ADVENTUM TECH

Concrete Monitoring IS SIMPLE

Concrete doesn't dry. It cures. Cement reacts with water (**hydration**), giving off heat and building strength hour by hour. How fast — and when it is safe to strip, stress or load — depends on **three factors**, all measured, set and calibrated in **LiveLoad.app**.

01

Temperature

Warmer concrete gains strength faster; colder concrete gains it slower. Too much heat is also harmful: it raises cracking risk and can reduce long-term strength

Cold: protect from freezing until ≈3.5 MPa (500 psi) — ACI 306R

Hot / mass: max ≈70 °C, core–surface Δ ≤19 °C (35 °F) — ACI 301

02

Age

Strength grows with time — but calendar days mislead: 3 days at 5 °C is not 3 days at 25 °C. Maturity joins time and temperature into one number.

$M = \sum (T - T_0) \cdot \Delta t$

°C·h, Nurse–Saul

Same mix + same maturity ≈ same strength — ASTM C1074

03

Ingredients

Cement type and content, w/c ratio, slag or fly ash, accelerators and retarders all reshape the strength curve. Every mix behaves differently.

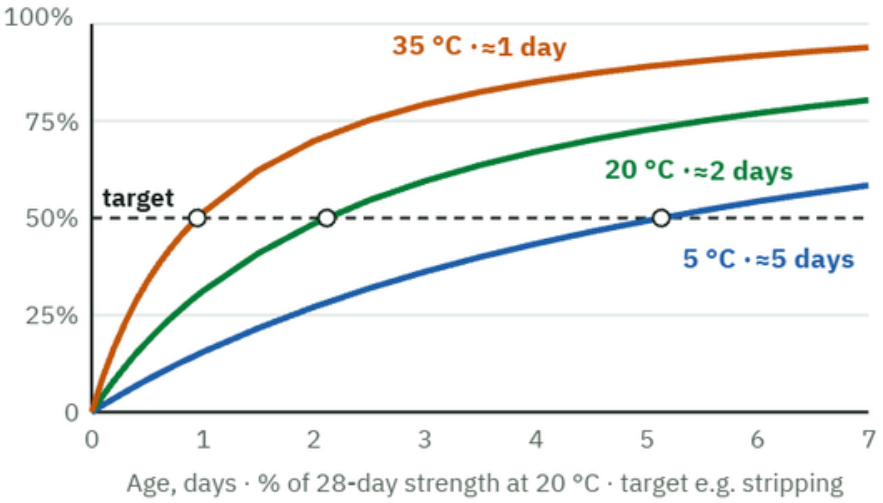
Calibrate once per mix: log temperature, break specimens at e.g. 1–3–7–28 d ASTM C1074 with C39 or EN 12390-3 breaks

Tune, set & calibrate in LiveLoad.app

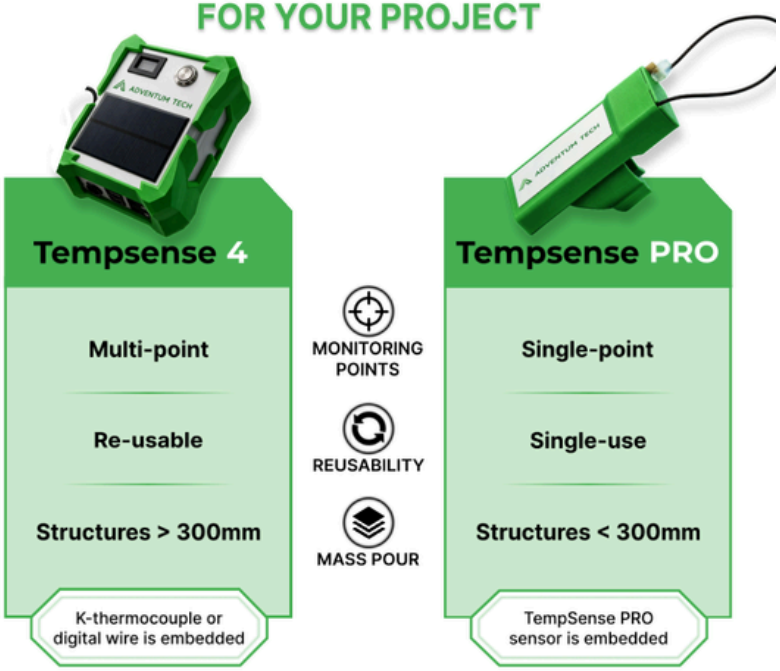
1. **Embed** — tie the sensor to rebar before the pour.
2. **Set** — mix, datum temperature, strength targets.
3. **Calibrate** — enter lab breaks; the app fits the strength–maturity curve.
4. **Act** — live strength in MPa, alerts at targets, QA reports.

Same mix, three temperatures

ILLUSTRATIVE



CHOOSE THE RIGHT SENSOR FOR YOUR PROJECT



Pick your system

Traditional pour
slabs, walls, columns
→ **TempSense Pro**

Special pour
winter, summer, precast
→ **Pro or TempSense 4**

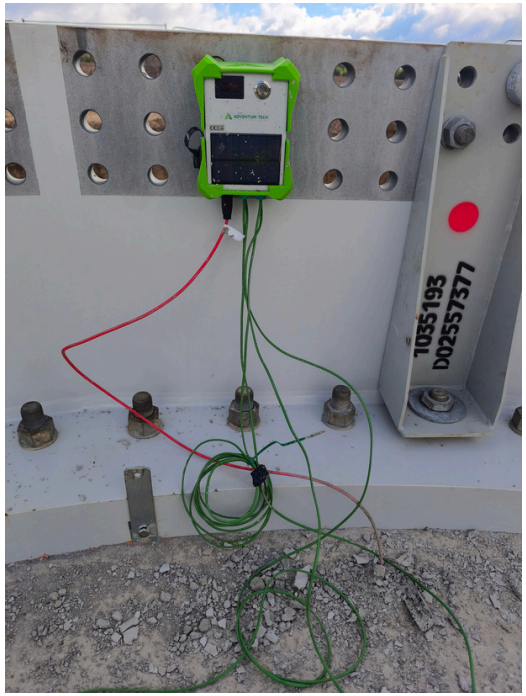
Mass pour
rafts, piers, thick sections
→ **TempSense 4**

EN13670 and ASTM1074 Compliant

ADVENTUM TECH

Concrete Monitoring FIELD GUIDE







01
Sensor position

Put sensors where the concrete will be weakest at the moment you need to make a decision. For strength, that's usually the coldest, most exposed or thinnest part of the element: edges, corners, top surfaces and thin sections. For thermal-cracking risk, it's the hottest point, which is normally the centre of the section. Fix each sensor firmly to the rebar so it stays in place during the pour and vibration.

02
Sensor quantity

Use at least one sensor for every area where a decision depends on strength. In a slab that means the mid-span, where stripping and back-propping are decided, plus the edges and corners exposed to the weather. In post-tensioned work, add sensors at the anchorage zones, because that's where stressing is allowed to start. More pours, more elements or more exposure conditions mean more sensors. One sensor per pour is rarely enough

03
Mass pours

In thick sections the core heats up while the surface cools, and that difference causes cracking. Place sensors at several points: the core at mid-depth, near the surface, and along the perimeter and corners, so you can track both the peak temperature and the core-to-surface difference. TempSense 3+ was built for this: four thermocouple points on one logger, with cables cut to whatever depth you need.

04
Best practice

Before you place anything, ask: "Where on this freshly poured structure is the first point that could fail, crack or hold up the programme?" That's where the sensors go. Always agree on sensor positions, quantities and strength targets with the project engineer, and record them in LiveLoad.app before the pour