

**The British Occupational Hygiene Society  
Faculty of Occupational Hygiene**

**PROFICIENCY MODULE SYLLABUS**

**P801: CONTROL OF DERMAL EXPOSURE AT WORK**

**Aim:** To provide theoretical and practical knowledge to enable the candidate to design and implement effective control of occupational dermal exposure to chemicals.

**Learning Outcomes:** The student must have an understanding of the health effects of skin exposure, techniques for the assessment of dermal exposure and the methods available to control exposure.

**Course Length:** It is envisaged this course would be run over 2 days and a further ½ day for the examination/assessment

<b>Content:</b>	<i>Topic</i>	<i>Time Allocation</i>
	1 Skin physiology and chemicals	10%
	2 Health effects of skin exposure	10%
	3 Skin as a route of exposure	15%
	4 Assessment of skin exposure	35%
	5 Methods of control of skin exposure.	30%

**Note:** Reference is made in this syllabus to HSE guidance and or documentation. This may not be the most up-to-date relevant publications from HSE/other sources and is intended as guidance for candidates only.

**1 SKIN PHYSIOLOGY AND CHEMICALS [10%]**

The structure of human skin: an explanation of the three major layers. What are the major components in each of these layers? What are the major functions of these components? Other skin components, e.g. sweat glands, hair follicles.

The protective functions of human skin: This will include the six major functions of the skin and the factors influencing these functions.

- Protecting the body against chemicals
- Protecting the body from invasion by pathogenic micro-organisms
- Protecting against physical agents including the rays of the sun
- Protecting against mechanical forces (mechanical stress) and shock
- Serving in temperature regulation and water loss management
- Protecting internal organs

Skin and chemicals; how chemicals permeate through the skin. Diffusion and the equations describing steady-state diffusion. Physical-chemical parameters influencing dermal uptake of chemicals.

The importance of keeping the skin supple and elastic to accommodate movement. The social importance of skin appearance and the psychological impact of skin disease.

**2 HEALTH EFFECTS OF SKIN EXPOSURE (LOCAL AND SYSTEMIC) [10%]**

A basic knowledge of diseases caused by dermal exposure to chemicals including definitions of various terms used to explain skin diseases; types of skin diseases; an explanation of the process involved in the development of contact dermatitis (irritant and allergic); an introduction to systemic diseases associated with skin absorption of chemicals; British statistics on skin diseases: incidence and prevalence. Surveillance schemes operating in Britain.

An understanding of the types of occupations and tasks associated with skin exposure and systemic diseases caused by dermal exposure to chemicals including the materials commonly associated with both local and systemic effects

Use of simple questionnaires and visual inspection to assess dermatitis. Other techniques to assess skin condition.

### **3 SKIN AS A ROUTE OF EXPOSURE (TRANSFER MECHANISMS) [15%]**

Knowledge of exposure processes at a conceptual level. A practical understanding of dermal exposure pathways and how skin is exposed to chemicals and explanation of different pathways for practical use in the workplace. Definition of skin exposure and uptake. Terminology used in the CEN standard on dermal exposure.

The role of hand contamination in contributing to ingestion exposure via hand-to-mouth contacts.

Wet-work and exposure – definition of relevant exposure factors, e.g. duration hands wet, number of occasions the hands wet over a working day and wearing of impervious gloves.

### **4 ASSESSMENT OF SKIN EXPOSURE [35%]**

An understanding of dermal hazard identification methods, including approaches for the identification of chemical hazards relevant to skin exposure. This will include R-phrases; contaminant mixture; wet-work.

Dermal exposure monitoring, its place in risk management, and the associated practical and technical issues. The methods used to assess the extent of dermal exposure. Interception, removal, tracer and skin stripping methods; advantages and disadvantages of each. QA/QC procedures. The role of biological monitoring in assessing skin exposure.

Exposure modelling and estimation: DREAM, EASE and other relevant approaches.

Other factors related to risk of skin disease, e.g. UV exposure, heat, skin abrasion.

Evaluation of the relative importance of dermal exposure versus inhalation exposure for systemic toxins.

### **5 METHODS OF CONTROL OF SKIN EXPOSURE [30%]**

Practical dermal exposure assessment techniques and dermal exposure risk management including the COSHH hierarchy of controls and the concept of “safe working distance” and such approaches, which will include avoidance of skin contact e.g. use of tools etc, protection systems and vigilance for early signs of disease. Personal protective equipment, which should only be considered as a last line of defence, and the suitability and effectiveness of skin care products. The limitations of “barrier” creams must also be included

Legal requirements for dermal exposure control; COSHH, pesticide regulations, biocide regulations, REACH. Occupational Exposure Limits and skin notation.

Appropriate training in the use PPE and the proper techniques for their donning and removal and the correct use of skin care products to reduce risk of dermatitis etc.

### **6 Suggested Further Reading:**

CEN/TS 15279:2006-06 Workplace exposure - Measurement of dermal exposure - Principles and methods.

Schneider et al. Conceptual model for assessment of dermal exposure. *Occup Environ Med* (1999) vol. 56 (11) pp. 765-73

Semple. Dermal exposure to chemicals in the workplace: just how important is skin absorption?. Occup Environ Med (2004) vol. 61 (4) pp. 376-82.

Kielhorn J, Melching-Kollmub S, Mangelsdorf I. Dermal absorption. Environmental Health Criteria 235 (2006) .

## 7 EXAMINATION/ASSESSMENT

There are two elements:

1. A 45 minute short answer BOHS examination consisting of 30 questions. Points are gained by correct answers and then calculated as a percentage. It is necessary to obtain 50% to pass the written examination.

2. A practical assessment - conducted by a BOHS approved practical assessor who is independent of the course provider. This practical assessor will bring some elements of the assessment material as appropriate and the course provider is responsible for providing all the suitable facilities, including all safety provisions, for the practical assessment.

During the assessment, examination candidates may have access to any relevant reference material, excluding computers, palm tops and/or mobile phones, but will not be permitted to communicate with other candidates. Practical assessors are not allowed to discuss the results with candidates, and can exclude candidates from assessments for disruptive or unsafe actions.

The practical assessment examination comprises two or more elements:

- a one-to-one exercise between the candidate and the practical assessor, which will usually involve a practical exercise(s)
- other(s) may involve viewings/inspections of facilities for faults and/or evaluation of situations as portrayed in photographs with questions. It may be necessary for the practical assessor to interrupt candidates during this section in order to complete the one-to-one exercise.

The practical assessment will contain the essential elements as detailed below:

At least two full case studies involving assessment of risk and determination of suitable controls for dermal exposure.

Successful completion of the above will lead to a:

**PROFICIENCY CERTIFICATE**  
in  
**CONTROL of DERMAL EXPOSURE**