SKC Europe

A Step by Step Guide to Surface and Skin Sampling

Contents

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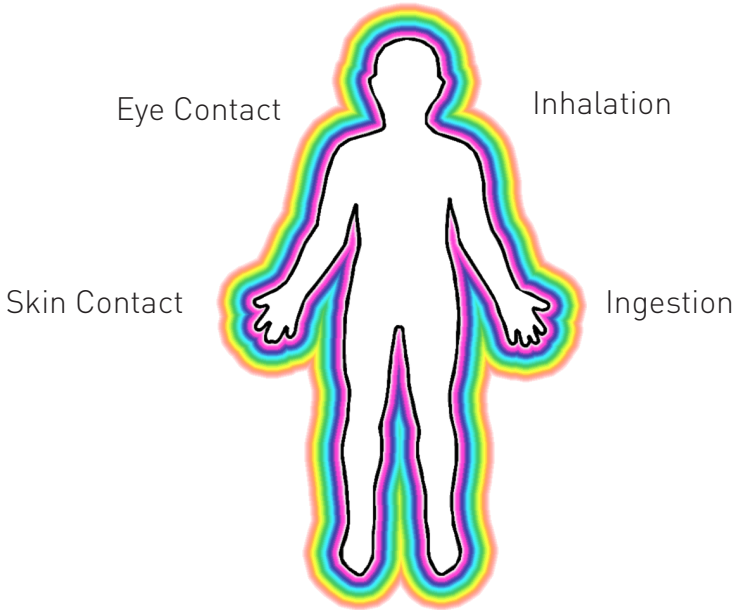
Introduction to Skin and Surface Sampling

Many occupational health professionals concentrate on air and particulate exposures in the workplace. However, NIOSH estimates that more than 13 million workers in the United States are exposed to chemicals that can be absorbed through the skin including production chemicals, disinfectants or cytotoxic drugs. To ensure a comprehensive worker exposure assessment, surface and dermal sampling need to be investigated as part of the assessment strategy.

This guide is intended to introduce a newcomer to SKC products that will enable the detection of chemicals that cause dermatitis or skin damage that can enter the body through intact skin and cause toxic effects in various organ systems.

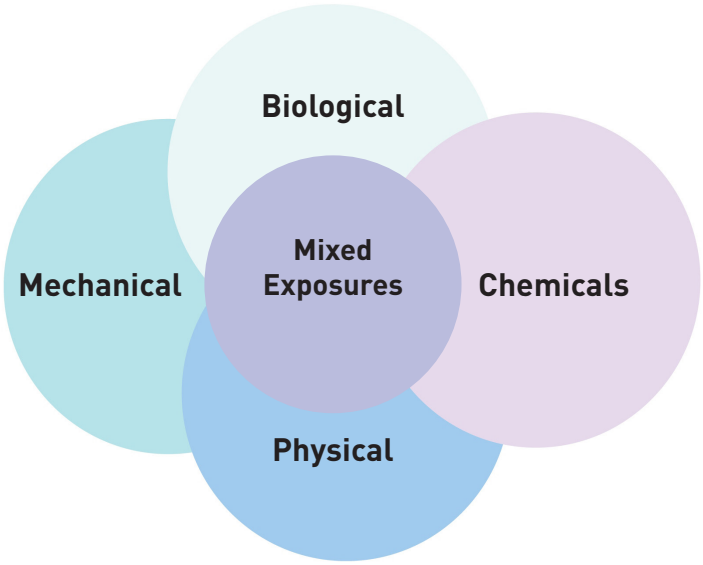
The properties of such hazards that may penetrate or injure the skin, are also toxic if ingested and/or inhaled and can remain as a hazard on surfaces for long periods of time.



Contamination is very easy to pick up from things like lockers, surfaces in the changing room or at the place of work even before gloves are put on. Careful attention should be paid to areas not normally regarded as potential problems, for example safety glasses, which have good skin contact over the bridge of the nose and behind the ears. Both of these areas have soft skin rarely exposed to harsh treatment and are very good at absorbing chemicals.

Most permeability tests carried out on clothing do not take in to consideration any mechanical abrasion and its effect on reducing protection. If skin is contaminated before protective clothing is put on, the uptake into the skin after donning protective clothing can increase dramatically. Once the inside, or contact surface of the clothing is contaminated it should be replaced immediately.

Workplace Hazards for the Skin



Occupations Most at Risk

- Healthcare
- Cleaning
- Painting / Spraying
- Agriculture
- Printing
- Construction
- Chemical Production

Skin Exposure Diseases

- Dermatitis
- Inflammation
- Rashes
- Eczema
- Ongoing Sensitivity

Chemicals that can be detected on Skin and Surfaces by using products supplied by SKC

- Aromatic amines
- Aliphatic amines
- Aromatic isocyanates
- Aliphatic isocyanates
- Acids and Phenols
- MOCA
- Nickel
- o-Phthalaldehyde

Other Hazards

- Lead
- Antimony
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Manganese
- Molybdenum
- Zinc
- Asbestos and Fungal Spore
- Bioaerosol contamination

Suggested Workplace Procedure

INITIAL EXPOSURE SURVEY

- Determine areas and jobs where hazardous chemicals are used.
- Check work surfaces, tools, production equipment, chemical storage and transfer areas with SWYPEs, to verify the need for Personal Protection Equipment (PPE) for employees. Identify and mark regulated areas, tools, carts, etc.
- After establishment of regulated areas where potential for skin exposure exists due to work practices and job requirements, survey areas outside of these regulated areas where contamination may be transferred.

OBSERVE THE PROCESS OF FLOW

- Check the final form of any product from the regulated area to stop transference to other areas.
- Check equipment (paperwork, tools, transport vehicles, etc.) leaving the regulated areas to verify they are free of contamination.
- Decontaminate all materials with decontamination solutions before leaving the regulated areas.
- Mark with tags or special paint all tools, carts, etc. that can become re-contaminated during normal use. Tagging can signify the potential for contamination and possible need for PPE

SECONDARY EXPOSURE SOURCES

- Observe the flow of people entering and leaving the regulated areas.
- Check water fountains, telephones, washing and changing rooms, lockers, and eating areas with SWYPEs. This will show contamination transferred via workers hands, clothing or shoes.
- Check office floors and aisles leading out of regulated areas, doors and door handles, office equipment such as phones, desk top computer keyboards even pens and pencils. Any of these items may have been contacted by contaminated PPE, clothing or shoes.
- Check and decontaminate all safety glasses, respirators, gloves and reusable personal safety equipment that are used in the regulated area. Replace any equipment that cannot be thoroughly decontaminated.
- Check surfaces, tools, measuring equipment in the QC labs that may carry contamination around the factory during or after quality checks.

THE ONGOING PROGRAMME

Weekly surveys will determine the need for decontamination and reinforce employee awareness. Changes in process, chemical usage, PPE supplier, batch to batch variations and ongoing training requirements require thorough re-evaluation of hazard assessment.
A frequent programme of assessment and decontamination will yield best results in minimising exposure hazards.

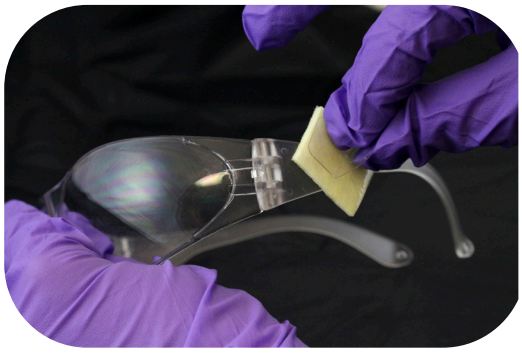
Colormetric Surface SWYPEs™

Chemical contamination on workplace surfaces can result in significant skin exposure. Identification of areas and tasks for risk of dermal exposure is a critical element in a hazard assessment as required by OSHA's PPE standard.

SWYPEs™ are a simple and sensitive technique to identify contaminated work sites where protective gloves and clothing must be worn.

Pump seals and hose connectors can be checked for leaks with Surface SWYPEs. Skin contact with uncured materials or surfaces in contact with uncured materials may result in worker exposures.

Procedures for the handling of drums should be checked to ensure that drum surfaces do not become contaminated. Surface SWYPEs can also be used to determine that urethane parts are completely cured before being handled with bare hands.



SWYPEs for surfaces

Gloves should be worn when using the Surface SWYPE detectors.

1. First, lightly spray the area to be tested with Developing Solution.
2. Wait approximately 30 seconds and then wipe with a Surface SWYPE pad.
3. Allow 2 – 3 minutes for the colour change reaction to occur.
4. Do not reuse the Surface SWYPE after activation.

The sensitivity of the Surface SWYPE is 3-5 µg for aromatic amines and isocyanates.

Chemical Group	Colour Indicator
Aromatic Amines	
• MOCA+MDA	Red-Orange
• Ethacure	Blue
• Diaminapheniline	Purple
Aromatic Isocyanates	Red-Orange
Aliphatic Isocyanates	Red-Orange
Aliphatic Amines	Pink
Acids/Bases	
• Neutral	Orange
• Acid	Pink
• Base	Blue
Phenols	Red

Colormetric Skin SWYPEs

A common sense approach is the key to the successful use of the SWYPE detection systems for reducing workplace exposures. The first step is to observe employee work practices. Tools, machinery controls, safety glasses or pencils that are handled with contaminated gloves, and may later be touched by bare skin, represent potential exposures.

The rapid colour indication of the Skin SWYPE helps to reinforce safe work practices and to educate workers in the prevention of skin exposures. They can also be used to test employees' hands to verify that gloves are providing protection from exposure.

Using Colormetric Skin SWYPEs

1. Using moderate pressure, wipe the suspected exposed skin area (behind the ear, pencil; bridge of nose, safety glasses, etc.) with the cloth pad portion of the Skin SWYPE.

2. Use a separate SWYPE for each area to be checked. To process, add 6 mm of Developing Solution to the small plastic cup provided. Place the Skin SWYPE in the cup with the cloth pad portion in the solution and the colour detection strip up at the top. The solution will cause a wicking process, carrying any contaminant, to the detector pad.

3. Remove the SWYPE from solution cup when the detector pad is saturated.

4. The test takes a minimum of 5 minutes for the colour change reaction to occur.

Wipe skin with SWYPE

Develop SWYPE in solution

Developing and Cleaning Solutions

The Cleaning/Developing Solution is necessary in order to increase the sampling efficiency of both the Surface and Skin SWYPE detection systems.

- When testing for contamination, the surface is lightly sprayed with the Cleaning/Developing Solution.
- The solution dissolves the contaminant prior to using the Surface or Skin SWYPE™.
- The SWYPE is designed to wick the solution into the pad, increasing the detection level, particularly on rough or porous surfaces.

DECONtamination Solutions are an important element in a dermal exposure reduction program.

A regular program using SWYPE detection followed by decontamination will assure minimal dermal exposures.

Cleaning/Decontamination

1. Wet area thoroughly with Cleaning/Developing Solution for Aromatic Amines
2. Use an abrasive pad if necessary, to enhance penetration. Do not rinse before applying Decontamination solution.
3. Spray the area with Decontamination solution and allow it to react for at least 5 minutes. Rinse with water.
4. Recheck the area with Surface SWYPE to verify decontamination is complete. If contamination is still present, repeat steps.
5. To decontaminate tools, mix 1-part DECONtamination solution with 3 parts cleaning/developing solution in a closed container.
6. Let tools soak for a minimum of 5 minutes and rinse with water.
7. Recheck with Surface SWYPE to verify decontamination is complete.

PERMEA-TEC Pads - Breakthrough Indicators for Gloves

Gloves and other personal protective equipment (PPE) can be evaluated for effectiveness in actual field use conditions with PERMEA-TEC Pads.

PERMEA-TEC Pads include both direct-reading colorimetric detectors and a micro-encapsulated solvent indicator system.

Chemical penetration through PPE is indicated by the pads changing colour. Normal sensitivity range, from 0.5 to 5 mg.

Indication of breakthrough can greatly improve PPE selection for specific applications.

To determine a user-safe time period for the glove, double gloving is recommended.

Steps:

1. Affix PERMEA-TEC sensors to the thumb, middle finger, and palm on the outside of the glove currently being worn and then place the glove to be evaluated over the first glove.

2. After one hour, remove the outside glove and the underlying PERMEA-TEC sensors.

3. Develop the pad by spraying it twice with Aromatic Amine Cleaning/Developing Solution.

Interpretation of results

1. A positive indication of breakthrough results in a colour change.

2. If no breakthrough is indicated, apply fresh PERMEA-TEC sensors and continue to wear the outside glove for another hour. Follow the steps above to determine if breakthrough has occurred and to determine a user-safe time period for gloves.

3. Send PERMEA-TEC Pads to a laboratory for analysis to identify the chemical, solvent or other compound, penetrating the gloves or garment.

Pre-exposure

Post-exposure

D-TAM Skin Cleansers and DECONtamination Solutions

D-TAM skin cleansers

D-TAM Skin Cleanser is formulated to remove water-insoluble contaminants such as aromatic amines, pesticides, phenol, epoxy resins, and paints/sealants from the skin. D-Tam Skin Cleanser will not disrupt or abrade the natural barrier properties of the skin.

D-TAM Skin Cleanser contains no emollients, such as lanolin or aloe vera, nor does it contain pumice or harsh surfactants and will not enhance penetration of contaminants into the skin.

D-TAM Gold Skin Cleanser
Removes many nonpolar compounds such as pentachlorophenol, MDI, PCBs and more.

DECONtamination solutions for Aromatic Amines and Isocyanates

DECONtamination solutions are an important element in a dermal exposure reduction program. It can be used when contamination is detected on workplace surfaces.

Made of biodegradable materials, these solutions can be used to effectively decontaminate workplace surfaces and minimise concern for hazardous waste disposal.

A regular program using SWYPE detection followed by decontamination will assure minimal dermal exposures.

SKC Full Disclosure® Kit

SKC Full Disclosure® wipe sampling provides instant detection of lead on skin and surfaces.

- Completely safe surface and skin testing
- Immediate colour change
- Easy to use
- Developed, tested and patented by NIOSH, CDC
- Meets NIOSH Method 9105 for Lead in Dust Wipes

Applications

- Identifying presence of lead and confirming decontamination by retesting
- Ensuring effectiveness of hand and skin washing for individuals exposed to lead (e.g. shooting ranges)
- Determining the effectiveness of lead removal

How It Works:

The test surface, i.e. skin, safety glasses, tables, workbenches, shoes, etc. is wiped with a wipe to collect lead that may be present. The mildly acidic aqueous solution is then sprayed onto the wipe to solubilise the lead, and then the aqueous rhodizonate test reagent is sprayed onto the wipe to produce the results. If solubilised lead is present, a pink to red colour bloom will appear immediately. The intensity of the colour bloom can indicate the relative amount of lead present. Positive wipes can be sent to a laboratory for quantitative analysis if desired.

Step 1 **Prepare the solution**

Step 2 **Wipe to sample**

Step 3 **Spray and read the results**

Ghost Wipes and Sterile Surface Swab Kit

Ghost Wipes

Ghost Wipes are used to collect samples from surfaces.

They hold together even when used on the roughest surfaces. In the lab, Ghost Wipes readily and completely dissolve during digestion for maximum recovery of target analyte(s) - there is no messy fibrous material to clog the sample uptake capillary or nebuliser

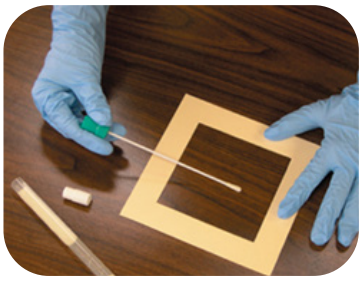
Ghost Wipes can also be used to collect samples of the following surface metals, as specified in OSHA Method ID-125G, Addendum B:

- Antimony
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Manganese
- Molybdenum
- Nickel
- Zinc

Please consult the method to see what procedure is used.

Sterile Surface Swab Kit

The Surface Swab Kit is ideal for determining the relative degree and type of biological contamination in an area.This non-destructive method can be used safely on most surfaces and is ideal for irregular surfaces such as air return grills.



Easy Four Step Sampling:

1. Remove the sterile swab from its package aseptically.

2. Remove the sealing cap from the tube containing the sponge and moisten the swab tip.

3. Using a rolling motion, gently swab the desired area thoroughly.

4. Templates are included in the kit for defined area sampling. Insert the swab into the tube, replace the sealing cap, and prepare for transport to a laboratory.

Summary of Skin and Surface Products

Surface and Skin SWYPE Indicators provide on-the spot colorimetric results in 3 minutes for many chemicals with EH40 skin notations.

PERMEA-TEC Sensors are worn like flexible adhesive bandages under PPE to detect breakthrough and are suitable for the OSHA PPE standard.

D-TAM Skin Cleanser is a skin friendly formula that removes many contaminants but does not enhance penetration of contaminants into skin.

DECONtamination Solutions safely remove aromatic amines and isocyanates from most surfaces.

SKC Full Disclosure® Kit wipe sampling provides instant detection of lead on skin and surfaces.

Ghost Wipes are used for sampling for lead and other metals on surfaces.

Sterile Surface Swab Kit Samples surfaces for bioaerosol contamination.

Also Available:

Smear Tabs designed for collecting samples on surfaces where dust and chemicals from the atmosphere have settled.

Stick-to-it Lift Tape samples surfaces for biological contaminants.

Microvacuum Cassettes enable efficient collection of asbestos or fungal spores.

Hazard Assessment Kits
Conveniently sized spray bottles of developing and decontamination solutions combined with fast acting SWYPEs™ enable the safety professional to identify and decontaminate previously unrecognised exposure sources.

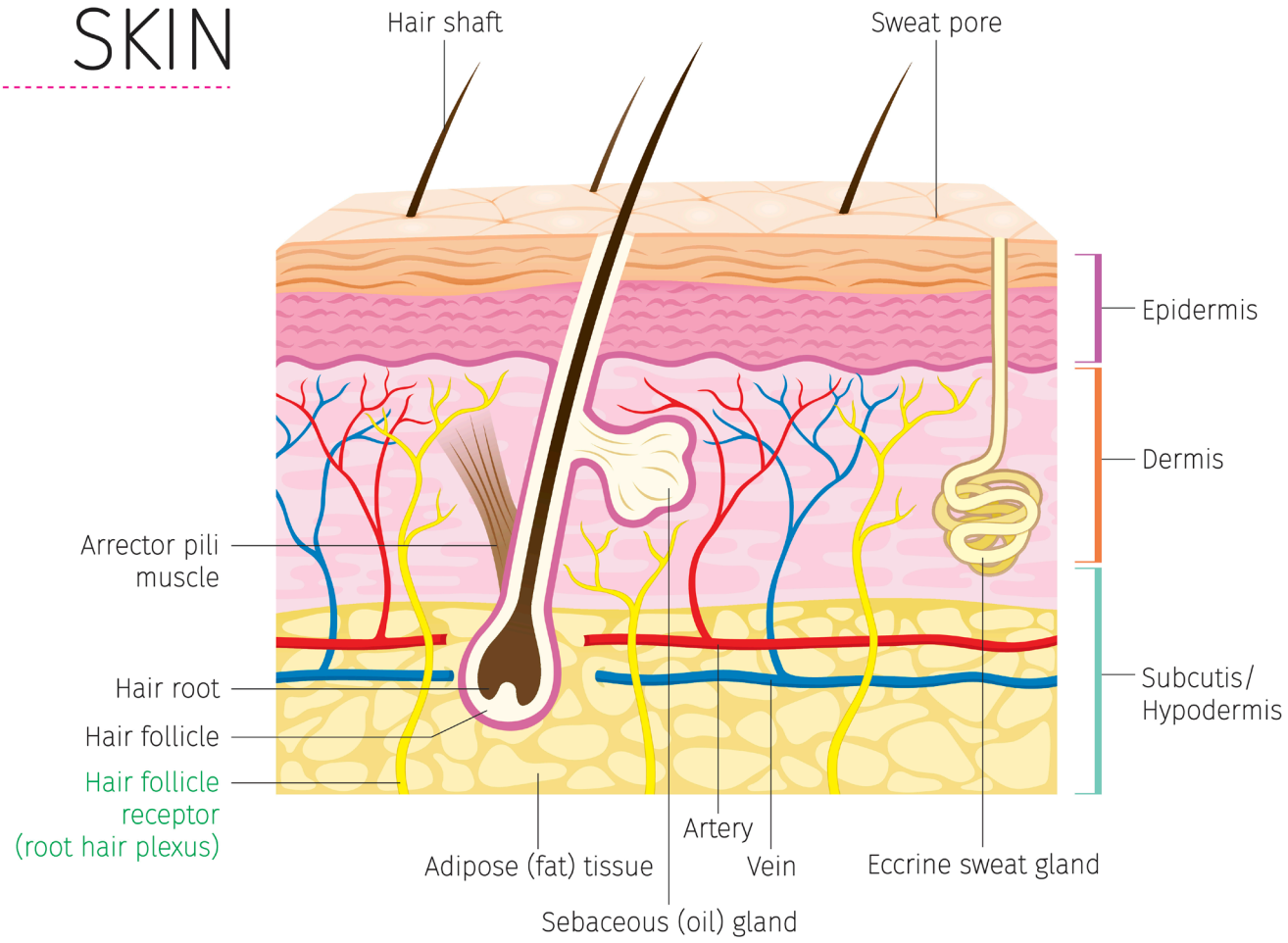
For Aromatic Amines, Aromatic Isocyanates, Aliphatic Amines, Aliphatic Isocyanates and Acid/Base Phenols, Nickel, o-Phthalaldehyde.

For further information on our surface and skin products see our website

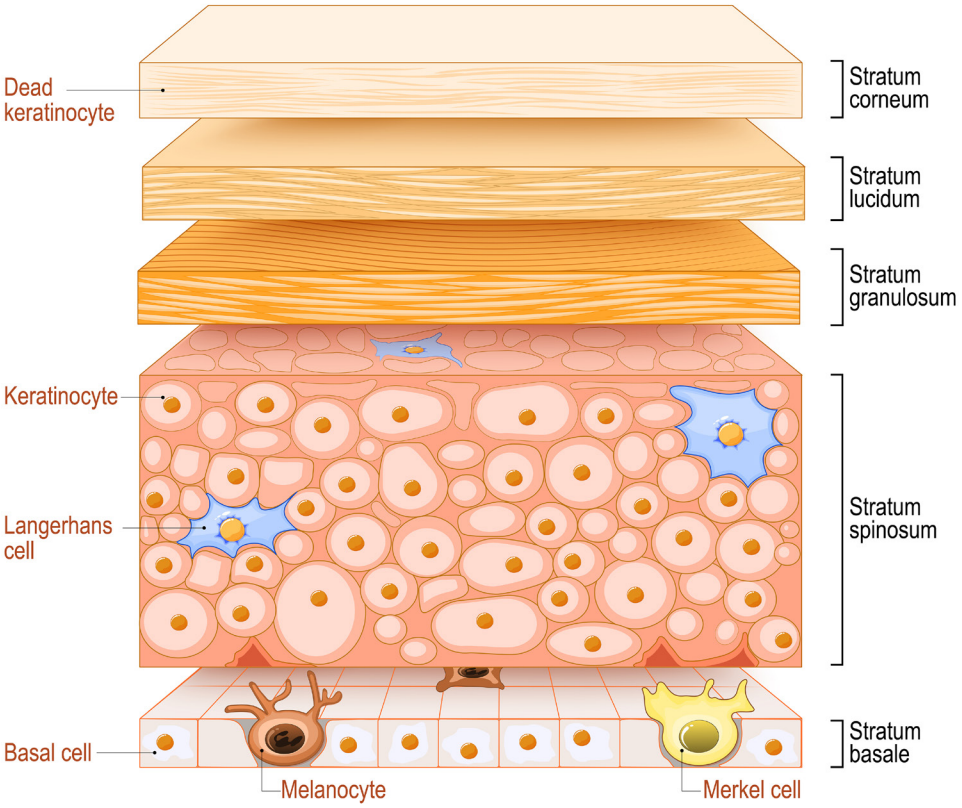
skcltd.com


GHOST WIPE
Environmental Express
1-800-343-5319
www.envexp.com

SKIN


Hair shaft
Sweat pore
Epidermis
Dermis
Subcutis/
Hypodermis
Arrector pili
muscle
Hair root
Hair follicle
Hair follicle
receptor
(root hair plexus)
Adipose (fat) tissue
Artery
Vein
Eccrine sweat gland
Sebaceous (oil) gland

EPIDERMIS


Dead keratinocyte
Stratum corneum
Stratum lucidum
Stratum granulosum
Keratinocyte
Langerhans cell
Stratum spinosum
Basal cell
Melanocyte
Merkel cell
Stratum basale

Surface and Skin Solutions from SKC Limited

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