The most feasible site for an injection installation of the Sudbury Aqueduct is at the Farm Pond outlet in the vicinity of Dudley Rd. in Framingham where the Metropolitan District Com. owns approximately 5.3 acres of land. The Sudbury Aqueduct bisects this parcel of land and abuts property that is owned by the town of Framingham. Furthermore, water drawn from the South Sudbury supply could be fluoridated by facilities located at Farm Pond.

In view of the need to provide complete treatment of the Sudbury supply in the near future, it is recommended that the fluoridation facilities be suitably designed for relocation to the treatment plant when constructed. Consideration should also be given to the relocation of the Leland St. chlorination facilities when a treatment plant is constructed. An analysis-and-control station is also required to monitor fluoride ion concentration in the Sudbury supply. The existing brick structure on the west side of Leland St. is not presently utilized and could be repaired and used to house sampling pumps and analysis-and-control equipment. The location of this facility is a sufficient distance downstream from the point of injection (approximately 10 000 ft) to ensure complete mixing and diffusion of the chemical solution.

Comparison of Alternatives

Evaluation of the alternatives indicates that the most feasible method to fluoridate the Metropolitan District water supply is to utilize chemical storage and feed facilities at the locations proposed in alternative II, shown on Fig. 3. This selection is based on the following comparison of the two alternatives.

1. Alternative II requires one less chemical storage and feed building and monitoring station.
2. Alternative II offers better centralization of facilities for chemical delivery and system operation, control, and maintenance.
3. Alternative II provides the best opportunity for diffusion and mixing of the fluoride solution.

Conclusion

It was decided that two sites be utilized for the location of fluoridation installation. Both sites proposed are centrally located in Framingham and are separated by a distance approximately 3 mi. Figure 2 shows the approximate location of both the injection facilities and monitoring stations for each proposed site. The installation at shaft 4 of the Southborough Tunnel would fluoridate all water entering the Hultman and Weston aqueducts. Facilities at Farm Pond would fluoridate water entering the Sudbury Aqueduct. Collectively, these three aqueducts furnish the Metropolitan Water District with its entire water supply.

AWWA STANDARD

for

ASBESTOS–CEMENT TRANSMISSION PIPE, 18 IN. THROUGH 42 IN., FOR WATER AND OTHER LIQUIDS

First approved by AWWA Board of Directors Jan. 26, 1975.

Prepared by

AWWA Standards Committee on Asbestos–Cement Pressure Pipe

F. GORDON DENSON, *Chairman*

Consumer Members

P. J. BRADY, Director of Utilities, Portsmouth, Va.	(AWWA)
F. G. DENSON, Engineering Department, Winnipeg, Man.	(AWWA)
J. R. HENDRICK, Water Department, Fort Worth, Tex.	(AWWA)
R. W. KING, Water Utilities, San Diego, Calif.	(AWWA)
J. L. WARDEN, US Bureau of Reclamation, Denver, Colo.	(USBR)
J. E. JOHNSON,* US Bureau of Reclamation, Denver, Colo.	(USBR)

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V. R. BICKEL, Department of Environmental Health, Albuquerque, N.M.	(APWA)
ROBERT S. BRYANT, Department of Water & Power, Los Angeles, Calif.	(ASCE)
K. J. CARL, Insurance Services Office, New York, N.Y.	(ISO)
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F. A. OBERT, Metcalf & Eddy, Boston, Mass.	(WPCF)
J. S. SLICER, Factory Mutual Research, Norwood, Mass.	(FMR)
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W. R. SEIPT, Certain–Teed Products Co., Valley Forge, Pa.	(AWWA)
D. W. SULLIVAN, The Flintkote Co., Ravenna, Ohio	(AWWA)

* Alternate

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Foreword

This foreword is for information only and is not a part of C402-75.

I—History of Standard

A new pipe material consisting of an intimate mixture of portland cement and asbestos fibers was introduced to the North American market in 1931 following a number of years of usage in other countries, particularly Italy.

In the ensuing years, this type of pipe gained popularity, and in 1949 AWWA established a committee on standard specifications for asbestos–cement pipe under the chairmanship of S. M. Clarke of Greeley and Hanson, Chicago.

The committee developed a standard for asbestos–cement water pipe, which was approved by the AWWA Board of Directors as a tentative standard, AWWA C400–53T, on May 15, 1953. In 1958, the committee was reactivated as Committee 8340D on Asbestos–Cement Pipe under the chairmanship of Roy H. Ritter, Whitman, Requardt and Assocs., Baltimore, to review several suggested changes and to recommend revisions to the standard. The committee produced a revised standard adopted by AWWA as C400–64T on Jan. 27, 1964. It was advanced to "standard" without revision on Jul. 2, 1965.

In early 1968, the committee was reactivated as the Standards Committee on Asbestos–Cement Pipe to review and revise all of the AWWA standards on asbestos–cement pipe. The committee produced a revised standard approved by the Board of Directors on Jan. 31, 1972, designated as "AWWA Standard for Asbestos–Cement Pressure Pipe for Water and Other Liquids, C400–72."

During the past five years, the asbestos–cement pipe manufacturers developed a large new range of pipe classifications, designed to give wider freedom of selection to design engineers. This is of particular significance for large pipeline projects where the possible savings in material cost can exceed the increased cost of more detailed design, better control of methods of installation, and provision of surge controls when justified.

This standard was developed to provide the user with a ready reference and specification for this type of pipe known as transmission pipe. The user should not confuse this standard with, or use it in place of, C400–75, "AWWA Standard for Asbestos–Cement Pressure Pipe for Water and Other Liquids." Detailed engineering study of the factors listed in Sec. II regarding local installation and operating conditions, is required to ensure adequate performance of transmission pipe.

The possibility of confusion between this standard and AWWA Standard C400–75, "Asbestos–Cement Pressure Pipe," was carefully reviewed. To reduce this possibility, the pressure pipe designation was revised to an upper limit of 24-in. diameter, and transmission pipe ranges were limited to a minimum diameter of 18 in. The overlapping sizes of 18–24 in. are not analogous.

II—Information Regarding Use of This Standard

When ordering pipe covered by this standard, local installation and operating conditions should be considered to determine the classification and type of pipe to specify. Also, certain other items must be specified to describe completely the pipe required.

The following criteria are presented for determining the type of pipe to be used under various soil and water conditions. Each condition should be considered separately, even though each may exist in combination with others.

These criteria are based on exposures within the temperature range of 40–80F (5–28C). For pipe exposures to temperatures beyond these limits, consult the manufacturer.

1. *Water transported through the pipe:*

(a) Use either Type I or Type II where $pH + \log (AH) \geq 12.0$

(b) Use Type II where $pH + \log (AH) \geq 10.0$

where

pH = index of acidity or alkalinity of the water in standard pH units

A = the total alkalinity in parts per million as $CaCO_3$

H = the calcium hardness in parts per million as $CaCO_3$.

2. Water within the soil surrounding the pipe:

Water Conditions Within the Soil	Minimum pH of the Soil	
	Type I	Type II
(a) Essentially quiescent	5.0	4.0
(b) Mildly fluctuating	5.5	5.0
(c) Rapidly moving or grossly cyclic	6.3	5.5

3. Waters and soils with soluble alkali sulfates:

	Water Alkali Sulfate *ppm*	Soil Nonacid Sulfate *ppm*
Type I will be attacked to varying degrees by concentrations	>150	>1 000
Type II is resistant to	all levels	all levels

NOTE: Acid sulfate soils and waters, whether the acid is inorganic or organic, must be evaluated independently of the preceding criteria, taking into consideration soil permeability and other factors.

For any service outside of these criteria, consult the manufacturer.

These criteria just previously given for sulfate "resistance" of Type I pipe were taken from *Concrete Manual* (8th edition), Bureau of Reclamation (pending printing as of Mar. 1975).

It is recommended that, for large pipeline projects, the purchaser evaluate local installation and operating conditions, operating pressures and surge pressures, trench loads, and surface loads as well as corrosive soils and corrosiveness of the liquids to be transported when determining the strength classification to be used.

The purchaser is referred to AWWA C401–64 (formerly AWWA H2) "Standard Practice for the Selection of Asbestos–Cement Water Pipe" for guidance in designing transmission pipe to fit his installation and operating conditions. Attention is directed to the fact that selection curves and related data in the current edition of AWWA C401–64 are applicable to pipe covered by AWWA Standard C400–75, "Asbestos–Cement Pressure Pipe, 4 in. Through 24 in., for Water and Other Liquids," not to transmission pipe covered by this standard.

The purchaser is referred to AWWA Standard C603–65 "Installation of Asbestos–Cement Water Pipe," for guidance in the laying of the pipe.

The following information summarizes the conditions and items that the purchaser should consider when preparing his supplementary specifications and lists the sections in the standard and other references where they may be found:

1. The standard used; that is, AWWA C402–75
2. Affidavit of compliance (Sec. 1.3), if required
3. Type of pipe to be furnished (Sec. 2.3 and second paragraph in "Foreword," Sec. II)
4. Classification of pipe (Sec. 3.1)
5. Nominal inside diameter (Sec. 3.2)
6. Lineal feet to be furnished in standard and random lengths (Sec. 3.3)
7. Number, size, classification, lengths, and extent of machining of special short lengths (Sec. 3.3.3)
8. Whether inspection by the purchaser (Sec. 5.1) and special markings (Sec. 6.1.4) are required.

AWWA C402-75

AWWA Standard for

Asbestos–Cement Transmission Pipe, 18 in. Through 42 in., for Water and Other Liquids

Section 1–General

Sec. 1.1—Scope

This standard pertains to asbestos–cement transmission pipe of two chemical types, each in nine strength classifications of 18-in. through 42-in.-diameter pipe, intended to be used for the transmission of water or other liquids under pressure and to be laid underground in public and private rights-of-way. Asbestos–cement transmission pipe is to be used in pipe systems having relatively steady flows and few appurtenances, which permit reasonable hydraulic analysis, including that for surge.

Sec. 1.2—Definitions

Under this standard, the following definitions shall apply:

1.2.1 *Inspection.* Inspection of the pipe and the tests by the inspector.

1.2.2 *Inspector.* The authorized representative of the purchaser, entrusted with the duty of inspecting pipe produced and tests performed under this standard.

1.2.3 *Lot.* Pipe of the same size, class, and type manufactured during a shift.

1.2.4 *Manufacturer.* The person, firm, or corporation that manufactures the pipe.

1.2.5 *Purchaser.* The person, firm, corporation, or government agency entering into a contract or agreement to purchase pipe according to this standard.

Sec. 1.3—Affidavit of Compliance

The purchaser's supplemental specifications may require an affidavit of compliance from the manufacturer, whether factory inspection has been required or not, to the effect that the materials furnished under the purchaser's order comply with all applicable requirements of this standard.

Section 2–Physical and Chemical Requirements

Sec. 2.1—Composition

Asbestos–cement pipe shall be composed of an intimate mixture of (1) portland cement or portland blast furnace slag cement and asbestos fiber with or without silica; (2) or portland pozzolana cement and asbestos fiber—both (1) and (2) with or without the addition of curing agents. The mixture shall be free from organic additives and the pipe shall be formed under pressure and cured.

Sec. 2.2—Physical Requirements

2.2.1 *Bursting strength.* Each length of pipe and each coupling shall have sufficient strength to withstand the minimum internal bursting pressures indicated for the classifications in Table 1.

TABLE 1
Pipe Classification

Classification	Minimum Internal Bursting Pressure *psi*
30	300
35	350
40	400
45	450
50	500
60	600
70	700
80	800
90	900

2.2.2 *Crushing strength.* Each length of pipe shall have sufficient strength to support the external test load indicated for its class in Table 2 when subjected to the crushing test procedure specified in Sec. 5.2.3.

Sec. 2.3—Chemical Requirements

Pipe shall be designated as either Type I or Type II according to its content of uncombined calcium hydroxide as determined by the test procedures in this standard for uncombined calcium hydroxide. The requirements for each type are

Type I—no limit on uncombined calcium hydroxide

Type II—1.0 per cent or less uncombined calcium hydroxide.

Section 3—Design

Sec. 3.1—Classification of Pipe

Pipe supplied under this standard shall be made in one or more of the classifications shown in Table 1. (The numerical value for each classification is equivalent to one tenth of the hydrostatic lot test pressure.

Sec. 3.2—Pipe Diameters

Pipe shall be made with nominal inside diameters of 18, 20, 21, 24, 27, 30, 33, 36, 39, and 42 in., as specified by the purchaser. The average inside diameter of a standard or random pipe length shall not be less than the nominal diameter by more than 1.5 per cent.

Sec. 3.3—Pipe Lengths

Pipe shall be produced in standard, random, and short lengths. At least 90 per cent of the total footage of pipe of any classification and size, excluding short lengths, shall be furnished in standard lengths. The remaining 10 per cent may be in random lengths.

3.3.1 *Standard length* shall be 13 ft ±1 in. Coupling areas shall be machined or otherwise rendered suitable for making a tight joint with the coupling.

3.3.2 *Random lengths* shall be cut from standard lengths and shall be not less than 7 ft long. The coupling area of all random lengths shall be machined or otherwise rendered suitable for making a tight joint with the coupling.

3.3.3 *Short lengths* for making connections to valves, fittings, or structures, and for making closures shall be furnished as specified by the purchaser. They shall be properly machined at ends or over their entire length to serve their intended purpose, as specified by the purchaser.

Sec. 3.4—Couplings

A coupling shall consist of an asbestos–cement sleeve of the same type and composition as the pipe and two rubber rings or a device that has equal or better bonding characteristics, strength, and serviceability as that of an asbestos–cement coupling. The manufacturer shall submit to the purchaser for approval, prior to manufacturing, specifications and drawings of alternate couplings.

3.4.1 *One coupling* of the same size and classification as the pipe shall be furnished with each standard and random length of pipe.

3.4.2 *Rubber rings* shall conform to the requirements of the latest edition of ASTM D1869, "Rubber Rings for Asbestos–Cement Pipe."

Sec. 3.5—Joints

Joints shall be capable of withstanding, without leakage, a hydrostatic pressure test as defined in Section 5.2.2.1.

Sec. 3.6—Wall Thickness

The wall thickness of the machined portion of any length of pipe shall not be less than the manufacturer's standard by an amount in inches exceeding that listed for the various sizes of pipe in Table 3.

TABLE 3
Wall Thickness Tolerances

Size of Pipe *in.*	Wall Thickness Tolerance *in.*
18	−0.12
20–24	−0.14
27–30	−0.17
33–36	−0.20
39–42	−0.23

TABLE 2
*External Test Load (Three-Edge Bearing)**—lb/lineal ft

Pipe Size *in.*	Classification								
	30	35	40	45	50	60	70	80	90
18	2 500	3 000	4 000	5 000	6 500	8 500	11 000	14 000	18 000
20	2 500	3 500	4 500	5 500	7 100	9 500	12 000	15 000	20 000
21	2 500	3 500	4 500	5 800	7 300	9 700	12 500	16 000	21 000
24	2 800	3 800	5 000	6 200	8 100	11 000	15 000	19 000	24 000
27	3 500	4 200	5 500	7 000	8 800	12 500	16 500	20 500	27 000
30	3 500	4 500	6 000	7 500	9 700	13 500	18 000	22 500	30 000
33	3 500	5 000	6 500	8 000	10 500	14 500	19 500	24 500	33 000
36	4 000	5 000	7 000	9 000	11 200	16 000	21 000	26 000	36 000
39	4 200	5 300	7 500	9 700	12 000	17 200	22 500	28 000	39 000
42	4 300	5 700	8 000	10 500	13 000	18 500	24 000	30 000	42 000

* It is necessary to apply a load factor to the above three-edge bearing loads in order to correlate them to the field loads. (See AWWA Standard C401-64.)

Section 4—Workmanship and Finish

Sec. 4.1—Imperfections

4.1.1 *Interior surfaces.* The inside surface of each length of pipe shall be free from bulges, dents, and tears that result in a variation in diameter of more than 0.20 in. from the diameter of adjacent unaffected portions of the surface.

4.1.2 *Coupling areas.* The coupling areas of the barrel of each length of pipe shall be free from dents and gouges that can cause leakage from the joint.

4.1.3 *Exterior surfaces.* Flaking on the exterior surface and edge of machined ends shall not extend back by more than 0.500 in. from the end, have

a depth of more than 0.125 in., and shall not extend around the perimeter for more than 0.500 in. at any one location.

4.1.4 *Straightness.* Each length of pipe shall not vary in straightness by more than 0.05 in./ft of length when the variation is measured as follows:

Measure the maximum ordinate from the exterior surface of the pipe by placing a straight edge that exceeds the pipe length against the exterior surface and measure the maximum distance from the exterior pipe surface to the straight edge.

Section 5—Inspection, Testing, and Rejection

Sec. 5.1—Inspection

5.1.1 *General.* Inspection by the purchaser shall not relieve the manufacturer of the responsibility to furnish material conforming in all respects to the requirements of this standard.

5.1.2 *Notification.* If inspection is specified by the purchaser, the manufacturer shall notify the purchaser, in advance, of the date, time, and place of testing of the pipe, so that the purchaser may be represented at the test.

5.1.3 *Access.* The inspector shall have free access to those parts of the manufacturer's plant that are involved in work performed under this standard. The manufacturer shall afford the inspector, without charge, all reasonable facilities for determining whether the pipe meets the requirements of this standard.

Sec. 5.2—Physical Test Requirements

5.2.1 *Test specimens.* All pipes and couplings tested under this standard shall be in a normal, air-dried condition when tested.

5.2.2 *Hydrostatic tests:*

5.2.2.1 Each standard, random, or short length of pipe and each coupling sleeve shall be tested under an internal hydrostatic pressure as shown for the routine proof test in Table 4. All air shall be expelled and the water pressure shall be increased to the test pressure at a uniform rate of not less than 100 psi/s. The test pressure shall be maintained for at least 5 s. Any pipe length or coupling sleeve that shows leakage, sweating, or other defects shall be rejected.

TABLE 4
Hydrostatic Tests

Classification	Routine Proof Test *psi*	Lot Test *psi*
30	225	300
35	263	350
40	300	400
45	338	450
50	375	500
60	450	600
70	525	700
80	600	800
90	675	900

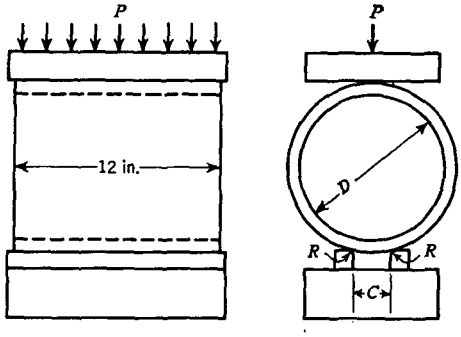


Fig. 1. Crushing Test Assembly

The diagram at the left shows a side view of the test assembly; that at the right, an end view. P *represents load;* R, *approximately 0.5 in.—the radius of the bearings;* D, *the nominal diameter of the pipe; and* C, *the clear space between supports.* C *should be approximately 1 in./ft of internal pipe diameter, but in no case less than 1 in.*

5.2.2.2 From each 300 standard lengths of pipe or fraction thereof of each size and classification, one 1-ft length of pipe, or longer, shall be cut from an unmachined portion of a pipe length. Each such length shall withstand the hydrostatic lot test shown in Table 4 in the manner specified in Sec. 5.2.2.1 except that the test pressure need not be held for 5 s. If inspection by the purchaser is specified, the inspector shall be permitted to select the length of pipe to be tested. Each length of pipe so tested shall be retested in the manner and at the pressure specified in Sec. 5.2.2.1.

5.2.3 *Crushing tests.* On lots containing more than 100 lengths of each size and classification, one length from each 300 lengths or fraction thereof shall be tested for crushing strength. If inspection by the purchaser has been specified, the length of pipe to be tested may be selected by the inspector. From each selected length, one unmachined length of pipe 1 ft long shall be cut. This section shall be tested by the crushing-test method shown in Fig. 1. After 75 per cent of the specified load has been reached, the loading shall be applied at a uniform rate of approximately 2 000 lb/min. The test section shall not fail until the total load applied meets or exceeds the applicable value shown in Table 2.

For this test, the two lower bearings shall consist of two straight strips with vertical sides, each strip having its interior top edge rounded to a radius of approximately 0.5 in. The strips shall be of hardwood or metal; if metal, a piece of leather belting 3/16 in. in thickness shall be laid over them. The strips shall be securely fastened to a rigid block, with the interior vertical faces parallel and a distance apart of approximately 1 in./ft of internal pipe diameter, but in no case less than 1 in. The upper bearing shall be a rigid wooden block, straight and true from end to end. The upper and lower bearings shall extend the full length of the test section.

For those sizes and classifications where the specified crushing load exceeds 30 000 lb/linear ft, the test length may be less than 1 ft long. In those cases, the test load shall be such as to produce an equivalent specified loading per linear foot.

5.2.4 *Machines for testing.* The machine used for the hydrostatic test shall be such that in no way is the hydrostatic test pressure counteracted.

The machines used for the crushing test shall be substantial and rigid throughout, so that the distribution of the load will not be appreciably affected by the deformation or yielding of any part of the machine.

Sec. 5.3—Retests (Physical) and Rejection

The failure of any specimen tested for crushing strength to support 75 per cent of the crushing load required in Table 2 shall be cause for rejection of the entire lot of that size and classification manufactured during the same shift as the test specimen. If any specimen tested for crushing strength supports more than 75 per cent but less than 100 per cent of the crushing load, two additional pipe sections of the same size and classification, manufactured during the same shift, shall be subjected to the crushing test. The additional lengths may be selected by the inspector, if inspection by the pur-

chaser has been specified. The failure of one of these additional specimens to meet the full crushing strength requirement shall be cause for rejection of the entire lot of that size and classification manufactured during the same shift as the test specimen.

If any pipe subjected to the hydrostatic tests specified in Sec. 5.2.2.2 fails to withstand the pressure specified in Table 4, two additional lengths of the same size and classification, manufactured during the same shift, shall be subjected to the same hydrostatic test. The additional lengths may be selected by the inspector, if inspection by the purchaser has been specified. The failure of one of these additional lengths to withstand the specified pressure shall be cause for rejection of the entire lot of that size and classification manufactured during the same shift as the test lengths.

Sec. 5.4—Test for Uncombined Calcium Hydroxide

The manufacturer shall perform this test as often as necessary to ensure compliance with the requirements for uncombined calcium hydroxide in Type II pipe.

5.4.1 *Reagents.*

Phenolphthalein indicator. Dissolve 1.0 g of phenolphthalein in 100.0 ml of absolute ethanol.*

Glycerol-ethanol solvent. Prepare a solution consisting of glycerol and anhydrous or absolute ethanol,* 1:2 by volume. To each litre of this solution, add 2.0 ml phenolphthalein indicator. Adjust the solvent to slightly basic with either dilute NaOH in absolute ethanol* or standard ammonium acetate, depending upon the original pH.

Strontium nitrate [$Sr(NO_3)_2$].

Standard ammonium acetate solution. Dissolve 16.0 g dry crystalline ammonium acetate in 1 l of absolute, or anhydrous, ethanol.*

Standardize the ammonium acetate solution by titrating against pure CaO that has been freshly prepared by calcining pure calcium carbonate or calcium oxalate to constant weight in a platinum crucible at 1650–1830F (900–1 000C).

When the calcined CaO has cooled in a desiccator, perform the following operations in rapid succession. Grind it in an agate mortar. Then weigh out 0.05–0.06 g CaO into a clean, dry 250-ml Erlenmeyer flask and add 60 ml of the glycerol–ethanol solvent and 2.0 g of anhydrous strontium nitrate to the flask. Place a TFE encapsulated magnetic stirring bar into the flask and attach a reflux condenser. Adjust the heating rate and stirring speed to obtain a vigorous boiling and complete agitation. Titrate the hot solution with standardized ammonium acetate solution every 5 min. The endpoint is reached when no further color appears in the solution after 10 min of boiling. Titration is to be carried out only on a hot solution. Good titration procedure is evidenced by a change to pink color upon cooling.

Step 1. Brush representative pieces of the pipe free of dust and drill with a clean, sharp 0.25-in. carbide-tipped drill inward from the outer surface at a rate of penetration of approximately 1 ipm until the drill point emerges from the inside wall. Catch the drillings on a clean sheet of glazed paper. Use a soft brush to collect all drillings. Screen through a 20-mesh screen immediately, and place in a weighing bottle.

Step 2. Place the bottle with top removed into a drying oven at 217F (105C) for 2 hr and then cool to room temperature in a desiccator.

Step 3. Weigh out 1 ± 0.010 g of the dried sample to the nearest 0.001 g and place in a clean, dry 250-ml Erlenmeyer flask, to which a TFE-encapsulated stirring bar, 60 ml of the glycerol-ethanol solvent, and 2.0 g $Sr(NO_3)_2$ have been added. Attach the flask to a water-cooled condenser (with a standard 24/40 glass joint) and place on a hot plate with a magnetic stirrer. Boil the solution gently for 30 min, stirring slowly. Then, remove the flask and filter the mixture, under vacuum, through a Buchner funnel. Bring the filtrate to a boil and titrate to a colorless endpoint with the standardized ammonium acetate reagent. Determine the endpoint by comparing with a similar mixture containing no phenolphthalein indicator.

5.4.2 *Calculations:*

where $$E = \frac{W\text{CaO} \times 1.32}{Va}$$

E = the weight in grams of $Ca(OH)_2$ per millilitre of standardized ammonium acetate solution

WCaO = the weight in grams of CaO in the standardized ammonium acetate solution

Va = the volume in millilitres of standardized ammonium acetate used in titration of the solution.

$$\text{Percentage uncombined } Ca(OH_2) = \frac{EV}{W} \times 100$$

where

V = the volume of standardized ammonium acetate solution required by the sample, in millilitres

W = the weight of the sample in grams.

Sec. 5.5—Test Records

The results of all tests shall be recorded and retained for one year, and shall be available to the purchaser at the place of manufacture.

Section 6—Marking and Delivery

Sec. 6.1—Marking

6.1.1 *Standard and random lengths.* Each standard or random length of pipe shall be clearly marked on the outside surface with the trade name, nominal inside diameter, classification, type, date, and shift of manufacture, and the word "Transmission."

6.1.2 *Short lengths.* Each short length of pipe shall be clearly marked on the outside surface with the nominal inside diameter, the classification, the letter *T* to indicate that it has been hydrostatically tested, and the word "Transmission."

6.1.3 *Couplings.* All component parts of each coupling shall be clearly marked for use with the pipe for which they are intended. Each coupling shall also be marked with the letter *T* to indicate that it has been hydrostatically tested.

6.1.4 *Special markings.* If factory inspection is made by the purchaser or his authorized inspector, each pipe and each coupling shall receive an additional special marking of no more than three letters, as specified by the purchaser.

Sec. 6.2—Preparation for Shipment

All pipe and couplings, unless otherwise specified, shall be prepared for standard commercial shipment.

* Specially denatured alcohol No. 30, 3a, or 2b, of the US Bureau of Internal Revenue, or alcohol consisting of 95 per cent specially denatured alcohol No. 3a plus 5 per cent isopropanol, may be substituted.