MATERIAL SPECIFICATION FOR ADMIXTURES FOR CONCRETE

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1303.01 SCOPE

This specification covers the materials for use as air entraining, chemical, and superplasticizing admixtures for concrete.

1303.01.01 Specification Significance and Use

This specification is written as a provincial-oriented specification. Provincial-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of the Ontario Ministry of Transportation.

Use of this specification or any other specification shall be according to the Contract Documents.

1303.01.02 Appendices Significance and Use

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

1303.02 REFERENCES

When the Contract Documents indicate that provincial-oriented specifications are to be used and there is a provincial-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.PROV, unless use of a municipal-oriented specification is specified in the Contract Documents. When there is not a corresponding provincial-oriented specification, the references below shall be considered to be to the OPSS listed, unless use of a municipal-oriented specification is specified in the Contract Documents.

This specification refers to the following standards, specifications, or publications:

Ontario Ministry of Transportation Publications

Designated Sources for Materials (DSM)

Laboratory Testing Manual:

LS-413	Method of Test for Non-volatile Content of Chemical Admixtures, Latex Admixtures and Curing Compounds
LS-422	Method of Test for Evaluation of Air Entraining Admixtures for Concrete
LS-423	Method of Test for Evaluation of Chemical Admixtures for Concrete
LS-424	Method of Test for Evaluation of Superplasticizing Admixtures

ASTM International

C 494	Chemical Admixtures for Concrete
E 70-97 (2002)	Test Method for pH of Aqueous Solutions with the Glass Electrode

1303.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Air Entraining Admixture means a type of admixture according to ASTM C 260 that causes development of a system of microscopic air bubbles in concrete during mixing, to increase the workability of the concrete and its resistance to freezing and thawing.

Chemical Admixture means Types A, B, C, D, E, and S admixtures according to ASTM C 494.

Non-Chloride Admixture means an admixture that contains not more than 0.01% chloride by mass of cement.

Superplasticizer means Types F and G admixtures according to ASTM C 494.

Type A means a water reducing admixture that reduces the quantity of mixing water required to produce concrete of a given consistency.

Type B means a retarding admixture that retards the setting of concrete.

Type C means an accelerating admixture that accelerates the setting and early strength development of concrete.

Type D means a water reducing and retarding admixture that reduces the quantity of mixing water required to produce concrete of a given consistency and retards the setting of concrete.

Type E means a water reducing and accelerating admixture that reduces the quantity of mixing water required to produce concrete of a given consistency and accelerates the setting and early strength development of concrete.

Type F means a superplasticizing admixture that reduces the quantity of mixing water required to produce concrete of a given consistency by 12% or greater.

Type G means a superplasticizing and retarding admixture that reduces the quantity of mixing water required to produce concrete of a given consistency by 12% or greater and retards the setting of concrete.

Type S Admixture means a specific performance admixture that provides desired performance characteristics, other than reducing water content or changing the time of setting of concrete or both, without any adverse effects on fresh, hardened, and durability properties of concrete.

1303.04 DESIGN AND SUBMISSION REQUIREMENTS

1303.04.01 Submission Requirements

1303.04.01.01 Admixtures

The supplier shall submit documentation verifying that each admixture used on the Contract is included on the ministry's DSM.

1303.05 MATERIALS

All admixtures shall be in liquid form.

All admixtures shall be non-chloride, with the exception of admixtures used in fast-track full-depth repairs to concrete pavements or concrete base.

Admixtures shall be according to LS-422, LS-423, and LS-424.

In addition, required performance characteristics of each Type S chemical admixture shall be demonstrated on Owner approved field trials prior to use in the work.

1303.08 QUALITY ASSURANCE

Admixtures shall be sampled and tested as specified in the Contract Documents.

Relative density and pH of air entraining admixtures, and non-volatile content and relative density of chemical and superplasticizing admixtures shall be according to the product data shown on the DSM, within the following tolerances:

a) Relative density:

   i. Where relative density is 1.050 or less, the tolerance shall be ± 0.005.
   ii. Where relative density is greater than 1.050, the tolerance shall be calculated according to the following formula:

      Tolerance = (relative density of acceptance sample-1.000)/10

b) Non-volatile content ± 2.5%.

c) pH ± 1.5.

Appendix 1303-A, November 2014
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

No information provided here.

Related Ontario Provincial Standard Drawings

No information provided here.