

**MILL TEST CERTIFICATE FOR CSA PORTLAND CEMENT TYPE HS**

**Production for Week Ending 2008:** 5-Oct 12-Oct 19-Oct 26-Oct 2-Nov 9-Nov 16-Nov

**CHEMICAL ANALYSIS**

SiO <sub>2</sub>	%	21.0	21.2	21.3	21.4	21.3		
Al <sub>2</sub> O <sub>3</sub>	%	4.0	4.0	3.9	4.0	3.9		
Fe <sub>2</sub> O <sub>3</sub>	%	4.4	4.5	4.5	4.6	4.6		
CaO	%	62.0	62.6	62.0	63.4	64.0		
MgO	%	3.34	2.86	2.98	2.18	2.29		
SO <sub>3</sub>	%	2.08	2.05	2.03	2.05	2.18		
Loss on Ignition	%	1.40	1.51	1.38	1.40	1.40		
Na <sub>2</sub> O	%	0.24	0.21	0.22	0.23	0.25		
K <sub>2</sub> O	%	0.52	0.54	0.54	0.49	0.51		
Insoluble Residue	%		0.46	0.46	0.49	0.15		
T. Alk.	%	0.58	0.57	0.57	0.56	0.58		
C <sub>3</sub> S	%	54	55	52	57	60		
C <sub>2</sub> S	%	19	20	22	19	16		
C <sub>3</sub> A	%	3.0	2.9	2.7	2.8	2.5		
C <sub>4</sub> AF	%	13.5	13.8	13.8	14.0	13.9		

**PHYSICAL PROPERTIES**

Blaine	m <sup>2</sup> /kg	406	409	402	408	422		
Retained on 45µ sieve	%	5.27	5.71	5.87	5.01	7.10		
Autoclave Expansion	%	0.055	0.041	0.037	0.005	0.003	0.016	0.020
Sulphate Expansion	%	0.028	0.028	0.028	0.073	0.073	0.073	0.073
Vicat Initial Set	min	95	94	94	95	91	92	92
False Set	%	62	76	79	85	70	62	59
Air Content	%	8.13	8.91	9.10	8.80	9.30	9.53	9.60
3 Day	MPa	19.2	18.4	17.5	19.8	20.7	18.5	20.5
7 Day	MPa	25.0	23.6	24.1	25.9	26.4	23.7	
28 Day	MPa	37.3	33.3	37.0				

Manufactured cement conforms to CSA Standard A3001-03.

Date: November 17, 2008

*Lloyd V Young*

Lloyd V. Young  
Quality Control Manager