



**CARROLL
TECHNOLOGIES
GROUP**

Zefon - Escort ELF Dust Pumps Brochure

Includes MSHA Final Rule Fact Sheet and Health Alert



P5-ELF1-5-2-1-0 Escort ELF Dust Pump with Mining Cyclone and Leather Case; 120/240 VAC, 5 Pack

Maintain the flow you need with the Escort ELF air sampling pump. Pumps feature a state-of-the-art laminar flow sensor for constant flow control with automatic compensation for changes in battery voltage, temperature, altitude, and sample load. Check against a primary standard is needed only once a month (or every 200 hours for coal mine dust sampling) to ensure accuracy. Easily adjust flow rate using a button keypad. An IP65-rated, stainless steel filled plastic case provides EMI/RFI protection. An inlet filter protects the pump by trapping particulate matter; a water stop filter prevents moisture from entering the pump. Run/hold feature allows "time out" during sampling process. Flow/fault indicator lights up when the inlet is blocked. Low-battery indicator lets you know when it is time to charge the NiMH battery.

Features and Specifications:

Flow Range	0.5 to 3 L/min	Weight (oz)	23
Accuracy	±2.5% of set point from 1 to 3 L/min	Height (Inch)	4.25
Display Type	3-digit LCD	Width (Inch)	4
Calibration	Built-in secondary standard	Depth (Inch)	2.25
Approval	NIOSH, MSHA, UL	Height (cm)	10.8
Battery Type	NiMH	Width (cm)	10.2
Power (VAC)	120 / 240	Depth (cm)	5.7

803462-2PK 2 Pack Coal Dust Cassette



Zefon's Pre-weighed Coal Dust Sampling Cassettes consist of a sealed outer plastic capsule and an inner pre-weighed filter capsule. The inner capsule contains a 5-micron PVC filter, and stainless-steel supports. Each filter cassette is supplied with a mine data card, which has the weight of the filter capsule recorded to the nearest 0.001mg, and a mailing carton addressed to the Mine Safety and Health Administration (MSHA). Specified for use in coal mine dust sampling per 30 CFR part 74.

456226 Zefon Sampling Line Assembly

Clear Vinyl (PVC) Flexible Tubing for Zefon Pumps. 36" in length with clip.

Features and Specifications:

Inside Diameter	1/4"
Outside Diameter	3/8"
Wall Thickness	1/16"



655101 DigiCal 5 Calibrator, 110V

A primary calibration device, the DigiCal™ Primary Flow Calibrator provides instantaneous readings when calibrating instruments like Zefon Escort ELF and LC Sampling Pumps. The Zefon DigiCal™ Primary Flow Calibrator is a NIST-traceable solution for airflow verification and calibration of personal and environmental pumps.

Just press the plunger and the DigiCal™ Calibrator does the work. Its frictionless flow cell replaces conventional bubble tubes and makes calibration easier. The DigiCal™ Calibrator achieves extreme accuracy by utilizing a quartz-controlled timer and microprocessor to provide instantaneous flow measurement and digital display.

Accurate measurements are possible within $\pm 0.5\%$ at any altitude. Up to 100 hours of usage on an overnight charge. The

DigiCal™ Primary Flow Calibrator can be used to calibrate all personal air sampling pumps, and the patented secondary flow standard inside Zefon's Escort ELF Sampling Pump.

Features and Specifications:

True Primary Standard

Compact, lightweight, easy to use

Works at any altitude without correction

Instant readout of volumetric flow

$\pm 0.5\%$ accuracy

Microprocessor controlled to provide fast, accurate, repeatable measurements

Two flow ranges to select from:

- DigiCal 5 – 1 – 6000cc (personal sampling pumps, such as the Escort)
- DigiCal30 – 0.1 – 30 LPM (area sampling pumps)



ZA0085 Environmental Express 2 Liter Calibration Jar

The Zefon® Cyclone Calibration Jar is a container with all the proper fittings and connections to calibrate Personal Sampling Pumps with the Zefon, SKC, or Dorr-Oliver Cyclones, and inhalable dust samplers.

Features and Specifications:

Compatible with both Zefon and SKC Aluminum Cyclones

Complete with all fittings and Tygon® tubing for connecting the sampling pump

802922 Escort ELF Maintenance Kit

The Zefon Escort ELF Pump Maintenance Kit for maintenance and/or repair of the Zefon Escort ELF Personal Sampling Pump.

The Zefon Escort ELF Pump Maintenance Kit includes Water Stop Filters, Dust Filters, O-rings, Screws, Belt Clips, Frit Filters, a Battery Plug, an Inlet Cover, and an Allen Wrench.





FACT SHEET

Final Rule - *Lowering Miners' Exposure to Respirable Crystalline Silica and Improving Respiratory Protection*



Overview

- To fulfill the Mine Act's mandate to prevent death, illness, and injury from mining and promote safe and healthful workplaces for miners, MSHA has issued a final rule that reduces miners' exposures to respirable crystalline silica and improves respiratory protection for all airborne hazards.
- Respirable crystalline silica (also known as silica dust or quartz dust) is a common occupational hazard for coal and metal/nonmetal (MNM) miners. Silica dust is generated by mining activities, including cutting, sanding, drilling, crushing, grinding, sawing, scraping, jackhammering, excavating, and hauling materials that contain silica. Silica dust also mixes with other dusts created during mining, such as coal dust, to create increased risk of illness and death.
- Inhalation of silica dust, a carcinogen, puts miners at risk for developing illnesses that are chronic, irreversible, and potentially fatal, such as:
 - Silicosis (acute silicosis, accelerated silicosis, chronic silicosis, and progressive massive fibrosis);
 - Non-malignant respiratory diseases (e.g., emphysema and chronic bronchitis);
 - Lung cancer; and
 - Kidney disease.
- Exposure to mixed coal mine dust containing respirable crystalline silica can lead to the development of black lung disease and progressive massive fibrosis.
- The final rule reduces the permissible exposure limit (PEL) for silica dust to 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air; creates an action level of $25 \mu\text{g}/\text{m}^3$; establishes uniform exposure monitoring and control requirements for coal and MNM mines; creates medical surveillance at MNM mines; and updates respiratory protection standards to better protect coal and MNM miners from exposure to all airborne hazards, including silica dust, diesel particulate matter, asbestos and other contaminants.
- MSHA will provide compliance assistance to the mining community (including industry and labor) through outreach workshops, virtual or onsite training, and the dissemination of best practice materials. MSHA staff from the Educational Field and Small Mine Services, Technical Support, and Mine Safety and Health Enforcement, working with the National Institute of Occupational Safety and Health (NIOSH), will assist mine operators and miners in implementing the final rule successfully.

Key Changes from the Proposed Rule

- **Compliance dates extended:** The final rule extends compliance dates to provide industry more time to plan and prepare for compliance with the new standards. Coal mine operators will have 12 months after publication, and MNM mine operators will have 24 months after

publication to comply with the final rule.

- **Exposure monitoring strengthened:** Under the final rule, miners' exposures to respirable crystalline silica will be monitored through recent sampling and qualitative evaluations; the final rule removes the option of using industry-wide objective data or historical sample data. The final rule strengthens periodic evaluations by adding a requirement that mine operators evaluate changes in the mining environment and their effects on miners' exposure levels.
- **Medical surveillance updated:** The final rule clarifies the timing of voluntary and mandatory medical examinations provided to MNM miners. Additionally, the rule adds a requirement that mine operators ensure that medical providers will submit the results of chest X-rays to NIOSH, once NIOSH's reporting system is established.

Final Rule

- **Lowers the PEL for respirable crystalline silica:** Under the final rule, the PEL for respirable crystalline silica in MNM and coal mines is lowered to 50 $\mu\text{g}/\text{m}^3$ for a full-shift exposure, calculated as an 8-hour time-weighted average (TWA), for all miners. If miner exposures are above the PEL, the mine operator is required to take corrective actions immediately and perform sampling until the exposures are at or below the PEL. In addition, mine operators are required to report all operator samples above the PEL to MSHA so the Agency is aware of the situation and can work with the mine operator to address the health hazard.
- **Establishes an action level for respirable crystalline silica:** MSHA is also establishing an action level for respirable crystalline silica of 25 $\mu\text{g}/\text{m}^3$ for a full-shift exposure, calculated as an 8-hour TWA. When miner exposures are at or above the action level but at or below the PEL, the final rule requires mine operators to conduct periodic sampling until miner exposures are below the action level.
- **Implements medical surveillance for MNM mines:** The final rule requires MNM operators to establish medical surveillance programs under which the operators provide periodic health examinations at no cost to miners. This is similar to the medical surveillance program available to coal miners under existing standards. The new medical surveillance requirements will provide MNM miners with information needed for early detection of respirable crystalline silica-related disease.
- **Updates the respiratory protection standard:** MSHA is replacing its existing respiratory standard with the ASTM International 2019 standard entitled "*Standard Practice for Respiratory Protection*," to help protect all miners exposed to respirable crystalline silica and other regulated airborne contaminants. The final rule will better protect miners who wear respirators.



HEALTH ALERT



Final Rule: Respirable Crystalline Silica

On April 18, 2024, MSHA issued its final rule, *Lowering Miners' Exposure to Respirable Crystalline Silica and Improving Respiratory Protection*, to reduce miner exposures to respirable crystalline silica and improve respiratory protection for all airborne hazards.

Important Dates:

- The final rule will take effect on June 17, 2024.
- Coal mine operators are required to be compliant by April 14, 2025
- MNM mine operators are required to be compliant by April 8, 2026

The Final Rule:

- Establishes a uniform permissible exposure limit (PEL) of 50 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$) and action level of 25 $\mu\text{g}/\text{m}^3$ for all mines.
- Uniform requirements for monitoring and controlling respirable crystalline silica
- Requires medical surveillance at MNM mines, modeled after existing requirements for coal mines.
- Updates the existing respiratory protection requirements to the ASTM F3387-19 Standard.

For more information, visit: www.msha.gov/regulations/rulemaking/silica

