

Maintenance and Calibration for Respirable Coal Mine Dust Certification Examination

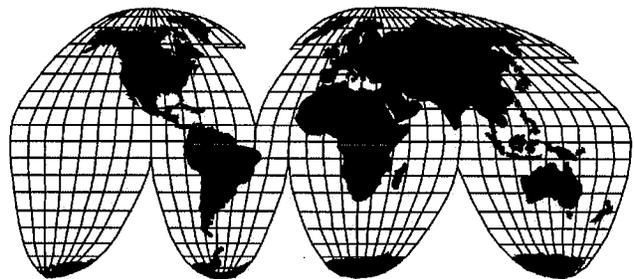


U.S. Department of Labor
Mine Safety and Health Administration
National Mine Health and Safety Academy

Instruction Guide Series
IG 101

2007

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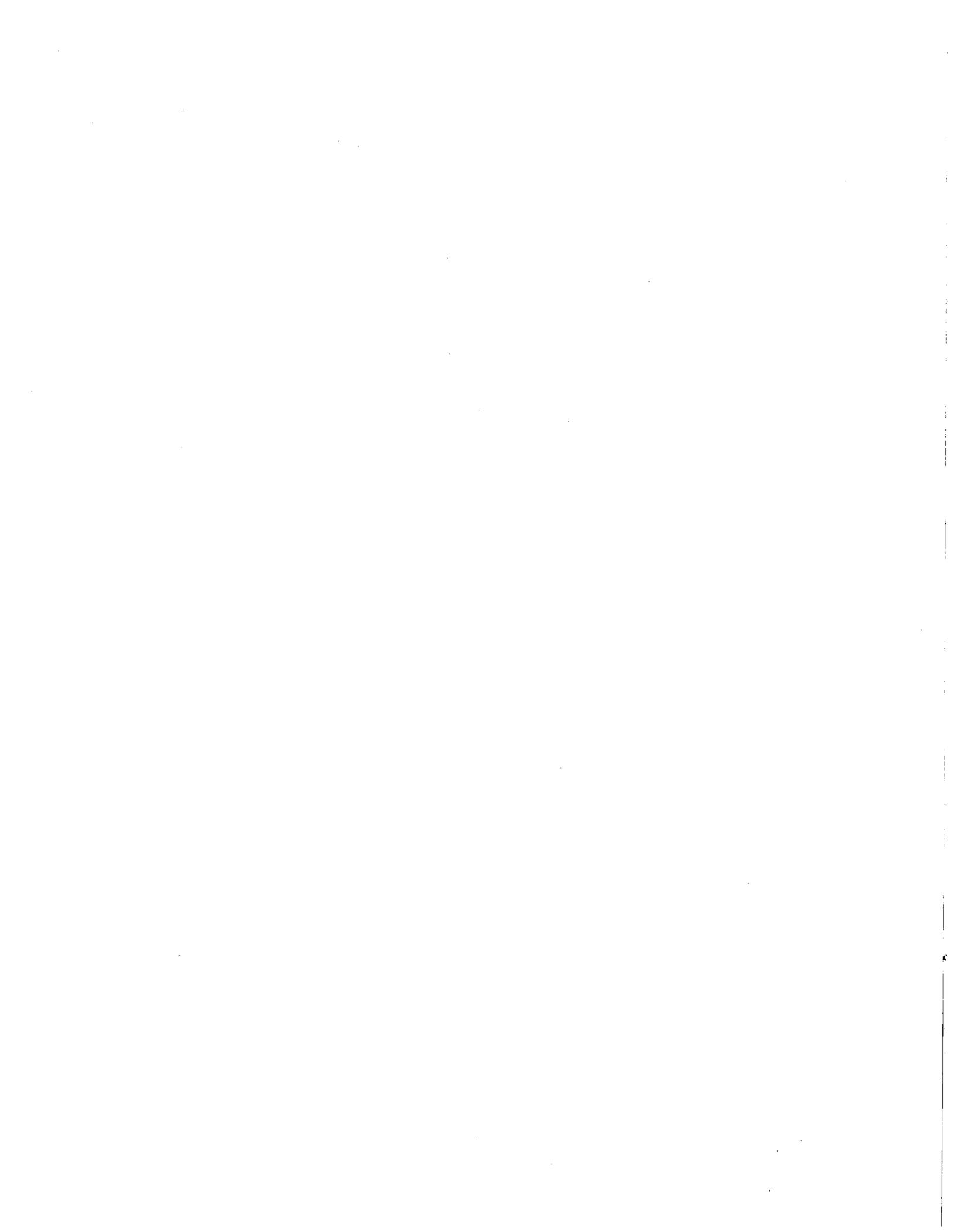


U.S. Department of Labor
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Secretary

Mine Safety and Health Administration
Assistant Secretary

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Certification Maintenance and Calibration for Respirable Coal Mine Dust Examination Question Pool

I. General Knowledge

1. The purpose of the ___ is to separate respirable and non-respirable dust.
 - a. vortex finder
 - b. tubing
 - c. grit pot
 - d. nylon cyclone

2. The purpose of the filter cassette is to collect the ___.
 - a. respirable dust
 - b. methane
 - c. non-respirable dust
 - d. moisture

3. A ___ is required on all personal dust samplers to smooth out the flow rate.
 - a. vortex finder
 - b. length of tubing
 - c. 10mm nylon cyclone
 - d. pulsation dampener

4. The flow rate of all properly calibrated personal dust samplers is ___ liters of air per minute.
 - a. 1.7
 - b. 2.0
 - c. 1.9
 - d. 2.5

5. The grit pot of a 10mm nylon cyclone of a personal dust sampler traps ___.
 - a. non-respirable dust
 - b. respirable dust
 - c. methane
 - d. moisture

6. The cutoff voltage of a nickel-cadmium battery is ___ volts per cell.
 - a. 1.0
 - b. 2.0
 - c. 1.3
 - d. 1.2

II. Pre-sampling Preparation and Sampling Train Assembly

1. Immediately prior to the sampling shift, the voltage of the battery ___ must be checked with the pump running.
 - a. under actual load
 - b. taken out of the case
 - c. with DC power source attached
 - d. all of the above
2. Sampling head assemblies of personal dust samplers must be cleaned _____.
 - a. hourly
 - b. monthly
 - c. weekly
 - d. after each use
3. Approved dust sampling devices shall be tested and examined ___ each sampling shift.
 - a. after
 - b. by MSHA
 - c. immediately before
 - d. none of the above
4. The pre-shift checks of the dust sampling devices must be performed by _____.
 - a. a Certified Person (Sampling)
 - b. a Certified Person (Maintenance/Calibration)
 - c. MSHA
 - d. either a or b
5. During the pre-shift checks of the MSA Escort ELF[®] personal dust sampler, the battery voltage shall not be less than _____.
 - a. 6.25 volts
 - b. 3.75 volts
 - c. 4.80 volts
 - d. 6.0 volts
6. Which of the following is **not** included in the report of respirable dust sampling results to the operator?
 - a. The mine identification number
 - b. The concentration of respirable dust expressed in mg/m³
 - c. The reason for voiding any samples
 - d. none of the above

7. Testing and examinations of pumps and sampling assemblies immediately prior to the shift of use must be performed _____.
- a. within 1 hour of the beginning of sampling
 - b. within 2 hours of the beginning of sampling
 - c. within 3 hours of the beginning of sampling
 - d. within 24 hours of the beginning of sampling

III. Calibration

1. The wet test meter must be ____.
 - a. at a 90° angle
 - b. in a level position
 - c. at a 45° angle
 - d. none of the above

2. When calibrating a personal dust sampler with a 1 liter, soap-film calibrator, it is necessary to record the average time of ____ readings.
 - a. 2
 - b. 4
 - c. 5
 - d. 6

3. When calibrating a personal dust sampler with a wet test meter, it is necessary to record the time of ____ complete revolutions.
 - a. 5
 - b. 3
 - c. 1
 - d. 2

4. The water manometer should indicate at least ____ inch(es) of water pressure differential for all personal dust sampling devices.
 - a. 0.5
 - b. 1.0
 - c. 3.0
 - d. 4.0

5. Before calibrating, the inside of the soap-film calibrator should be coated with _____.
 - a. clear water
 - b. soap film
 - c. oil to make the soap slide easily
 - d. none of the above

6. The cutoff voltage of a nickel-cadmium battery is ____ volts per cell.
 - a. 1.0
 - b. 2.0
 - c. 1.3
 - d. 1.2

7. The battery voltage of the Escort ELF[®] personal dust sampler under actual load must be at least ____ volts times the number of nickel-cadmium cells in the battery pack. (Escort ELF[®])
 - a. 1.2
 - b. 1.0
 - c. 1.25
 - d. 2.35

8. All personal dust samplers must be calibrated every ____ operational hours.
 - a. 160
 - b. 200
 - c. 240
 - d. 320

9. During calibration of any personal dust sampling device, a low reading on the water manometer would indicate ____.
 - a. high barometer
 - b. high voltage peak
 - c. system air leak
 - d. excessive air flow

10. The water manometer should indicate less than ____ inch(es) of water pressure differential for all personal dust sampling devices.
 - a. 0.5
 - b. 1.0
 - c. 3.0
 - d. 2.0

11. A ____ shall calibrate and maintain respirable dust sampling equipment.
 - a. a person directed by a Certified Person
 - b. Certified Person (Sampling)
 - c. Certified Person (Maintenance/Calibration)
 - d. state enforcement agency

12. To become a Certified Person Maintenance and Calibration, the applicant must ____.
 - a. petition the state
 - b. pass an exam conducted by MSHA
 - c. attend a course given by the state
 - d. also be certified for sampling

13. Coal mine dust personal sampling units shall be calibrated in accordance with ____.
 - a. NIST
 - b. state regulations
 - c. Informational Report No. 1240
 - d. company policy

14. MSHA will accept the use of a fast response calibrator for calibrating respirable dust pumps if they meet what requirements? ___
- a. have an LCD
 - b. average repetitive runs
 - c. have a volumetric tube traceable back to the National Institute of Standards and Technology
 - d. MSHA does not accept fast response calibrators
15. When calibrating any respirable dust sampler, the flow rate shall be 2.0 LPM plus or minus ___.
- a. 0.1 LPM
 - b. 0.2 LPM
 - c. 0.4 LPM
 - d. 0.3 LPM
16. When calibrating a personal dust sampler with an approved fast response calibrator it is necessary to obtain and average the results of ___ readings.
- a. 1
 - b. 3
 - c. 5
 - d. 7
17. To be considered suitable for compliance sampling, the respirable dust pump must be properly calibrated and the appropriate approval labels must be affixed to the exterior of the pump.
- a. True
 - b. False

IV. Maintenance

1. The ___ of the cyclone should be examined for scoring.
 - a. inner surface
 - b. outer surface
 - c. grit pot
 - d. none of the above

2. If an attempt is made to charge a battery with less than ___ volts per cell, cell polarity may reverse.
 - a. 2.0
 - b. 1.0
 - c. 1.25
 - d. 1.2

3. During calibration of any personal dust sampling device, a high reading on the water manometer would indicate _____.
 - a. system obstruction
 - b. excessive air flow
 - c. low barometer
 - d. either a or b

4. Scratches or cuts on the inside of the sampling head's nylon cyclone are called _____.
 - a. scoring
 - b. bruising
 - c. scratches
 - d. marking

5. There are ___ nickel-cadmium cells in the battery pack of the MSA Escort ELF® personal dust sampler.
 - a. 3
 - b. 4
 - c. 5
 - d. 6

6. A ___ shall calibrate and maintain respirable dust sampling equipment.
 - a. a person directed by a Certified Person
 - b. Certified Person (Sampling)
 - c. Certified Person (Maintenance/Calibration)
 - d. state enforcement agency

7. It is acceptable to repair respirable dust pumps and battery packs with parts equivalent to those provided by the manufacturer.
 - a. True
 - b. False

Answers

Section I

1. D
2. A
3. D
4. B
5. A
6. A

Section II

1. A
2. D
3. C
4. D
5. C
6. D
7. C

Section III

1. B
2. A
3. B
4. B
5. B

Section III (Continued)

6. A
7. A
8. B
9. C
10. C
11. C
12. B
13. C
14. C
15. A
16. B
17. A

Section IV

1. A
2. B
3. D
4. A
5. B
6. C
7. B

