

Focus on IFA's work

Issue: 12/2024

Development of a demountable aerosol collector

Problem

Exposure by inhalation to gases, dusts and aerosols is one of the most common forms of exposure to hazardous substances at the workplace. The technical measuring services (MGU) of the German Social Accident Insurance Institutions are supported by the Institute for Occupational Safety and Health's (IFA) laboratory of measuring equipment when performing workplace measurements. The sampling system for hazardous materials worn on the person (PGP) that is employed for the measurements was developed at the IFA for sampling dust, vapour, and gaseous hazardous substances in workplace atmospheres. For sampling the respirable dust fraction, the combination of the PGP system's universal mount and a cyclone fine dust collector has become established practice. The FSP 10 system for fine dust sampling is now generally used (Figure 1). The required controlled volume flow of 10 l/min is delivered by a sampling pump.

Lower limit values for numerous metals and increasingly precise analytics with lowered limits of quantitation have resulted in an existing problem only now becoming apparent: the inside of the cyclone fine dust collector is very difficult to clean thoroughly. Without careful cleaning, residual material is carried over from one measurement to the next, thereby distorting the results, particularly in metals analysis.

Activities

To eliminate this carry-over, the IFA, together with the German Social Accident Insurance Institution for the energy, textile, electrical and media products sectors (BG ETEM) and GSA Messgerätebau, has expanded the PGP

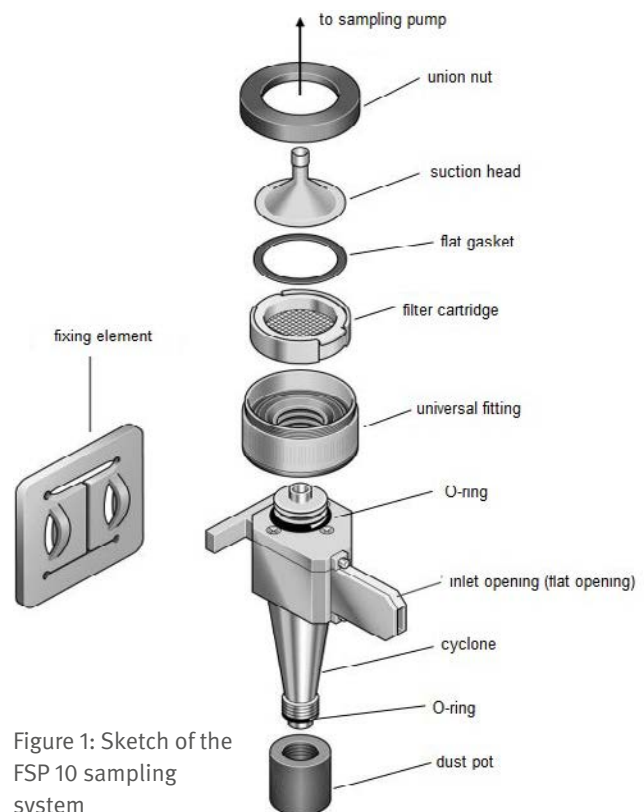


Figure 1: Sketch of the FSP 10 sampling system



Figure 2: PGP system; FSP 10-2 version (source: GSA)

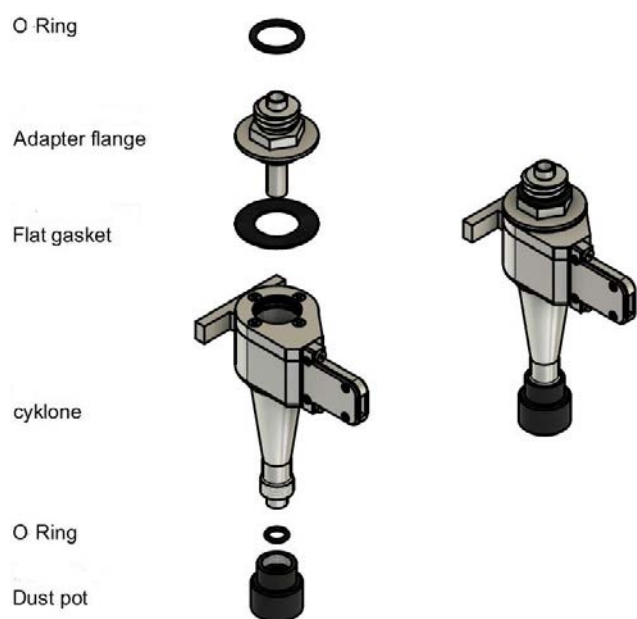


Figure 3: Sketch of the FSP 10-2 sampling system (source: GSA)

family of hazardous substance sampling systems worn on the person to include a respirable dust sampling head that can be dismantled: the FSP 10-2 (Figure 2).

The new FSP 10-2 is identical to the existing FSP 10 system but for one difference: the FSP 10-2 sampling heads enable the cyclone to be dismantlable, making it easier to detect and remove contamination from it (Figures 2 and 3).

Results and use

Comparative tests showed that the two types yield identical measurement results and can thus be used interchangeably. Based on the results, the PGP FSP 10-2 sampling system was approved by the IFA as part of the standard measurement method for respirable dust.

Use of the FSP 10-2 is recommended for measurements of metals and highly adhesive substances such as varnishes and resins, in order to facilitate complete cleaning and for avoidance of carry-over, particularly of metals. The FSP 10 system is still recommended for respirable dust measurements where metals are not an issue, and the presence of resins or varnishes is not suspected. Particular care must be taken during use of the FSP 10-2 system, with its additional threaded union, to ensure that the threaded joint is tight. Thorough cleaning after each measurement is absolutely essential with both systems. Detailed cleaning instructions have been provided in the work instructions for the FSP systems.

User group

Labour inspectors of the German Social Accident Insurance Institutions, technical measurement services, test bodies, OSH professionals and safety delegates

Technical enquiries

- IFA, Department “Hazardous Substances: Handling – Protective Measures”

Literature enquiries

- IFA, Department “Interdisciplinary Services”

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