



Cement Mill Test Report

Date of Issue: January 12, 2022

Plant:	Exshaw AB
Product:	Portland Cement Type HS
Manufactured:	December 1-31, 2021

CHEMICAL ANALYSIS

Item	Spec limit	Test Result
Rapid Method, X-Ray		
SiO ₂ (%)	---	19.7
Al ₂ O ₃ (%)	---	4.0
Fe ₂ O ₃ (%)	---	3.7
CaO (%)	---	62.4
MgO (%)	5.0 max	4.4
SO ₃ (%)	2.5 max **	2.8
Loss on ignition @ 950 (%)	3.0 max	2.5
Loss on ignition @ 550(%)		0.6
Insoluble residue (%)	0.75 max	0.33
Inorganic Process Addition (Cement Kiln Dust)	5.0 max	
Potential Phase Composition		
C ₃ S (%)	---	64.1
C ₂ S (%)	---	8.1
C ₃ A (%)	5 max	4.3
C ₄ AF (%)	---	11.4

PHYSICAL ANALYSIS

Item	Spec limit	Test Result
Blaine Fineness (m ² /kg)	---	428
Retained 45 um (%)	28 max	1.0
Autoclave expansion (%)	1.0 max	0.10
Compressive strength (MPa)		
1 day		20.9
3 day	14.5 min	33.0
7 day	20.0 min	37.7
28 day (August 2021 Results)	26.5 min	43.1
Time of setting (minutes)		
Vicat Initial	45 - 375	115
Mortar Bar Expansion (%) (C5)*	0.020 max	0.008
Sulphate Resistance (%) (C6) *	0.035 max	0.033
Colour (For Information Purposes Only)		31

Other Chemical Information:

NaEq (%) Weekly Averages Week Ending: 12/04 0.54 12/11 0.54 12/18 0.55 12/25 0.55

* Latest available value

** May exceed 2.5% SO₃ maximum based on our A3004-C5 results of <0.020% expansion at 14 days.

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of the applicable specification for Type HS.

CSA A3001-18 STANDARD SPECIFICATIONS FOR TYPE HS CEMENT.

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Certified By: *Lorraine Richards*

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