

**APPROVED SOURCES
WATER REDUCING & RETARDING ADMIXTURES & GUIDELINES**

**FOR USE IN STRUCTURAL CONCRETE: RETARDING
ADMIXTURES
GUIDELINES FOR DOSAGE RATES WITH ANTICIPATED
WORKING TIME LIMITS**

1. Dosage is in fluid ounces per 100 lbs. (mL/kg) of cement, fly ash, and ggbfs.
2. Check percent of air as retarding admixtures tend to increase air contents

Working time limits for various cements with -NO RETARDER

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	0	3.8	4.8	5.8
65	18	0	3.1	3.8	4.6
75	24	0	2.5	3.0	3.5
85	29	0	2.2	2.5	2.7
95	35	0	1.9	1.9	1.9

Working time limits for various cements with - LC 500R

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	Hours	Hours	Hours
55	13	2 (1.3)			
		3 (2.0)			
		4 (2.6)			
		5 (3.3)			
65	18	3 (2.0)	9.1	9.8	10.6
		4 (2.6)	10.2	11.0	11.7
		5 (3.3)	11.4	12.1	12.9
		6 (3.9)	13.2	13.9	14.7
75	24	3 (2.0)	6.2	6.7	7.2
		4 (2.6)	7.9	8.4	8.9
		5 (3.3)	9.4	9.9	10.4
		6 (3.9)			
85	29	3 (2.0)	5.5	5.8	6.0
		4 (2.6)	6.1	6.4	6.6
		5 (3.3)	8.2	8.5	8.7
		6 (3.9)			
95	35	3 (2.0)	4.7	4.7	4.7
		4 (2.6)	6.2	6.2	6.2
		5 (3.3)	7.6	7.6	7.6
		6 (3.9)	8.1	8.1	8.1
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with - Plastocrete 161-MR

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)			
		3 (2.0)			
		4 (2.6)			
		5 (3.3)			
65	18	3 (2.0)	4.9	5.6	6.4
		4 (2.6)	6.8	7.5	8.3
		5 (3.3)	10.9	11.6	12.4
		6 (3.9)	19.3	20.0	20.8
75	24	3 (2.0)	3.4	3.9	4.4
		4 (2.6)	4.5	5.0	5.5
		5 (3.3)	6.6	7.1	7.6
		6 (3.9)	10.5	11.0	11.5
		7 (4.6)	18.0	18.5	19.0
85	29	3 (2.0)	2.8	3.1	3.3
		4 (2.6)	3.5	3.8	4.0
		5 (3.3)	4.6	4.9	5.1
		6 (3.9)	6.5	6.8	7.0
		7 (4.6)	9.9	10.2	10.4
95	35	3 (2.0)	2.1	2.1	2.1
		4 (2.6)	2.6	2.6	2.6
		5 (3.3)	3.3	3.3	3.3
		6 (3.9)	4.6	4.6	4.6
		7 (4.6)	7.0	7.0	7.0
		8 (5.2)	11.6	11.6	11.6

Working time limits for various cements with – Plastiment 100

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)			
		3 (2.0)			
		4 (2.6)			
		5 (3.3)			
65	18	3 (2.0)	5.5	6.2	7.0
		4 (2.6)	7.6	8.3	9.1
		5 (3.3)	12.1	12.8	13.6
		6 (3.9)	21.5	22.2	23.0
75	24	3 (2.0)	3.8	4.3	4.8
		4 (2.6)	5.0	5.5	6.0
		5 (3.3)	7.4	7.9	8.4
		6 (3.9)	11.7	12.2	12.7
		7 (4.6)	20.1	20.6	21.1
85	29	3 (2.0)	3.2	3.5	3.7
		4 (2.6)	3.9	4.2	4.4
		5 (3.3)	5.2	5.5	5.7
		6 (3.9)	7.3	7.6	7.8
		7 (4.6)	10.9	11.2	11.4
95	35	3 (2.0)	2.4	2.4	2.4
		4 (2.6)	2.9	2.9	2.9
		5 (3.3)	3.7	3.7	3.7
		6 (3.9)	5.2	5.2	5.2
		7 (4.6)	7.9	7.9	7.9
		8 (5.2)	12.9	12.9	12.9

Working time limits for various cements with – Pozzolith 100XR

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)			
		3 (2.0)			
		4 (2.6)			
		5 (3.3)			
65	18	3 (2.0)	9.0	9.7	10.5
		4 (2.6)			
		5 (3.3)			
		6 (3.9)			
75	24	3 (2.0)	6.1	6.6	7.1
		4 (2.6)	7.8	8.3	8.8
		5 (3.3)	9.2	9.7	10.2
		6 (3.9)			
		7 (4.6)			
85	29	3 (2.0)	5.2	5.5	5.7
		4 (2.6)	6.7	7.0	7.2
		5 (3.3)	8.1	8.4	8.6
		6 (3.9)			
		7 (4.6)			
95	35	3 (2.0)	4.5	4.5	4.5
		4 (2.6)	6.0	6.0	6.0
		5 (3.3)	7.4	7.4	7.4
		6 (3.9)			
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with – Daratard 17

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)			
		3 (2.0)			
		4 (2.6)			
		5 (3.3)			
65	18	3 (2.0)			
		4 (2.6)			
		5 (3.3)			
		6 (3.9)			
75	24	3 (2.0)	4.3	4.7	5.3
		4 (2.6)	6.6	7.1	7.6
		5 (3.3)	7.6	8.1	8.6
		6 (3.9)			
		7 (4.6)			
85	29	3 (2.0)	4.3	4.6	4.8
		4 (2.6)	5.2	5.5	5.7
		5 (3.3)	6.5	6.8	7.0
		6 (3.9)			
		7 (4.6)			
95	35	3 (2.0)	3.9	3.9	3.9
		4 (2.6)	4.4	4.4	4.4
		5 (3.3)	5.7	5.7	5.7
		6 (3.9)			
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with – Eucon Retarder 100

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)			
		3 (2.0)	9.6	10.6	11.6
		4 (2.6)	10.4	11.4	12.4
		5 (3.3)	12.3	13.3	15.3
65	18	3 (2.0)	8.2	8.9	9.7
		4 (2.6)	10.0	10.7	11.5
		5 (3.3)	11.7	12.4	13.2
		6 (3.9)	12.9	13.6	14.4
75	24	3 (2.0)	7.5	8.0	8.5
		4 (2.6)	9.9	10.4	10.9
		5 (3.3)	11.9	12.4	12.9
		6 (3.9)	12.5	13.0	13.5
		7 (4.6)			
85	29	3 (2.0)	6.8	7.1	7.3
		4 (2.6)	9.6	9.9	10.1
		5 (3.3)	11.9	12.2	12.4
		6 (3.9)	11.9	12.2	12.4
		7 (4.6)			
95	35	3 (2.0)	6.8	6.8	6.8
		4 (2.6)	9.9	9.9	9.9
		5 (3.3)	11.8	11.8	11.8
		6 (3.9)	11.8	11.8	11.8
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with – Catexol 1000R

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)	4.5	5.5	6.5
		3 (2.0)	5.5	6.5	7.5
		4 (2.6)	7.0	8.0	9.0
		5 (3.3)			
65	18	3 (2.0)	4.8	5.5	6.3
		4 (2.6)	5.6	6.3	7.1
		5 (3.3)	6.8	7.5	8.3
		6 (3.9)			
75	24	3 (2.0)	5.2	5.7	6.2
		4 (2.6)	5.7	6.2	6.7
		5 (3.3)	6.7	7.2	7.7
		6 (3.9)			
		7 (4.6)			
85	29	3 (2.0)	4.8	5.1	5.3
		4 (2.6)	5.4	5.7	5.9
		5 (3.3)	6.2	6.5	6.7
		6 (3.9)			
		7 (4.6)			
95	35	3 (2.0)	4.5	4.5	4.5
		4 (2.6)	5.1	5.1	5.1
		5 (3.3)	5.7	5.7	5.7
		6 (3.9)	6.5	6.5	6.5
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with – FR-IL

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)			
		3 (2.0)			
		4 (2.6)			
		5 (3.3)			
65	18	3 (2.0)			
		4 (2.6)			
		5 (3.3)			
		6 (3.9)			
75	24	3 (2.0)	4.4	4.9	5.4
		4 (2.6)	4.6	5.1	5.6
		5 (3.3)	4.8	5.3	5.8
		6 (3.9)	5.7	6.0	6.7
		7 (4.6)			
85	29	3 (2.0)	3.4	3.7	3.9
		4 (2.6)	3.6	3.9	4.1
		5 (3.3)	3.8	4.1	4.3
		6 (3.9)	4.0	4.3	4.5
		7 (4.6)			
95	35	3 (2.0)			
		4 (2.6)			
		5 (3.3)			
		6 (3.9)			
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with – Pozzolith 300R

Mix Temp at point of discharge		Dosage	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	fl. oz. (ml/kg)	hours	hours	hours
55	13	2 (1.3)	4.5	5.5	5.5
		3 (2.0)	5.3	6.3	6.3
		4 (2.6)	6.8	7.8	8.8
		5 (3.3)			
65	18	3 (2.0)	4.6	5.3	6.1
		4 (2.6)	5.5	6.2	7.0
		5 (3.3)	6.8	7.5	8.3
		6 (3.9)			
75	24	3 (2.0)	4.7	5.2	5.7
		4 (2.6)	6.0	6.5	7.0
		5 (3.3)	7.2	7.7	8.2
		6 (3.9)			
		7 (4.6)			
85	29	3 (2.0)	4.6	4.9	5.1
		4 (2.6)	5.3	5.6	5.8
		5 (3.3)	6.4	6.7	6.9
		6 (3.9)			
		7 (4.6)			
95	35	3 (2.0)	4.1	4.1	4.1
		4 (2.6)	4.7	4.7	4.7
		5 (3.3)	5.6	5.6	5.6
		6 (3.9)	6.6	6.6	6.6
		7 (4.6)			
		8 (5.2)			

Working time limits for various cements with – Recover

Mix Temp at point of discharge		Dosage Rate	Type I/II, no fly ash	Type I/II with fly ash	Type IS, IP with fly ash
°F	°C	(oz/cwt)	hours	hours	hours
75	24	0	3.2	4.2	5.2
		3	4.8	5.8	6.8
		4	5.5	6.5	7.5
		5	6.3	7.3	8.3
		6	7.6	8.6	9.6
85	29	0	2.9	3.9	4.9
		3	4.4	5.4	6.4
		4	4.7	5.7	6.7
		5	5.3	6.3	7.3
		6	6.0	7.0	8.0
95	35	0	2.2	3.2	4.2
		3	2.8	3.8	4.8
		4	3.0	4.0	5.0
		5	3.7	4.7	5.7
		6	4.5	5.5	6.5

**APPROVED SOURCES
WATER REDUCING & RETARDING ADMIXTURES**

FOR USE IN CONCRETE PAVEMENTS:

NOTE: Mixed-to-placed time period may be extended as per Iowa DOT Standard Specifications Section 2301.13.D.

<u>Brand Name</u>	<u>Producer/Distributor</u>	<u>Recommended Minimum Dosage</u>	
		Kg/mL cementitious materials	100 lb./fl. oz. cementitious materials
Catexol 800 R	AXIM Concrete Technologies	2.0	3
Catexol 1000R	AXIM Concrete Technologies	2.0	3
Daratard 17	W.R. Grace & Company	2.0	3
Daratard HC	W.R. Grace & Company	2.0	3
Delvo Stabilizer	BASF Admixtures, Inc.	2.6	4
Eucon Retarder 100	Euclid Chemical Company Distributed by Brett Admixtures	1.3	2
LC-500R	RussTech	2.0	3
Plastiment	Sika Corporation	1.3	2
Plastiment 100	Sika Corporation	2.0	3
Plastocrete 161	Sika Corporation	1.3	2
Plastocrete 161 M R	Sika Corporation	2.0	3
Pozzolith 100 X R	BASF Admixtures, Inc.	2.0	3
Pozzolith 200N	BASF Admixtures, Inc.	2.0	3
Pozzolith 300R	BASF Admixtures, Inc.	2.0	3
Polychem R	General Resource Technology	2.0	3
Recover	W.R. Grace & Company	See Manufacturer's Recommendations	

<u>Brand Name (Con't)</u> <u>Dosage</u>	<u>Producer/Distributor</u>	<u>Recommended</u>	<u>Minimum</u>
		Kg/mL cementitious materials	100 lb./fl. oz. cementitious materials
Standard Delayed Set	Fritz-Pak Corporation	2.6	4*
WRDA with Hycol	W.R. Grace & Company	2.0	3

*Dry powdered admixture, pre-packaged in water-soluble bag.