



RESPIRATORY PROTECTION PROGRAM 2012



**NEW YORK CITY
COLLEGE OF
TECHNOLOGY**



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Respiratory Protection Program

2. Introduction

In the Respiratory Protection program, hazard assessment and selection of proper respiratory PPE are conducted in the same manner as for other types of PPE. In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used. References: OSHA Standards *Respiratory Protection* (29 CFR 1910.134)

3. Responsibilities

All Employees shall follow the requirements of the Respiratory Protection Program

Management

- Implement the requirements of this program;
- Provide a selection of respirators as required;
- Enforce all provisions of this program; and
- Appoint an individual to administer the respiratory protection program.

Program Administrator

- Review sanitation/storage procedures;
- Ensure respirators are properly stored, inspected and maintained;
- Monitor compliance for this program;
- Provide training for affected Employees;
- Review compliance and ensure monthly inspection of all respirators; and
- Provide respirator fit testing.

Designated Occupational Health Care Provider

- Conduct medical aspects of program.



4. Program Administrator

The Environmental, Health & Safety Officer will be designated as the program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

5. Voluntary Use of Respirators

OSHA requires that the voluntary use of respirators (i.e., when respirators are not required by the College), be controlled as strictly as if their use were required. So, any employee wearing a respirator voluntarily shall fall under this respiratory protection program, be issued a copy of Appendix D of 1910.134, and fill out a medical questionnaire (Appendix C) and have it evaluated by an appropriate individual. Training will be conducted on the proper storage, cleaning, and maintenance of the respirator. All steps will be taken to ensure that the respirator does not pose a health risk to the person donning it. Exception: Employees whose only use of respirators involves the voluntary use of filtering (non-sealing) face pieces (dust masks, with one OR two straps) do not fall under this program.

6. Program Evaluation

Evaluations of the workplace are necessary to ensure that the written respiratory protection program is being properly implemented. This includes consulting with employees to ensure that they are using the respirators properly. Evaluations shall be conducted as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

Program evaluation will include discussions with employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
- Appropriate respirator selection for the hazards to which the employee is exposed;
- Proper respirator use under the workplace conditions the employee encounters; and
- Proper respirator maintenance.

7. Record Keeping

The New York City College of Technology will retain written information regarding medical evaluations, fit testing, and the respirator program. The employee involvement in the respirator



program, assists the College in auditing the adequacy of the program, and provides a record for compliance determinations by OSHA.

8. Training and Information

Effective training for employees who are required to use respirators is essential. The training must be comprehensive, understandable, and recur annually and more often if necessary. Training will be provided prior to requiring the employee to use a respirator in the workplace. The training shall ensure that each employee can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- Limitations and capabilities of the respirator;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use, and check the seals of the respirator
- What the procedures are for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of this program.

Retraining shall be conducted annually and when:

- Changes in the workplace or the type of respirator render previous training obsolete;
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; and
- Other situation arises in which retraining appears necessary to ensure safe respirator use.

Training will be conducted by instructors who have adequate knowledge of OSHA training requirements. Training is divided into the following sections:

Classroom Instruction

1. Overview of the College Respiratory Protection Program & OSHA Standard;
2. Respiratory Protection Safety Procedures;
3. Respirator Selection;
4. Respirator Operation and Use;
5. Why the respirator is necessary;
6. How improper fit, usage, or maintenance can compromise the protective effect;
7. Limitations and capabilities of the respirator;
8. How to use the respirator effectively in emergency situations, including respirator malfunctions;
9. How to inspect, put on and remove, use, and check the seals of the respirator;



10. What the procedures are for maintenance and storage of the respirator;
11. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
12. Change out schedule and procedure for air purifying respirators (APR).

Fit Testing

- For each type and model of respirator used.

Hands-on respirator Training

1. Respirator Inspection;
2. Respirator cleaning and sanitizing;
3. Record Keeping;
4. Respirator Storage;
5. Respirator Fit Check; and
6. Emergencies.



Respirator Training Record

Employee Name (printed)

I certify that I have been trained in the use of the following respirator(s):

This training included the inspection procedures, fitting, maintenance and limitations of the above respirator(s). I understand how the respirator operates and provides protection. I further certify that I have heard the explanation of the respirator(s) as described above and I understand the instructions relevant to use, cleaning, disinfecting and the limitations of the respirator(s).

Employee Signature

EHSO Signature

Date



9. Basic Respiratory Protection Safety Procedures

1. Only authorized and trained Employees may use Respirators. Those Employees may use only the Respirator that they have been trained on and properly fitted to use.
2. Only Physically Qualified Employees may be trained and authorized to use Respirators. A pre-authorization and annual certification by a qualified physician will be required and maintained. Any changes in an Employees health or physical characteristics will be reported to the program administrator and will be evaluated by a qualified physician.
3. Only the proper prescribed respirator or SCBA may be used for the job or work environment. Air-purifying respirators may be worn in work environments when oxygen levels are 19.5 percent to 23.5 percent and when the appropriate cartridge, (as determined by the manufacturer and approved by NIOSH), for the known hazardous substance is used. SCBAs will be worn in oxygen deficient and oxygen rich environments (below 19.5 percent or above 23.5 percent oxygen).
4. Employees working in environments where a sudden release of a hazardous substance is likely will wear an appropriate respirator for that hazardous substance (example: Employees working in an ammonia compressor room will have an ammonia APR respirator on their person).
5. Only SCBAs will be used in oxygen deficient environments, environments with an unknown hazardous substance or unknown quantity of a known hazardous substance, or any environment that is determined "Immediately Dangerous to Life or Health" (IDLH).
6. Employees with respirators loaned on "permanent check out" will be responsible for the sanitation, proper storage and security. Respirators damaged by normal wear will be repaired or replaced by the College when returned.
7. The last Employee using a respirator and/or SCBA that is available for general use will be responsible for proper storage and sanitation. Monthly and after each use, all respirators will be inspected with documentation to assure its availability for use.
8. All respirators will be located in a clean, convenient and sanitary location.
9. In the event that Employees must enter a confined space; work in environments with hazardous substances that would be dangerous to life or health should an RPE (Respiratory Protection Equipment) fail (a SCBA is required in this environment); and/or conduct a HAZMAT entry, a "buddy system" detail will be used with a Safety Watchman with constant voice, visual or signal line communication. Employees will follow the established Emergency Response Program and/or Confined Space Entry Program when applicable.



10. Management will establish and maintain surveillance of jobs and work place conditions and degree of Employee exposure or stress to maintain the proper procedures and to provide the necessary RPE.
11. Management will establish and maintain safe operation procedures for the safe use of RPE with strict enforcement and disciplinary action for failure to follow all general and specific safety rules. Standard Operation Procedures for General RPE use will be maintained as an attachment to the Respiratory Protection Program and Standard Operation Procedures for RPE use under emergency response situations will be maintained as an attachment to the Emergency Response Program.

10. Selection of Respirators

The College has evaluated the respiratory hazard(s) in each workplace, identified relevant workplace and user factors and has based respirator selection on these factors. Also included are estimates of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. This selection has included appropriate protective respirators for use in IDLH atmospheres, and has limited the selection and use of air-purifying respirators. All selected respirators are NIOSH certified.

Filter Classifications - These classifications are marked on the filter or filter package.

N-Series: Not Oil Resistant

- Approved for non-oil particulate contaminants
- Examples: dust, fumes, mists not containing oil.

R-Series: Oil Resistant

- Approved for all particulate contaminants, including those containing oil
- Examples: dusts, mists, fumes
- Time restriction of 8 hours when oils are present.

P-Series: Oil Proof

- Approved for all particulate contaminants including those containing oil
- Examples: dust, fumes, mists
- See Manufacturer's time use restrictions on packaging.

Respirators for IDLH atmospheres.

The following respirators will be used in IDLH atmospheres:

- A full face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
- A combination full face piece pressure demand supplied-air respirator (SAR) with



auxiliary self-contained air supply.

- Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

Respirators for atmospheres that are not IDLH.

- The respirators selected shall be adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

11. Identification of Filters & Cartridges

All filters and cartridges shall be labeled and color coded with the NIOSH approval label. The user shall ensure that the label is not removed and remains legible. A change out schedule for filters and cartridge has been developed to ensure these elements of the respirators remain effective.

12. Respirator Filter and Canister Replacement

An important part of the Respiratory Protection Program includes identifying the useful life of cartridges and filters used on air-purifying respirators. Each filter and cartridge shall be equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or

If there is no ESLI appropriate for the conditions, a change schedule for canisters and cartridges based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life shall be implemented.

Filter & Cartridge Change Schedule

Stock of spare filters and cartridges shall be maintained to allow immediate change when required or desired by the employee.

Cartridges shall be changed based on the most limiting factor below:

- Prior to expiration date;
- Manufactures recommendations for the specific use and environment;
- After each use;
- When requested by employee;
- When contaminant odor is detected; and
- When restriction to air flow has occurred as evidenced by increase effort by user to



- breathe normally.
- Cartridges shall remain in their original sealed packages until needed for immediate use.

Filters shall be changed on the most limiting factor below:

- Prior to expiration date;
- Manufactures recommendations for the specific use and environment;
- When requested by employee;
- When contaminant odor is detected;
- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally; and
- When discoloring of the filter media is evident.
- Filters shall remain in their original sealed package until needed for immediate use.

13. Respiratory Protection Schedule by Job and Working Condition

The College maintains a Respiratory Protection Schedule by Job and Working Condition. This schedule is provided to each authorized and trained Employee. The Schedule provides the following information:

- Job/Working Conditions;
- Work Location;
- Hazards Present;
- Type of Respirator or SCBA Required;
- Type of Filter/Canister Required;
- Filter/Cartridge change out schedule.

The schedule will be reviewed and updated at least annually and whenever any changes are made in the work environments, machinery, equipment, or processes or if respirator different respirator models are introduced or existing models are removed.

Permanent respirator schedule assignments are:

Each person who engages in welding will have their own College provided dust-mist-fume filter APR. This respirator will be worn during all welding operations. (List others, as appropriate)

14. Physical and Medical Qualifications

Records of medical evaluations must be retained and made available in accordance with 29 CFR 1910.1020.

Medical evaluation required



Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. The College provides a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.

Medical evaluation procedures

The employee will be provided a medical questionnaire by the designated Occupational Health Care Provider.

Follow-up medical examination

The College shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions in Part B of the questionnaire or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the Physician deems necessary to make a final determination.

Administration of the medical questionnaire and examinations

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content. The College shall provide the employee with an opportunity to discuss the questionnaire and examination results with the Physician.

Supplemental information for the Physician

The following information must be provided to the Physician before the Physician makes a recommendation concerning an employee's ability to use a respirator:

- The type and weight of the respirator to be used by the employee;
- The duration and frequency of respirator use (including use for rescue and escape);
- The expected physical work effort;
- Additional protective clothing and equipment to be worn;
- Temperature and humidity extremes that may be encountered; and
- Any supplemental information provided previously to the Physician regarding an employee need not be provided for a subsequent medical evaluation if the information and the Physician remain the same.

The College has provided the Physician with a copy of the written respiratory protection program and a copy of the OSHA Standard 29 CFR1910.134.

Medical determination



In determining the employee's ability to use a respirator, the College shall obtain a written recommendation regarding the employee's ability to use the respirator from the Physician. The recommendation shall provide only the following information:

- Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;
- The need, if any, for follow-up medical evaluations;
- A statement that the Physician has provided the employee with a copy of the Physician's written recommendation; and
- If the respirator is a negative pressure respirator and the Physician finds a medical condition that may place the employee's health at increased risk if the respirator is used, the College shall provide an APR if the Physician's medical evaluation finds that the employee can use such a respirator. If a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the College is no longer required to provide an APR.

Additional Medical Evaluations

At a minimum, the College shall provide additional medical evaluations that comply with the requirements of this section if:

- An employee reports medical signs or symptoms that are related to ability to use a respirator;
- A Physician, supervisor, or the respirator program administrator informs the College that an employee needs to be reevaluated;
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation;



- A change occurs in workplace conditions (physical work effort, protective clothing, temperature, etc.) that may result in a substantial increase in the physiological burden placed on an employee.
- **Fit testing of tight-fitting** atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

15. Respirator Fit Testing

Before an employee is required to use any respirator with a negative or positive pressure tight-fitting face piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. The College shall ensure that an employee using a tight-fitting face piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least annually thereafter.

The College has established a record of the qualitative and quantitative fit tests administered to employees including:

- The name or identification of the employee tested;
- Type of fit test performed;
- Specific make, model, style, and size of respirator tested;
- Date of test; and
- The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

Additional fit tests will be conducted whenever the employee reports, or the College, Physician, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

If after passing a QLFT or QNFT, the employee notifies the College, program administrator, supervisor, or Physician that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator face piece and to be retested.

Types of Fit Tests

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of OSHA Standard 29 CFR 1910.134.

- **QLFT** may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or



greater than 100 for tight-fitting half face pieces, or equal to or greater than 500 for tight-fitting full face pieces, the QNFT has been passed with that respirator.

- **Qualitative fit testing** of these respirators shall be accomplished by temporarily converting the respirator user's actual face piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator face piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face piece.
- **Quantitative fit testing** of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.
- Any modifications to the respirator face piece for fit testing shall be completely removed, and the face piece restored to NIOSH approved configuration, before that face piece can be used in the workplace.

Fit test records shall be retained for respirator users until the next fit test is administered. Written materials required to be retained shall be made available upon request to affected employees.



Respirator Fit Test Record

Name: _____ Initials: _____

Type of qualitative/quantitative fit test used: _____

Name of test operator: _____ Initials: _____

Date: _____

Respirator Mfr./Model/Approval no. Size Pass/Fail or Fit Factor

Note: "Fit factor" is numerical result of quantitative fit test from instrument reading

1. _____	S M L	P	F	_____
2. _____	S M L	P	F	_____
3. _____	S M L	P	F	_____
4. _____	S M L	P	F	_____

Clean Shaven? Yes___ No___ (Fit-test cannot be done unless clean-shaven)

Medical Evaluation Completed? Yes___ No___

NOTES: _____



This record indicates that you have passed or failed a qualitative or quantitative fit test as shown above for the particular respirator(s) shown. Other types will not be used until fit tested.

16. Respirator Operation and Use

Respirators will only be used following the respiratory protection safety procedures established in this program. The Operations and Use Manuals for each type of respirator will be maintained by the Program Administrator and be available to all qualified users.

Surveillance by the direct supervisor shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the College shall reevaluate the continued effectiveness of the respirator.

For continued protection of respirator users, the following general use rules apply:

- Users shall not remove respirators while in a hazardous environment;
- Respirators are to be stored in sealed containers out of harmful atmospheres;
- Store respirators away from heat and moisture;
- Store respirators such that the sealing area does not become distorted or warped; and
- Store respirator such that the face piece is protected

Face piece seal protection

The College does not permit respirators with tight-fitting face pieces to be worn by employees who have:

- Facial hair that comes between the sealing surface of the face piece and the face or that interferes with valve function; and/or
- Any condition that interferes with the face-to-face piece seal or valve function.

If an employee wears corrective glasses or goggles or other personal protective equipment, the College shall ensure that such equipment is worn in a manner that does not interfere with the seal of the face piece to the face of the user.

Continuing Effectiveness of Respirators

The College shall ensure that employees leave the respirator use area:

- To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use;
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece; and
- To replace the respirator or the filter, cartridge, or canister elements.

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage



of the face piece, the College will replace or repair the respirator before allowing the employee to return to the work area.

17. Procedures for IDLH atmospheres

For all IDLH atmospheres, the College shall ensure that:

- One employee or, when needed, more than one employee is located outside the IDLH atmosphere;
- Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;
- The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;
- The College's EHSO is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue; and
- The College's EHSO authorized to do so by the College, once notified, provides necessary assistance appropriate to the situation.

Employee(s) located outside the IDLH atmospheres will be equipped with:

- Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
- Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
- Equivalent means for rescue where retrieval equipment is not required.

18. Cleaning and Disinfecting

The College shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The College shall ensure that respirators are cleaned and disinfected using the Standard Operating Procedure (SOP): Cleaning and Disinfecting.

The respirators shall be cleaned and disinfected when:

- Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;
- Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;
- Respirators maintained for emergency use shall be cleaned and disinfected after each use; and
- Respirators used in fit testing and training shall be cleaned and disinfected after each use



Cleaning and Storage of respirators assigned to specific employees is the responsibility of that Employee.

19. Respirator Inspection

All respirators/SCBAs, both available for "General Use" and those on "Permanent Check-out", will be inspected after each use and at least monthly. Should any defects be noted, the respirator/SCBA will be taken to the Program Administrator. Damaged respirators will be repaired or replaced. The inspection of respirators loaned on "Permanent Check-out" is the responsibility of that trained Employee.

Respirators shall be inspected as follows:

- All respirators used in routine situations shall be inspected before each use and during cleaning;
- All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and
- Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

Respirator inspections include the following:

- A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters or filters;
- Check of elastomeric parts for pliability and signs of deterioration; and
- Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The College shall determine that the regulator and warning devices function properly

For Emergency Use Respirators the additional requirements apply:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and
- Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.



20. Respirator Storage

Respirators are to be stored as follows:

- All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face piece and exhalation valve.
- Emergency Respirators shall be:
 1. Kept accessible to the work area;
 2. Stored in compartments or in covers that are clearly marked as containing emergency respirators; and
 3. Stored in accordance with any applicable manufacturer instructions.

Repair of Respirators

Respirators that fail an inspection or are otherwise found to be defective will be removed from service to be discarded, repaired or adjusted in accordance with the following procedures:

- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;
- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and
- Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

21. Breathing Air Quality and Use

The College shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen;
- Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
 - Oxygen content (v/v) of 19.5-23.5%;
 - Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
 - Carbon monoxide (CO) content of 10 ppm or less;
 - Carbon dioxide content of 1,000 ppm or less;
 - Lack of noticeable odor.
- Compressed oxygen will not be used in atmosphere-supplying respirators that have previously used compressed air;
- Oxygen concentrations greater than 23.5% are used only in equipment designed for



- oxygen service or distribution;
- Cylinders used to supply breathing air to respirators meet the following requirements:
 1. Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178);
 2. Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air;
 3. Moisture content in breathing air cylinders does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure;
 4. Breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines; and
 5. Breathing gas containers shall be marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.