

PERSOZ & KÖNIG HARDNESS

SWINTEK AUTOMATIC PENDULUM



Automated measurement
of coating hardness.



STANDARDS

ISO 1522 · ASTM D4366 · DIN 53157

The SWINTEK Pendulum is the new coating hardness testing equipment developed by NEURTEK; it is fully automated and designed to eliminate operator-induced variability. It determines the hardness of a coating by measuring the damping time of a pendulum oscillating over its surface, in accordance with the Persoz and König methods, the two international reference standards for this test.

Its stepper motor positioning system, electromagnetic launch mechanism and motorised sample platform ensure reliable, repeatable measurements free from operator influence, whilst the housing with hinged doors protects the test from ambient air disturbances.

APPLICATION

- **Industrial paints and varnishes:** quality control of curing and hardness of coatings in production.
- **Aluminium and galvanised coating:** verification of finish hardness in accordance with Qualicoat and other specifications.
- **Powder coatings:** assessment of the degree of cure in thermosetting paints.
- **Furniture and flooring industry:** quality control of wood coatings and decorative surfaces.
- **Coatings R&D:** development of new formulations and optimisation of curing parameters.
- **Accredited laboratories:** standardised testing with traceability via calibration certificate (SER-CT008).

GENERAL FEATURES

- Fully automated: positioning via stepper motor, electromagnetic release and automatic repositioning at the end of the test.
- Motorised sample platform that raises the test specimen to the test position without manual intervention.
- Automatic oscillation counter with an end-of-test signal at 3° (König) or 4° (Persoz).
- Interchangeable between the Persoz and König methods by simply replacing the pendulum assembly.
- Transparent housing with hinged doors that protects the test from draughts and facilitates access.
- 480 × 272-pixel TFT screen with a multilingual menu (Spanish and English) and an intuitive interface.
- Beveled standard glass plate included for verification and calibration of the equipment.
- Sample range: from 65 × 75 mm (minimum) to 102 × 229 mm (maximum).

TEST PRINCIPLE

The pendulum is placed on the surface of the coating and released from a defined starting angle. The duration of the oscillatory motion — measured until the amplitude of oscillation falls below the stopping angle — is directly proportional to the hardness of the coating: the greater the number of oscillations, the greater the hardness.

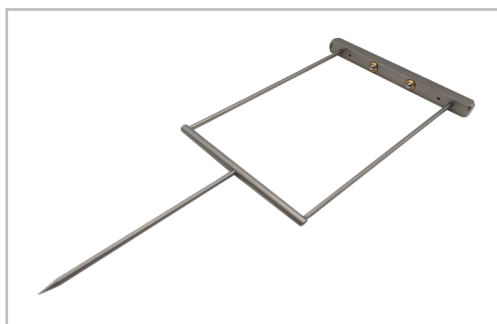
The two methods differ in the geometry of the pendulum and the operating angles:

- **Persoz method:** 500 g pendulum supported on two tungsten balls with a diameter of 8 mm. Start/end angle: 12° / 4°. Period: 1 s. Greater sensitivity for soft coatings.
- **König method:** a 200 g pendulum supported by two tungsten carbide balls, Ø 5 mm. Start/end angle: 6° / 3°. Period: 1.4 s. The most widely used European reference standard.

The equipment features an automatic oscillation counter and an audible/visual signal when the deflection falls below 3° (König) or 4° (Persoz), eliminating the need for manual reading and the associated errors.

COMPARISON OF THE PERSOZ AND KÖNIG METHODS

Parameter	Persoz	König
Pendulum mass	500 g	200 g
Support balls	2 x Ø 8 mm — tungsten	2 x Ø 5 mm — tungsten carbide
Distance between balls	50 mm	30 mm
Start angle	12°	6°
End angle	4°	3°
Oscillation period	1.0 s	1.4 s
Main standard	ISO 1522 / UNE 48024-80	ISO 1522 / DIN 53157



APPLICABLE STANDARDS

- **ISO 1522:** Paints and varnishes — Pendulum damping test (Persoz and König methods).
- **ASTM D4366:** Standard Test Methods for the Hardness of Organic Coatings by Pendulum Damping Tests.
- **DIN 53157:** German standard for determining the hardness of coatings by pendulum damping.
- **NFT 30 016:** Equivalent French standard for pendulum hardness testing.
- **BS 3900 E5:** British standard for pendulum damping tests on paints and varnishes.

TECHNICAL SPECIFICATIONS . NK-PK3200 BASE UNIT

Parameter	Value
Dimensions (L × W × H)	392 × 332 × 790 mm
Weight	34 kg
Minimum sample size	65 × 75 mm
Maximum sample size	102 × 229 mm
Test end angle — König	3°
Test angle — Persoz	4°
Display	480 × 272-pixel TFT panel
Control	Multilingual menu (ES / EN)
Power supply	220 V / 50 Hz
Operating voltage	24 VDC (power supply included)
Applicable standards	ISO 1522 · ASTM D4366 · DIN 53157 · NFT 30 016 · BS 3900 E5

MODELS AND ACCESSORIES

PK Automatic Pendulum

Code	Description
NK-PK3200-P	SWINTEK-AUTO pendulum — Persoz method
NK-PK3200-K	SWINTEK-AUTO pendulum — König method
NK-PK3200-PK	SWINTEK-AUTO pendulum — Persoz & König

The supply includes: base unit + housing with hinged doors + bevelled reference glass + corresponding pendulum assembly according to the chosen model.

Optional calibration	Code	Description
✓	SER-CT008	Calibration certificate for pendulum (weight 200–500 g, oscillation period 250–430 seconds)

Pendulum components

Code	Method	Mass	Support balls	Start/end angle	Oscillation period
NK-PK3210-P	Persoz	500 g	2 × tungsten balls, Ø 8 mm (spacing 50 mm)	12° / 4°	1.0 s
NK-PK3210-K	König	200 g	2 × tungsten carbide balls, Ø 5 mm (spacing 30 mm)	6° / 3°	1.4 s

Code	Description
NEU-1999002	100 × 100 × 10 mm bevelled pattern glass for pendulum