiency factor of fly ash comparing to portland cement
kS	efficiency factor of silica fume comparing to portland cement
K	clinker content in concrete (kg/m^3 of concrete)
KT	total production cost of concrete (CU/m^3)
KB	cost of concrete transportation and delivery (CU/m^3)
Keq	equilibrium constant for Cl^- binding (m^3 of pore solution/kg)
KG	fixed and general costs in concrete production (CU/m^3)
KM	mixing cost for concrete production (CU/m^3)
KP	purchase cost of materials for concrete production (CU/m^3)
L	lime content in mortar volume (kg/m^3)
L/C	lime-to-cement ratio, by weight
M	distance between outer surface and axis of symmetry (mm)
MAC	mac content in concrete (kg/m^3 of concrete)
N	the number of cells that the distance M is separated for the numerical solution
PCS	percentage of calcium sulphate in the cement (%)
PK	percentage of clinker in the cement (minus calcium sulphate) (%)
PL	the percentage of the pure CH in the lime

PMAC	percentage of minor additional const. in the cement (minus calcium sulphate) (%)
PPO	percentage of other pozzol. materials in the cement CEM V (minus calc. sulph.) (%)
PSCM	percentage of SCM in the cement (minus calcium sulphate) (%)
PSL	percentage of slag in the cement CEM V (minus calcium sulphate) (%)
P	SCM content in concrete (kg/m^3 of concrete)
r	degree of pozzolanic reaction of a cement SCM or a concrete addition
RH	ambient relative humidity (%)
S	silica fume content in concrete volume (kg/m^3)
SACT	maximum part of silica fume that may participate in the pozzolanic reactions
SL	slag content in concrete (kg/m^3 of concrete)
t	time (years)
ta	time of application of mortar coating (years)
tcr,carb	critical time required for reinforcement depassivation due to carbonation (years)
tcr,chlor	critical time required for reinforcement depassivation due to chlorides (years)
td	time required for total carbonation of mortar coating (years)
tpr,carb	critical time required for carbonation-induced corrosion to split the cover (years)
TMAX	the maximum time that the numerical solution terminates (years)
TI	Type I addition content in concrete volume (kg/m^3)
U…	value of concrete constituent C, TI, F, S, A, W, or D, per unit (€/kg)
W	initial water-content (effective) in concrete volume (kg/m^3)
WA	water added in concrete volume (kg/m^3)
WD	water added from admixtures in concrete volume (kg/m^3)
W/C	water-to-cement ratio, by weight
x	distance from the outer surface of concrete (m)
xc	concrete carbonation depth measured from concrete surface (mm)
xca	intitial (without any coating) carbonation depth of concrete (mm)
Zcarb	designed service life of a concrete structure regarding carbonation (years)
…1	quantities reffering in cement-lime mortar coatings

Greek Letters

γA	weight fraction of Al_2O_3, which contributes to the pozzolanic reactions (%)
γS	weight fraction of SiO_2, which contributes to the pozzolanic reactions (%)

ε	total concrete porosity (m^3 pore volume /m^3 concrete)
εc	porosity of carbonated concrete
εeff	effective porosity of concrete regarding chloride diffusion
ρ	ratio of the exposure time to the total time of a complete cycle

Abbreviations

AASHTO	American Association of States Highway and Transportation Officials
ACI	American Concrete Institute
AFM	atomic force microscopy
ASTM	American Society for Testing and Materials
BET	Brunauer, Emmett and Teller (method of)
CCP	concrete compositional parameters
C…/…	compressive strength classes in case of normal-weight and heavy-weight concrete
CAL	calcareous
CEB	Comité Euro-international du Béton
CEM…	cement type according to the series EN 197
CEN	Comité Européen de Normalisation
CH	calcium hydroxide
CSH	calcium silicate hydrate
EN	European Standard
mac	minor additional constituent
OPC	ordinary (normal) portland cement
RH	relative humidity
RILEM	Réunion Intern. des Laborat. d'Essais et de Recherches sur les Mat. et les Constr.
SCM	supplementary cementing materials
SEM	scanning electron microscopy
SIL	siliceous
X0	exposure class for no risk of corrosion or attack
XC…	exposure classes for risk of corrosion induced by carbonation
XD…	exposure classes for risk of corrosion induced by chlorides other than from sea water

XS… exposure classes for risk of corrosion induced by chlorides from sea water

XF… exposure classes for freeze/thaw attack

XA… exposure classes chemical attack

Cement Technology Notation

S: SiO_2

A: Al_2O_3

F: Fe_2O_3

C: CaO

M: MgO

H: H_2O

$\bar{S}$: SO_3

$\bar{C}$: CO_2

LOI: loss on ignition

References

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