



Smart IoT technology for any concrete construction: NEX TruMatch from Con-Cure.

The TruMatch curing box from Con-Cure meets or exceeds every DOT requirement for match-curing technology, and does so wirelessly.

Gone are the days of requiring hundreds of feet of wiring through buried conduit, clunky heated cylinders, and complex control panels, just to match-cure test cylinders for release-of-tension strength at precast plants.

HOW IT WORKS:

A sensor is placed inside the piece in the field. A wireless datalogging transmitter is connected to the sensor, and the reference temperature profile of the piece is simultaneously recorded (to an SD card inside the node for backup) and transmitted to the cloud for remote viewing using web-based software. The recorded temperature profile data always exists in two places at once, for perfect redundancy and foolproof data collection.

Temperature values from the field sensor are wirelessly synchronized by the TruMatch box, which adjusts the curing environment inside the box to the exact profile of the piece, every 10 minutes. Test cylinders are cured in a heated-and-cooled circulating water bath to ensure precise matching of the field temperatures.

A sensor inside a control cylinder inside the cure box is used to continuously track and match the temperatures between the piece and the cylinders inside the cure box, as a continuous feedback mechanism.

A sensor inside a monitored cylinder in the cure box verifies compliance for DOT requirements. Extra cylinders inside the cure box are broken at any desired age to determine the strength of the cylinders, which, through match-curing, provides the ideal measure of the actual in-place strength of the piece.

All data is recorded, and viewable graphically on the Con-Cure Dashboard website, and simple, one-click reports can be generated for every sensor's temperature profile to ensure compliance for any required specification.

Using the maturity method (ASTM C1074), users can easily predict when to begin breaking the match-cured cylinders to shorten the waiting times for critical construction operations such as de-tensioning pre-stressed tendons or removing precast pieces from formwork.

As a QC tool, match-curing is unrivaled. In combination with maturity, there is renewed certainty for concrete quality and consistency because when maturity estimates of the strength are in line with the actual crushing strength of the match-cured cylinders, practitioners are assured that the concrete in the piece has achieved the same strength. If maturity estimates differ from the actual strengths, then users can look at their QC processes to find the root cause for the discrepancy.

TruMatch from Con-Cure is the next generation of match-curing systems, using smart IoT technology to eliminate tedious wiring and complex equipment currently found in many precast plants.

TruMatch is new technology for an excellent QC process: *Match-Curing, reimagined.*

Specifications

| Con-Cure NEX Sensors (embedded in the field and in control and monitored test cylinders inside TruMatch) | |
|---|--|
| Type | Pre-calibrated Thermistors for zero drift. Steel-encased NTC, impervious to alkalis in fresh concrete |
| Temperature range | -40C to +100° C (-40F to +212F). Accurate to ±0.1C (±0.4F) from 0C to +75C (32F to +167F) |
| Length of lead | Standard length is 15ft. (5m). 8ft, 25ft, 50ft, and 100ft lengths are also stocked. Custom lengths available. |
| Termination | Secure, 100% watertight locking o-ring connector on both node and sensor. |
| Reusable | Yes , when encased in 0.25" i.d. greased, plastic sleeve. |
| Con-Cure NEX Recording cellular transmitters | |
| Recording Interval | 6 readings per hour (3x more often than required by ASTM C1074). Simultaneously records to internal SD. |
| Recording format (°T) | User-defined, °F or °C, switchable at will in Dashboard software |
| Power source | Rechargeable ultra-high capacity NiMH "D" batteries, 12,000mAh each. Up to 14 days between charges. |
| Data Channels | FOUR: Can record concrete temperatures from THREE sensor locations at once on a single device. Also has an internal channel to record "ambient" temperatures. |
| Enclosure | Rugged Pelican® Case. 100% Waterproof. |
| Weight | 0.7 kg with batteries |
| Dimensions | 6.8 x 4.75 x 2 in. |
| Maturity Calculations | Both TTF (Nurse-Saul) and Equivalent Age (Arrhenius) formulas are calculated, switchable at will |
| Maturity Variables | Datum Temperature (T _D), Specified Temperature (T _S) and Q (Activation Energy), switchable at will |
| Reporting | Strength estimates are reported in both PSI and MPa, switchable at will. One-click PDF reports. Reference temperature profile, control temperature profile and monitored temperature profile graphs are all produced at the same time by the system, viewable online and also via PDF reports. |
| Data format | Secure, tamper-proof and proprietary SSM (Maturity Curve) and Temperature History files are created. |
| Con-Cure TruMatch Cure Box: | |
| Control & Monitored Cylinders | Cylinders placed into cure box with sensor embedded inside for control and comparison. |
| Capacity | Up to 26ea 4"x8" cylinders or 11ea. 6"x12" cylinders |
| Temperature range | TruMatch heats AND cools the water for perfect match-curing in any environment where concrete is placed, including severe climates. Adjusts curing temps from +2C to +60C (35F to +140F) |
| Operating voltage and amps | 120VAC, 20AMP service. Current draw varies with application. |
| Water circulation rate | Approximately 3 gal per minute. |
| Temperature adjustments | Receives temperature setpoints from field sensor every 10 minutes. Temperature profile of control cylinder is adjusted immediately. |
| Dimensions | Curebox itself measures 45"x22"x19". Overall dimensions are 65"x22"x19" including control unit. |
| Fluid capacity | 165 Qts. (Water only. Water volume used decreases when cylinders are added.) |
| Weight | 165lbs. empty. Carrying handles are provided. |

Specifications for any Con-Cure product are always subject to change due to continual advances in product development and testing. Specifications current as of January, 2020.