

ABOUT

SKC GS Cyclones

The performance of the 10-mm Dorr-Oliver Cyclone is reported to suffer from bias associated with inlet orientation. The **GS-3 Cyclone** was developed by Gautam and Sreenath at West Virginia University to overcome this bias while remaining compatible with existing filter cassettes and holders used by U.S. mining inspectors. The **GS-3 Cyclone** has external dimensions similar to that of the Dorr-Oliver Cyclone but has three inlets compared to only one on the Dorr-Oliver. This multi-inlet feature eliminates orientation bias and sensitivity to wind velocity. In addition, the conductive plastic construction eliminates static effects seen with the nylon Dorr-Oliver. SKC also offers the **GS-1 Cyclone** with a single-inlet for users that must employ an exact equivalent of the single-inlet Dorr-Oliver for compliance sampling.



More Information

Gautam, M. and Sreenath, A., "Performance of a Respirable Multi-inlet Cyclone," *Jnl. of Aerosol Science (U.K.)*, Vol. 28, No. 7, 1997, pp. 1265-1281

Kar, K. and Gautam, M., "Orientation Bias of the Isolated 10 mm Nylon Cyclone at Low Stream Velocity," *AIHA Journal*, Vol. 56, 1995, pp. 1090-1098

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*For the single-inlet
GS-1 Cyclone
see page 85*

Easy Jarless Calibration

Cyclone calibration without a jar is easy using the new Defender Primary Standard Calibrator. Visit www.skccinc.com/FAQ/skcfags.php and search on "jarless." See pages 30-31 for information on the Defender.

GS-3 Respirable Dust Cyclone Overcomes Bias of Dorr-Oliver Cyclone

- ▶ **Meets ACGIH/ISO/CEN respirable convention of 4- μ m 50% cut-point at a 2.75 L/min flow rate***
 - 3.5- μ m 50% cut-point at a 3.7 L/min flow rate† for alternate applications
- ▶ **Tangential inlet design decreases particle losses due to impaction**
- ▶ **Multiple-inlet design overcomes problems reported with the Dorr-Oliver Cyclone**
 - Eliminates ambient wind speed and orientation effects
- ▶ **Conductive plastic is safe for underground mine use**
 - Eliminates adverse electrostatic effects

Sample Time:	Varies
Sample Rate:	2.75 L/min for 4- μ m cut-point* 3.7 L/min for 3.5- μ m cut-point†
Sample Pump:	Universal or AirChek XR5000
Sample Media:	25 or 37-mm filters in 3-piece cassettes
Tubing:	1/4-inch ID



The GS-3 Cyclone is a 10-mm lightweight conductive plastic sampler used with a standard three-piece cassette with filter for the collection of respirable dust particles. The GS-3 Cyclone's removable cassette adapter fits securely into the middle ring of the filter cassette during sampling. Designed to meet the ACGIH/ISO/CEN respirable convention, the GS-3 Cyclone has a 50% cut-point of 4 μ m (bias within ISO/NIOSH requirements) at 2.75 L/min* or 3.5 μ m at 3.7 L/min† for alternate applications.

Description		Cat. No.
GS-3 Cyclone with bowl adapter, cassette adapter, and grit pot	37 mm	225-100
	25 mm	225-103
Accessories		
Replacement Cassette Adapter	37 mm	225-102
	25 mm	225-101
Filter Cassette/Cyclone Holder, see p. 88 for details		225-1
Standard-size Multi-purpose Calibration Jar, see p. 88 for details		225-111
Replacement Grit Pots, pk/25		P225012

* Calibrated at U.K. Health and Safety Laboratory; visit www.skccinc.com/prod/225-100.asp to view the collection efficiency curve

† Determined using experimental data obtained at flows from 2.0 to 4.0 L/min

Respirable Dust Aluminum Cyclone Specified in NIOSH Respirable Dust Methods

- **Meets ACGIH/ISO/CEN respirable criteria of 4- μ m 50% cut-point at a 2.5 L/min flow rate***
 - 3.5- μ m 50% cut-point at a 2.8 L/min flow rate† for alternate applications
- **Eliminates adverse electrostatic effects**
- **Small and lightweight**
 - 6.6 x 3.8 cm (2.6 x 1.5 inches)
- **Specified in NIOSH Method 7500 for silica and NIOSH 0600 for respirable particulates**
- **Used with an open-face 3-piece cassette for more even particle deposition on the filter**
 - Available in 25 or 37 mm
 - Inserts into middle ring of cassette

Sample Time:	Varies
Sample Rate:	2.5 L/min for 4- μ m cut-point* 2.8 L/min for 3.5- μ m cut-point†
Sample Pump:	Universal or AirChek 2000/3000
Sample Media:	25 or 37-mm filters in 3-piece cassettes
Tubing:	1/4-inch ID

The SKC Aluminum Cyclone is a lightweight respirable dust sampler that is used by inserting it into the middle ring of an open-face three-piece cassette loaded with an appropriate filter. When attached to a sample pump, respirable particles collect on the filter and larger particles fall into the grit pot to be discarded. Available in 25 or 37 mm, the SKC Aluminum Cyclone provides sharp size selection of the respirable fraction. The SKC Aluminum Cyclone eliminates the electrostatic problems associated with nylon (non-conductive) cyclones and allows the cyclone to sample particles more efficiently.

ACGIH, NIOSH, ISO, and the European Standard Committee (CEN) specify a respirable collection efficiency convention with a median cut-point of 4 μ m. A leading aerosol research organization calibrated the SKC Aluminum Cyclone and carefully evaluated the results for bias over the entire ACGIH/ISO/CEN respirable convention. Results showed that using the cyclone at a flow rate of 2.5 L/min* provided the optimum match to the respirable convention curve.

Cassette Holder

The lightweight SKC Filter Cassette Holder is designed for attachment to a worker's collar and will accommodate either two or three-piece 37-mm cassettes with or without a cyclone, 25-mm cassette with cowl, or DPM Cassette with a GS-1 Cyclone.



Cat. No. 225-1

Easy-to-use Calibration Chamber

The aluminum calibration chamber fits both the 25 and 37-mm Aluminum Cyclone and allows standard 1/4-inch ID Tygon tubing to be attached for simple calibration.



Cat. No. 225-01-03

Description		Cat. No.
Cyclone‡ with grit pot	25 mm	225-01-01
	37 mm	225-01-02
Accessories		
Calibration Chamber, 25/37 mm		225-01-03
Filter Cassette Holder, 25/37 mm		225-1
Replacement Grit Pots, pk/25		P225011
Replacement O-rings, for 37-mm cyclones, pk/5		P22501

* As previously published, a flow rate of 2.6 L/min will yield a 4- μ m 50% cut-point, however, a 2.5 L/min flow rate will provide a better match over the entire curve.

† Determined using experimental data obtained at flows from 2.0 to 4.0 L/min

‡ Three-piece cassettes are required for use with SKC Aluminum Cyclones; see filter cassettes on pages 73-81 and 86.

Tech Tips

- A cyclone will not sample optimally if it is influenced by electrostatic charge. SKC cyclones are constructed of conductive plastic or aluminum that eliminates the static problem associated with non-conductive nylon cyclones.
- Cleaning cyclones before sampling prevents deviation in the collection efficiency curves.
- The cyclone grit pot must be in place during sampling for size selection. Do **not** remove grit pot during calibration and sampling.
- When calibrating size-selective samplers such as cyclones, use the sampler's calibration adapter. If an adapter does not exist, use the multi-purpose calibration jar with the smallest volume (see page 88). Jarless calibration is an option when using a Defender calibrator (see pages 30-31). Visit www.skcinc.com/EAQ/skcfags.php, search on "jarless."

Plastic Cyclone

The SKC Plastic Cyclone is designed to sample respirable dust as per MDHS 14/3 and the ISO/CEN criteria. The static-dissipating cyclone features a snap-together cassette system and is used at a 2.2 L/min flow with a 25 or 37-mm cyclone cassette. Cyclones include a grit pot. The Plastic Cyclone is also suitable for MDHS 10/2 and 91.



Description	Cat. No.
Plastic Cyclone with 25-mm plastic cassette	225-69
Plastic Cyclone with 37-mm plastic cassette	225-69-37
Filter Transport Cassette for 25-mm filters	225-67
Cassette, 25 mm	225-62
Cassette, 37 mm	225-62-37