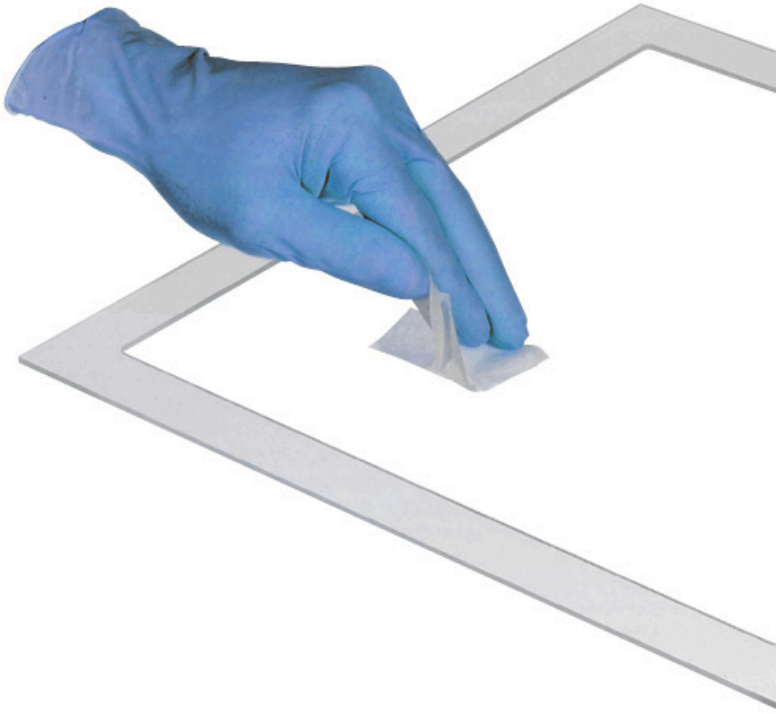
ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

SKC Wipe Sample Test Kit, 225-2401A

Wipe sampling of surfaces for toxic materials: choosing the filter and the wetting solvent, taking and recording wipe samples, field tests for carcinogenic amines, wipe tests on radioactive sources, lead and surface dust, and sending the samples to the laboratory.

AMTC-IN-0075

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About this document

These instructions cover the SKC Wipe Sample Test Kit, 225-2401A: a kit of filters, a template, gloves, sample bags and other supplies for taking wipe samples from surfaces contaminated with toxic materials. Wipe sampling complements an air sampling programme. It shows how well an industrial process is controlled and how good the housekeeping is.

Read Safety (p. 5) and Product and supplied items (p. 6) first. Before use (p. 8) tells you how to choose the filter and the wetting solvent for a contaminant. Procedure (p. 10) gives the steps for a wipe sample, a field test for carcinogenic amines, wipe tests on radioactive sources, lead and surface dust. After use and sample handling (p. 13) covers recording the samples and sending them to the laboratory.

Keep these instructions for the lifetime of the product. The current revision is on the product page at analyt-mtc.com.

How these instructions mark information

⚠ WARNING

A hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

A hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Practices not related to personal injury — damage to the product, the process or the sample.

Note
Information that helps understanding; never a hazard.

Document information

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Rev.	Date	Change
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CHAPTER 1

Safety

Read this chapter before you take a sample. Its safety messages are repeated in the steps where they apply.

Intended use

The SKC Wipe Sample Test Kit is for taking wipe samples from surfaces, and from the skin of personnel, for substances that can enter the body by ingestion, by inhalation or through contact. It is also for leak tests of sealed radioactive sources and wipe tests of surfaces for radioactive contamination. A laboratory analyses the samples. Solvents are not supplied with the kit.

Wipe sampling is a task for an industrial hygienist or a safety and health professional.

Note

Radioactive sources: check your licence first. Check your NRC or State licence to find out whether you are authorised to take your own wipe samples. If you are not, ask the NRC or your State agency for permission and for the procedure.

Safety messages

WARNING

Wear a new disposable glove for each sample. The contaminants you sample can enter the body from contaminated hands, and some are absorbed through the skin. Wear a new, disposable latex glove for each sample. It protects you from the material and keeps the samples from contaminating one another.

CAUTION

Skin samples: distilled water only. A solvent can harm the skin of the person you sample. When you sample the skin of personnel, never moisten the filter with any solvent other than distilled water.

WARNING

Leaking sealed source. A swab activity above 200 dpm shows that the sealed source may be leaking radioactive material. If the activity exceeds 200 dpm, close the package back up and notify the manufacturer of the source that it may be leaking.

NOTICE

No paper filters for HPLC. A paper filter does not suit analysis by high-performance liquid chromatography (HPLC), and the result can be wrong. Do not use paper filters for substances that are to be analysed by HPLC.

CHAPTER 2

Product and supplied items

The SKC Wipe Sample Test Kit, 225-2401A, holds the supplies for wipe sampling of surfaces: paper and glass fibre filters, a 10 cm × 10 cm template, gloves, sample bags, and materials for field tests and samples of surface dust. Solvents are not supplied with the kit.

What wipe sampling is for

To evaluate how well many industrial processes are controlled, an air sampling programme may need wipe samples as well. Many chemical agents can enter the body in these ways:

1. ingestion of the contaminant from food, drink or chewing gum that has touched contaminated surfaces or contaminated hands;
2. inhalation of the contaminant, or of its combustion products, when cigarettes, cigars or pipes that have touched contaminated surfaces or hands are smoked;
3. inhalation of the contaminant when it is stirred back up into the air;
4. contact of the contaminant with the inner surfaces of personal protective equipment, such as respirators.

Wipe sampling also gives a quantitative evaluation of housekeeping practice, and of the potential for contact with skin irritants. As a rule of thumb, take wipe samples when:

- the OSHA PEL or ACGIH TLV tables give the substance a “skin” notation, or its dermal LD50 is 200 mg/kg or less;
- the substance has an acute oral LD50 of 500 mg/kg or less and a significant chronic oral toxicity;
- the substance is a skin irritant, causes dermatitis or contact sensitisation, or is corrosive.

Limits of wipe sampling

Wipe samples of surfaces that may come into contact with the skin are often useful for substances that are absorbed through the skin. Wipe samples of the skin itself, such as fingers and hands, may not be useful for substances that the skin absorbs quickly. For these substances, biological exposure monitoring in a medical surveillance programme is often the method of choice.

If the contaminant is hard to remove from the surface, the result can be too low, down to a false negative. A different wetting solution can reduce that risk: ask an AIHA-accredited analytical laboratory which one to use. For example, in machining heavy metals such as chromium, oil mist from the machines and cutting fluids can make the metal dust stick to surfaces. Wetting the filter with distilled water may not recover all of the contaminant; a highly volatile solvent such as isopropanol may recover more.

For most contaminants there are no surface contamination standards against which to judge the level found. You may need to set your own standard for when an area or process counts as clean. Take into account the toxicity of the material, the route of exposure, the nature of the operation or process, interactions with other chemicals, and how effective and feasible the controls are.

Collection media

Four types of collection media are generally recommended:

Medium	Use
Ashless paper filters	Usually for materials analysed by atomic absorption spectrophotometry (AAS) or by inductively coupled plasma atomic emission spectrophotometry (ICP/AES). Not for substances to be analysed by HPLC.
Glass fibre filters	Usually for materials to be analysed by HPLC or by gas chromatography (GC).
pH test paper	For sampling corrosive surfaces. The paper reads directly, but you must know exactly what the material is. If the contaminant is unknown, or a mixture, take a regular wipe sample for cation and anion analysis.
Wash'n Dri™ towelettes	Used in NIOSH method 9100 for surface sampling of lead.

Parts of the kit

The kit is made up of these parts. Each is also available as a replacement part; the order codes are in Ordering information (p. 14).

Part	Pack
Stainless steel forceps	
Template, 10 cm × 10 cm	
Paper filters, 9 cm	box of 100
Glass fibre filters, 7 cm	box of 100
pH paper, 1–14	
Cotton swabs	pack of 100
Dropper bottles	pack of 3
Latex gloves	pack of 100
Sample bags	pack of 100
Marking pen	
Wash'n Dri™ towelettes	
Cover slips, 24 × 50	1 oz
Masking tape	
Microscope slides, 3 × 1, #1	pack of 72
Scotch™ Magic™ tape	
Sample containers, 50 mL tubes	pack of 20
Carrying case	

CHAPTER 3

Before use

Before you start

- Solvents are not supplied with the kit. Have the wetting solvents ready that Table 3-1 calls for the contaminants you sample.
- Take one new disposable glove, one clean filter and one new sample bag for each sample.
- For radioactive sources, check your NRC or State licence before you sample (see Safety (p. 5)).

NOTICE

No paper filters for HPLC. A paper filter does not suit analysis by high-performance liquid chromatography (HPLC), and the result can be wrong. Do not use paper filters for substances that are to be analysed by HPLC.

Choosing the filter and the wetting solvent

Table 3-1 lists many common inorganic and organic surface contaminants, with the filter medium and the wetting solvent for each. The list is not complete. If your contaminant is not in it, ask an AIHA-accredited analytical laboratory for the right filter and solution.

Abbreviations in Table 3-1: GFF glass fibre filter; AFP ashless filter paper; pH pH test paper; WDT Wash'n Dri™ towelette; EG ethylene glycol; IPA isopropanol; DiH_2O distilled water; Dry do not moisten the filter; * fill vial; b consult the laboratory. Solvents are not supplied with the kit.

Table 3-1. Contaminant information table

Contaminant	Filter	Solvent
2-Acetylaminofluorene	GFF	DiH_2O
Acrylamide	GFF	DiH_2O
Aldrin	GFF	Dry/EG
4-Aminodiphenyl	GFF	IPA
2-Aminopyridine	GFF	IPA
Ammonia	pH	DiH_2O
Aniline	GFF	IPA
Antimony (+ compounds)	AFP	DiH_2O
Arsenic (+ compounds)	AFP	DiH_2O
Barium (soluble compounds)	AFP	DiH_2O
Benzidine	AFP	IPA*
Benzoyl peroxide	GFF	DiH_2O
Beryllium (+ compounds)	AFP	DiH_2O
Cadmium (+ compounds)	AFP	DiH_2O
Calcium arsenate (as As)	AFP	DiH_2O
Calcium hydroxide	pH	DiH_2O
Calcium oxide	AFP	DiH_2O
Chlordane	GFF	Dry
Chlorinated camphene	GFF	EG
Chlordiphenyl	GFF	Dry

Contaminant	Filter	Solvent
Chromic acid and chromates (as CrO_3)	GFF	DiH_2O
Chromium, soluble chromic and chromous salts	AFP	DiH_2O
Chromium metals and insoluble salts	AFP	DiH_2O
Cobalt (+ compounds)	AFP	DiH_2O
Copper (+ compounds)	AFP	DiH_2O
Cyanides (as CN)	AFP	DiH_2O
DDT	GFF	Dry
Diazinon	GFF	Dry/EG
o-Dichlorobenzene	GFF	b
3,3'-Dichlorobenzidine	GFF	Dry
Dieldrin	GFF	Dry
Dinitrotoluene	AFP	Dry/EG
Endrin	GFF	Dry
Fluoride	AFP	DiH_2O
Gallium arsenide (Ga + As)	AFP	DiH_2O
Hydrochloric acid	pH	DiH_2O
Lead (+ compounds)	WDT	b
Lead chromate (as Pb)	WDT	b
Malathion	GFF	Dry/EG
4,4'-Methylene bis(2-chloroaniline) (MOCA)	GFF	Dry
α-Naphthylamine	GFF	Dry/DiH_2O
β-Naphthylamine	GFF	DiH_2O
Nickel metal and soluble compounds (as Ni)	AFP	DiH_2O
Nitric acid	pH	DiH_2O
N-Nitrosodimethylamine	GFF	b
Parathion	GFF	Dry/EG
Phosphoric acid	pH	DiH_2O
Phosphorus (red)	AFP	DiH_2O
Platinum (soluble salts, as Pt)	AFP	DiH_2O
Sodium fluoroacetate	GFF	Dry
Sodium hydroxide	AFP/pH	DiH_2O
Sulfuric acid	pH	Dry/DiH_2O
Tellurium (+ compounds)	AFP	DiH_2O
TEPP	GFF	Dry
Thallium	AFP	DiH_2O
Tin (as Sn)	AFP	DiH_2O
o-Toluidine	GFF	Dry/IPA
Trinitrotoluene	GFF	Dry/IPA
Uranium (soluble compounds)	AFP	DiH_2O
Warfarin	GFF	Dry

CHAPTER 4

Procedure

Taking a wipe sample

Use Table 3-1 in Choosing the filter and the wetting solvent (p. 8) for the filter and the solvent, and Table 4-1 for radioactive contamination.

1. Sketch the area to be sampled, with the exact places where you take the samples.
2. Draw on the sketch any equipment or process that may contribute to the contamination.
3. Note on the sketch what is relevant about the process, the control measures in place and the protective equipment worn by the personnel in the area; the sample area sketch in Recording the samples (p. 13) lists what to note.

   ⚠ WARNING

   Wear a new disposable glove for each sample. The contaminants you sample can enter the body from contaminated hands, and some are absorbed through the skin. Wear a new, disposable latex glove for each sample. It protects you from the material and keeps the samples from contaminating one another.

4. Put on a new, disposable latex glove.

   ⚠ CAUTION

   Skin samples: distilled water only. A solvent can harm the skin of the person you sample. When you sample the skin of personnel, never moisten the filter with any solvent other than distilled water.

5. Take out a clean filter.
6. If Table 3-1 calls for a solvent, moisten the filter with it.
7. Place the template on the surface.
8. Wipe the whole 100 cm² area, or an area of about 100 cm² if the surface is not flat.
9. Fold the filter into quarters, exposed side in.
10. Put the filter into a new sample bag without letting it touch any other surface.
11. Label the sample bag with a number, and put the same number at the sample location on the sketch.
12. Write any further notes about the sample on the wipe sample data sheet.
13. For each sample area, prepare at least one blank, treated in the same way as the samples, and submit it with them.

The samples are then ready for the laboratory: see After use and sample handling (p. 13).

Field test for carcinogenic amines

A field evaluation can show whether these carcinogenic amines are present:

- 4-aminobiphenyl
- benzidine
- 3,3'-dichlorobenzidine
- 4,4'-methylene bis(2-chloroaniline)
- α-naphthylamine
- β-naphthylamine

1. Moisten a paper filter.
2. Take the sample over a 5 cm sample area.
3. Apply 3 drops of fluorescamine dye to the contaminated area of the filter.
4. As a reference standard, put one more drop of fluorescamine on an area of the filter that is not contaminated.
5. Wait 6 minutes for the reaction to complete.
6. Irradiate the filter with ultraviolet light of 366 nm. If these amines are present, the contaminated area of the filter appears yellow.

After a positive result, take another sample on a glass fibre filter for HPLC analysis.

Radioactive sources

Radiation control requires wipe tests to find the level of surface contamination, and leak tests of sealed sources.

> **Note**
> **Radioactive sources: check your licence first.** Check your NRC or State licence to find out whether you are authorised to take your own wipe samples. If you are not, ask the NRC or your State agency for permission and for the procedure.

Leak test of a sealed source

1. Put on disposable rubber gloves.
2. Dampen a cotton swab with a solution of trisodium phosphate (TSP).
3. Wipe the source package or container with the swab.

   > **WARNING**
   > **Leaking sealed source.** A swab activity above 200 dpm shows that the sealed source may be leaking radioactive material. If the activity exceeds 200 dpm, close the package back up and notify the manufacturer of the source that it may be leaking.

4. If you have a radiation detection meter, such as a thin-end-window survey meter, measure the activity of the swab.

The manufacturer of the source can usually tell you how to handle a leaking source. If it cannot, contact your licensing agency.

If you have no survey meter, or if an independent analysis of the sample is warranted, put the swab into a plastic sample bag. Label the bag with the name of the radioactive source and the date, and send it as described in Sending radioactive samples (p. 13).

Wipe test of contaminated surfaces

1. Put on disposable rubber gloves.
2. Dampen a clean paper filter with a solution of trisodium phosphate (TSP) detergent or with isopropanol.
3. Wipe the surface inside the template.
4. If the surface is smaller than 100 cm², correct the final readings to an area of 100 cm².
5. If you have a radiation meter, such as a thin-end-window survey meter, measure the activity of the filter; Table 4-1 lists acceptable levels of surface contamination.
6. If you find higher levels, follow the notification and decontamination procedures of your licensing agency.

If you have no survey meter, or if an independent analysis of the sample is warranted, put the filter into a plastic sample bag. Label the bag with the name of the radioactive source and the date, and send it as described in Sending radioactive samples (p. 13).

Table 4-1. Acceptable radioactive surface contamination levels

Nuclide	Removable contamination (dpm/100 cm²)
U-natural, U-235, U-238 and associated decay products	1000
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20
Th-natural, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission), except Sr-90 and the others above	1000
H-3, C-14, except as DNA precursors (as DNA precursors, use the row above)	4000

From: ANSI, Control of Radioactive Surface Contamination on Materials, Equipment and Facilities to be Released for Uncontrolled Use. Final draft, proposed ANSI Standard N-3, June 1974.

Lead in surface wipe samples

For lead and its compounds, and for lead chromate, Table 3-1 gives Wash'n Dri™ towelettes as the medium; ask the laboratory about the wetting solvent. NIOSH method 9100 uses these towelettes for surface sampling of lead. Take the sample as in Taking a wipe sample (p. 10).

Miscellaneous surface dust

The microscope slides, cover slips and Scotch™ Magic™ tape of the kit are for sampling spores, pollen, dust mites and similar dust.

1. Apply a piece of tape lightly to the surface in question.
2. Remove the tape and transfer it to a microscope slide.
3. Label the sample and send it for visual analysis by polarised light microscopy.

CHAPTER 5

After use and sample handling

Recording the samples

Record each sampling on two forms: a sample area sketch and a wipe sample data sheet. Both carry the date, the name of the person who sampled and the area or process sampled.

Table 5-1. Sampling forms

Field	What to enter
Date, sampled by, area or process sampled	on both forms: the sampling and who did it
SAMPLE AREA SKETCH	
Sample area sketch	the sample area with the sample locations, in relation to processes, equipment, work stations and contaminated control equipment
Personal protective equipment (PPE)	the PPE worn by the personnel in the area
Additional comments	for example, a description of the process
WIPE SAMPLE DATA SHEET	
Sample number	the number on the sample bag; enter it at the matching place on the sketch as well
Sample location	where the sample was taken
Comments	any special information about the sample

Sketch the layout of the sample area on the back of the data sheet.

Sending the samples

Submit the labelled sample bags, with the blanks, to the analytical laboratory. Send the tape samples of surface dust for polarised light microscopy.

Sending radioactive samples

1. Put a note marked “Radioactive” into the package.
2. A parcel with a surface activity below 0.0005 R/hour need not be labelled as radioactive material. If the activity is higher, label and ship it to the applicable D.O.T. specifications.
3. Submit the sample to an NRC- or State-accredited laboratory for analysis.

Disposal

Dispose of used filters, gloves, swabs and their packaging under local regulations.

CHAPTER 6

Ordering information

Order from Analyt-MTC with the order codes.

Description	Pack	Order code
SKC Wipe Sample Test Kit (solvents not supplied)	each	225-2401A
REPLACEMENT PARTS		
Stainless steel forceps		225-13-1
Template, 10 cm × 10 cm		560-15
Paper filters, 9 cm	box of 100	560-21
Glass fibre filters, 7 cm	box of 100	560-24
pH paper, 1–14		560-27
Cotton swabs	pack of 100	560-28
Dropper bottles	pack of 3	560-31
Latex gloves	pack of 100	560-34
Sample bags	pack of 100	560-37
Marking pen		560-39
Wash'n Dri™ towelettes		560-40
Cover slips, 24 × 50	1 oz	560-42
Masking tape		560-43
Microscope slides, 3 × 1, #1	pack of 72	560-44
Scotch™ Magic™ tape		560-45
Sample containers, 50 mL tubes	pack of 20	560-46
Carrying case		560-98

CHAPTER 7

Service and contacts

The SKC Wipe Sample Test Kit is made by SKC. Analyt-MTC is your contact for it.

Ordering and support

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Ordering and questions

Analyt-MTC supplies the kit and its replacement parts and answers your questions about wipe sampling. Order with the order codes in these instructions. Warranty and returns follow the terms of Analyt-MTC.

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