Controlled Speed Nail Penetration Option (NPOcs)

THT product code = ARCSYS-NPOcs

The Nail Penetration and Crush Option comprises:

- Integrated support electronics
- EV+ or EV compatible
- 5 hardened steel nails (3 mm diameter - changed on request / 100 mm length)
- Moving distance 40 mm, Speed 1 mm/s to 200 mm/s
- Battery size range - up to 300 mm width, 40 mm thick and 400 mm height
- Fully integrated control and data collection software

The controlled speed nail penetration option is designed for both the EV and EV+.

The maximum cell size that can be tested is limited by the size of the calorimeter and the length of the motorised arm.

The maximum cell thickness and type of cell is limited by the strength of the motor.

The NPOcs consists of related electronics, hardware and integrated esARC software for system control.

Figure 1 shows the casing that encloses the motor.

Figure 2 shows the set-up within the EV calorimeter, note the support plate which is used to hold the cell and provide a stable base.
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As the test proceeds a graphical display is available on the 'auxiliary' tab. This allows manual control of the motorised shaft pre test and also displays when the nail has penetrated.

The test will be monitored in the same way as a normal ARC test with a graphical display of all test results provided live. Various safety parameters can be preset.

**Example: Nail Penetration Test**

Figure 5 shows data from a nail penetration test.

Initially the system was held isothermally before nail penetration commenced. Following the penetration the cell led into complete thermal disintegration (in fully adiabatic conditions).

**Fig. 3**

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**Fig. 4**

Figure 4 shows the test set-up screen. It is possible to set an abuse test temperature, a test speed and a distance. It is also possible to set a nail retraction distance if desired.

**Fig. 5**

Temperature as a Function of Time

Note: The OSU must be purchased with this option.