THOROUGHBRED

STATIONARY AND PORTABLE CONCRETE PLANTS

Stephens

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Tompkinsville

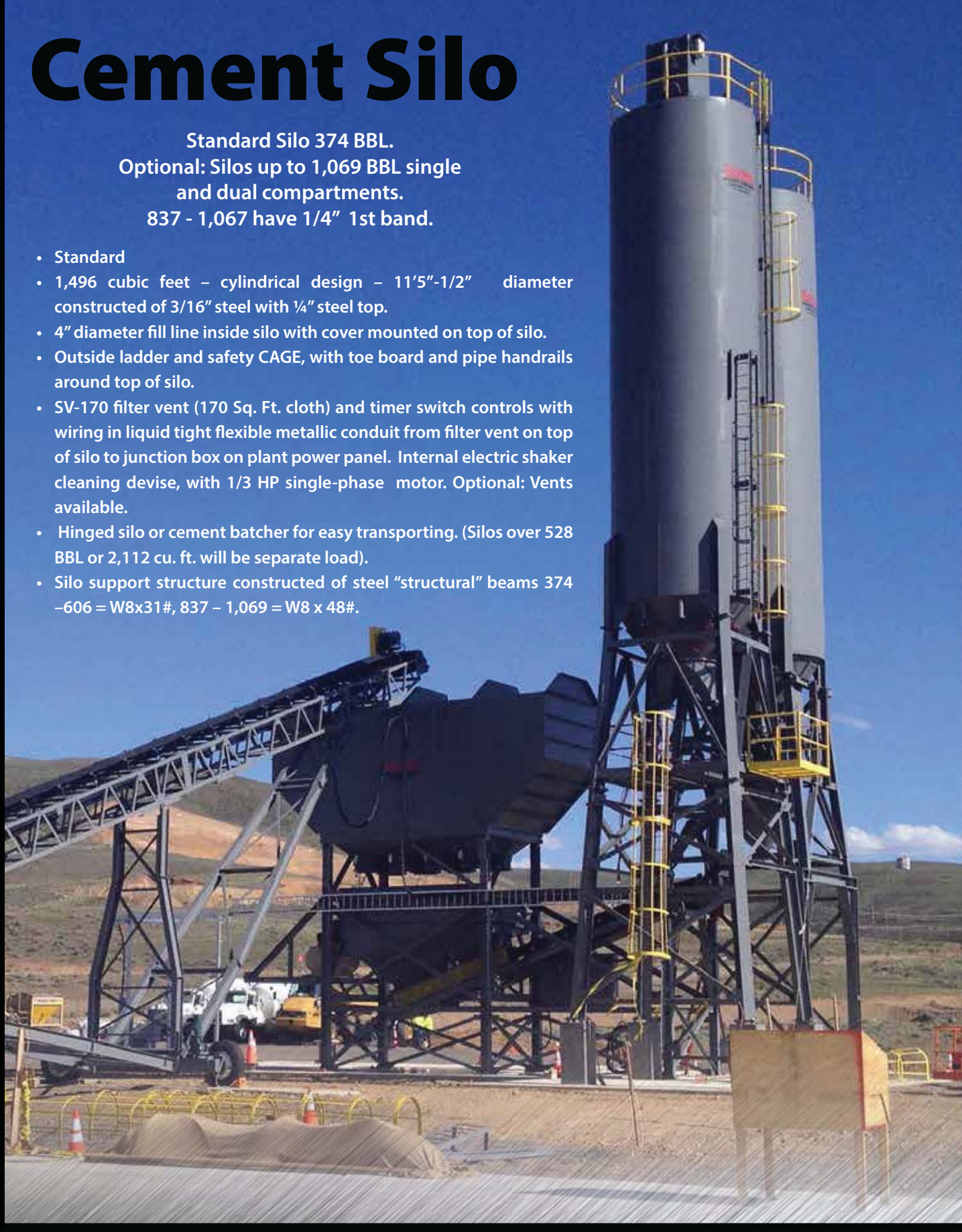
Thoroughbred

THOROUGHBRED

Cement Silo

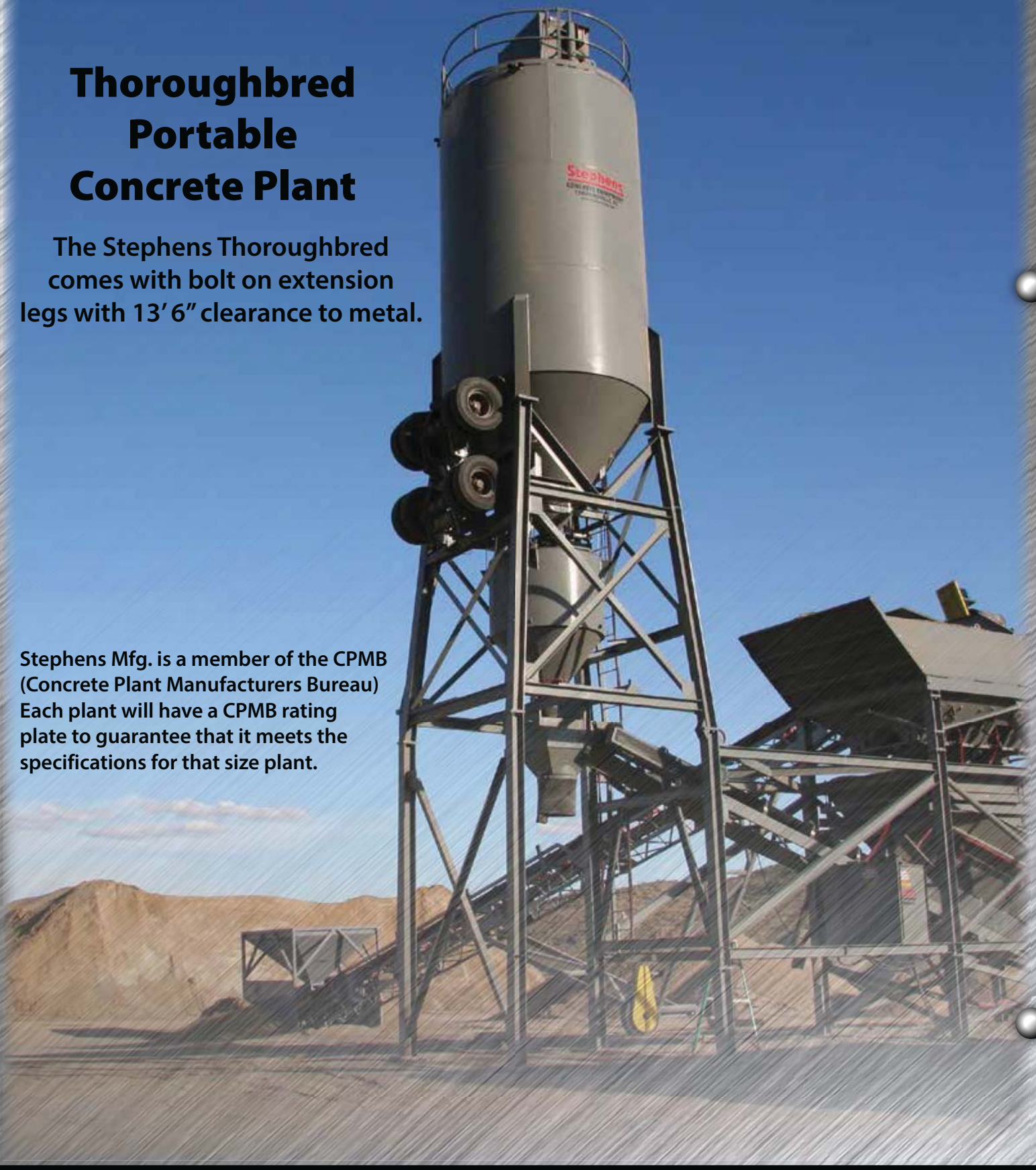
Standard Silo 374 BBL.
Optional: Silos up to 1,069 BBL single and dual compartments.
837 - 1,067 have 1/4" 1st band.

- Standard
- 1,496 cubic feet – cylindrical design – 11'5"-1/2" diameter constructed of 3/16" steel with ¼" steel top.
- 4" diameter fill line inside silo with cover mounted on top of silo.
- Outside ladder and safety CAGE, with toe board and pipe handrails around top of silo.
- SV-170 filter vent (170 Sq. Ft. cloth) and timer switch controls with wiring in liquid tight flexible metallic conduit from filter vent on top of silo to junction box on plant power panel. Internal electric shaker cleaning devise, with 1/3 HP single-phase motor. Optional: Vents available.
- Hinged silo or cement batcher for easy transporting. (Silos over 528 BBL or 2,112 cu. ft. will be separate load).
- Silo support structure constructed of steel "structural" beams 374 –606 = W8x31#, 837 – 1,069 = W8 x 48#.



Thoroughbred Portable Concrete Plant

The Stephens Thoroughbred comes with bolt on extension legs with 13' 6" clearance to metal.



Stephens Mfg. is a member of the CPMB (Concrete Plant Manufacturers Bureau) Each plant will have a CPMB rating plate to guarantee that it meets the specifications for that size plant.

Cement Batcher

- 14 yd cement batcher 140 cu. ft. with 10,000 lb. lever system, one "s" type load cell (100' cable) with 0-10 VDC digital readout, with inching gate on batcher inspection hatch on top of batcher.
- Hanger lugs for hanging test weights and safety chains to secure batcher. Optional: Limit Switches available.

Aggregate Bin

Standard 70 TON - Three Compartments.
(Optional: Bins up to 200 Ton- Six Compartments).

1400 cubic feet 70 ton – 51 cubic yards with heap – 3 compartment overhead storage bins.

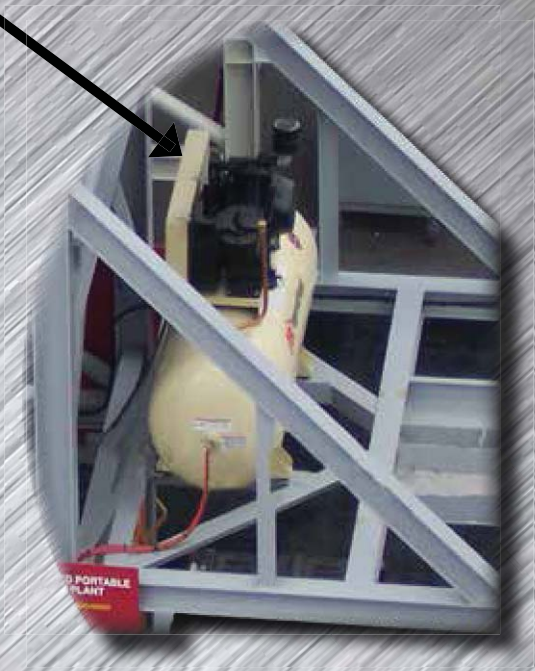
- **Bolt on extension legs between overhead bins and aggregate batcher.**
- **10 yards of material may be discharged from any two (2) compartments. (On 4-compartment bin consult factory).**
- **Hinged fold down sides for easy transportation. (Note: It may be to customer's advantage to have bins welded up to save crane time and labor in the field.)**
- **Two clam gates on each compartment. Gear type gates with six (6) ¾" teeth on each gear.**
- **Each gate has permanently lubricated bronze bushings.**
- **5" diameter air cylinder with electric solenoid.**
- **Heap plates.**
- **¼" abrasive resistant steel (400 brinnell) welded immediately above each gate (approx 12" tall.)**
  Optional: A/R Liners available

Aggregate Batcher

- **12 yard with 40,000 lbs lever system with one "s" type load cell and 0-10 VDC digital readout.**
- **580 Cu. Ft. capacity at water level.**
- **Two discharge openings in batcher with one (1) extra long double acting clamshell gates, under both openings. Gear type gate with six (6) ¾" teeth per gate. Gate has permanently lubricated bronze bushing. Gate will be actuated by two 5" air cylinders, with flo-restricators mounted in solenoid.**

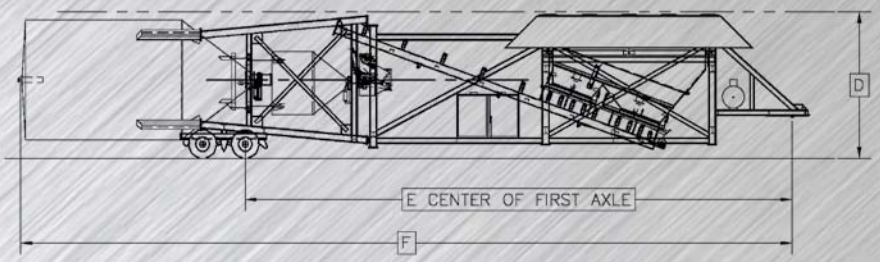
Transfer Conveyor

- 30" x 33'6" channel frame transfer conveyor.
- 15-HP 3-phase TEFC motor 230/460 volts.
- Stephens conveyors are rated by the CPMB (Concrete Plant Manufactures Bureau) for accurate discharge rates.
- Optional: 36 Transfer Conveyor available

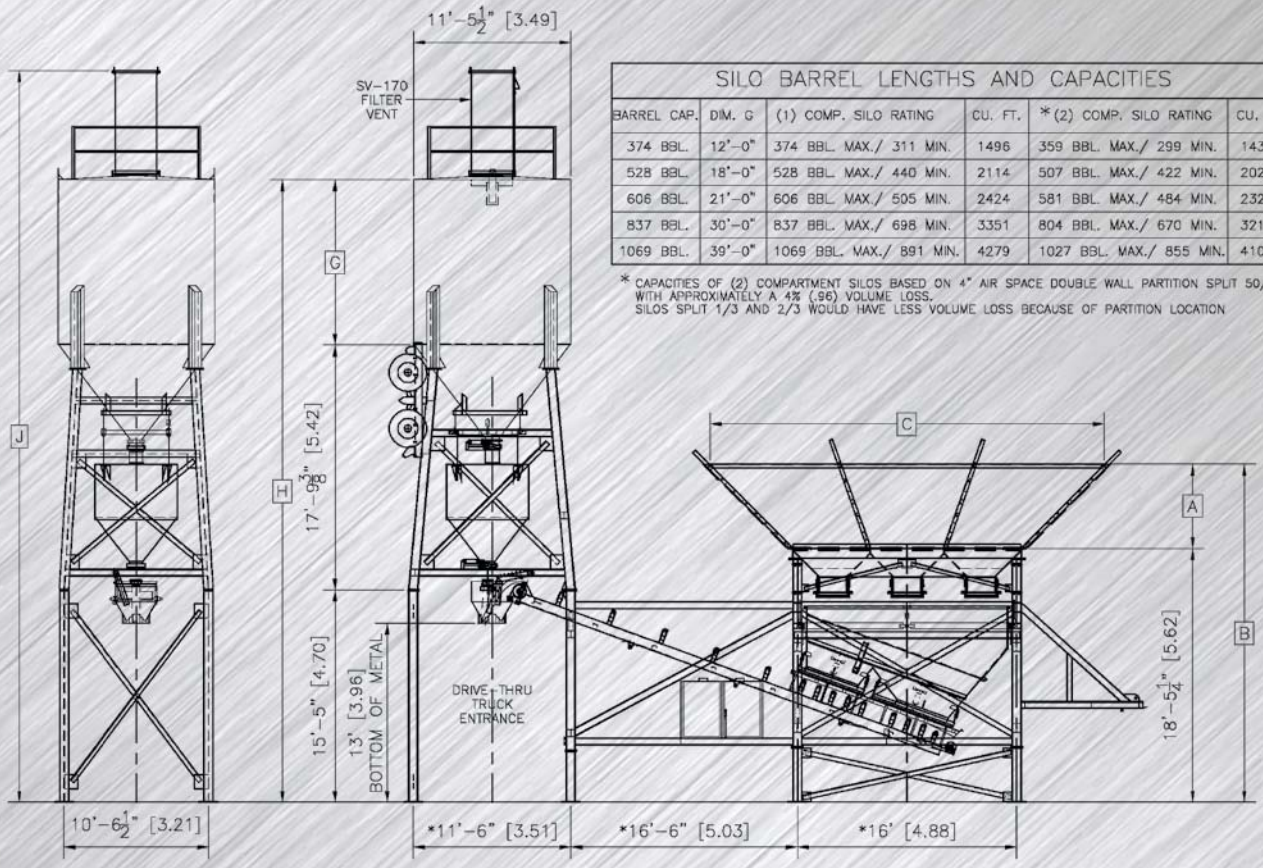


AIR COMPRESSOR
Standard: 15 HP 240 Gallon
Optional: 20 HP and Rotary Compressors

ELECTRICAL PANEL
200 AMP Power Panel
Optional: 400 and 600 AMP



THOROUGHBRED - TOWING POSITION



SILO BARREL LENGTHS AND CAPACITIES

BARREL CAP.	DIM. G	(1) COMP. SILO RATING	CU. FT.	*(2) COMP. SILO RATING	CU. FT
374 BBL.	12'-0"	374 BBL. MAX./ 311 MIN.	1496	359 BBL. MAX./ 299 MIN.	1436
528 BBL.	18'-0"	528 BBL. MAX./ 440 MIN.	2114	507 BBL. MAX./ 422 MIN.	2029
606 BBL.	21'-0"	606 BBL. MAX./ 505 MIN.	2424	581 BBL. MAX./ 484 MIN.	2327
837 BBL.	30'-0"	837 BBL. MAX./ 698 MIN.	3351	804 BBL. MAX./ 670 MIN.	3217
1069 BBL.	39'-0"	1069 BBL. MAX./ 891 MIN.	4279	1027 BBL. MAX./ 855 MIN.	4108

* CAPACITIES OF (2) COMPARTMENT SILOS BASED ON 4" AIR SPACE DOUBLE WALL PARTITION SPLIT 50/50 WITH APPROXIMATELY A 4% (.96) VOLUME LOSS.
SILOS SPLIT 1/3 AND 2/3 WOULD HAVE LESS VOLUME LOSS BECAUSE OF PARTITION LOCATION

70 TON - 200 TON

THOROUGHBRED PORTABLE CONCRETE PLANT DIMENSIONS CHART

DESCRIPTION	UNITS	A	B	C	D	E	F	G	H	J	CAPACITIES CU YARDS / CU METERS
70 TON AGG. BIN	STD.	3'-1 1/2"	21'-6 3/4"	22'-8 3/4"	14'-0"	---	---	---	---	---	51.85
	METRIC	.95 M	6.57 M	6.93 M	4.27 M	---	---	---	---	---	39.6
100 TON AGG. BIN	STD.	5'-1 1/2"	23'-6 3/4"	26'-8 3/4"	14'-0"	---	---	---	---	---	74.07
	METRIC	1.56 M	7.18 M	8.15 M	4.27 M	---	---	---	---	---	56.0
120 TON AGG. BIN	STD.	6'-1 1/2"	24'-6 3/4"	28'-8 3/4"	14'-0"	---	---	---	---	---	88.8
	METRIC	1.85 M	7.49 M	8.76 M	4.27 M	---	---	---	---	---	67.8
150 TON AGG. BIN	STD.	8'-2"	26'-7 1/4"	28'-0"	14'-0"	---	---	---	---	---	111.11
	METRIC	2.49 M	8.11 M	8.53 M	4.27 M	---	---	---	---	---	84.9
200 TON AGG. BIN	STD.	11'-4"	29'-9 1/4"	28'-0"	14'-0"	---	---	---	---	---	148.1
	METRIC	3.45 M	9.07 M	8.53 M	4.27 M	---	---	---	---	---	113.2
374 BARREL CEM. SILO	STD.	---	---	---	---	52'-5 3/8"	73'-11 3/8"	12'-0"	45'-2 3/8"	53'-1 3/4"	55.4
	METRIC	---	---	---	---	15.99 M	22.54 M	3.66 M	13.78 M	16.2 M	42.3
528 BARREL CEM. SILO	STD.	---	---	---	---	52'-5 3/8"	76'-11 3/8""	18'-0"	51'-2 3/8"	59'-1 3/4"	78.2
	METRIC	---	---	---	---	15.99 M	23.45	5.49 M	15.61 M	18.03 M	59.7
606 BARREL CEM. SILO	STD.	---	---	---	---	SEE NOTE A	SEE NOTE A	21'-0"	54'-2 3/8"	62'-1 3/4"	89.7
	METRIC	---	---	---	---	---	---	6.40 M	16.52 M	18.94 M	68.5
837 BARREL CEM. SILO	STD.	---	---	---	---	SEE NOTE A	SEE NOTE A	30'-0"	63'-2 3/8"	71'-1 3/4"	124.0
	METRIC	---	---	---	---	---	---	9.14 M	19.26 M	21.69 M	94.8
1069 BARREL CEM. SILO	STD.	---	---	---	---	SEE NOTE A	SEE NOTE A	39'-0"	72'-2 3/8"	80'-1 3/4"	158.3
	METRIC	---	---	---	---	---	---	11.89 M	22.01 M	24.43 M	121.0

NOTE A: MAY REQUIRE SPECIAL TWO PIECE DESIGN – PLEASE CONSULT FACTORY.

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- Reputation of honest, reliable and second to none sales and service
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- Simple and easy to service and maintain, features standard off the shelf parts
- Each plant is designed for your seismic requirements

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Local Distributor:

CERTIFICATE OF ANALYSIS: MISSISSAUGA PLANT
CSA: PORTLAND CEMENT GENERAL USE (TYPE GU)

			ANALYSIS OF:	Mar-2018
	CSA-A3001 -13 REQUIREMENTS	LIMITS	RESULTS	TEST METHOD
PHYSICAL	Fineness 45 μm Sieve (%) Retained	≤ 28	9	CSA A3004-A3
	Autoclave % Expansion	≤ 1.0	0.11	CSA A3004-B5
	Sulphate Expansion (%) *	≤ 0.020	0.019	CSA A3004-C5
	Initial Time of Set (min)	45 ≤ (min) ≤ 375	126	CSA A3004-B2
	Blaine (m^2/kg)		384	ASTM C204
	Air Content (%)		7	CSA A3004-C4
	Compressive Strengths at 1-day (MPa)		19.3	CSA A3004-C2
	Compressive Strengths at 3-day (MPa)	≥ 14.5	30.4	CSA A3004-C2
	Compressive Strengths at 7-day (MPa)	≥ 20.0	35.5	CSA A3004-C2
	Compressive Strengths at 28-day (MPa) *	≥ 26.5	41.7	CSA A3004-C2
CHEMICAL	Loss on Ignition (LOI) (%) ***	≤ 3.5	2.1	CSA A3003
	Insoluble Residue (%) *	≤ 1.5	0.73	CSA A3003
	Sulphur Trioxide (SO_3) (%)**	≤ 3.5	4.0	CSA A3003
	Magnesium Oxide (MgO) (%)	≤ 5.0	2.4	CSA A3003
	Silica Oxide (SiO_2) (%)		19.5	CSA A3003
	Alumina Oxide (Al_2O_3) (%)		5.4	CSA A3003
	Iron Oxide (Fe_2O_3) (%)		2.6	CSA A3003
	Calcium Oxide (CaO) (%)		62.2	CSA A3003
	Total Alkali (%)		0.93	ASTM C114
	Free Lime (%)		1.0	
	C_3S (%)		54	
	C_2S (%)		16	
	C_3A (%)		10	CSA A3003
	C_4AF (%)		8	

COMMENTS:

Parameters with no limit listed are included for information purposes only, and are not requirements of the standards.

* Indicates result from previous month.

** Compliant with A3004-C5 Test method for determination of expansion of hydraulic cement mortar bars due to internal cement sulphate attack limit of 0.020%.

*** The maximum loss of 3.5% is allowed for portland cements provided that the loss on ignition at 550°C is no more than 3.0%.

This certifies compliance with CSA-A3001-13 General Use Portland Cement.
The data is typical of product shipped by CRH Canada Group Inc. Individual shipments may vary.

REPORT PREPARED BY:	PRINT DATE:
Bruno Morgado, P. Eng. Performance Manager	April 5, 2018

CRH Canada Group Inc., Mississauga Cement Plant, 2391 Lakeshore Road West, Mississauga ON, L5J 1K1

APPENDIX K: BORAL RESOURCES FLYASH MATERIAL DATA SHEET

BORAL RESOURCES

Materials Testing & Research Facility
2650 Old State Hwy 113
Taylorsville, GA 30178
770-684-0102

CSA-A3001 Testing of Coal Creek Station Fly Ash

Sample Date: 3/4 - 3/9/18 **Report Date:** 4/19/2018

Sample Type: composite **MTRF ID:** 797CC

Chemical Analysis	Results		CSA-A3001 Limits Class F	Class CI	Class CH
Silicon Dioxide (SiO2)	52.44	%			
Aluminum Oxide (Al2O3)	15.01	%			
Iron Oxide (Fe2O3)	5.82	%			
Sum (SiO2+Al2O3+Fe2O3)	73.27	%			
Sulfur Trioxide (SO3)	0.75	%	5.0 max	5.0 max	5.0 max
Calcium Oxide (CaO)	12.98	%	<15.0	15 - 20	>20
Sodium Oxide Equivalent (Na2O+0.658K2O)	5.29	%			
Moisture**	0.03	%	3.0 max	3.0 max	3.0 max
Loss on Ignition	0.11	%	8.0 max	6.0 max	6.0 max
Physical Analysis					
Fineness, % retained on 45-µm sieve	21.19	%	34 max	34 max	34 max
Strength Activity Index**					
28 day, % of control	91	%	75 min	75 min	75 min
Water Requirement, % control	94	%			
Autoclave Soundness	0.01	%	0.8 max	0.8 max	0.8 max
Density	2.58				

***Optional Physical Requirements*

Boral Resources has generated the test data listed herein by test methods similar to applicable CSA methods and meets the requirements of current CSA-A3001 fly ash.

Doug Rhodes, CET
Facility Manager

AASHTO ACCREDITED

A3000-08

Cementitious materials compendium

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CANADIAN STANDARDS ASSOCIATION

Δ Contents

Δ Preface

This is the third edition of the CSA A3000, *Cementitious materials compendium*. It supersedes the previous editions published in 2003 and 1998.

The objective of the first edition of the CSA A3000 compendium was to consolidate the test methods that existed separately within each of the component Standards — A5, A8, A23.5, A362, and A363 — by eliminating redundancies and sometimes inconsistent guidance that existed between otherwise similar test methods within the five cementitious materials Standards and inserting them into a new series of Standards: the A456 series of test methods.

The objective of the second edition of the CSA A3000 compendium was to complete substantially this consolidation, creating the CSA A3000 series of Standards. The A5, A23.5, and A362 Standards were merged into the single Standard: A3001, *Cementitious Materials for Use in Concrete,* with A363, *Cementitious Hydraulic Slag,* being withdrawn. A3002, *Masonry and Mortar Cement,* superseded A8, and the test method Standards A456.1 through A456.3 were superseded by A3003, A3004, and A3005 respectively. All definitions and reference publications in this CSA A3000 series of Standards have been listed in A3001.

The A3001 Standard and its first amendment contain the following changes:

- the introductory Clause 0 has been removed in its entirety;
- the definition of blended hydraulic cements has been modified to be more concise in nature. The various types of blended cement, binary, ternary and quaternary, have been incorporated in the general definition of blended hydraulic cements. All definitions of specific blended cements (e.g., Portland pozzolan, Portland Silica Fume) have been deleted;
- a new class of cements known as portland-limestone cements has been introduced. These cements may only be used in sulphate environments when used with the minimum percentages of supplementary cementing materials, as stipulated in Table 5, and tested for sulphate resistance, as specified for type MSLb and HSLb blended cement;
- a new class of cements, known as portland-limestone blended cements, has been introduced. These cements have specific additional proportion requirements for sulphate resistant portland-limestone blended cement types MSLb and HSLb;
- the definition of portland-limestone cement has been amended to stipulate that portland-limestone cements must be produced by intergrinding;
- specific directions for reporting of alkali have been incorporated;
- the requirements for silica fume have been modified. A new class of silica fume known as SFI has been incorporated;
- the first note to Table 2 has been modified;
- the CaO limit between Type F and CI fly ash listed in Table 7 has been adjusted from the upper limit of < 8 to ≤ 15 for Type F fly ash. The lower limit of Type CI fly ash has been adjusted accordingly;
- Annex D has been removed from A3001 and replaced by a new Standard Practice E1, contained in A3004; and
- a new note to Clause 5.5 has been added in respect to silica fume.

The A3002 Standard and its first amendment contain the following changes:

- the 28 day maximum strength requirements have been moved to a new Annex A;
- minor adjustments in strength requirements have been made at the early ages; and
- a new Clause 5.3 has been added requiring reporting of water soluble chloride content of the masonry or mortar cement upon request.

The A3003 Standard and its first amendment contain the following changes:

- an initial qualification of operator clause has been added;
- the test method for determination of alkali has been modified to clarify to the user that the hydrochloric acid digestion method is not applicable to all cementitious materials.; and
- the insoluble residue test has been modified to incorporate the option to utilize a more rapid test procedure;

The A3004 Standard contains the following changes:

- the precision and accuracy statements of many of the tests have been expanded and more closely parallel the wording and detail used in ASTM;
- Test Method A3004-A2 has been modified to allow alternate methods of test;
- Test Method A3004-C7 has been modified with respect to the standard or reference cement to be used in the testing;
- A3004-C8 has been modified, to incorporate two test procedures Procedure A is the original test method and is used to determine resistance to the ettringite form of sulphate attack. Procedure B is used to determine resistance to the potential for the thaumasite form of sulphate attack;
- Test Method A3004-D1 for the determination of clay content in limestone for use in portland-limestone cements has been added;
- Test Method A3004-D2 for the determination of total organic carbon content in limestone for use in portland-limestone cements has been added; and
- Standard Practice A3004-E1 for the evaluation of alternate supplementary cementing materials has been added as a replacement for the discontinued Annex D of A3001.

The A3005 Standard contains the following changes:

- a table has been added listing common sieve sizes (Table 6);
- in Figure 8, missing mass requirements have been added to the Gillmore needles.

CSA gratefully acknowledges the following funding stakeholders and the industry association for their contribution to the development of A3000: Lafarge North America, Ciment Québec Inc., St. Lawrence Cement Inc., ESSROC, Italcementi Group, St. Marys Cement Inc., Lehigh Heidelberg Cement Group, and Cement Association of Canada.

These Standards were prepared by the Technical Committee on Hydraulic Cement and Supplementary Cementing Materials, under the jurisdiction of the Strategic Steering Committee on Concrete and Related Products, and have been formally approved by the Technical Committee. They will be submitted to the Standards Council of Canada for approval as National Standards of Canada.

September 2008

Notes:

(1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*

(2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

(3) *This publication was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.*

(4) *CSA Standards are subject to periodic review, and suggestions for their improvement will be referred to the appropriate committee.*

(5) *All enquiries regarding this Standard, including requests for interpretation, should be addressed to Canadian Standards Association, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.*

Requests for interpretation should

(a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;

(b) provide an explanation of circumstances surrounding the actual field condition; and

(c) be phrased where possible to permit a specific "yes" or "no" answer.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization *and are published in CSA's periodical* Info Update, *which is available on the CSA Web site at www.csa.ca.*

where

$\bar{X}$ = average strength

$X_1, X_2 \ldots X_n$ = the strength results of individual test samples, each of which is composed of the average of the samples, in accordance with CSA A3004-C2

n = 30 (total number of samples tested)

(b) Equation 2 — Standard deviation, MPa

Standard deviation shall be calculated as follows:

$$S = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \ \ldots \ (X_n - \bar{X})^2}{n-1}}$$

where

S = standard deviation

(c) Equation 3 — Coefficient of variation, %

The coefficient of variation shall be calculated as follows:

$$V = \frac{S}{\bar{X}} \times 100$$

where

V = coefficient of variation, %

5 Requirements for supplementary cementing materials and blended supplementary cementing materials

5.1 Types

The naming practice for supplementary cementing materials and blended supplementary cementing materials shall be as follows:

Type	Name
N	Natural pozzolans
F	Fly ash with low calcium oxide (CaO) content
CI	Fly ash with intermediate calcium oxide content
CH	Fly ash with high calcium oxide content
SF	Silica fume with high silicon dioxide (SiO_2) content
SFI	Silica with intermediate SiO_2 content
S	Ground granulated blast-furnace slag
BMb	Blended supplementary cementing materials (see Clause 5.2)

Note: *For materials other than those listed above that fall outside the scope of this Standard (e.g., quenched ground bottom ash, manufactured and other metallurgical slags, and silica fume with less than 75% SiO_2), see CSA A3004-E1.*

5.2 Proportions of blended supplementary cementing materials

5.2.1 Nomenclature

The naming practice for reporting the proportions of supplementary cementing materials in blended supplementary cementing materials shall be as follows:

BMb-Axx/Byy/zz

where

BMb = blended supplementary cementing material

A = percentage of the predominant supplementary cementing material in the product expressed by mass of the final blended product

xx = predominant supplementary cementing material

B = percentage of the secondary supplementary cementing material in the product expressed by mass of the final blended product

yy = secondary supplementary cementing material

zz = tertiary supplementary cementing material

Examples:

BMb-80CI/S — a blended supplementary cementing material with Type CI fly ash being the predominant supplementary cementing material and slag being the secondary supplementary cementing material. In this example, the Type CI fly ash comprises 80% of the blend within the tolerances specified in Clause 5.2.2, with the slag comprising the balance.

BMb-50F/30S/CH — a blended supplementary cementing material comprising 50% Type F fly ash, 30% slag, and the balance of the supplementary cementing material being Type CH fly ash within the tolerances specified in Clause 5.2.2.

5.2.2 Tolerances

The tolerance, at a 95% confidence level, on proportions of supplementary cementing materials in a blend shall be ± 1.5% for silica fume and ± 2.5% for all other supplementary cementing materials.

Example: *BMb*-60S/30CI/SF indicates a blended supplementary cementing material containing 57.5 to 62.5% slag, 27.5 to 32.5% Type CI fly ash, and 8.5 to 11.5% silica fume.

Δ 5.3 Special requirements

The following special requirements shall apply:

(a) Combinations of a single type of SCM shall meet the requirements of this Standard. See Tables 7 and 8.

(b) A blended supplementary cementing material shall be drawn either from a lot that is sampled and tested prior to use or from a source that has demonstrated through tests on its production that each individual type of SCM meets the requirements of this Standard. See Tables 7 and 8.

5.4 Chemical requirements

5.4.1 General

Supplementary cementing materials and blended supplementary cementing materials shall meet the requirements of Table 7.

Note: *Optional requirements that may be specified by the purchaser are found in Annex A.*

5.4.2 Chemical requirements for slag

Note: *For optimizing the performance characteristics of ground granulated blast-furnace slag, see ACI 233R.*

When one or more of the various forms of calcium sulphate ($CaSO_4$) are added, the sulphur trioxide (SO_3) derived from these additions shall not exceed the limit for SO_3 specified in Table 7. The determination of

SO_3 from the forms of $CaSO_4$ shall be established by subtracting the apparent SO_3 contribution of sulphide sulphur (S) content, determined and expressed as SO_3, from the total apparent SO_3 content measured on the sample. The calculation to correct for S is as follows:

$S1 = S2 - (2.5 \times S3)$

where
S1 = sulphur trioxide from sources other than sulphide sulphur (i.e., from the forms of calcium sulphate)
S2 = the total sulphur in the sample expressed as sulphur trioxide
2.5 = the molecular ratio of SO_3/S to express sulphide sulphur as sulphur trioxide
S3 = sulphide sulphur present

Examples:

Example #	S1: Sulphur trioxide	S2: Total apparent sulphur trioxide content	S3: Sulphide sulphur
1	4.0	10.25	2.5
2	1.5	6.5	2.0
3	0	5.0	2.0
4	3.75	5.0	0.5

Note: *Some instrumental methods of analysis incorrectly report sulphide sulphur as sulphur trioxide. Care should be taken to ensure the correct analysis and reporting of sulphide sulphur content.*

Δ 5.4.3 Total alkali

When requested by the purchaser, the manufacturer shall report the total alkali content of the supplementary cementing material, or the proportions and total alkali of each component of the blended supplementary cementing material, expressed as sodium oxide equivalent. The total alkali content shall be calculated in accordance with the formula in Clause 4.4.8.

Δ 5.5 Physical requirements

Supplementary cementing materials and blended supplementary cementing materials shall meet the requirements of Table 8.

Notes:

(1) *The uniformity of glass content of ground granulated blast-furnace slag should be monitored. The glass content (degree of vitrification) can be a good indicator of strength potential. Experience has indicated that a certain minimum degree of vitrification is necessary and that hydraulic potential generally increases with increasing glass content. One method to determine glass content is provided in CSA A3004-A4.*

(2) *Optional requirements that may be specified by the purchaser are found in Annex A.*

(3) *Cements containing supplementary cementing materials can develop lower compressive strengths at early ages than corresponding cements not utilizing supplementary cementing materials. This is more pronounced as the proportion of slag or fly ash is increased. When silica fume is utilized, experience indicates that strengths are frequently higher at early ages compared with the strength of corresponding cements not utilizing silica fume.*

(4) *Silica fume extracted from landfill storage, if not contaminated by other debris, is still suitable for use when interground in blended hydraulic cements. Such silica fume, if not interground in blended hydraulic cements should be treated as an ASCM in A3004-E1.*

5.6 Processing additions

5.6.1 Fly ash and natural pozzolan

When processing additions are used in the manufacture of blended supplementary cementing materials in which fly ash or natural pozzolan is the predominant component, the maximum amount used shall comply with the requirements of ASTM C 465 when tested in combination with a 20% replacement blend by mass with portland cement.

5.6.2 Slag

When processing additions are used in the manufacture of slag and blended supplementary cementing materials in which slag is the predominant component, the maximum amount used shall comply with the requirements of ASTM C 465 when tested in combination with a 50/50 blend by mass with portland cement.

6 Sampling, testing, and inspection

Sampling, testing, and inspection shall be performed in accordance with CSA A3004-A1.

7 Units, packaging, marking, storage, and reporting

7.1 General

Units, packaging, marking, storage, and reporting shall be performed in accordance with CSA A3004-A1.
Note: *A given mass of blended hydraulic cement has a larger absolute volume than the same mass of portland cement, which should be taken into consideration when purchasing cements and in proportioning concrete mixtures.*

7.2 Reporting

7.2.1

When petroleum coke is used in the production of fly ash, the producer shall certify that the amount of petroleum coke constitutes less than 30% of the fuel combusted.

Δ **7.2.2**

At the option of the purchaser, the manufacturer shall provide information regarding the following:
(a) the proportions of the individual components in a blended hydraulic cement and blended supplementary cementing material (see Clauses 4.1, 4.2.1, 5.1, and 5.2.1 for nomenclature); and
(b) the total alkali content as specified in Clause 4.4.8 for portland cement, blended hydraulic cements, and portland-limestone cement, and Clause 5.4.3 for supplementary cementing materials.

Δ **7.2.3**

At the option of the purchaser, the manufacturer shall provide information regarding the proportion of limestone in portland-limestone cement and in the portland-limestone blended hydraulic cement. See Clause 4.1 for nomenclature. When requested, the limestone quality shall be reported. See Clause 4.4.3.

Tables

Note: *The product specifications for portland cement, blended hydraulic cement, portland-limestone cement, and supplementary cementing materials are found in the tables listed in this section. Some products may have optional requirements, which are referenced in the annexes of this Standard. See Annex B.*

List of Tables

Product	Chemical requirements	Physical requirements	Requirements
Portland cement	Table 1	Table 4	—
Blended hydraulic cement	Table 2	Table 5	Table 9
Portland-limestone cement	Table 3	Table 6	—
Supplementary cementing materials and blended supplementary cementing materials	Table 7	Table 8	—

FINE - F

COARSE - C