

	<b>GTIIT_EHS_ISO file</b>	File No.: 文件编号：	GTIIT_EHS_03_08
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#### Approval process 审批过程

	Name 姓名	Title 职务	Signature 签名	Date 日期
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<b>Approved by</b> 批准人		Campus Safety Committee		

#### Reversion records 版本历史记录

Rev. No. 版本号	Publication date 出版日期	Rev. reason/ content modified 再版原因/更改内容
01	2019-11-01	New file 新建文件
02	2021-01-31	Update item 4.0 and 5.7 for the regular inspection period according to gas category 根据气体类别，更新定期检查期间的4.0和5.7项。
03	2022-06-28	Update the gas setting according to regulations and actual requirement 根据规定和实际需要更新气体设置
04	2023-05-01	Update the gas application and checking with blue font 使用蓝色字体更新气体应用和检查内容
05	2025-12-01	Regular renew 周期审阅更新

#### Relevant departments (select relevant departments with a “√”) 相关部门 (用√勾选相关部门)

Construction Dept. 校园建设部	√	Operation Dept. 校园运营部	√	Procurement Dept. 采购部	√
RIGS 研究创新和研 究生部	√	U.G. Dept. 本科教学部	√	I.T.Dept. 电脑信息部	√

#### Relevant documents 相关文件

No无

#### Distribution mode (black) 发放方式 (涂黑)

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Electronic edition ☒ Paper edition ☐  
 电子版 ☒ 纸版 ☐

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## 1.0 Purpose 目的

The purpose of this procedure is to ensure that the hazards associated with gas using are identified, discussed and all controlled measures have been put in place and acknowledged by those who perform the job related to gas using.

此程序的目的是为了确保作业人员识别并了解所有气瓶气体使用过程中的危险，并实施所有控制措施。

There are many types of Lab gases, including hydrogen, nitrogen, argon, chlorine, oxygen, carbon dioxide, compressed air, helium, and acetylene. They are usually stored in gas cylinders.

实验室用气种类较多，主要有氢气、氮气、氩气、氯气、氧气、二氧化碳、压缩空气、氦气及乙炔等，它们通常储存于气钢瓶内。

Some of these gases belong to combustible gas, combustion-supporting gas, toxic gas, etc. There are a lot of unsafe factors in the storage and use process, and the safe use and management of gas cylinders are required.

这些气体有些属于可燃气体、助燃气体、有毒气体等，在储存和使用过程中存在大量的不安全因素，需对气体钢瓶进行安全使用与管理。

## 2.0 Scope 范围

The provisions of this document apply to relevant Lab gas use departments and personnel within the GTIIT.

本文件规定适用于广东以色列理工学院内相关的实验室气体使用部门和人员。

## 3.0 Responsibilities 职责

### User units and department 使用单位及部门

- Responsible for the requisition of required gases.  
负责所需气体的申购。
- Responsible for daily pre-use inspection of gas cylinders and gas lines.  
负责气瓶及气体管路的日常使用前检查。
- Develop and train the operating procedures of gas cylinders and gas use.  
进行气瓶及气体使用操作程序的制定和培训。

### Operation Department 运营部

- Provide relevant technical requirements for gas cylinders and gas supply lines.  
提供对气瓶及供气管路的相关技术要求；

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- Responsible for the installation and maintenance of gas cylinders and gas lines.  
负责气瓶及气体管路的安装、维护保养。
- Responsible for the evaluation of the services of gas supply contractors and equipment installation and maintenance contractors.  
负责对供气承包商及设备安装、维护保养承包商服务的评估。

#### **Campus Construction Department 校园建设部:**

- Collecting information on the relevant requirements for laboratory gas supply lines.  
收集对实验室供气管路的相关需求信息；
- As a window for communication with labs, it is necessary to determine the information of all parties on the construction content, construction plan, construction cost and construction period.  
作为与实验室沟通的窗口，需要确定各方对施工内容，施工方案，以及施工费用和工期等信息；
- The CCD shall assist the school in the construction, renovation and training of gas circuits before they are put into use.  
建设部协助学校进行气路建设、改造和投入使用前培训等工作。
- Responsible for the construction and acceptance of lab gas supply piping installation projects.  
负责实验室供气管路项目的施工和竣工验收。

#### **Procurement Department 采购部:**

- Responsible for finding the qualified supplier for the procurement, installation and Operation of special equipment.  
负责找具有资质的供应商进行采购、安装、维护保养。
- Promptly return the product of illegal or unqualified supplier.  
对非法或不具有资质的供应商的产品应该及时退货。
- Responsible for the coordination and communication between user department and suppliers.  
负责使用部门与供应商之间的协调、沟通。

#### **EHSoffice 环境、健康卫生、安全办公室(简称：校园安全办公室):**

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- Responsible for the identification and evaluation of gas cylinder and giving reasonable advice.  
负责气瓶的辨识、评估，并提出合理化建议。
- Responsible for the outsourcing training and annual verification of gas cylinder operators.  
负责气瓶操作人员的委外培训、年审；
- Responsible for managing the special equipment operation certificate, building the management files and keeping records.  
负责特种设备操作证的证书的管理，建立管理档案，保存记录。
- The Campus EHS Office shall assist the school in the supervision of gas line abnormalities, daily training, and periodic testing.  
校园安全办公室协助学校进行气路异常情况处理、日常培训和定期检测等监督工作。
- Campus EHS Office assists the relevant departments in the inspection of installation effectiveness, provides appropriate gas safety training, and cover these piping into annual gas system inspection.  
校园安全办公室协助各个部门进行安装效果检查，提供相应的气体安全培训，并列入年度气路检查范围。
- Supervise gas using units or departments to improve the safety management and technical requirements of gas cylinder.  
督促气体使用单位、部门完善气瓶的安全管理，技术要求。
- Communicate and coordinate with government department of special equipment management.  
与当地特种设备主管部门的沟通、协调。
- When necessary, assist with gas cylinder safety training and publicity.  
必要时，协助进行气瓶及气体使用的安全培训及宣传。

#### 4.0 Terminology 术语

EHS: environment, health, safety

EHS: 环境、健康卫生、安全

**Gas Pipeline Online Inspection:** refers to routine inspections during operation.

气路管道在线检测：是指在运行过程中的常规性检查。

**Gas pipeline comprehensive inspection:** refers to the risk-based inspection of the pipeline in use according to the national regulations, according to a certain inspection cycle.

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气路管道全面检查：是指根据国家规定，按一定的检验周期对在用管道进行的基于风险的检验。

## 5.0 General Requirement 一般要求

### 5.1 Gas supplier project Procurement and Installation 气体供应项目采购及安装

- User Department applies for the procurement;  
使用部门提出采购申请；
- To improve the use and registration system, campus implements a registration management system for the use of gas cylinders in the Lab. Teachers and staff who need to use gas with cylinder must apply for cylinder purchases in the ERP system.  
为完善使用及登记制度，学校对实验室使用气体钢瓶实行登记管理制度，凡是需要使用气体钢瓶的教师职工，必须到ERP系统进行气瓶申购申请。
- User unit or department provides specific technical requirement to special equipments and confirm if it belongs to project before purchasing.  
使用方提出对设备的相关技术要求，确定是否属于项目或者单独供气合同；
- EHS evaluates whether the setting can meet the safely using condition.  
校园安全办公室评估环境设置是否符合安全使用条件；
- Any gas that has not passed the ERP gas application, lab shall not require the gas supplier to deliver gas in advance.  
未通过ERP气体申请的气体，均不得要求气体供应商提前送气。
- In case of applications involving newly introduced gases.  
如涉及新引入气体申请：
  - The procurement gas will not be approved until the using condition meet for safety requirement.  
气体采购申请必须在使用环境条件符合安全使用条件下，才可以被批准。
  - Before approving the application, CCD, Operation and EHS department will propose the request on special equipment/gas operation, installation, etc, and will ask the operation, Installation Company to provide qualification certificate and other materials.  
批准气体申购前，建设部、运营部门提出特种设备气体操作、安装等要求，及其操作、安装单位资质、资料提供；
  - After CCD, Operation and EHS confirms that the materials provided are complete, procurement department will do the acceptance check and make the final payment.

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建设部、运营部和校园安全办公室确认所提供资料已经齐全，采购部门方可办理验收及付尾款。

## 5.2 Lab gas safety management requirement 实验室安全用气及气体管理要求

### Before using gas 用气前须知：

- Before using the independent gas supply in lab, lab need to confirm with operation department whether the current central gas supply can meet the experimental needs.  
实验室在使用独立供气之前，需要和运营部确认目前中央供气是否可以满足实验需求。  
If it is satisfied, Lab need to apply to operation department and construction department for the lab gas piping to be connected to the central gas supply system.  
如果满足，则向运营部和建设部申请实验室气体接入中央供气管线。  
If it is not satisfied, lab need to provide the corresponding gas parameters to the CCD and EHS, and access the independent gas supply design process.  
如果不满足，则向建设部和安全办公室提供相应的气体参数，进入独立供气设计流程。
- Gas cylinders must be clearly marked and must be dedicated to the bottle.  
气体钢瓶必须具备明显标志，必须专瓶专用。
- Avoid coexistence of reacting gases, which can cause explosion due to the radical reaction, such as acetylene and oxygen, hydrogen and oxygen, chlorine and acetylene.  
避免会发生反应的气体混存，因反应剧烈甚至会产生爆炸，如：乙炔与氧气、氢气与氧气、氯气与乙炔等。  
Combustible and flammable gases cannot be allowed to stored with flammable gases together.  
Combustible and flammable gases cannot be stored with different categories combustible and flammable gases in a same fireproof gas cabinet.  
可燃和易燃气体禁止和助燃气体，以及其他不同类的可燃和易燃气体在防火柜内共同存放。
- Strictly follow the safe use of gas cylinders, and master the requirements for storage and use of gas cylinders.  
严格遵循气瓶安全使用规范，熟练掌握气体钢瓶储存和使用要求。
- For the temporary storage and use of flammable and explosive gases, laboratories and storage areas must improve the design of explosion-proof facilities according to the corresponding gas requirements, such as good ventilation, electrostatic discharge of flammable and explosive gas cylinder cabinets, leak detection of gas cylinders and accessories.



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对于易燃易爆气体暂存和使用，实验室和储存区必须根据相应气体要求完善防爆设施设计，如良好通风、易燃易爆气体气瓶柜静电释放、气瓶与配件接口泄漏检测等。

- When the gas cylinder arrives, the gas using unit should fill out the "cylinder use registration form" and register the use date, gas name, cylinder number, name of the receiving laboratory, and the person who receives it.  
气瓶到货时，气体使用单位应填写“钢瓶使用登记表”，登记使用日期、气体名称、钢瓶编号、领用实验室名称、领用人等。
- Clarify the responsibility of gas cylinder warehouse and Lab gas cylinder management personnel, and set up a special person to supervise and deal with the potential safety hazards in a timely manner; for example, the loss of gas cylinder accessories, gas leaks from gas cylinders, residual gas in gas cylinders, and empty cylinder handling need to be inspected regularly by special persons deal with.  
明确气瓶仓库和实验室气瓶管理人员责任，设置专人监管及时处理存在的安全隐患；如：气瓶附件丢失、气瓶气体泄漏、气瓶的残存气体及空瓶处理等都需专人定期检查处理。
- Strictly follow the requirements for safe use, transportation and storage of gas cylinders and Lab gas cylinders.  
严格遵循气瓶仓库和实验室气体钢瓶的安全使用、运输与存放环境的要求。
- Gas pipelines should be connected correctly, neatly and orderly, with media and flow direction markings, and gas pipelines should not be placed directly on the floor.  
For rooms with multiple gas pipelines, detailed pipeline diagrams should be posted. The material of pipeline shall be selected appropriately and there shall be no damage or aging phenomenon.  
气体管路应连接正确、整齐有序，有介质、流向标识，不得将气体管线直接放置在地上。对于存在多条气体管路的房间须张贴详细的管路图。管路材质选择合适，无破损或老化现象。
- The Lab shall conduct regular safety inspection of gas cylinders and keep records, and find out the potential risks timely. Gas cylinders shall be stopped using immediately if they are defective, have incomplete safety accessories or have been damaged and cannot guarantee safe use.  
实验室应定期对气瓶进行安全检查并做好记录，及时排查隐患。  
气体钢瓶如有缺陷、安全附件不全、已损坏等情况，不能保证安全使用时，须立即停止使用。



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- It is forbidden for labs to install or dismantle gas equipment and piping privately without completing the communication of safety settings.  
禁止实验室在未完成安全设置沟通情况下，私自进行气体设备的安装和拆卸。
- If gas piping and equipment installed by lab itself without application, they will be suspended using until the CCD and EHS confirms onsite inspection that the requirements for use are met, and the head of the EHS Office and CCD agrees that the lab's gas piping and equipment can be service before the operation of that equipment can begin.  
未经申请，实验室自行安装的气路和设备，必须暂停使用，直至建设部及安全办公室现场检查确认符合使用要求，以及校园建设及安全办公室领导同意实验室该气体管道和设备投入使用，方可开始进行该设备的操作。

### 5.3 Safe use of gas 气体的安全使用

- Before use, the experimenter shall test the safety condition of the gas cylinder and confirm the gas it contains.  
After use, the cylinder valve shall be closed in time and the safety condition shall be confirmed again.  
实验人员在使用前，须检测气瓶的安全状况，并确认其盛装的气体。  
使用完毕须及时关闭气瓶总阀，并再次确认其安全状况。
- The pressure reducing valve selected on the pressure gas cylinder should be classified and used exclusively. The nut should be tightened during installation to prevent pool leakage.  
压力气瓶上选用的减压阀要分类专用，安装时螺母要旋紧，防止泄漏。
- When opening and closing the pressure reducer and on-off valve, the action must be slow;  
开、关减压器和开关阀时，动作必须缓慢。
- When using, you should first turn the on-off valve and then open the pressure reducing valve. When you are finished, close the on-off valve first, and then close the pressure reducer after exhausting the remaining air. Never turn off the pressure reducer without closing the on-off valve.  
使用时应先旋动开关阀，后开减压阀，用完后，先关闭开关阀，放尽余气后，再关减压器。切不可只关减压器，不关开关阀。
- When using a pressure cylinder, the operator should stand perpendicular to the cylinder connection.  
使用压力气瓶时，操作人员应站在与气瓶接口处垂直的位置上。

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- It is strictly forbidden to knock during operation, and check for leaks frequently. Pay attention to the pressure gauge reading.  
操作时，严禁敲打撞击，并经常检查有无漏气，应注意压力表读数。
- Oxygen or hydrogen cylinders should be equipped with special tools and must not be in contact with oils. Operators should not wear clothing gloves that are contaminated with various greases or are prone to generate static electricity to avoid igniting or explosion.  
氧气或氢气瓶等，应配备专用工具，并严禁与油类接触，操作人员不能穿戴沾有各种油脂或易感应产生静电的服装手套操作，以免引起燃或爆炸。
- The distance between the flammable gas and the combustible gas bottle and the open flame should be more than 10 meters (when it is difficult to reach, measures such as isolation can be taken).  
可燃性气体和助燃性气体瓶，与明火的距离应大于10米(确难达到时，可采取隔离等措施)。
- The liquefied gas cylinder shall have a residual gas of not less than 0.5% -1.0% of the prescribed filling amount.  
液化气体气瓶应留有不少于0.5%-1.0%规定充装量的剩余气体。
- The gas in the bottle must not be used up, and a certain residual pressure must be retained.  
In general, the residual pressure of the gas cylinder should not be less than 0.05MPa, and the flammable gas should remain 0.2 ~ 0.3MPa.  
瓶内气体不得用尽，必须保留一定剩余压力。  
一般气瓶的剩余压力，应不小于0.05MPa，可燃性气体应剩余0.2~0.3MPa。
- The Lab should timely replace the damaged pressure gas cylinders, and should also replace the pressure gas cylinders with a greater risk of accident in a timely manner according to the service life of various types of cylinders and fatigue cycles.  
Make sure that there are no expired gas cylinders in Lab, and there is no accumulation of expired gas cylinders.  
实验室应对已损坏的压力气瓶及时更换，还应根据各类气瓶使用年限和疲劳周期，及时更换事故风险较大的压力气瓶。  
做到实验室无过期气瓶，无过期气瓶堆放现象。
- The Lab shall be equipped with corresponding protective equipment, formulate corresponding emergency plans, organize teachers and students to conduct emergency drills, and provide on-site first-aid supplies and facilities according to the risk factors.

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实验室应根据危险因素，配备相应的防护用品，制定相应的应急预案，组织师生开展应急演练，配备现场急救用品和设施等。

- The gas equipment in the Lab belongs to the gas supplier, and the laying of the gas pipeline should be the responsibility of the gas supplier.

The daily maintenance of gas equipment and pipelines is also the responsibility of the gas supplier.

The connecting hose from the gas pipeline to the gas-using equipment should use a special metal hose or a gas-specific rubber hose.

实验室内的燃气设备归燃气供应商所有，燃气管线的敷设应由燃气供应商负责。

燃气设备及管道的日常维护也由燃气供应商负责。

从燃气管道到用气设备的连接软管应使用专用金属软管或燃气专用胶管。

#### 5.4 Transportation of gas cylinders 气体钢瓶的运输

Gas cylinders are susceptible to vibration and shock during transportation, which may cause the cylinder valve to be damaged or broken, resulting in accident. To ensure the safety transportation of gas cylinders, pay attention to the following points:

气瓶在运输过程易受到震动和冲击，可能造成瓶阀撞坏或碰断而造成安全事故。为确保气瓶在运输过程中的安全，气瓶的运输时注意以下几点：

- The gas cylinder deliver time has fixed working hours (08:30-17:30) every Monday, Wednesday and Friday. Please determine the acutal deliver time according your lab's request.  
学校固定每周一、三、五工作时间（08:30-17:30）接收气体入校，其他时间不作为接收时间。请实验室根据要求确定送气时间。
- If the result of any inspection item is unqualified, the gas cylinder cannot be kept in campus.  
若有任何检查项目的检查结果为不合格，则该气瓶视为不合格气瓶不予入校。
- Vehicles transporting cylinders externally should have the "dangerous goods" safety sign and belong to special gas transportation vehicles;  
外部运输运气瓶的车辆应有“危险品”的安全标志，且属于特种气体专用运输车辆；
- Gas cylinders must be equipped with gas cylinder caps and anti-vibration rings; they must be removed when a pressure reducer is installed, and the gas cylinder caps must be tightened to prevent accidents caused by the valve breakage;  
气瓶必须佩戴好气瓶帽、防震圈；当装有减压器时应拆下，气瓶帽要拧紧，防止瓶阀摔断造成事故；

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- Cylinders are transported on campus using special cylinder transportation equipment, properly secured upright to prevent falling or falling;  
气瓶在校内转运使用专用气瓶运输设备，妥善直立固定，防止摔倒或跌落；
- When transporting, only one bottle of gas can be transported at a time, and gases that react with each other must not be transported simultaneously.  
运输时，一次只能运输一瓶气体，不得将存在相互反应的气体同时运输。

## 5.5 Selection of lab gas cylinder cabinets 实验室气瓶柜的选择

### 5.5.1 The storage requirements for cylinders contained toxic and hazardous, flammable and explosive gas 有毒有害、易燃易爆气体气瓶的储存要求

- Toxic and hazardous, flammable and explosive gas cylinders should be stored in independent fire-resistant protective cabinets in the laboratory.  
有毒有害、易燃易爆气体气瓶应储存在实验室的独立耐火防护柜。
- In addition to the storage of gas cylinders also need to set up supporting gas pipeline, leak alarm linkage, emergency shut-off valve, emergency evacuation pipeline and other supporting facilities, so as to meet the safety of the experiment.  
除了气瓶的储存，还需要设置配套的气路管线、泄漏报警联动装置、紧急切断阀、应急排空管线等配套设施，从而满足实验的安全。
- The teaching lab building and the research building are civil buildings with fire protection class C II. In order to prevent the effects of fire, consider improving the local fire protection and fire resistance class requirements, so as to ensure that flammable and explosive chemicals (including gases) do not constitute a source of danger in case of fire or lead to secondary disasters such as solid fires, the university uses 90 minutes fire, fire-resistant gas cabinets and chemical safety cabinets.  
教学实验楼和科研楼是消防防火等级为丙类二级的民用建筑物，为了防止火灾的影响，考虑提高局部防火及耐火等级要求，从而确保易燃易爆化学品（含气体）不构成火灾时的危险源或导致其引发固体火灾类的次生灾害，学校在实验室此类设备选择时，均采用90分钟防火、耐火气体柜和化学品安全柜。
- For specific setup requirements, laboratories can inform the Campus Safety Office or the Campus Construction Department of their gas requirements, which will collect the relevant needs and complete the gas circuit and corresponding system setup through professional design, and the Campus Construction Department will be responsible for completing the construction of the project.

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具体设置要求，实验室可以将用气要求告知校园安全办公室或校园建设部，由其收集相关需求，通过专业设计完成气路及相应系统设置，并由校园建设部负责完成项目的施工。

- The Campus Safety Office assists the laboratory in completing the construction acceptance and operation training for this gas circuit project.

校园安全办公室协助实验室完成该气路项目的施工验收和操作培训工作。

- Please refer to the corresponding attached guidelines for specific fireproof and fire-resistant gas cabinets and chemical safety cabinets settings.

具体的防火、耐火气体柜和化学品安全柜设置请参照相应的附件指引。

#### 5.5.2 Fireproof and fire-resistant cabinet requirements 防火耐火柜性能要求:

- All corresponding suppliers of fire-proof cabinets must provide a test report of fire resistance level in accordance with FM fire standard 6050.

所有相应的防火耐火柜供货商必须提供符合FM防火标准6050的耐火等级测试报告；

- At the same time in line with DIN-EN14470-2 (fire-proof gas cabinets set up standards) requirements of fire performance  $\geq 90$  minutes of the test certificate.

同时符合DIN-EN14470-2(耐火气瓶柜设置标准)要求的防火性能 $\geq 90$ 分钟的检测证书。

- Please refer to the annex "Fire-proof type (chemicals and gas) cabinet product requirement Fire-proof (chemicals and gas cylinders) cabinet product requirement." for specific fire-proof gas and chemical cabinet setting.

具体的防火、耐火气体柜和化学品安全柜设置要求请参照附件“Fire-proof type (chemicals and gas) cabinet product requirement 防火(化学品及气瓶)柜产品要求。”

#### 5.6 Storage requirements for gas cylinders 气体钢瓶的存放要求

- When the lab use a large amount of inert gas or CO<sub>2</sub> stored in a limited space, it must be installed oxygen detector and alarm.

For Labs using light flammable gases such as hydrogen and methane, ceilings should not be installed, and the air inlet of ventilation equipment should be set on the top of the wall as much as possible.

实验室有大量惰性气体或CO<sub>2</sub>存放在有限空间内时，还需加装氧气含量报警器。

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对于使用氢气、甲烷等轻质可燃气体的房间，不应安装吊顶，通风设备的引风口应尽量设置在墙的顶部。

Equipment exhaust venting should be near to the atmosphere, and avoid the source of fire and heat.

设备废气排放口应就近对大气排空，且避开火源热源。

- Cylinders of flammable gases such as acetylene must not be placed on insulators to facilitate the discharge of static electricity.

乙炔等可燃性气体的气瓶不得放于绝缘体上，以利于释放静电。

- Oxygen or hydrogen cylinders are strictly forbidden to contact with oil or grease. Users should not wear oily or greasy work clothes and gloves to avoid burning or explosion.

氧气瓶或氢气瓶严禁与油类接触，操作人员不能穿戴有油脂或油污的工作服和手套等操作，以免引起燃烧或爆炸。

- All kinds of gas cylinders should be used exclusively and must not be mixed. It is forbidden to contact gas cylinders with electrical equipment and wires.

各种气体气瓶要专用，不得混装。

- Cylinders containing flammable gas should be kept away from dense electrical wires to prevent short-circuiting of the wires and catch fire.

严禁将装有气体的钢瓶与电器设备及电线等相接触。

- The oxygen cylinder is connected to the reactor, etc., and a backfire device or a buffer (flame arrestor) should be installed.

氧气钢瓶与反应器等连接，应加装逆火装置或缓冲器。

- The glass buffer bottle connected to the cylinder must be covered with a barbed wire, and a pressure column is installed on the bottle.

内装可燃气体的钢瓶，应该远离电线密集处，以防止电线短路着火，引燃可燃气体。

连接钢瓶的玻璃缓冲瓶，必须加铁丝网罩，瓶上安装压力柱。

- The storage place should be ventilated and dry, prevent rainwater from flooding, avoid direct sunlight, fire source or other heat sources are strictly prohibited, there must be no trenches, underpasses, and ventilation holes at the bottom, and no pipeline crossing is prohibited

存储场所应通风、干燥、防止雨水漫淋，避免阳光直射，严禁明火和其它热源，不得有地沟、暗道和底部通风孔，并且严禁任何管线穿越；

- The lighting equipment in the warehouse where flammable and explosive gas cylinders are stored must be explosion-proof equipment. Electrical switches and fuses should be located outside the warehouse, and lightning protection devices should also be provided;



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存储可燃、爆炸性气体气瓶的库房内照明设备必须为防爆设备，电器开关和熔断器都应设置在库房外，同时应设避雷装置。

- The use of suspended ceiling design is prohibited in the temporary storage area of flammable and explosive gases.

易燃易爆气体暂存区域禁止采用吊顶设计。

- Cylinders should be stored separately and labelled. Empty cylinders and full cylinders should be stored separately.

Gas cylinders for oxygen or other oxidizing gases should be stored separately from fuel gas cylinders and other flammable materials at a distance of at least 6m.

Oxygen or other combustion-supporting gas cylinders. There should be no flammable items, oil stains and other debris around; If there is no separate storage, the distance between combustion-supporting materials and combustible gas must not be less than 10 meters.

气瓶应分类存储，并设置标签，空瓶和满瓶分开存放；

氧气或其他氧化性气体的气瓶应与燃料气瓶和其他易燃材料分开存放，间隔至少6m；

氧气或其他助燃气体瓶周围不得有可燃物品、油渍及其他杂物，间距不小于10米；

- It is strictly prohibited to store acetylene gas cylinders with oxygen cylinders, chlorine gas cylinders and flammable materials in the same room or in the same cabinet;

严禁乙炔气瓶与氧气瓶、氯气瓶及易燃物品同室或同柜储存；

- It is strictly forbidden to store hydrogen and flammable and explosive gases. Gases with oxidizing or combustion-supporting properties are stored in the same cabinet;

严禁氢气和易燃易爆气体，具备氧化性或助燃性质的气体同柜储存；

- Cylinders should be stored upright and fixed with railings or brackets. It is forbidden to use cylinder valves or heads to fix cylinders. The brackets should be made of flame-retardant materials and the bottom of the cylinders should be protected from corrosion.

气瓶应直立存储，用栏杆或支架以固定，禁止利用气瓶的瓶阀或头部来固定气瓶；支架应采用阻燃的材料，同时应保护气瓶的底部免受腐蚀；

- Do not place cylinders where they may be conductive;

禁止将气瓶放置到可能导电的地方；

- When storing cylinders (including empty cylinders), close the valve of the cylinder, remove the pressure reducer, put on and tighten the cap of the cylinder, and discharge it neatly;

气瓶(包括空瓶)储存时，应将瓶阀关闭，卸下减压器，戴上并旋紧气瓶帽，整齐排放；



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- Cylinder warehouses and laboratories using cylinders must store and store high-pressure gas cylinders in an upright position, and check them regularly for leaks. Strictly follow the safe operating procedures for using cylinders.

气瓶仓库和使用气瓶的实验室对高压气体钢瓶必须分类保管，直立固定并经常检查是否漏气，严格遵守使用钢瓶的安全操作规程。

## 5.7 Management of Lab gas cylinders 实验室气体钢瓶的管理

- Gas cylinders are dangerous goods. Users and storages should strengthen their awareness of safety precautions, and can be used under the premise of ensuring safety.  
气体钢瓶属于危险品，使用者和贮存者应加强安全防范意识，在确保安全的前提下方能使用。
- Post gas cylinder use requirements in the Lab according to the nature of the gas.  
按气体的性质在实验室张贴气体钢瓶使用要求。
- The safety management of cylinders is based on the principle of "who uses and who is responsible; who manages and who is responsible".  
钢瓶安全管理按“谁使用谁负责；谁管理，谁负责”的原则执行。
- Gas users (labs) and individuals (gas users, Lab leaders) are responsible for the maintenance and maintenance of the cylinders they receive.  
用气单位（实验室）和个人（气体使用人员、实验室负责人）对所领用钢瓶负有维护和保养的责任。
- Gas must be purchased from a qualified supplier.  
气体必须从有资质的供应商处购买。
- The Lab shall accept the gas cylinders provided by the supplier. The gas cylinders are unclear or do not correspond, the gas cylinders do not have safety helmets and anti-vibration rings, the color is missing, and the gas cylinders are not regularly identified.  
实验室需对供应商提供的气体钢瓶进行验收，对于气体名称标识不清或不对应，气体钢瓶没有安全帽和防震圈、颜色缺失、缺乏气体钢瓶定期安全检验标识等，应拒绝接收。
- The color and font of the gas cylinders should be clear, and there should be regular safety inspection signs (responsible by the supplier). Carry out regular inspections and leakage detection.

气瓶颜色和字体必须清楚，有定期安全检测标识（由供应商负责）等，对于长期存放在实验室不周转的气体钢瓶，由使用单位督促气体供应商或自行联系检验机构对钢瓶进行定期检测和检漏等工作。

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- The Warehouse and labs should establish purchasing and using record.  
实验室应建立气体购买及使用台账。  
Each cylinder must be equipped with a standard uniformly printed safety cylinder identification label by school, and the gas user must fill in the specifications as required.  
每个气瓶要配有学校统一印制的气瓶安全信息标识牌，用气单位要按要求规范填写。  
Safety warning signs should be posted near the cylinders of dangerous gases.  
危险气体钢瓶附近，应张贴安全警示标识。
- Cylinder operation must be performed in accordance with the requirements of safe operation, away from fire source.  
气瓶操作必须按安全操作要求执行，远离明火；
- If an accident occurs due to improper use, or if the consequences are bad due to improper storage or loss, the user should be held accountable.  
如因使用不当发生事故，或因保管不善损坏、丢失造成不良后果的，要追究领用人的责任。
- Establish gas cylinder storage requirements for cylinder storage and usage rules.  
建立气瓶存放和使用规则。
- Gas cylinder using units or departments manage the storage of gas cylinders properly, and inspect and replace them regularly.  
气瓶使用单位和部门的气瓶管理人员对气体钢瓶进行正确的存放，定期进行检查、更换。
- Gas cylinders are strictly forbidden from serving for an extended period of time, and the related inspection items and time shall be recorded, and expired or bad gas cylinders shall be scrapped in time.  
严禁气体钢瓶超期服役，并记录相关检查项目和时间，及时报废过期或状态不佳的气瓶。
- Before the cylinders are stored in the warehouse, the acceptance inspection of the cylinders should be done well, and the cylinders that pass the inspection should be registered one by one.  
气瓶入库储存前，应做好气瓶入库前验收检查工作，对检验合格的气瓶，应逐只进行登记。
- When the cylinders are distributed, the cylinder room administrator must carefully write the cylinder distribution registration form, which includes: gas name, serial number, cylinder number, storage date, distribution date, cylinder inspection date, Recipient's name, issuer's name, notes, etc.

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气瓶发放时，气瓶间管理员必须认真填写气瓶发放登记表，内容包括:气体名称、序号、气瓶编号，入库日明、发放日期、气瓶检验日明，领用单位、领用者姓名，发放人姓名，备注等。

- Establish a daily inspection mechanism for gas cylinders checking, covers the appearance, coloring, warning labels, accessories, and equipment status of gas cylinders to ensure that equipment and facilities are working without defects and in good condition.  
建立气瓶日常检查制度，对气瓶外观、涂色、警示标签标识、配件和设备状态等进行检查，确保设备和设施无带病工作，状态良好。
- Ensure gas cylinders in use passed regular inspection and are available for effective use.  
确保在用气瓶通过定期检测，并可供有效使用；
- For the cylinders containing corrosive gases (such as: carbon dioxide, hydrogen sulfide, etc.) need to complete a regular cylinder inspection every two years.  
承装腐蚀性气体的气瓶（二氧化碳、硫化氢等）每两年需完成一次气瓶检验；  
For general gases (air, oxygen, hydrogen, acetylene, etc.) cylinders need to complete a cylinder inspection every three years.  
对于一般气体（空气、氧气、氢气、乙炔等）气瓶，每三年需完成一次气瓶检验；  
For inert gases (nitrogen, argon, neon, helium, etc.) every five years need to complete a cylinder inspection.  
对于惰性气体（氮、氩、氖、氦等）每五年需完成一次气瓶检验；
- Only cylinders that pass regular inspections are allowed to continue to be used.  
只有通过定期检测的气瓶才允许继续使用。
- Regular testing is generally the responsibility of the unit that owns the gas cylinder, so it is recommended to rent gas cylinders from the gas supplier, and the testing of gas cylinders is the responsibility of the professional gas cylinder provider.  
检测一般为气瓶产权所属单位负责，所以建议向供气商租用气瓶，气瓶的检测由专业的气瓶提供商负责。
- Schools should equip with appropriate personal protective equipment, corresponding emergency plans, organize teachers and students to carry out emergency drills, and provide on-site first-aid supplies and facilities to implement emergency prevention and response work according to the characters of using gas.  
学校应根据储存和使用气体的危险因素，配备相应的个人操作防护用品，制定相应的应急预案，组织师生开展应急演练，配备现场急救用品和设施等落实应急预防和响应工作。

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## 5.8 Test requirements for gas supply pipeline and monitor system

供气管线和控制系统的检测要求：

No. 序号	Pipeline category 管线类别	Appearance Inspection 外观检查	On Line Inspection 在线检测频率	Comprehensive Pipeline Inspection 全面检测频率
1.	Inert gas pipeline of central gas supplies (including compressed air and vacuum) 中央供气惰性气体管线(含压缩空气及真空)	Once every six months 每半年一次	Once a year 一年一次	Once every six years 每6年一次
2.	Combustion-supporting gas pipeline of central gas supplies 中央供气助燃气体管线	Once every six months 每半年一次	Once a year 一年一次	Once every six years 每6年一次
3.	Liquified natural gas pipeline of central gas supplies (if start to use) LNG燃气管线(如投入使用)	Once every six months 每半年一次	Once a year 一年一次	Once every twelve years 每12年一次
4.	Inert gas pipeline of lab's independent gas supply 实验室独立供气惰性气体管线	Once every six months 每半年一次	Once a year 一年一次	Once every six years 每6年一次
5.	Combustion-supporting and flammable gas pipeline of lab's independent gas supply 实验室独立供气易燃及助燃气体管线	Once every six months 每半年一次	Once a year 一年一次	Once every six years 每6年一次
6.	Toxic gas pipeline of lab's independent gas supply 实验室独立供气有毒气体管线	Once every six months 每半年一次	Once a year 一年一次	Once every six years 每6年一次
7.	Central monitoring and alarm system 中央监控及报警系统	N/A	Once every six months 每半年一次	N/A

**Remarks:** The inspection frequency should not be lower than the minimum requirements of the relevant national pipeline pressure measurement regulations.

**备注：**检测周期应不低于国家相关管道测压规定的最低要求。

If one of the following situations occurs, a comprehensive inspection should be considered immediately:

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如果出现以下情况之一，应考虑立即进行全面检测：

- New high-pressure, flammable, or toxic gas pipeline  
新建高压、易燃气体、有毒气体气路管线；
- Leakage incidents affecting the safe operation of pipelines occurred twice within one year (excluding man-made misoperation)  
一年内发生两次影响管道安全运行的泄漏事故（不包含阀门人为误操作情况）；
- Severe corrosion is found in the partial pipeline  
发现管道出现严重局部腐蚀情况；
- Change the design transported medium, pressure, temperature etc. critical facotrs  
管道改变设计使用介质、压力、温度等关键参数；
- Natural disasters that affect the gas supply lines, such as earthquakes, typhoons, etc.;;  
发生自然灾害影响供气线路，如地震、台风等；
- There are multiple quality problems in the annual online inspection;  
年度在线检测中出现多个质量问题的情况；
- Carry out large-scale renovation and maintenance work on pipelines;  
对管线进行大型的改造维修工作；

## 6.0 Annex 附件

- Fire-proof type (chemicals and gas) cabinet product requirement 防火(化学品及气瓶)柜产品要求.
- Cylinder Use Registration Form 实验室钢瓶使用登记表
- [Gas safety inspection form](#) 气体安全检查表
- [Gas safety inspection form \(for lab\)](#) 气体安全检查表(实验室)