18-GP-1a
18 August 1950
CANCELLATION
October 1969

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Specification for COAL

This standard is cancelled as of October 1969. The part dealing with anthracite coal has been superseded by CGSB 18-GP-8, February 1967, and the remainder by CGSB 18-GP-7, May 1969.

18-GP-1a
18 August 1950
AMENDMENT NO. 1
20 June 1958

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Specification
for

COAL

Table C, page 5 - Change the Size Designation and Permissible Size Limits for Nut Slack to specify a top size of "From 2 inches to and including 1-1/4 inches".

Withdrawn/Retirée

CANADA

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

SPECIFICATION

FOR

COAL

18-GP-1A

18 AUGUST 1950

SUPERSEDES 18-GP-1
12 FEBRUARY, 1940

ARCHIVES COPY

Withdrawn/Retirée

THIS SPECIFICATION APPLIES TO COAL TO BE USED FOR GENERAL HEATING OR STEAM RAISING PURPOSES

NATIONAL RESEARCH COUNCIL, OTTAWA, CANADA

Price
15 CENTS

COMMENTS AND ENQUIRIES REGARDING THIS PUBLICATION SHOULD BE ADDRESSED TO THE CGSB SECRETARY

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18-GP-1a

18 August, 1950
Supersedes No. 18-GP-1
12 February, 1940.

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Specification
for

COAL*

1. DEFINITION

This specification applies to coal to be used for general heating or steam raising purposes.

2. DESIGNATION OF COAL

For the purpose of this specification, coal shall be designated by group, in accordance with the following classification**.

GROUP	ADJUSTED TO 10% ASH BASIS		CAKING PROPERTIES (2)
	VOLATILE MATTER Dry Basis	CALORIFIC VALUE B.t.u./lb. Moist Basis (1)	
Anthracites	Up to 13.5%	(Anthracites and Bituminous not classified on this basis but must have more than 9790 B.t.u./lb.)	Non-caking
Low Volatile Bituminous	13.5 - 20.6%		Caking
Medium Volatile Bituminous	20.6 - 28.6%		Caking
High Volatile Bituminous	More than 28.6%		Caking and Non-caking
Subbituminous	(Subbituminous and Lignites not classified on this basis)	7380-9790 B.t.u.	Non-caking
Lignites		Less than 7380 B.t.u.	Non-caking

(1) Moist Basis refers to coal containing its natural bed moisture but not including visible water on the surface of the coal.
(2) Caking properties as indicated by residue of Standard Volatile Matter Test.

N.B. - For supplementary information covering the coal-producing areas, coal reserves, mine production data, typical analyses of Canadian and United States Coals, methods of sampling and analysis, laboratory procedures, significance of tests for coal, etc., a knowledge of which is of value to both purchaser and vendor, see reference list on page 9. For further technical information or advice application may be made to Division of Fuels, Mines Branch, Dept. of Mines and Technical Surveys, Ottawa.

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* Separate specifications are to be prepared for Coke and Briquettes.

** Derived from "Standard Specifications for Classification of Coals by Rank", American Society for Testing Materials Designation: D388-38 (See also Publication No. 814, National Research Council).

Withdrawn/Retirée

3. GENERAL REQUIREMENTS

Coal for use in various types of heating equipment may be specified in order of usual preference in accordance with general practice, as follows:

Note: Coke and Briquettes, both of which are used with eminent satisfaction in many of the undernoted types of equipment, are covered by separate specifications.

EQUIPMENT	COAL TYPES	COAL SIZES
(a) Hand-Fired Heating and Cooking Stoves, Ranges and Small & Medium Size Hot Water Jacket Heaters of Conventional Type.	Anthracites	Pea, Nut, or Stove Size
	Non-caking High Volatile Bituminous or Subbituminous	Nut, Stove or Egg Size or mixture of these sizes.
	Low Volatile Bituminous (Caking)	Nut or Stove Size or mixture of these sizes.
	Medium and High Volatile Bituminous (Caking)	Nut or Stove Size or mixture of these sizes.
(b) Hand-Fired New Type (Non-Conventional) Equipment, including "Aga" and "Esse" Cookers.	Anthracites	Nut Size; or type, grade, and size of coal, as specified by the manufacturer.
(c) Domestic Type Warm Air Furnaces, Small Hot Water and Steam Boilers and Large Hand-Fired Hot Water Jacket Heaters.	Anthracites	Egg, Stove, Nut, or Pea Size
	Non-caking High Volatile Bituminous or Subbituminous	Stove, Egg, Cobble, or Lump (Single or Double Screened)
	Low Volatile Bituminous (Caking)	Nut, Stove, or Egg Size or mixture of these sizes.
	Medium and High Volatile Bituminous (Caking)	Nut, Stove, or Egg Size or mixture of these sizes.
	Lignite	Stove, Egg, Cobble, or Lump (Single or Double screened)
(d) Hand-Fired Domestic Furnaces and Boilers Equipped with Blowers	Anthracite 'Blower' Coal	No. 1 or No. 2 Buckwheat Size or mixture of these sizes or other suitable size specially prepared.
(e) Hand-Fired Furnaces and Boilers. (Larger sizes for Commercial and Small Industrial Uses)	Low Volatile Bituminous (Caking)	Mine Run or Screened Lump
	Medium and High Volatile Bituminous (Caking)	Mine Run or Screened Lump
	Non-caking High olatile Bituminous or Subbituminous	Screened Lump
	Lignite	Screened Lump

Withdrawn/Retiree

3. General Requirements (Cont'd)

EQUIPMENT	COAL TYPES	COAL SIZES
(f) Stoker-Fired Furnaces or Boilers.		
A. Bituminous Type Stokers		
1. Industrial (large) and commercial (medium) size stokers with feed rates in excess of 500 pounds of coal per hour.	Bituminous (both caking and non-caking varieties), Sub-bituminous, or Lignite	Fines, Slack, Nut Slack, or nearest equivalent sizes.
2. Semi-Commercial (small) size stokers with feed rates over 50 pounds and under 500 pounds of coal per hour.	Same as above except where experience has indicated need for a preferred size of coal, such as Prepared Stoker Size selected from vendor's description of preparation available for the purpose. (See Table C, Section 4)	
3. Domestic (very small) size stokers with feed rates under 50 pounds of coal per hour.	Bituminous (both caking and non-caking varieties), Sub-bituminous or Lignite; or mixtures of Bituminous (caking) and Subbituminous or Lignite non-caking coal.	Prepared Stoker Size selected from vendor's description of preparation available for the purpose. (See Table C, Section 4)
Remarks: The optimum coal for this purpose (domestic bituminous type stokers) is believed to be a good grade of bituminous coal with relatively weakly-caking properties, low in ash content (4% to 7%), high in B.t.u. value, with an ash fusion temperature within the range of 2200 to 2600°F; and of mixed size within the range 1/8 to 1 inch. Oil treatment is generally recommended for dust elimination. Coal having an undue proportion of fines (over 15% under 1/8" in size) should be avoided, also one that is extremely wet, as it will not feed out of the hopper properly.		
B. Anthracite Type Stokers		
1. For industrial and commercial use. These are specially designed plants using chain grate or rectangular retort stokers.	Anthracites	No. 1, No. 2, No. 3, No. 4 Buckwheat Sizes, Yard Screenings, or mixture of these sizes.
2. Domestic (very small) size stokers, anthra-tubes, and other auto-matically-fed anthracite burning equipment.	Anthracites	Pea, No. 1 Buckwheat, No. 2 Buckwheat (Rice), or No. 3 Buckwheat (Barley), as re-commended by maker.
(g) Blacksmith Forges	Low or Medium Volatile Bituminous (caking, low sulphur, low ash)	Slack, Nut Slack, or small-sized coals, according to requirements.

Withdrawn/Retirée

4. SIZING OF COAL

The coal shall conform to any one, or group, of the following size designations, as required by the purchaser. No quotation should be accepted by the purchaser unless the vendor has given the upper and lower permissible screen limits of the coal on which the quotation is made.

A - American Anthracite

According to "The Anthracite Standards Law", - Act 168, Commonwealth of Pennsylvania, effective September 1, 1949.

Size of Anthracite	Test Mesh Round (Inches)		Undersize Maximum	Ash Content Maximum	Maximum Slate	Percentage Bone
	Through	Over				
Broken	4-3/8	3¼ to 3	15%	11%	or 1-1/2%	2%
Egg	3¼ to 3	2-7/16	15%	11%	or 1-1/2%	2%
Stove	2-7/16	1-5/8	15%	11%	or 2%	3%
Nut	1-5/8	13/16	15%	11%	or 3%	4%
Pea	13/16	9/16	15%	12%	or 4%	5%
Buckwheat(No.1)	9/16	5/16	15%	13%	-	-
Rice(No.2 Buck)	5/16	3/16	17%	13%	-	-

Note: "Standard Anthracite" is anthracite which does not exceed the above specification as to undersize and ash or slate and bone content.
"Substandard Anthracite" is anthracite other than that defined as standard anthracite.
For allowable tolerances and supplementary explanation see reference 5, Reference List, page 9.

B - British (Welsh) Anthracite

Based on information furnished by the major Canadian importer, March 17,1949.

Size Designation	Size of Limiting Screens (Inches)	
	Through	Over
Since 1945		
Furnace	5 to 5½ rd.	2 rd.
Range	2 rd.	3/4 rd.
Blower	3/4 rd.	1/4 rd.
Screenings	1/4 rd.	0
Prior to 1940		
Cobbles (Approx. Amer. Broken)	--	3 rd.
French Nuts (Approx. Amer. Stove-Egg)..	3 rd.	1-1/8 rd. or 1-5/8 rd.
Stove Nuts (Approx. Amer. Nut)	1-5/8 rd.	11/16 sq.
Pea Nuts (Approx. Amer. Pea)	1-1/8 rd.	11/16 sq.
No. 1 Buckwheat (Blower)	11/16 sq.	7/16 sq.
No. 2 Buckwheat (Blower)	7/16 sq.	1/4 sq.
Screenings	1/4 sq.	0

Note: 11/16 sq. is approximately equal to 13/16 rd.
7/16 sq. is equivalent to 1/2 rd.
1/4 sq. is equivalent to 9/32 rd.

Withdrawn/Retiree

C - BITUMINOUS, SUBBITUMINOUS, AND LIGNITE COALS

CUSTOMARY TRADE DESIGNATION	SIZE (1) DESIGNATION ROUND-HOLE SCREEN (INCHES)	PERMISSIBLE SIZE (3) LIMITS, ROUND-HOLE SCREEN (INCHES)		REMARKS
		PASSING (2)	RETAINED ON (2)	
Mine Run	As mined	variable	1/8 (1/16)	Purchaser may specify maximum permissible size, in which case not more than 5% of the coal shall be retained on the screen defining the upper size limit, as stated by the vendor. The lower screen limit of 1/16" shall apply only to the bituminous coals of Alberta and British Columbia in the following districts: Crowsnest, Mountain Park, Nordegg and Cascade.
Dock or Pile Run	As lifted from dock or storage pile	variable	1/8 (1/16)	
Modified Mine, Dock, or Pile Run	As stated by vendor	variable	1/8 (1/16)	
Large Lump	Plus 4	variable	4	Upper size limit shall be stated by vendor.
Lump	Plus 1	variable	1	The purchaser may specify a maximum permissible size, in which case not more than 5% of the coal shall be retained on the screen defining the upper size limit, as stated by the vendor.
Egg or Stove	4 x 2	4	2	
Nut	2 x 3/4	2	3/4	
Prepared Stoker	As stated by vendor	variable As stated by vendor	variable As stated by vendor	Both upper and lower size limits and any special treatment applied to the coal shall be stated by the vendor.
Nut Slack	2 or 1-1/2 x 0	2 or 1-1/2	1/16 (1/32)	The lower screen limits of 1/32" and 1/64", for the sizes noted, shall apply only to the bituminous coals of Alberta and British Columbia in the following districts: Crowsnest, Mountain Park, Nordegg and Cascade.
Slack	1 or 3/4 x 0	1 or 3/4	1/32 (1/64)	
Fines	1/2 x 0	1/2	None	

(1) The specification for each size is based on the size as delivered to the consumer and does not necessarily indicate the size or types of the limiting screens used in the original preparation.

(2) Not more than 15 percent by weight of the coal shall pass the screen defining the lower size limit, and not more than 5 percent shall be retained on the screen defining the upper size limit.

(3) To take care of the off-size coals, and mixtures of sizes, either the purchaser or vendor may specify other upper and lower size limits than those shown here.

Withdrawn/Retired

5. BASIS FOR COMPARISON OF QUOTATIONS

(A) The vendor shall supply the following information with his tender or quotations:

1. The name, location, and seam (when known) of the mine or mines from which he proposes to supply the coal.

2. When required by the purchaser, a statement of the guaranteed quality of the coal, the analysis being given in the following form:

Example:	As Received Basis*	Dry Basis**
Moisture .....%	x.x	nil
Ash .....%	x.x	x.x
Volatile Matter .....%	xx.x	xx.x
Fixed Carbon .....%	xx.x	xx.x
	100.0	100.0
Sulphur .....%	x.x	x.x
Calorific Value, B.t.u./lb.....	xxxxx	xxxxx
Softening Temp. of Ash, °F***.....	xxxx	xxxx

* Representing coal as delivered.

** Representing coal after being oven dried to constant weight at 110°C (230°F).

*** When rendered necessary by the type of equipment in which the coal is to be burned, the purchaser may stipulate a minimum permissible softening point for the ash.

(B) From the information supplied in accordance with paragraph (A) of this clause, the purchaser may make the following computations to serve as a basis for the selection of fuel of the lowest net cost.

The purchaser may compute the cost per million B.t.u. contained in the delivered coal, in accordance with the following example:

Example:

A coal quoted at $10.00 per ton, which was stated to have a moisture content of 3 percent and a calorific value of 13580 B.t.u. per pound (as received basis) or 14000 B.t.u. per pound (dry basis), would cost:

(1) As Received Basis

$$\frac{1,000,000}{13580 \times 2000} \times \$10.00 = 36.8 \text{ cents per million B.t.u.}$$

(2) Dry Basis

$$\frac{100}{100 - 3} \times \frac{1,000,000}{14000 \times 2000} \times \$10.00 = 36.8 \text{ cents per million B.t.u.}$$

Withdrawn/Retirée

6. CAUSES FOR REJECTION OF TENDERS

Tenders may be rejected under the following circumstances:

(a) If the coal tendered is of a type that is known to be liable to spontaneous combustion when stored in the quantities or under the conditions made necessary by the circumstances under which it is to be used.

(b) If the sulphur content is such, or the chemical nature of the ash is such, as is known to be liable to cause excessive deterioration of the equipment in which the coal is to be used.

(c) If the purchaser knows, from information in his possession, confirmed by the Fuels Division, Mines Branch, regarding the coal, that the vendor's statement of guaranteed quality is impossible of fulfilment.

7. BASIS FOR REJECTION OR ACCEPTANCE OF DELIVERED COAL

The purchaser may, at his option:

(a) Reject any delivery of coal and cancel the contract when the coal supplied does not comply with the requirements specified by the purchaser, and/or with the guaranteed quality, provided that a tolerance of 2.5% of the calorific value (dry basis) and an increase of 2.5% on the moisture (as received) is allowed, or

(b) Accept any coal which is not of the guaranteed quality and, at his option, apply a price adjustment allowing a tolerance of 2.5% of the calorific value (dry basis) and an increase of 2.5% on the moisture (as received).

The adjustments shall be computed as follows:

1. B.t.u. Adjustment: The delivered contract price of the coal shall be multiplied by the ratio of the calorific value (dry basis) of the coal delivered, to 97.5% of the calorific value (dry basis) guaranteed by the contractor, and the product, computed to the nearest cent, shall be subtracted from the contract price.

2. Moisture Adjustment: If the moisture content exceeds the above-noted tolerance of 2.5%, an additional adjustment shall be made as follows: The delivered contract price of the coal shall be multiplied by: the per cent moisture as delivered, less the guaranteed moisture plus 2.5%, divided by 100, and the product, computed to the nearest cent, is the adjustment.

Withdrawn/Retirée

The above calculations for B.t.u. adjustment and moisture adjustment may be made at one time in accordance with the following formula:

$$\left[C.P. - \left(\frac{\text{B.t.u. delivered, dry} \times C.P.}{0.975 \times \text{B.t.u. guaranteed, dry}}\right)\right] + \left[C.P.\left(\frac{M-(M' + 2.5)}{100}\right)\right]$$

= Amount of adjustment, in cents.

where: C.P. = contract price, in cents.

M = Moisture percent by analysis in delivered coal.

M' = Moisture percent guaranteed.

Example: (Moisture "as received"; ash and calorific value-dry).

Guaranteed Analysis: Moist. - 3%; ash-7%; B.t.u. - 13,720
Delivered Analysis: Moist. - 8%; ash-10%; B.t.u. - 13,310
Contract Price: $10.00 per ton.

$$\left[1000 - \left(\frac{13310 \times 1000}{0.975 \times 13720}\right)\right] + \left[1000\left(\frac{8-(3 + 2.5)}{100}\right)\right]$$

= (1000 - 994) + 25 = 31 cents

Adjusted Price = $10.00 - $0.31 = $9.69

8. SAMPLING AND ANALYSIS

Sampling - Samples from shipments or storage shall be taken in accordance with the Canadian Government Specifications Board publication No.18-GP-4, entitled "Methods of Sampling Coal Deliveries".

The attention of the purchaser is called to the advantages of taking two samples, one to be retained as a referee sample, should any dispute arise with regard to the adjustment of coal accounts, or should the first sample be mislaid in shipment.

Analysis - Laboratory preparation and analysis of coal samples shall be carried out in accordance with the procedure described in ASTM Designation: D271-48: "Laboratory Sampling and Analysis of Coal and Coke".

Withdrawn/Retiree

REFERENCE LIST

1. "Coal Mines in Canada" - Annual publication No. 4-1, issued by Mineral Resources Division, Mines Branch, Department of Mines and Technical Surveys, Ottawa, - Free on request.

2. "Analysis Directory of Canadian Coals" - Memorandum Series No. 100, issued by Division of Fuels, Mines Branch, Dept. of Mines and Technical Surveys, Ottawa.

3. "Coals of Alberta, Their Occurrence, Analysis and Utilization", Report No. 35, Parts I to VI inclusive, Research Council of Alberta, University of Alberta, Edmonton, Alberta. Price $1.00.

4. "Typical Analyses of Coals of the United States" - Bulletin 446, issued by Bureau of Mines, United States Department of the Interior, Washington, D.C. - For sale by the Superintendent of Documents, Washington, D.C. Price 10 cents.

5. "The Anthracite Standards Law" Act 168, Commonwealth of Pennsylvania, The Secretary, Anthracite Committee, State Street Building, Harrisburg, Pa., Reprint free on request.

6. "Report of the Royal Commission on Coal, 1946" - Available from the King's Printer, Ottawa. Price $2.00.

7. "Report on the A.S.T.M. Standard Specifications for Classification of Coals by Rank and Grade and their application to Canadian Coals". Report No. 814, National Research Council, Ottawa. Price 25 cents.

8. "A.S.T.M. Standards on Coal and Coke - Covering Sampling Methods, Chemical Analysis, Methods of Testing, Specifications for Classifications, Definitions of Terms - Issued by the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

9. "Handbook on Coal Sampling" - Revision of Technical Paper 133 - Bureau of Mines, United States Department of the Interior, - For sale by the Superintendent of Documents, Washington, D.C. Price 10 cents.

10. "Symposium on Significance of Tests of Coal" - Proceedings of the 40th Annual Meeting, Vol. 37, Part II, 1937 - American Society for Testing Materials.

Correspondence regarding this specification should be addressed to the Secretary, Canadian Government Specifications Board, National Research Council, OTTAWA, Canada.

Withdrawn/Retirée