**Glasgow City Council**

**EDUCATION SERVICES**

**Technician Support Service**



**Technician Guidance Sheet TGS/16a**

Chemicals, Hazardous Substances or Equipment: Storage & Transportation

**Issued by: Technician Support Service**

**Date: September 2009**

**Revised October 2014**

**Role of the Senior Support Service Technician**

**Objectives:** The objective of this Guidance Sheet is to instruct Senior Support Service Technicians and Support Service Technicians in the management of storage and transportation of chemicals and hazardous substances or equipment.

**Persons responsible:** Senior and Support Service Technicians

The Senior Support Service Technician is responsible for coordinating and planning all the requests and demands for technician support, equipment and resources. This includes ensuring that equipment is used to its full potential and is properly and efficiently managed throughout the whole school.

The Senior Support Service Technician is responsible for organising and monitoring the duties of the Support Service Technician team, allowing time for unforeseen demands and factoring in time for medium and long term projects.

# Science Safety File (Code of Practice)

# The above code of practice indicates the following pertaining to all the staff concerned, found in section 2 of the Science Safety File (2.1-2.2).

# RESPONSIBILITIES

Responsibilities of staff in Secondary schools for the implementation of the Code of Practice are as described in the management standard Responsibility for Health, Safety and Welfare in the Education Service MSF/5, section 9

(i) Head of school or Head Teacher

(ii) Head of Department/Head of Faculty/Senior Support Service Technician

(iii) Teacher/Support Service Technician

Although specific responsibilities have been allocated to particular categories of staff it is incumbent upon every employee to take all reasonable steps to ensure the health and safety at work of themselves and others.

**Resource Managers**

The Support Service Technician team should ensure that all the resources, within their control, are safely stored, regularly maintained and available for use as required throughout the school.

It is the responsibility of the Senior Support Service Technician to ensure that a robust resource management system is agreed, communicated and implemented throughout the school. This is particularly necessary within the science department where the range of resources can include; hazardous chemicals and apparatus, expensive equipment and vulnerable materials (i.e. items which can be subject to serious misuse or pilfering).

As well as constructing, presenting and assembling the materials safely as required, it is the role of the technician to ensure the safe delivery and retrieval of equipment and resources.

**Methods of Transportation**

**Delivery and retrieval from the laboratory**

Whilst it is not always possible to deliver all equipment just prior to the lesson or to visit every practical room at the end of a period to remove equipment, technicians should plan and prioritise the daily delivery and removal of hazardous chemicals, dangerous apparatus, expensive equipment and vulnerable materials (i.e. items which can be subject to serious misuse or pilfering) in order to limit the amount of time these materials are left unattended or unsupervised.

* Schools should ensure that all staff are aware of which materials are subject to this type of delivery system.
* Certain items tend to be attractive to pupils e.g. syringes, scalpels, magnets, lenses, needles etc. It is prudent to ensure that any missing items are reported to the class teacher prior to the class being dismissed, as this will allow a careful and thorough search to be undertaken.
* If a hazardous substance or equipment has to be left in an unoccupied laboratory the door(s) must be kept locked at all times.
* It is essential that an agreed system is in place for reporting any shortages and that all staff (teachers and technicians) are aware of the local arrangements and adhere to them as agreed at the establishment level.

**General Laboratory Equipment**

* General laboratory equipment may be issued to the laboratory on a semi-permanent basis. Such items of equipment do not require to be removed from the laboratory on a daily basis.

* A system of checking numbers and the operational status of the equipment concerned should be undertaken at suitable intervals.

**Stock Chemicals**

* Large containers of chemicals, and stock bottles, should never be issued to the laboratory. Contents of large stock containers should be decanted into smaller bottles and jars, as required.
* Each container should be labelled with the chemical name of its contents and appropriate hazard warning label.

**General Storage of Chemicals**

*“Substances must be stored in such a way as to minimise possible hazards and in quantities which ensure a fairly rapid turnover. Deliberate limiting of stock will assist in keeping storage problems to a minimum.” Science Safety File Section 9.7*

*Access to storage areas shall be restricted to authorised persons only. Storage area door(s) should be locked and labelled with the prohibition sign “NO UNAUTHORISED PERSONS ALLOWED BEYOND THIS POINT” Science – Safety File Section 9.16*

These notes are for general guidance only, and particular attention should be paid to the information regarding storage on [SSERC Hazardous Chemicals](http://www.sserc.org.uk/index.php/chemistry-health-a-safety138) and the manufacturers’ data sheets for each chemical.

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| **Chemical Store** | * Restricted Access (Technicians & Teachers) * **Must be** kept locked at all times * Hazard warning sign “**No Unauthorised Persons Allowed Beyond This Point”** |
| **Chemical Stock List/Inventory** | * All mandatory fields on the chemical database must be completed * New stock **must be** added to chemical inventory within **2 days** of arrival * Stock check **must** be carried out annually * When a container is emptied in day to day usage, the technician who finishes the container should mark up the entry on the database as consumed i.e. Current Stock value should be marked as Zero * Chemicals **must be** deleted from chemical inventory **2 days** after being consumed or on removal from school |
| **Date Stamping/Labelling** | * All chemicals must be date stamped on arrival |
| **Clear Labelling** | * Chemicals should be clearly labelled * Old/worn labels should be replaced * All containers should be clearly labelled with appropriate hazard warning label(s) |
| **Chemicals which must not be used within schools** | * Chemicals listed in SSERC hazardous chemicals banned list should **never** be used in schools * Where chemicals listed in SSERC restricted list are kept in schools, attempts to use a safer alternative should be made   Reference should be made to the following documents:  [SSERC Hazardous Chemicals](http://www.sserc.org.uk/index.php/chemistry-health-a-safety138)  *Topics in safety 3rd Edition - ASE*  *Safeguards in the school laboratory 11th Edition - ASE*  *Be Safe 4th Edition, Health and Safety in Primary School Science and Technology – ASE* |
| **Shelving** | * Avoid weight overloading of shelves * Avoid overcrowding of shelves * Shelving units within the department should be regularly checked for signs of damage or corrosion and any damage reported to the Senior Support Service Technician |
| **Transporting Chemicals** | * Winchester and bottle carriers must be used as and when appropriate |
| **Spillage Kits** | * Spillage kits should be available * Manufacturers’ instructions on usage should be available |
| **Compressed Gases** | * Do not store in Chemical Store or Classroom * Cylinders must be stored and transported in trolleys provided for this purpose   Entry Door(s) to storage area(s) must be labelled with “**Compressed Gases**” safety sign - *See Science Safety File COP Appendix 4*   * For ease of handling only cylinders H655-940mm, W140 -176mm or cylinders of an equivalent size should be held within schools * Access to cylinder keys should be restricted to authorised staff * Cylinder and valve condition must be checked at least once per term and immediately before and after use * Formal recording of the above checks should be made using the record card provided for this purpose (TGS/10) * A leak test must be carried out annually and at any time where a leak is suspected (TGS/10) * Gas Regulators must be inspected and certified for use every 5 years – for a maximum 15 years, after which they must be replaced (Arranged by TSS) * Sulphur dioxide cylinders must not, as far as is practicable, be stored in close proximity to corrosive substances |
| **Bromine** | * Stocks kept to a minimum * Bromine liquid should only be purchased and stored in the form of 1ml or 2ml vials of concentrate no open bottles of bromine are permitted |
| **Poisonous Substances** | * Poisons may be stored in a chemical store with restricted access * If stored in a “poison cabinet”, the cabinet must be locked at all times * The storeroom door or cabinet must be labelled with “**Poison**” safety sign   *See Science Safety File COP Appendix 4* |
| **Flammable Liquids** | * Must be stored within lockable flammable liquid cabinets (FLC’s) * FLC’s can store no more than 50 Litres aggregated of flammable liquid within any one room * FLC’s must be kept locked at all times and keys removed immediately after use * FLC’s keys must not be stored where they can be accessed by unauthorised persons * Stocks of flammable liquids should be kept to the minimum required * No container of flammable liquid greater than 500ml should be allowed in any laboratory * Flammable liquids should be returned to secure storage immediately after use * Flammable liquid cabinets must display a “**Flammable Liquids**” warning sign   The entry door(s) to the storage area(s) should also be labelled “**Fire Risk**” - *See Science Safety File COP Appendix 4* |
| **Alkali Metal or Phosphorus**  **Storage**  **Record Keeping**  **Alkali Metals cont**  **Issue and Use**  **Disposal** | * Phosphorus should be stored in a separate area from alkali metals and flammable liquids * Bottles containing alkali metals (sodium, lithium or potassium) or phosphorus should be stored within sturdy non combustible compartmentalised containers to ensure that the bottle remains upright * Both the bottle and the container should be clearly labelled with the name of the substance, name of immersion liquid to be used and either a “water reactive” or “air reactive” warning sign, whichever is appropriate * No more than 10g of alkali metal or 25g of phosphorus should ever be purchased at any one time in order to minimise the amount held * Individual record cards should be kept for each alkali metal/phosphorus container * Any new consignment of alkali metal/phosphorus should be checked for condition and immersion levels before addition to chemical inventory – good condition should not be assumed * Alkali metal and phosphorus checks must be made and recorded 3 times per year during the months of September, January and May * Pass conditions should be as follows: * Immersion level requires alkali metals and phosphorus to be fully submerged, (lithium will float) * Condition of metal requires alkali metals to show no excessive oxidation or deterioration from previous check * Immersion liquid levels must be visually inspected immediately before and after issue * Alkali metals should be “freshly cut” before use (Only freshly cut pieces approximately the size of a grain of rice, should be used) * Where a teacher requests alkali metal to demonstrate the oxidisation of a freshly cut surface only minimal amount should be issued * There should only be enough for class use issued * Stock bottles should **never** be issued * Alkali metals must be delivered and collected at the beginning and at the end of a period directly to the teacher requesting. This will allow any necessary security checks to be undertaken prior to the class being dismissed. * Alkali metals/phosphorus must **never** be left unattended in classrooms * Disposal of small quantities of alkali metals and phosphorus left over from class demonstrations should always be in accordance with SSERC guidelines * Disposal of alkali metals and phosphorus past their use by date or short safe shelf life must be disposed of by special uplift |
| **Corrosive Substances (liquids –acid/alkali)** | * Acids and alkalis should be stored as far apart from each other as practicable * Containers should be stored at low level, placed in containment trays and kept separate from flammable substances * Where substances are stored at floor level a “kick board” must be fitted to prevent accidental damage and resultant spillage |
| **Oxidising Agents** | * Oxidising agents should be stored separately from combustible materials; separate storage could consist of separate areas within the one store   The entry door to the storage area should be labelled **“Oxidising Agent” -** *See Science Safety File COP Appendix 4* |
| **Chemicals stored in Fridges e.g. Biological Material** | * Fridges should be sited in an area where access is restricted * Fridge door should be labelled **“Biological Hazard”**   The entry door to the storage area should be labelled **“Biological Hazard” -** *See Science Safety File COP Appendix 4*   * No foodstuffs for human consumption are to be stored in fridges where chemicals or biological hazards are stored * All microbiological cultures should be disposed of after 1 year, this includes all subsequent subcultures * Stored biological materials and foodstuffs for practicals should be in separate sealed containers * All biological materials for storage should be dated * The refrigerator should be cleaned regularly and defrosted at least annually |
| **Radioactive Material** | * Schools **must not hold or use** the following items for radiological use: dismantled smoke alarms, old watches or aircraft instruments that glow in the dark, loose radioactive rocks, uranium or thorium salts or solutions, cloud chambers or sealed sources that have not been risk assessed by SSERC as suitable for use in schools * Radioactive sources should **not** be stored in a chemical storeroom or in the same room as flammable liquids * Sources must be stored in a lockable, steel cabinet which should be securely attached to the fabric of the building or to fitted furniture   The storage cabinet must display an “**Ionising Radiation”** pictogram warning sign, if the cabinet is located within a cupboard then the cupboard door must also display the warning pictogram however if the cabinet is located within a main room then the room door does not require to display the warning label; providing the cabinet labels are easily seen from a distance - *See Science Safety File COP Appendix 4*   * Gamma sources should be sited at the rear of the storage cabinet * Sealed sources should be kept within proper receptacles * The lockable steel cabinet must be fire resistant and capable of preventing exposure of the contents in the event of the building being destroyed by fire * The cabinet should have louvred ventilation * No other material, other than shielding or handling devices, must be stored within the locked cabinet – it must not be used a secure storage area for other items * Access should be restricted to authorised staff * The sources must not be stored “close” to a place where any one person works habitually, without any additional shielding this is usually interpreted as 1.5m for a pupil, 2m for a teacher and 3m for a technician. These distances are based on the amount of time each type of person is likely to spend at that distance * A logbook detailing use of the sources **must** be maintained |

**Bibliography**

Science Safety File – Code of Practice

Topics in Safety- ASE

SSERC



## Technician Support Service

## Science Code of Practice:

## Alkali Metals Record Card

## Lithium

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| **Inspection date** | **Immersion level**  **(paraffin)** | **Condition of metal** | **Quantity**  **(g)** | **Signature** | **Comments** |
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Record Cards should be completed using only **Pass** or **Fail** in the Immersion level and Condition of metal columns. **Pass** conditions should be as follows:

* Immersion liquid level should be sufficient to allow lithium to float
* Condition of metal requires alkali metal to show no excessive oxidation or deterioration from previous check

***Science Code of Practice 9.20***

*Bottles containing Alkali metals or phosphorus should be stored within separate sturdy non-combustible compartmentalised containers to ensure that the bottle remains upright. Both the bottle and lidded container should be clearly labelled with the name of the substance, name of the immersion liquid to be used and either a “water reactive” or “air reactive” warning sign, whichever is appropriate. “Water reactive” and “Air reactive” metals should not be stored in the same container. Immersion liquid levels should be checked at least once per term and immediately before use.*



## Technician Support Service

## Science Code of Practice:

## Alkali Metals Record Card

## Potassium

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| **Inspection date** | **Immersion level**  **(paraffin)** | **Condition of metal** | **Quantity**  **(g)** | **Signature** | **Comments** |
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***N.B Potassium must only ever be kept for a maximum of 2 years before disposal.***

Record Cards should be completed using only **Pass** or **Fail** in the Immersion level and Condition of metal columns. **Pass** conditions should be as follows:

* Immersion level requires alkali metal to be fully submerged
* Condition of metal requires alkali metal to show no excessive oxidation or deterioration from previous check

***Science Code of Practice 9.20***

*Bottles containing Alkali metals or phosphorus should be stored within separate sturdy non-combustible compartmentalised containers to ensure that the bottle remains upright. Both the bottle and lidded container should be clearly labelled with the name of the substance, name of the immersion liquid to be used and either a “water reactive” or “air reactive” warning sign, whichever is appropriate. “Water reactive” and “Air reactive” metals should not be stored in the same container. Immersion liquid levels should be checked at least once per term and immediately before use.*



## Technician Support Service

## Science Code of Practice:

## Alkali Metals Record Card

## Sodium

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| **Inspection date** | **Immersion level**  **(paraffin)** | **Condition of metal** | **Quantity**  **(g)** | **Signature** | **Comments** |
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Record Cards should be completed using only **Pass** or **Fail** in the Immersion level and Condition of metal columns. **Pass** conditions should be as follows:

* Immersion level requires alkali metal to be fully submerged
* Condition of metal requires alkali metal to show no excessive oxidation or deterioration from previous check

***Science Code of Practice 9.20***

*Bottles containing Alkali metals or phosphorus should be stored within separate sturdy non-combustible compartmentalised containers to ensure that the bottle remains upright. Both the bottle and lidded container should be clearly labelled with the name of the substance, name of the immersion liquid to be used and either a “water reactive” or “air reactive” warning sign, whichever is appropriate. “Water reactive” and “Air reactive” metals should not be stored in the same container. Immersion liquid levels should be checked at least once per term and immediately before use.*



## Technician Support Service

## Science Code of Practice:

## Alkali Metals Record Card

## Red Phosphorus

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| **Inspection date** | **Immersion level**  **(water)** | **Condition of phosphorus** | **Quantity**  **(g)** | **Signature** | **Comments** |
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Record Cards should be completed using only **Pass** or **Fail** in the Immersion level and Condition of phosphorus columns. **Pass** conditions should be as follows:

* Immersion level requires phosphorus to be fully submerged
* Condition of phosphorus requires phosphorus to show no excessive oxidation or deterioration from previous check

***Science Code of Practice 9.20***

*Bottles containing Alkali metals or phosphorus should be stored within separate sturdy non-combustible compartmentalised containers to ensure that the bottle remains upright. Both the bottle and lidded container should be clearly labelled with the name of the substance, name of the immersion liquid to be used and either a “water reactive” or “air reactive” warning sign, whichever is appropriate. “Water reactive” and “Air reactive” metals should not be stored in the same container. Immersion liquid levels should be checked at least once per term and immediately before use.*

## Technician Support Service

## Science Code of Practice:

## Alkali Metals Record Card

## White/Yellow Phosphorus



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| **Inspection date** | **Immersion level**  **(water)** | **Condition of phosphorus** | **Quantity**  **(g)** | **Signature** | **Comments** |
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Record Cards should be completed using only **Pass** or **Fail** in the Immersion level and Condition of phosphorus columns. **Pass** conditions should be as follows:

* Immersion level requires phosphorus to be fully submerged
* Condition of phosphorus requires phosphorus to show no excessive oxidation or deterioration from previous check

***Science Code of Practice 9.20***

*Bottles containing Alkali metals or phosphorus should be stored within separate sturdy non-combustible compartmentalised containers to ensure that the bottle remains upright. Both the bottle and lidded container should be clearly labelled with the name of the substance, name of the immersion liquid to be used and either a “water reactive” or “air reactive” warning sign, whichever is appropriate. “Water reactive” and “Air reactive” metals should not be stored in the same container. Immersion liquid levels should be checked at least once per term and immediately before use.*