

Supplementary Information

Online Resource 1 Chemical composition (determined by X-ray fluorescence) of the ILT cements used by the European laboratories and the equivalent CEM I, CEM II and CEM III used by laboratories outside Europa

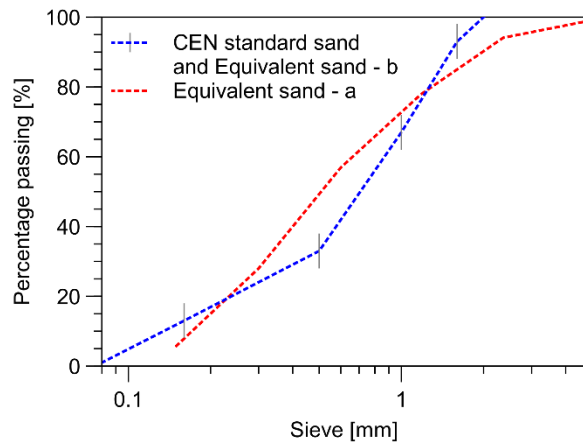
Binder type	Chemical composition [wt.%]											
	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	Na ₂ O	K ₂ O	TiO ₂	MnO	P ₂ O ₅	SO ₃	Remaining elements
CEM I 42.5 N	63.12	20.32	4.60	3.24	1.92	0.26	0.61	0.44	0.07	0.35	3.20	0.12
Equivalent CEM I - a	63.0	22.0	5.0	3.29	2.12	0.3	0.71	0.46	n.d.	n.d.	1.42	1.7
Equivalent CEM I - b	64.20	20.94	4.85	3.44	1.70	0.50		n.d.	n.d.	n.d.	1.88	2.49
CEM II/B-V 42.5 N	49.28	28.26	8.95	4.32	1.90	0.37	0.91	0.56	0.07	0.043	2.64	0.47
Equivalent CEM II - a	44.00	32.00	10.00	6.00	2.00	n.d.	n.d.	n.d.	n.d.	n.d.	2.50	3.50
Equivalent CEM II - b	48.90	28.32	11.66	4.58	1.44	1.01		0.34	0.01	0.16	1.58	2.00
CEM III/B 42.5 N	46.21	30.67	9.09	1.17	5.55	0.20	0.70	0.80	0.13	0.05	4.93	0.52
Equivalent CEM III - b	47.72	28.16	12.21	0.97	5.77	0.80		1.20	0.28	0.02	2.37	0.50

n.d. = not declared

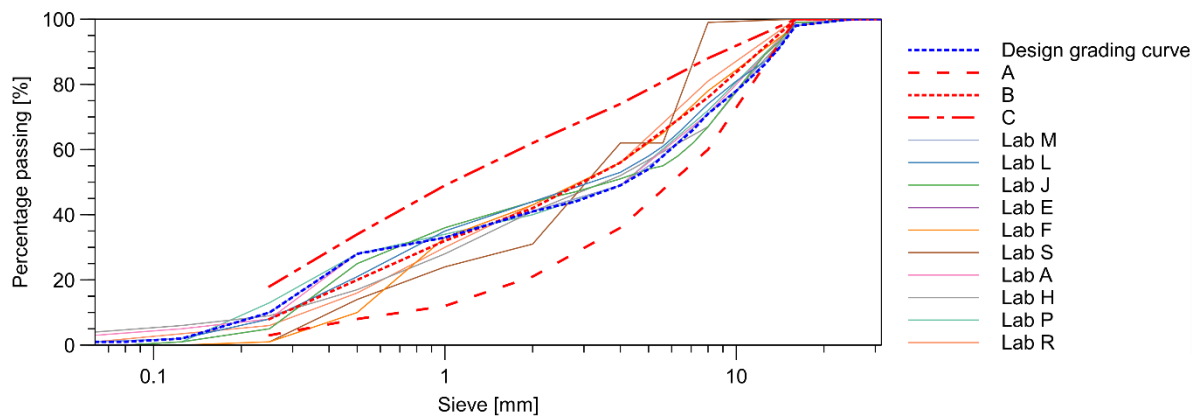
Online Resource 2 – Physical and mechanical properties of the ILT cements used by the European laboratories and the equivalent CEM I, CEM II and CEM III used by laboratories outside Europa

	CEM I 42.5 N	Equivalent CEM I - a	Equivalent CEM I - b	CEM II/B-V 42.5 N	Equivalent CEM II - a	Equivalent CEM II - b	CEM III/B 42.5 N	Equivalent CEM III - b
Loss on ignition [%]	1.69	1.64	n.d.	1.86	1.72	n.d.	0.74	n.d.
Blaine fineness [cm ² /g]	2640	3130	n.d.	4130	3900	n.d.	4840	n.d.
Density [g/cm ³]	3.16	3.15	n.d.	2.89	3.08	n.d.	2.97	n.d.
Strength 1 day [MPa]	9.9	n.d.	n.d.	12.6	-	n.d.	5.2	n.d.
Strength 2 days [MPa]	21.5	n.d.	n.d.	24.8	-	n.d.	13.9	n.d.
Strength 3 days [MPa]	n.d.	39.2	n.d.	n.d.	28.6	n.d.	n.d.	n.d.
Strength 7 days [MPa]	38.7	51.5	n.d.	40.5	38.6	n.d.	35.8	n.d.
Strength 28 days [MPa]	52.5	58.0	n.d.	52.8	58.0	n.d.	55.2	n.d.

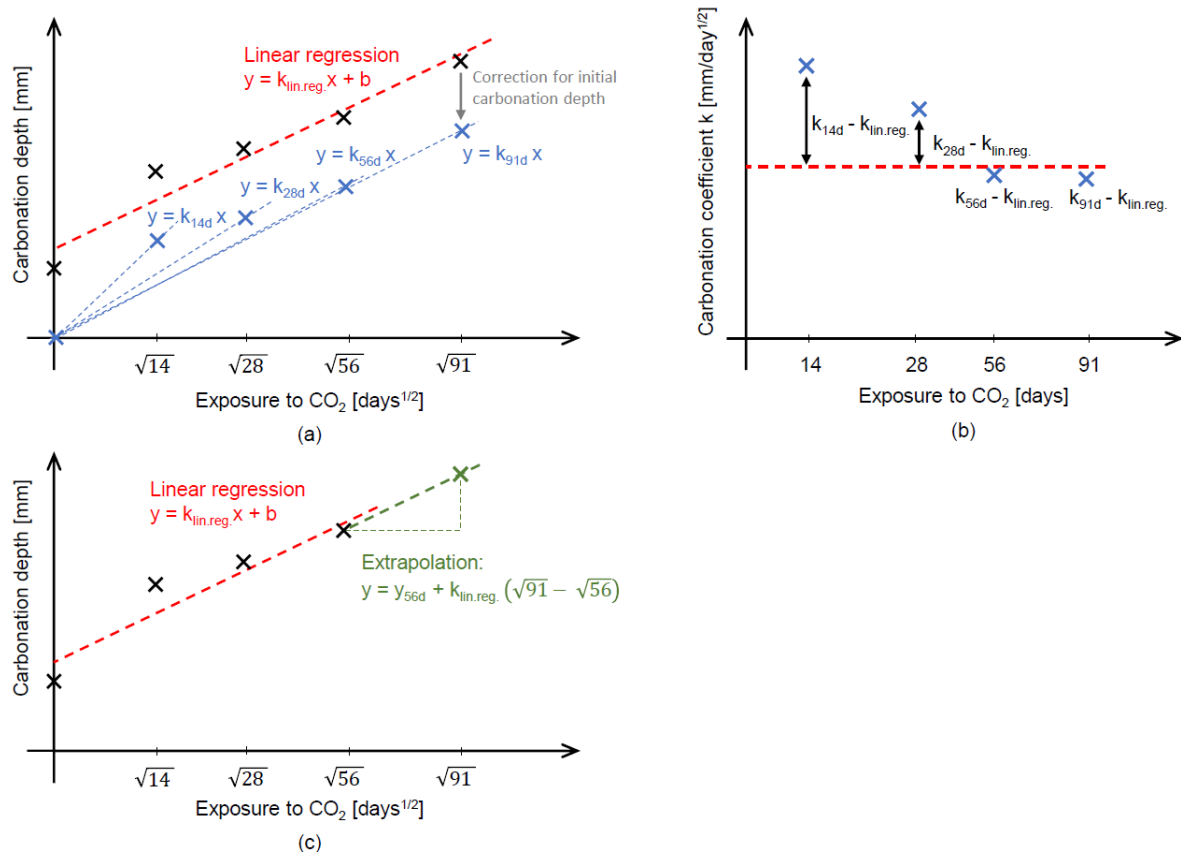
Online Resource 3 – Grading curve of CEN standard sand used by the European laboratories and sand used by laboratories outside Europa



Online Resource 4 - Design grading curve, A - B - C curves according to DIN 1045-2 [6] and individual actual grading curve of the concrete for each laboratory expressed as percentage passing on different sieve sets



Online Resource 5 - (a) Conceptual mean carbonation depth as a function of square root of time showing the methodology to calculate the carbonation coefficient based on linear regression and individual depths as an input for Figure 3, (b) the evolution of the carbonation coefficient in function of time and (c) the methodology to extrapolate carbonation depths up to 91 days (Section 3.3.3).

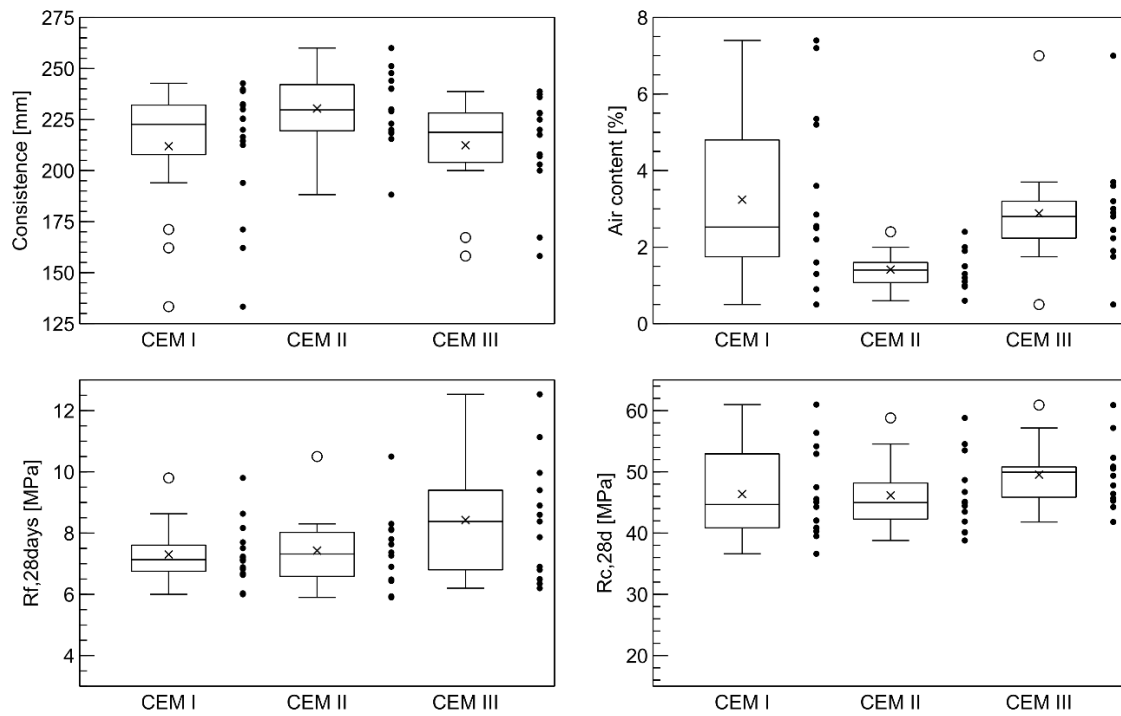


Online Resource 6 – Variables for statistical analysis

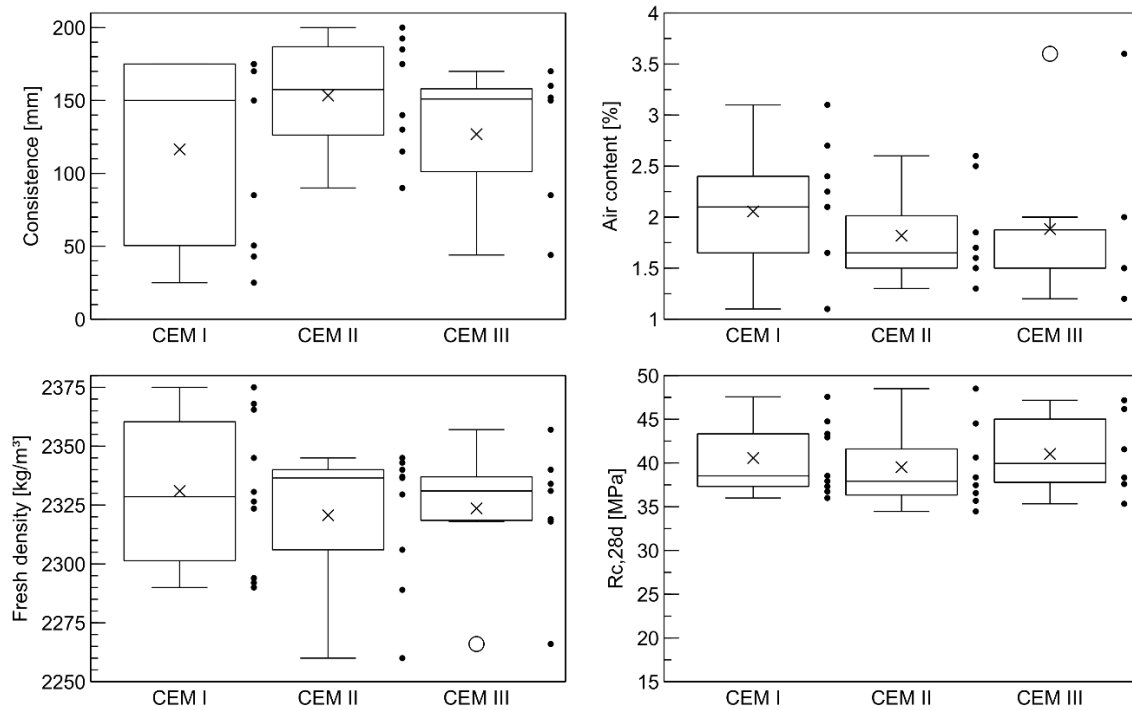
- Lab number
- Specimen type (mortar / concrete)
- Carbonation type (ACC / NAT)
- Binder type
- Specimen Name
- Standard
- Casting
- Curing type
- Curing temperature
- Curing relative humidity
- Curing age
- Preconditioning type
- Preconditioning temperature
- Preconditioning relative humidity
- Preconditioning duration
- Carbonation type
- Carbonation concentration
- Carbonation temperature
- Carbonation relative humidity
- Carbonation indicator
- Carbonation duration
- Carbonation repetition number
- Carbonation measuring side
- Carbonation measuring timing
- Carbonation measuring sequence

Online Resource 7 - Box-and-whisker plots and mean test results (black dots) for each laboratory for mortar and concrete and for the considered fresh and hardened properties

MORTAR



CONCRETE



Online Resource 8 - Straggler and outlier detection based on Cochran's test for mortar specimens (ISO 5725-2 [23])

	CEM I		CEM II		CEM III	
	Straggler	Outlier	Straggler	Outlier	Straggler	Outlier
Pre-defined sealed curing (1% CO ₂)	Lab Q	Lab K		Lab B	Lab K	
EN 13295	Lab J		Lab E			Lab K
EN 12390-12	Lab O					

Online Resource 9 – COV of repeatability and reproducibility of mortar (two graphs on the left) and concrete (two graphs on the right) after applying water (EN 13295) or pre-defined sealed curing (at 1% CO₂) for every binder type

