

**KANSAS DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISION TO THE  
STANDARD SPECIFICATIONS, 2015 EDITION**

**Add a new SECTION to DIVISION 2000:**

**SECTION 2009**

**RAPID HARDENING HYDRAULIC CEMENT**

**2009.1 DESCRIPTION**

This specification covers requirements for rapid hardening hydraulic cement for use in concrete placements where the required accelerated strength cannot be achieved using ordinary Portland Cement Mixtures.

**2009.2 REQUIREMENTS**

Provide material that contains 0% Calcium Chloride and complies with all applicable requirements of ATSM 1600 and the optional requirement for 14-day ASR Expansion in Table 2 shall apply. The following types shall be designated:

**Type URH-** Ultra Rapid Hardening for use where ultra-high early strength is desired.

**Type VRH-**Very Rapid Hardening for use where very high early strength is desired.

**Type MRH-**Medium Rapid Hardening for use where mid-range hardening high early strength is desired.

**Type GRH-** General Rapid Hardening for use when the higher strength properties of a Type VRH or a Type MRH cement is not required.

A rapid hardening hydraulic cement type and source must be prequalified before it can be utilized in KDOT projects.

The mixing of cements of differing types and or sources will be approved on a case by case basis. Prequalify such combinations.

A contractor must have moisture protective facilities to store the cement required for 3 active construction days. The Engineer's representative may waive this requirement if it is determined that a well-regulated supply from the cement producer can be maintained. Any cement that has been contaminated by moisture or reclaimed by any method is not acceptable.

Previously approved cement bulk stored at the source plant or terminal for over 6 months or in bulk or packaged and stored at a contractor or distributor facility for over 3 months after the initial producer QC test date is subject to resampling, testing, and the requirements of this subsection.

Cement stored at facilities, other than those described in the preceding paragraphs before the initiation of construction or delivered to such facilities during construction of KDOT projects is to be sampled and tested and is subject to the requirements of this Section. This requirement may be waived if certifications documenting that the cement is a prequalified type from a prequalified source are provided to the Engineer's representative.

**2009.3 TEST METHODS**

Conduct all tests required by ASTM C 1600 Table 1, and the Optional Requirement for 14-day ASR Expansion in Table 2. Field sample cement in accordance with the procedures of Part V, KT-29. Obtain all other cement samples in accordance with the requirements and procedures of ASTM C 183.

## 2009.4 PREQUALIFICATION

### a. Becoming Prequalified.

- (1) Submit the following to the Engineer of Tests:
  - (a) A copy of the quality control plan for the source. The plan should include information on what cement types are produced, where and how sampling is done, frequency, and what standards (AASHTO, ASTM, etc.) are applied.
  - (b) A 2-gallon sample of each rapid hardening hydraulic cement type produced by the source and permitted through this Section that is representative of the product intended for use on KDOT projects.
  - (c) Certified quality control test results of rapid hardening hydraulic cement, by type, that was produced by the source during the 6 months immediately before the prequalification request. Provide the high, low and average values or statistical analysis for each month. Include applicable statements and test reporting as described in **subsections 2009.2** If no processing additions were used during the previous 6-month reporting period, report this fact also.
  - (d) Statement that the rapid hardening hydraulic cement contains 0% Calcium Chloride.
  - (e) Documentation of routine Cement and Concrete Reference Laboratory (CCRL) inspection of the source laboratory performing the cement quality control testing. Include the results of the most recent evaluation.
  - (f) The names of the individuals responsible for the quality control for cement production at the source.
- (2) Prequalification of a rapid hardening hydraulic cement source, by type, will be based on rapid hardening hydraulic cement produced when the source is utilizing specific materials, equipment and processes. Any change in materials, materials sources, equipment or processes voids the source prequalification, and a new prequalification will be required.

**b. Maintaining Prequalified Status.** After a rapid hardening hydraulic cement source has acquired prequalified status, the source will be permitted to provide cement, by prequalified type, for use on KDOT projects provided the following conditions are complied with:

- (1) The quality-monitoring program meets the minimum sampling and testing frequencies established in ASTM C 183. This frequency may be altered somewhat with the approval of the Bureau Chief, Construction and Materials.
- (2) Submit monthly quality control reports for all prequalified rapid hardening hydraulic cement types within 2 weeks after completion of the testing. Include applicable statements and test reporting as described in **subsections 2009.2** If no processing additions were used for cement produced during the month, report that fact also for each product.
- (3) Utilize an approved laboratory to conduct quality control tests. The laboratory will be considered approved if it is properly equipped, has the capabilities to perform the tests required through this subsection and is routinely inspected through the CCRL program. Continued approval of the control laboratory and the source, by rapid hardening hydraulic cement type, will depend on satisfactory comparison of its test results with the results obtained by the Materials and Research Center on random verification samples of cement produced by the source.
- (4) The source has not changed materials, material sources, equipment, or processes since prequalification.

## 2009.5 BASIS OF ACCEPTANCE

### a. Prequalification as specified in **subsection 2009.4**.

**b.** A proper certification must accompany each shipment of cement. Provide a copy of the bill of lading which includes the following certification statement and the signature of a responsible source representative to the Field Engineer responsible for the project.

**Certification Statement**

**The material herein has been sampled and tested as prescribed by KDOT and complies with the applicable specification requirements for Type \_\_\_\_\_ rapid hardening hydraulic cement in accordance with the requirements of ASTM 1600. Material contains 0% Calcium Chloride.**

**Date \_\_\_\_\_ Signed \_\_\_\_\_**

If a processing addition is used in the manufacture of the rapid hardening hydraulic cement, include the following as a part of the certification statement:

**A processing addition, consisting of \_\_\_% of \_\_\_\_\_ and complying with the requirements of ASTM 1600 has been used in the manufacture of this cement.**

**c.** Identify the bills of lading with a project number, and denote the cement source, the type, and the quantity in the shipment. Retain this copy at the project or Contractor or distributor facility for the Engineer's representative's records.

**d.** In the case of more than one project being supplied by a contractor, producer, or distributor facility, the facility must provide the Engineer's representative either a copy of the bill of lading, or a signed listing of the bills of lading representing the cement, by type and source, incorporated into each project.

Note: Verification samples will be obtained by KDOT personnel at the project site. Test results that do not comply with the specifications of this subsection may be considered sufficient cause to rescind approval to furnish cement, by type, on a certification basis.

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