

**APPROVED SOURCES  
RETARDING, AND WATER REDUCING & RETARDING  
ADMIXTURES FOR BRIDGE DECK CONCRETE WHEN EXTENDED  
WORKING TIME IS REQUIRED**

**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./cwt | 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 – Plastiment

| 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./cwt | hours                 | hours                  | hours                    |
| 55                             | 13 | 2.0         |                       |                        |                          |
|                                |    | 3.0         |                       |                        |                          |
|                                |    | 4.0         |                       |                        |                          |
|                                |    | 5.0         |                       |                        |                          |
| 65                             | 18 | 3.0         | 5.1                   | 5.8                    | 6.6                      |
|                                |    | 4.0         | 7.1                   | 7.8                    | 8.7                      |
|                                |    | 5.0         | 11.4                  | 12.0                   | 13.0                     |
|                                |    | 6.0         | 20.2                  | 20.8                   | 19.0                     |
| 75                             | 24 | 3.0         | 3.6                   | 4.0                    | 4.2                      |
|                                |    | 4.0         | 4.7                   | 5.1                    | 5.4                      |
|                                |    | 5.0         | 6.9                   | 7.4                    | 7.8                      |
|                                |    | 6.0         | 10.9                  | 11.4                   | 12.1                     |
|                                |    | 7.0         | 18.9                  | 19.3                   | 20.5                     |
| 85                             | 29 | 3.0         | 3.0                   | 3.3                    | 3.1                      |
|                                |    | 4.0         | 3.6                   | 3.9                    | 3.8                      |
|                                |    | 5.0         | 4.9                   | 5.1                    | 5.1                      |
|                                |    | 6.0         | 6.9                   | 7.1                    | 7.2                      |
| 95                             | 35 | 7.0         | 10.2                  | 10.5                   | 10.3                     |
|                                |    | 3.0         | 2.2                   | 2.2                    | 2.2                      |
|                                |    | 4.0         | 2.7                   | 2.7                    | 2.7                      |
|                                |    | 5.0         | 3.5                   | 3.5                    | 3.5                      |
|                                |    | 6.0         | 4.9                   | 4.9                    | 4.9                      |
|                                |    | 7.0         | 7.4                   | 7.4                    | 7.4                      |
|                                |    | 8.0         | 12.1                  | 12.1                   | 12.1                     |

Working time limits for various cements with – Pozzolith 100 XR

| 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./cwt | hours                 | hours                  | hours                    |
| 55                             | 13 | 2.0         |                       |                        |                          |
|                                |    | 3.0         |                       |                        |                          |
|                                |    | 4.0         |                       |                        |                          |
|                                |    | 5.0         |                       |                        |                          |
| 65                             | 18 | 3.0         | 9.0                   | 9.7                    | 10.5                     |
|                                |    | 4.0         |                       |                        |                          |
|                                |    | 5.0         |                       |                        |                          |
|                                |    | 6.0         |                       |                        |                          |
| 75                             | 24 | 3.0         | 6.1                   | 6.6                    | 7.1                      |
|                                |    | 4.0         | 7.8                   | 8.3                    | 8.8                      |
|                                |    | 5.0         | 9.2                   | 9.7                    | 10.2                     |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 85                             | 29 | 3.0         | 5.2                   | 5.5                    | 5.7                      |
|                                |    | 4.0         | 6.7                   | 7.0                    | 7.2                      |
|                                |    | 5.0         | 8.1                   | 8.4                    | 8.6                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 95                             | 35 | 3.0         | 4.5                   | 4.5                    | 4.5                      |
|                                |    | 4.0         | 6.0                   | 6.0                    | 6.0                      |
|                                |    | 5.0         | 7.4                   | 7.4                    | 7.4                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
|                                |    | 8.0         |                       |                        |                          |

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./cwt | hours                 | hours                  | hours                    |
| 55                             | 13 | 2.0         |                       |                        |                          |
|                                |    | 3.0         |                       |                        |                          |
|                                |    | 4.0         |                       |                        |                          |
|                                |    | 5.0         |                       |                        |                          |
| 65                             | 18 | 3.0         |                       |                        |                          |
|                                |    | 4.0         |                       |                        |                          |
|                                |    | 5.0         |                       |                        |                          |
|                                |    | 6.0         |                       |                        |                          |
| 75                             | 24 | 3.0         | 4.3                   | 4.7                    | 5.3                      |
|                                |    | 4.0         | 6.6                   | 7.1                    | 7.6                      |
|                                |    | 5.0         | 7.6                   | 8.1                    | 8.6                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 85                             | 29 | 3.0         | 4.3                   | 4.6                    | 4.8                      |
|                                |    | 4.0         | 5.2                   | 5.5                    | 5.7                      |
|                                |    | 5.0         | 6.5                   | 6.8                    | 7.0                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 95                             | 35 | 3.0         | 3.9                   | 3.9                    | 3.9                      |
|                                |    | 4.0         | 4.4                   | 4.4                    | 4.4                      |
|                                |    | 5.0         | 5.7                   | 5.7                    | 5.7                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
|                                |    | 8.0         |                       |                        |                          |

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./cwt | hours                 | hours                  | hours                    |
| 55                             | 13 | 2.0         |                       |                        |                          |
|                                |    | 3.0         | 9.6                   | 10.6                   | 11.6                     |
|                                |    | 4.0         | 10.4                  | 11.4                   | 12.4                     |
|                                |    | 5.0         | 12.3                  | 13.3                   | 15.3                     |
| 65                             | 18 | 3.0         | 8.2                   | 8.9                    | 9.7                      |
|                                |    | 4.0         | 10.0                  | 10.7                   | 11.5                     |
|                                |    | 5.0         | 11.7                  | 12.4                   | 13.2                     |
|                                |    | 6.0         | 12.9                  | 13.6                   | 14.4                     |
| 75                             | 24 | 3.0         | 7.5                   | 8.0                    | 8.5                      |
|                                |    | 4.0         | 9.9                   | 10.4                   | 10.9                     |
|                                |    | 5.0         | 11.9                  | 12.4                   | 12.9                     |
|                                |    | 6.0         | 12.5                  | 13.0                   | 13.5                     |
|                                |    | 7.0         |                       |                        |                          |
| 85                             | 29 | 3.0         | 6.8                   | 7.1                    | 7.3                      |
|                                |    | 4.0         | 9.6                   | 9.9                    | 10.1                     |
|                                |    | 5.0         | 11.9                  | 12.2                   | 12.4                     |
|                                |    | 6.0         | 11.9                  | 12.2                   | 12.4                     |
|                                |    | 7.0         |                       |                        |                          |
| 95                             | 35 | 3.0         | 6.8                   | 6.8                    | 6.8                      |
|                                |    | 4.0         | 9.9                   | 9.9                    | 9.9                      |
|                                |    | 5.0         | 11.8                  | 11.8                   | 11.8                     |
|                                |    | 6.0         | 11.8                  | 11.8                   | 11.8                     |
|                                |    | 7.0         |                       |                        |                          |
|                                |    | 8.0         |                       |                        |                          |

Working time limits for various cements with – Catexol 1000 R

| 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./cwt | hours                 | hours                  | hours                    |
| 55                             | 13 | 2.0         | 4.5                   | 5.5                    | 6.5                      |
|                                |    | 3.0         | 5.5                   | 6.5                    | 7.5                      |
|                                |    | 4.0         | 7.0                   | 8.0                    | 9.0                      |
|                                |    | 5.0         |                       |                        |                          |
| 65                             | 18 | 3.0         | 4.8                   | 5.5                    | 6.3                      |
|                                |    | 4.0         | 5.6                   | 6.3                    | 7.1                      |
|                                |    | 5.0         | 6.8                   | 7.5                    | 8.3                      |
|                                |    | 6.0         |                       |                        |                          |
| 75                             | 24 | 3.0         | 5.2                   | 5.7                    | 6.2                      |
|                                |    | 4.0         | 5.7                   | 6.2                    | 6.7                      |
|                                |    | 5.0         | 6.7                   | 7.2                    | 7.7                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 85                             | 29 | 3.0         | 4.8                   | 5.1                    | 5.3                      |
|                                |    | 4.0         | 5.4                   | 5.7                    | 5.9                      |
|                                |    | 5.0         | 6.2                   | 6.5                    | 6.7                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 95                             | 35 | 3.0         | 4.5                   | 4.5                    | 4.5                      |
|                                |    | 4.0         | 5.1                   | 5.1                    | 5.1                      |
|                                |    | 5.0         | 5.7                   | 5.7                    | 5.7                      |
|                                |    | 6.0         | 6.5                   | 6.5                    | 6.5                      |
|                                |    | 7.0         |                       |                        |                          |
|                                |    | 8.0         |                       |                        |                          |

Working time limits for various cements with – Pozzolith 300 R

| 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./cwt | hours                 | hours                  | hours                    |
| 55                             | 13 | 2.0         | 4.5                   | 5.5                    | 5.5                      |
|                                |    | 3.0         | 5.3                   | 6.3                    | 6.3                      |
|                                |    | 4.0         | 6.8                   | 7.8                    | 8.8                      |
|                                |    | 5.0         |                       |                        |                          |
| 65                             | 18 | 3.0         | 4.6                   | 5.3                    | 6.1                      |
|                                |    | 4.0         | 5.5                   | 6.2                    | 7.0                      |
|                                |    | 5.0         | 6.8                   | 7.5                    | 8.3                      |
|                                |    | 6.0         |                       |                        |                          |
| 75                             | 24 | 3.0         | 4.7                   | 5.2                    | 5.7                      |
|                                |    | 4.0         | 6.0                   | 6.5                    | 7.0                      |
|                                |    | 5.0         | 7.2                   | 7.7                    | 8.2                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 85                             | 29 | 3.0         | 4.6                   | 4.9                    | 5.1                      |
|                                |    | 4.0         | 5.3                   | 5.6                    | 5.8                      |
|                                |    | 5.0         | 6.4                   | 6.7                    | 6.9                      |
|                                |    | 6.0         |                       |                        |                          |
|                                |    | 7.0         |                       |                        |                          |
| 95                             | 35 | 3.0         | 4.1                   | 4.1                    | 4.1                      |
|                                |    | 4.0         | 4.7                   | 4.7                    | 4.7                      |
|                                |    | 5.0         | 5.6                   | 5.6                    | 5.6                      |
|                                |    | 6.0         | 6.6                   | 6.6                    | 6.6                      |
|                                |    | 7.0         |                       |                        |                          |
|                                |    | 8.0         |                       |                        |                          |

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 | fl. oz./cwt | hours                 | hours                  | hours                    |
| 75                             | 24 | 0           | 3.2                   | 4.2                    | 5.2                      |
|                                |    | 3.0         | 4.8                   | 5.8                    | 6.8                      |
|                                |    | 4.0         | 5.5                   | 6.5                    | 7.5                      |
|                                |    | 5.0         | 6.3                   | 7.3                    | 8.3                      |
|                                |    | 6.0         | 7.6                   | 8.6                    | 9.6                      |
| 85                             | 29 | 0           | 2.9                   | 3.9                    | 4.9                      |
|                                |    | 3.0         | 4.4                   | 5.4                    | 6.4                      |
|                                |    | 4.0         | 4.7                   | 5.7                    | 6.7                      |
|                                |    | 5.0         | 5.3                   | 6.3                    | 7.3                      |
| 95                             | 35 | 6.0         | 6.0                   | 7.0                    | 8.0                      |
|                                |    | 0           | 2.2                   | 3.2                    | 4.2                      |
|                                |    | 3.0         | 2.8                   | 3.8                    | 4.8                      |
|                                |    | 4.0         | 3.0                   | 4.0                    | 5.0                      |
|                                |    | 5.0         | 3.7                   | 4.7                    | 5.7                      |
|                                |    | 6.0         | 4.5                   | 5.5                    | 6.5                      |

Working time limits for various cements with – Delvo Stabilizer  
(Hydration stabilizer)

| 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 |        |                       |                        |                          |
| 65                             | 18 | 2.0    | 4.4                   | 5.4                    | 6.4                      |
|                                |    | 3.0    | 4.9                   | 5.9                    | 6.9                      |
|                                |    | 4.0    | 5.4                   | 6.4                    | 7.4                      |
|                                |    | 5.0    | 5.9                   | 6.9                    | 7.9                      |
|                                |    | 6.0    | 6.4                   | 7.4                    | 8.4                      |
|                                |    | 7.0    | 7.4                   | 8.4                    | 9.4                      |
|                                |    | 8.0    | 8.4                   | 9.4                    | 10.4                     |
| 75                             | 24 | 2.0    | 3.3                   | 4.3                    | 5.3                      |
|                                |    | 3.0    | 3.8                   | 4.8                    | 5.8                      |
|                                |    | 4.0    | 4.3                   | 5.3                    | 6.3                      |
|                                |    | 5.0    | 4.8                   | 5.8                    | 6.8                      |
|                                |    | 6.0    | 5.3                   | 6.3                    | 7.3                      |
|                                |    | 7.0    | 5.8                   | 6.8                    | 7.8                      |
|                                |    | 8.0    | 6.8                   | 7.8                    | 8.8                      |
| 85                             | 29 | 3.0    | 3.0                   | 4.0                    | 5.0                      |
|                                |    | 4.0    | 3.5                   | 4.5                    | 5.5                      |
|                                |    | 5.0    | 4.0                   | 5.0                    | 6.0                      |
|                                |    | 6.0    | 4.5                   | 5.5                    | 6.5                      |
|                                |    | 7.0    | 5.0                   | 6.0                    | 7.0                      |
|                                |    | 8.0    | 5.5                   | 6.5                    | 7.5                      |
|                                |    | 9.0    | 6.5                   | 7.5                    | 8.5                      |
| 95                             | 35 | 4.0    | 2.7                   | 2.7                    | 2.7                      |
|                                |    | 5.0    | 3.2                   | 3.2                    | 3.2                      |
|                                |    | 6.0    | 3.7                   | 3.7                    | 3.7                      |
|                                |    | 7.0    | 4.2                   | 4.2                    | 4.2                      |
|                                |    | 8.0    | 4.7                   | 4.7                    | 4.7                      |
|                                |    | 9.0    | 5.2                   | 5.2                    | 5.2                      |
|                                |    | 10.0   | 6.2                   | 6.2                    | 6.2                      |

Working time limits for various cements with – Plastiment ES

| Mix Temp at Point of discharge |    | Dosage  | Type I/II, no fly ash | Type I/III with fly ash | Type IS, IP with fly ash |
|--------------------------------|----|---------|-----------------------|-------------------------|--------------------------|
| °F                             | °C |         |                       |                         |                          |
| 65                             | 18 | 3 (2.0) | 4.2                   | 5.8                     | 6.3                      |
|                                |    | 4 (2.6) | 6.5                   | 6.9                     | 7.8                      |
|                                |    | 5 (3.3) | 10.5                  | 11.0                    | 12.4                     |
|                                |    | 6 (3.9) | 18.8                  | 18.5                    | 18.9                     |
| 75                             | 24 | 3 (2.0) | 3.3                   | 3.8                     | 4.6                      |
|                                |    | 4 (2.6) | 4.4                   | 5.0                     | 5.8                      |
|                                |    | 5 (3.3) | 6.7                   | 7.0                     | 7.7                      |
|                                |    | 6 (3.9) | 10.3                  | 10.8                    | 11.5                     |
| 85                             | 29 | 7 (4.6) | 17.7                  | 17.5                    | 19.5                     |
|                                |    | 3 (2.0) | 2.5                   | 3.1                     | 3.7                      |
|                                |    | 4 (2.6) | 3.3                   | 3.7                     | 4.4                      |
|                                |    | 5 (3.3) | 4.5                   | 5.0                     | 5.5                      |
| 95                             | 35 | 6 (3.9) | 6.6                   | 6.8                     | 7.4                      |
|                                |    | 7 (4.6) | 10.2                  | 10.6                    | 10.6                     |
|                                |    | 3 (2.0) | 1.8                   | 2.2                     | 3.6                      |
|                                |    | 4 (2.6) | 2.5                   | 2.7                     | 2.9                      |
|                                |    | 5 (3.3) | 3.3                   | 3.6                     | 4.1                      |
|                                |    | 6 (3.9) | 4.5                   | 4.7                     | 5.1                      |
|                                |    | 7 (4.6) | 7.9                   | 7.9                     | 8.8                      |
|                                |    | 8 (5.2) | 11.8                  | 12.4                    | 12.9                     |