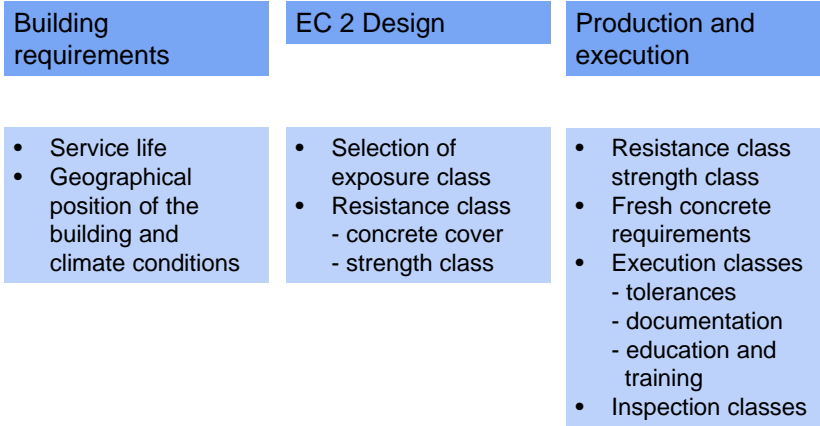


■ European Ready Mixed Concrete
Association ERMCO
Board meeting
Rome, 19 April 2016

■ ERMCO Technical Committee

■ Specification of durability by performance
Resistance classes



■ Resistance classes and 'deemed to satisfy' values for different cements → future EN 206

Preliminary values	Carbonation resistance class RC				Chloride resistance class RSD			Frost resistance class RF	
	RC20	RC30	RC40	RCX0 ¹	RSD45	RSD60	RSD75	RF2	RF10
Definition of class, depth of front after 50 years (mm)	20	30	40	-	45	60	75		
Classification standard	EN xxx	EN xxx	EN xxx	EN xxx	EN yyy	EN yyy	EN yyy	EN zzz	EN zzz
Deemed to satisfy	Maximum w/b-ratio b is the sum of cement and additions in the concrete, within the limits defining the cements according to EN 197								
CEM I	0,45	0,50	0,55	0,90	NA	NA	0,45 ²		
CEM II-A	0,45	0,50	0,55	0,90	0,40	0,50	0,60		
CEM II-B	NA	0,45	0,50	0,75	0,40	0,50	0,60		
CEM III-A	NA	0,45	0,50	0,75	?	?	?		
CEM III-B	NA	NA	0,45	0,65	0,38	0,45	0,55		
Minimum cement content (kg/m ³)	280	280	280	280	280	280	280		

- Min concrete cover for combination of exposure, resistance classe and working life → future EC

Preliminary values		Minimum cover for 50, 100 and 200 years design working life, recommended values (preliminary)						
Exposure Class		RC20 (RCH) RSD45 (RSDH)			RC30 (RCM) RSD60 (RSDM)		RC40 (RCL) RSD75 (RSDL)	
		50	100	200(?)	50	100	50	100
X0 ₁	(10)	<i>C_{min,b}</i>	<i>C_{min,b}</i>	<i>C_{min,b}</i>	<i>C_{min,b}</i>	<i>C_{min,b}</i>	<i>C_{min,b}</i>	<i>C_{min,b}</i>
XC1	(15)	10	15	20	10	20	10	20
XC2	(25)	15	20	30	20	30	25	35
XC3	(25)	15	20	30	20	30	25	35
XC4	(30)	15	20	30	20	30	25	35
XD1	(35)	15	20	30	20	30	25	35
XS1	(35)	15	20	30	20	30	25	35
XD2	(40)	45	55	65	55	70	70	NA
XS2	(40)	45	55	65	55	70	70	NA
XD3	(45)	55	65	75	70	NA	80	NA
XS3	(45)	55	65	75	70	NA	80	NA

■ Present situation

- two worlds: TC 250 WG and TC 104 WG
- TC 104 WG: > 30 members!
- some countries block: Spain, France (?), UK (?), DE (yes, but ...)
- far away from test methods and criteria
- research project on test methods and data background for 'deemed to satisfy' values. Funding to be found → > 5 years

■ Facts

- chance for further harmonization
- Performance test to be drafted!
- in rmc practice: ´deemed to satisfy´ values
- European harmonized ´deemed to satisfy values´ possible.
→ margin, not economical
- ´deemed to satisfy´ values on national level
- Initial type testing for **individual** limiting values (**only!**) for individual constituents. Non-transferable!
- conformity on the basis of ´deemed to satisfy´ values or individual limit values

■ Risks and chances for rmc industry

- concrete design by the designer
- limited choice of constituents
- additional testing of constituents and concrete
- knowledge of experts

- competence in concrete design → consultancy to the client!
- individual performance → competition
- technical and economical optimization

■ Tasks for ETC

- update ERMCO position
- what are the advantages for rmc industry?
- different warranty declaration for different concepts
- consider risks and chances

