

PERSOZ & KÖNIG HARDNESS

SWINTEK MANUAL PENDULUM



Measurement of surface hardness and the degree of curing of paints, varnishes and coatings.



NORMAS

ISO 1522 · ASTM D4366 · DIN 53157 · UNE 48024-80 · NFT 30 016 · BS 3900-E5

The Persoz & König manual pendulum is NK's benchmark instrument for measuring the surface hardness of paints and inks using the pendulum damping method. Designed and manufactured entirely by NK by NEURTEK, it offers reliable and accurate performance in laboratories requiring robust, easy-to-use equipment with low operating costs.

The same basic equipment is compatible with both the Persoz and König methods: simply switch the selector on the electronic control panel and fit the appropriate pendulum assembly to work with either system. The set includes a methacrylate enclosure to protect against draughts and a remote trigger to start the test without disturbing the pendulum.

APPLICATION

- **Decorative and industrial paints:** quality control of curing and hardness of coatings during production and on receipt of materials.
- **Printing inks:** assessment of the surface hardness of inks on metallic substrates, plastics and coated paper.
- **Aluminium and galvanised coatings:** verification of finishes in accordance with product specifications and industry standards.
- **Powder coatings:** determination of the degree of cure of thermosetting paints.
- **Coatings R&D:** development and validation of new formulations; optimisation of curing temperatures and times.

GENERAL FEATURES

- Compatible with the Persoz and König methods on a single base unit via electronic switching and replacement of the pendulum assembly.
- Integrated electronic cycle counter for automatic recording of the number of oscillations.
- Remote trigger for starting the test without mechanical disturbance of the pendulum.
- Methacrylate housing with built-in spirit level to protect against draughts and ensure the equipment is correctly levelled.
- Calibration glass included for checking the equipment before each test session.
- Robust, low-maintenance design; manufactured entirely by NEURTEK in Spain.
- Complies with UNE 48024-80, ISO 1522, DIN 53157, ASTM D4366, NFT 30 016 and BS 3900 E5.

TEST PRINCIPLE

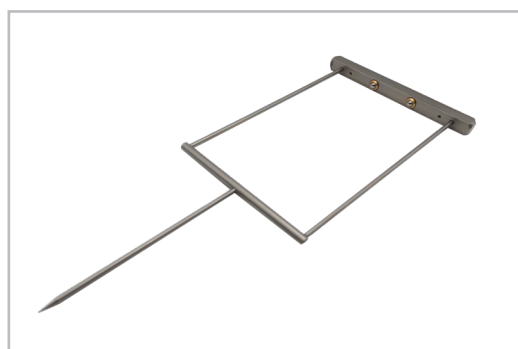
The pendulum rests on the surface of the coating and is released from the starting angle defined by each method. The electronic counter records the number of oscillations until the amplitude falls below the stopping angle. The higher the number of oscillations, the greater the hardness of the coating.

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

- **Persoz method:** start angle 12°, end angle 4°. Pendulum supported on two tungsten balls, Ø 8 mm. Greater sensitivity for soft coatings.
- **König method:** start angle 6°, end angle 3°. Pendulum supported.

COMPARISON OF THE PERSOZ AND KÖNIG METHODS

Parameter	Persoz	König
Pendulum mass	500 g	200 g
Support balls	2 × Ø 8 mm — tungsten	2 × 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).
- **UNE 48024-80:** Equivalent Spanish standard for pendulum damping hardness testing.
- **ASTM D4366:** Standard Test Methods for 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.

MODELS

PK Manual Pendulum

Code	Description
NK-PK3100-P	Hardness Pendulum — Persoz method (includes basic kit with Persoz pendulum)
NK-PK3100-K	Hardness Pendulum — König method (includes basic kit with König pendulum)
NK-PK3100-PK	Hardness Pendulum — Persoz & König method (includes basic kit with Persoz & König pendulum)

The supply includes: Basic unit with electronic control panel and Persoz / König selector, Pendulum body (Persoz or König depending on model ordered), Electronic cycle counter, Remote trigger for starting the test, Calibration glass for verification, Methacrylate housing to protect against draughts, Spirit level, Special packaging for transport, Instruction manual in Spanish

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

ACCESSORIES

Pendulum Parts

Code	Method	Mass	Support balls	Start/end angle	Oscillation period
NK-PK3210-P	Persoz	500 g	2 × tungsten carbide 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

Pattern

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