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CAP-232

File Ex2456
Assignment 66K1715

June 17, 1966

REPORT

on

PIPE AND COUPLINGS - ASBESTOS CEMENT

Cement-Asbestos Products Co.
Ragland, Alabama

CAPCO KIN 0000549

D E S C R I P T I O NPRODUCT COVERED:

Asbestos-cement pressure pipe and couplings in 4 to 12-in. sizes, inclusive, 150-psi pressure class. The pipe is 13 ft in length. Service connections in 3/4-in. size for use with pipe sizes 4 to 10 in., inclusive, 150-psi pressure class.

GENERAL CHARACTER:

The asbestos-cement pressure pipe and couplings covered by this Report are manufactured from a mixture of asbestos fibers, portland cement, and silica flour. A description of the method of fabrication is given in a latter section of this Report.

Construction features of the pipe couplings and ring gaskets are shown by Fig. 1.

The design of the pipe and couplings will permit slight angular deflection at the joints so that a pipe-line may be laid in curves of large radii.

USE:

The pipe and couplings covered by this Report are intended for use in underground water service where the working pressure does not exceed that for which it is rated and when installed in accordance with the manufacturer's installation instructions.

MARKING:

Pipe - Each length of pipe is marked as follows:

1. Manufacturer's trade name - "Cement-Asbestos Products Co."
2. Nominal inside diameter, pressure class.
3. Test pressure "T-350 PSI" for Class 100 and "T-525 PSI" for Class 150.

4. Date and shift of manufacturer.
5. Underwriters' Laboratories, Inc. label reading:

UNDERWRITERS' LABORATORIES, INC.



LISTED
NONMETALLIC PIPE FOR WATER MAINS

Couplings - Each coupling is stenciled with the following marking.

1. Manufacturer's trade name - "Cement-Asbestos Products Co."
2. Nominal inside diameter, pressure class.
3. Test pressure "T-350 PSI" for Class 100 and "T-525 PSI" for Class 150.

Rubber Sealing Rings - Each ring is marked with the following information molded into it.

1. Ring manufacturer's mark, "M."
2. Year of manufacture (may be indicated by a code letter).
3. The size and pressure class for which its use is intended.

TRANSPORTATION AND INSTALLATION OF PIPE:

TRANSPORTATION

Pipe is normally loaded on skids, secured by steel straps, and transported in flat-bodied trucks, or railroad cars.

CAPCO KIN 0000551

UNLOADING

Unloading is by hand or with the aid of ropes. Skids and hoisting equipment are employed for excessive drops and larger sizes.

DISTRIBUTION

After unloading, the pipe is distributed along the trench site, leaving the couplings and rubber rings in a central storage point until used, in such a manner as to protect the rubber from exposure to sun. The pipe and couplings may also be delivered assembled with one gasket in place.

TRENCHING AND LAYING

The trench is dug to allow proper clearances for working space at the sides of the pipe and for coupling clearance under the pipe.

ASSEMBLY OF "PERMAFLEX"

The parts forming the joint are the pipe ends, a coupling, and two rubber sealing rings. Before making the joint, the pipe ends, rubber rings, and interior of the couplings are thoroughly cleaned.

1. The rubber sealing rings are fitted inside the coupling in the gasket recesses. The outside surface of the pipe is lubricated with a hydrogenated vegetable-oil lubricant.
2. The coupling is then placed over the last pipe laid, and pulled on the pipe until stopped by a shoulder on the pipe. In those cases where the pipe is delivered with the coupling and one gasket in place, the other gasket is inserted and the plain end of the next pipe is assembled into the coupling.

3. The new pipe length to be laid is then brought up so that it is in alignment. The pipe is pulled into the coupling until the shoulder of the pipe comes in contact with the sealing ring. In the larger sizes, it may be necessary to aid the assembly of pipe and couplings by using a steel bar as a lever, pushed into the ground and acting against a wooden block inserted between the steel bar and the pipe or coupling. A jack and chain may also be used. In some instances the pipe can be pushed by hand.

4. After the joint is made, deviations in alignment can be adjusted and slight angular deflections may be made by lifting and moving the end of the last laid pipe.

5. Disassembly can be accomplished by lifting the end of the pipe or moving it from side to side and at the same time pulling the pipe from the coupling.

CAPCO KIN 0000553

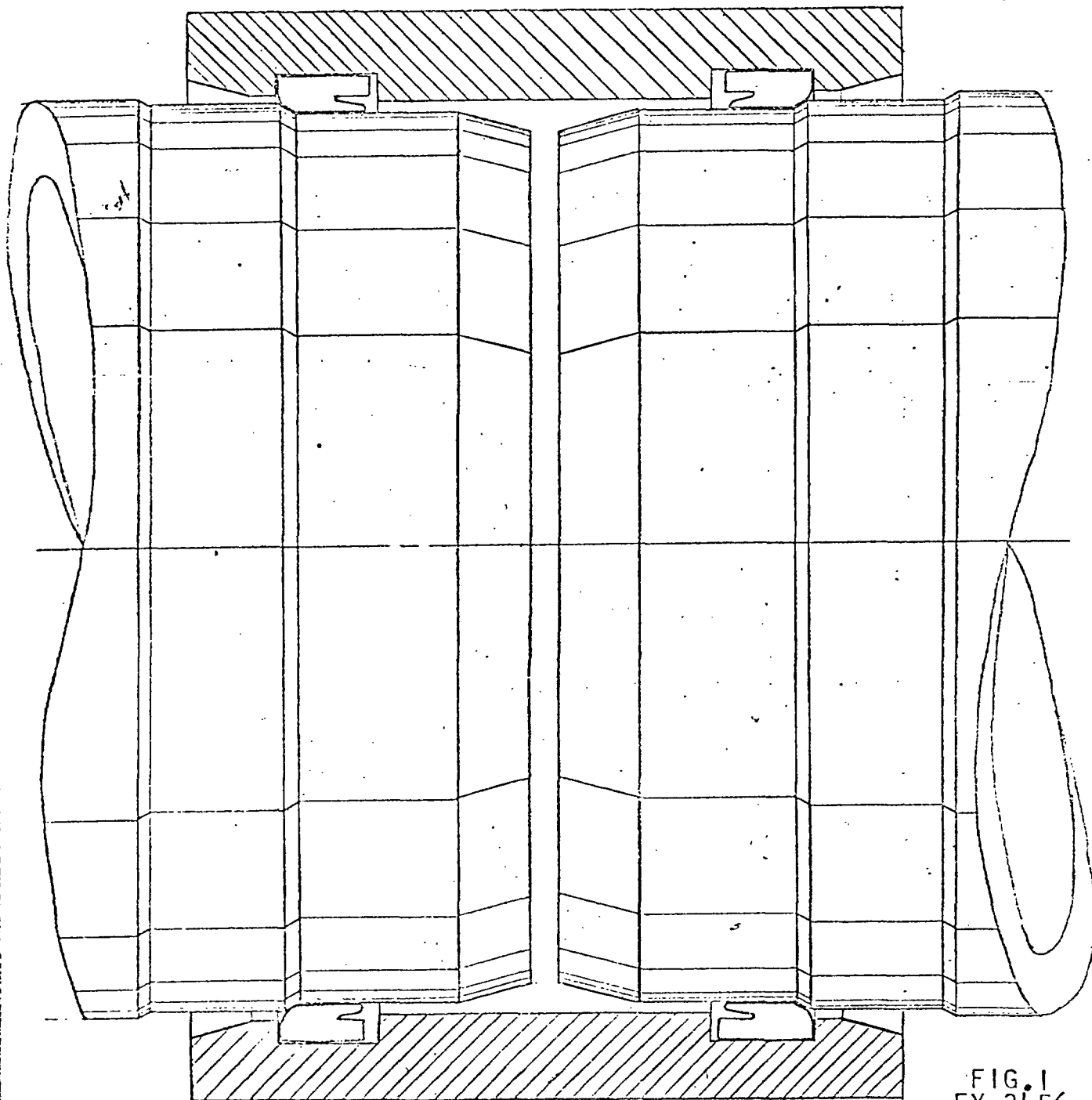


FIG. 1
EX 2456

CEMENT ASBESTOS PRODUCTS CO.
RAGLAND, ALABAMA

CAPCO KIN 0000554

DRAWN:

APPROVED:

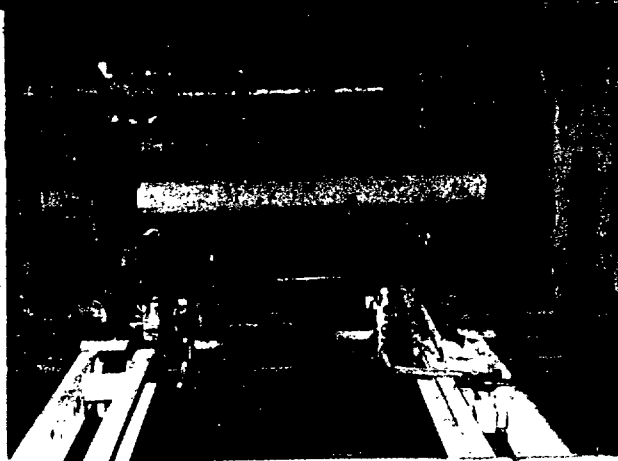
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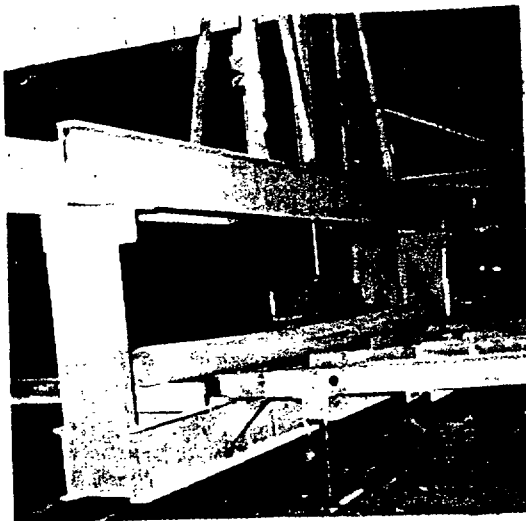
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EX 2456

FIG. 2



2A.
BURST TEST
SET-UP



2B. FLEXURE TEST



2C. CRUSHING TEST

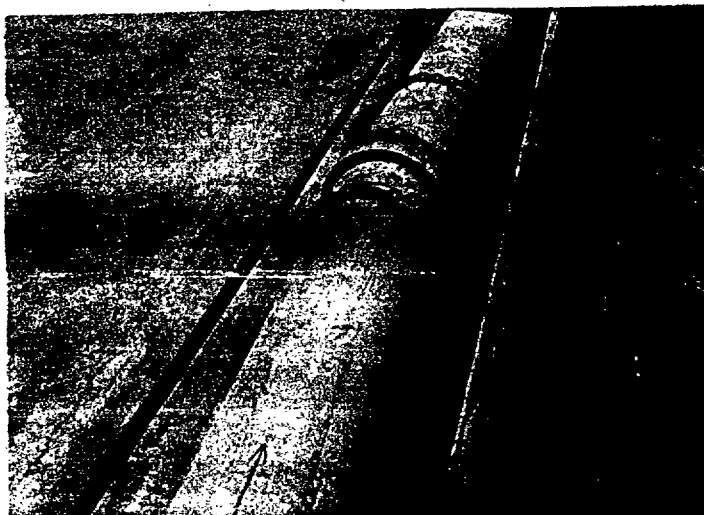
C66 - 834

CAPCO KIN 0000555

EX 2456

FIG. 3

RESTRAINED JOINT
TEST LINES



C66 - 8 3 5

CAPCO KIN 0000556

T E S T R E C O R D N O . 1SAMPLES:

Representative production samples of asbestos-cement pipe and couplings in sizes and types covered by this Report were used in the following tests, except as noted.

EXAMINATION OF PIPE AND COUPLINGS:

METHOD

The sample pipe, couplings, and rubber rings were examined to check the dimensions and design features against the manufacturer's drawings and manufacturing tolerances. The production methods and facilities at the manufacturer's plants were reviewed to develop information regarding the uniformity of production and the inspection program followed in production.

RESULTS

The dimensions of the pipe and couplings examined were found to be within the tolerances established by the manufacturer.

The manufacturing procedures followed and the manufacturer's inspection and test program are conducive to the production of uniform pipe and couplings, and the elimination of products not measuring up to the shop standard.

BURSTING TESTS:

METHOD

Individual lengths of pipe were installed in the plant hydrostatic test machines. See Fig. 2A. The assembly was filled with water, vented of air, and subjected to gradually increasing pressures until a value of four times the rated pressure was obtained. This was held for 5 sec, whereupon the pressure was increased until the pipe burst or until the maximum of the apparatus was attained.

RESULTS

The results of these tests are recorded in the following table.

The pressures at which the pipe burst were, in all cases, in excess of requirements.

<u>Pipe Size,</u> <u>In.</u>	<u>Pressure</u> <u>Class</u>	<u>Bursting Pressure,</u> <u>PSI</u>
4	150	980 †
4	150	1000 †
6	150	905
6	150	950
8	150	740
8	150	730
10	150	810
10	150	810
12	150	670
12	150	700

† - These samples did not burst maximum of test apparatus.

Hydrostatic test samples are required to sustain a pressure of at least four times the rated pressure or 5 sec.

FLEXURE TEST:

METHOD

Two full-length samples of the 4, 6, and 8-in. size pipe were placed on "V" block load supports in a tension and compression testing machine and loaded at the third points. See Fig. 2B. Each sample was loaded at a uniform rate until failure occurred. Note was made of the maximum load applied and the character of the failure.

RESULTS

The following table presents the results of these tests in comparison with the minimum flexure load requirements.

Pipe Size, In.	Pipe Length, Ft	Test Span, Ft	Load Span, Ft	Pressure Class	Required Minimum Load, Lb	Load at Failure, Lb
4	13	12	4	150	1000	1330
4	13	12	4	150	1000	1410
6	13	12	4	150	2800	3110
6	13	12	4	150	2800	2990
8	13	12	4	150	5700	6140
8	13	12	4	150	5700	6060

RING CRUSHING TESTS:

SAMPLES

Unmachined samples, 12 in. long, of each size pipe were selected from production stock for these tests.

METHOD

Each ring was placed in a horizontal position between wooden-block bearings in a tension and compression testing machine and loaded to failure. See Fig. 20. Observations were made to note the maximum load.

RESULTS

The following table presents the results of these tests in comparison with the required minimum crushing load.

Pipe Size, In.	Pressure Class	Required Minimum Load, Lb	Actual Load, Lb
4	150	5400	9720
4	150	5400	9130
6	150	5400	7890
6	150	5400	7300

(Table Cont'd)

<u>Pipe Size, In.</u>	<u>Pressure Class</u>	<u>Required Minimum Load, Lb</u>	<u>Actual Load, Lb</u>
8	150	5500	9130
8	150	5500	9300
10	150	7000	7030
10	150	7000	7090
12	150	7600	8380
12	150	7600	9350

HYDROSTATIC TESTS OF COUPLINGS:

SAMPLES

Samples of each size of coupling were used in these tests.

METHOD

Samples of each size of coupling were installed in the plant coupling tester and subjected to a hydrostatic proof test of four times the rated pressure for 5 sec, whereupon the pressure was increased to burst the coupling.

RESULTS

The couplings burst at the pressure indicated in the following table.

<u>Pipe Size, In.</u>	<u>Pressure Class</u>	<u>Bursting Pressure, PSI</u>
4	150	900
4	150	930
6	150	900
6	150	900
8	150	790
8	150	870
10	150	820
10	150	770
12	150	730
12	150	630

SERVICE CONNECTION (CORPORATION STOP) TESTS:

At least two full-length samples each of pipe sizes 4 to 10 in., inclusive, in the 150-psi pressure class, were used. Three-quarter-inch service connections were also used.

METHOD

Each pipe sample was cut in two, one-half placed aside as a control sample and the other half was drilled and tapped for attachment of a 3/4-in. service connection. The service connection was attached following the manufacturer's installation instructions. Each sample including the control samples, was subjected to a pressure of four times the rated pressure for 5 sec. The pressure was then increased until the pipe burst.

RESULTS

The results of this test are recorded in the following table:

Pipe Size, In.	Sample	Maximum Pressure, PSI	Remarks
4	A, control	900	Pipe burst
4	A, with connection	620	Pipe cracked across stop
4	B, control	950	Maximum of apparatus
4	B, with connection	890	Pipe cracked across stop
4	C, control	970	Maximum of apparatus
4	C, with connection	770	Pipe cracked across stop
6	A, control	1000	Maximum of apparatus
6	A, with connection	630	Pipe cracked across stop
6	B, control	950	Maximum of apparatus
6	B, with connection	770	Pipe cracked across stop
6	C, control	950	Maximum of apparatus
6	C, with connection	750	Pipe cracked across stop

(Table Cont'd)

Pipe Size, In.	Sample	Maximum Pressure, PSI	Remarks
8	A, control	750	Pipe burst at end connection
8	A, with connection	700	Pipe cracked across stop
8	B, control	700	Pipe cracked at end
8	B, with connection	655	Pipe cracked across stop
10	A, control	730	Pipe burst
10	A, with connection	675	Pipe cracked across stop
10	B, control	620	Pipe burst
10	B, with connection	600	Burst at 6 sec
10	C, control	610	Pipe burst
10	C, with connection	610	Pipe cracked across stop

ASSEMBLY AND DISASSEMBLY TESTS:

SAMPLES

Samples of the 8-in. Class 150 and 12-in. Class 150 pipe and couplings specially machined to the minimum coupling and maximum pipe dimensions permitted by the manufacturer's tolerances were used in these tests.

METHOD

The spigot ends of the pipe were given a coating of lubricant and the couplings were provided with the sealing ring and spacer gaskets. After the pipe and couplings were aligned, the assembly was made, following the manufacturer's installation instructions.

RESULTS

The assembly of two lengths of pipe and one coupling was accomplished with reasonable ease in all sizes. Disassembly of the pipe was also accomplished without undue difficulty. Examination of the disassembled samples showed no damage to the pipe, coupling, or gaskets.

RESTRAINED JOINT TESTS:

SAMPLES

Full-length samples of the 8-in. Class 150, and 12-in. Class 150 pipe with couplings of like sizes and classes were used in these tests. Some of the pipes were machined to the minimum dimensions permitted by the manufacturer's tolerances, while some of the couplings were machined to the maximum dimensions, and these were used to form the joints.

METHOD

Test lines of the pipe and couplings, together with rubber-ring gaskets consisting of four joints and five lengths of pipe were assembled in accordance with the manufacturer's installation instructions. The joints were deflected as shown in the test record. The pipeline was filled with water, vented of air, and subjected to increasing pressures in 50-psi increments up to twice the maximum rated pressure. Each increment of pressure was maintained until the Laboratories engineer was satisfied as to the equilibrium of the joint. Each test line was cycled twice in this manner from 0 to 300 psi to 0. Following this, the pressure was increased until failure occurred. The test assembly is shown by Figs. 3A and 3B.

RESULTS

In the tests with the assembled line of pipe and couplings, no leakage occurred at a pressure of twice the rated pressure of the test line. Specific test data are shown in the following table.

Pipe Size, In.	Pres- sure Class	Maximum Joint Deflection, Deg	Maximum Pressure, PSI	Remarks
8	150	5.42	550	End cap leaked at maximum pressure
12	150	5.33	390	End pipe began moving and fourth coupling broke

PHYSICAL TESTS OF SEALING RINGS:

METHOD

Representative samples of the gaskets were subjected to an accelerated oxygen pressure aging test for 96 hr in an oxygen bomb having a temperature of 70 C with oxygen at a pressure of 300 psi. The tensile strength and elongation of the samples were determined before and after the aging period. The hardness was measured before aging with a Shore-Type A durometer hardness gauge which has a scale graduated from 0 to 100.

Two-inch gauge marks were stretched to 6 in., held for 2 min, then released and measured 2 min later.

RESULTS

	<u>Before</u> <u>Aging</u>	<u>After</u> <u>Aging</u>	<u>Per Cent</u> <u>of Original</u>
Average Tensile Strength, PSI	2594	2031	78
Average Elongation, Per Cent	455	355	78
Hardness			
Sample recovered to 2.10 in.	55	-	-

FACTORY METHODS:

The factory of Cement-Asbestos Products Co. was visited by a representative of Underwriters' Laboratories, Inc. for the purpose of obtaining general information regarding the manufacture of asbestos-cement pipe and couplings covered by this Report and detailed information relative to the features of factory equipment and inspection that have a bearing on the quality of materials employed, character of the workmanship, the uniformity of the finished product, and practicability of handling and shipping the pipe and couplings. The following information covers briefly the manufacture of asbestos-cement pressure pipe and couplings.

Manufacturing Process - These asbestos-cement pipe and couplings are manufactured by the Mazza Process from an intimate mixture of asbestos fiber, portland cement, and silica flour.

A mixture of asbestos fiber, cement, silica flour, and water is conveyed to a vat provided with a hollow rotating cylinder, sheathed with a fine-metal gauze. A thin uniform layer of the mixture adheres to the sheath, and is transferred to an endless belt of felt equipped with two suction chambers to draw off excess water. The film of asbestos cement, approximately 0.005 in. thick then passes over a polished-steel mandrel onto which the required thickness is built up. While winding the pipe, a pressure is exerted on the mandrel to insure a homogenous compact product. Coupling stock is made in the same manner as the pipe, but is built up to a greater thickness for a given size.

After forming to the required size, the mandrel is immediately removed and the pipe is passed through a precured oven of steam for approximately 1-1/2 hr. The mandrel is then removed and the pipe is stored for at least 8 hr in a moist atmosphere. The pipe is then given a final cure by autoclave with steam at 115 psi for 16 hr.

After curing, the pipe is cut to the proper length and the ends machined to accommodate the couplings. Coupling stock is cut and machined to proper dimensions before autoclaving.

Each finished pipe and coupling is subjected to a hydrostatic test of three and one-half times rated pressure and each pipe in the 4, 6, and 8-in. size is given a flexural test at the proof test loads specified in the Laboratories' requirements. Automatic recorders on the pipe and coupling hydrostatic testers and on the pipe flexural tester record each test for review by quality-control personnel.

MRS

CAPCO KIN 0000565

C O N C L U S I O N S

The following conclusions apply to the pipe and couplings covered by this Report when used in public and private waterwork systems and connections to such systems, for the rated working pressures of the pipe and couplings (150 psi).

PRACTICABILITY:

The pipe and couplings can be properly handled and installed under conditions ordinarily met in service by those reasonably familiar with the installation of asbestos-cement pipe.

STRENGTH:

The pipe, couplings, and service connections covered by this Report, when installed according to the methods advocated, are capable of withstanding the working pressures for which they are designed and the stresses to which they are likely to be subjected in service.

These pipe and couplings meet the strength requirements, as evidenced by the results of the bursting test, ring crushing tests, restrained joint test, and flexural tests. The service connection features meet the strength requirements as evidenced by the results of the service connection tests.

UNIFORMITY:

The facilities and methods employed in the manufacture of the pipe and couplings covered by this Report are such as to insure an accurate and uniform product.

Examination of the pipe and couplings show that a high degree of uniformity is maintained in the manufacture of this product. The manufacturer maintains a rigid inspection program to insure uniformity of the product within established manufacturing procedures.

CONFORMITY:

The pipe and couplings covered by this Report are in conformance with the requirements of the Laboratories' Outline of Proposed Investigation for Asbestos-Cement Water Pipe and Couplings (Subject 107).

FOLLOW-UP SERVICE:

The asbestos-cement pipe and couplings covered by this Report will be placed under the Label Service.

Report by:

Reviewed by:

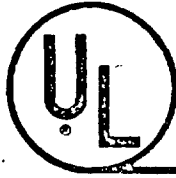
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MRS:pe

CAPCO KIN 0000567

CAPCO KIN 0000568



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an independent, not-for-profit organization testing for public safety

File Ex-156
Assignment CONK328A

December 2, 1968

REPORT

on

ASBESTOS-CEMENT PIPE AND COUPLINGS

Cement-Asbestos Products Co.
Ragland, Alabama

CAPCO KIN 0000569

D E S C R I P T I O NPRODUCT COVERED:

Asbestos-cement pressure pipe and couplings in 4-14 in. sizes, pressure Class 200 and 14 and 16 in. sizes, pressure Class 150. The pipe is 13 ft in length.

GENERAL CHARACTER:

The asbestos-cement pressure pipe and couplings covered by this Report are manufactured from a mixture of asbestos fibers, portland cement, and silica flour.

The design of the pipe and couplings will permit slight angular deflection at the joints so that a pipe line may be laid in curves of large radii.

USE:

The pipe and couplings covered by this Report are intended for use in underground water service where the working pressure does not exceed that for which it is rated and when installed in accordance with the manufacturer's installation instructions.

MARKING:

Pipe - Each length of pipe is marked as follows:

1. Manufacturer's trade name - "Cement-Asbestos Products Co."
2. Nominal inside diameter, pressure class.
3. Test pressure "T-700 PSI" for Class 200 and "T-525 PSI" for Class 150.
4. Date and shift of manufacture.
5. Underwriters' Laboratories, Inc.. label reading:

UNDERWRITERS' LABORATORIES, INC.



LISTED
NONMETALLIC PIPE FOR WATER MAINS

Couplings - Each coupling is stenciled with the following marking.

1. Manufacturer's trade name - "Cement-Asbestos Products Co."
2. Nominal inside diameter, pressure class.
3. Test pressure "T-700 PSI" for Class 200 and "T-525 PSI" for Class 150.

T E S T R E C O R D N O. 1SAMPLES:

Representative production samples of asbestos-cement pipe and couplings in sizes and types covered by this Report were used in the following tests, except where noted.

EXAMINATION OF PIPE AND COUPLINGS:

METHOD

The sample pipe, couplings, and rubber rings were examined to check the dimensions and design features against the manufacturer's drawings and manufacturing tolerances. The production methods and facilities at the manufacturer's plants were reviewed to develop information regarding the uniformity of production and the inspection program followed in production.

RESULTS

The dimensions of the pipe and couplings examined were found to be within the tolerances established by the manufacturer.

The manufacturing procedures followed and the manufacturer's inspection and test program are conducive to the production of uniform pipe and couplings, and the elimination of products not measuring up to the shop standard.

HYDROSTATIC TESTS OF PIPE AND COUPLINGS:

METHOD

Individual lengths of pipe and coupling were installed in a hydrostatic test machine. The assembly was filled with water, vented of air, and subjected to a gradually increasing pressure up to a value of four times the rated pressure (600 psi for Class 150 and/or 800 psi for Class 200). This pressure was maintained for 5 sec, whereupon it was increased until either failure occurred or the capacity of the test apparatus was reached.

RESULTS

The results of these tests are recorded in the following tabulations:

HYDROSTATIC TEST RESULTS

Size, In.	Pressure Class	Pressure At Burst Or Maximum Pressure PSI		Required Pressure PSI	
		Pipe	Coupling	Pipe	Coupling
4	200	930	1000 †	800	800
4	200	1000	1000 †	800	800
6	200	1000 †	1000 †	824	800
6	200	1000 †	1000 †	840	800
8	200	1000	960	800	839
8	200	910	860	800	784
10	200	940	960 †	838	800
10	200	875	1060 †	874	800
12	200	875	960 †	833	859
12	200	840 †	1010 †	773	801
14	150	725	600	635	600
14	150	650	600	629	600
16	150	640	960 †	600	600
16	150	665	960 †	600	647

† - No burst limit of apparatus.

FLEXURE TESTS:

METHOD

Two full lengths of the 4, 6 and 8 in. sizes, were placed on supports 12 ft apart. The load was applied by the manufacturer's production testing machine at a uniform rate at the third points, 4 ft apart and located 4 ft from the lower supports. Each sample was loaded in this manner until failure occurred and note was made of the maximum load applied and the character of the failure.

RESULTS

The following table presents the results of these tests in comparison with the minimum flexure-load requirement for a 12 ft span.

FLEXURE TEST RESULTS

<u>Pipe Size</u> <u>In.</u>	<u>Pressure</u> <u>Class</u>	<u>Minimum Required</u> <u>Load, Lb</u>	<u>Maximum Load</u> <u>Obtained Lb</u>
4	200	1400	1410
4	200	1400	1410
6	200	3700	3700
6	200	3700	3700
8	200	7600	7640
8	200	7600	7600

RING CRUSHING TESTS:

SAMPLES

The 12 in. samples were cut from each size pipe used in these tests.

METHOD

Each ring was placed on two lower bearings consisting of two straight wooden strips having their interior top edges rounded to a radius of approximately 1/2 in. Load was applied by an upper bearing of a straight wood block. The load was applied until failure occurred and note was made of the maximum load at failure.

RESULTS

The following table presents the results of these tests in comparison with the minimum required crushing load.

<u>Pipe Size</u> <u>In.</u>	<u>Pressure</u> <u>Class</u>	<u>Minimum Required</u> <u>Load, Lb</u>	<u>Maximum Load</u> <u>Obtained Lb</u>
4	200	8700	9220
4	200	8700	10800
6	200	9000	12950
6	200	9000	12950
8	200	9300	11590
8	200	9300	12750
10	200	11000	12850
10	200	11000	13350
12	200	11800	15950
12	200	11800	16150

(Table Cont'd)

<u>Pipe Size</u> <u>In.</u>	<u>Pressure</u> <u>Class</u>	<u>Minimum Required</u> <u>Load, Lb</u>	<u>Maximum Load</u> <u>Obtained Lb</u>
14	200	13500	15900
14	200	13500	15700
16	200	15400	18860
16	200	15400	18700
14	150	8600	9430
14	150	8600	11400
16	150	9200	11590
16	150	9200	11690

ASSEMBLY AND DISASSEMBLY TESTS:

SAMPLES

Samples of the 16 in. Class 200 pipe and couplings specially machined to the minimum coupling and maximum pipe dimensions permitted by the manufacturer's tolerances were used in these tests.

METHOD

The spigot ends of the pipe were given a coating of lubricant and the couplings were provided with the sealing ring and spacer gaskets. After the pipe and couplings were aligned, the assembly was made, following the manufacturer's installation instructions.

RESULTS

The assembly of two lengths of pipe and one coupling was accomplished with reasonable ease in all sizes. Disassembly of the pipe was also accomplished without undue difficulty. Examination of the disassembled samples showed no damage to the pipe, coupling, or gaskets.

RESTRAINED JOINT TESTS:

SAMPLES

Full length samples of the 12 in. Class 200, and 16 in. Class 150, and 16 in. Class 200 pipe with couplings of like sizes and classes were used in these tests. Some of the pipes were machined to the minimum dimensions permitted by the manufacturer's tolerances, while some of the couplings were machined to the maximum dimensions, and these were used to form the joints.

METHOD

The pipe and couplings, together with rubber ring gaskets were assembled in accordance with the manufacturer's installation instructions. Some of the joints were deflected as shown in the test record. The pipeline was filled with water, vented of air, and subjected to increasing pressure. Each increment of pressure was maintained until the Laboratories engineer was satisfied as to the equilibrium of the joint. Each test line was cycled three times in this manner from 0 to twice the rated pressure to 0. Following this, the pressure was increased until failure occurred. Four separate tests were conducted on the 16 in. Class 200 pipe and couplings.

RESULTS

In the tests with the assembled line of pipe and couplings, no leakage occurred at a pressure of twice the rated pressure of the test line. Specific test data are shown in the following table.

Pipe Size In.	Pressure Class	Maximum Joint Deflection Deg	Maximum Pressure, PSI	Remarks
12	200	5	600	No failure - no leaks
16	150	0	450	No failure - no leaks
16	200	4	450	Chain holding pipe broke
16	200	0	600	No failure - no leaks (three separate tests)

WAW

CAPCO KIN 0000576

C O N C L U S I O N

The product covered by this Report has been found to comply with the requirements covering the class and is judged to be acceptable for listing under the Label Service of Underwriters' Laboratories, Inc.

Report by:

W. A. Webb

W. A. WEBB
Project Engineer, Fire
Protection Department

WAW:JA

Reviewed by:

Miles R. Suchomel

MILES R. SUCHOMEL
Senior Project Engineer
Fire Protection Department

CAPCO KIN 0000548