

68. Subsection 2 of section 35 is in effect since 1 September 1996.

69. This regulation comes into effect on 1 January 1997.

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Draft Regulation

An Act respecting occupational health and safety (R.S.Q., c. S-2.1)

Occupational health and safety in mines — Amendments

Notice is hereby given, in accordance with sections 10 and 11 of the Regulations Act (R.S.Q., c. R-18.1) and section 224 of the Act respecting occupational health and safety (R.S.Q., c. S-2.1), that the Regulation to amend the Regulation respecting occupational health and safety in mines and amending various regulatory provisions, the text of which appears below, may be adopted by the Commission de la santé et de la sécurité du travail and submitted to the Government for approval upon the expiry of 60 days following this publication.

The purpose of the draft regulation is to ensure the health and safety of workers in the mining sector and to prescribe standards that are more appropriate to that sector.

To that end, it proposes to introduce certain safety devices or safety measures to be used when operating certain pieces of equipment, such as scaling bars, miners' lamps and non-railbound motorized vehicles, and to amend certain provisions respecting the quality of breathable air when equipment operating with a diesel engine is used, so as to bring them into compliance with certain standards.

It also provides further details respecting the measures to be taken during boring work, the ventilation of a raise and the access routes to a stope.

To date, study of the matter has revealed little impact on small and medium-sized businesses, since the standards provided for in the Regulation reflect for the most part the practice already established in the mining sector, in addition to improving the safety of workers.

Further information may be obtained by contacting Mr. Ghislain Fortin, Commission de la santé et de la sécurité du travail, 524, rue Bourdages, Québec (Québec), G1K 7E2, tel.: (418) 646-3908, fax: (418) 528-2376.

Any interested person having comments to make on the matter is asked to send them in writing, before the expiry of the 60-day period, to Mr. Alain Albert, Vice-Chairman for Programming and Consulting, Commission de la santé et de la sécurité du travail, 1199, rue de Bleury, 14^e étage, Montréal (Québec), H3B 3J1.

PIERRE SHEDLEUR,
*Chairman of the Board of Directors and
Chief Executive Officer of the Commission
de la santé et de la sécurité du travail*

Regulation to amend the Regulation respecting occupational health and safety in mines and amending various regulatory provisions

An Act respecting occupational health and safety (R.S.Q., c. S-2.1, s. 223, 1st par., subpars. 1, 7, 10, 17, 19, 41, 42, and 2nd and 3rd pars.)

1. The Regulation respecting occupational health and safety in mines and amending various regulatory provisions, approved by Order in Council 213-93 dated 17 February 1993 and amended by the Regulation approved by Order in Council 1326-95 dated 4 October 1995, is further amended in section 1

(1) by inserting the following before the definition of "armoured cable":

““ANSI”: the American National Standards Institute; (ANSI)”;

(2) by inserting the following after the definition of "new development":

““NIST”: the National Institute for Standards and Technology; (NIST)”.

2. The figures “103.1, 108.2,” are inserted after the figure “103,” in section 27.

3. The following paragraph is added at the end of section 36:

“While drilling work is being carried out, no person may use, near the drilling zone, any noisy machine or tool such as internal combustion or pneumatic equipment, drills, impact hammers, or carry out noisy work such as bolting by means of pneumatic tools.”.

4. The words and figures “not exceeding 3.6 metres (12 ft.)” are inserted in the first sentence of section 37, after the words “Scaling bars”.

5. The following is substituted for subparagraph *b* of paragraph 3 of section 40:

“(b) by more than 3 metres (9.8 ft.) the top of the boom or bucket of mechanical equipment when raised to its highest operating position, except for a sandpit operation where the slope of the working face is at all points less than 45° in relation to the horizontal;”.

6. The following is substituted for section 60:

“**60.** In an underground travelway inclined at 50° or more from the horizontal, rest landings covering the compartment served by ladders shall be installed at vertical distances not exceeding 7 metres (23 ft.), except for openings to allow the passage of persons, which shall be equal to or greater than 1 square metre (10.8 sq. ft.) in area and, for every landing built from (insert here the date of coming into force of this Regulation), at least 70 centimetres (27.6 in.) in width.”.

7. The following paragraph is added at the end of section 71:

“Notwithstanding the foregoing, a stope may be operated with only one passage to the surface if:

- (1) that stope is operated for sampling purposes only;
- (2) no hoisting, exploration, development or new development work is carried out simultaneously with the operation of that stope;
- (3) a refuge station complying with the standards in sections 127 and 128 is installed less than 10 minutes from the work station;
- (4) the refuge station is equipped with an autonomous respiratory protection device with a full mask whose minimum duration of use is 90 minutes for each worker assigned to that site and to the haulage that may result therefrom;
- (5) the quantity of broken rock is absolutely necessary for the sample to be representative of the deposit to be exploited;
- (6) the timbering of the shaft and collar frame is kept wet.”.

8. The following is added after section 75:

“**75.1** Where a tunnel is used under a reserve of non-consolidated materials to recover those materials, the tunnel shall have at least 2 separate passages by which workers may evacuate the work stations.”.

9. The following is inserted after section 100:

“**100.1** The minimum rate of ventilation of a diesel engine used in an underground mine shall be that appearing on the inspection certificate issued by the Canadian Explosive Atmospheres Laboratory, CANMET, according to Standard Non-railbound Diesel-powered Machines for Use in Non-gassy Underground Mines, CAN/CSA-M424.2-M90, or the rate of ventilation prescribed in the federal certification index of the United States, in Parts 31 and 32, Title 30, Code of Federal Regulations, Mine Safety and Health Administration or, failing that, 5.5 cubic metres per minute per kilowatt (144.8 sq. ft. per minute per H.P.) at the engine shaft.”.

10. The following is substituted for paragraph 2 of section 101:

“(2) where equipment operating with a diesel engine is used, the rate of ventilation required to meet the requirements prescribed in section 100.1 and in paragraphs 1 and 2 of section 102.”.

11. Section 102 is amended

(1) by substituting the following for paragraph 1:

“(1) the ventilation in places where such engines are used shall be sufficient to dilute the contaminants present in the exhaust gases to exposure values measured in the worker’s respiratory zone; those exposure values shall be:

(a) below 1.5 milligrams of respirable combustible dust per cubic metre of air;

(b) below the exposure values provided for in Schedule A to the Regulation respecting the quality of the work environment;”;

(2) by inserting the following after paragraph 1:

“(1.1) the sampling and analysis protocol for respirable combustible dust shall be that of the Canadian Explosive Atmospheres Laboratory, CANMET, described in Schedule VI;”;

(3) by substituting the following for paragraph 2:

“(2) notwithstanding paragraph 2 of section 101, when several pieces of equipment operated by diesel engines are used simultaneously in the same ventilation circuit, the volume of fresh air to be supplied shall be 100 % of the flow given for the most demanding unit in terms of ventilation, 75 % of the flow given for the second unit and 50 % of the flow given for any additional unit, up to

2.7 cubic metres per minute per kilowatt (71 sq. ft. per minute per H.P.) at the engine shaft;”;

(4) by deleting paragraph 3; and

(5) by substituting the following for paragraph 6:

“(6) every diesel engine shall be fitted with a device for purifying or diluting exhaust gases;”.

12. The following is substituted for section 103:

“**103.** At least once a week, the flow of air in cubic metres per minute supplying a zone affected by the operation of an underground diesel engine shall be measured and entered in the register of the work station concerning diesel engines.”.

13. The following is inserted after section 103:

“**103.1** The measurements to evaluate the exposure values to respirable combustible dust provided for in section 102 shall be taken:

(1) at least once every 6 months;

(2) following any modification likely to alter the quality of air.

The result of those measurements shall be entered in the register of the work station concerning diesel engines.”.

14. The following is inserted after section 104:

“**104.1** In a raise:

(1) notwithstanding section 104, the ventilation flow in the work station shall supply at least 5 changes of air per hour;

(2) ventilation shall be supplied by means of a compressed air pipe that shall be:

(a) less than 6.1 metres (20 ft.) from the heading;

(b) equipped with a muffler;

(c) directed towards the head-frame;

(d) independent of the compressed air pipe that supplies a drill or other pneumatic tool.”.

15. The following is substituted for section 107:

“**107.** The air flow control devices for ventilating a raise shall be:

(1) designed so that a minimum ventilation of 5 changes of air per hour in the work station is maintained at all times;

(2) placed outside of and less than 10 metres (32.8 ft.) from the raise.”.

16. The following is substituted for the second paragraph of section 108:

“However, the wearing of such a lamp is not obligatory in the locations provided for in section 109 provided that the lamp is within the person’s reach.”.

17. The following is inserted after section 108:

“**108.1** A miner’s lamp used underground shall yield a level of illumination of at least 1 500 lux at 1.2 metres (4 ft.) from the light source.

Notwithstanding the foregoing, if the ground to be evaluated is more than 3.6 metres (12 ft.) from the miner’s lamp, auxiliary lighting shall also be installed.

108.2 In an underground mine, measures shall be developed to evaluate and maintain miners’ lamps.

The result of the testing of those lamps shall be entered in the register concerning miners’ lamps.”.

18. The following is inserted after the heading of Subdivision 1 of Division VI:

“**174.01** Any non-railbound motorized vehicle powered by a diesel engine, manufactured from (*insert here the date of coming into force of this Regulation*) and used in an underground mine shall comply with Standard Non-railbound Diesel-powered Machines for Use in Non-gassy Underground mines, CAN/CSA-M424.2-M90.”.

19. The word “railbound” is inserted before the word “motorized” in section 181.

20. The following is inserted after section 181:

“**181.1** A non-railbound motorized vehicle shall:

(1) have service brakes capable of stopping the vehicle and keeping it stationary when it carries the maximum load for which it was designed on the steepest slope on which it may be required to travel;

(2) have a parking brake that:

(a) is mechanically operated;

(b) is capable of keeping the vehicle stationary when it is loaded:

i. on a slope of 15 % in the case of a vehicle used on the surface;

ii. on a slope of 20 % in the case of a vehicle used underground;

(c) where it is applied, is capable of maintaining its power in spite of the contraction of the brake's parts, any power loss or any leak.

For the purposes of this section, "service brakes" means the main system of any type used to stop a vehicle and keep it stationary without the assistance of any deceleration device or dynamic braking."

21. The words "or in a mine operated in a permafrost zone" are inserted after the words "salt mine" in the second paragraph of section 374.

22. The following sentence is added at the end of section 393: "In the case of a sinking crosshead, the roof shall be supported by the crosshead and not by the hoisting rope."

23. Section 394 is amended

(1) by substituting the words "of the top of the conveyance" for the words "of the roof" at the end of the first paragraph; and

(2) by inserting the following paragraph after the first paragraph:

"Notwithstanding the foregoing, where the conveyance is a sinking crosshead, the lanyard shall not be attached to the hoisting rope, but to an element fixed to the crosshead."

24. Section 398 is amended

(1) by substituting "10 metres (32.8 ft.)" for "15 metres (49.2 ft.)" in the fourth line; and

(2) by substituting "5 metres (16.4 ft.)" for "8 metres (26.2 ft.)" in the eighth and ninth lines.

25. Schedule VI attached hereto is added at the end.

26. This Regulation comes into force on the fifteenth day following the date of its publication in the *Gazette officielle du Québec*.

SCHEDULE VI

(s. 102)

SAMPLING AND ANALYSIS PROTOCOL FOR RESPIRABLE COMBUSTIBLE DUST (RCD)

1. Principle underlying the protocol

A sample of respirable dust is taken on a silver membrane filter (0.8-micrometer pores, 25 millimetres in diameter). Once the sampling is completed, the filter is weighed and then placed in a furnace at 400 degrees Celsius for at least 1.5 hours. Such temperature and the catalytic action of the silver membrane filter combine to eliminate carbon-based substances. That loss in mass is therefore equivalent to the quantity of respirable combustible dust.

2. Precision and accuracy

CONCENTRATION RANGE (RCD): 0.04 to 3.0 milligrams per cubic metre (100-litre sample).

ACCURACY: < 10 % (pure diesel dust samples).

PRECISION: ± 0.04 milligrams (on gravimetric analysis only).

3. Interference

Carbon-based mineral dust (coal, graphite).

Some sulphide mineral dusts.

4. Equipment

Personal sampler: 10-millimetre Dorr-Oliver nylon cyclone. Silver membrane filter 25 millimetres in diameter with 0.8-micrometer pores. Three-piece plastic cassette with backup pad.

Personal sampling pump. Flexible plastic tube to connect the pump to the cassette.

Flowmeter.

Furnace equipped with automatic temperature control system. Fire-proof glass or stainless steel plates for filters.

Electrobalance (0.01-milligram readability).

5. Sampling

The flow of the sampling pump shall be calibrated at 1.7 litres per minute using the flowmeter. When using a

cyclone, the flow must be fixed at 1.7 litres per minute under the actual temperature and pressure conditions of the sampling site. Calibration of the flow is done with the entire sampling device (pump, tube, cyclone, filter cassette).

The sampling flow shall be measured at the end of sampling and the difference with the initial flow shall be less than 5 %.

The sampling volume shall range from 400 to 1 000 litres.

Once the sampling is completed, the cassette shall be plugged and sent to the laboratory for analysis.

6. Analysis

Using tweezers, the filter shall be withdrawn from the cassette case making sure not to touch the dust deposit. The filters to be analyzed shall be placed in the same clean room as the balance for an acclimatization period of at least 2 hours.

After that period, each filter shall be weighed at least twice. If the difference between the two readings is 0.3 milligrams or more, a third reading is required. The mass of the filter is the average of the masses that differ by 0.2 milligrams or less.

The filters shall be placed on heating plates, which shall then be inserted in the furnace. The position of the filters shall be carefully recorded using a diagram on which each filter is identified and its position in relation to the others indicated (identification marks on filters may burn off during the heating process).

The furnace shall be heated to 400 degrees Celsius. A timer equipped with an audible alarm may be used to indicate the end of the heating period, which shall be at least 1.5 hours at a temperature of 400 degrees Celsius.

At the end of the heating process, samples shall be removed from the furnace. They may be removed from the plates if it can be done safely. Otherwise, it is recommended to wait until the plates have cooled. Filters may sometimes tend to adhere to the plate. A scalpel blade inserted between the filter and the surface while holding the filter with tweezers usually frees the filter without damaging it.

Filters shall then be placed in the same place as the balance for 2 hours. Filters shall be re-weighed as described in the second paragraph.

The mass of respirable combustible dust is the difference between the final mass obtained pursuant to the sixth paragraph and the initial mass obtained pursuant to the second paragraph.

7. Quality control

The accuracy of the furnace temperature reading shall be periodically verified by using an electronic thermometer.

The balance shall be calibrated at the beginning of each weighing session using the manufacturer's directions for internal calibration. Thereafter, every 3 months or more if needed, the accuracy of the balance shall be checked using NIST Class S weights. Every year, the balance shall be cleaned and its accuracy checked again using Class 1 (ANSI/ASTM) weights.

The calibration of flowmeters shall be done by a laboratory that must file certificates demonstrating that the calibration procedures comply with NIST Standards.

Analytical and sampling blanks shall be analyzed at the same time as the other samples. The loss in mass of analytical blanks should never exceed 0.04 milligrams and that loss in mass shall be applied as a correction factor.

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