

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

Delete SECTION 1731 and replace with the following:

SECTION 1731

PREPACKAGED GROUT USED IN POST-TENSIONING

1731.1 DESCRIPTION

This specification covers Class C (Prepackaged) grouts to be used to protect post-tensioning steel in haunched slab bridges.

1731.2 MATERIALS

a. Provide material that does not contain aluminum or other components which produce hydrogen, carbon dioxide or oxygen gas.

b. Proportion Class C grouts to conform to the requirements of paragraph 3.3.3 of Post-Tensioning Institute (PTI) Specification M55.1-12(13), "Specification for Grouting of Post-Tensioned Structures" w/Addendum #1.

c. Provide material complying with the requirements listed in **TABLE 1731-1**. Conduct all tests with material mixed to produce the minimum time of efflux. Unless indicated otherwise within a test procedure, perform testing at nominal ambient room temperatures of approximately 68 degrees F.

TABLE 1731-1: GROUT USED IN POST-TENSIONING		
Property	Test Method	Requirement
Initial Set Time, min./max.	ASTM C 953	3 hours / 12 hours
28-day Compressive Strength (avg. of 3 ASTM C 109 cubes)	ASTM C 942	Min. 7,000 psi
Permeability @ 28 days ^d	ASTM C 1202 ^a	Max. 2,500 coulombs after 6 hours
Height Change @ 24 hr	ASTM C 1090	0.0% to +0.1%
Height Change @ 28 days		Max. +0.2%
Time of efflux, immediately after mixing ^{b,d}	ASTM C 939 (Standard)	Min. 20 seconds Max. 30 seconds
	ASTM C 939 (Modified) ^c	Min. 9 seconds Max. 20 seconds
Time of efflux, 30 minutes after mixing with remixing for 30 seconds ^{b,c}	ASTM C 939 (Standard)	Max. 30 seconds ^f
	ASTM C 939 (Modified) ^c	Max. 30 seconds ^f
Expansion	ASTM C 940 (Modified) ^g	Max. 2.0% for up to 3 hours
Wick-Induced Bleed		Max. 0.0% @ 3 hours
Schupack Pressure Bleed	ASTM C 1741	As per PTI M55.1-12(13) Table 4.1
Accelerated Corrosion @ 56 days (w/c = 0.45)	PTI M55.1-12 (13), Appendix B	$t_{corr} \geq t_{control}$ and $t_{corr} > 1000$ hours
Wet Density ^d	ASTM C 138 or C 188	Report max. & min. obtained test value, lb/ft ³
Total Chloride Ions	ASTM C 1152	Max. 0.08% by weight of mixed grout

^aUse 30V dc rather than the test standard of 60V dc.

^bUse either the standard of the modified test method.

^cModify the ASTM C 939 test by filling the cone to the top instead of to the standard level. The time of efflux is the time to fill a one liter container placed directly under the flow cone.

^dUse the minimum and maximum w/c indicated on the manufacturer's technical data sheet.

^e Use the minimum w/c indicated on the manufacturer's technical data sheet.

^f In addition, this value must be within 10 seconds of the corresponding "immediate" value using the same test method and w/c.

^g Modify the ASTM C 940 test in accordance with PTI Specification M55.1-12(13), paragraph C4.4.6.1.

1731.3 TEST METHODS

Test in accordance with the requirements stated in **subsection 1731.2c**.

1731.4 PREQUALIFICATION

a. Each grout intended for use under this specification must be prequalified before use. Submit a written request to be evaluated for prequalification to the Chief of Materials and Research. Provide the following for the material to be evaluated:

- (1) Name, address and telephone number of the manufacturer. Include the name of the preferred contact person.
- (2) Brand name of the grout.
- (3) A complete description, literature, Technical Data Sheet and set of instructions.
- (4) Material Safety Data Sheets.

(5) A copy of test results performed as outlined in **subsection 1731.2c** from a recognized laboratory. Include evidence that the laboratory is inspected regularly. A recognized laboratory is one operated by any State Transportation Agency, the Federal Highway Administration, or other cement and concrete laboratory regularly inspected by the Cement & Concrete Reference Laboratory (CCRL) of the National Institute of Standards and Technology. Test results are to be no more than 24 months out of date.

- (6) An infra-red spectrum of the grout which was used in the laboratory tests.

b. Forward a one gallon sample of each grout being submitted for prequalification to the Engineer of Tests.

c. The information, test reports and test results obtained at the Materials and Research Center on samples submitted, will be reviewed by the Chief of Materials and Research. The manufacturer will be advised of the results.

d. The Bureau of Materials and Research will maintain a list of prequalified products. Products that have been prequalified will remain prequalified as long as the formulation and manufacturing processes remain unchanged, and field experience indicates that the grout functions appropriately. Changes in formulation or manufacturing processes will require new prequalification testing.

Failure of the material to function appropriately in the field will be cause for removal of the product from prequalified status. Products removed from prequalified status will be considered for requalification if the manufacturer can provide evidence that the cause of failure has been positively identified, and necessary formulation changes and/or quality control measures have been implemented to eliminate that cause. Complete prequalification testing may be required for products that have been removed from prequalified status.

1731.5 BASIS OF ACCEPTANCE

Prequalification as specified in **subsection 1731.4**.

Receipt and approval of a Type C certification as specified in **DIVISION 2600**.