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Exercise 2: Rheology – analysis of examples of application - solution

Questions: For each of the 6 applications, indicate the key rheological parameters and types of fresh-state rheological behavior required. Indicate the types of tests you would recommend to characterize them. Indicate the requirements for maintaining the workability of UHPFRC over time (open time).

Solution:

Application	Yield stress	Plastic viscosity	Rheological behavior	Tests	Workability open time
1	+	-	Low thixotropy	Slump-flow at t = 0, 1 et 2 h Slope tolerance	2 h
2	-	+++	/	Slump-flow at t = 0, 1 and 2 h	2 h
3	++	-	Thixotropy	Slump-flow at t = 0 and 1 h Slope tolerance	1 h (on site mixing)
4	-	+++	/	Slump-flow at t = 0, 1 and 2 h	2 h
5	+++	-	Thixotropy	Slump-flow at t = 0 and 1 h Slope tolerance	> 1 h (on site mixing)
6	+++	+++	Shear thinning (pumping) Bond to support (spraying on vertical surface)	Optimization in the lab with a rheometer Slump-flow at t = 0 and 1 h + slump idem	> 1 h (on site mixing) even 2 h upon time needed to spray

NB 1 : degree of importance of rheological parameter: +, ++, +++ = more important, - = not important

NB 2: reference time t for tests and workability open time = end of mixing. Tests at 0 h in fabrication plant, at 1 h and 2 h on site.

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