NAKAYAMA
Co.,Ltd.

Apparatus for green sand quality control

Digital Permeability Tester

NKP

for molding sand

(NKP-V3)

※ The image shows a small orifice function (optional)
※ The image is under development

- Calculation of standard method is unnecessary
- Standard table (quick comparison) in quick method is unnecessary
- The adjustment of the Borehole is unnecessary
- A water tank is unnecessary

Unlike conventional products, water is unnecessary.

Method for measurement: Make TP(Tamp down three times). Fit it in the predetermined position.

(Measurement example)

This apparatus is for quick and precise measurement of permeability of green sand mold, dry sand mold, and other sand molds following the standard set by the molding sand research committee of Japan Foundrymen's Society (NIK).

■ specification

Type	NKP-V3
Size	H300 × W280 × D400 mm
Weight	about 17kg
monitor	Touch panel
Power supply	AC 100V
Option	RS232 communication possible Dedicated application

● sold separately

Digital Permeability Tester for sand casting mold

● How to use the tester

Quick method

Place the tester on a horizontal base. A sand test piece is packed in a test cylinder, inserted in the tester together with the cylinder, and sealed with a rubber plug to prevent air leak.

Then, the start button is pushed to start the measurement.

Quick method (small orifice) *option

As before, insert firmly into the "rubber stopper" so that no air leaks out.

Next, 1. Select the orifice type,

2.Press the start button.

Then measurement starts.

Standard method

$$\text{Permeability} = \frac{V \times H}{P \times A \times T}$$

V= air volume passed through the test piece (cc) 2000cc

P = pressure difference between the upper side and lower side of the specimen (Pa) (P = Pa ÷ 98)

A= sectional area of the specimen (A=19.635cm^2)

H= height of the specimen (cm) (5.0 ± 0.1cm)

T = time necessary for the air of 2000cc to pass the specimen (min).

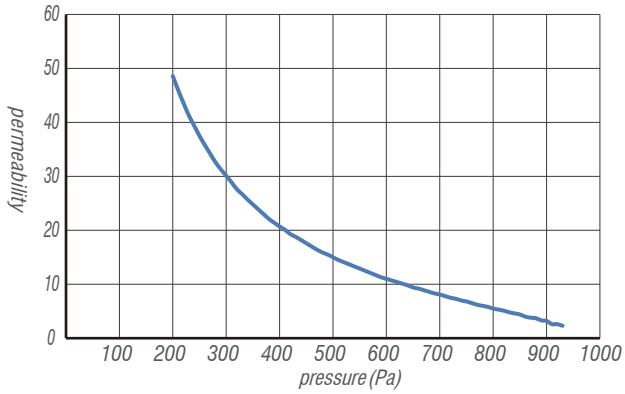
Orifice measurement

Air pressure in chamber / Time necessary for discharging air of 2000cc	=	Large orifice: 30s Small orifice: 4m30s (allowance: 2%)

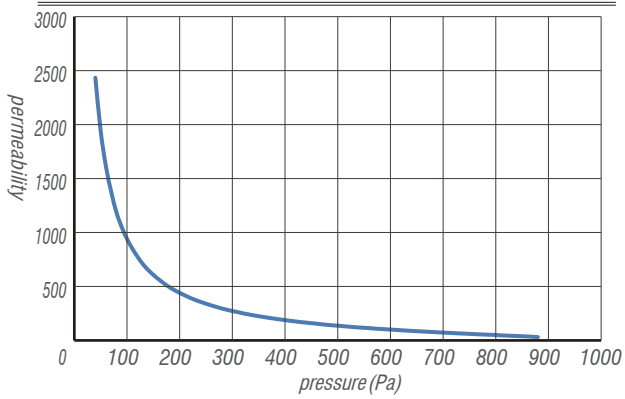
Table.1 The relation between air pressure and permeability

- Use the small orifice for medium to fine sand grains.
- Use the large orifice for medium to coarse sand grains.

● small orifice



● large orifice



● sold separately

Testing of dry sand mold

A standard specimen (50mm in diameter and 50mm in height) is prepared with a sand rammer and is taken out with a push rod for drying. A weak specimen is taken out on a disc of 50mm diameter and sent to drying on the disc.

The specimen is dried at 105 to 115 degree C for one to two hours and taken out for cooling. After cooling, it is inserted in a dry sand permeability specimen cylinder. The valve on the cylinder is opened and air is sent from the rubber bulb to the rubber sheath in the cylinder for ensuring pressure tight support of the specimen. The cylinder is inserted into the rubber stopper, and permeability is measured in the same way as the case of the green sand.

Permeability test of mold surface

For measuring permeability of formed sand molds or formed cores, the receiving end of a rubber tube is connected to the tester at the “rubber plug” using a part in the options. The other end of the rubber tube is pushed against the test piece surface. Then testing is proceededed in the same way as in the measurement of test pieces in the test cylinder.

This way of testing is not as precise as that of the proper testing using a test piece in the cylinder, yet is convenient in accessing permeability of already formed molds.

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