

Product testing with ultrasound

Testing setting and hardening with ultrasonic measurements

Newchem recently acquired the IP-8 Ultrasonic Measuring System¹. It is a highly precise non-destructive ultrasonic testing that can be used for measuring mortars, concrete, grouts, fillers, tile adhesives, flooring and many more.

Benefits and possibilities

- Evaluation of the **setting and hardening** process
- **Strength development** from mixing up to 28 days in one measurement
- **Temperature** development
- **Shrinkage**
- Evaluation of the best mixing ratio with different **formulations** and raw materials (simultaneous measurement of up to 4 mixes)
- Adjusting setting time with **accelerators or retarders**
- **Quality control**

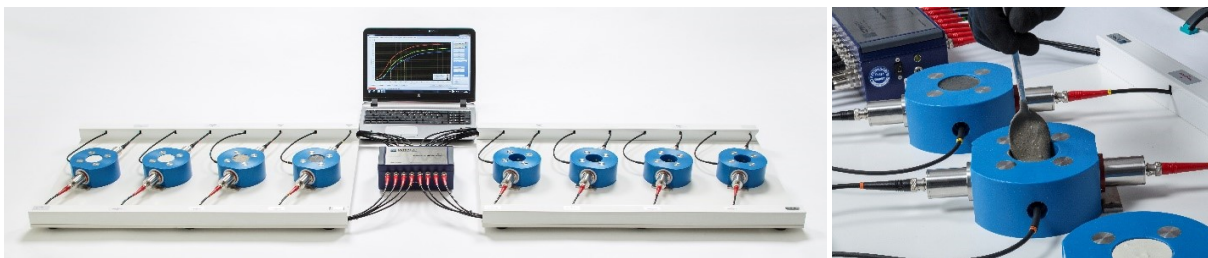
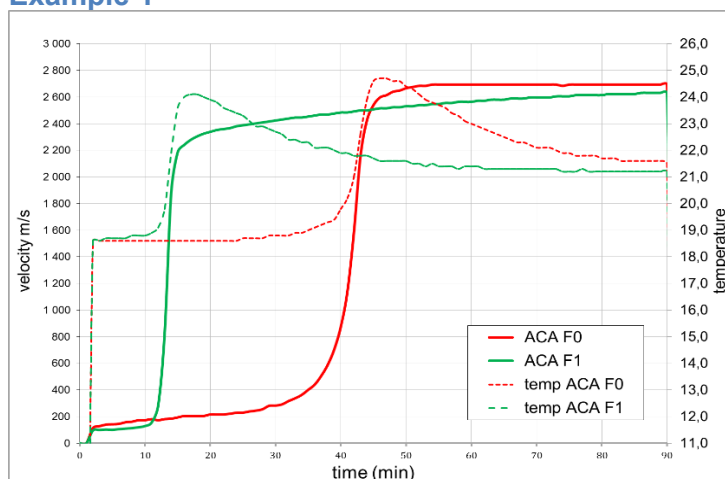


Figure 1 and 2 Setup and use of the IP-8 Ultrasonic Measuring System. © ultratest

Example 1



Component (total m %)	
Standard sand < 2,5 mm	63
OPC	37
ACA F0	3,71 0
ACA F1	0 3,71
Denka D 200 retarder	0,1 0,1

Figure 3 Setting and temperature curves of mixes with two different amorphous calcium aluminates (ACA F0 red curves, ACA F1 green curves, see table 1).

Table 1 Acceleration mixes with different types of ACA, w/b = 0,45, OPC = CEM I 42,5 R Lafarge.

These measurements were carried out to determine if the admixture of the amorphous calcium aluminate (ACA F1) has similar accelerating properties to the admixture of ACA F0. The curves show that ACA F1 reacts even faster, while developing less heat than ACA F0. We could therefore determine that ACA F1 has excellent properties.

¹ Ultratest.de

Example 2

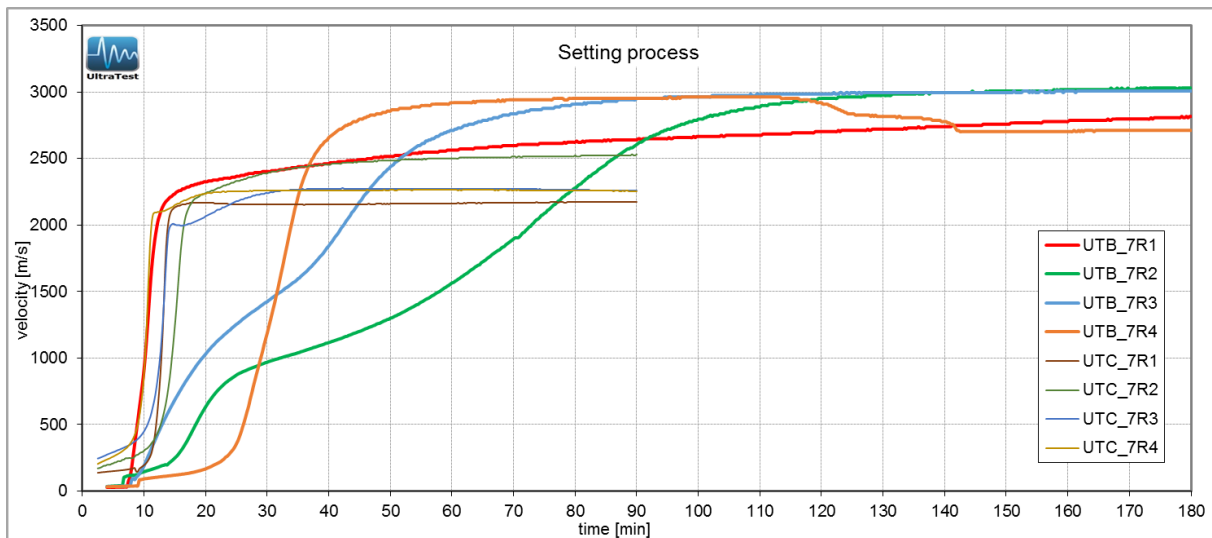


Figure 4 Setting curves of different mixes (see table 2).

Component (total m%)	UT-B7R-1	UT-B7R-2	UT-B7R-3	UT-B7R-4	UT-C7R-1	UT-C7R-2	UT-C7R-3	UT-C7R-4
Standard sand < 0,6 mm	75				46			
OPC	22,5				45			
Newchem ACC	2,5				9			
Denka D 200	0,1	0	0	0	0,2	0	0	0
Citric acid	0	0,1	0	0	0	0,2	0	0
Tartaric acid	0	0	0,1	0	0	0	0,2	0
Trisodium citrate	0	0	0	0,1	0	0	0	0,2

Table 2 Mixes with Newchem ACC accelerator and different retarders. w/b = 0,45, OPC = CEM I 42,5 R Lafarge.

The curve charts demonstrate the setting development of 8 different mixes. They have been measured to compare different retarders added to standard accelerated mixes. This allows us to propose adapted formulations to different application needs.

Have your products tested!

Do you want to get your materials and mixes analysed? All that we need is the amount to fill a 95 ml sample body. We can help you determine best ratio for different applications, support you with technical knowledge and confirm your product's quality.

We offer testing your materials and formulations.

Contact us at technical@newchem.org
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