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# **RUSSTECH<sup>®</sup>**

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## **LIQUID CALCIUM CHLORIDE 32%**

### **PRODUCT DESCRIPTION:**

32% Calcium Chloride solution, when added to concrete, mortar or stucco at recommended dosage accelerates the rate of hydration of the cement. The faster hydration rate reduces both initial and final set times, allowing the concrete to achieve higher early strengths.

During cold weather placement of concrete, 32% Calcium Chloride helps protect the concrete against freeze damage by accelerating the rate of strength gain and by lowering the early free-water content of the mixture.

Use of Calcium Chloride, in either cold-weather or standard concreting, allows finishing to be started sooner, earlier stripping of forms, a reduced need for heating and protection and earlier use of the treated concrete. All these benefits represent savings in time and money for the contractor.

### **LIMITATIONS:**

Use of 32% Calcium Chloride in concrete containing aluminum or copper, concrete placed in contact with galvanized metal, used in prestressed or post-tensioned concrete is not recommended and should be avoided. Consult ACI 318, Standard Building Code for Reinforced Concrete for specific information on allowable chlorides in concrete under various conditions.

Do not use 32% Calcium Chloride where sulfate-resisting concrete is required or with oxychloride stuccos.

32% Calcium Chloride, when used at normally recommended dosages for concrete, will *not* lower the freezing point of concrete to any significant degree and thus is *not* intended to be used as an antifreeze.

### **APPLICABLE STANDARD:**

32% Calcium Chloride is classified as a Type C accelerating chemical admixture for concrete under ASTM C-494. The specific effects of chemical admixtures may vary with the properties of other ingredients in the concrete mix. Therefore, if ASTM C-494 must be met on a project, it is recommended that the actual job materials to be used in the mix design be tested to establish the required calcium chloride dosage. 32% Calcium Chloride conforms to the requirements of ASTM D-98.

### **TECHNICAL DATA:**

The ability of 32% Calcium Chloride to accelerate the rate of cement hydration can reduce the set time of normal concrete by as much as two thirds. While actual set time is influenced by the type of cement utilized, 32% Calcium Chloride will accelerate the rate of set regardless of the type cement used.

32% Calcium Chloride, while not increasing the total amount of heat generated by the hydration process does have dramatic effect on the heat of hydration by causing the heat to develop and be released in approximately one-half the normal time. This effect contributes to Calcium Chloride's value in winter concrete work since earlier heat release aids in quicker finishing and form removal.

Concrete can sustain serious damage if it freezes before it achieves sufficient strength (500 psi minimum) and low free water level. The utilization of calcium chloride assists in obtaining these levels faster, thus getting concrete out of the freeze "danger zone" more quickly. Even when using Calcium Chloride 32%, concrete should be maintained at a temperature above 50F for the first three days and above freezing for the following three days.

32% Calcium Chloride is compatible with concrete mixtures utilizing fly ash and/or slag as a partial replacement for Portland cement. Fly ash and slag should be dosed in the same manner and at the same rate as Portland cement.

Tests show that the use of 32% Calcium Chloride can increase workability in a concrete mix. Less water is required to produce a given slump and bleed water is reduced in 32% Calcium Chloride treated concrete.

### **METHOD OF APPLICATION:**

32% Calcium Chloride should be added to the aggregates in the mixer drum or as a portion of the mixing water during batching. Total mixing water should be reduced by the amount of 32% Calcium Chloride used.

In the batching sequence, the 32% Calcium Chloride should be added in such a way as to prevent its coming in contact with dry cement.

In ready mixed concrete, the 32% Calcium Chloride should be added at the plant and placed within one hour after the start of mixing.

32% Calcium Chloride may be used in conjunction with other chemical admixtures although each admixture should be introduced separately into

the concrete mix.

### Dosage Rates For 32% Calcium Chloride In Gallons Per Yard:

Cubic Yards Per Batch	32% Calcium Chloride Admixture	Cement (lbs./yard)						
		400	450	500	550	600	650	700
1.0	1%	0.9	1.0	1.1	1.3	1.4	1.5	1.7
	2%	1.8	2.0	2.2	2.6	2.8	3.0	3.4
1.5	1%	1.35	1.55	1.7	1.9	2.0	2.2	2.3
	2%	2.7	3.1	3.4	3.8	4.0	4.4	4.6
2.0	1%	1.8	2.0	2.2	2.6	2.8	3.0	3.4
	2%	3.6	4.0	4.4	5.2	5.6	6.0	6.8
2.5	1%	2.3	2.5	2.8	3.1	3.4	3.7	4.0
	2%	4.6	5.0	5.6	6.2	6.8	7.4	8.0
3.0	1%	2.7	3.1	3.4	3.8	4.0	4.4	4.6
	2%	5.4	6.2	6.8	7.6	8.0	8.8	9.2
3.5	1%	3.15	3.5	4.0	4.3	4.7	5.2	5.5
	2%	6.3	7.0	8.0	8.6	9.4	10.4	11.0
4.0	1%	3.6	4.0	4.4	5.2	5.6	6.0	6.8
	2%	7.2	8.0	8.8	10.4	11.2	12.0	13.6
4.5	1%	4.1	4.6	5.1	5.6	6.1	6.6	7.1
	2%	8.2	9.2	10.2	11.2	12.2	13.2	14.2
5.0	1%	4.6	5.0	5.6	6.2	6.8	7.4	8.0
	2%	9.2	10.0	11.2	12.4	13.6	14.8	16.0
5.5	1%	5.0	5.6	6.2	6.9	7.4	8.0	8.7
	2%	10.0	11.2	12.4	13.8	14.4	16.0	17.4
6.0	1%	5.4	6.2	6.8	7.6	8.0	8.8	9.2
	2%	10.8	12.4	13.6	15.2	16.0	17.6	18.4
6.5	1%	5.9	6.6	7.3	8.0	8.8	9.6	10.3
	2%	11.8	13.2	14.6	16.0	17.6	19.2	20.6
7.0	1%	6.6	7.0	8.0	8.6	9.4	10.4	11.0
	2%	13.2	14.0	16.0	17.2	18.8	20.8	22.0

**WARNING!**

The amount of 32% Calcium Chloride by weight of cement should not exceed two percent. Over-dosing can result in flash set of the concrete.

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**RussTech Inc.**

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