National Diploma Unit B Supplement

NEBOSH National Diploma
Unit B - Hazardous Agents in The Workplace

Introduction

This Supplement contains updates to your study material for Unit B of the NEBOSH National Diploma. Please read it carefully.

Element B1: Principles of Toxicology and Epidemiology

The Legal Framework

In the **KEY INFORMATION** box at the beginning of this main section, the third and fourth bullet points have been amended to read:

- "For those who manufacture and supply chemicals **CLP** and **REACH** are particularly applicable.
- The classification, labelling and packaging of chemicals is regulated by **CLP.**"

Overview Of End-User Workplace Legislation

In the first **GLOSSARY** box in this subsection, the first bullet point has been amended to read:

- "It is listed in Table 3.2 of Part 3 of Annex VI of the **CLP Regulation** and for which an indication of danger specified for the substance is very toxic, toxic, harmful, corrosive or irritant."

Overview of Manufacturer and Supplier Legislation

This subsection has been revised and now reads as follows:

"There are three standards of note:

- **United Nations Globally Harmonised System of Classification and Labelling of Chemicals (GHS)** - this non-legally-binding international agreement establishes:
  - New harmonised criteria for the classification of chemicals according to their hazardous properties.
  - New harmonised labelling and provision of information requirements including new hazard warning symbols (pictograms) for labels.

  The aim of GHS is to standardise the laws governing the classification and labelling of chemicals globally, the principle being 'one chemical – one label, worldwide'.
- **European Regulation (EC) No. 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (CLP) Regulation** – this EU Regulation puts a duty on manufacturers and suppliers to:
  - Classify dangerous chemicals using the new scientific criteria agreed under GHS.
  - Provide information to the end user in the form of a label that will make use of new hazard warning symbols (pictograms) agreed under GHS.
  - Package the chemical safely.

CLP enacts GHS within the EU. It is a direct-acting Regulation (as opposed to a Directive) and therefore has direct effect in each EU member state. It does not have to be transposed into UK legislation.

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) – this EU Regulation puts a duty on manufacturers and suppliers to:

- **Register** chemicals that they manufacture or supply in quantities of one tonne or more per year with the European Chemicals Agency (ECHA).
- Submit to ECHA a portfolio of technical information and an assessment of the physicochemical, toxicological and environmental properties of each chemical.
- Provide to customers a safety data sheet (SDS) derived from this information.
- Notify ECHA of any increases in the quantities of the chemical being produced, or changes to the chemical. This might require the provision of additional technical data about the chemical to ECHA.

After registration, portfolios are **evaluated** by ECHA. One of the stated aims of the evaluation process is to eliminate unnecessary animal testing by manufacturers. For substances of very high concern (SVHCs) **REACH** may impose a requirement for manufacturers/suppliers to gain specific **authorisation** prior to use of the substance. SVHCs are carcinogens, mutagens and reproductive toxins, or substances that are toxic, persistent and bio-accumulative.

Certain substances deemed to present a very high risk may be restricted by **REACH**.

REACH is enforced in the UK under the **REACH Enforcement Regulations 2008** and the **REACH Enforcement (Amendment) Regulations 2013**. These enforcement regulations essentially allocate **REACH** enforcement duties to, and confer powers on, various enforcement agencies (HSE, EA, SEPA, LA, etc.). They amend a number of existing regulations (including **COSHH** and **CAR**) and wholly revoke others. The 2013 Regulations change the way **REACH** is implemented in the UK so that businesses no longer need to remove asbestos from second-hand articles before selling them. The effect of the enforcement regulations is that some requirements that once found themselves in several pieces of UK legislation are now consolidated in one place – **REACH**.

The requirements of **REACH** are wide-ranging."

Labelling and Packaging Regulations and Transition Periods

This subsection has been replaced by the following revised subsection:

"Labelling and Packaging Regulations

The **CLP Regulation** requires that:

- Substances are classified, labelled and packaged according to the **CLP Regulation**.
- Mixtures (or 'preparations') are classified, labelled and packaged according to the **CLP Regulation**."

In the second **MOR**E box which follows this subsection, the text now reads:

"The HSE website has a wealth of information on this topic at:

http://www.hse.gov.uk/chemicals/index.htm"

Revision Question 2 has been deleted and subsequent questions in the element renumbered.

The Classification of Chemicals According to Health Effect

In the **KEY INFORMATION** box at the beginning of this main section, the original first six bullet points have been replaced by the following:

- "Suppliers and manufacturers of chemicals have to classify, label and package chemicals according to **CLP**.
- In accordance with the **Globally Harmonised System (GHS)**:
  - Harmonised classification and labelling information is available for many substances in Tables 3.1 and 3.2 of Part 3 of Annex VI of **CLP**.
  - Where these tables do not apply, the supplier must classify and label according to the Approved Classification and Labelling Guide (ACLG) and possibly CLP.
  - Labelling requires the application of suitable phrases and symbols."

Classification, Labelling And Safety Data Sheets (SDSs)

The material under this subheading, including the subsections **The Role of Harmonised Classifications, The Approved Guide and Labelling and Risk Phrases**, has been substantially revised to read as follows:

"In the first section of this element we examined the various regulations that govern chemicals in the workplace and require the manufacturer or supplier to **classify, label and package** chemicals.

CLP imposes a duty on the manufacturers and suppliers of chemicals to classify those chemicals according to their:

- physicochemical properties;
- health effects; and
- environmental effects.

Having classified the chemical, the supplier must then use the derived information to label the chemical appropriately and they must package the chemical safely.

The regulations impose these duties on a broad group of duty holders such as manufacturers, suppliers, importers, wholesalers and retailers.

The Role of Harmonised Classifications

For many substances the classification and labelling information is available in **Part 3 of Annex VI of CLP**:

- **Table 3.1** contains the harmonised classification and labelling information under the CLP system (incorporating GHS).

The Approved Guide

However, if the supplier wishes to classify a substance that is not contained in this table, or a preparation (mixture), then they will have to **self-classify**. This self-classification can be done by applying the criteria contained in the HSE **Approved Classification and Labelling Guide (ACLG)**. This approved guide allows the supplier to use appropriate test data to determine what the classification should be. The supplier may have to also self-classify substances according to **CLP**. Guidance on classification under **CLP** is published by the EU.

Much of the information required for self-classification is currently derived from animal testing. This is a tightly regulated and highly emotive area that will be discussed in the next section of this element. One of the aims of **CLP** and **REACH** is to reduce the amount of animal testing carried out by encouraging the sharing of data within specific industry groups and the creation of large communal databases for use in both classification and labelling.

Labelling and Risk Phrases

Under **CLP**, classification requires the identification of **hazard and precautionary statements** that will appear on the label of the substance/preparation. Hazard and precautionary statements are represented by H- and P-numbers respectively, for example:

H320 - Causes eye irritation.

P271 - Use only outdoors or in well-ventilated areas.

The regulations also require the use of standard hazard symbols on labels to aid in the communication of the hazard type.

CLP Health Hazard Symbols

Use for substances that are **fatal** or **toxic** when inhaled, ingested or on skin contact.

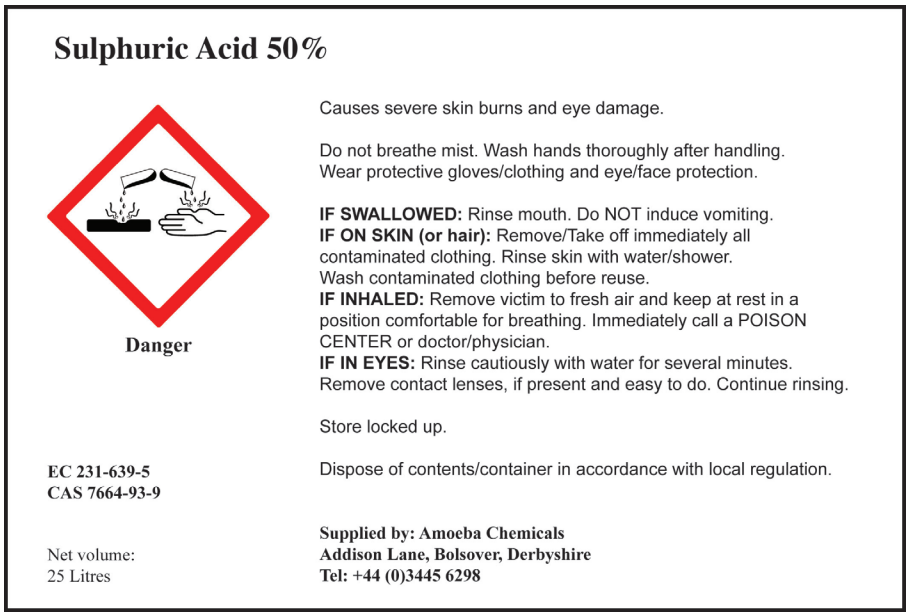
Used for substances that are **harmful** (when inhaled, ingested or on skin contact), **irritant** (when inhaled or on contact with skin or eyes) or **sensitising** on skin contact.

Use for substances that are **corrosive** (to skin or eyes).

Used for substances that are **carcinogenic** (category 1A, 1B and 2), Mutagenic (category 1A, 1B and 2), **toxic to reproduction** (category 1A, 1B and 2), **sensitising** (respiratory system), capable of causing organ damage (single and repeat exposures), or represent an aspiration hazard.

Example

Below is an example of a label for sulphuric acid. (NB this is purely illustrative, to show the sort of information displayed.)



CLP labelling for dangerous chemicals

CLP labels must generally contain: name, address and telephone number of the supplier; nominal quantity (when made available to the general public); product identifiers (e.g. name and CAS number); hazard pictograms; signal words (e.g. 'danger' or 'warning'); hazard statements and any applicable precautionary statements (covering prevention, response, storage and disposal) and supplemental information."

Safety Data Sheets (SDSs)

The penultimate paragraph under this subheading has been amended to read:

"Safety data sheets must be supplied (in paper or electronic form) free of charge when the substance is first provided. They must be kept up-to-date and revised and reissued accordingly."

Health Effects

Dermatitic Hazards

At the end of this subsection, immediately before the **Revision Questions**, the content of the **MORE** box is now as follows:

"Additional information is available from the HSE at:

www.hse.gov.uk/chemical-classification/index.htm

http://www.hse.gov.uk/chemical-classification/legal/index.htm

CLP and GHS are explained in more detail at:

http://echa.europa.eu/home_en.asp"

Summary

The Legal Framework

The second bullet point under this subheading now reads:

- "Overviewed the regulatory framework for those who manufacture or supply chemicals; **REACH** and **CLP**."

The Routes of Attack of Chemicals

The fifth and sixth bullet points under this subheading now read as follows:

- "Explained the legal duty of suppliers and manufacturers to classify, label and package chemicals according to **CLP.**
- Outlined the use of Table 3.1 of Annex VI of CLP and the **Approved Classification and Labelling Guide (ACLG)**."

Element B2: Hazardous Substances and Other Chemicals – Assessment of Risk

Factors to Consider when Assessing Risks

Individual Susceptibilities

In this subsection, the first paragraph of the second bullet point has been amended to read:

- "**Women of child-bearing capacity** - certain hazardous substances (e.g. lead and mercury) have specific effects on the unborn child in the womb. These substances will be identified with hazard statements such as:
  - **H360** – May damage fertility or the unborn child."

Control Measures

Meaning of Adequate Control

The fourth paragraph of the text under this subheading now reads:

"Where the hazardous substance is either **carcinogenic/mutagenic** (i.e. carries the hazard statements H350, H340 or is listed in Schedule 1 of **COSHH**) or is capable of causing occupational **asthma** (i.e. carries the hazard statement H334 or is listed in Section C of HSE publication *Asthmagen? Critical Assessments of the Evidence for Agents Implicated in Occupational Asthma*) then control will only be deemed adequate if:

- the appropriate WEL is not exceeded;
- the 'principles of good practice' for control have been applied; and
- exposure is reduced to as low a level as is reasonably practicable."

Exam Skills

Suggested Answer Outline

The second paragraph under this subheading now reads:

"There are many sources of information available including:

- Information provided with the product (labels, safety data sheets, hazard statements).
- Published information (annex VI of CLP Regulation, schedule I of COSHH, European Chemicals Agency list of candidate substances, EH40, journals and publications).
- External bodies (HSE, ILO, Chemical Industries Association)."

Possible Answer By Exam Candidate

The answer to part (a) is now:

"The published sources of information an employer could use to determine if carcinogens are used in their workplace include:

- *Labels.*
- *Material safety data sheets.*
- *Hazard statements.*
- *EH40.*
- *Science papers."*

Element B7: Physical Agents 2 – Radiation

Non-Ionising Radiation

Measuring Non-Ionising Radiation

Exposure Limit Values

The eighth paragraph under this subheading has been amended to read as follows:

"Exposure limit values vary depending on the frequency of the radiation and the part of body exposed."

Element B8: Psychosocial Agents

Identification and Control of Stress

Common Law And Civil Cases

At the end of this subsection, immediately before the **HINTS AND TIPS** box, the following new paragraph has been added:

"The practical guidance from Court of Appeal guidelines has established the following factors to be considered when determining the likelihood of reasonably foreseeable harm caused by work-related stress:

- the nature and extent of the work being carried out;
- special regard to work which is intellectually or emotionally demanding for the employee;
- situations where the workload is greater than normal;
- cases where unreasonable demands are being made of the employee;
- instances where others doing the same job are suffering harmful levels of stress;
- evidence of abnormal levels of sickness or absenteeism in the same job or department;
- whether employees have informed the employer of their stress;
- that no occupations should be considered to be intrinsically harmful to mental health."

Element B10: Work Environment Risks and Controls

Temperature and Thermal Environment

Legal Framework

In this subsection, the second bullet point has been updated to read:

"The **Construction (Design and Management) Regulations 2015 (CDM)** – contain a similar explicit requirement for the temperature of indoor workplaces to be reasonable during working hours (regulation 24). This requirement exists because the **WHSWR** do not apply on construction sites."

Assessing Heat Stress

Other Indices

In this subsection, the bullet point headed **Predicted 4-Hour Sweat Rate (P4SR)** has been expanded to read as follows:

"The predicted 4-hour sweat rate (P4SR) uses the following six thermal parameters to calculate a nominal sweat rate that would be necessary to maintain thermal equilibrium:

- air temperature;
- radiant temperature;
- relative humidity;
- air velocity (v);
- clothing insulation;
- metabolic rate (M).

This sweat rate can be used as an index of strain on the individual and limiting values can be set for different circumstances. So, for example, the recommended upper limit for acclimatised young men is set at 4.51, whereas for clothed industrial workers the limit reduces to 2.71."

Lighting

Measurement and Assessment of Light Levels

Units

In this subsection, immediately below the diagram entitled "Four stages of light", the following new text has been inserted:

"The power of a light source to emit light is luminous intensity, which is measured in units of candela (cd).

The quantity of light emitted by a source or received by a surface is the **luminous flux**, which is measured in units of lumen (lm)."