



Isokinetic rectangular sampling probe SYS 529.

Isokinetic sampling probes are required, for example, for leakage testing of built-in filter systems in cleanrooms and cleanroom facilities. In the existing standards and guidelines, probes with rectangular cross-sections are recommended.

The Topas probes have a rectangular cross-section at the suction point, which merges steadily into a round cross-section for the hose connection. The manufacturing process guarantees a high-quality, smooth surface inside the probe, including all transitions. The constructive design of the probe is based on the international standard ISO 14644-3 as well as the VDI 2083-3.

Applications

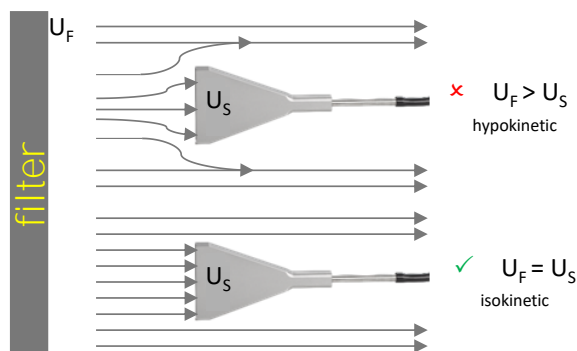
- leakage testing of built-in filter systems

Features

- location-independent count rate
- precise scanning even in filter corners
- low scanning time due to larger probe width (transverse to the scan direction)

Principle of isokinetic sampling

Sampling is called isokinetic if the downstream flow velocity of the filter is equal to the flow velocity at the inlet of the probe.



U_S ...flow velocity at probe inlet
 U_F ...flow velocity from the filter

If the downstream flow velocity of the filter (U_F), for example, is greater than the flow velocity at the probe inlet (U_S), part of the airflow will bypass the probe. Large particles, unlike small particles, cannot follow the change in airflow and just they are captured by the probe. The sample is fractionated and the measurement results falsified.

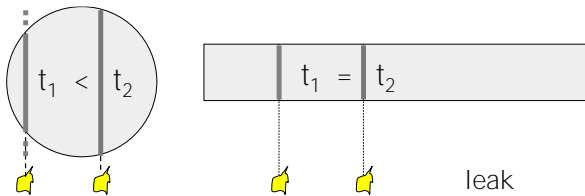
Consequently, it is important that the dimensions of the probe are adapted to the sampling volume flow and the downstream velocity of the filter to ensure compliance with the isokinetic sampling.

Comparison of probe cross-sections

The illustration underlines the systematic error in sampling caused by circular probes compared to a rectangular probes: due to the geometry the measuring time varies over the probe cross-section at a constant scanning speed. With the rectangular design, the measuring time is constant over the probe cross-section.



Specifications



t...leakage residence time

Comparison of the leakage residence time (t) depending on the probe design.

Standard requirements

The configuration of probes for filter testing is described in various standards:

standard	requirement (Q)/ recommendation (C)	SYS 529
		design for: 28,3 l/min
ISO 14644-3: 2020	cross-section (C): rectangular	✓
	dimensions (C): 1 cm x 8 cm	1,5 cm x 8 cm
	$U_S = U_F \pm 20\%$	✓
	$U_F = 45 \text{ cm/s}$ (Q; isokinetic)	31 – 47 cm/s
VDI 2083-3	cross-section (C): rectangular	✓
	isokinetic sampling (Q)	✓
	aspect ratio < 1:6 (Q)	✓ 1:5,3

Variation on standard ISO 14644-3

ISO 14644-3:2020 specifies isokinetic sampling ($U_S = U_F \pm 20\%$) for filter testing. Therefore, probes with a rectangular cross-section of 1 cm x 8 cm and a sampling volume flow of 28,3 l/min are suitable for testing filters with downstream flow velocities of (47 – 71) cm/s. The rectangular sampling probe SYS 529 with a cross-section of (1,5 x 8) cm and a sampling volume flow of 28,3 l/min can be used for filter downstream flow velocities of (31 – 47) cm/s. Both types of probes are suitable for testing HEPA

filters, for example, where a downstream velocity of (45 – 50) cm/s is typical.

Details

The probe housings are made of aluminium and differ insignificantly in weight from conventional probes. The high-quality inner surfaces minimise the adhesion of particles.

Accessories (optional)

- cap
- cap and filter
- antistatic silicone tube

Technical specifications - general

material	
probe housing	anodised aluminium
hose connection	stainless steel
length	
without hose connection	150 mm
with hose connection	230 mm
weight	ca. 170 g

Technical specifications – probe-specific

	sampling volume flow	velocity at the probe inlet	
		actual value	application field
SYS 529	28,3 l/min	39 cm/s	31 ... 47 cm/s
SYS 528	50 l/min	39 cm/s	31 ... 47 cm/s
	56,6 l/min	44 cm/s	35 ... 53 cm/s

The hose connection for the SYS 529 is 8 mm, that for the SYS 528 is 10 mm.

The probe dimensions can be customised on request.

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QMS certified according
to DIN EN ISO 9001.



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