

LEARNER STUDY GUIDE

MONITOR AND MAKE RECOMMENDATIONS ON THE APPLICATION OF HEALTH AND SAFETY PRINCIPLES REGARDING HAZARDOUS SUBSTANCES IN THE WORKING PLACE HAZARDOUS SUBSTANCES

HAZCHEM

UNIT 120370

LEVEL 04

CREDITS 3

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INTRODUCTION

Dear Learner

We welcome you to this learning programme – Hazardous Substances.

Congratulations on choosing to upgrade your skills. We believe that this is one of many learning programmes that will develop and improve your skills.

Over the past couple of years, South Africa has made a significant shift from the old dispensation in education (where learners used to be bombarded with theory and very little practical work) to an outcomes-based education model (based on competency rather than on theory). The aim of the shift is to make the South African labour force more productive and show them how to apply the knowledge that they have gained from training programmes.

The learning programme you are about to start is outcomes-based and in line with the outcomes as stipulated in the applicable unit standard. The assessment is also in line with the assessment criteria as stipulated in the unit standard. Once you have been declared competent on the outcomes of this unit standard, you will receive credits towards a nationally recognised qualification.

You will be assessed formatively and summative. The formative assessment will be conducted as you work through the lessons of this Study Guide and the summative assessment will be conducted when you have completed your training. Assessment can also be defined as the method that is used to determine whether you have mastered the skills that you will be taught during this learning programme. Assessment usually consists of two components, namely

instructional learning (as conducted during this learning programme) and the workplace assessment – to determine your practical skills and your ability to implement what you have learnt.

The purpose with the Practical Guide Logbook (which will be handed to you by your assessor) will be to assess whether you can apply what you have learnt in the workplace.

Another added advantage to the new dispensation is the fact that recognition of prior learning is also considered and can count towards achieving credits towards a skills programme or qualification. Life experience, work experience and previous courses attended can be taken into consideration for recognition of prior learning purposes, should it relate to the specific learning programme or qualification you are working towards. This is merely a brief description to the new dispensation and barely covers what one can learn about this.

So, you will undergo theoretical training; receive your Practical Guide Logbook and Learner Assessment Workbook & Portfolio of Evidence. These documents contain the requirements for your summative assessments that must be included in the PoE. At this point, you and your assessor will sign the Assessment Plan and your assessment will commence! You will be guided all the way.

We hope that this makes you as excited as it does us and it is a real privilege for us to be able to facilitate and assess you on the outcomes of the unit standard that we are about to start.

Please feel free to communicate any questions to your facilitator or to your assessor.

Remember; look out for the following icons in your Study Guide:



This icon indicates an activity that must be completed in or during training (Class Work)



This icon indicates an activity that must be completed and placed in your Portfolio of Evidence (PoE).

LEARNING PROGRAMME SCHEDULE

Learning Programme Name: **Hazardous Substances**

UNIT STANDARD	UNIT ID	US NQF LEVEL	US CREDITS
Monitor and make recommendations on the application of health and safety principles regarding hazardous substances in the working place	120370	NQF Level 4	3 Credits

Details of the Learning Programme Schedule:

- ✪ This learning programme will be trained over a period of 1 DAY
- ✪ The learner has 6 HOURS (1 DAY) in which to complete the FORMATIVE and SUMMATIVE Assessments
- ✪ The learner has to spend a minimum of 21 HOURS (4 DAYS) in the work environment in the form of practical work

Good Luck and enjoy your learning experience!

UNIT STANDARD

Monitor and make recommendations on the application of health and safety principles regarding hazardous substances in the working place

SAQA US ID	UNIT STANDARD TITLE			
120370	Monitor and make recommendations on the application of health and safety principles regarding hazardous substances in the working place			
ORIGINATOR				
SGB Occupational Health and Safety				
PRIMARY OR DELEGATED QUALITY ASSURANCE FUNCTIONARY				
-				
FIELD			SUBFIELD	
Field 09 - Health Sciences and Social Services			Preventive Health	
ABET BAND	UNIT STANDARD TYPE	PRE-2009 NQF LEVEL	NQF LEVEL	CREDITS
Undefined	Regular-Fundamental	Level 4	NQF Level 04	3
REGISTRATION STATUS		REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Reregistered		2018-07-01	2023-06-30	SAQA 06120/18
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT		
2024-06-30		2027-06-30		

In all of the tables in this document, both the pre-2009 NQF Level and the NQF Level is shown. In the text (purpose statements, qualification rules, etc.), any references to NQF Levels are to the pre-2009 levels unless specifically stated otherwise.

This unit standard does not replace any other unit standard and is not replaced by any other unit standard.

PURPOSE OF THE UNIT STANDARD

This unit standard requires of learners to demonstrate the ability to monitor, advice and report on compliance with legislation regarding hazardous substances.

Learners credited with this unit standard are capable of:

- Monitoring, advising and reporting on the scope and understanding of the specified requirements as regards to hazardous substances in a work place.
- Demonstrating knowledge pertaining to the application of methods in preventing exposure to hazardous substances in a work place.
- Demonstrating knowledge pertaining to the classification, physical state, health effects and disposal methods of hazardous substances in a workplace.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

The Unit Standard outcomes and credits are based on the assumption that learners attempting this Unit Standard can already read, write and communicate at NQF Level 3 or equivalent.

UNIT STANDARD RANGE

The following scope and context applies to the whole unit standard at any working place.

Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.

Specified requirements include legal and site-specific requirements and are contained in one or more of the following documents:

Legal Requirements:

Include and are contained in one or more, but not limited to the following documents:

- Relevant Acts: e.g. Mine Health & Safety Act, 1996 (Act no 29/1996), and Minerals Act and Regulations, 1991 (Act no 50/1991). And Occupational Health and Safety (Act no 85/1993).
- Mandatory Codes of Practice.
- SABS and other relevant Standards.
- Chief Inspector of Mines' Directives.

Site Specific Requirements:

- Hazard Identification and Risk Assessments (HIRA).
- Occupational Health and Safety Risk Management Programme.
- Managerial Instructions.
- Mine Standard Procedures.
- List of Recorded OH&S Risks.
- Working Guides.
- Equipment and Materials Specifications.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Monitor advice and report on the scope and understanding of the specified requirements as regards to hazardous substances in a work place.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The explanation of the scope and application in terms of specified requirements in preventing exposure to hazardous substances confirms understanding.

ASSESSMENT CRITERION 2

The explanation regarding the provision of training and information in accordance with specified requirements confirms understanding.

ASSESSMENT CRITERION 3

The explanation as regards to the duties of a person exposed to hazardous substance in accordance with specified requirements confirms understanding.

ASSESSMENT CRITERION 4

The demonstration of the process to assess potential exposure to hazardous substances in accordance to specified requirements confirms understanding.

ASSESSMENT CRITERION 5

The explanation in terms of the air monitoring programs in accordance with specified requirements confirms understanding.

SPECIFIC OUTCOME 2

Demonstrate knowledge pertaining to the application of methods in preventing exposure to hazardous substances in a work place.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The explanation in terms of the use of preventive measures other than PPE in accordance with specified

requirements confirms understanding.

ASSESSMENT CRITERION 2

The explanation regarding the safety, health and environmental practices in terms of the storage of Hazardous substances confirms understanding.

ASSESSMENT CRITERION 3

The explanation in terms of the examination, test, maintenance and control measures in accordance with specified requirements confirms understanding.

ASSESSMENT CRITERION 4

The explanation in terms of the importance of record keeping in regards with hazardous substances in accordance with specified requirements confirms understanding.

SPECIFIC OUTCOME 3

Demonstrate knowledge pertaining to the classification, physical state, health effects and disposal methods of hazardous substances in a workplace.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The explanation in terms of the classes and physical state of hazardous substances confirms understanding.

ASSESSMENT CRITERION 2

The explanation the different categories of hazardous substances and their health effects in accordance with specified requirements confirms understanding.

ASSESSMENT CRITERION 3

The explanation regarding the disposal methods of hazardous substances in accordance with specified requirements confirms understanding.

UNIT STANDARD ASSESSOR CRITERIA

N/A

REREGISTRATION HISTORY



1. CRITICAL CROSS-FIELD OUTCOMES (CCFO)

a) Unit Standard CCFO Identifying

Identify and solve problems and make decisions using critical and creative thinking.

Note: The ability of the candidate to assess hazardous conditions and make recommendations indicates capability i.t.o. problem solving skills.

b) Unit Standard CCFO Working

Work effectively with others as members of a team, group, organisation or community.

Note: The ability and willingness of the candidate to accept, interpret and delegate work instructions correctly, when and if required, in an appropriate manner, indicates that he/she can work effectively as a team member in the bigger organisational structure.

c) Unit Standard CCFO Organising

Organise and manage themselves and their activities responsibly and effectively.

Note: The competence of inspections and recommendations will indicate that the candidate can organise and manage activities in his/her working environment.

d) Unit Standard CCFO Collecting

Collect, analyse, organise and critically evaluate information.

Note: The ability of the candidate to interpret acquired data and perform basic calculations will indicate proficiency in collecting, organising and evaluating information.

e) Unit Standard CCFO Communicating

Communicate effectively, using visual, mathematical and / or language skills in the modes of oral and/or written presentations.

Note The ability of the candidate to communicate requirements and recommendations will indicate his/her effectiveness to communicate information in the modes of oral and written presentations.

f) Unit Standard CCFO Science

Use science and technology effectively and critically showing responsibility towards the environment and health of others.

Note: The ability of the candidate to select the appropriate formulae and perform the relevant calculations indicates that he/she is able to use science and technology.

g) Unit Standard CCFO Demonstrating

Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

Note: The ability of the candidate to identify unsafe acts and conditions and to make recommendations to the workforce confirms understanding that a specific situation, action or decision can have a devastating effect.

As per the SAQA Board decision/s at that time, this unit standard was Reregistered in 2012; 2015.

UNIT STANDARD NOTES

N/A



FORMATIVE ASSESSMENT

Definitions

In these regulations any word or expression to which a meaning has been assigned in the Act shall have the meaning so assigned and, unless the context otherwise indicates—

"air monitoring" means the monitoring of the concentrations of airborne hazardous chemical agents;

"Asbestos Abatement Regulations" means the Asbestos Abatement Regulations, 2020, published as Government Notice No. R.11196 of 10 November 2020 under section 43(1) of the Act;

"assessment" means a programme to determine any risk from exposure to an HCA associated with the workplace in order to identify the steps needed to be taken to remove, reduce or control such HCA;

"BEI" or "biological exposure index" is a value for assessing biological monitoring results, intended as a reference guideline for the likelihood of adverse health effects, and generally represents the level of determinants that are most likely to be observed in specimens collected from healthy employees who have been exposed to HCAs with inhalation exposure at the occupational exposure limit, as listed in Table 4 of Annexure 2, as revised from time to time and published in the Gazette;

"carcinogen" or "CARC" means any chemical agent or mixture which induces cancer or increases its incidence, classified by the GHS as—

- (a) Category 1: known or presumed human carcinogens; or
- (b) Category 2: suspected human carcinogens;

"CAS number" or "chemical identity" means the number or name, respectively, that uniquely identifies a chemical, given in accordance with the nomenclature systems of the International Union of Pure and Applied Chemistry or the Chemical Abstracts Service, or a technical name;

"chemical agent" means a GHS-aligned chemical agent or mixture;

"consumer product" means a product containing an HCA, which—

- (a) is packed or repacked primarily for use by a household consumer or for use in an office;
- (b) if the product is packed or repacked primarily for use by a household consumer, is packed in the way and quantity in which it is intended to be used by a household consumer; and
- (c) if the product is packed or repacked primarily for use in an office, is packed in the way and quantity in which it is intended to be used for office work;

"container", in relation to an HCA, means anything in or by which an HCA is, or has been, wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function as a container;

"cut-off value" or "GHS cut-off value" or "GHS concentration limit" means the minimum concentration of an HCA, expressed as a percentage, to trigger the classification of a mixture containing the HCA;

"exposed" means exposed to an HCA whilst at the workplace and "exposure" has a corresponding meaning;

"Facilities Regulations" means the Facilities Regulations, 2004, published as Government Notice No. R. 924 of 3 August 2004;

"General Administrative Regulations" means the General Administrative Regulations, 2003, published as Government Notice No. R. 929 of 25 June 2003;

"GHS hazard classification" means the GHS hazard classes and hazard categories assigned to HCAs; GHS divides hazards into three major groups – health, physical and environmental.

"hazard category" means a division of criteria within a hazard class in the GHS, where these hazard categories compare hazard severity within a hazard class and

"hazard class" means the nature of a physical, health or environmental hazard under the GHS;

"hazard pictogram" means a graphical composition, including a symbol plus other graphical elements such as a border, background pattern or colour that is intended to convey specific information, that is assigned in the GHS to a hazard class or

hazard category;

"hazard statement" means a statement assigned in the GHS to a hazard class or hazard category describing the nature of the hazards of an HCA including, if appropriate, the degree of hazard;

"hazardous chemical agent" or "HCA" means a GHS-aligned chemical agent

"importer" means an employer or self-employed person who, by any means, imports an HCA into the Republic that is to be used, or could reasonably be expected to be used, at a workplace;

"Lead Regulations" means the Lead Regulations, 2001, published as Government Notice No. R. 236 of 28 February 2002;

"manufacturer" means an employer or self-employed person who manufactures an HCA that is to be used, or could reasonably be expected to be used, at a workplace;

"measurement programme" means a programme according to the monitoring strategy as contemplated in HSG 173;

"monitoring" means the planning, carrying out, and recording of the results of a measurement programme;

"OEL" or "occupational exposure limit" means a limit value set by the Minister, which represents the airborne concentration of an HCA, where the exposure standard may be—

- (a) an eight-hour time-weighted average;
- (b) a ceiling limit; or
- (c) a short-term exposure limit;

"OEL ceiling limit" or "ceiling limit" or "C" means a maximum or peak airborne concentration of an HCA determined over the shortest analytically practicable period of time, which does not exceed 15 minutes;

"OEL eight-hour time-weighted average" or "TWA" means the maximum average airborne concentration of an HCA when calculated over an eight-hour working day, for a five-day working week;

"OEL-ML" or "occupational exposure limit - maximum limit" means an HCA as listed

"OEL-RL" or "occupational exposure limit - restricted limit" means an HCA as listed

"OEL-short-term exposure limit" or "STEL" means the time-weighted average maximum airborne concentration of an HCA calculated over a 15-minute period;

"OESSM" means the Occupational Exposure Sampling Strategy Manual, published by the National Institute for Occupational Safety and Health (NIOSH),

"permanent respirator zone" means an area where the concentration of an airborne HCA during normal operations exceeds the OEL-RL for that HCA;

"precautionary statement" means a phrase prescribed by the GHS that describes recommended measures that should be taken to minimise or prevent—

- (a) the adverse effects resulting from exposure to an HCA; or
- (b) the improper storage or handling of an HCA;

"respirator zone" means an area where the concentration of an airborne HCA exceeds the recommended limit for that agent;

"safety data sheet" or "SDS" means a document that is aligned to the GHS, providing information on hazard classification, properties of hazardous chemicals, procedures for handling or working with hazardous chemicals in a safe manner, and the effects of hazardous chemicals on health and safety at the workplace, and that is prepared in accordance with regulation 14A;

"sensitiser" means an HCA that causes a substantial proportion of exposed people to develop an allergic reaction in normal tissue after repeated exposure, and includes dermal sensitisers and respiratory sensitisers;

"signal word" means the word "danger" or "warning" used on a GHS-aligned label to indicate to the reader a potential hazard, as well as the relative severity level of such hazard;

"skin", the notation, means that the HCA might be absorbed in toxicologically significant amounts through direct contact with skin or mucous membranes and eyes from airborne exposure to gases,

vapours or liquids, so that conclusions about exposure and health effects based solely on airborne concentration limits may be incomplete;

"**the Act**" means the Occupational Health and Safety Act, 1993 (2014) (Act No. 85 of 1993);



SPECIFIC OUTCOME 1

REQUIREMENTS IN PREVENTING EXPOSURE TO HAZARDOUS SUBSTANCES

PREVENTING EXPOSURE TO HAZARDOUS SUBSTANCES

(S01/AC1)

(1) An employer must ensure that the exposure of an employee is either prevented or, where this is not reasonably practicable, adequately controlled:

Provided that—

(a) where there is exposure for which there is a restricted limit, the control of the exposure must be regarded as adequate if the level of exposure is below that limit or if the relevant area is zoned and the level of exposure is reduced to below that restricted limit by means of adequate personal protective equipment only after the level has been reduced to as low as is reasonably practicable by any other means than personal protective equipment; or

(b) where there is exposure for which there is a maximum limit, the control of the exposure must be regarded as adequate if the exposure is at a level as low as is reasonably practicable below that maximum limit: Provided that in the case of temporary excursions above the control limit, the employer must ensure—

- (i) that the excursion is without a significant risk from exposure;
- (ii) that the excursion is not indicative of a failure to maintain adequate control;
- (iii) that during the excursion, the area is temporarily demarcated and prescribed and identified as contemplated in regulation 8(b); and
- (iv) that the provisions of regulation 11 are complied with.

(2) Where reasonably practicable, the employer must control the exposure of an employee by—

- (a) limiting the amount of an HCA (hazardous chemical agent) used, which may contaminate the working environment;
- (b) limiting the number of employees who will be exposed or may be exposed;
- (c) limiting the period during which an employee will be exposed or may be exposed;
- (d) using a substitute for an HCA;

(e) introducing engineering control measures (methods for minimizing hazards, including process control, enclosure and isolation, and ventilation) for the control of exposure, which may include—

- (i) process separation, automation or enclosure;
 - (ii) the installation of local extraction ventilation systems to processes, equipment and tools for the control of emissions of an airborne HCA;
 - (iii) use of wet methods; and
 - (iv) separate workplaces for different processes; and
- (f) introducing appropriate work procedures which an employee must follow where materials are used or processes are carried out which could give rise to exposure of an employee, and which procedures must include written instructions to ensure—
- (i) that an HCA is safely handled, used and disposed of;
 - (ii) that process machinery, installations, equipment, tools and local extraction and general ventilation systems are safely used and maintained;
 - (iii) that machinery and work areas are kept clean; and
 - (iv) that early corrective action may be readily identified.

(3) An employer must ensure that the emission of an HCA into the atmosphere comply with the provisions of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

.Equipment to limit exposure to hazardous substances

The objective is to prevent, or to adequately control, exposure to substances hazardous to health, so as to prevent ill health.

- using control equipment, e.g. total enclosure, partial enclosure, Local Exhaust Ventilation (LEV) workplace fume and dust extraction
- controlling procedures, e.g. ways of working, supervision and training to reduce exposure, maintenance, examination and testing of control measures;
- Worker behaviour, ensure employees follow the control measures.
- Changing how often a task is undertaken, or when, or reducing the number of employees

nearby, can make an improvement to exposure control.

Control equipment can be:

- general ventilation
- extraction systems such as local exhaust ventilation
- Enclosure or where the air cannot be cleaned, respiratory protective equipment (RPE).

Includes:

- spillage capture
- decontamination
- clean-up procedures and
- Personal protective equipment (PPE).

Ways of working includes:

- operating procedures
- supervision and training
- emergency procedures
- decontamination and
- 'Permits to work' for tasks such as maintenance.

Employers are responsible for taking effective measures to control exposure and protect health.

These measures can also improve production or cut waste. This includes:

- Wearing any PPE necessary
- Using control equipment
- Following hygiene procedures
- Warning supervisors if anything appears to be wrong

THE PROVISION OF TRAINING AND EDUCATION AND INFORMATION (SO1/AC2)

The intent of providing workers with appropriate information, training and instruction is to ensure that they can competently perform their duties and tasks without risk to their health and safety or the health and safety of any other person, and to ensure that they have a thorough understanding

of the potential major hazards.

Information

Providing employees with health and safety information and training reduces the chance of them suffering injuries or ill health. It helps them acquire the skills, knowledge and attitude to make them competent in the safety and health aspects of their work and instils a positive health and safety culture.

Training

Training means showing a person the correct method of doing a task and making sure that he or she can carry out the task correctly and safely. It can be formal, mandatory training such as Hazchem Safety Training Course and informal on the job training such as showing a person the correct method of doing a job, pointing out dangers and ensuring that the person understands and can do the job safely. All workers must be trained in safe work practices. This may include training in the safe use of equipment and safe work practices.

Work practices and the effectiveness of any training provided should be monitored. Where unsafe work practices are detected and safety, health and welfare measures are not being followed by any worker, the work or activity should be stopped until corrective action has been taken and safety controls are fully complied with. New or young crew members may also require extra supervision.

Training and Education

(1) Every employer who undertakes work which is liable to expose an employee to an HCA must, before any employee is exposed or may be exposed, after consultation with the health and safety committee established for that section of the workplace, provide that employee with suitable and sufficient information, instruction and training, as well as thereafter inform, instruct and train that employee at intervals as may be recommended by that health and safety committee.

(2) The information, instruction and training contemplated in subregulation must include—

(a) in regard to these regulations for HCAs—

(i) the chemical substance regulations that are in place that govern all aspects of HCA use at the workplace;

(ii) the legislated OELs that are in place; and

(iii) the duties of persons who are likely to be exposed to an HCA, as contemplated in

regulation 4;

- (b) details of the HCAs to which the employee is likely to be exposed at the workplace, including—
- (i) the names of the HCAs and where they may be found in the workplace;
 - (ii) information on the potential harmfulness of the HCAs at the workplace; and
 - (iii) significant findings of the HCA exposure assessment, as required by regulation 5(2);
- (c) information on how to access the relevant SDSs;
- (d) the information that each part of an SDS provides;
- (e) the information that each part of the label on containers provides and why the information is being provided;
- (f) the work practices and procedures that must be followed for the use, handling, storage, transportation, spillage and disposal of an HCA, in emergency situations, as well as for good housekeeping and personal hygiene;
- (g) the necessity of personal air sampling, biological monitoring and medical surveillance;
- (h) the need for engineering controls and how to use and maintain them;
- (i) the need for personal protective equipment, including respiratory protective equipment, and its use and maintenance;
- (j) the precautions that must be taken by an employee to protect themselves against health risks associated with exposure, including wearing and using protective clothing and respiratory protective equipment; and
- (k) the necessity, correct use, maintenance and potential of safety equipment, facilities and Engineering control measures provided.

(3) An employer must give written instructions of the procedures to be followed in the event of spillages, leakages or any similar emergency situations to the drivers of vehicles transporting an HCA.

(4) As contemplated in section 37(2) of the Act, the employer and mandatary must agree in

writing to the arrangements and procedures between them to ensure compliance by the mandatory with information, instruction and training requirements specified in regulation 3.



DUTIES OF PERSONS EXPOSED TO HAZARDOUS CHEMICAL AGENTS (SO1/AC3)

Exposure to chemicals commonly used in workplaces can lead to a variety of short- and long-term health effects such as poisoning, skin rashes and disorders of the lung, kidney and liver.

The following occupations are considered a risk of exposure to hazardous substances:

Welders, garage and engineering workers, through paints, solvents, oils and grease, exhausts and other fumes. Construction trades workers, through exposed to fumes and dusts and specific hazards such as lead and asbestos.

First Aid: Chemical Exposure

Stop the source. Remove the victim from contact with the chemical spill, airborne particles, or fumes.

Clear the lungs. Take the victim to fresh air.

Flush the eyes. Flush the affected eye with water for at least 15 minutes.

Clean the skin.

Every person who is or may be exposed to an HCA must obey a lawful instruction given by or on behalf of the employer or self-employed person regarding—

- (a) HCA release prevention;
- (b) the wearing of personal protective equipment;
- (c) the wearing of monitoring equipment to measure personal exposure;
- (d) reporting for health evaluations and biological tests as required by these regulations;
- (e) the cleaning up and disposal of materials containing an HCA;
- (f) housekeeping at the workplace, personal hygiene and environmental and health practices;
- (g) Information, instruction and training as contemplated in regulation 3.



THE PROCESS TO ASSESS EXPOSURE TO HCA

(SO1/AC4)

(1) An employer or self-employed person must, after consultation with the relevant health and safety representative or relevant health and safety committee, cause an assessment to be made immediately, and thereafter at intervals not exceeding two years, to determine if any employee may be exposed by any route of intake.

(2) The employer must inform the relevant health and safety representative or relevant health and safety committee in writing of arrangements made for the assessment contemplated in subregulation (1), give them reasonable time to comment thereon, and ensure that the results of the assessment are made available to the relevant representative or committee who may comment thereon.

(3) When making the assessment, the employer or self-employed person must keep a record of

the assessment and take into account such matters as—

- (a) the HCA to which an employee may be exposed;
- (b) the effects the HCA may have on an employee;
- (c) where the HCA may be present, and the physical form in which it is likely to exist;
- (d) the route of intake by which, and the extent to which, an employee may be exposed; and
- (e) the nature of the work process, and any reasonable deterioration in, or failure of, control measures.

(4) If the assessment made in accordance with subregulation 3 indicates that any employee may be exposed, the employer must ensure that monitoring is carried out in accordance with the provisions of regulations 6 and 7, and that the exposure is controlled as contemplated in regulation 10.

(5) An employer or self-employed person must immediately review the assessment required by subregulation (1) if—

- (a) there is reason to suspect that the previous assessment is no longer valid; or
- (b) there has been a change in a process involving an HCA or in the methods, equipment or procedures for the use, handling, control or processing of the HCA, and the provisions of sub-regulations (2) and (3) will apply

AIR MONITORING PROGRAMS

(SO1/AC5)

Monitoring environmental conditions in the workplace is an important tool in assessing potential hazards or exposures to various chemical compounds, biological agents and physical parameters.

Air sampling is the process of capturing some aspect of the air or a portion of the environment. The environment can be either an outdoor area or a smaller enclosed space.

There are a number of reasons to conduct air sampling or air monitoring. The overriding reason to monitor and conduct assessments is to evaluate the potential hazards in the workplace air as part of a comprehensive health and safety program. Based on the specifics of the environment, monitoring might include assessing exposure to chemical compounds, biological agents (such as fungi or molds, anthrax (a highly infectious, often fatal, bacterial disease of mammals, especially cattle and sheep, that is transmissible to humans and causes skin ulcers), or dust mites or

physical characteristics of the environment (such as temperature, humidity or airflow). These various chemical compounds, biological agents or physical characteristics will be referred to in this guide as "agents or characteristics."

The primary reasons to monitor are:

- Evaluate compliance with regulations and laws
- Estimate exposure for protection of staff
- Estimate exposure for protection of the public
- Estimate concentration for protection of collections, objects
- Estimate effectiveness of ventilation or other contaminant controls

The decision to monitor can be based on a number of issues, including those listed above, and may take other reasons or factors into account. If there is a reasonable chance that conditions or concentrations will exceed occupational exposure levels—such as the Permissible Exposure Level (PEL) published by the Occupational Safety and Health Administration (OSHA)—there is an obligation under the OSHA regulation to evaluate the conditions, and this is routinely done by monitoring the air.

A workplace evaluation normally begins with a close look at the operations, especially the materials or products used in the immediate workplace, adjacent areas and the immediately surrounding area. This evaluation may include a review of processes, equipment used, chemicals or products used (which often calls for a review of safety data sheets or SDSs), and other factors affecting the workplace environment.

The evaluation could consist of the following steps:

1. Determine the agents or characteristics that will be monitored. E.g. is the stressor a chemical and/or biological hazard
2. Obtain the sampling and analytical methods available for this stressor.
3. Once the sampling method is determined, the sampling strategy should be designed. Designing a sampling strategy is discussed below.
4. Conduct the sampling, survey, or monitoring.
5. Analyse samples

6. Interpret sampling results.

7. Make recommendations or implement controls, based on the results.

8. Document the assessment and results of the analyses.

(1) Where the inhalation of an HCA is concerned, an employer contemplated in regulation 5(4) must ensure that the measurement programme of the airborne concentrations of the HCA to which an employee is exposed, is—

(a) carried out in accordance with the provisions of these regulations;

(b) carried out only after the relevant health and safety representative or relevant health and safety committee has been informed thereof and given a reasonable opportunity to comment thereon;

(c) carried out by an approved inspection authority; and

(d) representative of the exposure of an employee to the airborne HCA in accordance with the provisions of subregulation (2).

(2) In order to comply with the provisions of subregulation (1)(d), an employer must—

(a) ensure that the measurement programme, in the case of a group measurement, makes provision for the selection of the number of persons for a sample to be done as contemplated in Chapter 3 and 4 and Technical Appendix A of the OESSM: Provided that such sample size must be chosen for the top 10% of the group at the 95% confidence level for an HCA with a control limit, and for the top 10% of the group at the 90% confidence level for an HCA with a recommended limit; and

(b) subject to the criteria contained in regulation 6(1), carry out representative measurements at least every 24 months for an HCA with an OEL-ML or an OEL-RL as listed in Table 2 or 3 of Annexure 2.

SPECIFIC OUTCOME 2

METHODS IN PREVENTING EXPOSURE TO HAZARDOUS SUBSTANCES

PREVENTATIVE MEASURES

(SO2/AC1)

The first defense in preventing employee exposure to hazardous chemical solvents is prevention. Any company utilizing dangerous chemical solvents should have a written handling and disposal procedure for each chemical solvent.

- Provide the appropriate ventilation to remove concentrations of the chemical solvent in the air.
- Provide employees with respiratory protection when necessary to eliminate exposure risk.
- Create and utilize a detailed processing, handling and storage procedure for all chemical solvents used within the workplace.
- Store all chemicals properly to reduce exposure and utilize both normal and emergency use policies for those chemical solvents within the workplace.
- Utilize sound workplace practices and techniques to limit employee exposure. This should include both process and maintenance related activities, especially, since maintenance-related exposures constitute a higher portion of employee exposures than typical processing.

All of these preventive measures can be employed within the workplace regardless of the chemical solvents used.

MATERIALS HANDLING AND STORAGE

(SO2/AC2)

an employer must—

- (i) ensure that an HCA that is used, handled or stored at the workplace is correctly labelled;
- (ii) ensure that a container labelled for an HCA is used for only the use, handling or storage of that HCA;
- (iii) as far as is reasonably practicable, ensure that when an HCA is transferred or decanted at the workplace, from its original container into a destination container, the destination container is correctly labelled for that HCA; and

(iv) ensure that an HCA within pipework is identified by a label or sign or in any other suitable manner, on or near the pipework, subject to the following:

- (aa) Where the product is a mixture of two or more HCAs, the intermediate or finished product name may be used for identification;
- (bb) sampling, loading points or any other termination point of a pipe, where during normal operations an employee may be exposed to an HCA, must be identified; and
- (cc) pipework, including the splitting of flanges, where an employee may be exposed during routine maintenance activities, should be identified as far as is reasonably practicable.

Hazardous Materials Safety Guide

CLASS	STORAGE	HAZARD	PPE's
 Flammable	Separate Storage	Ignite Easily and Burn Rapidly	  
 Corrosive	Store Away From Flammables, Reactives and Health Hazards	Causes Tissue Damage on Contact	  
 Reactive	Store Away From Corrosives, Health Hazards and Flammability Hazards	Reacts Violently with Air, Water and Other Substances	  
 Health Hazard	Secure Storage in Well Ventilated Stockroom	Toxic if Inhaled, Ingested or Absorbed Through The Skin	  
Non Hazardous	Secure Storage in Well Ventilated Stockroom	Presents No More Than a Moderate Hazard	Supervisor's Discretion
 Particularly Hazardous Substances	Carcinogens, Highly Toxic Chemical, and Reproductive Toxins Require Special Precautions. <ul style="list-style-type: none"> • Develop Standard Operating Procedures (SOPs). • Establish a Designated Work Area. • Use PPEs and Fume Hoods to Control Exposure. • Establish Decontamination and Emergency Response Procedures. 		

MEDICAL SURVEILLANCE AND CONTROL MEASURES

(SO2/AC3)

- (1) An employer must ensure that an employee is under medical surveillance if—
- (a) the employee may be exposed to an HCA listed in Table 4 of Annexure 2;
 - (b) the exposure of the employee to any chemical agent hazardous to his or her health is such that an identifiable disease or adverse effect to his or her health may be related to the exposure, there is a reasonable likelihood that the disease or effect may occur under the particular conditions of his or her work, and there are techniques to diagnose indications of the disease or the effect as far as is reasonably practicable; or
 - (c) the occupational health practitioner recommends that the relevant employee should be under medical surveillance, in which case the employer may call on an occupational medicine practitioner to ratify the appropriateness of such recommendation.
- (2) In order to comply with the provisions of subregulation (1), the employer must, as far as is reasonably practicable, ensure—
- (a) that an initial health evaluation is carried out by an occupational health practitioner immediately before or within 14 days after a person commences employment, where any exposure exists or may exist, which comprises—
 - (i) an evaluation of the employee's medical and occupational history;
 - (ii) a physical examination; and
 - (iii) any other essential examination which, in the opinion of the occupational health practitioner, is desirable in order to enable the practitioner to do a proper evaluation;
 - (b) that, subsequent to the initial health evaluation contemplated in paragraph (a), the relevant employee undergoes examinations as contemplated in paragraph (a)(ii) and (iii), at intervals not exceeding two years or at intervals specified by an occupational medicine practitioner.
- (3) An employer may not permit an employee, who has been certified unfit for work by an occupational medicine practitioner, to work in a workplace or part of a workplace in which he or she would be exposed:

Provided that the relevant employee may be permitted to return to work which will expose him or

her, if he or she is certified fit for that work beforehand by an occupational medicine practitioner.

(4) The employer must record and investigate the incident contemplated in subregulation (3) in compliance with regulation 8 of the General Administrative Regulations.

RECORD KEEPING

(SO2/AC4)

An employer must—

- (a) keep records of the results of all assessments, air monitoring, and medical surveillance reports required by regulations 5, 6 and 7, respectively: Provided that personal medical records may be made available to only an occupational health practitioner;
- (b) subject to the provisions of paragraph (c), make the records contemplated in paragraph (a), excluding personal medical records, available for inspection by an inspector;
- (c) allow any person, subject to the personal written consent of an employee, to peruse the records with respect to that particular employee;
- (d) make the records of all assessments and air monitoring available for perusal by the relevant health and safety representative or relevant health and safety committee;
- (e) keep all records of assessments and air monitoring for a minimum period of 30 years;
- (f) if the employer ceases activities, hand over or forward all records by registered post to the relevant regional director; and
- (g) keep, for at least three years, a record of the investigations and tests carried out in terms of regulation 12(b) and of any repairs resulting from these investigations and tests

SPECIFIC OUTCOME 3

THE CLASSIFICATION, PHYSICAL STATE, HEALTH EFFECTS AND DISPOSAL METHODS

CLASSES AND PHYSICAL STATE OF HAZARDOUS SUBSTANCES

(SO3/AC1)

Not all hazardous chemicals belong to dangerous goods and not all dangerous goods are hazardous chemicals

Dangerous goods or more known as hazardous materials such as solids, liquids, or gases that can harm people, other living organisms, property or the environment. Any goods listed in the dangerous goods list or meeting dangerous goods classification criteria for 9 classes will be regarded as dangerous goods.

- CLASS 1** Explosive's
- CLASS 2** Gases
- CLASS 3** Flammable Liquids
- CLASS 4** Flammable Solids
- CLASS 5** Oxidizing Substances
- CLASS 6** Toxic & Infectious Substances
- CLASS 7** Radioactive
- CLASS 8** Corrosives
- CLASS 9** Other Substances & Articles

Hazardous chemicals: Generally speaking, hazardous chemicals refer to substances or mixtures that may pose harm to facilities / property, human health and the environment. Any substance or mixtures meeting the GHS classification criteria are divided into three major groups – health, physical and environmental.

GHS (Globally Harmonized System of Classification and Labelling of Chemicals) in South Africa

The Hazardous Chemical Substance Regulations under the Occupational Health and Safety Act require that manufacturers, importers and suppliers of hazardous chemical substances for use at workplace provide free safety data sheets that are compliant with ISO 11014 or national standards.

GHS covers all hazardous chemicals and may be adopted to cover chemicals in the workplace, transport, consumer products, pesticides and pharmaceuticals. The target audiences for GHS include workers, transport workers, emergency responders and consumers.

Category	Standards
Classification and Labelling	SANS 10234-2008-A: List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)
Safety data sheets	Standard 16-section SDSs. SANS 11014:2010 Safety data sheet for chemical products - Content and order of sections

CATEGORIES OF HAZARDOUS SUBSTANCES

(SO3/AC2)

Hazardous chemicals are substances that can cause adverse health effects such as poisoning, breathing problems, skin rashes, allergic reactions, allergic sensitisation, cancer, and other health problems from exposure.

Classifications of substances hazardous to health:

- Chemicals
- products containing chemicals
- fumes
- dusts
- vapours
- mists
- gases and asphyxiating (suffocating) gases

- biological agents (germs)



DISPOSAL OF HAZARDOUS CHEMICAL AGENTS

(SO3/AC3)

An employer must, as far as is reasonably practicable—

- (a) recycle all HCA waste;
- (b) ensure that all HCA waste is classified and disposed of as waste in terms of the following legislation:
 - (i) The Waste Classification and Management Regulations, 2013, published as Government Notice No. R. 634 of 23 August 2013; and
 - (ii) the National Norms and Standards for the Assessment of Waste for Landfill Disposal, published as Government Notice No. R. 635 of 23 August 2013; and
- (c) ensure that all collectable HCA waste is placed in containers that prevent the likelihood of

exposure during handling;

- (d) ensure that all vehicles, reusable containers and covers, which have been in contact with HCA waste, are cleaned and decontaminated after use in such a way that the vehicles, containers or covers do not cause a hazard inside or outside the premises concerned;
- (e) ensure that all employees occupied in the collection, transport and disposal of HCA waste, who may be exposed to that waste, are provided with suitable personal protective equipment; and
- (f) ensure that if the services of a waste disposal contractor are used, a provision is incorporated into the contract stating that the contractor must also comply with the provisions of these regulations.

RISK ASSESSMENT FOR STORAGE AND HANDLING HAZARDOUS CHEMICALS (SO3/AC4)

Managing the risk: - To manage the risk, it is necessary to know the potential hazards and the probability of occurrence the hazardous event. Manage the risk as follows; these are also called 4 T's of managing the risk. (Treat, transfer, Tolerate and Terminate)

1. You live with the low risk activities. (Tolerate)
2. Manage the medium risk activities, by suitable control and mitigation measures. (Treat)
3. Avoid or eliminate high risk activities or transfer them somewhere else (Terminate or Transfer)

.EXAMPLE –

Task/Activity	Hazard Identification	Access the Risk
Transportation of raw material and chemicals	Spillage of material during transportation	Exposure of the liquid chemical can cause injuries and burn. Especially acetic acid, Pyridine, Hydrochloric acid etc. The liquid material spillage can cause land pollution, air pollution due to

		spread of vapors of the chemicals
Storage of raw material and finished product	Spillage of material during handling. The material may catch fire as some chemicals like Pyridine, Ethanol are flammable Health risks in case of contact with material.	Exposure to toxic vapors and fumes. Health risk to workers Risk of catching fire
Disposal of solid and hazardous waste like packing material and used chemical drums.	Exposure to toxic remains of material. Injury while handling solid and hazardous waste drums	Health effect and minor injury
Storage and handling of finished goods.	Chances of spillage while transferring from reactor to storage drum or container. Chances of accident while transporting the goods.	Injury to workers. Health risks are also involved.

The following precautions are taken and safety procedures are to be followed to prevent any incidents.

- The toxic and hazardous chemicals are stored separately and in well covered storage shed to protect them from direct sunlight.
- The area is well ventilated to keep the concentration level of toxic chemicals well below the PEL Values. (permissible exposure)
- Compatibility is taken care while deciding storage location of individual chemicals. The flammable chemicals are stored away from oxidizing chemicals like hydrogen peroxide and nitrates.
- The SDS of all the chemicals stored are available at the point of use, and the people are trained in SDS.

- Sufficient Number of fire extinguishers is available in the storage area. All the staffs in the area is well trained in fire-fighting as well as first aid.
- Safety shower and eyewash is readily available near the storage area and periodic inspection/ testing is done to keep them in working at all the times.
- First aid box is available in the stores.
- The storage stock level of highly hazardous chemicals is maintained minimum to keep the hazard level low.
- Sufficient stock of emergency PPEs like canister mask, escape mask, breathing suit is maintained and all people working in the stores are well trained in the use of these safety PPEs.
- All chemical storage containers are well marked identified with name label and other GHS hazardous symbols and Pictograms are followed.
- People are required to take a bath if they are exposed to toxic chemical
- A separate lunch room is provided to the workers as to avoid any remote chance of food getting contaminated with toxic chemical. People are advised to wash their hands thoroughly before taking lunch or tea.
- All the transfer operations are mechanised as far as possible.
- All the electrical fittings are in the stores in operation area are flameproof.
- As the operations are done in closed manner, it is transferred using pump in order to avoid spillage.
- The reactor controls are made automatic as far as possible and there is high temperature and high level alarms are fitted on the reactor.
- Smoking is strictly prohibited in the factory premises.
- Nobody is allowed to carry any lighter or match box inside the factory premises in order to control the source of ignition and avoid the fire.

See attached SDS for petrol which will be discussed with this section

SAFETY DATA SHEETS (SDS) - The GHS SDS has 16 sections in a set order, and minimum information is prescribed.

- **Hazard Statement** – This hazard statement would appear both on the label and on the SDS.
- **Precautionary Statement** – These statements are standardized phrases that describe the recommended steps to be taken to minimize or prevent adverse effects from exposure to or resulting from improper handling or storage of a hazardous product.
- **Signal word** – There are two signal words used by the GHS – Danger and Warning. These signal words are used to communicate the level of hazard on both the label and the SDS. The appropriate signal word to use is set out by the classification system. Category 1 is dangerous while category 2 is a warning.
- **Pictogram** – refers to the GHS symbol on the label and SDS. Not all categories have a symbol associated with them.
- **Class** – Class is the term used to describe the different types of hazards. For example, Gases under Pressure is an example of a class in the physical hazards group.

GHS hazard groupings

There are three major hazard groups:

- Physical hazards.
- Health hazards.
- Environmental hazards.

Within each of these hazard groups there are *classes* and *categories*.

Classes within the Health hazard group

Criteria for classifying chemicals have been developed for the following health hazard classes:

- Acute toxicity.
- Skin corrosion/irritation.
- Serious eye damage/eye irritation.
- Respiratory or skin sensitization.

- Germ cell mutagenicity.
- Carcinogenicity.
- Reproductive toxicity.
- Specific target organ toxicity - single exposure.
- Specific target organ toxicity - repeated exposure.
- Aspiration hazard.

Classes within the Physical hazard group

Criteria for classifying chemicals have been developed for the following physical hazard classes:

- Explosives.
- Flammable gases.
- Aerosols.
- Oxidizing gases.
- Gases under pressure.
- Flammable liquids.
- Flammable solids.
- Self-reactive substances and mixtures.
- Pyrophoric liquids.
- Pyrophoric solids.
- Self-heating substances and mixtures.
- Substances and mixtures which, in contact with water, emit flammable gases.
- Oxidizing liquids.
- Oxidizing solids.
- Organic peroxides.
- Corrosive to metals.

Classes within the Environmental hazard group

Criteria for classifying chemicals have been developed for the following environmental hazard classes:

- Hazardous to the aquatic environment (acute and chronic).
- Hazardous to the ozone layer.

Respirator zone

An employer must ensure—

(a) that any workplace or part thereof under his or her control, where the concentration of an HCA in the air is or may be such that the exposure of an employee working in that workplace exceeds the restricted limit without the wearing of respiratory protective equipment, is zoned as a respirator zone;

(b) that a respirator zone is clearly demarcated and identified by a notice indicating that the relevant area is a respirator zone and that personal protective equipment as contemplated in regulation 11 must be worn there; and

(c) that no person enters or remains in a permanent respirator zone unless he or she is wearing the required personal protective equipment.

Personal protective equipment and facilities

(1) If it is not reasonably practicable to ensure that the exposure of an employee is adequately controlled as contemplated in regulation 10, the employer must—

(a) in the case of an airborne HCA, provide the employee with suitable respiratory protective equipment and protective clothing; and

(b) in the case of an HCA which can be absorbed through the skin, provide the employee with suitable non-HCA impermeable protective equipment.

(2) Where respiratory protective equipment is provided, the employer must ensure—

- (a) that the relevant equipment is capable of controlling the exposure to below the OEL for the relevant HCA;
 - (b) that the relevant equipment is correctly selected and properly used;
 - (c) that information, instructions, training and supervision, which is necessary with regard to the use of the equipment, is known to the employee; and
 - (d) that the equipment is kept in good condition and efficient working order.
- (3) An employer must, as far as is reasonably practicable—
- (a) not issue any used personal protective equipment to an employee, unless the relevant protection equipment is decontaminated and sterilised;
 - (b) provide separate containers or storage facilities for personal protective equipment when not in use; and
 - (c) ensure that all personal protective equipment not in use is stored in only the place provided therefor.
- (4) An employer must, as far as is reasonably practicable, ensure that all contaminated personal protective equipment is cleaned and handled in accordance with the following procedures:
- (a) Where personal protective equipment is cleaned on the premises of an employer, care must be taken to prevent contamination during handling, transport and cleaning;
 - (b) where personal protective equipment is sent off the premises to a contractor for cleaning purposes, the equipment must be packed in impermeable containers;
 - (c) the impermeable containers must be tightly sealed and must have a clear indication thereon that the contents thereof are contaminated; and
 - (d) the relevant contractor must be fully informed of the requirements of these regulations and of the precautions that must be taken for handling contaminated personal protective equipment.
- (5) Subject to the provisions of subregulation (4)(b), an employer must ensure that no person removes dirty or contaminated personal protective equipment from the premises: Provided that where contaminated personal protective equipment has to be disposed of, it is treated as HCA waste as contemplated in regulation 15.

(6) Subject to the provisions of the Facilities Regulations, an employer must, where reasonably practicable, provide an employee who is using personal protective equipment, as contemplated in subregulation (1), with—

(a) adequate washing facilities, which are readily accessible and located in an area where the facilities will not become contaminated, in order to enable an employee to meet a standard of personal hygiene consistent with the adequate control of exposure, and to avoid the spread of an HCA;

(b) two separate lockers, separately labelled "protective clothing" and "personal clothing", and ensure that the clothing is kept separately in the locker concerned; and

(c) separate "clean" and "dirty" change rooms if the employer uses or processes an HCA to the extent that the HCA could endanger the health of persons outside of the workplace.

PROHIBITIONS

No person may, as far as is reasonably practicable—

(a) use compressed air or permit the use of compressed air to remove particles of an HCA from any surface or person;

(b) smoke, eat, drink or keep food or beverages in a respirator zone or permit any other person to smoke, eat, drink or keep food or beverages in that zone;

(c) use statements such as "non-toxic", "non-harmful", "non-polluting" or "non-hazardous" or similar statements indicating the HCA as not hazardous, or any other statements that are inconsistent with the HCA's GHS classification on the label or packaging of any HCA; and

(d) Manufacture, procure, use, handle or store within the workplace—

(i) a prohibited HCA as listed in Table 1 of Annexure 2;

(ii) ozone-depleting substances provided for in the Regulations regarding the Phasing-Out and Management of Ozone Depleting Substances, published as Government Notice No. R. 351 of 8 May 2014; and

(iii) persistent organic pollutants prohibited by the Prohibition on the Import, Export, Possession, Acquisition, Sale, Use and Disposal of Agricultural Remedies, under

section 7 of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947), published as Government Notice No. R. 862 of 29 July 2016.

Offences and penalties

STAATSKOERANT, 29 Maart 2021 No. 44348 33

Any person who contravenes or fails to comply with any provision of regulation 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,14, 14A, 14B, 14C or 14D shall be guilty of an offence and liable on conviction to a fine or to imprisonment for a period not exceeding six months and, in the case of a continuous offence, to an additional fine of R500 for each day on which the offence continues or additional imprisonment of one day for each day on which the offence continues: Provided that the period of such additional imprisonment shall in no case exceed 90 days.