

# Calibration and Testing of Channel-Type Positive Pressure Leaks in Leak Testing

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## Introduction

Positive pressure leak testing technology is an important research testing in the field of leak testing. Compared with vacuum leak testing technology, it has the advantages of no need to vacuum the inspected parts, and the working state and leak testing state can be kept consistent, etc.

## Research objectives

This paper introduces several calibration methods of Channel-type positive pressure leaks in leak testing. According to one of the methods of calibration, a calibration device of positive pressure leak is made and the calibration method of pressure leaks is researched and validated. By analyzing the calibration results and exploring more reasonable and effective technical parameters, it can provide a reference for laboratory or field inspection to obtain more accurate leak rate of pressure leaks

## Methods

Calibration method

$$Q = d(p \cdot V) / dt = p \cdot dV / dt + V \cdot dp / dt \tag{1}$$

Calibration test scheme

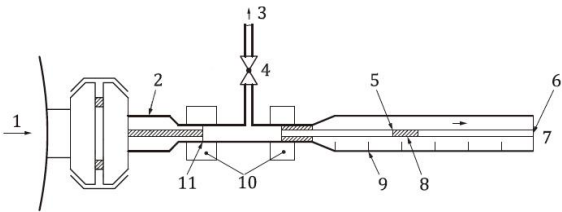


Figure 1. Calibration schematic diagram

Leak and equipment



Figure 2. Channel-type positive pressure leak



Figure 3. The leak is connected to the hose



Figure 4. Capillary and liquid segment

## Conclusions

- 1)This method is suitable for channel-type positive pressure leakage with large leak rate, and the lower limit of leak rate measured in this test is 10<sup>-4</sup> magnitude;
- 2) As for the inside diameter of the capillary, the inside diameter of the capillary was calculated as 0.5mm~0.8mm during this test;
- 3) As for the capillary liquid segment, the liquid of segment liquid during this test was water, and a small amount of stain was added to enhance the contrast; the length of the liquid segment was about 0.5cm~1cm;
- 4) Before obtaining the liquid segment, the inside of the capillary can be wetted to prevent liquid loss when moving the liquid segment;
- 5) The liquid segment initially moves a distance without being used for data recording, and the data is recorded when it moves at approximately uniform speed.

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