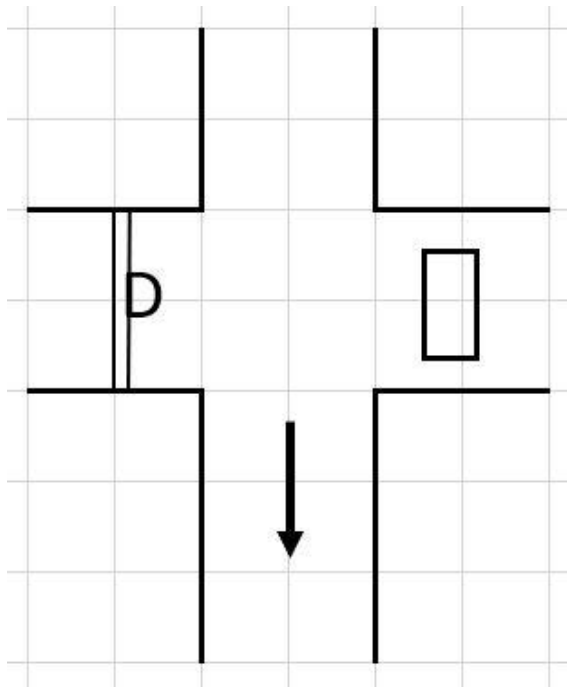


Tech Problem

The Field of Dreams Mine is a 3 entry development. Air enters the mine through the #1 entry and exits the mine through the #2 and #3 entries. You are standing in the #2 entry. You will need to determine the airflow in the #2 entry using a vane anemometer and using a smoke tube. Take a reading from the test port in the permanent stopping with man door between the #1 and #2 entries using the magnehelic gauge.

Field Set-Up



Field Set-Up Notes

Use 10 feet widths on the field. The pipe used for height can be anything measurable. I am providing the heights and widths for each exercise (anemometer and smoke tube). They will be different.

Anemometer

Width 19 feet

Height 9 feet

Anemometer Reading – “See Anemometer Picture”

Anemometer Reading is 1222 ft/min

Correction Factor is -35

Corrected Anemometer Reading is 1187 ft/min

Area is 171 ft²

Airflow is 1187 ft X 171 ft² = 202,977 CFM

Smoke Tube

Width 18 feet

Height 7 feet

Smoke Tube – measure off 10 feet

Quadrant 1 time is 12 seconds

Quadrant 2 time is 13 seconds

Quadrant 3 time is 15 seconds

Quadrant 4 time is 10 seconds

Avg Time = 12.5 sec

Velocity = 10 ft/12.5 sec = 0.8 ft/sec = 48 ft/min

Area = 126 ft²

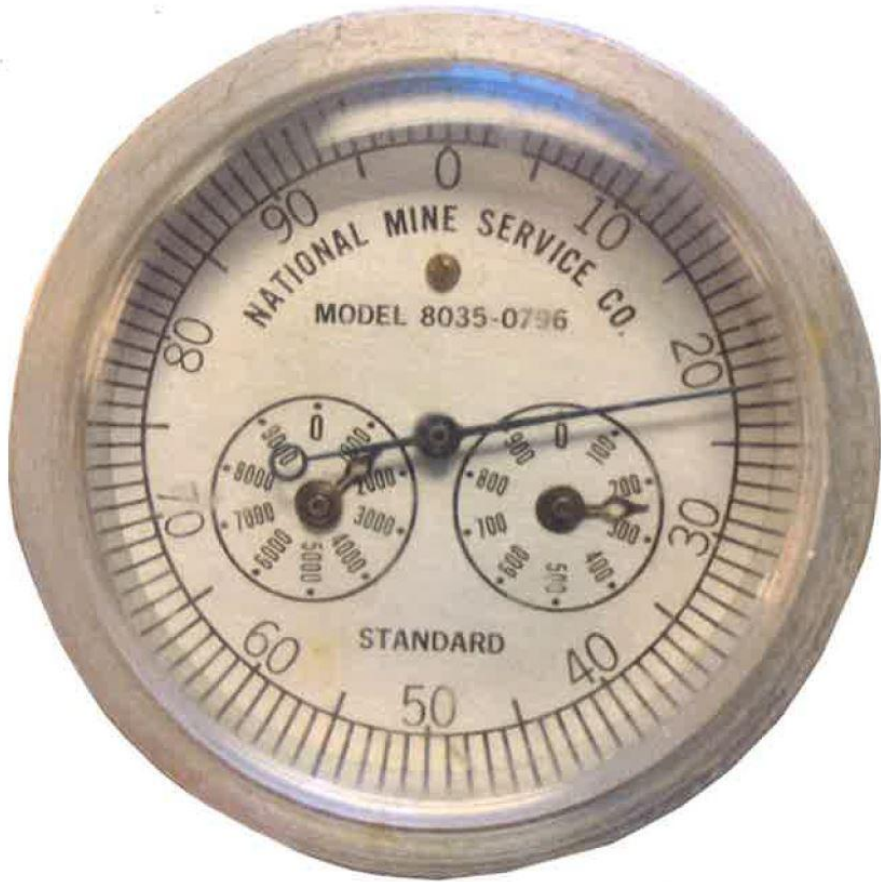
Air Flow = 126 ft² X 48 ft/min = 6,048 CFM

Magnehelic

Magnehelic Reading – “See Magnehelic Picture”

Magnehelic Reading is 0.16 in H₂O

Reflected as “Positive” [should use high pressure hose]





2022 Southeast Regional Mine Rescue Contest Technician Team Test

Name: _____ Team _____

1. Turn the instrument on by pressing and holding the center [Enter] navigation button on the _____ front of the instrument for at least 3 seconds.
 - a. Upper
 - b. Middle
 - c. Lower

2. Visually check the _____ for damage. Visually inspect the LCD display after it stabilizes.
 - a. MX-6
 - b. Detector
 - c. Instrument

3. BATTERY STATUS – Under the main menu [_____] option, select [BATTERY] to view the battery status.
 - a. CONFIGURE
 - b. DISPLAY
 - c. VIEW

4. When activated, instrument detects and measures concentration of carbon monoxide, methane, oxygen and nitrogen dioxide in the _____ air continuously and simultaneously.
 - a. Mine
 - b. Room
 - c. Ambient

5. In case of an alarm, the sensor(s) in alarm will be _____ on the display.
- a. Highlighted
 - b. Flashing
 - c. Red
6. Atmospheric pressure – Force exerted by _____. Atmospheric pressure is measured on a barometer.
- a. Air
 - b. Temperature
 - c. Weather
7. _____ - To scatter, spread out, or blend.
- a. Disperse
 - b. Diffuse
 - c. Mix
8. Main fan – A mechanical ventilator installed at the surface which operates by either exhausting or blowing (pushing) to _____ airflow through the mine.
- a. Create
 - b. Induce
 - c. Cause
9. Regulator – An adjustable door or opening in a stopping/Bulkhead used to control and adjust the _____ of airflow in the mine in order to ensure proper distribution.
- a. Quantity
 - b. Amount
 - c. Volume

10. Return – the air course along which the ventilated air of the mine is _____ or conducted to the surface.

- a. Moved
- b. Conveyed
- c. Returned

11. Two gases that are highly soluble in water are hydrogen sulfide and _____

- a. Methane
- b. Nitrogen dioxide
- c. Sulfur dioxide

12. A gas that is normally found near the roof or in high place in the mine is said to have a _____ specific gravity.

- a. High
- b. Middle
- c. Low

13. Of the gases we've talked about, which ones are toxic if you inhale them?

- a. Carbon monoxide, nitrogen oxide, hydrogen sulfide, sulfur dioxide, and acetylene.
- b. Carbon monoxide, oxides of nitrogen, hydrogen sulfide, sulfur dioxide, and acetylene.
- c. Carbon monoxide, oxides of nitrogen, hydrogen sulfide, radon, and acetylene

14. Line Brattice – Line brattice is used to _____ intake air from the last open crosscut to the working face.

- a. Direct
- b. Divert
- c. Channel

15. Auxiliary Fans and Tubing – Auxiliary fans and tubing are used to provide _____ airflow to face areas during mining operations.

- a. Adequate
- b. Sufficient**
- c. Needed