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EVALUATION OF ACCESSORY MATERIALS FOR DESALINATION PLANTS (Final Report)

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16. ABSTRACT

Test results on accessory coatings, sealants, and polymeric products are presented. This was one part of a five-part investigation to evaluate concrete and accessory materials under a variety of temperature-pressure-salinity conditions encountered in a sea water distillation plant. Test conditions included exposure to distilled water, brine, and steam at temperatures ranging from 100° to 290° F; steam and distilled water exposures were conducted in autoclaves. Many materials perform satisfactorily at the lower temperatures, but the number decreases as the temperature increases to 290° F. Ethylene-propylene diene monomer was the least affected rubber at any exposure conditions. Phenolic coatings were least affected of the coating groups at any exposure condition. Exceptions to this point out the importance of formulation within families of materials. Previous reports on this study are General Reports No. 37, 37A (OSW R&D Report No. 390), 37B1, 37B2; Report REC-OCE-69-8; and Report REC-ERC-71-26.

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Applied Sciences Branch
Division of General Research
Engineering and Research Center
Denver, Colorado

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INTRODUCTION

The economic feasibility of large-scale desalting plants is in part dependent upon the development of improved designs and the use of construction materials which can lead to substantial cost reductions. The extensive use of concrete and necessary accessory materials in this type of construction has been proposed as a cost-saving item. Very little background data are available concerning the performance of the accessory materials with concrete under the environmental conditions that will be encountered in desalination plants.

The accessory materials include: protective coatings and linings, sealants, gaskets, and other miscellaneous construction products. These materials are generally organic in nature.

To obtain the necessary performance data, the U.S. Bureau of Reclamation (USBR) conducted research studies on concrete and the accessory materials under environmental conditions similar to those that will exist in an evaporator-type desalting plant. The environmental test conditions included distilled water, brine, and steam at 100° F (38.7° C), 203° F (95° C), 225° F (107.2° C), 250° F (121.1° C), and 290° F (143.3° C). These studies were performed under contract to the Office of Saline Water (OSW).

This report summarizes the studies pertaining to the accessory materials, and it covers the work performed from May 1965 to June 1973, under the following OSW contracts:

1. "Selection and Evaluation of Accessory Coatings, Sealants, and Polymeric Products," Part III, Agreement No. 14-01-0001-544, Work Order No. 1, dated May 7, 1965. This work hereafter in the report is referred to as WO1.

2. "Environmental Testing of Organic Materials," Agreement No. 14-30-2532, Work Order No. 5, dated March 26, 1970. This work hereafter in the report is referred to as WO5.

Based on the results from WO1, the most promising materials were selected for additional testing under WO5. This work consisted of:

a. Evaluating the performance of the coatings applied at various thicknesses in order to determine the effect of thickness on corrosion protection.

b. Evaluating the performance of sealers, rubbers, and plastics under stresses simulating operating stresses in environmental exposures.

Earlier reports have been published regarding the work under WO1. These include:

1. General Report No. 37, "Behavior of Concrete and Coating Materials in Hot Saline Water," October 1966.

2. General Report No. 37A, "Evaluation of Concrete and Related Materials for Desalination Plants," June 1968.

3. General Report No. 37B, "Evaluation of Concrete and Related Materials for Desalination Plants," August 1968.

4. Laboratory Report No. REC-OCE-69-8, "Evaluation of Concrete and Related Materials for Desalination Plants," December 1969.

5. Laboratory Report No. REC-ERC-71-26, "Evaluation of Concrete and Related Materials for Desalination Plants," May 1971.

Studies relative to the performance of concrete are summarized in USBR Report No. REC-ERC-71-15, "Evaluation of Concrete for Desalination Plants," March 1971.

CONCLUSIONS

General

1. For most materials subjected to the three exposure environments of distilled water, steam, and brine, the steam was most severe and the brine least severe.

2. At 100° F (37.8° C) temperatures in all of the three exposure conditions, many coatings, rubbers, and plastics performed satisfactorily, and a wide selection of materials is available.

Coatings

1. In any exposure condition a greater number of coatings were found to perform satisfactorily on steel substrates than on concrete substrates.

2. On steel, the coating which performed the most satisfactorily in all three test environments at all test temperatures, 100° F (37.8° C) through 290° F (143.3° C), was a baked-on phenolic coating, C-32. As a group, the phenolics and the epoxy phenolics generally demonstrated good potential for satisfactory high-temperature performance.

3. On concrete, no coating tested under these conditions was found to be satisfactory for all

environments and all temperatures. However one phenolic coating performed satisfactorily at 290° F (143.3° C) and one neoprene performed satisfactorily at 250° F (121.1° C) in brine only. An epoxy coating performed satisfactorily at 225° F (107.2° C) in brine, steam, and water.

4. Increased coating thickness over the recommended thickness generally did not improve performance and in some cases contributed to early cracking.

Rubber Materials

1. As a group Ethylene Propylene Diene Monomer (EPDM) rubber performed more satisfactorily than other rubber materials in all test environments, and offers best potential for protection of concrete structures at high temperatures in any environment.

2. One butyl rubber performed satisfactorily at 290° F (143.3° C) in brine and water, and at 250° F (121.1° C) in steam.

3. Rubber specimens tested at 20 percent strain in steam and water showed only slightly greater change in properties compared to unstrained specimens.

Plastics

1. An unreinforced polyphenylene oxide performed satisfactorily at 290° F (143.3° C) in all environments and may be suitable for protection of concrete substrates as well as manufacture of accessory components.

2. A polysulfone performed satisfactorily in the unstrained condition at temperatures of 250° F (121.1° C), but was sensitive to strain at temperatures over 100° F (37.8° C) in steam and water environments.

Joint Sealants

1. An EPDM sealant showed good potential for satisfactory performance in all test environments at all temperatures if suitable primers can be obtained to avoid possible bond failures.

RECOMMENDATIONS

The following recommendations are made for a multistage evaporation type sea water desalting plant which would use conventional portland cement concrete as the principal construction material. It is assumed that the maximum operating temperature would not exceed 290° F (143° C) and that a maintenance-free period of at least 4 years would be anticipated.

1. Protect all concrete surfaces in contact with flowing mineral-free distilled water as follows:

   a. In areas where water temperatures are 203° F (95° C) or less, a phenolic coating (C-9) or a neoprene asphalt coating (C-20) should be selected.

   b. In areas where water temperatures exceed 203° F (95° C) 1/16-inch thick high temperature butyl sheeting (R-7) or 1/16-inch thick EPDM sheeting (R-11, 17, 20, 30) should be selected, provided that the sheeting is fully adhered to the substrate and mechanically anchored at all edges and appropriate intermediate intervals.

2. Protect all concrete surfaces exposed to steam as follows:

   a. In areas where steam temperatures are 203° F (95° C) or less, sufficient thickness of sacrificial concrete* or an epoxy coating (C-47) should be selected.

   b. In areas where steam temperatures exceed 203° F (95° C), 1/16-inch thick EPDM sheeting (R-11, 17, 30), fully adhered and mechanically anchored should be considered although sufficient thickness of sacrificial concrete* may be used up to 250° F (121.1° C).

3. Concrete surfaces exposed to brine should be protected as follows:

   a. In areas where brine temperatures are between 203° F (95° C) and 250° F (121.1° C), sufficient thickness of sacrificial concrete* or neoprene coating (C-5) or phenolic coating (C-61) should be selected.

   b. In areas where brine temperatures exceed 250° F (121.1° C) phenolic coating (C-61) or 1/16-inch thick butyl sheeting (R-6, 7, 21, 29) or 1/16-inch thick EPDM sheeting (R-11, 17, 22, 30) should be selected provided that the sheeting is fully adhered to the substrate and mechanically anchored at all edges and appropriate intermediate intervals.

4. For maximum service life all mild steel surfaces should be protected with a baked-on phenolic coating (C-32) where size and other conditions

*See U.S. Bureau of Reclamation Report No. REC-ERC-71-15, "Evaluation of Concrete for Desalination Plants" March 1971.

permit. Otherwise, phenolic coating (C-60) or epoxy phenolic coating (C-63) should be selected for water and steam service at 203° F (95° C) and above. Several coatings are listed in Table 1 that would perform satisfactorily in low temperature steam and water; and all brine temperatures on steel substrates.

5. An EPDM joint sealant (J-7) should be selected for all environments where expansion does not exceed 5 percent. Manufacturers recommended primer should be used until further study can be made.

6. EPDM rubber (R-11, 17, 30) should be selected for manufacturing of water stops for expansion joints and for gasket material for all exposure conditions.

7. For gravity flow water conveyance the following plastics may be selected for pipe manufacture:

a. 290° F (143.3° C) maximum—polyphenylene oxide.

b. 250° F (121.1° C) maximum—polysulfone.

c. 100° F (37.8° C) maximum—polyvinyl chloride.

8. Further research and development is needed in the following areas:

a. Determine suitable prime coat for EPDM sealants and establish a wider selection of satisfactory sealants.

b. Determine suitable plastics for satisfactory operation under stress conditions at high temperatures.

c. Determine protective coatings for concrete that would perform satisfactorily under a wide variety of operating conditions. Coatings tests should be investigated where one side of the concrete is exposed to the atmosphere.

TEST PROGRAM

Selection of Materials

Sixty-eight samples of coating materials were originally considered for testing in this program. Thirteen of these samples were eliminated for various reasons as follows: In some cases the manufacturer withdrew from participation. In other instances review of the manufacturer's literature or preliminary examination of the coating indicated that the material was not satisfactory for the purpose of this study.

The remaining 55 coatings were entered into as many of the 15 exposure environments described below as possible. A few materials were known to be unsuitable at high temperatures and were exposed only to lower temperatures. Where quantities of the coating were limited, higher temperature exposures were generally selected. Coatings that were received after operation of lower temperature exposure facilities had been discontinued were exposed to higher temperatures only.

Various manufacturers of rubbers and plastics were contacted to obtain comments on materials that might be applicable for use in desalting plants. Selection of the materials was based on manufacturers' recommendations, and preliminary tests.

A list of all materials tested is shown in Tables 1, 1A, 2, 3, and 4.

Test Environments

The accessory materials were subjected to brine, steam, and distilled water exposures; conditions that will exist in an evaporator-type desalting plant.

Brine exposure.—For testing the accessory materials in brine, five independent synthetic sea water test systems were constructed in the USBR Laboratory as shown in Photographs 1 and 2. The test systems were operated under the conditions listed in Table 5. These systems were constructed in a series of loops so that the available laboratory space was used more efficiently. Build into each of the five test loops was a smaller bypass loop, Photograph 3, used for testing the coatings and sealants. These smaller loops were designed for operating in conjunction with, or independently of, the main test loops used to test concrete speciments. The rubber and plastic materials were also tested in the main test loops.

The composition of the synthetic sea water used in the brine exposure tests at 290° F (143.3° C), 250° F (121.1° C), 225° F (107.2° C), and 203° F (95.0° C) is given in Table 6. This composition corresponds to the requirements of ASTM D 1141, Formula A, for "Substitute Ocean Water." The synthetic brine was given an acid pretreatment before use to reduce the quantity of carbonates. Because of the low solubility of the calcium salts, it was impossible to dissolve enough sea salts to obtain a concentration of 175,000 ppm specified for the 100° F (37.8° C) tests. To

overcome the solubility problem, the brine for the 100° F (37.8° C) test was modified to duplicate a softened water by substituting sodium salts for a large percentage of calcium and magnesium salts. The composition of the softened brine solution is given in Table 7.

Additional information on the construction and operation of the synthetic sea water test systems can be found in USBR Report No. REC-ERC-71-15, "Evaluation of Concrete for Desalination Plants," March 1971.

Steam and distilled water exposures.—A local manufacturer fabricated five autoclave test chambers as shown in Photographs 4 and 5. This equipment was used to test the materials under the steam and distilled water exposure conditions as listed in Table 8. The samples were placed in the test chambers as shown in Photograph 5, and the chambers were filled to half their depth with demineralized water to simulate the distilled water condition in the lower half of the chamber. The steam environment was obtained in the upper half of the chamber.

TEST SPECIMENS

Coatings

For the coatings tests, both portland cement mortar specimens and mild steel specimens were coated. The mild steel panels were 6- by 6- by 1/8-inch (15.2- by 15.2- by 0.3-cm), A1S1 M 1020 (SAE-1020) steel. Before coating, the mild steel panels were solvent washed with xylene (Federal Specification TT-X-916b) and sandblast cleaned to base metal.

The mortar specimens were 6- by 6- by 1-inch (15.2 by 15.2- by 2.5-cm) blocks and were composed of the following mix:

1 part by weight cement (laboratory blend, Type II)
0.38 part water by weight
2 parts by weight graded sand

The gradation of the sand was:

Sieve size	Percent by weight
No. 8	17
No. 16	17
No. 30	23
No. 50	23
No. 100	14
Pan	6

The blocks were cured for 28 days at 73° F (22.7° C), 100 percent relative humidity, and then air dried for a minimum of 7 days. Before applying the coatings, the following steps were taken to prepare the blocks:

1. Surfaces sandblasted and then "sack-rubbed" with a 2:1 sand-cement grout. The surface grout was cured for 3 days at 73° F (22.7° C), 100 percent relative humidity. After the curing period, excessive surface protrusions were ground off by rubbing the grouted surfaces together. The blocks were then rinsed clean and air dried for 14 days minimum.

2. Removal of gases and free water in mortar blocks by degassing. Preliminary tests indicated that with an increase in temperature the contained gases and water expanded and in escaping from the blocks caused damage to the coatings. To prevent this damage the mortar blocks were heated in a 360° F (182.2° C) oven for at least 12 hours and then cooled and stored in a desiccator until ready for coating.

The coatings were applied either in the laboratory according to the manufacturers' recommendations or test specimens were provided to the manufacturer for application. In the latter case, the manufacturer performed the degassing step.

Rubber and plastic materials.—The samples were generally standard manufacturers' test slabs 6 inches (15.2 cm) square by 0.06 inch (0.15 cm) to 0.10 inch (0.25 cm) thick. One plastic material (P-3) was a disk measuring 4 inches (10.2 cm) in diameter. The entire test slab was used in WO1 exposures. One-inch-wide specimens were cut from rubber test slabs in WO5. These WO5 rubber specimens were stressed to 20 percent elongation for exposure as shown in Photograph 6.

Samples of rigid plastic that were exposed under strain (WO5) were cut to provide 1-inch (2.5-cm) parallel edge specimens. The rigid plastic specimens were bent in a frame that held them at 25 and 50 percent of ultimate bending strain.

Joint sealers.—These specimens consisted of two 3- by 2- by 1-inch (7.6- by 5.1- by 2.5-cm) portland cement mortar blocks with the sealer applied between the blocks. The mortar mix is identical to the mix used in the coatings mortar blocks.

LABORATORY TESTS

Coatings.—The steel and concrete coated specimens were usually examined at the various time intervals

listed in Table 9, "Performance of Protective Coatings." Any deficiencies in the coatings were noted and recorded. Weight changes were also noted to assist in the evaluation.

Rubber and plastic materials.—Physical property tests were conducted on these materials in accordance with ASTM test methods listed below:

1. Tensile strength and elongation: Rubber—ASTM: D 412; Grip velocity: 20 in./min. (50.8 cm/min).

   Hard rubber—ASTM: D 530; Grip velocity: 2 in./min. (5.0 cm/min).

   Rigid plastic—ASTM: D 638; Grip velocity: 0.2 in./min. (0.5 cm/min).

2. Tear strength—ASTM: D 642 (rubber only).

3. Indentation hardness—ASTM: D 2240 (rubber only) using a 5-second interval before reading and a single material thickness. Shore "A" units were used for all samples except R-19, a natural rubber. For R-19, Shore "D" units were used.

4. Specific gravity—ASTM: D 792, Method A-1, except that the entire sample was used.

One sample of each rubber and plastic material was removed for testing at the various time intervals listed in Tables 10-16. After the samples were removed, they were washed to remove surface debris. Before obtaining the immersed weights, samples were held for 1 hour in 23° C (73° F) water, in order to achieve proper sample temperature and to prevent air bubbles from clinging to the surface during the weighing. The dry weight of the samples was then obtained.

To determine change in the dimensions of the 6-inch (15.2-cm) square samples, the length was measured 1 inch (2.5 cm) from each edge and averaged while width was measured 1 inch (2.5 cm) from the bottom only. Diameter of the circular specimen was used for this dimensional change measurement.

After obtaining weight and dimensional measurements, dumbbell-type tensile specimens were cut from the rubber and plastic test slabs. Tear test specimens were also cut from the rubber test slabs. Tensile testing was accomplished in an electronic recorder-type testing machine housed in an environmental control chamber which provides precisely controlled temperature and humidity conditions meeting ASTM and USBR specifications testing requirements. These facilities are shown in Photographs 7 and 8. For evaluating the performance of strained plastics under WO5, visual observations were made.

Joint sealers.—Concrete joint sealer specimens were evaluated by observing change in appearance during the exposure period. Performance was indicated by curling, cracking, bond failure of the sealant to the concrete and other visually detected changes in the sealant. Metal joint sealer specimens, identified in Table 17, were tested under WO5. These were evaluated by three methods: specimens were observed for change in appearance; measured for change in hardness; and tested for extensibility at the end of the exposure period.

A Rex hardness gage was selected to determine hardness changes since it was small enough to fit between the metal bars and provide good contact with the sealant. Although the Rex hardness values are not easily related to more conventional hardness measurements, the change during exposure is of principal significance.

Extensibility of the metal joint sealant specimens was determined by testing only the compressed specimens. The first step was to remove the compression restraints to allow the sealant to recover to its uncompressed condition. No recovery occurred in any case. Specimens were then put into an extension machine which moved the metal bar apart at a rate of 1/8-inch (0.3 cm) per hour.

Specimens were extended 0.05 inch (0.1 cm) until the original uncompressed dimension of 0.5-inch (1.3-cm) width between metal bars was obtained and were observed for bond failures after a specimen relaxation time of 4 hours. Specimens were then extended an additional 10 percent or 0.05 inch (0.1 cm) beyond the original 0.5-inch (1.3-cm) width. After 4 hours in this position, observation of bond failure was made. Bond failure was indicated by failure of more than 30 percent of the bond area of a specimen. Results were summarized as the number of specimens failing out of three specimens tested for each exposure condition for each material.

ELECTRONIC DATA PROCESSING

In order to eliminate the tedious and lengthy process of calculating specific gravity, average thickness, tear strength, tensile strength, and sample volume, a limited computer program was written. The program was then expanded to allow for automatic sorting and tabulation of final data. A work form was prepared to allow measurements and instrument readings to be recorded

directly on punch card data sheets. The computer program and a standardized documentation are included in Tables 18 and 19.

DISCUSSION OF TEST RESULTS

Coatings—General

A summary of coatings performance is shown in Tables 1 and 1A.

A complete performance history of each coating is listed in Table 9. Abbreviations used in the table to provide the maximum information in a minimum of space are listed at the bottom of each table page. Some of the typical failures mentioned by abbreviations in Table 9 are shown in Photograph 9.

Coatings on Steel

The most outstanding coating in the test series was C-33, a baked-on phenolic applied at the manufacturer's plant. This coating is intended only for metal substrates. There was no indication of deterioration of this coating in any of the 15 exposure environments at any time in the test program.

As a group, the phenolics, as well as the epoxy phenolics, demonstrated good potential for high temperature performance on steel in all three exposure conditions (brine, water, and steam). However, the many exceptions in each group indicate that reliance on material type would not be sufficient to obtain desired coating performance.

A polyvinylidene fluoride (PVF) coating and an epoxy coating also performed well at moderately high temperatures.

The PVF was not tested in brine because of a limited supply of the coating. Since water was as severe or a more severe exposure than brine for all but four of the coatings in the study, it is likely that the PVF would also perform well in brine.

At higher temperatures a much larger number of coatings on steel performed better in brine than in steam or water. These included an asphalt modified neoprene and a chlorinated polyether in addition to the previously mentioned coatings which also performed satisfactorily in steam and water.

At moderately high temperatures, coatings on steel which performed well only in brine included a coal-tar modified epoxy, a fluoroelastomer, and several neoprene coatings.

Coatings on Concrete

The search for a coating that would protect concrete at high temperature was disappointing. Only one out of nearly 40 coatings tested provided satisfactory service on concrete at 290° F (143.3° C). This material C-61, a phenolic coating, performed satisfactorily at 290° F (143.3° C) in brine but blistered severly at temperatures above 100° F (37.8° C) in water and steam. A neoprene coating performed satisfactorily at 250° F (121.1° C) in brine only.

The highest temperature that any coating on concrete survived, in all three environments, was 225° F (107.2° C). An epoxy lasted over 1 year at this temperature. A phenolic coating performed satisfactorily at 203° F (95.0° C) for 2 years.

A wide variety of coatings performed satisfactorily in all environments at 100° F (37.8° C).

Coating Performance versus Coating Thickness

The testing program under WO5 included application of some of the more promising coatings in various thicknesses and number of coats. The purpose of this was to determine the effect of coating thickness on corrosion protection.

In general, the results of this study indicated that very little gain in performance resulted from increased thickness. Indeed, in many instances additional coating thickness resulted in earlier crack development.

Coatings No. C-2, C-3, C-5, C-9, C-47, C-60, C-63, C-67, and C-68 were applied in multiple thicknesses. Each thickness is separately evaluated in Table 9.

Since only 20 to 25 months exposure time was available for this study, it was not possible to determine minimum acceptable coating thickness for individual coatings.

Rubber Materials

Table 2 summarizes the performance of the rubber materials tested under this program. Tables 10, 11, and 12 show detailed physical property test results for unstressed rubber materials exposed to brine, water, and steam under WO1. Tables 13 and 14 show detailed physical property test results for selected rubber materials exposed under 20 percent strain in water and steam under WO5. These same materials were exposed to brine conditions. However, the data from the brine exposure were not tabulated since limited access to the brine loops allowed only limited testing and the data

were essentially the same as data from the water exposure.

EPDM was the only rubber material to perform satisfactorily in all environments at all temperatures for at least 48 months. However, only three of the six EPDM materials tested performed this well (see R-11, R-17, and R-30).

Most other rubber materials performed fairly well at moderately high temperatures in brine but only R-7, a high-temperature butyl, also showed good performance in water and steam at moderately high temperatures.

The specimens which were placed in water exposure under 20 percent strain showed little difference in performance from the specimens not under strain. Reduction in strength of steam exposure specimens was generally accelerated in strained condition. The aging increase of strained steam specimens was greater in materials that showed poorer performance in the unstrained condition. This increase was more noticeable at higher temperature.

Rigid Plastics

As shown in Table 3, the unreinforced polyphenylene oxide performed better than other materials in high temperature environments. However, a glass reinforced sample provided by the same manufacturer showed poor dimensional stability at even moderately low temperatures.

At moderately high temperatures a polysulfone performed well and a rigid epoxy offered good service for short-term (20-month) exposure. The polysulfone exhibited increased clouding (opacity change) with increased temperature. This opacity change is shown in Photograph 10.

The semirigid epoxy and semirigid PVC were satisfactory only at low temperatures.

A more detailed description of sample performance is shown in Table 15. Performance of samples selected for exposure under strain is described in Table 16.

The exposure of specimens under strain was done under WO5. The polysulfone exhibited low resistance to cracking at temperatures over 100^{o} F (37.8^{o} C) with the steam exposure being slightly more severe in this respect than the water exposure. Typical stress cracking is shown in Photograph 11.

The glass reinforced polyphenylene-oxide performance under strain was disappointing. The manufacturer was asked to provide additional samples for this testing identical to the material which had performed so well in the unstrained condition. Samples submitted were glass reinforced instead of the unreinforced material originally tested. This second material exhibited poor dimensional stability and an irregular cracking pattern at temperatures over 100^{o} F (37.8^{o} C) as shown in Photograph 12. However, there appeared to be little sensitivity to strain. Considering the good performance of the unreinforced material, new samples for retesting would have been requested if there had been sufficient time remaining in the program.

Joint Sealants

A summary of joint sealant performance is shown in Table 4. Results of extensibility tests performed on three of the eight materials investigated are shown in Table 17. The extensibility tests were performed under WO5. Selection of materials was based on the relatively good performance of one material, a neoprene, from WO1 and the addition of two more materials that looked promising. One neoprene joint sealant, the most difficult to apply of all the sealants, performed satisfactorily in the brine environment at moderately high temperatures. However, performance was not as good in the autoclave environments, particularly steam.

The two materials added to testing under WO5 were an EPDM and a silicone. The silicone softened at temperatures over 100^{o} F (37.8^{o} C) and reverted to a semifluid consistency at temperatures of 250^{o} F (121.1^{o} C) and higher. However, bond integrity of the low temperature specimens was best of the three materials in the extensibility tests.

The EPDM did not perform satisfactorily in bond retention in the extension tests. Nevertheless, this material was rated highest of the joint sealants tested because of the good resistance to hardening. It is possible that the bond problem could be overcome by selection of the proper primer.

Materials that performed unsatisfactorily in preliminary tests were a chlorosulfonated polyethylene, a neoprene, and a butyl. The neoprene did not cure properly; the chlorosulfonated polyethylene and the butyl changed severely in physical appearance, showing early sign of degradation in short-term screening tests.

Table 1

PROTECTIVE COATINGS TESTED
SUMMARY OF PERFORMANCE
STEEL SUBSTRATE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
C- 1	Neoprene	250	60+	100	36	100	36+
C- 2	Epoxy Phenolic	250	60	203	20+	203	20
C- 3	Epoxy Phenolic	250	60+	225	42	203	30
C- 4	Neoprene	250	52+	100	36	100	36
C- 5	Neoprene	250	60+	100	36	100	36+
C- 6	Chlorosulfonated Polyethylene	203	30	100	36+	100	36+
C- 7	Chlorosulfonated Polyethylene	203	30	100	36+	100	36+
C- 8	Resin Varnish	225	39+	100	36+	100	36+
C- 9	Phenolic	290	59+	225	61+	203	61
C-10	Vinyl	100*	35+	100*	36+	100*	36+
C-11	Bituminous	100	15	100	2	100	2
C-12	Phenolic	290	59	100	36	100	36+
C-13	Phenolic	250	60+	100	36	100	36
C-14	Coal-tar Epoxy	250	60	100	36+	100	36+
C-15	Polyester	100	33+	No test		No test	
C-16	EPDM	100*	1	No test		No test	
C-17	Coal-tar Epoxy	250*	60+	203	61	203	42
C-18	Coal-tar Epoxy	250*	60+	203	42	203	42
C-19	Fluoroelastomer	250	60	No test		No test	
C-20	Neoprene-Asphalt	290	59+	100	36+	203	36
C-21	Vinyl	100*	35+	100*	36+	100*	36+
C-22	Vinyl	100*	35+	100*	36+	100*	36+
C-23	Fluoroelastomer	250	60	203	36	203	48
C-24	Polyester	100	3	No test		No test	
C-25	Acrylic Epoxy	100	35	100	36+	100	36+
C-32	Baking Phenolic	290	59+	290	59+	290	59+
C-33	Glass Resin	100	1	No test		No test	
C-35	Polyethylene	100	8	No test		No test	
C-36	Polypropylene	100	10	No test		No test	
C-37	Chlorinated Polyether	290	54	203	55	225	56
C-38	Polyarylether	100	13	100	2	100	36
C-39	PE-PVAC	100	19	No test		No test	
C-40	Porcelain	290**	14	No test		No test	
C-43	Epoxy	100	28+	No test		No test	
C-44	Epoxy	100	17	No test		No test	

Table 1 - Continued

PROTECTIVE COATINGS TESTED
SUMMARY OF PERFORMANCE
STEEL SUBSTRATE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
C-45	Polyimide	100	29	100	21	100	36+
C-47	Epoxy	290	54	100	36	100	36+
C-48	Stainless Steel	100	28	100	2	100	2
C-49	Silicone	100	27+	100	36+	100	36+
C-50	Urethane	100	26+	100	36+	100	36+
C-55	Polyvinylfluoride	No test		250**	48	225	45
C-56	Polyvinylidene Fluoride	No test		250	58+	250*	58+
C-57	Epoxy	290	38+	203	48	203	48
C-58	Epoxy	No test		290**	1	203**	3
C-59	Ceramic	203**	6	203	3	203	3
C-60	Phenolic	250	39+	290	48+	290	48+
C-62	Epoxy Phenolic	250**	6	203	15	203	9
C-63	Epoxy Phenolic	290	32	290	36+	290	48+
C-64	Epoxy Phenolic	290	32	290	42	225	43+
C-65	Epoxy	290	29+	250	40	250	40
C-66	Acrylic Epoxy	250**	6	No test		No test	
C-67	Epoxy	290	20+	250	20	250	20
C-68	Polyester	250**	13	100	20	100	20

* Maximum exposure temperature
** Minimum exposure temperature

Table 1A

PROTECTIVE COATINGS TESTED
SUMMARY OF PERFORMANCE
CONCRETE SUBSTRATE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
C- 1	Neoprene	225	39	100	36+	100	36+
C- 2	Epoxy Phenolic	100	35+	100	36+	100	36+
C- 3	Epoxy Phenolic	203	30+	100	36+	100	36
C- 4	Neoprene	100	22+	100	36+	100	36+
C- 5	Neoprene	250	60+	100	36+	100	36+
C- 6	Chlorosulfonated Polyethylene	100	35+	100	36+	100	36+
C- 7	Chlorosulfonated Polyethylene	100	35+	100	36+	100	36+
C- 8	Resin Varnish	100	8	100	36+	100	36+
C- 9	Phenolic	203	30	203	61	203	24
C-10	Vinyl	100*	35+	100*	36+	100*	24+
C-11	Bituminous	100	36+	100	36+	100	36+
C-14	Coal-tar Epoxy	100	28+	100	36+	100	36+
C-15	Polyester	100	33+	No test		No test	
C-16	EPDM	100*	1	No test		No test	
C-17	Coal-tar Epoxy	225	39	100	36+	100	24+
C-18	Coal-tar Epoxy	203	30	100	36+	100	36+
C-19	Fluoroelastomer	203	30	No test		No test	
C-20	Neoprene-Asphalt	203	23	203	48	100	36+
C-21	Vinyl	100*	35+	100*	36+	100*	36+
C-22	Vinyl	100*	35+	100*	36+	100*	36+
C-23	Fluoroelastomer	100	35+	100	36+	100	36
C-24	Polyester	100	3	No test		No test	
C-25	Acrylic Epoxy	100	35	100	36+	100	36+
C-33	Glass Resin	100	1	No test		No test	
C-36	Polypropylene	100	7	No test		No test	
C-38	Polyarylether	100	35+	100	2	100	36
C-39	PE-PVAC	100	35+	No test		No test	
C-43	Epoxy	100	28+	No test		No test	
C-44	Epoxy	100	30+	No test		No test	
C-47	Epoxy	225	25	100	36+	203	61+
C-49	Silicone	100	27+	100	12	100	5
C-50	Urethane	100	26+	100	36+	100	36+
C-51	Epoxy	100	25+	100	36+	100	36+
C-52	Sulfur	100	1	100	2	100	3
C-55	Polyvinylfluoride	No test		No test		203**	2
C-56	Polyvinylidene Fluoride	No test		No test		203**	48

Table 1A - Continued

PROTECTIVE COATINGS TESTED
SUMMARY OF PERFORMANCE
CONCRETE SUBSTRATE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
C-58	Epoxy	No test		250**	3	225**	3
C-61	Phenolic	290	32+	100	24+	100	24+
C-62	Epoxy Phenolic	290**	3	203	3	203	6
C-64	Epoxy Phenolic	225	9	100	18+	100	18+
C-65	Epoxy	250	30	225	18	225	36
C-66	Acrylic Epoxy	225**	6	No test		No test	

* Maximum exposure temperature
** Minimum exposure temperature

Table 2

RUBBER MATERIALS TESTED
SUMMARY OF PERFORMANCE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
R- 5	Neoprene	250	58	100	36+	100	36+
R- 6	Hi-Temp Butyl	290	56	100	36+	100	36+
R- 7	Hi-Temp Butyl	290	56+	290	48+	250	61
R- 9	Chlorobutyl	225	42+	100	36+	100	36+
R-11	EPDM	290	56+	290	48+	290	48
R-17	EPDM	290	56+	290	48+	290	48
R-18	Chlorosulfonated Polyethylene	225	42+	100	36+	100	36+
R-19	Flexible Ebonite (natural)	100	31	100	18	100	18
R-20	EPDM	250	58	290	48+	100	36+
R-21	Butyl	290	56+	100	36	100	36
R-22	EPDM	290	56+	100	36+	100	36+
R-23	Butyl	250	58	100	36+	100	36+
R-24	Butyl	225	42+	100	36+	100	36+
R-27	Polyacrylate	100	29+	100	36+	100	36+
R-28	Polyacrylate	100	29+	100	36+	100	36+
R-29	Butyl	290	52+	100	36+	100	36+
R-30	EPDM	290	52+	290	48+	290	48
R-32	Silicone	250	43	203	18	225	30
R-34	Nitrile Butadiene	100	20+	100	20+	100	20+

Table 3

RIGID PLASTICS TESTED
SUMMARY OF PERFORMANCE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
P-1	Polysulfone	250	60+	250	61+	250	61+
P-3	Polyphenylene Oxide	290	60+	290	61+	290	61+
P-3	Polyphenylene Oxide (glass reinforced)	No test		203	6	225	6
P-5	Epoxy	100	35+	100	36+	100	36+
P-6	Epoxy	250	21	250	21	250	21
P-7	Polyvinyl Chloride	100	35+	100	36	100	36
P-8	Polyester (glass reinforced)	No test		100	36	100	36

Table 4

JOINT SEALANTS TESTED
SUMMARY OF PERFORMANCE

Sample No.	Material	Limits of satisfactory service					
		Brine		Water		Steam	
		°F	Months	°F	Months	°F	Months
J-1	Chlorosulfonated Polyethylene	Unsatisfactory in screening tests					
J-2	Neoprene	250	30	250	6+	250	6
J-3	Neoprene	Unsatisfactory in screening tests					
J-4	Butyl	Unsatisfactory in screening tests					
J-5	Polysulfide	100	30+	No test		No test	
J-6	Epoxy	100	29+	No test		No test	
J-7	EPDM	No test		290	6+	290	6+
J-8	Silicone	No test		225	6	225	6

Table 5

OPERATING DATA OF THE SALINE WATER TEST SYSTEMS

System No.	1	2	3	4	5
On-line date	January 1965	February 1965	August 1966	May 1966	June 1966
Description of Saline Solution					
a. Dissolved solids content	175,000 ppm	38,400 ppm	73,000 ppm	73,000 ppm	73,000 ppm
b. Solution temperature	100° F	290° F	203° F	225° F	250° F
c. System pressure	0.95 psia	58 psia	12 psia	19 psia	30 psia
d. Solution velocity	±4 fps	±4 fps	±4 fps	± fps	±4 fps
e. Solution velocity in orifice	10 fps	10 fps	—	—	—
f. Dissolved oxygen	0.2-0.8 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Description of Test Chambers					
a. Length for concrete tests	60 ft	60 ft	120 ft	120 ft	120 ft
b. Diameter for concrete tests	12 in.	12 in.	12 in.	12 in.	12 in.
c. Length for coatings test	14 ft	14 ft	14 ft	14 ft	14 ft
d. Diameter for coatings tests	8 in.	8 in.	8 in.	8 in.	8 in.
e. Length for rubber tests	6 ft	6 ft	6 ft	6 ft	6 ft
f. Diameter for rubber tests	12 in.	12 in.	12 in.	12 in.	12 in.

Table 6

COMPOSITION OF SYNTHETIC SEA WATER
ASTM Specification D-1141, Formula A
(Substitute ocean water)

Salt	Percentage
NaCl	58.49
$MgCl_2 \cdot 6H_2O$	26.46
Na_2SO_4	9.75
$CaCl_2$	2.765
KCl	1.645
$NaHCO_3$	0.477
KBr	0.238
H_3BO_3	0.071
$SrCl_2 \cdot 6H_2O$	0.095
NaF	0.007

Density of sea water equals 1.025 at 15° C.

Table 7

COMPOSITION OF SOFTENED SYNTHETIC SEA WATER FOR 100° F BRINE TEST

Salt	Percentage
NaCl	69.40
$MgCl_2 \cdot 6H_2O$	17.12
Na_2SO_4	10.61
$CaCl_2$	0.725
KCl	1.718
$NaHCO_3$	0.0
KBr	0.249
H_3BO_3	0.075
$SrCl_2 \cdot 6H_2O$	0.100
NaF	0.007

Table 8

OPERATING DATA FOR STEAM AND DISTILLED WATER TEST SYSTEMS

Autoclave No.	Temperature ° F	Pressure
1	100	22 to 24 in. vacuum
2	203	3 psig
3	225	5 psig
4	250	25 psig
5	290	47 psig

Table 9

PERFORMANCE OF PROTECTIVE COATINGS

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-1	Brine				
Neoprene	100	36	Sat	35	Sat
	203	30	SBF 5 Mo	30	SBF 6 Mo
Primer and	225	39	SBF 39 Mo	39	SB 3 Mo
7 coats	250	60	Sat	60	BrB 47 Mo; BrB, SBF 60 Mo
brushed 25 mils	290	59	SB 7 Mo; B,BF 45 Mo	17	SvB,BrB 5 Mo; BrB, P 12 Mo
	D. Water				
	100	36	SBF 5 Mo	36	Sat
	203	6	SBF 1 Mo; SvB 6 Mo	6	SBF 1 Mo; B,SvBF 3 Mo
	225	1	SvB 1 Mo	2	SBF 1 Mo; BrB,P 2 Mo
	250	1	SvB,SBF 1 Mo	1	SvB,BF 1 Mo
	290	1	SvB,P 1 Mo	1	SvB 1 Mo
	Steam				
	100	36	Sat	36	Sat
	203	1	B,SvBF 1 Mo	6	B,SBF 1 Mo; BrB 3 Mo
	225	1	SvBF 1 Mo	2	SBF 1 Mo; SvB,C 2 Mo
	250	1	SvB,SBF 1 Mo	1	SvB 1 Mo
	290	1	SvB 1 Mo	1	SvB 1 Mo
C-2	Brine				
Epoxy	100	35	Sat	35	Sat
Phenolic	203	30	Sat	30	C 4 Mo; B 8 Mo
	225	39	SB 36 Mo	15	SB 3 Mo;C,P 9 Mo; SvC 12 Mo
8 coats					
brushed	250	60	SB 18 Mo	60	SB 5 Mo; BrB 42 Mo
10 mils	290	45	B 4 Mo; SvB 12 Mo; BrB 45 Mo	27	B,SBF 12 Mo; SvBF 21 Mo
	D. Water				
	100	36	SB 1 Mo	36	Sat
	203	61	BrB,P 42 Mo; BrB,C,Co 61 Mo	21	B,C 6 Mo; SvB,C 18 Mo
	225	61	BrB 2 Mo; BrB,Co 61 Mo	30	BrB 12 Mo; SvB 24 Mo
	250	61	Co 61 Mo	30	SvC,P 15 Mo
	290	24	BrB,P 4 Mo; SvC 21 Mo	4	B,C 2 Mo
	Steam				
	100	36	Sat	36	Sat
	203	51	BrB,C 24 Mo; BrB,P,Co 51	15	SC 2 Mo; SvC 9 Mo
	225	36	BrB 9 Mo; BrB,Co 36 Mo	6	SvC 5 Mo; B,P,C 6 Mo
	250	30	SvC 9 Mo	1	SvC,B 1 Mo
	290	24	C 4 Mo; SvC 18 Mo	24	C 2 Mo; SvC 21 Mo

B = Blisters
BF = Bond Failure
Br = Broken
Co = Corrosion
C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-2 Epoxy Phenolic Primer brushed plus 1 coat sprayed 10 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	SCo 20 Mo		
	250	20	SB,Co 20 Mo		
	290	20	SB,Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	C,Co 20 Mo		
	250	12	SvC 6 Mo; Co 12 Mo		
	290	20	SvC 6 Mo; Co 20 Mo		
C-2 Epoxy Phenolic Primer brushed plus 2 coats sprayed 17 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	SC,Co 20 Mo		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	SB,Co 20 Mo		
	290	20	SB,Co 20 Mo.		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	C 20 Mo		
	250	12	SvC 6 Mo; Co 12 Mo		
	290	20	SvC 6 Mo; Co 20 Mo		

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-2 Epoxy Phenolic Primer brushed plus 3 coats sprayed 24 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	C, Co 20 Mo		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	SB,Co 20 Mo		
	290	20	SB,Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	SCz 20 Mo		
	250	12	SvC 6 Mo; Co 12 Mo		
	290	20	SvC 6 Mo; Co 20 Mo		
C-3 Epoxy Phenolic Primer and 2 coats brushed 10 mils	Brine				
	100	35	Sat	35	Sat
	203	30	Sat	30	Sat
	225	39	Sat	24	SB 1 Mo; SvC 18 Mo; SvC, P 24 Mo
	250	60	Sat	47	SC 5 Mo; B 8 Mo; SvBrB 18 Mo
	290	45	SB 3 Mo; BrB 45 Mo	45	B 1 Mo; BrB 2 Mo; SvB, C 27 Mo
	D. Water				
	100	36	SB 30 Mo	36	Sat
	203	48	Sat	42	B 9 Mo; BrB 12 Mo; SvC 42 Mo
	225	61	SB 18 Mo; SC 42 Mo	42	SB 1 Mo; B 18 Mo; BrB, C 42 Mo
	250	42	SB 1 Mo; C 9 Mo; SvC 36 Mo	42	B 1 Mo; BrB 6 Mo; C 15 Mo; Sv C 42 Mo
	290	24	SB 1 Mo; SC 4 Mo; SvC, B 24 Mo	4	SB 1 Mo; SvC 3 Mo; SvC, P 4 Mo
	Steam				
	100	36	Sat	36	Sat
	203	48	SB 3 Mo; SC 30 Mo	42	SB 3 Mo; C 15 Mo; SvC, P 24 Mo
	225	42	SB 2 Mo; SC 15 Mo; C, Co 42 Mo	42	B 2 Mo; SvC 9 Mo; SvC, P, B 24 Mo
	250	24	B 9 Mo; SC 18 Mo	6	SB 1 Mo; SvC 5 Mo
	290	18	SB 1 Mo; BrB 6 Mo; BrB, P 9 Mo	1	SvC 1 Mo

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-3 Epoxy Phenolic Primer brushed plus 1 coat sprayed 19 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	SCz 20 Mo		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	Bond Weak 20 Mo		
	290	20	Cz,Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	SCz 20 Mo		
	290	20	C 12 Mo; SvC 20 Mo		
C-3 Epoxy Phenolic Primer brushed plus 2 coats sprayed 27 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Cz 20 Mo		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	Bond Weak 20 Mo		
	290	20	Cz,Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	SCz 20 Mo		
	290	20	C 12 Mo; SvC 20 Mo		

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-3	Brine				
Epoxy	100				
Phenolic	203				
	225				
Primer	250	25	Sat		
brushed	290	20	Cz,B 20 Mo		
plus					
3 coats	D. Water				
sprayed	100	20	Sat		
35 mils	203	20	Sat		
	225	20	Sat		
	250	20	Bond Weak 20 Mo		
	290	20	Cz,Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	SCz 20 Mo		
	290	12	C 6 Mo; SuC 12 Mo		
C-4	Brine				
Neoprene	100	22	Sat	22	Sat
	203	21	SBF 6 Mo	21	B,BF 1 Mo; SvB,BrB 6 Mo
Primer	225	29	SB 8 Mo	29	Sat
and	250	52	Sat	60	BrB 40 Mo
7 coats	290	49	SBF 11 Mo; B 20 Mo; Co 49 Mo	11	SB 2 Mo; BrB,P 11 Mo
brushed heat cured	D. Water				
24 mils	100	36	SB 1 Mo	36	Sat
	203	9	SB,BF 1 Mo; SvB 6 Mo; BrB 9 Mo	9	B,BF 1 Mo; SvB,BrB 6 Mo
	225	1	SvB 1 Mo	1	B,BF 1 Mo
	250	1	SvB,BF 1 Mo	3	B 1 Mo; SvB,BrB 3 Mo
	290	1	SvB,P 1 Mo	1	SvB 1 Mo
	Steam				
	100	36	SB 1 Mo	36	Sat
	203	9	SB 1 Mo; SvB 6 Mo; BrB 9 Mo	9	B 3 Mo; SvB,BrB 9 Mo
	225	1	SvB 1 Mo	6	SB 1 Mo; BrB,P 5 Mo
	250	1	SvB,P 1 Mo	3	SB 1 Mo; B,BF 2 Mo; SvB 3 Mo
	290	1	SvB,C 1 Mo	1	SvB 1 Mo

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Mo = Month
P = Peeling
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Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-5 Neoprene Primer plus 22 coats brushed 40 mils	Brine				
	100	35	Sat	35	Sat
	203	30	SBF 5 Mo	30	SB 21 Mo
	225	39	Sat	39	Sat
	250	60	Sat	60	Sat
	290	45	B 1 Mo; SvB 15 Mo; BrB 45 Mo	45	B 1 Mo; SvB 12 Mo; BrB 27 Mo
	D. Water				
	100	36	Sat	36	Sat
	203	61	B 5 Mo; BrB 21 Mo	61	BrB 6 Mo; SvBrB 61 Mo
	225	61	B 2 Mo; BrB 61 Mo	42	BrB 9 Mo; SvBrB 42 Mo
	250	48	B 1 Mo; BrB 5 Mo	36	BrB 3 Mo; SvBrB 36 Mo
	290	30	B 1 Mo; BrB 3 Mo	24	BrB 6 Mo; SvBrB 12 Mo
	Steam				
	100	36	Sat	36	Sat
	203	61	B 6 Mo; BrB 48 Mo	61	B 15 Mo; BrB 61 Mo
	225	42	B 2 Mo; BrB 9 Mo	15	BrB 6 Mo; SvBrB 15 Mo
	250	42	B 1 Mo; BrB 6 Mo	6	BrB 2 Mo; SvB, P 6 Mo
	290	30	BrB,P 1 Mo	5	BrB 2 Mo; SvB,P 5 Mo
C-5 Neoprene Primer plus 10 coats brushed 24 mils	Brine				
	100				
	203				
	225				
	250	25	SB 25 Mo		
	290	20	B 6 Mo; Co 20 Mo		
	D. Water				
	100	20	B 20 Mo		
	203	20	B 3 Mo		
	225	20	B 1 Mo		
	250	20	B 1 Mo; Co 12 Mo		
	290	20	C,B,Co 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 2 Mo		
	225	20	B 1 Mo		
	250	20	B 1 Mo; Co 12 Mo		
	290	20	C,B,Co 1 Mo		

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Co = Corrosion
C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-5 Neoprene Primer plus 15 coats brushed 34 mils	Brine				
	100				
	203				
	225				
	250	25	SB 25 Mo		
	290	20	B 6 Mo; Co 20 Mo		
	D. Water				
	100	20	B 20 Mo		
	203	20	B 2 Mo		
	225	20	B 1 Mo		
	250	20	B 1 Mo; Co 12 Mo		
	290	20	C,B,Co 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 2 Mo		
	225	20	B 1 Mo		
	250	20	B 1 Mo; Co 12 Mo		
	290	20	C,B,Co 1 Mo		
C-5 Neoprene Primer plus 20 coats brushed 44 mils	Brine				
	100				
	203				
	225				
	250	25	SB 25 Mo		
	290	20	B 6 Mo; Co 20 Mo		
	D. Water				
	100	20	B 12 Mo		
	203	20	B 2 Mo		
	225	20	B 1 Mo		
	250	20	B 1 Mo; Co 12 Mo		
	290	20	C,B,Co 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 2 Mo		
	225	20	B 6 Mo		
	250	20	B 1 Mo; Co 12 Mo		
	290	20	C,B,Co 1 Mo		

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-6 Chlorosulfonated Polyethylene Primer plus 6 coats brushed 30 mils	Brine				
	100	35	Sat	35	Sat
	203	30	SBF 4 Mo	21	B 1 Mo; BrB 21 Mo
	225	10	B 8 Mo; BrB 9 Mo	3	BrB,P 3 Mo
	250	9	B 5 Mo; P 7 Mo	8	B 4 Mo; BrB 7 Mo
	290	1	SvB,P 1 Mo	2	SvB 1 Mo
	D. Water				
	100	36	Sat	36	Sat
	203	1	SvB 1 Mo	1	SvB 1 Mo
	225	1	SvB 1 Mo	2	SvB 1 Mo
	250	1	SvB 1 Mo	1	SvB 1 Mo
	290	1	SvB 1 Mo	1	P 1 Mo
	Steam				
	100	36	Sat	36	Sat
	203	1	SvB 1 Mo	1	SvB 1 Mo
	225	1	SvB 1 Mo	1	SvB 1 Mo
	250	2	SvB 1 Mo	1	SvB 1 Mo
	290	1	SvB,C 1 Mo	1	P 1 Mo
C-7 Chlorosulfonated Polyethylene Primer plus 6 coats brushed 30 mils	Brine				
	100	35	Sat	35	Sat
	203	30	SBF 6 Mo	21	SB 1 Mo; B,BF 6 Mo; BrB 21 Mo
	225	10	SvB,BrB 9 Mo	4	SvB 4 Mo
	250	9	B 6 Mo; SvB,P 9 Mo	8	B 4 Mo; BrB 6 Mo
	290	1	SvP 1 Mo	2	SvB 1 Mo; BrB,P 2 Mo
	D. Water				
	100	36	Sat	36	Sat
	203	1	SvB 1 Mo	1	SvB 1 Mo
	225	1	SvB 1 Mo	1	SvB 1 Mo
	250	1	SvB 1 Mo	1	SvB 1 Mo
	290	1	SvB 1 Mo	1	SvB 1 Mo
	Steam				
	100	36	Sat	36	Sat
	203	1	SvB 1 Mo	1	SvB 1 Mo
	225	1	SvB 1 Mo	1	SvB 1 Mo
	250	1	SvB 1 Mo	1	SvB,P 1 Mo
	290	1	SvB 1 Mo	1	SvB 1 Mo

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Cz = Crazing
Mo = Month
P = Peeling
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Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-8	Brine				
Resin	100	35	Sat	35	SB,SBF 8 Mo
Varnish	203	30	Sat	30	SBF 1 Mo; BrB,C 30 Mo
	225	39	Sat	18	SBF 1 Mo; C 9 Mo; P 10 Mo
7 coats	250	60	SB 24 Mo; Co 60 Mo	48	SBF 1 Mo; SvBF 24 Mo
brushed	290	45	B 5 Mo; BF 45 Mo	17	B,BF 1 Mo; SvC,P 15 Mo
heat cured					
20 mils	D. Water				
	100	36	Sat	36	Sat
	203	42	SB 9 Mo; BrB 36 Mo; Co 42 Mo	6	SB 1 Mo; P 3 Mo; SvB,C, P 6 Mo
	225	42	SB 2 Mo; BrB,Co 42 Mo	4	SB 1 Mo; BrB 2 Mo; C 4 Mo
	250	42	B 1 Mo; BrB 9 Mo	4	SB 1 Mo; C,P 2 Mo; BrB 4 Mo
	290	61	B 1 Mo	9	SB,BF,P 1 Mo; SvBF 9 Mo
	Steam				
	100	36	Sat	36	Sat
	203	61	B 12 Mo; BrB 48 Mo; Co 61 Mo	61	B 12 Mo; C,P 42 Mo
	225	42	SB 2 Mo; C 18 Mo; BrB, Co 42 Mo	61	SB 1 Mo; SBF 12 Mo; BrB, P 18 Mo
	250	4	SB 1 Mo; SvB,C 4 Mo	6	SB,P,BF 1 Mo; SvB,C 5 Mo
	290	61	SB 1 Mo; C 4 Mo; BrB 24 Mo; Co 61 Mo	5	SB,P,BF 1 Mo; SvB,C 5 Mo
C-9	Brine				
Phenolic	100	35	Sat	35	Sat
	203	30	Sat	30	SC 30 Mo
Primer	225	39	Sat	36	SC 1 Mo; B 15 Mo; BrB 36 Mo
plus	250	60	Sat	30	C 4 Mo; B,SvC 24 Mo
2 coats	290	59	Sat	45	SvB,C 45 Mo
brushed					
22 mils	D. Water				
	100	30	SB 12 Mo	36	Sat
	203	61	Sat	61	SB 5 Mo; SC 15 Mo
	225	61	Sat	21	SB 2 Mo; BrB 6 Mo; C 21 Mo
	250	42	SB 1 Mo; Cz 5 Mo; C 15 Mo; BrB 42 Mo	36	SB 1 Mo; SC 2 Mo; SvC 36 Mo
	290	61	SB 1 Mo; SC 5 Mo; SCo 61 Mo	24	SC 1 Mo; C 6 Mo; SvC 24 Mo
	Steam				
	100	36	Sat	24	Sat
	203	61	Co 61 Mo	48	SC 24 Mo; C 42 Mo
	225	61	SB 4 Mo; SC 15 Mo; B, Co 61 Mo	9	SC 1 Mo; C 6 Mo
	250	48	SC 12 Mo; C,Co 48 Mo	36	SC 1 Mo; SvC 3 Mo
	290	47	SB,SC 1 Mo; C 9 Mo; SvC,Co 47 Mo	24	SC 1 Mo; SvC 5 Mo

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-9 Phenolic Primer plus 2 coats brushed 26 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 3 Mo; Co 20 Mo		
	225	12	B 1 Mo; C 3 Mo		
	250	1	SvC 1 Mo		
	290	1	SvC 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 6 Mo; Co 20 Mo		
	225	6	B 2 Mo; C 3 Mo		
	250	1	SvC 1 Mo		
	290	1	SvC 1 Mo		
C-9 Phenolic Primer plus 3 coats brushed 31 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 1 Mo; Co 20 Mo		
	225	6	B 1 Mo; SvC 6 Mo		
	250	1	SvC 1 Mo		
	290	1	SvC 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 3 Mo; Co 20 Mo		
	225	6	B 2 Mo; SvC 6 Mo		
	250	1	SvC 1 Mo		
	290	1	SvC 1 Mo		

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
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Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-9 Phenolic Primer plus 4 coats brushed 38 mils	Brine 100 203 225 250 290	 25 20	 Sat Sat		
	D. Water 100 203 225 250 290	 20 12 6 1 1	 Sat B 1 Mo; SvC,SvB 12 Mo B 1 Mo; SvC 6 Mo SvC 1 Mo SvC 1 Mo		
	Steam 100 203 225 250 290	 20 20 3 1 1	 Sat B,C 6 Mo; Co 20 Mo B 1 Mo; C 3 Mo SvC 1 Mo SvC 1 Mo		
C-10 Vinyl (VR-3) 4 coats brushed 8 mils	Brine 100 203 225 250 290	 35	 Sat	35	Sat
	D. Water 100 203 225 250 290	 36	 Sat	36	Sat
	Steam 100 203 225 250 290	 36	 Sat	24	Sat

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-11 Bituminous 3 coats brushed 10 mils	Brine				
	100	15	B,P 15 Mo	35	Sat
	203	24	SB 5 Mo; P 15 Mo; BrB, Co 24 Mo	30	SB 5 Mo; BrB 24 Mo
	225	18	SB 12 Mo; BrB,Co 18 Mo	15	SB 2 Mo; BrB 10 Mo
	250	9	B 3 Mo; BrB 6 Mo; Sv BrB 9 Mo	24	B 3 Mo; BrB,P 9 Mo; SvBrB 24 Mo
	290	15	Co 15 Mo	17	SB 1 Mo; BrB 5 Mo; SvBrB 15 Mo
	D. Water				
	100	2	SB 1 Mo; BrB,Co 2 Mo	36	Sat
	203	9	B 1 Mo; BrB,Co 9 Mo	2	B,C 2 Mo
	225	48	C 42 Mo; SvC,Co 48 Mo	2	BrB 2 Mo
	250	30	B,C 5 Mo; BrB,P 15 Mo	3	SB 1 Mo; BrB,P 3 Mo
	290	1	B,C,P 1 Mo	24	BrB 1 Mo
	Steam				
	100	2	SB 1 Mo; BrB,Co 2 Mo	36	Sat
	203	36	SB 1 Mo; C 15 Mo; B,Co 18 Mo	2	C 2 Mo
	225	6	SB 1 Mo; C,SvB 5 Mo	2	C,P 2 Mo
	250	1	SvC,SvB 1 Mo	4	BrB 2 Mo; SvC 4 Mo
	290	61	C 2 Mo; BrB 4 Mo	2	SC 1 Mo; SvC 2 Mo
C-12 Phenolic Experimental System 2 coats brushed 10 mils	Brine				
	100	55	Sat		
	203	30	Sat		
	225	39	Sat		
	250	60	Sat		
	290	59	SBF 8 Mo; SB,Co 59 Mo		
	D. Water				
	100	36	SB 1 Mo		
	203	61	C 1 Mo; SvC,Co 61 Mo		
	225	61	Cz 1 Mo; SvCz,Co 61 Mo		
	250	61	SBF,SC 1 Mo; C 9 Mo; P 61 Mo		
	290	61	SC 1 Mo; BF 61 Mo		
	Steam				
	100	36	Sat		
	203	1	SvC 1 Mo		
	225	1	C 1 Mo		
	250	1	SvC 1 Mo		
	290	61	SC 1 Mo		

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-13	Brine				
Phenolic	100	35	Sat		
Experimental	203	30	Sat		
System	225	39	Sat		
	250	60	Sat		
2 coats	290	45	SBF 1 Mo; BF,Co 30 Mo; BrB,Co 45 Mo		
brushed 8 mils					
	D. Water				
	100	36	SB 1 Mo		
	203	1	SvC 1 Mo		
	225	1	C 1 Mo		
	250	1	BrB,Co 1 Mo		
	290	1	BrB,C 1 Mo		
	Steam				
	100	36	SB 2 Mo		
	203	1	SvC 1 Mo		
	225	1	SvC 1 Mo		
	250	1	BrB,C 1 Mo		
	290	1	BrB 1 Mo		
C-14	Brine				
Coal-tar	100	35	Sat	28	Sat
Epoxy	203	30	Sat	1	C,P 1 Mo
	225	39	Sat	2	SC 1 Mo; SvC 2 Mo
3 coats	250	60	SB 15 Mo	1	SvC 1 Mo
brushed 22 mils	290				
	D. Water				
	100	36	Sat	36	Sat
	203	2	SvB 1 Mo; SvC 2 Mo	15	SB 1 Mo; SC 2 Mo; SvC 15 Mo
	225	2	B 1 Mo; SvC 2 Mo	2	SB 1 Mo; SvC 2 Mo
	250	1	SvB,C 1 Mo	1	SvC 1 Mo
	290				
	Steam				
	100	36	Sat	36	Sat
	203	3	C,Co 3 Mo	1	SvC 1 Mo
	225	6	SB 1 Mo; SC 3 Mo; SvC 6 Mo	2	SvC 2 Mo
	250	2	SB,Co 1 Mo; SvC 2 Mo	1	SvC 1 Mo
	290				

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Cz = Crazing
Mo = Month
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Sat = Satisfactory
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Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-15 Polyester Primer plus 2 coats brushed	Brine 100 203 225 250 290 D. Water 100 203 225 250 290 Steam 100 203 225 250 290	 33 2 1 1	 Sat B 1 Mo; SvBF 2 Mo B,BF 1 Mo B,BF 1 Mo	 33 2 1 1	 Sat SvB 1 Mo; SvBF 2 Mo B,C,P 1 Mo B,C,P 1 Mo
C-16 EPDM Experimental System 7 coats brushed	Brine 100 203 225 250 290 D. Water 100 203 225 250 290 Steam 100 203 225 250 290	1	P 1 Mo	2	B,BrB 1 Mo

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-17	Brine				
Coal-tar	100	35	Sat	35	Sat
Epoxy	203	30	Sat	30	Sat
	225	39	Sat	39	SC 7 Mo; SB 36 Mo
3 coats	250	60	Sat	3	C,P 3 Mo
brushed	290				
25 mils					
	D. Water				
	100	36	Sat	36	Sat
	203	61	SB 1 Mo; SBrB 61 Mo	1	SvC 1 Mo
	225	42	SB 2 Mo; C 9 Mo; SvBrB 42 Mo	1	SvC 1 Mo
	250	42	SB 1 Mo; BrB 9 Mo; SvBrB 42 Mo	1	SvC 1 Mo
	290				
	Steam				
	100	36	Sat	24	Sat
	203	61	SB 2 Mo; B42 Mo; BrB 61 Mo	1	SvC 1 Mo
	225	61	SB 3 Mo; C 9 Mo; BrB 42 Mo	1	SvC 1 Mo
	250	61	SC 3 Mo; C 6 Mo	1	SvC 1 Mo
	290				
C-18	Brine				
Coal-tar	100	35	Sat	28	Sat
Epoxy	203	30	Sat	30	SC 1 Mo; C 30 Mo
	225	2	SvC 2 Mo	2	SvC 2 Mo
3 coats	250	60	Sat	1	SvC 1 Mo
brushed	290				
25 mils					
	D. Water				
	100	36	Sat	36	Sat
	203	61	SB 1 Mo; SC,B 42 Mo; BrB 61 Mo	2	SvC 2 Mo
	225	42	SB 2 Mo; SC 6 Mo; SvBrB 42 Mo	2	SvC 2 Mo
	250	42	SB 1 Mo; C,B 6 Mo; BrB 42 Mo	1	SvC 1 Mo
	290				
	Steam				
	100	36	Sat	36	Sat
	203	61	SB 5 Mo; SBrB 42 Mo; BrB 61 Mo	3	SC 1 Mo; SvC 3 Mo
	225	61	SB 3 Mo; SC 6 Mo;BrB 61 Mo	1	SvC 1 Mo
	250	42	C 42 Mo	1	SvC 1 Mo
	290				

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-19	Brine				
Fluoro-elastomer	100	35	Sat	35	Sat
Experimental	203	30	Sat	30	SB 2 Mo; B 30 Mo
System	225	39	Sat	30	SB 7 Mo; SvC,P 30 Mo
	250	60	SB,Co 60 Mo	18	SB 3 Mo; B,SP 6 Mo; P 15 Mo
Epoxy primer	290	10	SB 7 Mo; BrB,P 8 Mo; SvP 10 Mo	10	P 8 Mo; SvP 10 Mo
plus					
10 coats	D. Water				
brushed	100				
10 mils	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				
C-20	Brine				
Neoprene-asphalt	100	35	Sat	35	Sat
	203	30	Sagging,SB 1 Mo	29	C 23 Mo; SvC 29 Mo
	225	39	Sagging, 1 Mo	39	B 10 Mo
Primer	250	60	Sagging, 1 Mo	60	SB 24 Mo; BrB, Co 60 Mo
plus	290	59	Sagging, 1 Mo	17	B 5 Mo; P 12 Mo; SvP 17 Mo
7 coats					
30 mils	D. Water				
	100	36	Sat	36	Sat
	203	9	B 1 Mo; SvB 9 Mo	48	SB 1 Mo; B 12 Mo
	225	9	SB 1 Mo; BrB 3 Mo; SvBrB 9 Mo	42	SBrB 2 Mo; SvBrB 42 Mo
	250	1	SvBrB 1 Mo	2	BrB 1 Mo; SvB,P 2 Mo
	290	9	BrB 1 Mo; SvBrB 9 Mo	1	SvB 1 Mo
	Steam				
	100	36	Sat	36	Sat
	203	48	SB 1 Mo; B 9 Mo; BrB 36 Mo	42	SB 3 Mo; BrB 18 Mo
	225	48	SB 4 Mo; C 48 Mo	30	SB 3 Mo; BrB 9 Mo; SvC 30 Mo
	250	42	B 2 Mo; BrB 3 Mo; SvC 42 Mo	2	B 1 Mo; BrB,P 2 Mo
	290	24	B 1 Mo; BrB 4 Mo; SvBrB 9 Mo	1	BrB,P 1 Mo

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-21 Vinyl (VR-3) 4 coats brushed 8 mils	Brine 100 203 225 250 290	35	Sat	35	Sat
	D. Water 100 203 225 250 290	36	Sat	36	Sat
	Steam 100 203 225 250 290	36	Sat	36	Sat
C-22 Vinyl (VR-3) 4 coats brushed 8 mils	Brine 100 203 225 250 290	35	Sat	35	Sat
	D. Water 100 203 225 250 290	36	Sat	36	Sat
	Steam 100 203 225 250 290	36	Sat	36	Sat

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Cz = Crazing
Mo = Month
P = Peeling
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-23	Brine				
Fluoro-elastomer	100	35	Sat	35	Sat
Experimental	203	30	Sat	2	B 1 Mo; BrB 2 Mo
System	225	39	Sat	10	SB 4 Mo; P 6 Mo; SvP 10 Mo
	250	60	SB 9 Mo; SC 42 Mo	8	C,B 3 Mo; P 6 Mo; SvP 8 Mo
	290	45	SB 12 Mo; C,B 45 Mo	5	SC 1 Mo; C 2 Mo; P 4 Mo
9 coats					
brushed	D. Water				
6 mils	100	36	Sat	36	SB 24 Mo
	203	48	SB 1 Mo; SC 36 Mo; SvC 48 Mo	5	SB 1 Mo; P 5 Mo
	225	42	SB 1 Mo; B 9 Mo; C,BrB, Co 42 Mo	21	SB 1 Mo; SvB 5 Mo; C,P 21 Mo
	250	30	SB 1 Mo; B 9 Mo; SvC 30 Mo	5	SB 1 Mo; B 3 Mo; SvP 5 Mo
	290	18	SB 1 Mo; B,SC 6 Mo; SvC, P 18 Mo	1	SvP 1 Mo
	Steam				
	100	36	Sat	36	SB 24 Mo
	203	48	SB 1 Mo; B 6 Mo; C 48 Mo	4	SB 1 Mo; BrB,P 4 Mo
	225	42	B 4 Mo; SvB 12 Mo; C, BrB,Co 42 Mo	3	SB 2 Mo; P 3 Mo
	250	21	SB 1 Mo; SvB 4 Mo; BrB 21 Mo	1	SvP 1 Mo
	290	5	SB 1 Mo; SvC 5 Mo	1	SvP 1 Mo
C-24	Brine				
Polyester	100	22	B,P 3 Mo; P 8 Mo	35	BrB,P 3 Mo; SvC 35 Mo
	203	1	P 1 Mo	1	SvC,P 1 Mo
Primer	225				
plus	250				
glass	290				
mat in					
2 coats	D. Water				
plus	100				
2 coats	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-26 Acrylic-epoxy 3 coats brushed 12 mils	Brine				
	100	35	SC 3 Mo	35	SC 3 Mo
	203	4	C 1 Mo	1	C 1 Mo
	225	3	SvC 3 Mo	1	C,P 1 Mo
	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo
	D. Water				
	100	36	Sat	36	Sat
	203	1	SvC 1 Mo	1	SvC 1 Mo
	225	1	SvC 1 Mo	1	SvC 1 Mo
	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo
	Steam				
	100	36	Sat	36	Sat
	203	1	SvC 1 Mo	1	SvC 1 Mo
	225	1	C 1 Mo	1	SvC 1 Mo
	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo
C-32 Baking Phenolic Manufacturer applied 5 mils	Brine				
	100	35	Sat		
	203	30	Sat		
	225	39	Sat		
	250	60	Sat		
	290	59	Sat		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	57	Sat		
	250	47	Sat		
	290	59	Sat		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	47	Sat		
	250	57	Sat		
	290	59	Sat		

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-33 Glass Resin	Brine				
	100	2	P,Co 1 Mo	1	Ineffective
	203	1	SvCo 1 Mo	1	Ineffective
Manufacturer applied dipped on concrete	225	1	SvCo 1 Mo	1	Ineffective
	250	1	C,Co 1 Mo	1	Ineffective
	290	3	P,B 2 Mo; Co 3 Mo	1	Ineffective
	D. Water				
Sprayed on steel 0.2 mil	100				
	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				
C-35 Polyethylene	Brine				
	100	11	SB 8 Mo; B,P 9 Mo; SvP 11 Mo		
Flame sprayed 10 mils	203	2	Co 1 Mo; P 2 Mo		
	225	2	SvP 2 Mo		
	250	1	C,Co 1 Mo		
	290	1	C,P 1 Mo		
	D. Water				
	100				
	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-36 Polypropylene Flame sprayed 20 mils	Brine 100 203 225 250 290 D. Water 100 203 225 250 290 Steam 100 203 225 250 290	 10 1 2 1 1	 C 1 Mo; Co 10 Mo SvC 1 Mo SvP,Co 2 Mo SvP 1 Mo SvP 1 Mo	 7 1 2 1 1	 Holes 1 Mo; B 7 Mo SvC 1 Mo SvP,Co 2 Mo SvP 1 Mo SvP 1 Mo
	Brine 100 203 225 250 290 D. Water 100 203 225 250 290 Steam 100 203 225 250 290				

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-37 Chlorinated Polyether	Brine				
	100	28	Sat		
	203	26	Sat		
	225	34	SB 1 Mo		
Manufacturer applied 30 mils	250	57	SB 1 Mo		
	290	54	SB 1 Mo		
	D. Water				
	100	31	Sat		
	203	55	SB 1 Mo; B 15 Mo; BrB, BF 55 Mo		
	225	56	SB 1 Mo; B 4 Mo; BrB, Co 56 Mo		
	250	56	SB 1 Mo; B 4 Mo; B,C 56 Mo		
	290	25	B 1 Mo; B,SC 10 Mo; BrB, SvC 25 Mo		
	Steam				
	100	31	Sat		
	203	55	SB 6 Mo; B 42 Mo; SvB 55 Mo		
	225	56	SB 1 Mo; SvB 56 Mo		
	250	56	SB 1 Mo; B,C 37 Mo; BrB 56 Mo		
	290	25	B 1 Mo; B,SC 10 Mo; BrB, SvC 25 Mo		
C-38 Polyarylether	Brine				
	100	22	B 7 Mo; SvB 13 Mo	35	Sat
	203	30	B 1 Mo; SvB 5 Mo; BrB, P 21 Mo	28	SB 1 Mo; BrB 28 Mo
7 coats brushed 8 mils	225	18	B,P 8 Mo; BF 15 Mo	18	SvB 10 Mo
	250	9	C 1 Mo; B 3 Mo; P 6 Mo; BrB,P 9 Mo	8	B 1 Mo; P 6 Mo; B,P 8 Mo
	290	6	B 1 Mo; SvB,P 5 Mo	9	SvB 1 Mo; BrB 2 Mo
	D. Water				
	100	2	SB 1 Mo; B 2 Mo	36	SC 21 Mo
	203	1	SvB 1 Mo	1	SvB 1 Mo
	225	1	SvB 1 Mo	1	SvB 1 Mo
	250	1	SvB 1 Mo	1	SvB 1 Mo
	290	1	B,C 1 Mo	1	SvB 1 Mo
	Steam				
	100	2	SB 1 Mo; B 2 Mo	36	SC 18 Mo
	203	1	SvB 1 Mo	1	SvB 1 Mo
	225	1	SvB 1 Mo	1	SvB 1 Mo
	250	1	B,C 1 Mo	1	SvB 1 Mo
	290	1	SvB 1 Mo	1	SvB 1 Mo

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-39 PE-PVAC Flame sprayed manufacturer applied 20 mils	Brine 100 203 225 250 290 D. Water 100 203 225 250 290 Steam 100 203 225 250 290	 19 1 1 1 1	 SP 11 Mo SvP 1 Mo SvP 1 Mo SvP 1 Mo SvP 1 Mo	 35 4 2 1	 Sat P 1 Mo; SvP 4 Mo SvP 1 Mo SvP 1 Mo
C-40 Porcelain Enamel Manufacturer applied dipped 12 mils	Brine 100 203 225 250 290 D. Water 100 203 225 250 290 Steam 100 203 225 250 290	 26	 SB 1 Mo; C 14 Mo; SvC, Co 20 Mo		

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-43 Epoxy	Brine				
	100	28	Sat	28	Sat
	203	2	SB 1 Mo; BrB,C,P 2 Mo	2	C,P, 2 Mo
Primer	225	1	SvP 1 Mo	1	SvP 1 Mo
plus	250	1	SvP 1 Mo	1	SvC,P 1 Mo
2 coats	290	1	SvP 1 Mo	1	SvC,P 1 Mo
brushed					
10 mils	D. Water				
	100				
	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				
C-44 Epoxy	Brine				
	100	30	SP 8 Mo; SCo 17 Mo	30	Sat
	203	1	P 1 Mo	1	P 1 Mo
2 coats	225	1	SvC,P 1 Mo	1	SvC,P 1 Mo
brushed	250	1	SvC,P 1 Mo	1	SvC,P 1 Mo
24 mils	290	1	SvC,P 1 Mo	1	SvC,P 1 Mo
	D. Water				
	100				
	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-45 Polyimide	Brine				
	100	29	SB,Co 29 Mo		
	203	3	SB,BrB 1 Mo; P 2 Mo; PC 3 Mo		
2 coats manufacturer applied 0.5 mils	225	1	P 1 Mo		
	250	1	P 1 Mo		
	290	1	SvC,P 1 Mo		
	D. Water				
	100	36	SB 1 Mo; SCo 21 Mo		
	203	2	B 1 Mo; P 2 Mo		
	225	1	SvP 1 Mo		
	250	1	SvP 1 Mo		
	290	1	SvP 1 Mo		
	Steam				
	100	36	Sat		
	203	2	B 1 Mo; SvP 2 Mo		
	225	1	SvP 1 Mo		
	250	1	SvP 1 Mo		
	290	1	SvP 1 Mo		
C-47 Epoxy	Brine				
	100	28	Sat	28	Sat
	203	26	Sat	26	Sat
Primer plus 3 coats brushed 35 mils	225	34	Sat	34	SB 19 Mo; B 25 Mo
	250	57	Sat	60	SB 5 Mo; BrB 45 Mo; SC 60 Mo
	290	54	Cz (Top Coat) 54 Mo	40	SB 4 Mo; B 25 Mo; BrB 40 Mo
	D. Water				
	100	36	SB 24 Mo	36	Sat
	203	61	SB 1 Mo; BrB 61 Mo	61	SB 3 Mo; SC 15 Mo; BrB 48 Mo
	225	61	SB 1 Mo; B 15 Mo; BrB, Co 61 Mo	61	SB 2 Mo; B,C 15 Mo; BrB 42 Mo
	250	61	SB 1 Mo; B, C 61 Mo	61	SB 1 Mo; BrB 48 Mo; SBrB 61 Mo
	290	24	SB 1 Mo; SvBrB 24 Mo	24	SB 1 Mo; BrB 15 Mo; C,P, SvBrB 24 Mo
	Steam				
	100	36	Sat	36	Sat
	203	61	SB 2 Mo; BrB,SCo 61 Mo	61	Sat
	225	61	SB 42 Mo; SCo 61 Mo	61	C 42 Mo; SvB,BrB,C 61 Mo
	250	61	SB 7 Mo; BrB,P 48 Mo; C, P 61 Mo	48	SB 1 Mo; B 6 Mo; SvC 48 Mo
	290	36	SB 1 Mo; B 6 Mo; BrB,C, 30 Mo	24	SvC 5 Mo; B 18 Mo; BrB, P 24 Mo

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-47 Epoxy Primer plus 1 coat brushed 16 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 1 Mo; C, B 12 Mo,Co 20 Mo		
	225	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	250	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	290	20	B 1 Mo; SvC,B 12 Mo; Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	225	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	250	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	290	20	B 1 Mo; SvC,B 12 Mo; Co 20 Mo		
C-47 Epoxy Primer plus 2 coats brushed 24 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	225	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	250	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	290	20	B 1 Mo; SvC,B 12 Mo; Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	225	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	250	20	B 1 Mo; C,B 12 Mo; Co 20 Mo		
	290	20	B 1 Mo; SvC,B 12 Mo; Co 20 Mo		

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-47 Epoxy Primer plus 3 coats 32 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	SB 12 Mo		
	203	20	SvB 1 Mo; C,B 12 Mo; Co 20 Mo		
	225	20	SvB 1 Mo; C,B 12 Mo; Co 20 Mo		
	250	20	SvB 1 Mo; C,B 12 Mo; Co 20 Mo		
	290	20	SvB 1 Mo; SvC,B 12 Mo; Co 20 Mo		
	Steam				
	100	20	Sat		
	203	20	SB 1 Mo; C,B 12 Mo; Co 20 Mo		
	225	20	SB 1 Mo; C,B 12 Mo; Co 20 Mo		
	250	20	SB 1 Mo; C,B 12 Mo; Co 20 Mo		
	290	20	SB 1 Mo; SvC,B 12 Mo; C 20 Mo		
C-48 Stainless Steel Primer plus 2 coats 7 mils	Brine				
	100	28	Erosion, Co 28 Mo		
	203	5	SB,C 2 Mo; C,P 3 Mo; SvC,P 5 Mo		
	225	1	SvC 1 Mo		
	250	6	B,C 3 Mo; SvC,B,P 6 Mo		
	290	1	B,C 1 Mo		
	D. Water				
	100	2	Erosion,Co 2 Mo		
	203	1	SvC,Co 1 Mo		
	225	1	Sv Erosion 1 Mo		
	250	2	Sv Erosion 1 Mo		
	290	1	Sv Erosion 1 Mo		
	Steam				
	100	2	SvC		
	203	1	SvC,P,Co 1 Mo		
	225	1	Sv Erosion 1 Mo		
	250	1	Sv Erosion 1 Mo		
	290	1	Sv Erosion 1 Mo		

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-49 Silicone Primer plus 2 coats 12 mils	Brine				
	100	27	Sat	27	Sat
	203	26	BF 11 Mo; SvBF 26 Mo	11	SvBF 3 Mo
	225	9	SvC,P 9 Mo	3	BF 1 Mo; C 2 Mo; SvBF 3 Mo
	250	3	B,P 3 Mo	4	SB 1 Mo; B,BF,P 4 Mo
	290	3	BF 3 Mo	1	BF,P 1 Mo
	D. Water				
	100	36	Sat	36	SBF 12 Mo; SvBF 36 Mo
	203	9	C,Co 1 Mo; BF 3 Mo	18	B,BF 1 Mo; SvBF 18 Mo
	225	6	B,BF,Co 1 Mo; SB 3 Mo	6	B,BF 1 Mo
	250	3	B,BF 1 Mo; BrB 3 Mo	1	BF,B 1 Mo
	290	1	BF,P,C,Co 1 Mo	1	BF,B 1 Mo
	Steam				
	100	36	Sat	36	BF 5 Mo; SvBF 36 Mo
	203	15	SB 4 Mo; BF 9 Mo; SvC 15 Mo	24	B,BF 1 Mo; SvBF 9 Mo
	225	12	B,BF,Co 1 Mo; SvB 3 Mo; Co 12 Mo	15	B,BF 1 Mo; SvC 15 Mo
	250	5	SB,Co 1 Mo; BF 3 Mo; SC 4 Mo	5	BF 1 Mo; SvBF 5 Mo
	290	1	B,P,Co 1 Mo	1	BF 1 Mo; C,P 2 Mo
C-50 Urethane 5 coats 5 mils	Brine				
	100	26	Sat	26	Sat
	203	2	SvB 1 Mo; BrB,Co 2 Mo	6	SB 1 Mo; SvC,P 6 Mo
	225	1	B,Co 1 Mo	1	BF,B,C 1 Mo
	250				
	290				
	D. Water				
	100	36	Sat	36	Sat
	203	1	SvB,Co 1 Mo	1	SvB,C 1 Mo
	225	1	SvB 1 Mo	1	SvB,C 1 Mo
	250				
	290				
	Steam				
	100	36	Sat	36	Sat
	203	1	SvB,Co 1 Mo	1	B,C 1 Mo
	225	1	SvB 1 Mo	1	SvBrB 1 Mo
	250				
	290				

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-51 Epoxy	Brine				
	100			25	Sat
	203			1	C,P 1 Mo
Manufacturer applied	225			1	C,P 1 Mo
	250			1	SvC,P 1 Mo
51 mils	290			1	SvC,P 1 Mo
	D. Water				
	100			36	Sat
	203			1	SvC 1 Mo
	225			1	SvC 1 Mo
	250			1	SvC 1 Mo
	290			1	SvC 1 Mo
	Steam				
	100			36	Sat
	203			1	SvC 1 Mo
	225			1	SvC 1 Mo
	250			1	SvC 1 Mo
	290			1	SvC 1 Mo
C-52 Sulfur	Brine				
	100			1	SvC 1 Mo
	203			1	B,C 1 Mo
Manufacturer applied	225			1	B,C 1 Mo
	250				
20 mils	290				
	D. Water				
	100				
	203			2	SvC 2 Mo
	225			1	SvC 1 Mo
	250			1	SvC 1 Mo
	290				
	Steam				
	100				
	203			5	C 3 Mo; SvC 5 Mo
	225			1	SvC 1 Mo
	250			1	SvC 1 Mo
	290				

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-55 Polyvinyl Fluoride Manufacturer applied 10 mils	Brine				
	100				
	203				
	225				
	250				
	290				
	D. Water				
	100				
	203				
	225				
	250	58	SB 1 Mo; SvB 58 Mo		
	290	21	B 1 Mo; BC 9 Mo; SvBrB 21 Mo		
	Steam				
	100	33	Sat		
	203	57	SB 57 Mo	2	C 1 Mo; SvC 2 Mo
	225	58	SB 45 Mo	58	P 58 Mo
	250	58	SB 3 Mo; B,C 45 Mo; B,SvC 58 Mo	58	SvC 58 Mo
	290			27	BrB 1 Mo; SvBrB 27 Mo
C-56 Polyvinylidene Fluoride Manufacturer applied 25 mils	Brine				
	100				
	203				
	225				
	250				
	290				
	D. Water				
	100				
	203				
	225				
	250	58	Sat		
	290	58	B 39 Mo; BrB,Co 58 Mo		
	Steam				
	100	33	Sat		
	203	57	Sat	57	SB 5 Mo; BrB,P 57 Mo
	225	58	Sat	39	SB 2 Mo; C,P 39 Mo
	250	58	Sat	33	SC 12 Mo; C,P 33 Mo
	290			27	SB,C 3 Mo; C,P 21 Mo

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-57 Epoxy Manufacturer applied 40 mils	Brine				
	100	13	Sat		
	203	12	Sat		
	225	21	Sat		
	250	42	Sat		
	290	38	Sat		
	D. Water				
	100	31	Sat		
	203	55	SB 3 Mo; BrB,Co 55 Mo		
	225	56	B 4 Mo; B,Cr 10 Mo; Co 56 Mo		
	250	56	B 1 Mo; SvB,C 56 Mo		
	290	37	B 1 Mo; SvB,C 25 Mo		
	Steam				
	100	31	Sat		
	203	55	SB 1 Mo; BrB,Co 55 Mo		
	225	56	SB 1 Mo; BrB,16 Mo		
	250	56	SB 1 Mo; B,Cr 43 Mo		
	290				
C-58 Epoxy 1 coat 40 mils	Brine				
	100				
	203				
	225				
	250				
	290				
	D. Water				
	100				
	203				
	225				
	250			3	SvC 3 Mo
	290	1	SvC,SCo 1 Mo	4	C 1 Mo
	Steam				
	100				
	203	3	SvC,Co 3 Mo		
	225	3	SvC,Co 3 Mo	3	SvC 3 Mo
	250	3	SvC,Co 3 Mo		
	290	4	C 4 Mo	4	SvC 1 Mo

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-59 Ceramic Zinc Primer plus 2 coats brushed 20 mils	Brine				
	100				
	203	6	B,C 6 Mo		
	225	12	B,C 12 Mo		
	250				
	290	6	B,BF 6 Mo		
	D. Water				
	100	27	Continuous Sv Chalking		
	203	3	Cz,P,Chalking 3 Mo		
	225	3	Cz,P,Chalking 3 Mo		
	250	3	Cz,P,Chalking 3 Mo		
	290	3	BF 3 Mo		
	Steam				
	100	27	Continuous Chalking		
	203	3	Cz,P,Chalking		
	225	3	Cz,P,Chalking		
	250	3	Cz,P,Chalking		
	290	3	BF 3 Mo		
C-60 Phenolic Primer plus 2 coats brushed 15 mils	Brine				
	100				
	203				
	225	15	Sat		
	250	39	Sat		
	290	32	SB,Co 32 Mo		
	D. Water				
	100	24	Sat		
	203	49	Sat		
	225	49	Sat		
	250	49	Sat		
	290	48	Sat		
	Steam				
	100	24	Sat		
	203	49	Sat		
	225	49	Sat		
	250	49	SBrB 49 Mo		
	290	48	Sat		

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-60 Phenolic	Brine				
	100				
	203				
Primer plus	225				
2 coats	250	13	SvC,P 13 Mo	25	Sat
brushed on	290	6	SvC,P 6 Mo	6	SvC 6 Mo
steel 20 mils	D. Water				
	100	20	SB 2 Mo; SC 18 Mo	20	Sat
Manufacturer	203	20	Sat	6	SvC,B 6 Mo
applied on	225	20	SC 20 Mo	6	SvC,B 6 Mo
concrete	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo
	Steam				
	100	20	Sat	20	Sat
	203	20	Sat	12	SvC,B 12 Mo
	225	20	SC 20 Mo	20	C 12 Mo; SvC 20 Mo
	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo
C-60 Phenolic	Brine				
	100				
	203				
Primer plus	225				
3 coats	250	13	SvC,P 13 Mo	25	SC 13 Mo
brushed	290	6	SvC,P 6 Mo	6	SvC 6 Mo
30 mils on steel	D. Water				
manufacturer	100	20	SB 3 Mo; B 18 Mo	20	Sat
applied on	203	20	B 2 Mo; C 6 Mo	6	SvC,B 6 Mo
concrete	225	20	SC 6 Mo; C 18 Mo	6	B 2 Mo; SvC 6 Mo
	250	1	SC 1 Mo	1	SC 1 Mo
	290	1	SC 1 Mo	1	SC 1 Mo
	Steam				
	100	20	SB 12 Mo	20	Sat
	203	20	B 2 Mo; C 6 Mo; Co 20 Mo	12	SC 12 Mo
	225	20	SC 3 Mo; C 18 Mo	6	B 2 Mo; SvC 6 Mo
	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo

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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-60 Phenolic	Brine				
	100				
	203				
Primer plus	225				
4 coats	250	13	SvC,P 13 Mo	25	SC 13 Mo
brushed	290	6	SvC,P 6 Mo	6	SvC 6 Mo
50 mils on					
steel manu-	D. Water				
facturer	100	20	B 6 Mo; C 18 Mo	20	Sat
applied on	203	20	B 2 Mo; Co 20 Mo	12	SC 12 Mo
concrete	225	20	SC,B 3 Mo; CB 12 Mo	6	B 1 Mo; SvC 6 Mo
	250	1	SC 1 Mo	1	SC 1 Mo
	290	1	SC 1 Mo	1	SC 1 Mo
	Steam				
	100	20	SB 6 Mo	20	Sat
	203	20	B 2 Mo; Co 20 Mo	18	SvC 18 Mo
	225	20	SC,B 3 Mo; CB 12 Mo	6	B 1 Mo; SvC 6 Mo
	250	1	SvC 1 Mo	1	SvC 1 Mo
	290	1	SvC 1 Mo	1	SvC 1 Mo
C-61 Phenolic	Brine				
	100				
	203				
Primer plus	225			15	SC 6 Mo
2 coats	250			36	Sat
10 mils	290			32	Sat
	D. Water				
	100			24	Sat
	203			18	B 3 Mo; SvB,C 18 Mo
	225			9	B,Co 3 Mo; SvB,C 9 Mo
	250			3	SvB,C 3 Mo
	290			3	SvC 3 Mo
	Steam				
	100			24	Sat
	203			18	SB 3 Mo; SvC 18 Mo
	225			12	SB,C 3 Mo; SvC 12 Mo
	250			3	SvB,C 3 Mo
	290			3	SvC 3 Mo

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Mo = Month
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Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-62 Epoxy Phenolic	Brine				
	100				
	203				
	225				
9 coats sprayed 10 mils	250	6	C 6 Mo		
	290	9	C 9 Mo	6	SvB,C 3 Mo
	D. Water				
	100				
	203	15	SvC 15 Mo	3	B,C 3 Mo
	225	27	SvC 27 Mo	6	B 3 Mo; SvC 6 Mo
	250	27	SvC 27 Mo	6	B 3 Mo; SvB,C 6 Mo
	290	9	SvC 9 Mo	6	B 3 Mo; B,C 6 Mo
	Steam				
	100				
	203	9	SC 6 Mo; SvC 9 Mo	6	B 3 Mo; SvC 6 Mo
	225	9	SvC 9 Mo	3	BrB 3 Mo
	250	9	SvC 9 Mo	6	B,C 3 Mo; SvC 6 Mo
	290	9	SvC 9 Mo		
C-63 Epoxy Phenolic	Brine				
	100				
	203				
	225	15	Sat		
Primer plus 2 coats brushed 10 mils	250	29	Sat		
	290	32	SBrB,Co 32 Mo		
	D. Water				
	100	24	Sat		
	203	49	Sat		
	225	49	Sat		
	250	49	Sat		
	290	36	Sat		
	Steam				
	100	24	Sat		
	203	49	Sat		
	225	49	Sat		
	250	49	Sat		
	290	48	Sat		

B = Blisters
BF = Bond Failure
Br = Broken
Co = Corrosion
C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-63 Epoxy Phenolic Primer plus 1 coat brushed 15 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	Sat		
	290	20	Sat		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	Sat		
	290	20	Sat		
C-63 Epoxy Phenolic Primer plus 2 coats brushed 22 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	SB 1 Mo		
	250	20	Sat		
	290	20	Sat		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	SB 1 Mo		
	250	20	Cz		
	290	20	Cz		

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-63 Epoxy Phenolic Primer plus 3 coats 30 mils	Brine				
	100				
	203				
	225				
	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	Sat		
	290	20	Sat		
	Steam				
	100	20	Sat		
	203	20	Sat		
	225	20	Sat		
	250	20	Cz 12 Mo; SvCz 20 Mo		
	290	20	Cz 12 Mo; SvCz 20 Mo		
C-64 Epoxy Phenolic Manufacturer applied 10 mils	Brine				
	100				
	203				
	225	9	Sat	9	C 6 Mo; SvC 9 Mo
	250	30	Sat	18	SC 6 Mo; SBrB,P 18 Mo
	290	32	SBrB,Co 32 Mo	3	SvC 3 Mo
	D. Water				
	100	18	Sat	18	Sat
	203	43	SB 12 Mo; BrB 43 Mo	6	BrB 3 Mo; SvBrB,C 6 Mo
	225	43	Sat	6	B,C 3 Mo; SvB,C 6 Mo
	250	43	SB 3 Mo	6	B 3 Mo; BrB 6 Mo
	290	42	SB 12 Mo; B 29 Mo	6	SvC 6 Mo
	Steam				
	100	18	Sat	18	Sat
	203	43	SB 24 Mo; B 43 Mo	6	C 3 Mo; SvC 6 Mo
	225	43	Sat	6	SC 3 Mo; SvC 6 Mo
	250	30	SB 3 Mo; B,C 24 Mo; BrB, C,Co 30 Mo	6	SvC 6 Mo
	290	12	SC 6 Mo	6	SvC 6 Mo

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Co = Corrosion
C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-65 Epoxy with Fiberglass	Brine				
	100				
	203				
	225	9	Sat	9	SB 9 Mo
1 - Primer	250	30	Sat	30	B,C,BF 30 Mo
1 - Base coat	290	29	Sat	29	B 6 Mo; SvB 29 Mo
1 - Embedment coat	D. Water				
1 - Finish coat	100	15	Sat		
	203	40	Sat		
	225	40	Sat		
Brushed 40 mils	250	40	SvB 40 Mo		
	290	18	BrB 8 Mo; Top coating only		
	Steam				
	100	15	Sat	15	Sat
	203	40	B 3 Mo	40	B 15 Mo; BrB 40 Mo
	225	40	Sat	40	B 3 Mo; B,BF 40 Mo
	250	40	SvB 40 Mo	27	B 3 Mo; C 15 Mo; SvC 27 Mo
	290	9	SvB 9 Mo	9	B 3 Mo; SvB 9 Mo
C-66 Acrylic Epoxy	Brine				
	100				
	203				
1 coat, 10 mils	225			3	C,P 3 Mo
	250	6	SvC,P 6 Mo	6	SvC 6 Mo
	290				
	D. Water				
	100				
	203				
	225				
	250				
	290				
	Steam				
	100				
	203				
	225				
	250				
	290				

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-67 Epoxy with glass flakes	Brine				
	100				
	203				
	225				
2 coats troweled 60 mils	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 18 Mo; Intercoat		
	225	20	B 1 Mo; Intercoat		
	250	20	B 1 Mo; Intercoat		
	290	1	SvB,C 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 3 Mo; Intercoat		
	225	20	B 1 Mo; Intercoat		
	250	20	B 1 Mo; Intercoat		
	290	6	SvB,C 6 Mo		
C-67 Epoxy with glass flakes	Brine				
	100				
	203				
	225				
2 coats troweled 80 mils	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 6 Mo; Intercoat		
	225	20	B 1 Mo; Intercoat		
	250	20	B 1 Mo; Intercoat		
	290	1	SvB,C 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 2 Mo; Intercoat		
	225	20	B 1 Mo; Intercoat		
	250	20	B 1 Mo; Intercoat		
	290	6	SvB,C 6 Mo		

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-67 Epoxy with glass flakes	Brine				
	100				
	203				
	225				
2 coats troweled 100 mils	250	25	Sat		
	290	20	Sat		
	D. Water				
	100	20	Sat		
	203	20	B 2 Mo; Intercoat		
	225	20	B 1 Mo; Intercoat		
	250	20	B 1 Mo; Intercoat		
	290	1	SvB,C 1 Mo		
	Steam				
	100	20	Sat		
	203	20	B 2 Mo; Intercoat		
	225	20	B 1 Mo; Intercoat		
	250	20	B 1 Mo; Intercoat		
	290	6	SvB,C 6 Mo		
C-68 Polyester with glass flakes	Brine				
	100				
	203				
	225				
	250	13	SvC,B 13 Mo		
2 coats troweled 60 mils	290	16	SvC,B,P 6 Mo		
	D. Water				
	100	20	Surface Cz 6 Mo		
	203	12	SvC 12 Mo		
	225	6	SvC,Co 6 Mo		
	250	1	SvC,Co 1 Mo		
	290	1	SvC,Co 1 Mo		
	Steam				
	100	20	Surface Cz 6 Mo		
	203	12	SvC 12 Mo		
	225	6	SvC,Co 6 Mo		
	250	6	SvC,Co 6 Mo		
	290	1	SvC,Co 1 Mo		

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C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 9 - Continued

Material and application data	Exposure environment and temp degrees F	Exposure time mo	Coating performance steel	Exposure time mo	Coating performance concrete
C-68 Polyester with glass flakes 2 coats 80 mils	Brine				
	100				
	203				
	225				
	250	13	SvC,B 13 Mo		
	290	6	SvC,B,P 6 Mo		
	D. Water				
	100	20	Surface Cz 6 Mo		
	203	12	SvC 12 Mo		
	225	6	SvC,Co 6 Mo		
	250	1	SvC,Co 1 Mo		
	290	1	SvC,Co 1 Mo		
	Steam				
	100	20	Surface Cz 6 Mo		
	203	12	SvC 12 Mo		
	225	6	SvC,Co 6 Mo		
	250	6	SvC,Co 6 Mo		
	290	1	SvC,Co 1 Mo		
C-68 Polyester with glass flakes 2 coats 100 mils	Brine				
	100				
	203				
	225				
	250	13	SvC,B,13 Mo		
	290	6	SvC,B,P 6 Mo		
	D. Water				
	100	20	Surface Cz 6 Mo		
	203	12	SvC 12 Mo		
	225	6	SvC,Co 6 Mo		
	250	1	SvC,Co 1 Mo		
	290	1	SvC,Co 1 Mo		
	Steam				
	100	20	Surface Cz 6 Mo		
	203	12	SvC 12 Mo		
	225	6	SvC,Co 6 Mo		
	250	6	SvC,Co 6 Mo		
	290	1	SvC,Co 1 Mo		

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Co = Corrosion
C = Cracking
Cz = Crazing
Mo = Month
P = Peeling
Sat = Satisfactory
S = Slight
Sv = Severe

Table 10

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 5

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	6.0	5.8	.066	53	1.42	67	250	2340	330
100 DEGREES FAHRENHEIT									
1	5.7	5.8	.068	50	1.43	67	240	2440	350
2	6.0	6.0	.068	56	1.42	67	250	2230	310
3	5.9	5.7	.066	51	1.44	71	200	2530	330
4	5.9	5.8	.065	50	1.45	71	220	2400	320
5	6.0	6.0	.067	54	1.45	70	220	2330	330
6	6.0	5.9	.066	53	1.45	70	180	2020	280
9	5.9	6.0	.065	53	1.44	71	180	2170	300
12	6.0	5.7	.067	53	1.44	70	170	1960	270
15	6.0	5.9	.067	53	1.45	71	160	2190	290
18	6.0	5.9	.067	54	1.45	71	190	2600	310
24	6.0	5.8	.066	53	1.46	70	190	1870	280
31	5.9	6.0	.065	53	1.46	71	170	2150	320
203 DEGREES FAHRENHEIT									
1	6.0	6.1	.069	56	1.42	67	220	2310	300
2	6.0	5.8	.066	54	1.43	69	220	2500	320
3	5.9	5.8	.066	52	1.44	72	180	2420	290
4	5.7	5.6	.066	49	1.45	72	180	2490	310
5	5.8	5.9	.066	51	1.46	72	140	1940	250
6	5.8	6.0	.066	53	1.46	72	180	2570	300
9	5.9	5.7	.065	51	1.45	73	130	2470	280
14	5.6	6.1	.064	50	1.44	71	160	2100	240
17	5.6	5.7	.066	49	1.53	74	140	1550	170
24	5.7	5.7	.066	51	1.47	72	140	2270	240
30	5.9	5.8	.066	53	1.47	72	140	2060	210
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.069	55	1.42	67	250	2400	130
2	5.7	5.9	.068	53	1.43	68	190	2190	290
3	5.9	5.9	.066	52	1.45	73	200	2110	260
4	5.7	6.1	.065	52	1.45	73	150	2300	290
5	5.9	5.8	.066	52	1.46	73	170	1410	180
6	5.9	6.0	.066	54	1.44	72	180	2470	280
9	5.9	5.8	.066	53	1.43	73	170	2160	240
12	6.0	6.0	.065	55	1.42	74	130	2160	220
15	5.7	5.7	.066	50	1.47	74	100	1860	170
18	5.8	5.8	.066	52	1.46	75	110	2040	180
24	5.9	5.9	.065	53	1.46	75	120	2080	160
42	5.8	5.8	.066	52	1.49	82	120	1170	80
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.067	53	1.42	69	210	2310	290
2	6.0	5.9	.068	56	1.43	70	180	2440	260
3	5.9	5.8	.065	51	1.45	73	170	2430	250
4	5.9	5.7	.066	51	1.46	74	170	2120	250
5	6.0	5.8	.067	53	1.47	74	160	1530	170
6	5.9	6.1	.067	55	1.44	73	120	2000	210
9	6.1	5.9	.066	57	1.42	75	110	1750	180
12	5.9	5.8	.065	51	1.47	74	120	2030	200
15	5.8	5.8	.066	51	1.47	76	140	2450	180
18	5.8	5.9	.066	52	1.49	77	120	1820	140
24	5.8	5.8	.065	51	1.48	77	90	2030	170
58	6.6	6.7	.074	71	1.31	68	50	1160	120
290 DEGREES FAHRENHEIT									
1	6.0	6.4	.074	63	1.34	68	100	1360	170
2	6.0	5.9	.069	55	1.40	74	90	1830	190
3	6.0	6.1	.066	53	1.42	75	140	1500	150
4	6.0	6.1	.067	55	1.41	74	90	1780	160
5	6.3	6.1	.069	62	1.35	74	100	1250	130
9	6.0	5.9	.068	55	1.38	77	80	1110	90
14	5.9	6.1	.068	53	1.41	80	90	960	60
18	6.1	6.1	.068	53	1.40	78	50	370	30
56	6.3	6.2	.072	56	1.34	81	50	320	15

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 6

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.086	55	1.13	55	170	2080	320
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.084	55	1.14	55	130	2240	330
2	5.9	5.9	.087	57	1.14	55	150	2340	330
3	5.9	5.9	.085	55	1.14	57	120	2300	340
4	5.9	5.9	.089	60	1.15	55	130	2390	350
5	5.9	5.9	.084	55	1.14	57	140	2200	350
6	6.0	5.9	.085	57	1.14	57	130	2280	350
9	5.9	5.9	.083	54	1.14	55	120	2010	320
12	6.0	5.9	.084	56	1.14	55	70	1880	280
15	6.0	5.9	.084	55	1.14	55	90	2210	320
18	6.0	5.9	.093	60	1.14	55	110	2170	300
24	5.9	5.9	.085	58	1.14	56	160	2000	300
31	5.9	6.0	.086	57	1.14	57	90	2210	320
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.084	59	1.14	56	180	2250	340
2	6.0	6.0	.088	60	1.13	55	140	1990	290
3	6.0	6.0	.082	56	1.14	58	100	2230	310
4	6.0	6.0	.086	59	1.14	59	150	2140	300
5	6.0	6.0	.087	58	1.14	57	130	2210	280
6	6.0	6.0	.092	61	1.14	57	170	2180	290
9	6.0	6.0	.089	59	1.14	58	90	1920	250
14	6.1	6.0	.096	64	1.13	57	100	1980	250
17	6.0	5.9	.092	58	1.18	59	80	1950	240
24	6.0	6.0	.085	58	1.14	61	70	2010	260
30	6.0	6.0	.093	62	1.14	58	80	1830	220
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.082	56	1.14	56	120	2160	310
2	6.0	6.1	.081	59	1.14	57	90	1730	270
3	6.0	6.1	.085	58	1.14	59	110	2020	280
4	6.0	6.0	.089	61	1.14	59	110	2060	280
5	6.1	6.0	.103	69	1.14	58	110	2040	270
6	6.1	6.0	.083	58	1.14	61	90	2070	280
9	6.1	6.0	.090	63	1.14	58	100	1970	260
12	6.0	6.0	.084	59	1.14	60	70	1840	240
15	6.0	6.0	.087	58	1.14	60	80	1920	210
18	5.9	5.9	.088	57	1.15	61	90	2030	220
24	6.0	6.0	.085	57	1.14	61	80	1930	230
42	6.0	6.0	.089	60	1.15	61	80	1890	210
250 DEGREES FAHRENHEIT									
1	6.0	6.0	.087	58	1.14	56	160	2230	300
2	6.0	6.0	.081	57	1.14	58	130	2110	270
3	6.0	6.0	.086	59	1.14	58	100	1990	270
4	6.1	6.0	.081	55	1.14	60	90	2000	250
5	6.1	6.0	.087	59	1.14	60	80	2020	270
6	6.0	6.0	.084	57	1.14	60	90	2000	260
9	6.1	6.0	.098	66	1.14	60	70	1950	230
12	6.0	5.9	.089	57	1.15	61	110	1740	220
15	6.0	6.0	.083	55	1.14	60	90	2000	220
18	6.0	5.9	.079	56	1.15	58	70	1970	220
24	6.0	5.9	.082	56	1.14	60	70	1960	220
58	6.6	6.6	.092	74	1.11	57	50	1110	130
290 DEGREES FAHRENHEIT									
1	6.3	6.2	.106	74	1.12	56	70	1590	210
2	6.2	6.2	.092	66	1.12	57	70	1330	200
3	6.2	6.2	.096	66	1.12	59	90	1320	180
4	6.2	6.2	.091	65	1.12	59	90	1460	200
5	6.2	6.2	.085	62	1.12	62	70	1520	210
9	6.2	6.2	.082	60	1.13	58	60	1440	170
12	6.4	6.3	.091	70	1.12	59	50	1260	180
14	6.2	6.1	.092	64	1.12	58	90	1500	200
18	6.3	6.3	.088	66	1.12	56	50	1470	170
24	6.0	6.0	.087	57	1.14	59	70	1680	190
56	6.3	6.2	.086	64	1.16	53	60	1080	170

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 7

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.085	56	1.15	67	240	2020	350
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.084	58	1.15	66	230	2130	390
2	5.9	5.9	.084	57	1.15	67	260	2170	400
3	5.9	5.9	.091	59	1.15	67	260	2120	360
4	5.9	5.9	.085	58	1.14	66	210	2220	410
5	5.9	5.9	.087	58	1.16	67	270	2100	400
6	5.9	5.9	.090	59	1.15	68	190	2100	420
9	5.9	5.9	.095	62	1.15	66	190	1920	330
12	5.9	5.9	.092	61	1.16	65	180	2030	350
15	5.9	5.9	.080	55	1.16	64	190	2020	350
18	5.9	5.9	.082	56	1.16	65	160	2120	400
24	5.9	5.9	.084	56	1.16	67	310	1980	340
31	5.9	5.9	.090	59	1.16	67	200	2030	350
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.086	56	1.15	67	240	2090	330
2	5.9	5.9	.087	58	1.15	66	220	2060	380
3	5.9	5.9	.100	65	1.16	63	190	2130	370
4	5.9	5.9	.092	60	1.16	69	240	2120	350
5	5.9	5.9	.084	55	1.16	68	220	2190	380
6	5.9	5.9	.090	58	1.16	67	180	2110	400
9	5.9	5.9	.082	55	1.16	66	150	2000	350
14	5.9	5.9	.086	56	1.16	67	220	2020	350
17	5.9	5.9	.085	62	1.19	63	170	2190	360
24	5.9	5.9	.092	63	1.16	65	180	2090	360
30	5.9	5.9	.085	57	1.17	67	170	2150	370
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.084	55	1.16	68	260	2090	400
2	5.9	5.9	.083	56	1.16	68	230	2190	370
3	6.0	6.0	.082	55	1.16	70	220	2240	360
4	5.9	5.9	.084	55	1.16	70	150	2230	330
5	6.0	6.0	.084	56	1.16	69	220	2110	360
6	5.9	5.9	.085	60	1.16	68	210	2160	330
9	5.9	5.9	.090	59	1.16	68	250	2160	340
12	5.9	5.9	.087	57	1.16	68	160	2040	320
15	5.9	5.9	.090	59	1.16	67	170	2190	330
18	5.9	5.9	.084	56	1.16	68	150	2230	310
24	5.9	5.9	.085	58	1.16	67	200	2210	330
42	5.9	5.9	.085	56	1.17	68	230	2070	360
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.089	58	1.16	67	250	2160	340
2	5.9	5.9	.082	55	1.16	69	230	2290	340
3	5.9	6.0	.085	56	1.16	70	170	2250	320
4	5.9	5.9	.087	58	1.16	70	170	2280	310
5	5.9	5.9	.089	57	1.16	69	200	2200	350
6	5.9	5.9	.087	57	1.16	69	220	2250	330
9	5.9	5.9	.083	56	1.16	69	150	2250	270
12	5.9	5.9	.086	57	1.16	68	170	2130	350
15	5.9	5.9	.086	58	1.17	68	150	2280	310
18	5.9	5.9	.088	58	1.16	67	150	2310	300
24	5.9	5.9	.088	58	1.16	68	160	2260	320
58	6.1	6.1	.088	64	1.14	65	170	2020	330
290 DEGREES FAHRENHEIT									
1	6.0	6.0	.086	60	1.15	67	170	2250	320
2	6.0	6.0	.086	60	1.15	67	190	2330	300
3	6.0	6.0	.086	58	1.15	69	160	2340	290
4	6.0	5.9	.089	60	1.15	69	180	2340	280
5	6.0	6.0	.089	60	1.15	68	200	2230	310
6	6.0	6.0	.086	62	1.15	65	150	2260	270
9	6.0	6.0	.090	63	1.15	65	160	2240	280
12	6.0	6.0	.086	64	1.15	64	110	2200	290
14	6.0	5.9	.089	59	1.16	68	270	2360	280
18	6.0	6.0	.084	58	1.15	66	140	2340	270
24	5.9	5.9	.095	64	1.16	67	170	2370	270
56	6.1	6.0	.086	63	1.21	64	130	2130	260

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 9

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.092	57	1.12	60	210	2020	350
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.089	57	1.12	60	190	2050	360
2	5.9	5.9	.086	56	1.12	60	210	2050	360
3	5.9	5.9	.092	58	1.13	62	190	1980	330
4	5.9	5.9	.084	56	1.12	62	200	2010	340
5	5.9	5.9	.090	58	1.13	60	180	1860	320
6	5.9	5.9	.087	58	1.13	61	160	1780	310
9	5.9	5.9	.087	57	1.13	60	150	1910	330
12	5.9	5.9	.091	60	1.13	58	150	1880	320
15	5.9	5.9	.090	58	1.13	59	220	1950	330
18	5.9	5.9	.089	57	1.13	58	140	1860	280
24	5.9	5.9	.092	59	1.13	59	220	1950	330
31	5.9	5.9	.093	61	1.13	59	160	1790	310
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.090	59	1.13	57	240	1960	330
2	6.0	6.0	.095	63	1.13	59	160	1800	300
3	6.0	6.0	.095	65	1.12	59	180	1880	300
4	6.0	6.0	.092	61	1.13	63	80	1920	280
5	6.0	6.0	.093	61	1.13	62	170	1830	280
6	6.0	6.0	.088	60	1.13	61	160	1870	290
9	6.0	6.0	.093	64	1.12	60	150	1670	240
14	6.1	6.1	.090	63	1.12	60	120	1630	240
17	6.1	6.1	.095	63	1.16	61	110	1810	250
24	6.1	6.0	.099	68	1.13	61	110	1530	220
30	6.1	6.1	.094	64	1.13	59	90	1640	250
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.097	62	1.13	59	210	1870	310
2	6.0	6.1	.090	61	1.13	62	160	1850	290
3	6.1	6.1	.086	61	1.13	62	180	1910	300
4	6.1	6.0	.098	67	1.13	61	130	1890	290
5	6.1	6.1	.096	66	1.13	62	140	1660	280
6	6.1	6.1	.092	64	1.13	63	150	1570	250
9	6.2	6.1	.093	67	1.12	61	130	1610	240
12	6.1	6.1	.096	67	1.13	62	110	1510	220
15	6.1	6.1	.092	63	1.13	63	120	1670	210
18	5.9	6.0	.088	60	1.13	63	110	1830	220
24	6.1	6.1	.092	62	1.13	64	120	1700	230
42	6.1	6.1	.086	60	1.14	65	110	1550	210
250 DEGREES FAHRENHEIT									
1	6.0	6.0	.091	61	1.13	61	240	1830	290
2	6.0	6.1	.090	62	1.13	60	150	1860	270
3	6.1	6.1	.090	62	1.13	63	140	1850	280
4	6.0	6.1	.087	61	1.13	62	160	1900	280
5	6.1	6.1	.084	57	1.13	64	160	1740	270
6	6.1	6.1	.089	62	1.13	64	140	1740	270
9	6.1	6.1	.087	60	1.12	64	130	1700	280
12	6.1	6.0	.093	62	1.13	64	120	1550	210
15	6.0	6.1	.090	61	1.13	63	100	1650	210
18	6.1	6.0	.091	63	1.14	62	100	1600	190
24	6.0	6.1	.097	68	1.13	63	90	1520	190
58	6.8	6.8	.100	89	1.09	56	60	900	100
290 DEGREES FAHRENHEIT									
1	6.5	6.5	.107	78	1.10	58	110	1020	180
2	6.4	6.3	.094	68	1.11	62	100	1270	190
3	6.3	6.2	.096	70	1.11	62	70	1630	210
4	6.3	6.3	.092	68	1.11	62	120	1380	190
5	6.4	6.3	.096	71	1.10	60	80	1260	200
6	6.2	6.2	.094	67	1.12	60	60	1300	180
9	6.2	6.2	.092	64	1.11	59	70	1400	200
12	6.5	6.4	.095	76	1.10	58	50	1050	140
14	6.3	6.3	.094	67	1.11	62	130	1270	170
18	6.4	6.3	.089	72	1.10	59	70	1190	150
24	6.1	6.1	.094	65	1.12	61	90	1440	170
56	6.3	6.3	.101	78	1.15	56	70	1050	150

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 11

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.077	50	1.17	69	230	1690	430
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.079	52	1.18	72	220	1820	420
2	5.9	5.9	.077	49	1.18	73	240	1860	380
3	5.9	5.9	.079	52	1.18	72	250	1750	350
4	5.9	5.9	.083	52	1.18	71	230	1720	340
5	5.8	5.9	.078	50	1.19	72	260	1700	340
6	5.9	5.9	.082	51	1.18	72	200	1750	380
9	5.8	5.8	.078	51	1.18	72	220	1770	350
12	5.8	5.8	.078	51	1.19	71	210	1790	340
15	5.8	5.9	.078	50	1.19	69	180	1780	340
18	5.8	5.8	.078	51	1.18	70	170	1730	350
24	5.8	5.8	.080	50	1.18	71	290	1770	340
31	5.8	5.8	.079	51	1.19	72	220	1780	340
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.077	51	1.19	72	210	1890	340
2	5.8	5.9	.078	51	1.19	72	230	1850	340
3	5.9	5.9	.078	50	1.19	74	200	1810	310
4	5.8	5.9	.078	52	1.19	75	230	1850	300
5	5.9	5.9	.081	53	1.20	73	240	1770	280
6	5.9	5.9	.081	52	1.19	73	210	1700	310
9	5.8	5.8	.079	51	1.19	73	190	1800	300
14	5.8	5.9	.086	52	1.20	71	150	1810	270
17	5.9	5.9	.076	52	1.25	73	160	1860	260
24	5.9	5.9	.081	53	1.21	70	160	1880	290
30	5.9	5.9	.081	54	1.20	71	160	1820	280
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.074	50	1.19	73	310	1850	360
2	5.9	5.9	.077	51	1.19	71	200	1860	290
3	5.9	5.9	.080	51	1.19	73	210	1890	310
4	5.8	5.9	.079	51	1.19	75	190	1760	250
5	5.9	5.9	.080	53	1.20	75	190	1710	250
6	5.9	5.9	.079	53	1.20	72	230	1860	300
9	5.9	5.9	.080	53	1.20	74	140	1820	230
12	5.8	5.9	.083	54	1.20	74	150	1770	240
15	5.9	5.9	.080	52	1.21	72	150	1730	220
18	5.8	5.9	.078	53	1.20	72	140	1940	240
24	5.9	5.9	.083	53	1.21	70	170	1960	280
42	5.9	5.9	.080	54	1.23	73	140	1850	220
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.077	51	1.19	72	260	1830	330
2	5.9	5.9	.081	53	1.19	74	210	1760	250
3	5.9	5.9	.079	51	1.19	75	190	1790	240
4	5.9	5.9	.077	51	1.20	74	180	1810	280
5	5.9	5.9	.079	53	1.20	74	180	1850	280
6	5.9	5.9	.081	53	1.21	74	220	1620	240
9	5.9	5.9	.079	52	1.21	74	250	1770	240
12	5.8	5.9	.083	53	1.21	74	250	1700	250
15	5.9	5.9	.077	51	1.21	73	140	1790	240
18	5.9	5.9	.080	54	1.22	71	140	1750	180
24	5.8	5.8	.081	53	1.20	69	150	1640	280
58	5.7	5.8	.080	49	1.20	71	170	1740	240
290 DEGREES FAHRENHEIT									
1	5.9	6.0	.085	58	1.18	70	210	1750	270
2	5.9	5.9	.079	53	1.19	72	200	1830	250
3	5.9	5.9	.077	50	1.19	74	170	1560	220
4	5.9	5.9	.080	51	1.19	71	210	1630	230
5	5.9	5.9	.085	54	1.18	73	150	1760	260
6	5.9	5.9	.078	51	1.19	75	130	1750	240
9	5.9	5.9	.079	51	1.19	72	150	1740	200
12	5.9	5.9	.082	52	1.19	71	120	1660	220
14	5.9	5.8	.082	51	1.21	74	250	1740	210
18	5.8	5.8	.078	49	1.20	75	130	1820	200
24	5.8	5.9	.082	52	1.20	74	140	1830	220
56	5.7	5.8	.079	52	1.22	70	160	1720	170

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 17

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.080	51	1.14	72	230	2170	300
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.087	54	1.15	71	230	1940	270
2	5.9	5.9	.080	54	1.15	70	190	2150	310
3	5.9	5.9	.083	53	1.15	72	230	2160	340
4	5.9	5.9	.077	50	1.15	72	210	2150	300
5	5.9	5.9	.077	49	1.15	72	260	2030	280
6	5.9	5.9	.077	51	1.15	72	210	2140	320
9	5.8	5.8	.078	50	1.14	72	160	2060	290
12	5.8	5.9	.084	55	1.15	70	150	2110	280
15	5.9	5.9	.079	50	1.15	69	160	2080	290
18	5.8	5.9	.084	52	1.15	70	160	2180	310
24	5.9	5.8	.077	50	1.15	71	330	2000	260
31	5.8	5.8	.079	51	1.15	71	180	2060	290
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.083	55	1.15	69	270	2050	300
2	5.9	5.9	.087	56	1.15	70	220	1930	270
3	5.9	5.9	.079	50	1.15	74	200	2180	290
4	5.8	5.9	.081	50	1.15	73	200	2200	290
5	5.9	5.9	.080	51	1.16	72	240	2130	320
6	5.9	5.9	.081	53	1.15	73	200	2090	280
9	5.8	5.8	.077	50	1.16	73	170	2110	280
14	5.9	5.9	.078	50	1.16	73	160	2090	260
17	5.9	5.9	.075	49	1.20	71	140	2200	280
24	5.8	5.8	.087	54	1.16	72	190	2160	260
30	5.8	5.9	.082	52	1.16	69	160	2110	260
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.076	50	1.16	71	200	1940	280
2	5.9	5.9	.081	54	1.15	72	200	2090	300
3	5.9	5.9	.078	52	1.15	75	230	2180	270
4	5.9	5.9	.079	49	1.15	75	190	2210	280
5	5.9	5.9	.081	54	1.16	73	160	1960	230
6	5.9	5.9	.078	51	1.16	74	220	2040	250
9	5.8	5.8	.083	53	1.15	73	150	2030	230
12	5.8	5.8	.079	52	1.16	73	160	2030	260
15	5.8	5.8	.075	49	1.17	73	150	1920	210
18	5.8	5.8	.087	55	1.16	73	140	2210	220
24	5.8	5.8	.075	50	1.17	73	170	2130	230
42	5.8	5.9	.080	51	1.17	71	140	2120	240
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.086	55	1.16	73	290	2100	280
2	5.9	5.9	.076	50	1.15	72	180	2190	250
3	5.9	5.9	.077	50	1.16	75	160	2130	240
4	5.8	5.9	.079	50	1.16	75	190	2180	260
5	5.9	5.9	.077	49	1.16	75	150	2200	270
6	5.8	5.8	.075	49	1.16	76	220	2160	260
9	5.8	5.8	.077	50	1.16	76	180	2180	220
12	5.9	5.9	.080	53	1.17	74	180	1990	230
15	5.8	5.8	.079	49	1.17	77	140	1990	200
18	5.8	5.8	.080	49	1.17	75	130	2210	220
24	5.8	5.8	.081	52	1.16	73	150	2270	250
58	5.9	5.9	.088	56	1.16	68	140	2040	230
290 DEGREES FAHRENHEIT									
1	5.8	5.8	.081	51	1.16	74	200	2160	210
2	5.8	5.8	.081	52	1.16	76	170	2320	230
3	5.7	5.8	.083	52	1.16	78	190	2370	220
4	5.7	5.7	.078	48	1.16	77	230	2140	200
5	5.7	5.8	.079	51	1.15	75	160	2120	220
6	5.8	5.8	.079	50	1.16	75	150	2050	200
9	5.8	5.8	.085	52	1.16	74	130	2240	200
12	5.7	5.7	.074	46	1.17	79	130	2000	200
14	5.8	5.7	.080	48	1.16	78	290	2200	190
18	5.7	5.7	.076	47	1.16	79	150	2160	180
24	5.7	5.7	.077	48	1.16	78	150	2040	190
56	5.7	5.7	.086	53	1.18	77	180	1950	160

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 18

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.055	40	1.33	68	230	1270	460
100 DEGREES FAHRENHEIT									
1	6.0	6.0	.055	41	1.33	65	220	1170	390
2	5.9	5.9	.056	40	1.32	67	220	1450	450
3	6.1	5.8	.055	40	1.32	71	210	1370	480
4	5.8	5.8	.053	37	1.34	71	200	2850	480
5	6.0	5.9	.055	40	1.34	69	220	1340	460
6	6.0	5.9	.055	40	1.34	73	220	1290	420
9	5.9	6.0	.055	40	1.33	71	200	1080	350
12	5.9	5.8	.055	39	1.34	70	180	1280	400
15	5.9	5.9	.055	39	1.35	73	180	1290	400
18	5.9	5.8	.054	39	1.35	70	180	1360	430
24	5.7	5.8	.053	38	1.34	70	230	1370	420
31	6.0	5.8	.054	40	1.33	70	200	1420	460
203 DEGREES FAHRENHEIT									
1	6.1	5.9	.056	41	1.32	66	230	1520	460
2	6.0	6.1	.055	42	1.32	67	210	1160	420
3	6.0	5.8	.054	39	1.34	73	210	1240	420
4	5.9	6.0	.053	38	1.34	72	190	1160	380
5	5.8	5.9	.054	38	1.34	73	240	1230	410
6	6.0	5.8	.053	39	1.34	72	230	1450	480
9	6.0	5.7	.054	39	1.33	74	230	1330	390
14	5.9	5.9	.055	39	1.31	68	180	1300	360
17	5.9	5.8	.055	39	1.41	71	170	1390	350
24	5.9	6.0	.053	40	1.33	73	150	1210	280
30	6.2	5.9	.056	44	1.30	69	150	1420	350
225 DEGREES FAHRENHEIT									
1	6.1	5.9	.056	42	1.32	64	270	1570	490
2	6.0	6.1	.057	43	1.32	65	230	1450	480
3	6.1	5.8	.054	40	1.34	74	230	1270	380
4	6.0	5.8	.055	40	1.34	75	210	1360	390
5	5.9	6.0	.055	40	1.34	75	160	1100	310
6	6.3	5.9	.057	45	1.30	70	160	1420	410
9	6.7	6.4	.056	54	1.22	66	100	760	190
12	6.2	6.3	.056	47	1.28	70	130	1060	240
15	6.3	6.0	.056	43	1.30	70	150	1380	290
18	6.1	5.9	.058	44	1.30	72	140	1500	240
24	5.9	5.9	.056	41	1.30	73	160	1600	270
42	6.1	5.9	.053	39	1.33	79	160	1420	200
250 DEGREES FAHRENHEIT									
1	6.1	5.9	.058	44	1.31	65	250	1580	480
2	6.1	6.0	.058	44	1.30	71	240	1560	360
3	5.9	6.0	.055	40	1.32	73	190	1120	320
4	5.9	6.1	.056	42	1.33	74	180	1150	310
5	6.0	6.2	.055	42	1.33	73	150	1130	310
6	6.1	6.2	.056	45	1.29	73	160	1090	290
9	6.4	6.4	.057	53	1.24	71	110	1150	250
12	6.1	6.1	.056	43	1.31	71	170	970	220
15	5.9	6.1	.054	39	1.33	73	130	1100	220
18	6.1	5.8	.052	39	1.35	76	140	1390	220
24	6.1	5.9	.054	40	1.34	76	140	1390	220
58	7.4	7.4	.074	70	1.14	57	20	220	30
290 DEGREES FAHRENHEIT									
1	9.7	9.7	.080	141	1.07	47	40	170	98
2	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 19

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.8	.136	82	1.08	33	130	980	50
100 DEGREES FAHRENHEIT									
1	5.8	6.1	.139	87	1.09	26	120	630	80
2	6.4	5.9	.131	88	1.09	36	170	750	110
3	5.8	6.1	.141	85	1.09	38	200	730	45
4	5.8	6.1	.145	89	1.09	36	160	600	57
5	5.6	6.1	.139	83	1.09	31	110	650	75
6	6.0	5.8	.139	86	1.11	43	160	620	56
9	6.3	5.8	.134	87	1.11	46	200	870	20
12	5.6	6.1	.147	88	1.11	45	190	790	35
15	5.9	6.0	.144	92	1.14	44	170	650	25
18	6.3	5.8	.141	97	1.15	92	250	990	10
24	5.8	6.3	.141	94	1.14	87	170	650	15
31	6.0	6.1	.137	96	1.16	91	160	610	30
203 DEGREES FAHRENHEIT									
1	5.7	6.6	.142	96	1.10	47	250	1130	33
2	6.1	5.7	.137	88	1.11	56	380	1620	15
3	6.2	5.8	.137	86	1.10	56	320	1800	4
4	6.1	5.8	.141	87	1.12	60	330	1690	4
5	5.7	6.3	.139	88	1.11	55	210	1330	6
6	5.9	6.1	.140	88	1.11	52	280	1290	7
7	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225 DEGREES FAHRENHEIT									
1	6.4	5.9	.136	90	1.12	55	340	1420	23
2	5.9	5.9	.136	86	1.13	58	350	1580	14
3	5.8	5.6	.150	82	1.13	59	320	1480	8
4	5.7	6.1	.145	89	1.14	63	270	1760	4
5	5.8	6.1	.141	87	1.13	60	280	1520	3
6	5.9	5.9	.138	88	1.13	58	260	1480	4
7	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	5.4	6.1	.142	86	1.11	55	300	1290	2
2	5.9	6.1	.140	87	1.12	51	240	1370	2
3	5.9	5.9	.136	86	1.12	60	290	1740	4
4	5.8	6.0	.147	90	1.13	62	310	1310	2
5	5.8	5.8	.140	85	1.13	63	330	1870	4
6	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	5.9	6.1	.138	93	1.13	54	320	1450	1
2	5.6	6.7	.148	84	1.12	45	280	1120	3
3	6.0	6.0	.139	93	1.12	59	280	1320	2
4	5.8	6.5	.154	97	1.10	51	240	1220	4
5	5.9	6.1	.152	92	1.11	50	200	990	5
6	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 20

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	6.0	6.1	.062	39	1.13	59	280	1390	560
100 DEGREES FAHRENHEIT									
1	6.0	6.0	.060	40	1.14	59	220	1570	590
2	6.0	6.0	.062	40	1.14	58	260	1630	450
3	5.9	6.0	.060	38	1.12	58	280	1580	590
4	6.0	6.1	.060	39	1.13	58	280	1480	590
5	5.8	5.9	.063	37	1.13	58	290	1490	530
6	6.0	6.0	.062	40	1.16	64	240	1550	410
9	5.9	6.0	.060	38	1.14	63	210	1520	390
12	6.1	6.0	.061	40	1.16	62	230	1540	390
15	5.8	6.0	.062	38	1.15	59	190	1600	400
18	6.0	6.0	.060	39	1.15	65	200	1750	450
24	5.9	5.9	.063	39	1.14	59	280	1650	420
31	6.0	5.9	.063	40	1.17	58	230	1660	420
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.063	40	1.15	62	260	1520	440
2	5.8	5.9	.062	39	1.16	63	260	1660	380
3	5.9	6.1	.062	39	1.15	66	260	1650	460
4	6.1	5.9	.061	37	1.14	65	240	1750	490
5	5.8	6.1	.062	39	1.17	66	210	1770	390
6	5.8	5.9	.060	37	1.16	62	260	1580	530
9	5.9	6.0	.061	38	1.15	62	210	1590	340
14	5.9	5.9	.061	38	1.18	66	210	1700	350
17	6.0	5.9	.063	41	1.24	70	150	1650	350
24	5.8	5.7	.061	38	1.20	69	170	1640	310
30	5.7	5.9	.061	38	1.20	65	160	1870	300
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.063	40	1.14	58	280	1470	470
2	5.9	5.9	.063	38	1.14	55	270	1480	530
3	5.9	5.9	.061	37	1.14	60	290	1570	520
4	5.9	6.1	.061	39	1.15	66	170	1710	420
5	5.9	5.9	.064	40	1.17	66	190	1600	400
6	5.9	5.9	.062	39	1.16	63	230	1490	390
9	5.7	5.7	.061	36	1.17	67	180	1660	310
12	5.8	5.7	.060	36	1.18	69	140	1600	350
15	5.8	6.0	.061	39	1.18	64	160	1550	340
18	5.8	5.9	.061	38	1.18	65	170	1310	290
24	5.9	5.7	.061	38	1.20	72	160	1670	330
42	5.9	5.8	.062	41	1.25	61	150	1480	370
250 DEGREES FAHRENHEIT									
1	5.9	6.0	.062	40	1.15	61	280	1570	500
2	5.9	5.9	.062	38	1.15	64	280	1760	440
3	5.9	5.9	.062	39	1.15	66	180	1490	350
4	5.9	6.0	.062	40	1.17	63	250	1800	410
5	6.0	6.0	.060	39	1.17	68	200	1570	360
6	5.7	5.9	.061	37	1.17	64	210	1540	390
9	5.9	5.7	.061	38	1.18	69	180	1680	280
12	5.8	5.8	.062	39	1.20	67	160	1640	330
15	5.8	6.1	.062	39	1.20	70	140	1530	310
18	5.7	5.9	.062	38	1.21	65	130	1590	380
24	5.9	5.9	.063	41	1.21	63	150	1740	330
58	5.5	5.5	.057	33	1.23	83	160	1800	250
290 DEGREES FAHRENHEIT									
1	5.9	5.9	.063	39	1.18	70	120	1400	320
2	5.7	5.7	.058	35	1.20	80	190	1120	260
3	5.6	5.6	.056	33	1.20	80	190	1720	230
4	5.4	5.7	.056	31	1.19	76	230	1160	210
5	5.6	5.8	.059	34	1.18	74	140	1510	290
6	5.8	5.7	.055	33	1.20	83	150	1540	240
9	5.4	5.5	.058	31	1.20	78	170	1450	250
12	5.5	5.5	.056	32	1.22	78	150	1770	240
14	5.4	5.4	.057	29	1.20	80	260	1660	230
18	5.5	5.5	.054	31	1.22	84	160	1890	210
24	5.6	5.5	.056	33	1.22	87	200	1570	170
56	5.5	5.4	.054	31	1.27	87	230	1150	120

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 21

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.066	48	1.26	61	230	1100	700
100 DEGREES FAHRENHEIT									
1	5.9	5.8	.057	45	1.26	61	190	1120	750
2	5.9	5.9	.067	50	1.26	63	210	1090	760
3	5.9	5.9	.065	48	1.26	63	200	1120	760
4	5.9	5.9	.071	53	1.26	64	190	1140	730
5	5.9	5.9	.054	46	1.27	62	190	1080	730
6	5.9	5.9	.068	50	1.27	65	200	1080	750
9	5.9	5.8	.064	46	1.26	62	180	1090	750
12	5.9	5.8	.064	46	1.27	63	220	1230	660
15	5.9	5.9	.064	48	1.27	63	210	1070	640
18	5.9	5.9	.065	49	1.27	60	190	1080	690
24	5.9	5.8	.067	50	1.26	62	230	1220	710
31	5.9	5.8	.069	50	1.26	65	210	1110	720
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.069	51	1.27	68	210	1080	690
2	5.9	5.9	.071	52	1.26	70	230	1120	640
3	5.9	5.9	.069	51	1.25	73	250	1260	600
4	5.9	5.9	.070	52	1.26	71	220	1130	580
5	6.0	5.9	.066	50	1.26	71	190	1120	610
6	5.9	5.9	.066	50	1.26	72	210	1110	620
9	5.9	5.9	.065	47	1.25	67	160	1180	560
14	6.0	6.0	.067	51	1.26	65	200	1070	500
17	5.9	5.9	.072	54	1.31	68	170	1120	540
24	6.0	5.9	.070	53	1.27	65	170	1080	530
30	6.0	6.0	.071	54	1.27	65	180	1160	560
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.064	49	1.26	68	230	1160	650
2	5.9	5.9	.069	52	1.26	70	220	1180	590
3	6.0	5.9	.069	52	1.26	72	210	1220	560
4	5.9	5.9	.069	52	1.26	69	190	1180	530
5	6.0	5.9	.068	53	1.27	71	170	1200	520
6	5.9	5.9	.063	49	1.27	74	210	1250	540
9	6.0	5.9	.070	52	1.26	72	210	1160	480
12	6.0	5.9	.069	48	1.26	69	150	1190	440
15	6.0	5.9	.066	50	1.26	72	190	1170	470
18	5.9	5.9	.065	50	1.26	70	190	1120	460
24	5.9	5.9	.070	53	1.28	74	200	1250	480
42	5.9	5.9	.069	54	1.31	73	150	1120	450
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.069	51	1.27	69	200	1130	560
2	5.9	5.9	.070	52	1.27	71	220	1210	560
3	5.9	5.9	.063	47	1.27	72	220	1260	540
4	5.9	5.9	.066	50	1.27	73	210	1120	490
5	6.0	6.0	.069	52	1.27	73	200	1160	540
6	5.9	5.9	.062	47	1.27	72	190	1150	480
9	5.9	5.9	.068	51	1.27	73	230	1260	490
12	5.9	5.9	.065	49	1.28	71	190	1090	440
15	5.9	5.9	.069	51	1.28	72	160	1200	490
18	5.9	5.9	.069	51	1.28	72	170	1200	460
24	5.9	5.8	.064	47	1.28	69	170	1120	430
58	6.2	6.3	.074	61	1.21	57	170	1020	490
290 DEGREES FAHRENHEIT									
1	6.1	6.1	.066	55	1.22	67	180	1000	510
2	5.9	5.9	.064	47	1.25	71	200	1190	550
3	5.9	5.9	.065	48	1.26	75	200	1080	520
4	6.0	5.9	.066	50	1.25	71	180	1070	500
5	6.0	5.9	.070	53	1.24	74	190	1070	520
6	6.0	5.9	.069	52	1.26	70	200	1080	460
9	5.9	5.9	.065	47	1.26	71	160	1090	470
12	6.1	6.0	.063	49	1.26	70	140	1040	440
14	6.0	5.9	.068	52	1.27	72	220	1170	450
18	6.0	6.0	.068	54	1.25	67	160	1150	450
24	6.0	5.9	.063	47	1.27	74	170	1170	440
56	6.1	6.1	.070	55	1.28	69	160	1010	350

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 22

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.8	.070	47	1.16	67	290	1780	670
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.064	45	1.16	66	240	1780	720
2	5.9	5.9	.070	45	1.16	68	230	1840	700
3	5.9	5.8	.072	48	1.16	67	240	1790	670
4	5.8	5.8	.070	45	1.16	70	260	1890	690
5	5.9	5.8	.077	49	1.16	68	270	1600	600
6	5.9	5.8	.078	51	1.17	69	230	1890	750
9	5.8	5.8	.073	46	1.16	68	230	1750	680
12	5.8	5.8	.080	52	1.18	65	250	1600	570
15	5.8	5.8	.079	51	1.17	63	240	1690	620
18	5.8	5.8	.072	47	1.17	66	190	1900	650
24	5.8	5.8	.076	50	1.18	63	310	1880	670
31	5.8	5.8	.078	51	1.18	66	210	1450	520
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.075	51	1.16	66	250	1730	640
2	5.9	5.9	.072	48	1.16	68	230	1790	620
3	5.9	5.9	.072	50	1.16	70	240	1830	570
4	5.9	5.9	.073	49	1.17	67	240	1850	590
5	5.9	5.8	.067	47	1.18	70	220	1630	590
6	5.9	5.8	.074	49	1.17	65	220	1860	650
9	5.8	5.8	.077	51	1.17	68	180	1800	620
14	5.9	5.8	.073	47	1.17	68	190	1800	620
17	5.8	5.9	.077	51	1.21	68	170	1840	570
24	5.9	5.8	.072	47	1.17	69	180	1870	630
30	5.9	5.8	.076	50	1.17	65	180	1790	590
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.076	51	1.16	67	290	2350	650
2	5.9	5.9	.071	48	1.17	68	230	1880	640
3	5.9	5.9	.079	53	1.17	72	240	1930	590
4	5.9	5.9	.080	51	1.17	69	230	1740	530
5	5.9	5.9	.071	48	1.17	71	180	1710	570
6	5.8	5.9	.077	51	1.18	70	240	1750	600
9	5.8	5.8	.069	46	1.18	70	230	1760	580
12	5.8	5.9	.073	49	1.17	71	190	1680	570
15	5.9	5.9	.070	46	1.18	69	200	1670	580
18	5.8	5.8	.071	46	1.17	68	190	1770	550
24	5.9	5.8	.075	50	1.18	70	220	1840	580
42	5.8	5.8	.072	49	1.19	71	220	1640	490
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.070	45	1.16	68	320	1830	630
2	5.9	5.9	.074	50	1.16	69	250	1870	640
3	5.9	5.9	.066	46	1.17	70	230	1750	550
4	5.9	5.9	.073	49	1.17	71	240	1870	600
5	5.9	5.9	.073	49	1.17	71	240	1690	550
6	5.9	5.8	.078	51	1.16	70	240	1750	610
9	5.9	5.8	.069	47	1.17	71	210	1860	580
12	5.8	5.8	.071	46	1.18	70	240	1620	560
15	5.8	5.9	.076	49	1.18	70	210	1710	550
18	5.8	5.8	.077	51	1.18	68	170	1740	540
24	5.8	5.8	.077	50	1.18	67	200	1740	560
290 DEGREES FAHRENHEIT									
1	6.5	6.6	.079	69	1.11	55	290	930	550
2	5.9	5.9	.084	56	1.15	64	230	1270	700
3	5.9	5.9	.076	51	1.16	66	210	1360	620
4	6.1	6.0	.074	53	1.14	62	210	1240	660
5	6.2	6.1	.080	62	1.13	64	160	1080	680
6	5.9	5.8	.075	49	1.14	69	160	1290	620
9	5.8	5.8	.071	47	1.15	68	170	1260	540
12	6.1	6.1	.076	54	1.14	62	170	1100	520
14	6.0	6.0	.081	56	1.15	62	240	1260	550
18	6.2	6.1	.080	59	1.13	56	140	940	410
24	5.9	5.9	.074	51	1.16	65	170	1420	530
56	6.1	6.1	.085	60	1.15	54	130	1040	450

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 23

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.075	58	1.33	56	160	1560	740
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.077	59	1.32	53	150	1540	800
2	5.9	5.9	.072	56	1.33	57	140	1510	720
3	5.9	5.9	.077	58	1.32	56	100	1460	730
4	5.9	5.9	.073	56	1.32	60	140	1460	690
5	5.9	5.9	.076	58	1.32	58	120	1440	740
6	5.9	5.9	.078	58	1.33	57	130	1550	740
9	5.9	5.9	.088	64	1.32	56	90	1470	750
12	5.9	5.9	.083	61	1.33	52	100	1370	740
15	5.9	5.9	.082	61	1.33	55	80	1470	740
18	5.9	5.9	.074	57	1.33	55	100	1550	760
24	5.9	5.9	.083	61	1.33	55	190	1220	690
31	5.9	5.9	.074	57	1.33	56	130	1010	660
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.083	61	1.32	55	170	1490	720
2	5.9	5.9	.083	62	1.32	55	100	1470	720
3	5.9	5.9	.080	61	1.32	59	120	1130	640
4	5.9	5.9	.081	61	1.32	58	110	1420	700
5	5.9	5.9	.077	58	1.33	57	120	1330	720
6	5.9	5.9	.077	59	1.32	56	140	1470	740
9	5.9	5.9	.075	58	1.32	54	120	1330	710
14	5.9	5.9	.079	59	1.33	51	170	1360	790
17	5.9	5.9	.074	56	1.38	53	130	1360	770
24	5.9	5.9	.078	59	1.34	50	170	1330	730
30	5.9	5.9	.083	61	1.34	52	130	1190	740
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.076	58	1.33	56	150	1480	710
2	5.9	5.9	.074	57	1.32	53	150	1420	710
3	5.9	5.9	.077	60	1.33	55	170	1310	730
4	5.9	5.9	.084	62	1.32	54	120	1340	730
5	5.9	5.9	.084	62	1.33	53	160	930	680
6	5.9	5.9	.078	59	1.33	53	160	1300	790
9	5.9	5.9	.081	62	1.32	50	170	1230	820
12	5.9	5.9	.077	58	1.33	49	150	610	590
15	5.9	5.9	.076	57	1.33	50	170	1190	800
18	5.9	5.9	.085	63	1.34	52	150	1210	770
24	5.9	5.9	.078	60	1.35	54	160	1300	740
42	5.9	5.9	.078	60	1.37	50	150	600	530
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.075	58	1.33	53	150	1280	720
2	5.9	5.9	.081	62	1.33	53	160	1320	750
3	5.9	5.9	.076	58	1.33	56	150	1330	790
4	5.9	5.9	.074	57	1.34	52	190	1350	790
5	5.9	5.9	.076	58	1.35	53	160	1250	810
6	5.9	5.9	.083	63	1.34	51	160	1200	760
9	5.9	5.9	.078	60	1.34	50	180	1230	810
12	5.9	5.9	.086	63	1.36	48	170	1120	840
15	5.9	5.9	.085	62	1.35	49	170	1200	820
18	5.9	5.9	.083	64	1.35	48	140	1190	800
24	5.9	5.9	.076	58	1.36	49	160	1190	800
58	6.3	6.3	.089	74	1.26	36	130	830	650
290 DEGREES FAHRENHEIT									
1	6.0	6.0	.077	61	1.30	42	140	960	890
2	5.9	5.9	.074	59	1.32	47	160	910	780
3	5.9	5.9	.074	58	1.34	49	140	990	900
4	6.0	6.0	.078	60	1.32	44	160	990	860
5	6.0	6.0	.085	64	1.31	48	130	920	890
6	5.9	5.9	.082	63	1.33	46	150	900	850
9	5.9	5.9	.091	69	1.33	42	120	760	810
12	6.0	6.0	.080	62	1.33	41	130	780	820
14	6.0	5.9	.084	62	1.35	45	160	770	760
18	6.1	6.0	.080	64	1.34	41	110	840	880
24	6.0	6.0	.077	61	1.37	44	110	570	590
56	6.1	6.1	.085	70	1.42	39	70	430	620

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 24

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.082	51	1.14	60	330	1630	650
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.078	51	1.15	57	330	1680	750
2	5.9	5.9	.078	52	1.14	61	320	1720	660
3	5.9	5.9	.076	50	1.14	62	320	1720	680
4	5.9	5.9	.077	51	1.15	61	310	1810	680
5	5.9	5.9	.082	52	1.15	62	310	1830	680
6	5.8	5.9	.075	50	1.15	63	300	1820	700
9	5.8	5.9	.083	52	1.15	60	330	1750	600
12	5.9	5.9	.081	52	1.16	60	320	1830	630
15	5.9	5.9	.085	53	1.15	60	360	1790	570
18	5.9	5.9	.082	53	1.15	60	260	1820	590
24	5.8	5.9	.082	52	1.16	62	400	1930	610
31	5.8	5.9	.078	52	1.16	61	340	1830	580
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.081	53	1.15	61	380	1960	600
2	6.0	5.9	.083	54	1.14	63	270	1910	510
3	5.9	6.0	.080	53	1.15	67	250	1930	470
4	6.0	5.9	.076	51	1.14	67	240	1870	430
5	6.0	5.9	.081	53	1.15	65	240	1900	420
6	6.0	6.0	.079	53	1.15	65	260	1990	450
9	5.9	6.0	.078	53	1.14	65	170	1800	360
14	6.0	6.1	.083	56	1.15	64	150	1650	350
17	5.9	6.0	.081	53	1.19	65	160	1730	320
24	6.0	6.0	.082	55	1.15	66	160	1700	310
30	6.0	6.0	.080	54	1.15	64	140	1640	330
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.080	53	1.15	62	300	1820	490
2	6.0	6.0	.078	53	1.14	63	380	1810	460
3	6.0	6.0	.077	52	1.15	66	190	1650	360
4	6.0	6.0	.084	57	1.14	65	200	1950	420
5	6.0	5.9	.086	58	1.15	66	170	1730	390
6	6.1	6.0	.080	56	1.14	66	170	1870	400
9	6.1	6.1	.063	58	1.14	64	180	1660	340
12	6.0	6.0	.085	57	1.14	64	130	1640	330
15	6.0	6.0	.080	54	1.15	65	160	1740	350
18	5.9	5.9	.077	51	1.16	67	150	1320	240
24	6.0	5.9	.083	56	1.16	70	170	1760	320
42	6.0	6.0	.083	56	1.17	68	140	1340	250
250 DEGREES FAHRENHEIT									
1	6.0	6.0	.084	55	1.14	62	270	1880	460
2	5.9	6.0	.087	57	1.14	64	250	1870	410
3	6.0	6.0	.083	55	1.15	66	190	1700	370
4	6.0	6.0	.078	53	1.15	65	210	1700	400
5	6.0	6.0	.078	53	1.15	67	190	1730	380
6	5.9	6.0	.083	54	1.15	67	170	1620	370
9	6.0	6.0	.087	57	1.14	65	140	1630	360
12	6.0	6.0	.082	55	1.17	66	160	1640	320
15	6.0	6.0	.084	56	1.15	67	150	1520	330
18	6.0	6.0	.083	55	1.16	67	140	1280	250
24	6.0	5.9	.075	52	1.16	69	140	1630	310
58	7.1	7.2	.094	87	1.09	55	70	800	190
290 DEGREES FAHRENHEIT									
1	6.7	6.6	.092	75	1.10	59	150	900	260
2	6.3	6.2	.084	60	1.13	64	140	1280	310
3	6.2	6.3	.081	58	1.13	65	140	1220	320
4	6.3	6.3	.080	59	1.13	61	170	1210	300
5	6.6	6.3	.082	67	1.11	63	130	1210	310
6	6.2	6.1	.078	54	1.14	67	110	1320	270
9	6.2	6.2	.079	57	1.13	64	120	1330	280
12	6.4	6.4	.081	63	1.12	63	110	1180	250
14	6.3	6.4	.083	60	1.13	63	200	1160	270
18	6.6	6.4	.089	72	1.11	61	110	1160	240
24	6.1	6.1	.080	57	1.14	66	150	1320	260
56	6.4	6.6	.089	67	1.13	63	90	730	170

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 27

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.8	.102	68	1.31	72	120	2140	150
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.096	64	1.32	72	130	1990	150
2	5.8	5.8	.099	67	1.32	74	110	1780	130
3	5.9	5.8	.100	66	1.32	72	140	2080	120
4	5.8	5.8	.103	67	1.32	73	100	1930	150
7	5.8	5.8	.101	68	1.31	73	110	1870	140
10	5.8	5.8	.100	67	1.32	73	80	1720	120
13	5.8	5.8	.100	67	1.32	71	150	1720	100
16	5.8	5.8	.100	67	1.33	70	100	2100	110
22	5.8	5.8	.101	72	1.32	70	160	2200	130
29	5.7	5.8	.100	68	1.32	72	110	2320	130
203 DEGREES FAHRENHEIT									
1	5.8	5.8	.085	61	1.32	76	130	2190	120
2	5.8	5.8	.087	63	1.32	75	120	2290	120
3	5.8	5.8	.090	62	1.32	76	120	1830	130
4	5.8	5.8	.093	64	1.32	74	140	2060	140
7	5.8	5.8	.093	64	1.32	76	120	1850	110
12	5.7	5.8	.100	67	1.39	80	260	1230	30
15	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225 DEGREES FAHRENHEIT									
1	5.9	5.8	.084	64	1.33	75	120	2060	130
2	5.8	5.8	.097	65	1.33	77	120	2180	130
3	5.8	5.8	.095	64	1.34	85	130	1780	130
4	5.9	5.8	.093	65	1.36	82	150	1350	95
7	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	5.8	5.8	.087	60	1.33	76	120	1820	100
2	5.8	5.8	.095	64	1.33	80	120	2140	130
3	5.8	5.8	.103	68	1.36	87	200	1630	80
4	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 28

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.7	5.7	.098	63	1.32	69	140	2010	230
100 DEGREES FAHRENHEIT									
1	5.7	5.8	.095	62	1.32	70	170	1940	170
2	5.7	5.8	.082	65	1.32	70	170	2300	220
3	5.7	5.7	.084	64	1.32	67	190	1980	250
4	5.7	5.8	.086	64	1.32	68	110	1960	280
7	5.7	5.7	.098	67	1.31	66	160	1990	200
10	5.7	5.7	.096	64	1.32	69	120	1930	220
13	5.7	5.8	.095	65	1.32	70	220	2040	200
16	5.7	5.8	.096	65	1.32	66	150	2140	210
22	5.6	5.7	.098	65	1.31	64	220	1990	250
29	5.7	5.7	.094	65	1.32	67	160	2110	210
203 DEGREES FAHRENHEIT									
1	5.8	5.8	.100	67	1.32	74	190	2020	210
2	5.7	5.8	.094	64	1.32	72	180	2230	230
3	5.8	5.7	.089	64	1.33	70	160	1790	220
4	5.8	5.8	.085	64	1.32	68	180	1910	250
7	5.8	5.8	.099	68	1.31	74	180	1700	150
12	5.8	5.8	.099	69	1.36	71	170	1260	60
15	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225 DEGREES FAHRENHEIT									
1	5.7	5.8	.104	67	1.30	70	170	2200	210
2	5.7	5.7	.103	65	1.33	74	210	1920	160
3	5.7	5.8	.096	63	1.35	85	150	1820	200
4	5.9	5.8	.098	68	1.35	79	170	1220	95
7	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	5.8	5.7	.092	64	1.32	73	130	1940	230
2	5.7	5.7	.097	67	1.34	79	160	1800	150
3	5.7	5.7	.102	70	1.36	85	170	1530	130
4	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 29

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.8	.076	48	1.13	67	260	2560	610
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.075	48	1.14	65	280	2050	620
2	5.9	5.9	.077	48	1.14	66	250	1980	580
5	5.9	5.8	.078	48	1.13	65	220	1960	570
8	5.9	5.9	.077	47	1.14	65	220	2090	560
11	5.9	5.8	.077	47	1.14	65	330	2030	610
14	5.9	5.8	.078	49	1.14	65	290	2100	610
20	5.8	5.9	.074	48	1.13	65	300	2140	600
27	5.9	5.8	.076	49	1.14	66	290	2100	570
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.079	49	1.14	67	240	2040	600
2	5.9	5.9	.076	48	1.14	66	280	2000	570
5	5.8	5.8	.076	48	1.14	66	220	1960	530
10	5.9	5.9	.077	50	1.14	66	190	1960	520
13	5.9	5.8	.078	49	1.18	68	180	2110	540
20	5.9	5.9	.076	48	1.13	67	180	1960	510
26	5.9	5.9	.077	49	1.14	65	250	2070	550
225 DEGREES FAHRENHEIT									
3	5.9	5.9	.074	50	1.14	65	220	1980	540
6	5.9	5.9	.078	49	1.14	67	200	2030	560
9	5.9	5.8	.079	49	1.14	68	210	2050	510
12	5.9	5.8	.079	49	1.14	69	190	2060	510
18	5.9	5.9	.079	50	1.14	69	200	2150	510
36	5.9	5.9	.078	49	1.15	69	230	2000	480
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.078	49	1.14	69	280	2020	590
2	5.9	5.8	.076	47	1.14	72	170	2020	560
5	5.9	5.8	.076	50	1.14	66	240	1940	480
8	5.9	5.9	.079	49	1.14	69	260	2050	480
11	5.9	5.9	.077	49	1.14	69	190	2100	510
14	5.8	5.9	.077	48	1.14	68	230	2150	480
20	5.9	5.9	.076	49	1.14	67	190	2180	510
54	6.2	6.2	.082	56	1.12	63	170	1880	480
290 DEGREES FAHRENHEIT									
1	5.9	5.9	.078	50	1.13	68	280	2040	580
2	6.0	5.9	.076	52	1.12	68	190	1990	550
3	5.9	5.9	.075	50	1.13	68	220	1870	500
6	5.9	5.9	.076	50	1.13	67	190	1990	500
8	6.0	6.0	.077	51	1.13	66	170	1830	440
10	6.0	5.9	.077	49	1.14	69	290	2030	480
14	6.0	6.0	.078	52	1.13	68	180	2080	430
20	5.9	5.9	.077	49	1.13	71	200	2110	470
52	6.0	6.0	.080	55	1.15	69	150	1500	320

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 30

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.8	.075	48	1.16	63	170	1280	630
100 DEGREES FAHRENHEIT									
1	5.8	5.9	.073	48	1.16	62	160	1290	640
2	5.9	5.9	.076	48	1.17	63	130	1290	640
5	5.8	5.8	.077	48	1.16	62	130	1200	580
8	5.8	5.8	.076	48	1.17	62	140	1270	580
11	5.8	5.8	.077	48	1.16	61	200	1310	590
14	5.9	5.8	.077	48	1.16	61	130	1300	560
20	5.8	5.8	.075	49	1.16	58	190	1350	520
27	5.8	5.8	.074	49	1.16	62	170	1430	620
203 DEGREES FAHRENHEIT									
1	5.9	5.8	.077	49	1.16	63	140	1440	580
2	5.8	5.8	.073	48	1.16	62	140	1420	570
5	5.8	5.8	.075	48	1.16	62	130	1420	510
10	5.8	5.8	.075	48	1.17	61	130	1440	480
13	5.8	5.8	.078	49	1.21	64	140	1500	480
20	5.8	5.8	.077	48	1.17	64	130	1540	500
26	5.8	5.9	.074	50	1.17	60	120	1480	450
225 DEGREES FAHRENHEIT									
3	5.8	5.8	.076	48	1.16	63	170	1420	520
6	5.8	5.8	.076	48	1.16	62	130	1400	530
9	5.8	5.8	.075	47	1.17	61	160	1490	510
12	5.8	5.8	.077	48	1.17	61	150	1520	490
18	5.7	5.8	.077	48	1.17	61	170	1710	520
36	5.8	5.8	.079	51	1.21	60	160	1570	450
250 DEGREES FAHRENHEIT									
1	5.9	5.8	.073	47	1.17	65	150	1520	590
2	5.8	5.8	.074	48	1.16	65	170	1390	490
5	5.8	5.8	.073	47	1.17	63	160	1550	500
8	5.8	5.8	.076	47	1.18	63	210	1580	500
11	5.8	5.8	.074	47	1.17	63	140	1600	530
14	5.8	5.8	.077	48	1.18	61	140	1580	460
20	5.8	5.8	.076	48	1.18	63	180	1610	490
54	5.9	5.9	.077	50	1.18	61	150	1570	410
290 DEGREES FAHRENHEIT									
1	5.8	5.8	.078	49	1.16	61	230	1590	640
2	5.9	5.8	.078	49	1.17	65	210	1530	660
3	5.9	5.8	.076	49	1.18	64	200	1470	610
6	5.8	5.7	.074	47	1.17	62	200	1440	510
8	5.8	5.7	.073	46	1.18	62	160	1510	560
10	5.7	5.7	.076	46	1.18	64	290	1610	510
14	5.7	5.8	.076	48	1.18	64	180	1600	470
20	5.8	5.7	.077	48	1.18	62	160	1600	480
52	5.8	5.8	.079	52	1.25	61	160	1460	430

Table 10 - Continued

PERFORMANCE OF
RUBBER MATERIALS
BRINE LOOP EXPOSURE

SAMPLE NUMBER R 32

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.9	.081	56	1.25	67	60	970	180
100 DEGREES FAHRENHEIT									
6	5.8	5.9	.080	56	1.26	67	60	1050	150
13	5.9	5.8	.074	54	1.26	65	50	1000	170
203 DEGREES FAHRENHEIT									
7	5.8	5.9	.083	57	1.27	69	50	960	120
13	5.9	5.8	.073	53	1.26	66	40	890	140
225 DEGREES FAHRENHEIT									
9	5.8	5.9	.081	56	1.26	67	70	1040	140
250 DEGREES FAHRENHEIT									
9	5.8	5.8	.081	57	1.27	68	60	1010	140
43	5.7	5.8	.073	51	1.28	66	70	790	90
290 DEGREES FAHRENHEIT									
9	5.8	5.7	.079	54	1.27	67	60	730	140
41	5.3	5.5	.063	38	1.36	81	50	340	5

Table 11

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 5

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	6.0	5.8	.066	53	1.42	67	250	2340	330
100 DEGREES FAHRENHEIT									
1	5.9	6.0	.066	53	1.44	69	210	1510	230
2	6.4	5.8	.066	54	1.44	68	170	2230	320
3	5.9	5.8	.065	51	1.44	68	160	2360	310
4	5.7	5.9	.066	51	1.44	70	150	2410	310
5	5.9	5.8	.066	51	1.44	70	170	2380	290
6	5.9	5.7	.068	50	1.44	69	180	2320	310
9	5.7	5.9	.066	51	1.45	70	240	2560	300
12	5.8	5.8	.067	52	1.44	70	190	2300	290
18	5.9	5.9	.066	52	1.44	67	190	2410	300
24	5.9	5.7	.066	51	1.45	69	170	2410	310
36	5.9	5.9	.066	53	1.45	67	160	2220	280
203 DEGREES FAHRENHEIT									
1	6.9	6.8	.076	70	1.29	64	90	1450	200
2	6.6	6.9	.077	75	1.26	62	90	750	140
3	7.0	7.5	.080	84	1.23	60	50	620	120
4	7.1	7.2	.087	85	1.21	55	40	740	130
5	7.5	7.4	.082	85	1.25	62	40	610	100
6	7.0	7.2	.081	78	1.26	64	70	820	150
9	6.6	7.0	.073	67	1.31	63	60	710	90
12	6.8	6.6	.064	59	1.37	71	50	800	100
18	6.9	7.3	.080	79	1.25	60	40	580	100
24	7.1	7.5	.079	82	1.24	64	40	380	80
36	6.7	7.0	.067	62	1.35	65	50	660	70
61	7.1	7.1	.081	83	1.24	64	30	240	40
225 DEGREES FAHRENHEIT									
1	7.2	7.0	.076	80	1.26	62	80	1100	160
2	7.2	6.9	.078	78	1.24	61	60	950	150
3	7.1	6.8	.079	75	1.23	62	40	970	140
4	7.3	7.2	.076	82	1.23	58	50	970	140
5	7.2	7.2	.077	78	1.24	65	60	330	50
6	7.5	7.3	.081	86	1.23	63	30	520	80
9	6.8	6.8	.071	64	1.31	70	80	290	30
12	6.4	6.8	.065	55	1.39	72	60	840	100
18	7.3	7.1	.082	84	1.25	56	30	330	50
24	7.3	7.1	.077	79	1.26	62	40	300	50
36	6.8	6.8	.068	64	1.32	66	70	400	30
61	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	6.7	7.3	.071	72	1.29	67	70	1310	180
2	6.7	6.6	.076	67	1.29	67	70	1230	150
3	6.8	6.7	.075	72	1.28	65	50	970	130
4	7.2	6.7	.077	72	1.27	61	40	1120	140
5	6.7	6.9	.073	68	1.30	68	40	870	110
6	6.6	7.0	.078	70	1.27	65	60	820	100
9	6.7	6.6	.083	65	1.30	65	30	390	40
18	6.6	6.9	.075	67	1.29	65	30	360	60
24	6.7	7.4	.074	72	1.27	65	30	350	50
36	6.7	6.5	.074	62	1.31	66	50	260	30
61	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	7.1	7.1	.077	78	1.24	66	50	970	130
2	7.2	7.4	.079	80	1.24	63	30	270	50
3	6.7	7.5	.073	72	1.25	63	60	200	40
4	7.1	7.0	.075	74	1.25	63	30	290	50
5	6.9	7.0	.077	71	1.23	66	50	240	40
6	6.8	6.7	.071	64	1.29	68	50	370	50
12	6.4	6.6	.058	51	1.42	75	100	560	60
18	7.1	6.7	.079	70	1.25	68	20	190	30
24	6.4	6.4	.064	50	1.37	76	70	450	30
48	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 6

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.086	55	1.13	55	170	2080	320
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.080	56	1.14	53	120	2150	350
2	5.9	5.9	.083	54	1.13	56	90	1950	310
3	5.9	5.9	.084	55	1.13	56	110	1860	290
4	5.9	5.9	.083	54	1.13	57	90	2070	330
5	5.9	5.9	.084	55	1.14	55	110	2150	330
6	6.0	5.9	.084	54	1.14	56	180	2160	320
9	5.9	5.9	.089	58	1.14	56	110	2270	310
12	5.9	5.9	.088	58	1.14	56	110	2240	330
18	6.0	6.0	.087	58	1.13	54	100	2180	320
24	5.9	6.0	.096	60	1.13	54	100	1970	300
36	6.0	6.0	.085	58	1.13	56	130	1830	270
203 DEGREES FAHRENHEIT									
1	6.3	6.2	.093	65	1.12	56	90	1680	250
2	6.4	6.3	.091	66	1.12	56	80	1570	230
3	6.4	6.4	.092	69	1.12	58	60	1440	210
4	6.4	6.4	.097	73	1.11	54	70	1340	190
5	6.5	6.4	.098	74	1.11	56	60	1450	200
6	6.5	6.5	.098	73	1.11	55	70	1380	190
9	6.6	6.5	.094	72	1.11	57	60	1180	150
12	6.6	6.6	.092	73	1.11	59	50	1450	170
18	6.7	6.7	.094	77	1.10	58	50	1240	150
24	6.8	6.7	.096	82	1.09	57	70	1280	160
36	6.6	6.6	.101	78	1.11	57	80	1270	150
61	6.9	6.8	.111	94	1.09	59	50	730	100
225 DEGREES FAHRENHEIT									
1	6.4	6.4	.090	67	1.12	55	90	1570	230
2	6.4	6.4	.091	67	1.11	58	70	1340	200
3	6.5	6.4	.096	73	1.11	55	70	1450	200
4	6.6	6.5	.091	71	1.10	57	60	1300	170
5	6.6	6.6	.095	74	1.10	58	60	1380	180
6	6.6	6.5	.088	69	1.10	55	60	1270	170
9	7.4	7.2	.100	100	1.08	45	60	790	170
12	6.7	6.6	.097	79	1.10	59	40	1170	160
18	7.0	6.8	.100	91	1.09	47	60	930	140
24	7.0	6.9	.101	90	1.08	55	40	770	130
36	6.9	6.9	.100	89	1.09	55	50	1040	130
61	7.3	7.2	.113	109	1.08	52	40	800	100
250 DEGREES FAHRENHEIT									
1	6.4	6.4	.096	72	1.11	57	60	1270	190
2	6.7	6.6	.092	73	1.10	58	80	1130	160
3	6.8	6.7	.094	75	1.09	59	50	1150	160
4	6.8	6.8	.098	81	1.09	56	40	1110	150
5	6.9	6.8	.097	79	1.09	59	40	1130	160
6	7.0	6.9	.098	83	1.09	59	50	790	110
9	7.0	7.0	.100	89	1.09	58	50	840	100
12	7.0	6.9	.100	86	1.09	59	40	910	120
18	7.1	7.0	.101	92	1.08	57	40	780	130
24	7.2	7.1	.100	94	1.08	55	30	560	100
36	7.4	7.2	.100	95	1.08	56	30	460	80
61	7.5	7.5	.101	111	1.07	55	30	500	80
290 DEGREES FAHRENHEIT									
1	6.8	6.7	.090	74	1.09	59	50	1110	170
2	6.9	6.8	.100	87	1.09	57	40	880	140
3	7.0	7.0	.099	86	1.09	58	50	690	110
4	7.1	7.0	.099	87	1.08	57	30	590	100
5	7.1	7.1	.101	97	1.08	57	30	830	110
6	7.1	7.0	.101	100	1.08	56	30	640	100
9	7.2	7.2	.100	96	1.08	56	40	870	100
12	7.3	7.2	.098	91	1.08	55	40	640	120
18	7.4	7.3	.101	99	1.08	53	20	410	90
24	7.4	7.4	.101	107	1.07	53	30	490	80
48	7.7	7.7	.101	116	1.06	48	30	390	90

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 7

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.085	56	1.15	67	240	2020	350
100 DEGREES FAHRENHEIT									
1	5.8	5.9	.087	55	1.15	66	200	2030	410
2	5.9	5.9	.090	59	1.15	67	170	2040	380
3	5.9	5.9	.087	56	1.15	64	180	2040	420
4	5.9	5.9	.084	55	1.15	64	190	1990	410
5	5.9	5.9	.084	55	1.15	66	160	2040	430
6	5.9	5.9	.100	62	1.16	64	320	2120	370
9	5.9	5.9	.088	57	1.16	65	210	2060	360
12	5.9	5.9	.088	57	1.15	65	200	2100	410
18	5.9	5.9	.088	58	1.15	65	220	2020	380
24	5.9	5.9	.084	55	1.15	65	200	2030	390
36	5.9	5.9	.087	57	1.15	65	190	2010	370
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.088	58	1.14	65	160	2090	340
2	6.0	6.0	.088	59	1.15	65	220	2110	340
3	6.0	6.0	.082	57	1.15	65	150	2020	350
4	6.0	6.1	.090	61	1.14	65	160	2080	310
5	6.1	6.0	.096	65	1.14	64	130	2100	340
6	6.1	6.1	.091	61	1.14	64	250	2190	340
9	6.1	6.1	.094	63	1.15	66	130	2260	330
12	6.0	6.0	.086	60	1.15	66	150	2240	320
18	6.1	6.1	.087	61	1.14	64	160	2120	320
24	6.1	6.1	.092	63	1.14	64	240	2100	310
36	6.1	6.1	.093	63	1.14	65	180	2100	270
61	6.2	6.1	.090	63	1.14	66	160	2090	300
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.088	60	1.15	63	170	2050	320
2	6.1	6.0	.093	63	1.15	65	160	2070	280
3	6.1	6.1	.090	63	1.14	63	120	2090	290
4	6.1	6.1	.092	62	1.14	63	180	1960	270
5	6.1	6.1	.089	61	1.14	65	200	2140	320
6	6.1	6.1	.089	61	1.14	64	180	2160	310
9	6.1	6.1	.089	61	1.14	65	170	2120	280
12	6.1	6.1	.092	63	1.15	65	150	2070	290
18	6.2	6.1	.093	65	1.14	65	140	1710	220
24	6.1	6.1	.093	65	1.14	65	140	2010	280
36	6.1	6.1	.100	72	1.14	64	190	2050	250
61	6.2	6.2	.091	67	1.14	65	160	2000	260
250 DEGREES FAHRENHEIT									
1	6.1	6.1	.086	59	1.15	63	140	1960	260
2	6.1	6.1	.090	61	1.15	65	190	2180	280
3	6.1	6.1	.090	64	1.14	64	120	2130	290
4	6.1	6.1	.090	62	1.14	65	120	1990	260
5	6.1	6.1	.093	64	1.14	64	110	2200	290
6	6.1	6.1	.098	67	1.14	63	230	2330	280
9	6.2	6.1	.094	65	1.14	65	200	1730	200
12	6.1	6.1	.094	64	1.14	65	120	2200	280
18	6.1	6.1	.089	63	1.14	65	150	2140	270
24	6.1	6.1	.098	68	1.14	65	150	2150	260
61	6.2	6.2	.098	68	1.14	63	130	2080	260
290 DEGREES FAHRENHEIT									
1	6.1	6.1	.090	64	1.14	68	150	2280	270
2	6.1	6.1	.100	69	1.14	63	110	2180	250
3	6.1	6.1	.100	68	1.14	65	240	2230	280
4	6.1	6.1	.089	62	1.14	65	110	1990	250
5	6.1	6.1	.094	65	1.14	66	120	2210	260
6	6.1	6.1	.093	64	1.14	65	120	2120	240
9	6.1	6.1	.090	62	1.14	66	190	2230	250
12	6.1	6.1	.090	62	1.14	66	200	2210	250
18	6.2	6.1	.091	65	1.14	66	100	2080	250
24	6.1	6.1	.090	62	1.14	67	170	2140	250
48	6.2	6.1	.092	65	1.14	64	120	1740	190

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 9

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.092	57	1.12	60	210	2020	350
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.085	55	1.12	58	150	1760	320
2	5.9	5.9	.076	50	1.12	60	110	1480	350
3	5.9	5.9	.076	50	1.12	60	150	1890	320
4	5.9	5.9	.089	57	1.12	59	140	1750	300
5	5.9	5.9	.095	59	1.13	58	140	1660	290
6	5.9	5.9	.090	57	1.13	58	250	1810	310
9	5.9	6.0	.086	55	1.12	60	180	1800	270
12	6.0	6.0	.092	55	1.13	59	170	2000	330
18	6.0	6.0	.080	55	1.12	59	170	1620	270
24	6.0	6.0	.088	59	1.12	59	150	1820	320
36	6.0	6.0	.088	58	1.12	59	140	1760	290
203 DEGREES FAHRENHEIT									
1	6.3	6.3	.105	75	1.10	57	120	1540	260
2	6.5	6.4	.100	73	1.10	59	110	1470	240
3	6.5	6.5	.100	79	1.10	57	90	1290	220
4	6.6	6.6	.100	76	1.09	56	80	1250	200
5	6.6	6.6	.100	78	1.10	59	70	1360	200
6	6.7	6.7	.101	85	1.09	57	120	1340	190
9	6.9	6.8	.098	78	1.09	60	60	1060	150
12	6.6	6.6	.100	75	1.09	59	100	1320	180
18	7.0	6.9	.101	90	1.08	57	80	1040	130
24	7.1	7.0	.101	95	1.08	58	90	900	130
36	7.1	6.9	.101	93	1.08	58	70	860	100
61	7.3	7.2	.109	100	1.07	62	50	680	100
225 DEGREES FAHRENHEIT									
1	6.3	6.3	.106	68	1.10	57	110	1330	240
2	6.6	6.5	.101	82	1.09	58	90	1070	180
3	6.7	6.7	.091	75	1.09	58	70	1060	180
4	6.8	6.7	.095	78	1.08	57	90	1160	190
5	6.9	6.7	.097	82	1.08	59	80	1060	160
6	7.0	6.9	.099	85	1.08	59	60	1030	150
9	7.4	7.2	.102	100	1.07	51	100	630	130
12	6.7	6.6	.095	82	1.09	58	70	1020	160
18	7.1	7.2	.101	101	1.07	54	40	470	90
24	7.5	7.4	.101	111	1.07	50	60	560	100
36	7.3	7.1	.101	106	1.07	57	50	750	100
61	7.5	7.4	.104	105	1.07	57	40	700	90
250 DEGREES FAHRENHEIT									
1	6.5	6.4	.101	81	1.10	58	90	1370	230
2	6.8	6.7	.101	91	1.09	56	90	1160	170
3	6.9	6.8	.101	91	1.08	56	60	920	140
4	6.9	7.0	.098	87	1.08	55	40	790	120
5	7.0	6.9	.101	92	1.08	59	50	900	130
6	6.9	6.9	.102	98	1.08	58	90	890	110
9	7.1	7.1	.101	98	1.08	60	60	770	90
12	7.1	7.1	.101	92	1.08	62	50	830	120
18	7.2	7.1	.101	102	1.07	57	40	680	110
24	7.2	7.1	.102	100	1.07	58	50	760	110
36	7.4	7.3	.101	105	1.07	58	50	590	80
61	7.7	7.6	.103	129	1.06	46	40	570	80
290 DEGREES FAHRENHEIT									
1	6.6	6.5	.112	84	1.09	57	80	910	180
2	7.0	7.0	.102	103	1.07	56	50	800	120
3	7.2	7.1	.102	105	1.07	57	50	780	110
4	7.2	7.1	.102	106	1.07	56	40	630	90
5	7.3	7.3	.101	104	1.07	57	40	670	100
6	7.4	7.2	.102	103	1.07	57	40	620	90
9	7.4	7.4	.101	107	1.07	54	50	660	90
12	7.4	7.3	.101	100	1.07	57	60	650	120
18	7.6	7.5	.101	114	1.06	53	30	540	110
24	7.5	7.5	.101	113	1.07	54	40	640	90
48	7.6	7.5	.102	121	1.07	52	40	520	80

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 11

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.077	50	1.17	69	230	1690	430
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.076	49	1.17	68	230	1440	410
2	5.8	5.8	.075	49	1.16	68	200	1540	450
3	5.9	5.8	.076	49	1.16	66	220	1380	350
4	5.8	5.8	.077	51	1.18	69	170	1510	280
5	5.9	5.9	.078	51	1.18	70	180	1660	300
6	5.8	5.9	.076	50	1.17	66	260	1670	440
9	5.9	5.9	.078	50	1.17	65	280	1540	390
12	5.9	5.9	.077	51	1.16	67	230	1640	410
18	5.8	5.9	.077	52	1.18	68	230	1790	360
24	5.8	5.9	.075	50	1.18	70	220	1700	300
36	5.8	5.9	.078	50	1.18	67	180	1770	310
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.079	56	1.17	70	150	1770	290
2	5.9	5.9	.080	54	1.18	71	170	1770	260
3	5.9	6.0	.080	53	1.19	71	140	1620	250
4	6.0	5.9	.081	52	1.16	66	160	1250	220
5	5.9	5.9	.075	50	1.17	69	270	1680	280
6	5.9	5.9	.078	52	1.16	66	180	1570	260
9	5.9	5.9	.075	51	1.19	72	120	1780	200
12	5.8	5.8	.077	52	1.19	73	150	1890	210
18	5.9	5.9	.078	54	1.18	68	130	1750	210
24	5.9	5.9	.077	52	1.16	68	230	1800	260
36	5.9	5.9	.076	49	1.17	69	200	1620	200
61	5.9	5.9	.075	53	1.16	74	150	1440	180
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.070	52	1.18	71	190	1810	260
2	5.9	5.8	.081	55	1.19	73	140	1780	230
3	5.9	6.0	.078	52	1.18	70	130	1770	260
4	5.9	5.9	.082	55	1.18	67	130	1800	260
5	5.9	5.9	.080	54	1.18	74	140	1670	200
6	5.9	5.9	.083	54	1.18	73	160	1860	210
9	5.9	5.9	.077	52	1.19	76	160	1540	140
12	5.9	5.9	.077	52	1.19	73	120	1880	200
18	5.9	5.9	.078	53	1.18	71	130	1890	210
24	6.0	6.0	.078	52	1.16	68	120	1550	160
36	5.9	5.9	.076	52	1.19	73	170	1780	160
61	6.0	6.0	.079	55	1.18	70	130	1610	120
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.082	54	1.20	71	130	1360	190
2	5.9	5.9	.079	52	1.19	71	210	1550	210
3	5.9	5.9	.076	52	1.18	72	140	1710	230
4	5.9	5.9	.076	51	1.19	72	140	1850	230
5	5.9	5.9	.078	52	1.19	74	130	1540	190
6	5.9	5.9	.079	52	1.18	73	200	1760	200
9	5.8	5.8	.076	51	1.19	71	170	1820	200
12	5.8	5.9	.076	51	1.19	75	130	1950	200
18	5.9	5.9	.079	54	1.19	70	120	1740	190
24	5.9	5.9	.079	53	1.18	70	110	1760	200
36	5.8	5.9	.078	51	1.19	73	140	1800	180
61	5.9	5.9	.077	53	1.19	69	110	1700	160
290 DEGREES FAHRENHEIT									
1	6.0	6.0	.077	54	1.18	71	120	1610	220
2	6.0	5.9	.082	56	1.18	67	120	1560	250
3	5.9	5.9	.078	52	1.17	69	170	1690	250
4	5.9	5.9	.075	52	1.17	69	110	1490	210
5	5.9	5.9	.078	52	1.18	70	140	1340	180
6	5.9	5.9	.080	53	1.18	68	110	1680	230
9	5.9	5.9	.082	56	1.19	68	130	1600	210
12	5.9	5.8	.076	51	1.19	72	200	1320	180
18	5.9	5.9	.081	54	1.19	69	120	1550	210
24	5.8	5.9	.073	49	1.19	72	150	1670	180
48	5.9	5.9	.082	57	1.18	69	100	1290	130

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 17

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.080	51	1.14	72	230	2170	300
100 DEGREES FAHRENHEIT									
1	5.8	5.9	.077	49	1.14	71	200	2030	320
2	5.8	5.9	.081	51	1.15	70	150	1970	290
3	5.8	5.9	.083	53	1.13	69	170	2130	300
4	5.9	5.8	.078	49	1.14	69	160	2060	300
5	5.9	5.9	.077	48	1.15	70	160	2010	280
6	5.9	5.9	.080	50	1.15	69	280	1990	270
9	5.9	5.9	.078	49	1.15	70	200	2150	280
12	5.9	5.9	.082	53	1.15	70	180	2200	330
18	5.9	5.9	.081	52	1.14	67	190	2130	320
24	5.9	5.9	.082	52	1.15	68	240	1980	270
36	5.9	5.8	.079	50	1.15	68	220	2090	280
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.080	52	1.14	72	160	1990	260
2	5.9	5.9	.077	51	1.15	72	150	2020	260
3	5.9	5.9	.083	54	1.15	72	120	2070	260
4	5.9	5.9	.081	53	1.14	68	150	2050	240
5	5.9	5.9	.087	55	1.15	71	130	2000	250
6	5.9	5.9	.083	53	1.15	72	260	2130	240
9	5.9	5.9	.078	50	1.15	73	150	1940	190
12	5.8	5.8	.080	51	1.15	72	140	2150	210
18	5.9	5.9	.081	52	1.15	72	160	2150	240
24	5.9	5.9	.085	57	1.14	69	270	1990	220
36	5.8	5.8	.079	50	1.16	70	150	2190	210
61	5.9	5.9	.083	53	1.15	77	160	2160	230
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.081	53	1.15	71	140	1970	240
2	5.9	5.9	.078	51	1.15	72	150	1950	220
3	5.9	5.9	.086	56	1.15	71	110	2050	250
4	5.9	5.9	.079	51	1.15	71	130	1810	200
5	5.9	5.9	.079	51	1.14	73	150	2050	240
6	5.9	5.9	.081	52	1.15	73	140	2140	240
9	5.9	5.9	.082	53	1.16	75	200	2160	200
12	5.8	5.8	.078	50	1.15	74	130	1920	190
18	5.9	5.9	.088	57	1.15	70	160	1980	210
24	5.9	5.9	.079	52	1.15	73	130	2000	180
36	5.8	5.8	.089	54	1.15	72	150	1830	170
61	5.9	5.9	.074	53	1.15	70	170	1860	180
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.080	51	1.16	74	130	1600	180
2	5.9	5.9	.081	51	1.15	74	200	2110	230
3	5.9	5.9	.079	50	1.15	73	130	2050	210
4	5.8	5.8	.085	52	1.15	70	130	2010	210
5	5.9	5.9	.079	49	1.15	73	120	1980	210
6	5.9	5.9	.079	50	1.15	74	230	1680	160
9	5.8	5.8	.080	50	1.16	73	240	2140	190
12	5.8	5.8	.080	50	1.15	74	140	2240	220
18	5.9	5.8	.078	50	1.15	71	130	2030	180
24	5.9	5.9	.080	53	1.15	72	130	2170	200
36	5.8	5.8	.075	48	1.16	74	130	2050	180
61	5.9	5.9	.083	54	1.15	73	140	1790	160
290 DEGREES FAHRENHEIT									
1	5.9	5.9	.080	51	1.15	75	110	2070	230
2	5.9	5.9	.086	55	1.15	72	120	2010	220
3	5.9	5.9	.084	52	1.15	73	210	2140	220
4	5.9	5.9	.080	51	1.14	72	110	1980	210
5	5.9	5.9	.082	51	1.15	73	120	2060	210
6	5.8	5.8	.089	52	1.16	73	140	2190	210
9	5.8	5.8	.080	49	1.16	75	180	2160	180
12	5.7	5.8	.085	53	1.16	74	260	2100	190
18	5.8	5.8	.080	50	1.16	75	140	2370	230
24	5.7	5.7	.077	48	1.16	73	160	2040	180
48	5.9	5.9	.084	56	1.14	71	120	1890	180

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 18

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.055	40	1.33	68	230	1270	460
100 DEGREES FAHRENHEIT									
1	6.0	5.8	.056	41	1.33	66	200	1250	460
2	6.1	5.8	.057	41	1.31	65	170	1250	480
3	6.0	5.8	.055	39	1.31	63	170	1310	460
4	6.0	5.8	.057	40	1.33	69	180	1330	400
5	6.1	5.8	.058	40	1.32	66	180	1100	400
6	6.1	5.9	.057	41	1.32	66	200	1290	440
9	5.9	5.8	.057	40	1.33	68	220	1300	400
12	6.0	5.9	.056	40	1.32	66	170	1180	420
18	6.2	5.9	.059	43	1.30	64	140	1040	380
24	6.0	5.8	.059	40	1.33	71	170	1250	410
36	6.1	5.9	.056	40	1.32	64	160	1070	320
203 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
225 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 19

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.8	.136	82	1.08	33	130	980	50
100 DEGREES FAHRENHEIT									
1	5.9	5.7	.137	82	1.09	38	200	770	40
2	5.9	5.9	.132	84	1.08	40	150	700	55
3	5.6	5.7	.141	79	1.08	35	180	690	60
4	5.6	6.3	.144	89	1.08	35	170	740	40
5	5.9	6.2	.137	88	1.07	34	150	600	55
6	5.9	5.8	.136	81	1.09	87	220	750	40
9	5.8	6.1	.140	85	1.09	85	150	680	40
12	6.1	5.8	.140	86	1.09	85	220	860	20
18	5.6	6.1	.140	81	1.08	85	140	750	90
24	5.9	6.1	.140	87	1.05	95	170	1120	8
203 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER P-20

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	6.0	6.1	.062	39	1.13	59	280	1390	560
100 DEGREES FAHRENHEIT									
1	6.0	5.9	.061	39	1.15	58	250	1490	450
2	5.9	6.0	.062	39	1.15	60	220	1520	420
3	5.9	5.9	.061	37	1.12	54	230	1530	530
4	6.0	6.0	.063	40	1.13	58	210	1510	550
5	6.0	5.9	.063	39	1.12	55	220	1400	560
6	5.8	5.9	.062	38	1.14	58	210	1630	430
9	5.9	5.9	.061	38	1.13	53	270	1440	530
12	5.9	5.9	.061	39	1.14	57	220	1550	370
18	5.9	5.9	.062	38	1.12	50	230	1470	570
24	5.8	5.7	.063	37	1.12	53	230	1310	490
36	5.9	5.8	.062	37	1.12	53	250	1640	530
203 DEGREES FAHRENHEIT									
1	5.8	5.9	.062	38	1.16	66	200	1630	320
2	5.8	5.8	.063	37	1.14	57	190	1360	450
3	6.0	5.9	.063	39	1.15	61	140	1390	390
4	5.9	5.8	.061	36	1.14	65	160	1370	340
5	5.8	6.0	.060	37	1.15	65	140	1340	370
6	6.1	5.7	.061	37	1.13	60	200	1530	370
9	5.9	5.8	.062	38	1.15	64	140	1550	300
12	5.9	5.9	.060	37	1.14	61	120	1440	280
18	5.7	5.9	.062	37	1.14	60	140	1570	220
24	6.0	5.8	.063	39	1.15	66	180	1700	260
36	5.7	5.7	.060	36	1.17	70	130	1460	220
61	5.7	5.7	.059	35	1.20	83	150	1630	170
225 DEGREES FAHRENHEIT									
1	5.8	6.1	.058	36	1.15	61	180	1300	390
2	5.7	5.7	.059	35	1.16	63	170	1370	380
3	6.0	5.9	.062	38	1.15	61	120	1360	300
4	5.9	5.8	.060	37	1.17	74	140	1660	260
5	6.0	5.8	.064	39	1.12	59	140	1400	330
6	5.9	6.1	.062	40	1.15	63	100	1420	250
9	5.8	5.8	.060	36	1.16	68	100	1440	170
12	5.6	5.6	.060	33	1.15	67	120	1490	280
18	5.9	5.8	.061	38	1.17	68	120	1520	200
24	6.0	5.8	.060	37	1.15	66	110	1530	160
36	5.8	5.7	.059	36	1.17	72	120	1570	170
61	5.9	5.8	.062	38	1.15	64	120	1470	230
250 DEGREES FAHRENHEIT									
1	5.6	5.8	.055	33	1.20	77	150	1380	330
2	5.8	5.7	.062	36	1.17	63	180	1260	260
3	5.6	5.8	.056	34	1.17	75	140	1430	320
4	5.7	5.8	.057	35	1.19	75	130	1430	240
5	5.8	5.8	.059	36	1.17	70	110	1360	240
6	5.7	5.6	.059	35	1.17	69	180	1480	250
9	5.7	5.7	.060	34	1.15	59	210	1350	290
12	5.9	5.7	.060	37	1.17	69	140	1730	260
18	5.8	5.7	.060	35	1.14	58	130	1270	330
24	5.9	5.7	.058	36	1.15	65	140	1170	260
36	5.7	5.7	.060	35	1.17	70	150	1360	240
61	5.8	6.0	.060	38	1.18	66	110	1320	210
290 DEGREES FAHRENHEIT									
1	5.7	5.8	.059	36	1.16	69	130	1470	270
2	5.9	5.7	.060	37	1.18	68	120	1360	240
3	5.8	5.8	.061	36	1.16	66	160	1300	310
4	5.8	5.7	.058	34	1.16	63	130	1290	260
5	5.9	5.7	.060	36	1.17	70	120	1500	260
6	5.7	5.6	.059	33	1.16	65	140	1310	310
9	5.9	5.6	.059	36	1.19	72	140	1490	250
12	5.6	5.7	.058	34	1.18	70	180	1410	220
18	5.9	5.7	.059	36	1.18	69	140	1480	240
24	5.8	5.6	.058	35	1.18	72	150	1560	220
48	5.9	5.7	.058	36	1.15	66	120	1180	210

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 21

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.066	48	1.26	61	230	1100	700
100 DEGREES FAHRENHEIT									
1	5.9	5.8	.055	45	1.26	60	190	1050	650
2	5.9	5.9	.061	48	1.26	61	160	1050	730
3	5.9	5.8	.063	48	1.26	60	170	1070	730
4	5.9	5.9	.065	50	1.26	60	180	1150	710
5	5.9	5.9	.062	49	1.26	58	180	1120	750
6	5.9	5.9	.069	51	1.26	58	190	1090	720
9	5.9	5.9	.069	50	1.26	55	200	1110	690
12	5.9	5.9	.067	51	1.26	62	180	1110	760
18	5.9	5.9	.064	50	1.25	60	130	1130	680
24	5.9	5.9	.066	50	1.25	61	180	1140	710
36	5.9	5.9	.069	51	1.26	61	180	1110	640
203 DEGREES FAHRENHEIT									
1	6.2	6.1	.066	53	1.20	61	150	900	580
2	6.1	6.2	.073	58	1.21	63	170	1020	530
3	6.3	6.3	.066	57	1.21	60	140	960	510
4	6.3	6.4	.068	59	1.20	58	150	960	480
5	6.2	6.3	.072	58	1.21	63	170	1070	480
6	6.3	6.3	.073	61	1.20	63	160	1020	470
9	6.4	6.4	.073	62	1.20	63	130	950	440
12	6.4	6.5	.075	62	1.20	62	130	950	440
18	6.6	6.7	.072	66	1.17	57	120	740	340
24	6.6	6.7	.068	66	1.17	54	140	990	380
36	6.7	6.8	.072	67	1.17	54	100	860	360
61	7.0	7.1	.079	81	1.14	52	100	650	310
225 DEGREES FAHRENHEIT									
1	6.2	6.2	.072	58	1.21	63	180	920	510
2	6.3	6.3	.074	60	1.20	58	190	940	570
3	6.2	6.2	.068	59	1.21	66	140	1000	450
4	6.4	6.3	.075	62	1.19	56	130	1010	480
5	6.4	6.3	.063	56	1.20	59	150	960	450
6	6.5	6.4	.075	65	1.19	61	140	960	400
9	6.7	6.9	.078	74	1.17	62	140	560	200
12	6.6	6.6	.073	66	1.18	64	140	870	360
18	6.8	6.7	.070	69	1.16	52	100	830	340
24	6.6	6.7	.083	78	1.17	56	120	740	320
36	6.9	6.9	.076	73	1.16	55	80	670	290
61	7.2	7.1	.078	86	1.13	48	90	600	250
250 DEGREES FAHRENHEIT									
1	6.4	6.3	.061	55	1.20	54	170	930	520
2	6.3	6.4	.063	56	1.20	61	150	980	460
3	6.5	6.4	.066	60	1.18	58	140	890	490
4	6.5	6.5	.074	65	1.18	60	160	980	450
5	6.5	6.4	.066	59	1.19	59	120	870	470
6	6.5	6.6	.084	70	1.17	59	150	950	410
9	6.5	6.6	.073	64	1.19	58	160	980	400
12	6.6	6.6	.072	65	1.19	62	130	1010	380
18	6.6	6.6	.079	73	1.18	60	130	890	330
24	6.6	6.7	.068	65	1.16	57	100	780	310
36	6.8	7.0	.087	81	1.15	53	80	730	280
61	7.7	7.5	.092	101	1.11	45	80	500	230
290 DEGREES FAHRENHEIT									
1	6.3	6.3	.059	55	1.20	63	100	1000	470
2	6.5	6.4	.068	61	1.19	60	140	1010	420
3	6.6	6.5	.070	63	1.18	59	160	940	390
4	6.6	6.5	.077	67	1.17	59	120	960	410
5	6.5	6.6	.066	61	1.17	53	120	820	380
6	6.6	6.7	.073	67	1.17	60	110	910	380
9	6.8	6.7	.069	67	1.16	56	110	870	330
12	6.8	6.9	.075	72	1.17	58	140	890	340
18	7.1	7.2	.075	79	1.14	52	70	730	320
24	7.2	7.4	.078	84	1.13	53	80	670	260
48	7.6	7.8	.080	96	1.07	49	50	330	140

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 22

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.8	.070	47	1.16	67	290	1780	670
100 DEGREES FAHRENHEIT									
1	5.9	5.8	.070	47	1.16	67	210	1620	670
2	5.8	5.9	.074	49	1.16	64	210	1700	670
3	5.9	5.9	.074	48	1.15	64	210	1740	700
4	5.9	5.9	.072	47	1.15	65	190	1680	620
6	5.9	5.9	.074	49	1.16	61	240	1790	700
9	5.9	5.9	.075	48	1.16	63	250	1810	650
12	5.9	5.9	.070	47	1.15	62	180	1770	640
18	5.9	5.9	.075	51	1.15	61	210	1860	680
24	5.8	5.8	.073	48	1.15	62	240	1790	610
36	5.8	5.8	.065	46	1.15	60	200	1920	650
203 DEGREES FAHRENHEIT									
1	6.2	6.1	.080	56	1.12	61	170	1460	570
2	6.3	6.2	.082	60	1.13	58	190	1290	530
3	6.3	6.3	.078	60	1.13	57	150	1300	510
4	6.4	6.4	.086	65	1.11	55	150	1300	490
6	6.4	6.5	.086	66	1.11	55	150	1330	520
9	6.5	6.5	.083	64	1.11	52	130	1190	450
12	6.6	6.5	.085	65	1.12	58	120	1100	400
18	6.8	7.0	.087	79	1.09	46	100	840	400
24	7.0	7.1	.089	83	1.08	47	120	690	320
36	7.0	7.1	.091	78	1.09	51	90	830	330
61	7.6	7.6	.102	110	1.07	48	60	610	260
225 DEGREES FAHRENHEIT									
1	6.3	6.3	.083	64	1.12	57	150	1390	580
2	6.4	6.5	.085	66	1.11	56	150	1270	550
3	6.4	6.4	.086	65	1.11	55	120	1120	510
4	6.7	6.8	.085	71	1.09	47	110	950	450
6	7.0	7.1	.088	80	1.08	49	80	680	290
9	6.5	6.6	.084	68	1.12	60	90	1010	160
12	6.9	6.9	.088	72	1.10	53	90	980	430
18	7.3	7.5	.100	101	1.07	39	70	710	340
24	7.1	7.2	.100	94	1.08	39	50	580	300
36	7.5	7.5	.101	99	1.07	39	30	240	320
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	6.5	6.5	.083	67	1.12	55	160	1140	610
2	6.9	7.0	.090	79	1.09	50	130	880	490
3	7.2	7.3	.092	90	1.08	45	80	630	430
4	7.5	7.8	.100	102	1.07	39	70	610	390
5	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	7.1	7.1	.091	85	1.08	47	100	680	520
2	8.6	8.6	.101	143	1.14	33	40	390	380
3	8.4	8.3	.101	129	1.09	27	70	280	270
4	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 23

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.075	58	1.33	56	160	1560	740
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.082	62	1.33	54	140	1510	760
2	5.8	5.9	.083	61	1.32	53	100	1460	740
3	5.9	5.9	.074	56	1.32	54	130	1560	750
4	5.9	5.9	.076	58	1.32	55	110	1490	740
5	5.9	5.9	.084	61	1.33	53	100	1500	780
6	5.9	5.9	.083	61	1.32	53	120	1440	740
9	5.9	5.9	.076	58	1.32	55	160	1460	730
12	5.9	5.9	.083	61	1.33	55	110	1400	750
18	5.9	5.9	.083	62	1.32	55	120	1510	740
24	5.9	5.9	.076	58	1.32	55	110	1390	730
36	5.9	5.9	.076	58	1.32	54	120	1320	710
203 DEGREES FAHRENHEIT									
1	6.0	6.1	.079	62	1.29	47	150	1160	810
2	6.1	6.1	.080	63	1.29	43	150	1070	840
3	6.1	6.1	.089	67	1.29	40	140	1020	780
4	6.1	6.1	.087	69	1.27	39	140	990	760
5	6.1	6.1	.086	67	1.28	42	160	1110	790
6	6.2	6.2	.084	68	1.26	38	150	900	780
9	6.3	6.2	.094	73	1.26	38	100	850	730
12	6.2	6.3	.090	73	1.26	37	100	840	720
18	6.4	6.4	.100	86	1.22	29	90	650	670
24	6.6	6.6	.100	92	1.20	28	100	540	650
36	6.6	6.7	.101	92	1.20	28	80	490	540
61	7.5	7.4	.106	120	1.13	22	40	300	390
225 DEGREES FAHRENHEIT									
1	6.1	6.1	.080	63	1.29	44	100	1040	810
2	6.1	6.1	.078	63	1.27	41	140	1010	830
3	6.1	6.2	.084	67	1.27	39	100	910	820
4	6.2	6.2	.085	69	1.25	37	120	910	790
5	6.3	6.2	.086	70	1.23	35	110	850	730
6	6.4	6.4	.090	79	1.22	30	80	260	380
9	7.1	7.3	.097	100	1.17	18	40	120	370
12	6.6	6.5	.093	77	1.22	36	70	570	590
18	6.8	6.8	.101	100	1.18	27	70	540	500
24	7.2	7.1	.101	115	1.15	19	60	360	430
36	7.3	7.2	.101	111	1.15	23	0	0	0
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	6.3	6.2	.079	66	1.28	38	120	850	890
2	6.3	6.3	.091	74	1.25	37	100	770	790
3	6.4	6.4	.088	77	1.23	34	80	640	700
4	6.6	6.5	.088	78	1.22	28	80	580	720
5	6.5	6.4	.091	79	1.22	30	70	550	680
6	6.6	6.8	.096	87	1.19	25	70	410	620
9	7.0	6.9	.097	93	1.18	21	70	390	570
12	7.1	7.0	.101	101	1.17	27	50	360	540
18	7.6	7.1	.101	119	1.14	17	30	290	440
24	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	6.3	6.3	.083	69	1.25	36	110	660	880
2	6.7	6.5	.085	79	1.21	24	90	450	760
3	6.8	6.6	.100	94	1.25	23	80	390	690
4	7.1	6.8	.101	103	1.16	15	50	290	700
5	6.8	6.9	.095	88	1.19	22	50	280	590
6	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 24

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.082	51	1.14	60	330	1630	650
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.077	50	1.14	59	310	1680	650
2	5.9	5.9	.083	53	1.14	57	310	1640	640
3	5.9	5.9	.082	52	1.13	61	310	1760	630
4	5.9	5.9	.082	52	1.14	60	250	1720	580
5	5.9	5.9	.076	49	1.14	60	260	1790	620
6	5.9	5.9	.077	50	1.14	60	350	1910	620
9	5.9	5.9	.083	53	1.15	60	320	1790	550
12	5.9	5.9	.079	51	1.14	63	280	1790	570
18	5.9	6.0	.080	53	1.14	60	270	1600	490
24	5.9	5.9	.077	51	1.14	62	300	1700	500
36	6.0	5.9	.081	53	1.14	63	270	1680	430
203 DEGREES FAHRENHEIT									
1	6.3	6.4	.090	65	1.11	60	150	1320	340
2	6.6	6.6	.089	71	1.10	55	110	1070	270
3	6.7	6.6	.092	76	1.10	55	80	950	240
4	6.8	7.0	.090	78	1.09	53	90	810	220
5	7.0	6.9	.092	81	1.10	55	80	890	210
6	7.0	7.1	.096	86	1.09	53	80	800	210
9	7.3	7.2	.095	88	1.08	56	60	710	170
12	7.3	7.4	.092	89	1.08	53	50	730	190
18	7.4	7.5	.100	99	1.07	53	50	470	150
24	7.6	7.5	.101	106	1.07	52	60	500	140
36	7.6	7.7	.100	101	1.07	55	50	470	120
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
225 DEGREES FAHRENHEIT									
1	6.5	6.4	.095	72	1.11	56	120	1070	280
2	6.8	6.7	.094	77	1.10	54	100	920	260
3	7.0	7.1	.092	81	1.09	55	60	790	230
4	7.1	7.1	.091	82	1.08	53	70	790	230
5	7.4	7.2	.094	89	1.08	55	70	730	180
6	7.6	7.4	.099	99	1.07	51	50	550	170
9	7.7	7.6	.100	105	1.07	55	50	530	140
12	7.3	7.5	.100	96	1.08	57	50	610	150
18	7.8	7.6	.096	101	1.07	54	40	470	140
24	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	7.0	6.9	.091	78	1.09	55	90	770	220
2	7.2	7.1	.100	91	1.08	57	80	690	190
3	7.5	7.4	.095	93	1.07	55	60	640	180
4	7.4	7.3	.100	99	1.08	55	50	640	170
5	7.5	7.5	.099	98	1.07	56	60	610	150
6	7.6	7.5	.100	103	1.07	56	90	620	160
9	7.5	7.5	.100	101	1.07	54	50	620	140
12	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	7.4	7.3	.097	93	1.08	54	60	550	180
2	7.7	7.6	.100	105	1.18	53	40	490	160
3	8.0	7.9	.100	112	1.08	51	40	510	170
4	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 27

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.8	.102	68	1.31	72	120	2140	150
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.086	62	1.31	70	120	1960	130
2	5.8	5.8	.091	66	1.31	67	100	1540	130
3	5.8	5.8	.091	64	1.31	69	80	1280	110
4	5.8	5.8	.086	61	1.31	74	90	2030	140
5	5.8	5.8	.088	62	1.32	70	100	2130	120
6	5.8	5.8	.087	62	1.31	71	150	2170	130
9	5.8	5.8	.089	65	1.32	68	150	1620	110
12	5.8	5.8	.090	65	1.32	72	90	2160	150
18	5.8	5.7	.096	68	1.31	73	110	1490	110
24	5.8	5.8	.092	65	1.32	74	100	2180	160
36	5.8	5.8	.089	63	1.31	72	110	1810	100
203 DEGREES FAHRENHEIT									
1	5.9	5.8	.088	67	1.31	73	90	1590	120
2	5.7	5.8	.094	71	1.36	78	350	2600	20
3	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225 DEGREES FAHRENHEIT									
1	5.8	5.7	.084	64	1.36	92	230	2380	60
2	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 29

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.8	.076	48	1.13	67	260	2560	610
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.075	47	1.14	64	280	2030	580
2	5.8	5.9	.076	48	1.13	64	290	2020	620
3	5.9	5.8	.076	48	1.12	66	230	2070	590
4	5.8	5.8	.076	48	1.13	65	250	2080	560
5	5.9	5.9	.077	48	1.14	65	240	2080	570
6	5.9	5.9	.078	49	1.14	65	330	2170	580
9	5.9	5.9	.077	49	1.14	65	340	2110	560
12	5.9	5.9	.077	48	1.13	66	230	2090	560
18	5.9	5.9	.078	49	1.13	65	240	2100	580
24	5.9	5.9	.077	49	1.14	66	280	2150	580
36	5.9	5.9	.077	49	1.13	65	280	2050	540
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.080	52	1.12	66	240	1930	520
2	6.0	6.0	.079	52	1.13	66	180	1890	490
3	6.0	6.0	.079	52	1.13	65	190	1930	460
4	6.1	6.0	.079	53	1.12	63	200	1990	500
5	6.1	6.1	.077	52	1.13	67	230	1980	470
6	6.1	6.1	.081	54	1.12	67	310	2030	450
9	6.1	6.1	.080	53	1.13	68	200	1950	420
12	6.1	6.1	.080	54	1.12	68	220	2000	440
18	6.2	6.1	.081	56	1.12	65	190	1950	460
24	6.1	6.1	.082	56	1.11	66	230	1960	420
36	6.2	6.1	.081	55	1.12	67	200	1900	380
61	6.3	6.3	.082	60	1.11	66	170	1730	350
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.080	53	1.13	66	220	1930	510
2	6.1	6.0	.080	53	1.13	66	270	2010	490
3	6.1	6.1	.080	53	1.12	65	190	1950	470
4	6.1	6.1	.079	53	1.12	65	220	1950	440
5	6.1	6.1	.081	54	1.12	68	210	1870	410
6	6.1	6.1	.082	56	1.12	67	200	2030	420
9	6.2	6.2	.080	58	1.12	66	270	1720	350
12	6.1	6.1	.080	54	1.12	68	180	1940	410
18	6.2	6.2	.080	58	1.11	65	170	1720	360
24	6.2	6.3	.082	58	1.11	67	140	1540	300
36	6.2	6.2	.080	59	1.11	65	190	1680	310
61	6.5	6.4	.086	65	1.10	64	140	1570	300
250 DEGREES FAHRENHEIT									
1	6.2	6.1	.080	54	1.12	65	210	1820	500
2	6.1	6.1	.081	55	1.12	65	230	1900	420
3	6.1	6.1	.081	54	1.12	65	160	1930	450
4	6.1	6.2	.082	55	1.11	64	140	1940	400
5	6.2	6.1	.081	54	1.12	68	150	2000	420
6	6.2	6.1	.080	55	1.12	67	260	1980	410
9	6.2	6.1	.081	55	1.12	67	190	1800	360
12	6.1	6.1	.080	54	1.12	69	140	1990	390
18	6.2	6.2	.082	57	1.12	66	160	1790	330
24	6.3	6.2	.083	58	1.11	68	160	1700	320
36	6.4	6.3	.082	58	1.11	67	150	1630	320
61	6.7	6.6	.089	71	1.09	60	130	1210	250
290 DEGREES FAHRENHEIT									
1	6.1	6.1	.081	54	1.12	67	180	1920	460
2	6.1	6.1	.081	55	1.12	68	160	1860	420
3	6.2	6.2	.081	55	1.12	67	180	1920	390
4	6.2	6.2	.079	55	1.11	68	150	1920	380
5	6.2	6.2	.082	56	1.11	68	170	1860	370
6	6.3	6.2	.084	57	1.11	67	150	1850	360
9	6.3	6.2	.083	58	1.11	68	170	1820	330
12	6.3	6.2	.082	57	1.12	68	240	1880	340
18	6.4	6.3	.083	61	1.11	68	150	1660	320
24	6.4	6.4	.085	62	1.10	69	150	1470	280
48	6.7	6.6	.090	72	1.09	65	110	950	180

Table 11 - Continued

PERFORMANCE OF
RUBBER MATERIALS
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 32

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.8	5.9	.081	56	1.25	67	60	970	180
100 DEGREES FAHRENHEIT									
3	5.8	5.9	.081	56	1.27	68	70	1040	110
6	5.8	5.9	.076	55	1.26	68	60	1150	150
9	5.8	5.9	.082	57	1.26	71	60	1080	140
12	5.9	5.8	.076	55	1.26	68	50	870	130
18	5.8	5.9	.074	54	1.26	73	60	1170	120
30	5.9	5.8	.081	57	1.26	66	60	890	100
203 DEGREES FAHRENHEIT									
3	5.8	5.9	.073	53	1.27	69	60	930	80
6	5.9	5.8	.070	51	1.27	69	50	870	150
9	5.8	5.8	.073	52	1.27	62	70	820	110
12	5.8	5.7	.072	51	1.27	69	60	740	110
18	5.7	5.8	.072	49	1.27	67	80	860	110
30	5.6	5.8	.068	45	1.28	69	60	740	50
55	5.7	5.6	.052	34	1.29	80	60	560	60
225 DEGREES FAHRENHEIT									
3	5.8	5.8	.075	53	1.27	71	60	550	60
6	5.7	5.8	.076	52	1.27	71	60	780	80
9	5.8	5.7	.069	49	1.27	72	50	720	140
12	5.7	5.8	.074	51	1.28	65	80	790	80
18	5.8	5.7	.068	45	1.29	70	60	600	80
30	5.9	5.8	.067	43	1.30	80	60	480	50
55	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
3	5.8	5.7	.072	50	1.28	67	50	650	90
6	5.8	5.6	.074	50	1.28	74	60	580	100
9	5.7	5.6	.066	42	1.29	76	50	410	70
12	5.5	5.7	.057	37	1.28	71	60	550	50
18	5.4	5.6	.043	26	1.29	76	60	460	50
30	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
3	5.6	5.8	.074	49	1.29	68	60	600	60
6	5.6	5.5	.059	37	1.30	70	50	260	40
9	5.6	5.4	.070	45	1.31	70	40	190	15
12	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 5

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	6.0	5.8	.066	53	1.42	67	250	2340	330
100 DEGREES FAHRENHEIT									
1	5.6	5.7	.067	49	1.43	67	160	2250	310
2	5.9	6.0	.066	53	1.43	69	180	2200	330
3	5.8	6.3	.065	54	1.45	69	180	2270	320
4	5.9	5.8	.066	51	1.44	70	180	2570	350
5	6.3	5.8	.065	53	1.45	69	160	2160	300
6	5.9	6.0	.066	53	1.46	70	240	2490	320
9	5.9	5.8	.066	52	1.45	69	220	2710	300
12	6.2	5.9	.064	54	1.46	71	150	2500	300
18	6.3	5.9	.065	55	1.46	71	170	2460	290
24	5.6	5.6	.066	48	1.46	70	180	2530	300
36	5.8	5.9	.067	52	1.46	70	190	2350	260
203 DEGREES FAHRENHEIT									
1	6.5	6.5	.073	64	1.30	64	110	1270	190
2	7.0	7.0	.079	80	1.25	61	60	1110	170
3	7.0	7.4	.080	86	1.24	61	70	810	130
4	7.2	7.2	.079	81	1.23	60	50	920	130
5	7.2	7.0	.078	79	1.24	64	40	520	70
6	6.6	6.9	.069	67	1.31	69	70	880	90
9	6.9	7.1	.070	68	1.31	69	50	790	80
12	6.9	6.6	.058	57	1.40	73	70	1020	100
18	6.7	7.0	.074	74	1.27	60	30	620	80
24	7.4	7.2	.075	81	1.26	64	40	500	70
36	6.4	6.4	.065	56	1.36	71	60	670	50
61	7.5	7.3	.082	89	1.23	69	30	190	20
225 DEGREES FAHRENHEIT									
1	7.2	7.5	.078	86	1.23	62	90	1290	190
2	7.6	7.4	.078	88	1.21	63	90	980	150
3	7.3	7.7	.082	89	1.21	62	40	850	130
4	7.0	7.2	.078	78	1.26	61	50	1040	140
5	7.1	7.0	.075	75	1.25	62	30	600	80
6	7.3	7.5	.081	86	1.24	61	20	260	40
9	6.8	6.8	.070	65	1.32	71	60	410	30
12	6.7	6.6	.063	57	1.36	74	80	670	30
18	6.9	7.1	.073	74	1.28	65	30	290	30
24	6.7	6.6	.072	66	1.32	71	60	330	20
36	6.7	6.7	.068	59	1.33	74	80	390	20
61	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	6.9	6.5	.072	68	1.31	68	70	1390	170
2	7.0	6.6	.080	71	1.27	65	40	980	120
3	6.9	6.6	.077	70	1.26	66	50	1040	120
4	6.9	6.6	.076	68	1.29	64	50	1140	130
5	7.0	6.8	.075	72	1.27	67	40	480	60
6	7.1	7.0	.081	74	1.25	66	150	310	40
9	6.7	6.6	.078	64	1.32	71	30	400	40
12	6.5	6.3	.061	53	1.41	76	70	850	70
18	6.6	6.6	.072	63	1.31	72	30	370	40
24	6.6	6.5	.068	63	1.33	75	50	590	40
36	7.2	6.6	.073	64	1.27	70	40	320	10
290 DEGREES FAHRENHEIT									
1	6.9	7.0	.073	74	1.27	67	50	1150	150
2	6.7	7.1	.073	73	1.26	66	50	930	120
3	6.9	7.0	.074	72	1.28	66	50	660	70
4	7.1	7.4	.073	79	1.25	64	30	600	60
5	6.9	7.3	.076	75	1.25	68	20	390	40
6	7.5	6.7	.074	72	1.28	69	40	350	30
9	6.6	6.6	.068	62	1.32	71	40	600	40
12	6.4	7.0	.058	54	1.40	80	50	560	40
18	7.1	6.9	.071	68	1.30	74	60	580	40
24	6.7	6.8	.071	62	1.33	75	70	530	20
36	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 6

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.086	55	1.13	55	170	2080	320
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.090	58	1.13	53	100	1820	300
2	5.9	5.9	.093	60	1.13	53	110	1940	330
3	5.9	6.0	.080	52	1.14	54	130	2140	350
4	6.0	6.0	.085	54	1.13	55	70	2070	320
5	6.0	5.9	.087	57	1.14	54	110	2080	330
6	6.0	5.9	.085	56	1.14	55	110	1980	300
9	5.9	6.0	.084	55	1.14	56	180	2150	300
12	6.0	6.0	.085	56	1.13	55	120	2190	320
18	6.0	6.0	.083	57	1.13	56	90	2150	330
24	6.0	6.0	.085	56	1.13	55	110	2080	310
36	6.0	6.0	.084	56	1.14	55	120	2040	280
203 DEGREES FAHRENHEIT									
1	6.3	6.2	.090	64	1.12	54	90	1580	230
2	6.3	6.3	.090	65	1.12	57	90	1350	220
3	6.4	6.3	.089	67	1.12	58	100	1540	210
4	6.4	6.4	.089	67	1.11	57	100	1510	210
5	6.4	6.4	.091	68	1.11	58	70	1550	210
6	6.4	6.4	.100	77	1.11	56	120	1370	190
9	6.5	6.4	.100	77	1.11	57	70	1500	190
12	6.6	6.5	.093	73	1.11	58	60	1480	190
18	6.6	6.6	.100	78	1.10	55	60	1270	170
24	6.8	6.7	.095	79	1.10	55	70	1240	170
36	6.8	6.8	.091	78	1.09	57	40	1140	140
61	7.1	7.1	.102	91	1.08	55	40	870	120
225 DEGREES FAHRENHEIT									
1	6.4	6.3	.102	70	1.11	54	90	1480	230
2	6.4	6.4	.090	68	1.11	56	80	1530	220
3	6.5	6.4	.096	73	1.11	57	60	1490	200
4	6.6	6.5	.088	69	1.10	58	50	1380	200
5	6.6	6.5	.095	75	1.10	57	80	1100	170
6	6.6	6.5	.092	75	1.10	54	60	1450	200
9	6.9	6.6	.098	82	1.10	56	90	1290	170
12	7.1	6.8	.094	89	1.09	54	50	1270	200
18	7.0	6.9	.100	90	1.09	54	50	990	150
24	7.1	7.0	.097	92	1.08	54	40	870	140
36	7.2	7.1	.100	98	1.08	53	50	550	100
61	7.6	7.5	.102	119	1.07	48	30	480	60
250 DEGREES FAHRENHEIT									
1	6.6	6.5	.088	68	1.11	59	50	1340	180
2	6.7	6.6	.093	76	1.10	57	40	1170	160
3	6.7	6.7	.100	83	1.09	57	50	1170	160
4	6.8	6.8	.100	85	1.09	56	50	1040	140
5	6.9	6.8	.100	83	1.09	58	40	1090	160
6	7.0	6.9	.097	84	1.09	56	160	1050	160
9	7.5	7.0	.100	88	1.09	56	40	980	130
12	7.1	7.0	.100	90	1.09	57	40	1030	150
18	7.1	7.1	.101	98	1.08	57	50	980	130
24	7.2	7.2	.101	101	1.08	56	40	510	80
36	7.5	7.5	.101	109	1.07	52	30	530	110
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	6.7	6.6	.094	76	1.10	54	70	1200	200
2	6.8	6.8	.100	83	1.09	56	60	1080	170
3	7.0	6.9	.100	88	1.09	55	40	1070	170
4	7.1	7.0	.100	94	1.08	53	40	980	160
5	7.1	7.1	.094	86	1.08	55	40	870	150
6	7.2	7.0	.099	93	1.08	54	30	940	170
9	7.3	7.2	.101	100	1.08	54	30	820	110
12	7.3	7.3	.099	94	1.08	52	30	820	140
18	7.6	7.5	.101	105	1.07	54	20	700	130
24	7.6	7.6	.101	108	1.07	51	40	670	140
36	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 7

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.085	56	1.15	67	240	2020	350
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.090	58	1.15	64	200	2070	380
2	5.9	5.9	.084	55	1.15	66	180	1950	360
3	5.8	5.9	.088	56	1.16	65	210	2040	390
4	5.9	5.9	.087	56	1.15	66	150	1960	340
5	5.9	5.9	.085	54	1.15	66	210	2030	370
6	5.9	5.9	.088	57	1.16	65	260	1900	300
9	5.9	5.9	.090	59	1.15	64	280	2090	370
12	5.9	5.9	.088	58	1.15	65	210	2110	380
18	5.9	6.0	.085	58	1.15	65	190	2090	400
24	5.9	5.9	.084	56	1.15	65	210	2030	400
36	5.9	5.9	.088	60	1.15	64	210	1990	350
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.087	59	1.15	64	160	2050	310
2	6.0	6.0	.093	63	1.14	63	150	2020	300
3	6.1	6.0	.092	64	1.15	64	240	1980	300
4	6.0	6.1	.087	58	1.14	64	290	2110	320
5	6.1	6.1	.093	62	1.15	64	150	1900	310
6	6.1	6.0	.088	60	1.14	65	240	2070	300
9	6.1	6.0	.096	66	1.14	64	130	2020	260
12	6.1	6.1	.088	61	1.14	65	130	1940	280
18	6.1	6.1	.089	61	1.14	66	170	2110	280
24	6.1	6.1	.089	62	1.14	64	150	1970	300
36	6.1	6.1	.094	67	1.14	62	170	1990	260
61	6.2	6.2	.090	65	1.13	63	150	1930	270
225 DEGREES FAHRENHEIT									
1	6.1	6.0	.093	64	1.14	63	160	2100	350
2	6.1	6.0	.094	64	1.14	64	200	2010	300
3	6.1	6.1	.088	60	1.16	64	150	2010	330
4	6.1	6.1	.090	62	1.14	63	150	2040	280
5	6.1	6.1	.091	63	1.13	63	160	2110	320
6	6.1	6.1	.094	65	1.14	63	160	2110	320
9	6.1	6.1	.092	64	1.14	64	230	2100	290
12	6.1	6.1	.088	61	1.14	64	180	2070	320
18	6.2	6.2	.091	64	1.14	63	160	1980	320
24	6.2	6.1	.093	66	1.14	63	90	1770	300
36	6.2	6.2	.092	64	1.14	65	230	1930	260
61	6.4	6.3	.091	67	1.12	56	110	1330	240
250 DEGREES FAHRENHEIT									
1	6.1	6.1	.092	63	1.14	61	140	2090	270
2	6.1	6.1	.094	65	1.14	62	130	1940	250
3	6.2	6.1	.096	66	1.13	63	130	2180	300
4	6.1	6.1	.095	65	1.13	64	150	2130	270
5	6.2	6.1	.097	68	1.13	64	130	2090	260
6	6.2	6.1	.091	64	1.13	62	210	2090	300
9	6.2	6.1	.096	67	1.14	63	120	2180	250
12	6.1	6.1	.096	67	1.14	66	150	2150	270
18	6.1	6.1	.091	64	1.14	65	120	2160	270
24	6.1	6.1	.096	67	1.14	65	150	2040	240
36	6.2	6.2	.100	74	1.13	63	140	1890	240
61	6.4	6.3	.100	77	1.12	57	100	1240	190
290 DEGREES FAHRENHEIT									
1	6.2	6.1	.088	63	1.14	66	130	2220	280
2	6.2	6.1	.090	62	1.14	64	190	1950	240
3	6.2	6.1	.091	64	1.14	65	130	2190	250
4	6.2	6.1	.092	64	1.14	64	130	2170	240
5	6.2	6.1	.094	66	1.14	65	140	2160	250
6	6.2	6.2	.098	69	1.13	64	190	1920	240
9	6.2	6.1	.092	65	1.14	64	130	2000	240
12	6.1	6.1	.090	63	1.14	65	130	2190	260
18	6.2	6.2	.089	62	1.13	65	110	2000	270
24	6.2	6.1	.091	64	1.14	65	120	1980	220
36	6.5	6.4	.097	76	1.11	58	90	950	160
48	6.6	6.5	.102	85	1.11	53	90	880	130

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 9

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.092	57	1.12	60	210	2020	350
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.087	56	1.12	58	150	1910	340
2	5.9	5.9	.085	54	1.12	58	150	1860	350
3	5.9	5.9	.091	59	1.13	59	170	1970	320
4	5.9	5.9	.086	55	1.12	59	140	1990	340
5	5.9	5.9	.089	57	1.12	58	150	1980	330
6	5.9	5.9	.092	58	1.13	58	220	2100	360
9	6.0	6.0	.094	60	1.13	58	210	1940	320
12	5.9	6.0	.093	60	1.12	57	180	1960	330
18	6.0	6.0	.094	62	1.12	58	140	1910	320
24	6.0	6.0	.091	60	1.12	57	180	1860	330
36	6.0	6.0	.088	59	1.12	57	160	1950	300
203 DEGREES FAHRENHEIT									
1	6.3	6.2	.094	65	1.11	57	110	1460	240
2	6.5	6.4	.100	77	1.10	56	90	1330	220
3	6.6	6.6	.099	81	1.10	55	90	1120	210
4	6.6	6.6	.101	77	1.09	55	130	1350	210
5	6.7	6.6	.102	85	1.09	55	100	1300	200
6	6.7	6.7	.101	83	1.09	57	120	1330	200
9	6.9	6.8	.101	88	1.08	56	70	1140	160
12	7.0	6.9	.100	88	1.08	56	70	930	150
18	7.0	6.9	.101	97	1.08	56	70	1000	160
24	7.1	7.1	.101	103	1.07	55	60	900	140
36	7.2	7.2	.101	98	1.07	54	70	720	120
61	7.6	7.5	.116	117	1.06	54	40	450	80
225 DEGREES FAHRENHEIT									
1	6.4	6.4	.096	73	1.10	54	110	1440	240
2	6.6	6.6	.100	78	1.09	57	120	1070	180
3	6.7	6.7	.100	84	1.09	57	60	1110	180
4	6.7	6.7	.101	86	1.08	56	90	1290	190
5	6.9	6.9	.100	87	1.08	59	80	930	160
6	7.0	6.9	.099	89	1.08	54	70	950	170
9	7.2	7.1	.100	94	1.08	57	90	820	130
12	7.4	7.2	.101	102	1.07	55	50	790	130
18	7.6	7.4	.101	114	1.06	53	50	800	140
36	7.7	7.6	.102	121	1.06	52	40	480	80
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	6.8	6.8	.101	80	1.08	56	80	940	190
2	7.0	6.9	.101	92	1.08	53	70	920	170
3	7.0	7.0	.095	88	1.07	56	60	790	140
4	7.1	7.1	.099	92	1.07	56	50	690	130
5	7.3	7.2	.098	95	1.07	56	50	620	120
6	7.3	7.3	.102	105	1.06	49	80	580	100
9	7.4	7.4	.101	101	1.07	55	30	650	100
12	7.5	7.3	.101	107	1.07	55	40	710	110
18	7.6	7.5	.101	111	1.06	53	40	630	110
24	7.6	7.5	.102	114	1.06	53	30	570	90
36	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	6.9	6.9	.103	83	1.08	56	70	800	180
2	7.2	7.1	.101	99	1.07	53	70	730	140
3	7.4	7.3	.100	103	1.06	51	50	590	120
4	7.5	7.3	.102	116	1.06	50	50	900	160
5	7.6	7.4	.100	107	1.06	50	30	540	120
6	7.4	7.3	.102	109	1.06	50	60	760	140
9	7.7	7.6	.101	116	1.06	50	30	500	90
12	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
36	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 11

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.077	50	1.17	69	230	1690	430
100 DEGREES FAHRENHEIT									
1	5.8	5.9	.076	50	1.16	66	220	1510	460
2	5.9	5.9	.074	51	1.18	69	180	1550	380
3	5.9	5.8	.079	52	1.19	69	180	1620	370
4	5.9	5.9	.076	49	1.16	67	220	1610	440
5	5.9	5.9	.074	48	1.16	65	220	1500	410
6	5.9	5.9	.076	49	1.17	66	260	1540	410
9	5.8	5.9	.074	50	1.18	71	240	1670	300
12	5.9	5.9	.077	52	1.18	68	180	1740	330
18	5.9	5.9	.076	49	1.16	67	200	1670	380
24	5.9	5.9	.078	52	1.16	64	220	1660	360
36	5.9	5.9	.080	52	1.16	63	200	1750	330
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.081	53	1.19	71	130	1750	260
2	5.9	5.9	.081	54	1.18	70	140	1660	270
3	5.9	6.0	.079	53	1.19	70	230	1610	250
4	6.0	5.9	.076	51	1.16	66	200	1580	290
5	5.9	5.9	.078	52	1.18	71	130	1700	240
6	5.9	5.9	.075	52	1.18	72	220	1930	250
9	5.9	5.9	.078	52	1.19	72	140	1820	230
12	5.8	5.8	.075	50	1.19	74	120	1690	200
18	5.9	5.9	.079	54	1.19	72	170	1950	230
24	5.9	5.9	.077	52	1.19	73	130	1730	200
36	5.8	5.8	.076	50	1.18	72	170	1650	210
61	5.9	5.9	.076	51	1.18	76	140	1630	190
225 DEGREES FAHRENHEIT									
1	6.0	6.0	.077	54	1.17	70	170	1840	290
2	5.9	6.0	.076	51	1.16	67	180	1570	280
3	6.0	5.9	.076	50	1.16	68	160	1500	280
4	5.9	5.9	.077	52	1.18	70	130	1840	250
5	5.9	5.9	.077	51	1.18	74	150	1900	210
6	6.0	5.9	.076	53	1.17	70	130	1730	260
9	5.9	5.8	.081	54	1.20	75	200	1750	180
12	5.8	5.8	.076	50	1.20	75	140	2020	230
18	5.9	5.9	.081	53	1.20	77	150	1890	200
24	5.9	5.8	.080	54	1.19	75	160	1760	180
36	5.8	5.8	.074	49	1.19	75	270	1760	210
61	5.9	5.8	.075	50	1.19	76	130	1590	140
250 DEGREES FAHRENHEIT									
1	5.9	5.8	.076	53	1.18	72	150	1620	230
2	5.8	5.9	.077	50	1.20	75	140	1630	220
3	5.9	5.9	.075	51	1.18	73	130	1710	230
4	5.9	5.9	.080	53	1.18	72	160	1800	230
5	5.8	5.8	.076	49	1.20	77	150	1820	220
6	5.8	5.8	.076	49	1.21	81	240	1800	180
9	5.7	5.8	.072	48	1.21	69	140	1710	170
12	5.7	5.7	.075	48	1.21	79	160	1880	180
18	5.7	5.7	.075	49	1.21	78	140	1780	190
24	5.7	5.7	.072	47	1.21	76	170	1740	160
36	5.7	5.7	.078	50	1.22	81	160	1710	160
61	5.8	5.8	.075	51	1.21	77	120	1480	120
290 DEGREES FAHRENHEIT									
1	5.9	5.9	.077	52	1.19	70	130	1790	240
2	5.9	5.9	.081	53	1.19	72	210	1550	210
3	5.9	5.9	.079	52	1.18	69	140	1520	210
4	5.9	5.9	.084	55	1.18	70	140	1680	220
5	5.9	5.9	.076	51	1.19	71	110	1310	190
6	5.8	5.8	.075	51	1.20	73	220	1840	190
9	5.7	5.8	.073	50	1.20	74	130	1750	170
12	5.7	5.8	.074	49	1.20	76	160	1820	200
18	5.7	5.7	.080	51	1.22	79	160	1670	180
24	5.7	5.7	.076	48	1.23	81	200	1870	170
36	5.8	5.8	.078	52	1.21	77	120	1380	100
48	5.8	5.8	.078	52	1.21	80	120	1220	70

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 17

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.080	51	1.14	72	230	2170	300
100 DEGREES FAHRENHEIT									
1	5.9	5.8	.079	51	1.14	70	170	2110	310
2	5.9	5.9	.081	50	1.14	70	160	2000	330
3	5.9	5.9	.082	51	1.15	70	180	2080	310
4	5.9	5.9	.083	52	1.14	69	160	2030	280
5	5.9	5.9	.085	54	1.15	69	160	2060	310
6	5.9	5.9	.079	50	1.15	70	220	2130	300
9	5.9	5.9	.080	51	1.15	69	260	1980	260
12	5.9	5.9	.079	50	1.15	71	180	2100	270
18	5.9	5.9	.080	51	1.15	72	180	2070	290
24	5.8	5.8	.085	55	1.15	68	260	2040	280
36	5.8	5.8	.082	52	1.15	68	210	1980	240
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.079	51	1.16	71	180	1910	260
2	5.9	5.9	.079	51	1.15	73	200	1890	270
3	5.9	5.9	.079	51	1.16	71	170	1990	260
4	5.9	5.8	.078	49	1.15	72	250	2020	250
5	5.8	5.9	.076	50	1.16	74	160	2060	250
6	5.9	5.9	.078	49	1.15	72	270	2010	240
9	5.8	5.8	.078	50	1.16	75	150	2090	210
12	5.7	5.7	.081	50	1.16	75	160	2290	250
18	5.8	5.8	.081	51	1.16	75	180	2040	210
24	5.9	5.8	.087	55	1.16	73	140	2040	230
36	5.7	5.7	.086	53	1.17	73	270	2220	210
61	5.8	5.8	.078	49	1.17	80	170	1640	130
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.078	51	1.14	72	180	2090	280
2	5.8	5.9	.078	50	1.15	72	190	1980	240
3	5.9	5.8	.087	55	1.15	74	140	1990	250
4	5.9	5.8	.085	54	1.16	73	150	2210	250
5	5.9	5.9	.084	54	1.15	74	150	2190	260
6	5.8	5.9	.083	54	1.15	71	160	2230	250
9	5.8	5.8	.081	51	1.16	78	329	2250	220
12	5.7	5.7	.078	48	1.17	78	160	2020	190
18	5.7	5.8	.083	53	1.17	78	160	2030	200
24	5.7	5.8	.083	52	1.16	78	180	2020	210
36	5.7	5.7	.084	52	1.16	74	290	2220	200
61	5.8	5.8	.081	52	1.16	78	140	1880	140
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.082	52	1.15	74	130	1820	200
2	5.8	5.8	.079	49	1.16	75	140	2230	220
3	5.8	5.8	.079	48	1.15	74	130	2120	210
4	5.8	5.8	.083	51	1.16	73	150	2090	200
5	5.8	5.8	.076	48	1.16	76	140	2290	220
6	5.7	5.7	.085	52	1.16	78	280	2280	210
9	5.7	5.8	.081	49	1.17	77	150	2140	170
12	5.7	5.7	.077	48	1.16	80	150	2370	200
18	5.7	5.7	.078	47	1.17	79	140	2410	210
24	5.7	5.7	.082	49	1.17	76	130	2340	190
36	5.7	5.7	.081	50	1.17	80	160	2220	170
61	5.7	5.7	.085	53	1.18	79	150	2180	150
290 DEGREES FAHRENHEIT									
1	5.8	5.8	.077	48	1.16	77	150	2020	220
2	5.7	5.7	.073	48	1.17	76	250	2130	220
3	5.7	5.7	.077	47	1.17	77	160	2300	210
4	5.8	5.8	.078	47	1.16	75	130	1640	160
5	5.7	5.7	.081	50	1.17	79	130	2000	190
6	5.7	5.7	.078	48	1.17	78	210	2230	200
9	5.7	5.6	.075	46	1.18	80	150	2280	180
12	5.6	5.6	.080	48	1.17	81	170	1990	160
18	5.7	5.7	.083	51	1.18	80	170	2370	190
24	5.6	5.6	.076	45	1.18	82	190	2060	150
36	5.7	5.7	.082	50	1.18	80	150	1850	110
48	5.6	5.6	.079	49	1.19	82	250	1550	70

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 18

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.055	40	1.33	68	230	1270	460
100 DEGREES FAHRENHEIT									
1	5.9	6.1	.054	41	1.32	64	170	990	360
2	6.1	6.0	.057	41	1.30	62	160	1130	480
3	6.1	5.9	.056	40	1.33	65	180	1310	470
4	6.0	6.1	.056	42	1.32	66	160	1120	390
5	5.8	6.1	.057	40	1.32	64	130	1040	380
6	5.9	6.1	.055	40	1.33	63	150	1100	420
9	6.1	5.9	.055	39	1.33	67	170	1350	460
12	6.1	6.1	.055	41	1.32	66	170	1270	450
18	6.2	6.1	.059	43	1.30	64	120	990	350
24	6.1	6.1	.057	42	1.31	65	140	1030	340
36	6.0	6.3	.055	41	1.31	65	140	1100	330
203 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
225 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 19

	AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
	MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL										
	0	5.9	5.8	.136	82	1.08	33	130	980	50
100	DEGREES FAHRENHEIT									
	1	5.9	6.3	.139	88	1.09	35	140	530	30
	2	5.6	6.3	.140	87	1.08	38	200	730	50
	3	5.7	6.3	.145	90	1.08	40	140	730	90
	4	6.3	5.5	.136	86	1.08	34	150	720	35
	5	5.7	5.7	.139	79	1.08	30	120	620	90
	6	6.0	5.6	.136	81	1.09	84	190	910	65
	9	6.0	5.7	.136	82	1.09	85	220	790	10
	12	6.4	5.8	.135	86	1.09	87	180	770	30
	18	5.8	6.3	.139	88	1.08	86	140	580	20
	24	6.4	5.8	.136	90	1.07	93	250	920	4
203	DEGREES FAHRENHEIT									
	1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225	DEGREES FAHRENHEIT									
	1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250	DEGREES FAHRENHEIT									
	1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290	DEGREES FAHRENHEIT									
	1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 20

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	6.0	6.1	.062	39	1.13	59	280	1390	560
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.062	38	1.12	56	260	1150	540
2	6.0	6.1	.063	40	1.14	60	200	1530	440
3	6.0	5.9	.061	38	1.16	61	220	1570	430
4	6.0	5.9	.060	38	1.14	63	200	1620	460
5	5.9	5.9	.062	38	1.15	61	200	1660	450
6	5.8	5.9	.062	37	1.15	56	240	1440	560
9	5.9	5.9	.060	37	1.15	56	280	1540	460
12	5.8	6.0	.061	39	1.15	61	210	1760	410
18	5.9	5.9	.060	37	1.14	61	220	1660	400
24	5.8	5.9	.060	37	1.15	58	250	1720	440
36	5.9	5.9	.062	39	1.15	61	240	1700	390
203 DEGREES FAHRENHEIT									
1	6.0	5.7	.062	38	1.15	58	160	1510	440
2	5.9	5.6	.058	34	1.16	73	210	1520	240
3	5.8	5.5	.056	33	1.17	69	190	1630	300
4	5.7	5.7	.060	33	1.17	69	240	1500	320
5	5.6	5.5	.057	33	1.21	79	140	1540	220
6	5.7	5.7	.059	34	1.19	78	200	1630	220
9	5.6	5.7	.059	34	1.19	75	150	1410	180
12	5.7	5.6	.057	34	1.20	82	170	1680	180
18	5.6	5.6	.057	34	1.22	83	180	1600	160
24	5.6	5.6	.059	34	1.19	76	160	1810	190
36	5.6	5.5	.057	32	1.23	86	200	1700	140
61	5.6	5.5	.057	33	1.23	89	170	1680	90
225 DEGREES FAHRENHEIT									
1	5.9	5.8	.059	38	1.17	73	180	1520	320
2	5.8	5.6	.057	35	1.20	76	160	1540	280
3	5.6	5.8	.059	35	1.19	73	150	1390	270
4	5.6	5.6	.056	32	1.19	75	150	1640	300
5	5.6	5.7	.057	34	1.19	80	170	1780	200
6	5.6	5.6	.056	34	1.20	78	160	1870	190
9	5.6	5.5	.056	32	1.22	85	200	1680	170
12	5.5	5.5	.057	32	1.23	89	160	1590	150
18	5.4	5.5	.058	32	1.19	80	160	1140	160
24	5.5	5.6	.056	33	1.23	87	180	1520	140
36	5.6	5.4	.056	32	1.24	89	260	1830	100
61	5.5	5.6	.057	33	1.23	86	170	1540	70
250 DEGREES FAHRENHEIT									
1	5.8	5.7	.059	34	1.17	75	170	1430	350
2	5.7	5.4	.055	31	1.19	77	160	1530	230
3	5.6	5.5	.056	32	1.22	84	150	1570	170
4	5.4	5.6	.057	31	1.23	84	150	1660	180
5	5.4	5.6	.056	30	1.23	87	170	1720	200
6	5.4	5.3	.056	28	1.21	85	210	1480	190
9	5.5	5.4	.055	30	1.23	86	170	1420	140
12	5.4	5.4	.056	30	1.25	92	220	1880	160
18	5.4	5.4	.054	28	1.24	88	200	1610	170
24	5.3	5.4	.058	31	1.25	88	180	1590	150
36	5.4	5.3	.055	30	1.26	92	230	1600	90
61	5.4	5.5	.055	31	1.23	84	210	1570	80
290 DEGREES FAHRENHEIT									
1	5.5	5.7	.056	33	1.22	86	160	1400	250
2	5.4	5.4	.056	30	1.24	88	180	1550	200
3	5.4	5.5	.055	31	1.23	86	190	1630	160
4	5.5	5.4	.057	30	1.21	84	160	1630	220
5	5.3	5.4	.055	30	1.25	90	160	1650	160
6	5.4	5.4	.054	30	1.25	91	240	1930	160
9	5.5	5.3	.055	31	1.26	90	200	1660	130
12	5.3	5.3	.056	28	1.25	91	240	1920	150
18	5.2	5.3	.055	28	1.25	87	200	1670	160
24	5.2	5.3	.056	28	1.23	91	230	1690	140
36	5.3	5.4	.056	31	1.25	90	180	1330	50
48	5.4	5.3	.055	30	1.25	86	210	1400	60

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 21

AGE MONTHS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	WEIGHT GRAMS	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH PPI	TENSILE STRENGTH PSI	ELONGATION PERCENT
ORIGINAL									
0	5.9	5.9	.066	48	1.26	61	230	1100	700
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.064	49	1.25	57	200	1170	790
2	5.9	5.9	.062	48	1.26	61	180	1050	760
3	5.9	5.9	.064	50	1.26	58	220	1100	760
4	5.9	5.9	.067	49	1.25	58	170	1070	750
5	5.9	5.9	.068	50	1.25	56	210	1130	740
6	5.9	5.9	.063	48	1.26	57	200	1060	720
9	5.9	5.9	.061	49	1.25	60	220	1090	650
12	5.9	5.9	.068	53	1.25	63	210	1180	680
18	6.0	6.0	.066	52	1.25	58	180	1100	710
24	5.9	5.9	.063	50	1.25	58	230	1180	680
36	6.0	6.0	.070	52	1.24	59	230	1190	650
203 DEGREES FAHRENHEIT									
1	6.1	6.1	.057	52	1.23	64	160	950	560
2	6.2	6.3	.071	58	1.21	56	150	840	580
3	6.3	6.3	.063	56	1.20	56	130	780	570
4	6.4	6.4	.070	59	1.19	56	150	840	550
5	6.4	6.4	.072	62	1.20	57	170	980	600
6	6.3	6.4	.074	63	1.20	60	140	950	530
9	6.4	6.5	.068	60	1.19	58	130	860	490
12	6.5	6.6	.072	65	1.19	57	140	820	500
18	6.6	6.7	.072	68	1.17	54	110	770	430
24	6.7	6.8	.067	67	1.16	49	100	750	450
36	6.7	6.9	.063	66	1.16	51	110	770	420
61	7.0	7.2	.086	88	1.14	49	70	620	330
225 DEGREES FAHRENHEIT									
1	6.2	6.3	.073	59	1.20	59	150	940	620
2	6.3	6.4	.072	61	1.20	56	160	910	530
3	6.4	6.4	.064	57	1.19	57	100	860	520
4	6.3	6.4	.076	62	1.19	57	130	910	490
5	6.3	6.3	.076	62	1.19	59	130	930	510
6	6.4	6.6	.077	67	1.18	52	120	850	480
9	6.6	6.7	.077	68	1.18	56	130	830	420
12	6.6	6.8	.077	71	1.17	54	110	770	440
18	6.9	7.1	.083	82	1.14	53	80	600	400
24	7.0	7.1	.077	81	1.14	48	90	450	260
36	7.1	7.4	.080	83	1.13	46	60	520	280
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	6.3	6.3	.074	60	1.21	61	140	940	540
2	6.4	6.4	.076	67	1.19	55	130	900	470
3	6.5	6.6	.075	65	1.18	55	130	870	440
4	6.5	6.5	.079	69	1.17	55	130	850	420
5	6.4	6.5	.067	62	1.19	59	140	670	300
6	6.6	6.7	.079	69	1.17	54	250	880	420
9	6.6	6.8	.079	72	1.17	56	90	780	370
12	6.6	6.8	.067	64	1.17	58	110	900	410
18	6.9	7.1	.074	73	1.15	48	70	590	320
24	7.0	6.9	.081	82	1.15	50	80	670	300
36	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	6.4	6.4	.076	62	1.20	55	140	870	520
2	6.5	6.6	.071	64	1.18	55	130	860	470
3	6.6	6.6	.073	68	1.17	52	120	840	450
4	6.6	6.6	.073	67	1.16	54	90	840	440
5	6.6	6.6	.080	71	1.16	53	100	800	430
6	6.7	6.8	.078	73	1.16	51	140	860	420
9	7.0	7.1	.071	73	1.14	49	70	590	350
12	7.0	7.2	.085	81	1.14	48	90	690	430
18	7.5	7.7	.095	96	1.12	46	60	510	270
24	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 22

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.8	.070	47	1.16	67	290	1780	670
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.066	46	1.15	64	240	1700	670
2	5.9	5.9	.073	49	1.15	65	200	1670	700
3	5.8	5.8	.073	48	1.17	65	220	1710	650
4	5.9	5.8	.074	48	1.15	65	190	1780	730
5	5.8	5.9	.070	48	1.16	63	200	1560	590
6	5.9	5.9	.075	50	1.16	64	260	1890	700
9	5.9	5.8	.073	49	1.16	64	260	1860	670
12	5.9	5.9	.072	48	1.15	65	200	1880	610
18	5.9	5.9	.075	52	1.15	63	180	1690	560
24	5.9	5.8	.072	48	1.15	65	190	1930	590
36	5.9	5.9	.066	47	1.15	63	210	1790	530
203 DEGREES FAHRENHEIT									
1	6.1	6.1	.071	54	1.14	62	190	1440	540
2	6.3	6.3	.081	61	1.12	58	160	1370	540
3	6.3	6.3	.083	64	1.12	56	130	1350	520
4	6.3	6.4	.082	62	1.11	52	190	1320	520
5	6.4	6.4	.082	63	1.12	54	130	1350	490
6	6.4	6.5	.088	65	1.11	52	160	1210	450
9	6.5	6.6	.090	68	1.11	54	120	1200	470
12	6.6	6.6	.090	67	1.11	50	110	1020	430
18	6.7	6.8	.091	78	1.09	46	110	1210	480
24	6.9	7.1	.094	85	1.09	44	90	940	420
36	7.0	7.1	.088	79	1.09	48	110	1020	380
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
225 DEGREES FAHRENHEIT									
1	6.2	6.2	.085	62	1.12	57	190	1450	570
2	6.3	6.3	.087	64	1.12	55	180	1260	550
3	6.4	6.5	.085	66	1.11	55	110	1270	530
4	6.5	6.5	.082	66	1.11	52	130	1160	470
6	6.7	6.8	.091	79	1.09	45	100	1000	450
9	7.0	7.1	.086	75	1.09	52	80	800	370
12	7.1	7.2	.093	81	1.09	48	80	770	430
18	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	6.5	6.6	.082	66	1.10	58	160	1180	560
2	7.0	7.1	.087	81	1.09	46	80	700	430
3	7.4	7.4	.092	93	1.07	43	70	660	420
4	7.5	7.7	.097	100	1.07	40	70	690	380
5	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	7.1	7.1	.082	82	1.09	45	90	620	520
2	8.1	8.0	.098	122	1.08	31	60	370	430
3	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 23

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.075	58	1.33	56	160	1560	740
100 DEGREES FAHRENHEIT									
1	5.9	5.9	.074	56	1.32	55	120	1490	770
2	5.9	5.9	.081	60	1.32	54	100	1440	730
3	5.9	5.8	.082	61	1.34	54	120	1510	750
4	5.9	5.9	.083	61	1.32	54	110	1500	750
5	5.9	5.9	.076	58	1.32	54	110	1530	760
6	5.9	5.9	.083	60	1.33	53	150	1450	730
9	5.9	5.9	.076	58	1.32	54	140	1440	740
12	5.9	5.9	.083	61	1.31	54	110	1370	730
18	5.9	6.0	.082	61	1.32	55	110	1600	760
24	5.9	5.9	.077	59	1.32	53	140	1510	760
36	5.9	5.9	.082	63	1.32	53	150	1300	710
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.078	60	1.30	46	140	1190	780
2	6.0	6.1	.077	62	1.29	43	150	1070	790
3	6.1	6.2	.079	65	1.28	42	140	1000	780
4	6.1	6.1	.083	66	1.28	42	170	1060	730
5	6.1	6.2	.085	67	1.28	42	140	980	780
6	6.2	6.3	.079	67	1.27	38	150	970	780
9	6.3	6.3	.082	68	1.26	39	120	880	760
12	6.3	6.4	.089	73	1.25	39	120	790	750
18	6.3	6.6	.088	78	1.24	33	110	840	710
24	6.6	6.5	.095	85	1.22	29	90	660	690
36	6.6	6.6	.092	86	1.22	33	90	620	570
61	7.4	7.3	.099	110	1.15	23	40	220	360
225 DEGREES FAHRENHEIT									
1	6.1	6.1	.085	66	1.28	42	150	1120	810
2	6.1	6.2	.087	69	1.28	37	140	980	820
3	6.2	6.1	.085	69	1.27	37	130	970	830
4	6.3	6.2	.088	72	1.26	35	140	860	800
5	6.2	6.2	.086	71	1.26	36	140	920	800
6	6.4	6.2	.088	76	1.24	30	100	720	770
9	6.6	6.6	.085	80	1.21	30	100	480	620
12	6.5	6.6	.085	78	1.23	33	70	480	680
18	7.0	6.9	.092	99	1.17	22	60	390	580
24	7.1	6.8	.100	104	1.17	19	50	320	510
250 DEGREES FAHRENHEIT									
1	6.1	6.3	.089	71	1.27	35	130	830	860
2	6.3	6.3	.094	78	1.24	32	100	730	810
3	6.4	6.4	.082	72	1.23	30	100	620	790
4	6.4	6.6	.087	78	1.22	27	80	580	770
5	6.4	6.5	.086	78	1.23	30	90	610	820
6	6.6	6.4	.099	87	1.21	25	80	460	660
9	6.9	6.8	.101	101	1.18	20	50	350	610
12	7.1	7.3	.100	102	1.16	21	30	200	500
18	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	6.5	6.4	.075	68	1.26	38	100	650	830
2	6.6	6.6	.076	75	1.22	28	80	520	840
3	6.9	6.6	.079	81	1.19	22	80	390	860
4	6.9	6.9	.073	85	1.19	23	40	320	770
5	6.9	7.0	.092	90	1.18	18	40	180	690
6	7.1	7.3	.060	93	1.18	14	90	380	870
18	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 24

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.9	5.9	.082	51	1.14	60	330	1630	650
100 DEGREES FAHRENHEIT									
1	5.8	5.9	.086	54	1.14	56	300	1740	660
2	5.9	5.9	.076	51	1.14	57	310	1640	640
3	5.9	5.9	.083	52	1.15	58	330	1720	730
4	5.9	5.9	.083	52	1.14	59	300	1760	650
5	5.9	5.9	.078	52	1.15	58	310	1820	660
6	5.9	5.9	.083	53	1.15	59	340	1850	620
9	5.9	5.9	.085	54	1.14	59	340	1740	560
12	5.9	5.9	.078	51	1.14	60	310	1740	600
18	5.9	5.9	.091	59	1.14	60	250	1810	540
24	5.9	5.9	.078	51	1.14	61	330	1760	520
36	6.0	6.0	.081	54	1.14	61	260	1770	470
203 DEGREES FAHRENHEIT									
1	6.3	6.4	.085	64	1.12	58	130	1210	340
2	6.4	6.5	.083	68	1.10	55	120	1150	290
3	6.6	6.6	.084	70	1.11	58	120	950	240
4	6.7	6.7	.096	77	1.10	56	120	920	230
5	6.6	6.7	.096	80	1.10	56	90	890	240
6	7.0	6.9	.090	78	1.09	54	100	920	230
9	7.1	7.1	.098	88	1.08	54	60	690	160
12	7.4	7.4	.094	92	1.08	55	60	680	160
18	7.4	7.3	.100	97	1.08	53	60	640	150
24	7.6	7.7	.101	108	1.07	50	50	500	130
36	7.6	7.7	.096	97	1.07	52	40	430	110
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
225 DEGREES FAHRENHEIT									
1	6.6	6.4	.085	66	1.11	57	140	1150	290
2	6.6	6.5	.097	78	1.10	55	120	1040	270
3	6.8	6.9	.088	77	1.09	55	90	800	220
4	7.0	6.9	.096	84	1.09	53	90	850	220
5	7.1	7.0	.097	89	1.08	53	70	790	220
6	7.6	7.4	.093	97	1.07	49	50	590	190
9	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
250 DEGREES FAHRENHEIT									
1	7.0	6.9	.087	76	1.09	55	100	880	240
2	7.3	7.1	.094	90	1.07	53	60	750	210
3	7.4	7.5	.100	99	1.07	53	60	520	170
4	7.6	7.6	.096	98	1.07	52	40	590	180
5	7.5	7.8	.100	105	1.06	54	50	560	180
6	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	7.1	7.2	.094	87	1.08	57	70	680	220
2	7.8	7.6	.099	104	1.07	49	50	480	180
3	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 27

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.8	5.8	.102	68	1.31	72	120	2140	150
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.088	64	1.31	68	110	2220	150
2	5.8	5.8	.088	63	1.31	70	80	2100	180
3	5.8	5.8	.095	68	1.32	70	100	1690	130
4	5.8	5.8	.088	63	1.31	71	100	1860	100
5	5.8	5.8	.085	61	1.32	73	95	2210	130
6	5.8	5.8	.090	64	1.32	72	130	2200	130
9	5.9	5.8	.091	66	1.32	67	120	1740	110
12	5.8	5.8	.093	67	1.31	70	120	1680	120
18	5.8	5.9	.087	63	1.32	69	100	1890	110
24	5.8	5.8	.092	66	1.31	71	120	1710	110
36	5.8	5.8	.093	67	1.32	73	110	2410	130
203 DEGREES FAHRENHEIT									
1	5.8	5.8	.093	66	1.33	77	110	1750	120
2	5.7	5.8	.090	67	1.38	81	420	2720	40
3	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225 DEGREES FAHRENHEIT									
1	5.7	5.8	.085	61	1.36	92	300	2490	70
2	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 28

	AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
	MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL										
	0	5.7	5.7	.098	63	1.32	69	140	2010	230
100	DEGREES FAHRENHEIT									
	1	5.8	5.8	.090	64	1.30	65	100	1790	220
	2	5.8	5.8	.095	68	1.30	63	110	1650	210
	3	5.7	5.8	.094	66	1.32	63	110	1820	220
	4	5.7	5.8	.093	65	1.31	63	140	1960	190
	5	5.8	5.8	.095	65	1.32	64	120	1960	240
	6	5.7	5.7	.098	65	1.32	65	220	1860	240
	9	5.8	5.8	.094	67	1.31	65	210	1720	200
	12	5.7	5.8	.093	66	1.31	66	150	1870	200
	18	5.8	5.8	.091	65	1.32	62	160	2040	210
	24	5.7	5.7	.093	66	1.31	64	170	1960	240
	36	5.7	5.8	.095	67	1.32	67	180	2040	190
203	DEGREES FAHRENHEIT									
	1	5.8	5.8	.095	66	1.33	76	140	1230	140
	2	5.6	5.7	.087	63	1.38	76	430	2320	10
	3	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
225	DEGREES FAHRENHEIT									
	1	5.7	5.5	.090	66	1.37	86	340	1710	50
	2	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
250	DEGREES FAHRENHEIT									
	1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290	DEGREES FAHRENHEIT									
	1	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 29

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.8	5.8	.076	48	1.13	67	260	2560	610
100 DEGREES FAHRENHEIT									
1	5.7	5.8	.076	47	1.13	63	250	2020	580
2	5.8	5.9	.077	48	1.13	64	260	1990	590
3	5.8	5.9	.078	48	1.14	65	270	2080	570
4	5.9	5.8	.077	48	1.13	65	250	2080	610
5	5.9	5.9	.078	48	1.14	65	260	2090	610
6	5.8	5.9	.075	47	1.14	65	280	2150	600
9	5.9	5.9	.078	49	1.13	64	310	2060	550
12	5.9	5.9	.074	48	1.13	64	240	2160	590
18	5.9	5.9	.077	49	1.13	64	300	2160	630
24	5.9	5.9	.077	49	1.13	64	240	2060	570
36	5.9	5.9	.078	49	1.13	65	250	2090	570
203 DEGREES FAHRENHEIT									
1	6.0	6.0	.080	52	1.13	66	300	1980	490
2	6.1	6.1	.080	53	1.12	63	260	1870	540
3	6.1	6.1	.083	54	1.13	63	220	1770	480
4	6.1	6.1	.080	53	1.12	63	250	1840	530
5	6.1	6.1	.081	54	1.12	66	180	1700	450
6	6.2	6.1	.082	54	1.12	65	260	1890	490
9	6.1	6.1	.082	55	1.12	66	210	1870	460
12	6.2	6.2	.081	55	1.11	64	200	1870	470
18	6.3	6.2	.083	58	1.11	63	220	1850	490
24	6.3	6.2	.085	59	1.11	63	180	1740	410
36	6.2	6.2	.081	56	1.12	65	210	1790	390
61	6.5	6.4	.086	64	1.10	65	150	1470	310
225 DEGREES FAHRENHEIT									
1	6.1	6.1	.080	53	1.11	64	230	1770	490
2	6.1	6.1	.081	55	1.12	62	230	1850	480
3	6.2	6.1	.080	55	1.12	64	180	1740	450
4	6.2	6.1	.082	55	1.12	63	190	1820	480
5	6.2	6.2	.081	54	1.11	64	200	1910	480
6	6.3	6.2	.083	58	1.11	63	170	1820	430
9	6.3	6.3	.082	58	1.11	65	250	1700	400
12	6.3	6.3	.083	58	1.11	64	160	1740	400
18	6.4	6.3	.085	62	1.11	61	140	1690	380
24	6.4	6.3	.084	61	1.10	65	150	1620	370
36	6.5	6.4	.085	63	1.10	63	200	1450	310
61	7.4	7.2	.100	94	1.07	51	60	640	170
250 DEGREES FAHRENHEIT									
1	6.2	6.1	.082	55	1.11	64	210	1800	480
2	6.2	6.2	.081	55	1.11	65	210	1770	460
3	6.3	6.2	.081	56	1.10	62	180	1790	450
4	6.2	6.2	.083	56	1.11	65	180	1850	420
5	6.2	6.2	.082	56	1.11	66	190	1900	430
6	6.3	6.3	.083	57	1.11	65	230	1790	400
9	6.3	6.3	.085	60	1.11	62	150	1660	350
12	6.3	6.3	.083	58	1.11	65	150	1820	420
18	6.3	6.3	.084	59	1.11	61	150	1770	350
24	6.4	6.3	.082	60	1.11	64	140	1570	310
36	6.8	6.7	.091	73	1.09	60	100	830	220
61	TESTING DISCONTINUED DUE TO EXCESSIVE CHANGE IN PHYSICAL CHARACTERISTICS								
290 DEGREES FAHRENHEIT									
1	6.2	6.2	.081	56	1.11	65	160	1760	470
2	6.3	6.2	.082	57	1.11	64	150	1670	420
3	6.3	6.3	.083	57	1.11	63	150	1750	450
4	6.3	6.3	.082	59	1.10	63	160	1770	420
5	6.3	6.3	.083	59	1.11	65	170	1710	390
6	6.4	6.4	.084	60	1.10	63	220	1700	380
9	6.5	6.4	.086	63	1.10	63	140	1560	360
12	6.4	6.4	.083	61	1.10	65	140	1640	360
18	6.6	6.6	.086	65	1.10	64	200	1460	300
24	6.8	6.8	.089	70	1.09	63	110	1150	240

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER P 30

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.8	5.8	.075	48	1.16	63	170	1280	630
100 DEGREES FAHRENHEIT									
1	5.8	5.8	.074	48	1.16	60	140	1340	640
2	5.8	5.9	.077	49	1.16	61	160	1320	680
3	5.8	5.8	.074	48	1.16	62	130	1290	600
4	5.8	5.9	.076	48	1.16	61	120	1380	650
5	5.8	5.9	.074	48	1.17	61	120	1330	630
6	5.8	5.8	.074	48	1.17	59	190	1500	680
9	5.8	5.8	.074	48	1.16	58	190	1450	630
12	5.8	5.8	.076	49	1.16	59	150	1470	620
18	5.8	5.9	.078	49	1.16	59	140	1500	640
24	5.8	5.8	.073	48	1.16	58	170	1480	620
36	5.8	5.8	.075	48	1.16	60	160	1570	630
203 DEGREES FAHRENHEIT									
1	5.9	5.9	.076	49	1.16	62	170	1400	500
2	5.9	5.9	.078	50	1.15	60	130	1300	420
3	5.9	5.9	.078	51	1.16	61	150	1310	430
4	5.9	5.9	.077	49	1.16	59	220	1370	460
5	5.9	5.9	.076	49	1.17	62	160	1360	430
6	5.9	5.9	.075	49	1.16	61	200	1420	410
9	5.9	5.9	.075	49	1.16	60	140	1490	420
12	5.8	5.8	.076	48	1.17	63	150	1440	390
18	5.9	5.9	.075	49	1.16	60	150	1480	450
24	5.9	5.9	.076	50	1.16	58	140	1480	390
36	5.8	5.8	.073	47	1.17	63	180	1640	380
61	5.9	5.9	.077	51	1.16	63	150	1420	330
225 DEGREES FAHRENHEIT									
1	5.9	5.9	.076	51	1.14	61	180	1380	480
2	5.9	6.0	.078	50	1.15	59	170	1380	510
3	5.9	5.9	.077	50	1.16	59	140	1410	500
4	5.9	5.9	.077	49	1.17	59	180	1350	490
5	5.8	5.9	.077	48	1.16	61	170	1560	470
6	5.9	5.9	.077	51	1.16	60	180	1520	430
9	5.9	5.8	.077	49	1.17	62	190	1660	490
12	5.8	5.8	.076	48	1.17	64	140	1620	440
18	5.9	5.9	.076	50	1.16	65	160	1540	420
24	5.9	5.9	.076	50	1.17	63	160	1540	410
36	5.8	5.8	.076	49	1.17	62	240	1520	370
61	6.0	5.9	.079	53	1.16	64	130	1330	320
250 DEGREES FAHRENHEIT									
1	5.9	5.9	.078	50	1.16	59	210	1460	600
2	5.9	5.9	.078	50	1.16	58	210	1440	560
3	5.9	5.9	.075	49	1.15	58	210	1470	560
4	5.9	5.8	.076	49	1.17	58	140	1480	540
5	5.8	5.8	.076	48	1.17	61	150	1550	540
6	5.9	5.8	.078	49	1.16	57	230	1500	470
9	5.8	5.8	.076	48	1.17	57	150	1480	430
12	5.7	5.7	.074	47	1.18	62	170	1620	430
18	5.8	5.8	.076	48	1.18	61	160	1590	420
24	5.8	5.8	.076	49	1.17	58	160	1540	420
36	5.9	5.8	.079	50	1.17	61	150	1110	310
61	6.0	6.0	.079	54	1.16	57	110	1160	330
290 DEGREES FAHRENHEIT									
1	5.9	6.0	.075	50	1.16	58	220	1300	640
2	5.9	5.9	.079	51	1.16	55	210	1300	610
3	5.9	5.9	.077	50	1.16	54	170	1370	570
4	5.9	5.8	.076	50	1.16	56	180	1390	520
5	5.9	5.8	.077	49	1.16	59	170	1340	530
6	5.9	5.9	.078	50	1.16	56	230	1350	520
9	5.9	5.8	.076	49	1.17	55	150	1420	450
12	5.8	5.7	.073	47	1.18	59	180	1510	450
18	5.8	5.8	.075	49	1.17	62	180	1490	470
24	5.6	5.7	.075	48	1.18	59	160	1450	440
36	6.1	6.0	.078	55	1.15	55	110	1030	370
48	6.1	6.1	.081	57	1.15	54	70	930	290

Table 12 - Continued

PERFORMANCE OF
RUBBER MATERIALS
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 32

AGE	LENGTH	WIDTH	DEPTH	WEIGHT	SPECIFIC GRAVITY	SHORE HARDNESS	TEAR STRENGTH	TENSILE STRENGTH	ELONGATION
MONTHS	INCHES	INCHES	INCHES	GRAMS			PPI	PSI	PERCENT
ORIGINAL									
0	5.8	5.9	.081	56	1.25	67	60	970	180
100 DEGREES FAHRENHEIT									
3	5.8	5.9	.084	58	1.26	65	80	930	90
6	5.9	5.9	.076	55	1.26	67	40	990	160
9	5.9	5.8	.075	54	1.26	69	50	1000	200
12	5.8	5.9	.082	57	1.26	71	70	1120	140
18	5.9	5.8	.074	54	1.26	67	70	950	160
30	5.9	5.8	.079	56	1.26	67	60	980	130
203 DEGREES FAHRENHEIT									
3	5.9	5.8	.080	56	1.26	69	40	830	120
6	5.8	5.9	.076	53	1.26	73	60	1020	110
9	5.8	5.9	.075	53	1.27	72	60	890	100
12	5.8	5.8	.077	53	1.27	70	60	770	100
18	5.8	5.7	.079	55	1.28	70	50	770	100
30	5.8	5.7	.079	53	1.29	70	50	680	70
55	5.6	5.7	.074	48	1.30	79	90	700	50
225 DEGREES FAHRENHEIT									
3	5.8	5.9	.073	53	1.27	71	60	830	80
6	5.9	5.8	.077	53	1.27	72	50	700	110
9	5.8	5.7	.074	53	1.27	71	50	640	110
12	5.9	5.7	.073	52	1.27	70	50	710	120
18	5.8	5.7	.071	50	1.28	71	50	550	80
30	5.7	5.8	.079	53	1.29	69	60	730	70
55	5.6	5.6	.069	43	1.31	77	70	420	50
250 DEGREES FAHRENHEIT									
3	5.9	5.8	.074	53	1.28	66	40	680	120
6	5.7	5.8	.073	51	1.29	68	60	680	90
9	5.6	5.7	.079	53	1.29	69	50	610	80
12	5.6	5.7	.078	52	1.30	73	60	550	70
18	5.7	5.6	.072	47	1.32	71	50	350	30
30	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	
290 DEGREES FAHRENHEIT									
3	5.7	5.7	.074	49	1.29	59	30	260	60
6	5.6	5.4	.070	44	1.32	62	30	160	15
9	5.6	5.4	.045	27	1.20	70	40	170	10
18	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION							TESTING DISCONTINUED	

Table 13

RUBBER MATERIALS - 20 PERCENT STRAIN
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 7

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.088	64	1980	430	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.089	64	1990	430	8
100 DEGREES FAHRENHEIT					
1	.090	62	2030	420	16
2	.086	63	2080	450	29
3	.088	63	2010	450	32
6	.084	63	1980	440	19
12	.081	63	1970	450	27
17	.081	61	1930	480	33
20	.086	61	1980	470	27
209 DEGREES FAHRENHEIT					
1	.078	62	2170	400	47
2	.083	64	2140	370	57
3	.087	63	2070	370	62
6	.082	61	2090	380	68
12	.089	62	2020	360	65
17	.085	60	2030	380	74
20	.084	60	1970	360	79
225 DEGREES FAHRENHEIT					
1	.081	64	2180	380	53
2	.084	63	2110	380	56
3	.083	63	2190	370	63
6	.084	61	2060	310	71
12	.087	61	1930	340	75
17	.089	60	1830	330	83
20	.092	60	1840	310	89
250 DEGREES FAHRENHEIT					
1	.084	64	2270	350	58
2	.075	64	2440	330	69
3	.086	63	2170	320	66
6	.090	62	2170	280	75
12	.092	64	2160	270	70
17	.090	62	1830	250	87
20	.092	64	1870	260	92
290 DEGREES FAHRENHEIT					
1	.088	62	2260	350	71
2	.076	63	2480	330	73
3	.086	63	2050	300	74
6	.087	64	2060	250	75
12	.086	64	1900	230	81
17	.086	62	2000	250	88
20	.085	64	1880	240	83

Table 13 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 20

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.062	61	1630	470	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.063	57	1600	470	8
100 DEGREES FAHRENHEIT					
1	.062	57	1690	500	24
2	.063	56	1680	470	28
3	.061	56	1730	420	24
6	.062	55	1680	440	28
12	.061	55	1750	470	36
17	.061	56	1780	460	52
20	.061	58	1840	430	28
200 DEGREES FAHRENHEIT					
1	.059	60	1860	360	65
2	.059	60	1700	320	65
3	.059	60	1690	310	67
6	.059	62	1700	290	72
12	.059	63	1700	270	83
17	.059	60	1610	260	81
20	.060	63	1700	270	83
225 DEGREES FAHRENHEIT					
1	.057	65	1750	330	66
2	.059	65	1640	320	70
3	.059	64	1620	310	68
6	.059	59	1570	270	77
12	.059	63	1520	250	83
17	.058	63	1560	260	88
20	.060	63	1570	250	84
250 DEGREES FAHRENHEIT					
1	.058	65	1530	290	76
2	.057	66	1610	280	81
3	.058	66	1540	270	68
6	.057	61	1430	240	81
12	.058	64	1340	220	84
17	.059	60	1510	240	82
20	.056	67	1560	230	83
290 DEGREES FAHRENHEIT					
1	.057	66	1600	290	74
2	.058	66	1540	260	75
3	.057	66	1520	260	75
6	.056	63	1500	240	77
12	.057	63	1420	200	81
17	.057	66	1480	220	87
20	.055	69	1540	230	81

Table 13 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 29

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.072	61	2090	620	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.072	59	1970	570	10
100 DEGREES FAHRENHEIT					
1	.072	61	2290	620	28
2	.072	61	2250	580	45
3	.071	60	2160	580	41
6	.070	59	2160	590	35
12	.071	61	2120	570	52
17	.068	61	2140	580	68
20	.069	61	2130	590	58
200 DEGREES FAHRENHEIT					
1	.072	66	2010	460	68
2	.071	61	2160	520	58
3	.074	64	2090	440	77
6	.074	58	1980	480	74
12	.076	59	1920	450	79
17	.074	58	1870	440	91
20	.076	59	1820	400	86
225 DEGREES FAHRENHEIT					
1	.070	62	2190	550	58
2	.069	62	2170	510	60
3	.071	61	2290	510	70
6	.071	59	1850	430	86
12	.078	57	1430	350	98
17	.080	57	1330	330	100
20	.077	56	1220	320	101
250 DEGREES FAHRENHEIT					
1	.071	62	2180	490	63
2	.071	61	2030	460	71
3	.074	61	1830	390	78
6	.072	59	1720	350	89
12	.073	61	1540	300	81
17	.077	57	1210	290	100
20	.075	61	1330	290	96
290 DEGREES FAHRENHEIT					
1	.072	62	2120	460	70
2	.076	60	1870	420	88
3	.083	61	1760	380	84
6	.072	61	1610	300	91
12	.076	61	1410	280	104
17	.083	59	1160	260	113
20	.077	62	1100	240	113

Table 13 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 30

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.078	66	1570	640	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.077	63	1610	590	19
100 DEGREES FAHRENHEIT					
1	.077	64	1740	590	26
2	.076	64	1670	580	35
3	.073	63	1680	580	35
6	.075	62	1620	560	28
12	.076	63	1680	560	44
17	.076	62	1690	540	58
20	.074	63	1690	510	55
200 DEGREES FAHRENHEIT					
1	.069	59	2080	500	56
2	.070	64	2020	450	61
3	.071	60	2030	500	72
6	.073	63	1940	420	74
12	.074	62	1850	410	73
17	.072	61	1790	380	85
20	.071	62	1760	380	84
225 DEGREES FAHRENHEIT					
1	.071	66	2030	420	70
2	.071	67	1950	440	70
3	.070	67	1950	440	74
6	.075	62	1790	370	82
12	.074	65	1640	340	87
17	.075	63	1640	330	87
20	.072	65	1670	320	90
250 DEGREES FAHRENHEIT					
1	.069	65	1870	460	77
2	.071	65	1770	440	76
3	.072	65	1640	400	74
6	.074	62	1630	370	85
12	.073	64	1530	320	81
17	.074	60	1480	340	98
20	.075	62	1450	310	87
290 DEGREES FAHRENHEIT					
1	.071	65	1830	490	74
2	.073	65	1790	430	75
3	.072	65	1570	360	76
6	.072	62	1640	340	85
12	.073	64	1660	320	80
17	.074	60	1550	330	97
20	.072	65	1570	320	88

Table 13 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
WATER AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 34

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.083	64	3330	550	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.081	64	2920	480	10
100 DEGREES FAHRENHEIT					
1	.080	64	3210	480	20
2	.076	65	2960	420	21
5	.080	62	3190	480	18
12	.081	62	3380	470	16
17	.078	62	3380	500	30
20	.075	65	3030	420	29
200 DEGREES FAHRENHEIT					
1	.081	64	2920	370	32
2	.076	66	2990	340	46
5	.074	66	3350	350	53
12	.076	68	3410	340	61
17	.075	69	3280	310	75
20	.073	72	3060	270	79
225 DEGREES FAHRENHEIT					
1	.077	66	3430	370	49
2	.079	67	3240	360	46
5	.072	69	3110	290	67
12	.081	81	3160	200	92
17	.074	93	3730	140	97
20	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				
250 DEGREES FAHRENHEIT					
1	.078	79	3660	260	73
2	.070	93	3470	130	101
3	.072	94	5090	90	98
6	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				
290 DEGREES FAHRENHEIT					
1	.082	98	4860	80	100
2	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				

Table 14

RUBBER MATERIALS - 20 PERCENT STRAIN
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 7

AGE	THICKNESS	SHORE HARDNESS	TENSILE STRENGTH	ELONGATION	TENSION SET
MONTHS	INCHES		PSI	PERCENT	PERCENT
ORIGINAL NO STRAIN					
0	.088	64	1980	430	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.089	64	1990	430	8
100 DEGREES FAHRENHEIT					
1	.085	63	2000	460	20
2	.080	64	1990	430	26
3	.087	62	1950	490	31
6	.083	61	1970	460	25
12	.083	62	1930	430	28
17	.089	61	1990	430	42
20	.086	62	1910	430	31
203 DEGREES FAHRENHEIT					
1	.082	62	2100	380	56
2	.080	64	2050	360	57
3	.083	61	2080	360	66
6	.081	62	2140	360	62
12	.082	62	2050	330	70
17	.087	61	1940	340	79
20	.088	61	1960	340	82
225 DEGREES FAHRENHEIT					
1	.085	65	2130	390	60
2	.087	63	2060	380	67
3	.088	63	2050	370	67
6	.090	59	1860	280	76
12	.086	58	1790	330	84
17	.089	57	1570	310	103
20	.090	56	1410	300	100
250 DEGREES FAHRENHEIT					
1	.084	60	2030	370	65
2	.085	60	1880	360	76
3	.085	57	1670	350	85
6	.087	56	1440	230	91
12	.088	58	1200	200	101
17	.090	52	1250	220	100
20	.091	55	930	210	110
290 DEGREES FAHRENHEIT					
1	.084	60	1960	380	70
2	.091	57	1690	350	86
3	.094	53	1120	290	91
6	.097	51	1000	190	96
12	.096	52	890	190	97
17	.100	53	810	180	103
20	.100	51	620	170	105

Table 14 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 20

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.062	61	1630	470	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.063	57	1600	470	8
100 DEGREES FAHRENHEIT					
1	.063	59	1680	490	28
2	.062	59	1730	450	27
3	.062	59	1670	470	29
6	.062	57	1670	490	32
12	.061	56	1730	440	22
17	.061	61	1810	420	29
20	.060	61	1630	450	35
203 DEGREES FAHRENHEIT					
1	.058	62	1770	360	70
2	.057	65	1750	350	73
3	.057	66	1810	320	82
6	.056	67	1710	280	76
12	.054	73	1900	250	74
17	.054	75	1890	230	85
20	.053	76	1860	230	81
225 DEGREES FAHRENHEIT					
1	.059	67	1660	330	71
2	.055	71	1770	320	68
3	.057	73	1730	290	75
6	.054	71	1750	230	80
12	.052	82	1890	200	77
17	.052	80	1860	190	85
20	.054	83	1850	190	84
250 DEGREES FAHRENHEIT					
1	.054	71	1720	290	68
2	.054	73	1660	260	81
3	.053	78	1660	210	76
6	.053	82	1550	180	80
12	.052	90	1690	140	90
17	.051	87	1460	120	87
20	.050	92	1500	110	83
290 DEGREES FAHRENHEIT					
1	.053	78	1680	230	74
2	.052	81	1600	190	80
3	.073	82	1080	170	78
6	.053	84	1330	140	83
12	.051	93	1650	110	95
17	.052	92	1380	90	87
20	.051	93	1180	70	86

Table 14 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 29

AGE	THICKNESS	SHORE HARDNESS	TENSILE STRENGTH	ELONGATION	TENSION SET
MONTHS	INCHES		PSI	PERCENT	PERCENT
ORIGINAL NO STRAIN					
0	.072	61	2090	620	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.072	59	1970	570	10
100 DEGREES FAHRENHEIT					
1	.070	60	2200	590	39
2	.073	62	2120	560	40
3	.071	61	2100	560	47
6	.070	59	2170	570	34
12	.073	59	2140	570	48
17	.068	61	2150	570	64
20	.071	60	2030	570	67
203 DEGREES FAHRENHEIT					
1	.077	61	2130	510	65
2	.071	61	2190	520	71
3	.071	63	2030	500	80
6	.071	61	1920	460	82
12	.074	60	1810	460	87
17	.079	59	1680	440	96
20	.076	58	1590	410	96
225 DEGREES FAHRENHEIT					
1	.069	63	2120	490	66
2	.071	62	2590	520	76
3	.071	61	1950	500	82
6	.077	57	1400	390	90
12	.079	53	930	290	106
17	.089	46	740	250	154
20	.088	47	700	230	142
250 DEGREES FAHRENHEIT					
1	.072	61	1900	500	77
2	.071	59	1650	440	85
3	.078	55	1190	370	100
6	.087	50	800	240	105
12	.085	48	580	180	168
17	.097	39	420	170	211
20	.095	42	320	130	231
290 DEGREES FAHRENHEIT					
1	.078	59	1640	440	86
2	.087	54	1110	330	97
3	.099	49	700	280	102
6	.093	45	540	170	101
12	.085	45	400	160	193
17	.097	45	350	140	210
20	.093	42	280	130	260

Table 14 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 30

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.078	66	1570	640	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.077	63	1610	590	19
100 DEGREES FAHRENHEIT					
1	.077	64	1690	600	46
2	.075	63	1710	600	39
3	.077	63	1660	580	38
6	.077	60	1560	560	43
12	.075	60	1630	580	45
17	.074	61	1730	620	47
20	.074	61	1530	580	77
203 DEGREES FAHRENHEIT					
1	.073	63	1760	390	76
2	.071	65	1880	370	72
3	.071	67	1900	340	75
6	.071	64	1860	320	78
12	.071	68	1880	310	83
17	.074	67	1900	310	87
20	.072	69	1860	280	77
225 DEGREES FAHRENHEIT					
1	.073	67	1860	350	74
2	.072	67	1770	370	70
3	.072	68	1830	340	75
6	.071	68	1770	280	78
12	.071	71	1920	280	80
17	.073	67	1750	270	87
20	.072	70	1790	270	88
250 DEGREES FAHRENHEIT					
1	.072	66	1850	380	76
2	.072	68	1850	380	73
3	.071	67	1720	350	77
6	.072	63	1530	310	87
12	.073	67	1630	300	90
17	.074	62	1570	290	95
20	.073	67	1500	270	95
290 DEGREES FAHRENHEIT					
1	.073	69	1780	360	80
2	.073	68	1730	330	80
3	.073	66	1470	300	85
6	.074	64	1340	290	98
12	.073	65	1370	250	92
17	.077	67	1290	230	103
20	.074	67	1140	230	100

Table 14 - Continued

RUBBER MATERIALS - 20 PERCENT STRAIN
STEAM AUTOCLAVE EXPOSURE

SAMPLE NUMBER R 34

AGE MONTHS	THICKNESS INCHES	SHORE HARDNESS	TENSILE STRENGTH PSI	ELONGATION PERCENT	TENSION SET PERCENT
ORIGINAL NO STRAIN					
0	.083	64	3330	550	0
ORIGINAL, 20 PERCENT STRAIN, STANDARD ATMOSPHERE					
1	.081	64	2920	480	10
100 DEGREES FAHRENHEIT					
1	.080	65	3160	460	15
2	.083	63	2990	470	17
5	.080	63	3200	470	25
12	.080	62	3430	480	25
17	.077	65	3210	440	25
20	.080	64	3070	430	67
203 DEGREES FAHRENHEIT					
1	.082	65	3100	350	44
2	.080	69	3210	330	54
5	.078	74	3800	300	65
12	.074	81	3170	270	77
17	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				
225 DEGREES FAHRENHEIT					
1	.077	69	3510	390	47
2	.077	77	3940	310	65
6	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				
250 DEGREES FAHRENHEIT					
1	.073	94	3840	80	102
2	.076	94	3690	50	103
6	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				
290 DEGREES FAHRENHEIT					
1	.078	93	2060	10	102
2	SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE EVALUATION				

Table 15

PERFORMANCE OF RIGID PLASTICS

Material	Exposure environment degrees F	Exposure time mo	Performance
P-3 Polyphenylene Oxide (PPO) Unreinforced	Brine		
	100	35	Satisfactory
	203	30	Satisfactory
	225	39	Satisfactory
	250	60	Satisfactory
	290	59	Satisfactory
	D. Water		
	100	36	Satisfactory
	203 - 290	61	Satisfactory
	Steam		
	100	36	Satisfactory
	203 - 290	61	Satisfactory
P-5 Epoxy	Brine		
	100	35	Satisfactory
	203 - 290	21	Swelling, center soft, cracks near edges
	D. Water		
	100	36	Satisfactory
	203 - 290	21	Swelling, center soft, cracks near edges
	Steam		
	100	36	Satisfactory
	203 - 290	21	Swelling, center soft, cracks near edges
P-6 Epoxy	Brine		
	100	35	Satisfactory
	203 - 250	60	Warping at 21 Mo
	290	36	Severe warping at 21 Mo; cracking at 36 Mo
	D. Water		
	100	36	Satisfactory
	203 - 250	61	Warping at 21 Mo
	290	36	Severe warping at 21 Mo; Cracking at 36 Mo
	Steam		
	100	36	Satisfactory
	203 - 250	61	Warping at 21 Mo
	290	36	Severe warping at 21 Mo; cracking at 36 Mo
P-7 Epoxy Glass Fiber Reinforced	Brine		
	100	35	Satisfactory
	203	36	Severe swelling, warping, brittle
	D. Water		
	100	36	Very slight swelling
	203	36	Severe swelling, warping, brittle
	Steam		
	100	36	Very slight swelling
	203	36	Severe swelling, warping, brittle
P-8 Polyester Glass Fiber Reinforced	D. Water		
	100	36	Slight delamination, blistering and crazing.
	203	24	Severe delamination, blistering and cracking
	Steam		
	100	36	Slight delamination, blistering and crazing
	203	24	Severe delamination, blistering and crazing

Table 16

PERFORMANCE OF RIGID PLASTICS UNDER STRAIN

Material	Exposure environment degrees F	EXPOSURE STRAIN: Unstrained — Exposure time mo	Unstrained — Performance	Unstrained — Time mo	25% Ult. Bending Strain — Performance	25% Ult. Bending Strain — % recovery	50% Ult. Bending Strain — Performance	50% Ult. Bending Strain — % recovery
P-1 Polysulfone	Brine							
	100	35	Satisfactory					
	203	30	Satisfactory					
	225	39	Cloudy					
	250	60	Semiopaque					
	290	59	Opaque 2 Mo; warping 6 Mo					
	D. Water							
	100	36	Satisfactory	6	Satisfactory	84	Slight crazing	72
	203	61	Satisfactory	6	Satisfactory	20	Cracking, crazing	16
	225	61	Cloudy	6	Cloudy	12	Cloudy, cracking, crazing	12
	250	61	Slight elongation loss semiopaque	6	Semiopaque	-8	Semiopaque	-8
	290	27	Severe warping 24 Mo; blistering 27 Mo	6	Opaque, swelling	-76	Opaque, swelling, cracking	-20
	Steam							
	100	36	Satisfactory	6	Satisfactory	76	Slight crazing	72
	203	61	Satisfactory	6	Cracking	20	Cracking	16
	225	61	Cloudy	6	Severe cracking	20	Severe cracking, broken	0
	250	61	Slight elongation loss semiopaque	6	Semiopaque	-4	Semiopaque, severe cracking	-6
	290	48	Warping 24 Mo; severe warping 48 Mo	6	Opaque, swelling,cracking	-36	Opaque, swelling, cracking, crazing	-10
P-3 Polyphenylene -oxide (PPO) Glass fiber reinforced	D. Water							
	100	6	Satisfactory	6	Satisfactory	68	Slight cracking	60
	203	6	Slight cracking	6	Slight cracking	4	Slight cracking	12
	225	6	Slight cracking	6	Slight cracking	4	Slight cracking	4
	250	6	Slight warping, cracking	6	Cracking	-44	Cracking	0
	290	6	Severe warping, cracking	6	Severe warping, cracking	-12	Severe warping, cracking	0
	Steam							
	100	6	Satisfactory	6	Satisfactory	68	Satisfactory	60
	203	6	Satisfactory	6	Satisfactory	4	Satisfactory	12
	225	6	Slight cracking	6	Slight cracking	4	Slight cracking	4
	250	6	Slight warping	6	Cracking	0	Cracking	4
	290	6	Severe warping, cracking	6	Severe warping, cracking	-60	Severe warping, cracking	0

Table 17

PERFORMANCE OF JOINT SEALERS
3-MONTH AUTOCLAVE EXPOSURE

Material	Exposure environment degrees F	Hardness (Rex)		Extensibility No. of bond failures out of 3 samples	
		original	final	Extended to dimensions existing before compression*	Extended additional 10 percent
J-2 Neoprene	D. Water	60			
	100		72	0	0
	203		82	0	2
	225		77	0	0
	250		85	0	3
	290		85	1	3
	Steam				
	100		65	0	0
	203		82	0	2
	225		81	0	1
	250		87	0	3
	290		92	1	3
J-7 EPDM	D. Water	55			
	100		54	0	0
	203		63	2	3
	225		58	2	3
	250		60	0	1
	290		60	0	3
	Steam				
	100		56	0	0
	203		54	2	3
	225		59	3	3
	250		63	0	3
	290		65	1	3
J-8 Silicone	D. Water	45			
	100		45	0	0
	203		14	0	1
	225		13	0	0
	250		Soft	Reverted under exposure	
	290		Soft	Reverted under exposure	
	Steam				
	100		40	0	0
	203		18	0	0
	225		16	0	0
	250		Soft	Reverted under exposure	
	290		Soft	Reverted under exposure	

J-1,3,4,5,6 These materials performed unsatisfactorily. See text.

*Specimens exposed under 10 percent compression.

Table 18

AUTOMATH 1800 SOURCE
PROGRAM LISTING

```
EFN              PROGRAM:  C2JSAL                    JOB:     0822

     0DIMENSION SN(100),AGE(100,11),BLNG(100,11),WTH(100,11),NC(100),
     1TWTH(100,11),TNTH(100,11),TRTH(100,11),WT(100,11),SMWT(100,11),
     2TNLD(100,11),TRLD(100,11),ELONG(100,11),SHORE(100,11),TH(100,11),
     3SPG(100,11),TEAR(100,11),TENSIL(100,11),VOL(100,11),CNT(100),
     4MP(5)
     0COMMON SN, AGE, BLNG, WTH, NC, TWTH, TNTH, TRTH, WT, SMWT, TNLD,
     1TRLD, ELONG, SHORE, NA, K, CNT ,NS
      MP(1) = 100
      MP(2) = 203
      MP(3) = 225
      MP(4) = 250
      MP(5) = 290
      CALL HOERGN
      DO 50 K = 1, NA
      NS = NC(K)
      DO 51 JR = 1, NS
   51 CNT(JR) = AGE(K, JR)
      CALL HOERDR (CNT, NS)
      CALL HOEAGE
   50 CONTINUE
      DO 11 K = 1, NA
      NS = NC(K)
      DO 12 JR = 1, NS
      TH(K,JR) = (TNTH(K,JR) + TRTH(K,JR)) * 0.5
      SPG(K,JR) = WT(K,JR) / (WT(K,JR) - SMWT(K,JR))
      TEAR(K,JR) = TRLD(K,JR) / TRTH(K,JR)
      TENSIL(K,JR) = TNLD(K,JR) / (TWTH(K,JR) * TNTH(K,JR))
      VOL(K,JR) = WT(K,JR) - SMWT(K,JR)
   12 CONTINUE
   11 CONTINUE
      DO 15 KK = 1,NA,5
      K = KK
      KNUM = SN(K) - 1100.0
      WRITE (3,31)
  310FORMAT (1H1, 45X, 7H TABLE // 41X, 19H RUBBER MATERIALS
     1 / 38X, 23H BRINE  LOOP  EXPOSURE //)
      WRITE (3,16) KNUM
   16 FORMAT (39X, 19H SAMPLE NUMBER   R ,I2 /)
      WRITE (3, 17)
  170FORMAT (10X, 87H AGE   LENGTH  WIDTH  DEPTH  WEIGHT  SPECIFIC   SH
     1ORE      TEAR     TENSILE  ELONGATION / 47X, 38H GRAVITY  HARDNESS
     2  STRENGTH  STRENGTH / 9X, 86H MONTHS INCHES  INCHES INCHES  GRAMS
     3                          PPI       PSI       PERCENT /)
      DO 15 M = 1, 5
      WRITE (3,20) MP(M)
   20 FORMAT (5X,I5,21H  DEGREES  FAHRENHEIT)
      NS = NC(K)
      DO 72 L = 1, NS
      JAGE = AGE(K,L)
      JWT  = WT(K,L)
      JSHOR = SHORE(K,L)
```

Table 18 - Continued

AUTOMATH 1800 SOURCE
PROGRAM LISTING

```
EFN              PROGRAM:  C2JSAL                    JOB:     0822

      JTEAR =10.0*AINT(0.1 * TEAR(K,L) + 0.5)
      JTENS =10.0*AINT(0.1 * TENSIL(K,L) + 0.5)
      IF (ELONG(K,L) .LE. 100.0 ) GO TO 26
      JELON =10.0*AINT(0.1 * ELONG(K,L) + 0.5)
   26 JELON  = ELONG (K,L)
      IF (JWT .EQ. 888) GO TO 22
      IF (JWT .EQ. 999) GO TO 24
     OWRITE (3,18) JAGE, BLNG(K,L), WTH(K,L), TH(K,L), JWT, SPG(K,L),
     1JSHOR, JTEAR, JTENS, JELON
   18 FORMAT (10X,I3,2F8.1,F7.3,I7,F10.2,I9,3I10)
      GO TO 72
   22 WRITE (3, 23) JAGE
  230FORMAT (10X, I3, 87H      SAMPLE TOO BRITTLE TO ALLOW QUANTITATIVE
     1 EVALUATION          TESTING DISCONTINUED  )
      GO TO 72
   24 WRITE (3, 25) JAGE
  250FORMAT (10X, I3, 78H      TESTING DISCONTINUED DUE TO EXCESSIVE CHA
     1NGE IN PHYSICAL CHARACTERISTICS  )
   72 CONTINUE
      K = K + 1
   15 CONTINUE
      CALL EXIT
      END
```

Table 18 - Continued

AUTOMATH 1800 SOURCE
PROGRAM LISTING

EFN PROGRAM: PROG02 JOB: 0822

```
      SUBROUTINE HOERGN
     0DIMENSION SN(100),AGE(100,11),BLNG(100,11),WTH(100,11),NC(100),
     1TWTH(100,11),TNTH(100,11),TRTH(100,11),WT(100,11),SMWT(100,11),
     2TNLD(100,11),TRLD(100,11),ELONG(100,11),SHORE(100,11),SNT(100,11),
     3 CNT(100)
     0COMMON SN, AGE, BLNG, WTH, NC, TWTH, TNTH, TRTH, WT, SMWT, TNLD,
     1TRLD, ELONG, SHORE, NA, K, CNT ,NS
      N = 0
      DO 1 I = 1,100
      DO 1 J = 1,11
     0READ (2,2)  SNT(I,J),AGE(I,J),BLNG(I,J),WTH(I,J),TWTH(I,J),
     1TNTH(I,J),TRTH(I,J),WT(I,J),SMWT(I,J),TNLD(I,J),TRLD(I,J),
     2ELONG(I,J),SHORE(I,J)
   2 FORMAT(F8.0,F4.0,F6.0,2F5.0,8F6.0)
     N = N +1
     IF (SNT(I,J) .EQ. 9999.0) GO TO 3
   1 CONTINUE
   3 SN(1) = SNT(1,1)
     N = N - 1
     N2 = N/11
     N3 = N2 * 11
     N3 = N - N3
     N2 = N2 + 1
     NA = 1
     N4 = 11
     DO 4 I = 1, N2
     IF (I .EQ. N2) N4 = N3
     IF (N4.EQ. 0) GO TO 6
     DO 5 J = 1, N4
     DO 7 K = 1, NA
     IF (SNT(I,J) .EQ. SN(K)) GO TO 5
   7 CONTINUE
     IF (SNT(I,J) .EQ. 9999.0)GO TO 5
     NA = NA + 1
     SN(NA) = SNT(I,J)
   5 CONTINUE
   4 CONTINUE
   6 CALL HOERDR (SN, NA)
     CALL C2JGRP (SN,NA)
     DO 8 K = 1, NA
   8 NC(K) = 0
     DO 9 L = 1, NA
     N4 = 11
     DO 10 I = 1, N2
     IF (I.EQ. N2) N4 = N3
     IF (N4.EQ. 0) GO TO 10
     DO 11 J = 1, N4
     IF (SNT(I,J) .NE. SN(L)) GO TO 11
  30 IF (( L .EQ. I) .AND. (J .LE. NC(L))) GO TO 11
     NC(L) = NC(L) + 1
     NS = NC(L)
```

Table 18 - Continued

AUTOMATH 1800 SOURCE
PROGRAM LISTING

EFN PROGRAM: HOERGN JOB: 0822

```
      IF ( SNT(L,NS) .EQ. SNT(I,J)) GO TO 30
      TP0 =  SNT (L,NS)
      TP1 =  AGE (L,NS)
      TP2 = BLNG (L,NS)
      TP3 =  WTH (L,NS)
      TP4 = TWTH (L,NS)
      TP5 = TNTH (L,NS)
      TP6 = TRTH (L,NS)
      TP7 =   WT (L,NS)
      TP8 = SMWT (L,NS)
      TP9 = TNLD (L,NS)
      TP10= TRLD (L,NS)
      TP11=ELONG (L,NS)
      TP12=SHORE (L,NS)
      SNT   (L,NS) = SNT (I,J)
      AGE   (L,NS) = AGE  (I,J)
      BLNG  (L,NS) = BLNG (I,J)
      WTH   (L,NS) = WTH  (I,J)
      TWTH  (L,NS) = TWTH (I,J)
      TNTH  (L,NS) = TNTH (I,J)
      TRTH  (L,NS) = TRTH (I,J)
      WT    (L,NS) = WT   (I,J)
      SMWT  (L,NS) = SMWT (I,J)
      TNLD  (L,NS) = TNLD (I,J)
      TRLD  (L,NS) = TRLD (I,J)
      ELONG(L,NS) = ELONG(I,J)
      SHORE(L,NS) = SHORE(I,J)
      SNT   (I,J)  = TP0
      AGE   (I,J) = TP1
      BLNG  (I,J) = TP2
      WTH   (I,J) = TP3
      TWTH  (I,J) = TP4
      TNTH  (I,J) = TP5
      TRTH  (I,J) = TP6
      WT    (I,J) = TP7
      SMWT  (I,J) = TP8
      TNLD  (I,J) = TP9
      TRLD  (I,J) = TP10
      ELONG(I,J) = TP11
      SHORE(I,J) = TP12
   11 CONTINUE
   10 CONTINUE
    9 CONTINUE
      RETURN
      END
```

Table 18 - Continued

AUTOMATH 1800 SOURCE
PROGRAM LISTING

EFN PROGRAM: PROG03 JOB: 0822

```
      SUBROUTINE HOERDR (X, N)
      DIMENSION X(1100)
      DO 3 J = 1, N
      DO 3 K = J, N
      IF (X(K).GE.X(J)) GO TO 3
      TMP = X(K)
      X(K) = X(J)
      X(J) = TMP
    3 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE C2JGRP (X,MM)
      DIMENSION TM (100),X(100)
      DO 5 K = 1, MM
      TM(K) = X(K)
    5 CONTINUE
      L=1
      J=1
      DO 10 K=1,MM
      AL = L
      X(K) = TM(J) + ((AL - 1.0) * 100.0)
      L=L+1
      IF(L.LT.6) GO TO 10
      IF(L.GE.6) GO TO 8
    8 L=1
      J=J+1
   10 CONTINUE
      RETURN
      END
```

Table 18 - Continued

AUTOMATH 1800 SOURCE
PROGRAM LISTING

EFN PROGRAM: PROG05 JOB: 0822

```
      SUBROUTINE HOEAGE
     0DIMENSION SN(100),AGE(100,11),BLNG(100,11),WTH(100,11),NC(100),
     1TWTH(100,11),TNTH(100,11),TRTH(100,11),WT(100,11),SMWT(100,11),
     2TNLD(100,11),TRLD(100,11),ELONG(100,11),SHORE(100,11),SNT(100,11),
     3 CNT(100)
     0COMMON SN, AGE, BLNG, WTH, NC, TWTH, TNTH, TRTH, WT, SMWT, TNLD,
     1TRLD, ELONG, SHORE, NA, K, CNT ,NS
      DO 2  JJ = 1, NS
      DO 3  KK = JJ, NS
      IF (AGE(K, KK) .EQ. CNT(JJ)) GO TO 4
    3 CONTINUE
      GO TO 2
    4 TP1 =  AGE (K, JJ)
      TP2 = BLNG (K, JJ)
      TP3 =  WTH (K, JJ)
      TP4 = TWTH (K, JJ)
      TP5 = TNTH (K, JJ)
      TP6 = TRTH (K, JJ)
      TP7 =   WT (K, JJ)
      TP8 = SMWT (K, JJ)
      TP9 = TNLD (K, JJ)
      TP10= TRLD (K, JJ)
      TP11=ELONG (K, JJ)
      TP12=SHORE (K, JJ)
      AGE  (K,JJ) = AGE  (K, KK)
      BLNG (K,JJ) = BLNG (K, KK)
      WTH  (K,JJ) = WTH  (K, KK)
      TWTH (K,JJ) = TWTH (K, KK)
      TNTH (K,JJ) = TNTH (K, KK)
      TRTH (K,JJ) = TRTH (K, KK)
      WT   (K,JJ) = WT   (K, KK)
      SMWT (K,JJ) = SMWT (K, KK)
      TNLD (K,JJ) = TNLD (K, KK)
      TRLD (K,JJ) = TRLD (K, KK)
      ELONG(K,JJ) = ELONG(K, KK)
      SHORE(K,JJ) = SHORE(K, KK)
      AGE  (K, KK) = TP1
      BLNG (K, KK) = TP2
      WTH  (K, KK) = TP3
      TWTH (K, KK) = TP4
      TNTH (K, KK) = TP5
      TRTH (K, KK) = TP6
      WT   (K, KK) = TP7
      SMWT (K, KK) = TP8
      TNLD (K, KK) = TP9
      TRLD (K, KK) = TP10
      ELONG(K, KK) = TP11
      SHORE(K, KK) = TP12
    2 CONTINUE
      RETURN
      END
```

Table 19

PROGRAM DOCUMENTATION

PURPOSE

* COMPUTATION AND DISPLAY OF ELESTOMER DATA AFTER EXPOSURE TO SALINE WATER.

NECESSARY INPUT VARIABLES

* N. LAST, SN(I). AGE(I, J), BLNG(I, J), WTH(I, J), TWTH(I, J), TNTH(I, J). TRTH(I, J), WT(I, J), SMWT(I, J), TNLD(I, J), TRLD(I, J), ELONG(I, J) SHORE(I, J)

ARRAY LIMITS

* SEE ABOVE - FOR ALL ARRAYS I = 100
J = 11

DESCRIPTIONS

* N = NUMBER OF SAMPLES
LAST = CHECK VARIABLE, MUST BE IN FIRST AND LAST CARD.
SN(I) = SAMPLE IDENTIFICATION CODE
AGE(I, J) = MONTHS OF EXPOSURE
BLNG(I, J) = SPECIMEN LENGTH - INCHES
WTH(I, J) = SPECIMEN WIDTH - INCHES
TWTH(, J) = TENSILE SPECIMEN WIDTH - INCHES
TNTH(I, J) = TENSILE SPECIMEN THICKNESS - INCHES
TRTH(I, J) = TEAR SPECIMEN THICKNESS - INCHES
WT(I, J) = SAMPLE DRY WEIGHT - GRAMS
SMWT(I, J) = SAMPLE IMMERSED WEIGHT - GRAMS
TNLD(I, J) = ULTIMATE TENSIL LOAD - POUNDS
TRLD(I, J) = TEAR LOAD - POUNDS
ELONG(I, J) = ULTIMATE ELONGATION - PERCENT
SHORE(I, J) = SHORE HARDNESS - A OR D UNITS

VARIABLE TYPES

* STANDARD REAL, INTEGRS AND ALPHANUMERIC.

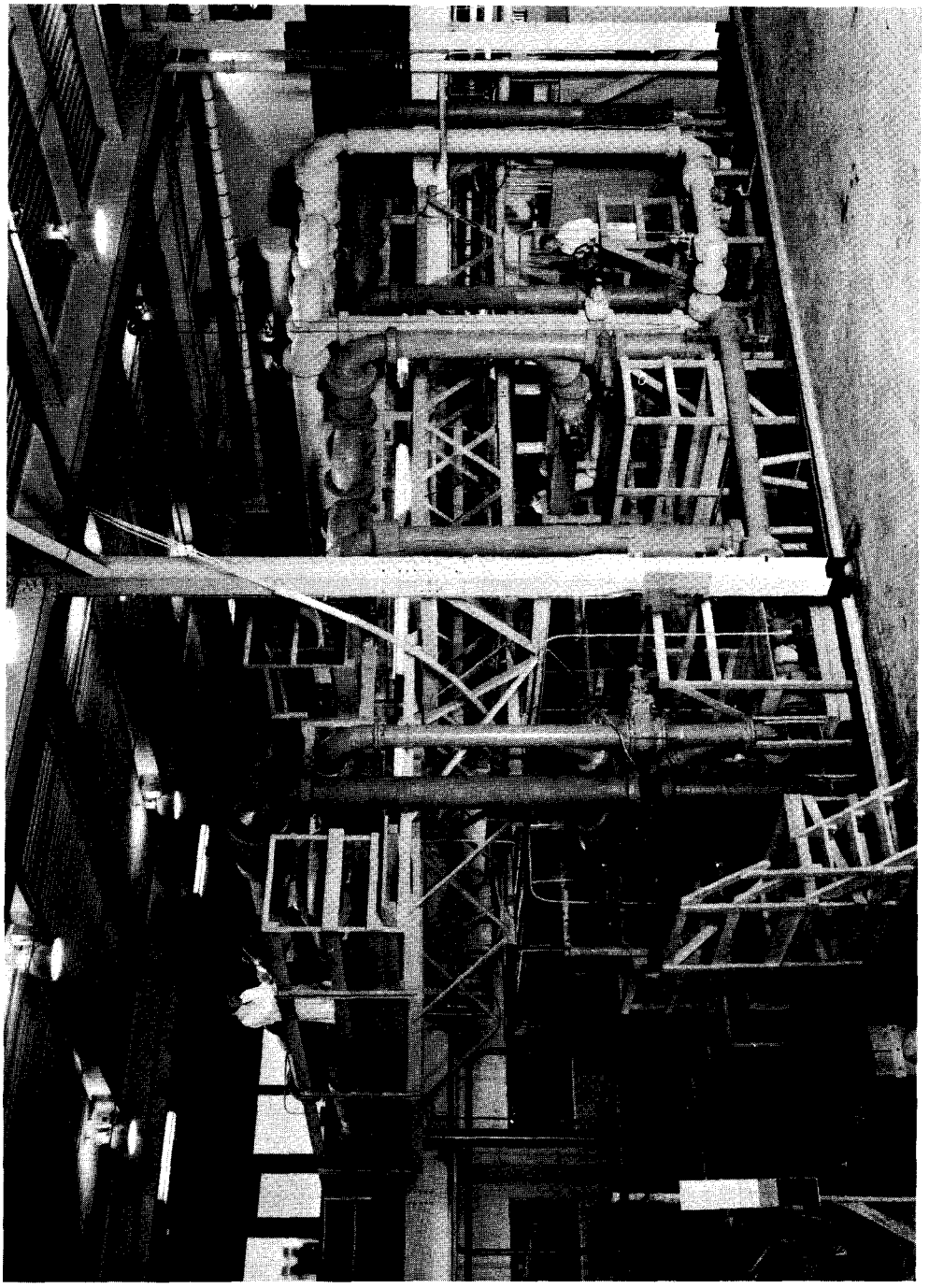
OUTPUT VARIABLES

* SN(I), AGE(I, J), WT(I, J), BLNG(I, J), WTH(I, J), TH(I, J), SPG(I, J) SHORE(I, J), TEAR(I, J), TENSIL(I, J), ELONG(I, J), VOLUME(I, J)

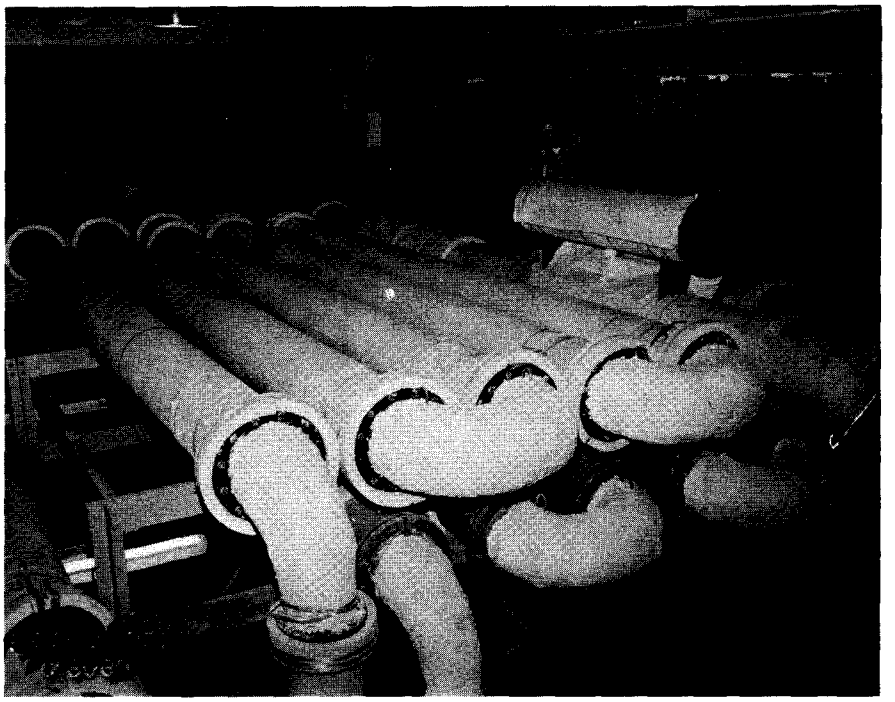
Table 19 - Continued

PROGRAM DOCUMENTATION

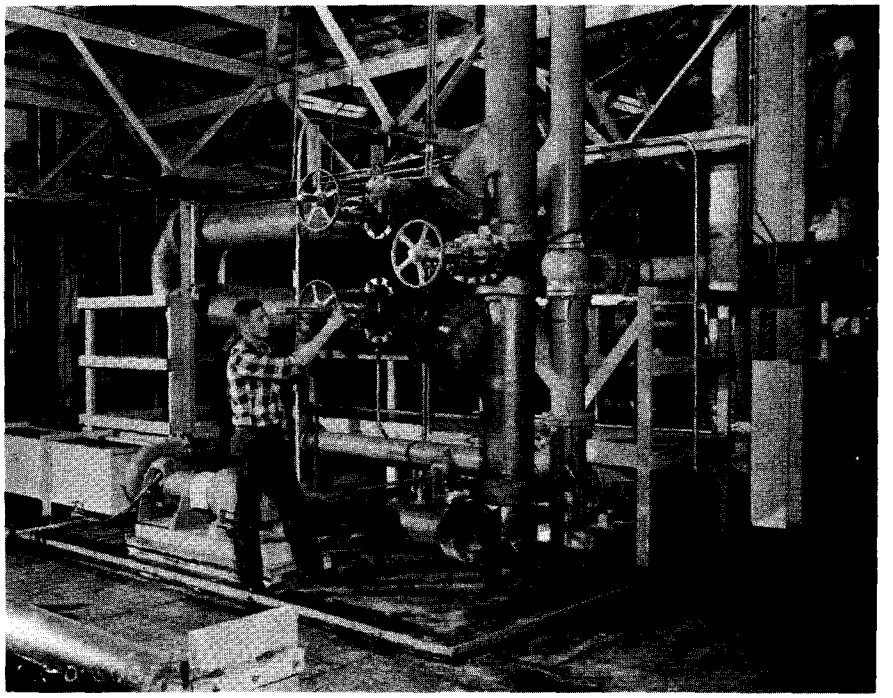
```
      ARRAYS
      --------
*       SEE ABOVE - FOR ALL ARRAYS  I = 100

      DESCRIPTIONS
      -------------
*       TH(I,J) = AVERAGE SAMPLE THICKNESS - INCHES
        SPG(I,J) = SPECIFIC GRAVITY AT 73 DEGREES F.
        TEAR(I,J) = TEARING STRENGTH - POUNDS PER INCH THICKNESS.
        TENSIL(I,J) = TENSILE STRENGTH - POUNDS PER SQUARE INCH.
        VOLUME(I,J) = SAMPLE VOLUME - CUBIC CM. (CONVERTED TO
                      CUBIC INCHES)

      VARIABLE TYPES
      ----------------
*       ALL VARIABLES ARE STANDARD REAL AND INTEGRS.

   STORAGE REQUIRED
   -------------------
*    STORAGE REQUIRED IS ABOUT

   TAPES USED
   ------------
*    TAPE 2 READ
     TAPE 3 WRITE

   WRITTEN BY                    DATE
   ------------                  ------
*    BERNIE JONES                4/3/67
     PHILLIP F. ENGER

   ADDITIONAL INFORMATION
   ---------------------------
*    NONE

*    END DOCUMENTATION
```



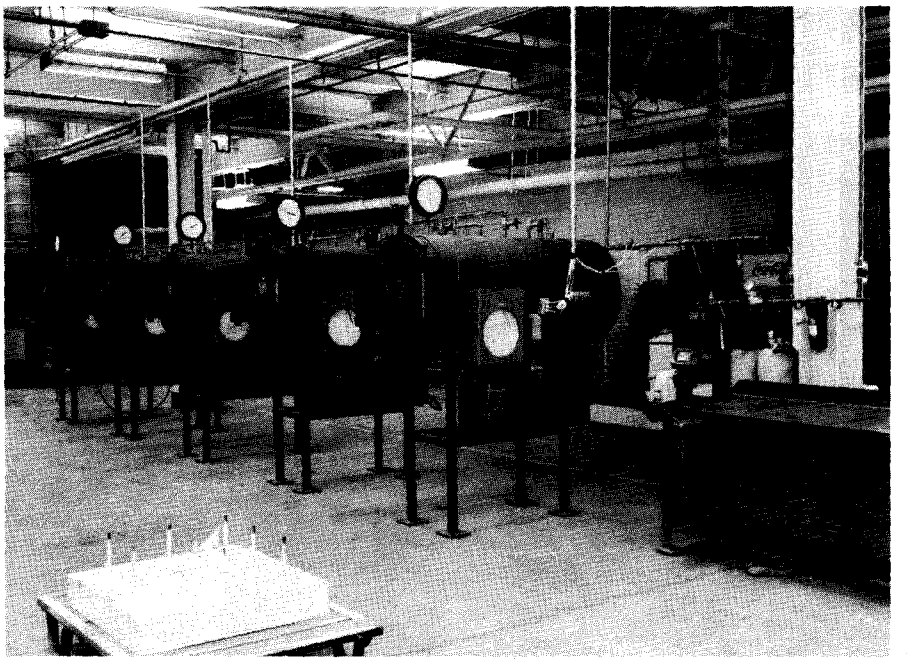
Photograph 1. Synthetic sea water (brine) test systems. Photo PX-D-58619



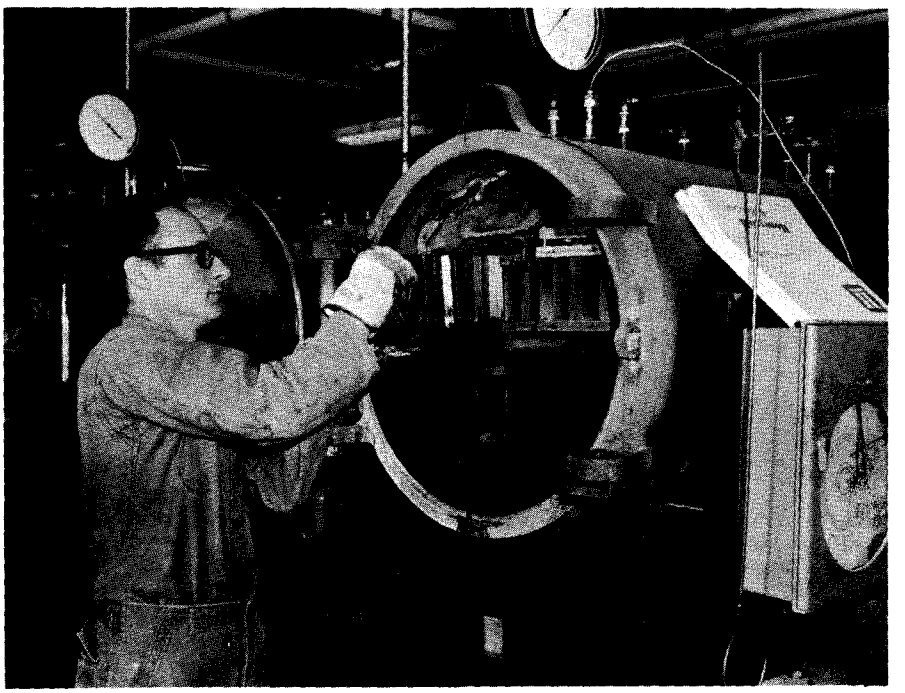
Photograph 2. Closeup view of 225° F (top) and 203° F (bottom) brine test chambers. Photo PX-D-60851



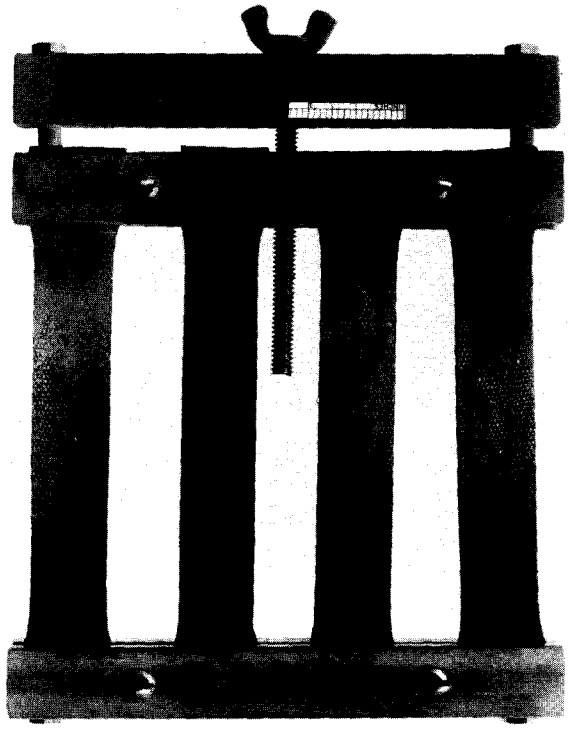
Photograph 3. View of typical coating material test chamber bypass loop. Photo PX-D-60852



Photograph 4. Autoclave test chambers for steam and water exposure. Water demineralizer tanks are shown in the right of the photograph. Photo P800-D-73505

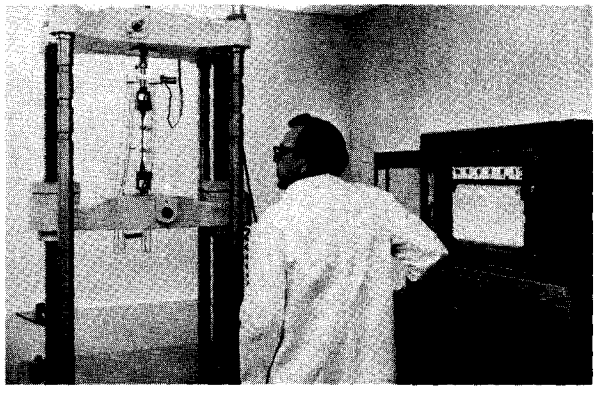


Photograph 5. Placement of test specimens in autoclave. Water exposure is in the lower half of the chamber, steam exposure is in the top half of the chamber. Photo P800-D-73497

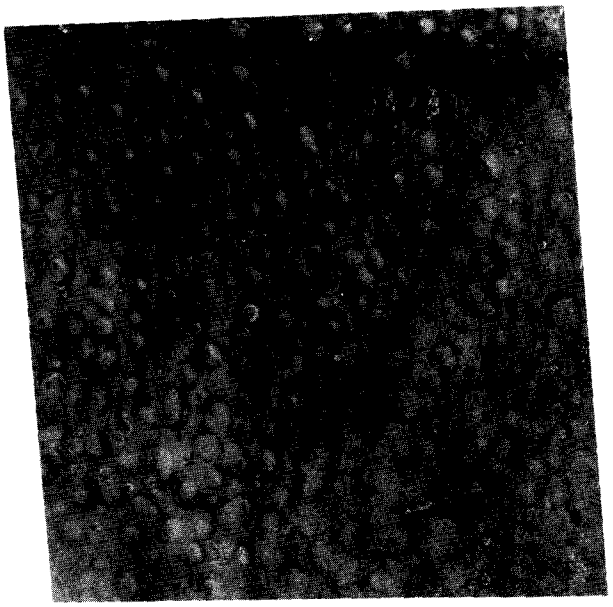


Photograph 6. Rubber specimens strained to 20 percent elongation in metal frame. Photo P800-D-73498

Photograph 7. Environmental control chamber where physical properties testing of rubber sheeting is conducted under closely controlled temperature and humidity conditions. Photo PX-D-61982

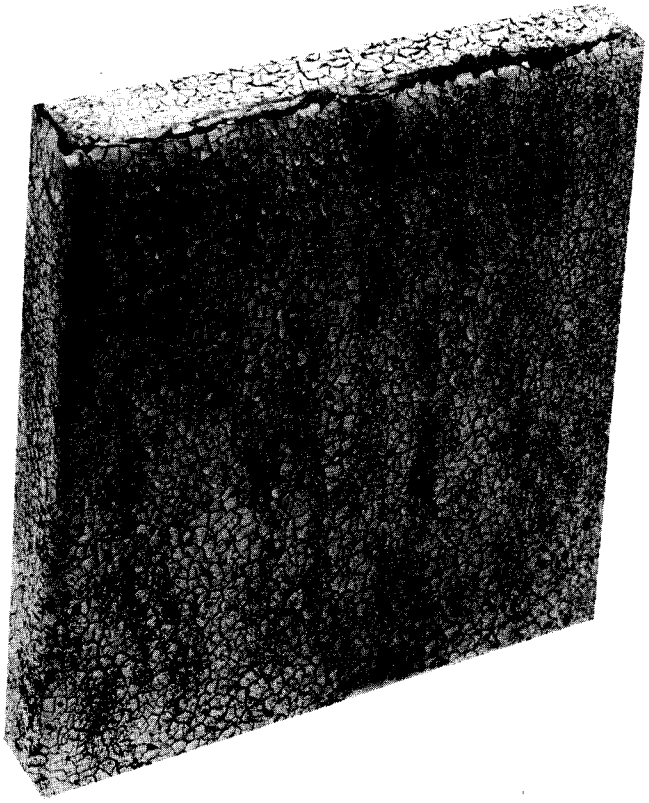


Photograph 8. Sixty-thousand-pound Universal testing machine with recorder and extensometer equipment for measuring tensile strength and elongation properties of rubber sheeting. Photo PX-D-66762

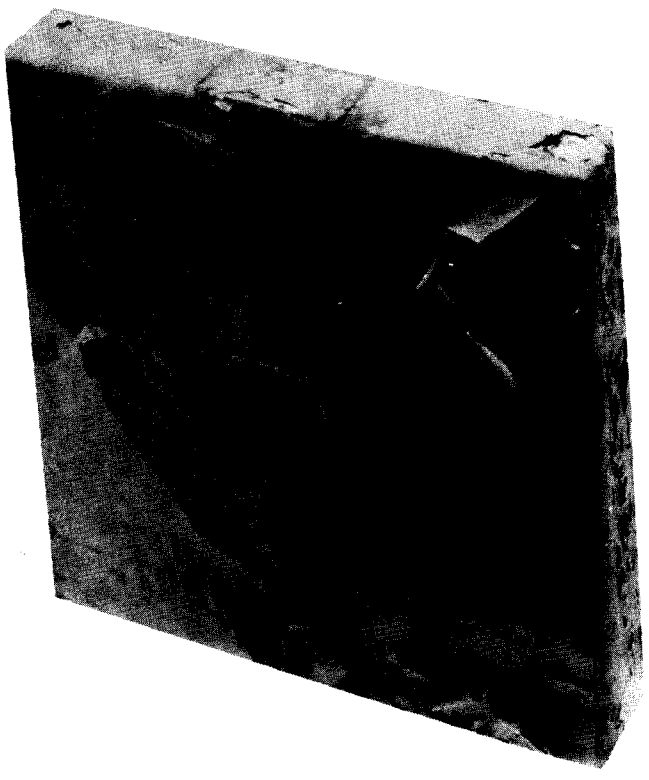


a. Blistering. Photo P800-D-73499

b. Cracking. Photo P800-D-73500

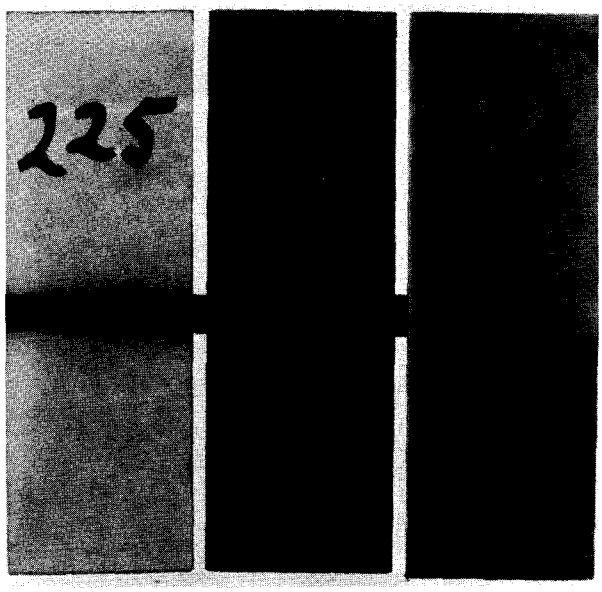


c. Severe crazing. Photo P800-D-73501

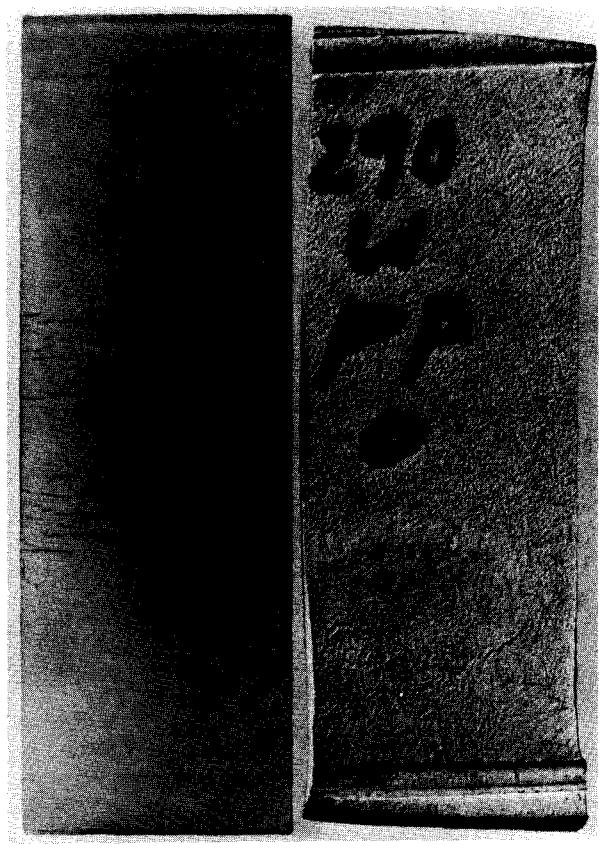


d. Peeling. Photo P800-D-73502

Photograph 9. Typical distress patterns in coating samples.



Photograph 10. Change in opacity of polysulfone plastic at 250° F (121.1° C) and 290° F (143.3° C). Photo P800-D-73503



Photograph 11. Typical stress cracking in polysulfone plastic (left). Typical warping and surface crazing in glass reinforced polyphenylene oxide plastic. Photo P800-D-73504

GPO 850-117

7-1750 (3-71)
Bureau of Reclamation

CONVERSION FACTORS–BRITISH TO METRIC UNITS OF MEASUREMENT

The following conversion factors adopted by the Bureau of Reclamation are those published by the American Society for Testing and Materials (ASTM Metric Practice Guide, E 380-68) except that additional factors (*) commonly used in the Bureau have been added. Further discussion of definitions of quantities and units is given in the ASTM Metric Practice Guide.

The metric units and conversion factors adopted by the ASTM are based on the "International System of Units" (designated SI for Systeme International d'Unites), fixed by the International Committee for Weights and Measures; this system is also known as the Giorgi or MKSA (meter-kilogram (mass)-second-ampere) system. This system has been adopted by the International Organization for Standardization in ISO Recommendation R-31.

The metric technical unit of force is the kilogram-force; this is the force which, when applied to a body having a mass of 1 kg, gives it an acceleration of 9.80665 m/sec/sec, the standard acceleration of free fall toward the earth's center for sea level at 45 deg latitude. The metric unit of force in SI units is the newton (N), which is defined as that force which, when applied to a body having a mass of 1 kg, gives it an acceleration of 1 m/sec/sec. These units must be distinguished from the (inconstant) local weight of a body having a mass of 1 kg, that is, the weight of a body is that force with which a body is attracted to the earth and is equal to the mass of a body multiplied by the acceleration due to gravity. However, because it is general practice to use "pound" rather than the technically correct term "pound-force," the term "kilogram" (or derived mass unit) has been used in this guide instead of "kilogram-force" in expressing the conversion factors for forces. The newton unit of force will find increasing use, and is essential in SI units.

Where approximate or nominal English units are used to express a value or range of values, the converted metric units in parentheses are also approximate or nominal. Where precise English units are used, the converted metric units are expressed as equally significant values.

Table I

QUANTITIES AND UNITS OF SPACE

Multiply	By	To obtain
LENGTH		
Mil	25.4 (exactly)	Micron
Inches	25.4 (exactly)	Millimeters
Inches	2.54 (exactly)*	Centimeters
Feet	30.48 (exactly)	Centimeters
Feet	0.3048 (exactly)*	Meters
Feet	0.0003048 (exactly)*	Kilometers
Yards	0.9144 (exactly)	Meters
Miles (statute)	1,609.344 (exactly)*	Meters
Miles	1.609344 (exactly)	Kilometers
AREA		
Square inches	6.4516 (exactly)	Square centimeters
Square feet	*929.03	Square centimeters
Square feet	0.092903	Square meters
Square yards	0.836127	Square meters
Acres	*0.40469	Hectares
Acres	*4,046.9	Square meters
Acres	*0.0040469	Square kilometers
Square miles	2.58999	Square kilometers
VOLUME		
Cubic inches	16.3871	Cubic centimeters
Cubic feet	0.0283168	Cubic meters
Cubic yards	0.764555	Cubic meters
CAPACITY		
Fluid ounces (U.S.)	29.5737	Cubic centimeters
Fluid ounces (U.S.)	29.5729	Milliliters
Liquid pints (U.S.)	0.473179	Cubic decimeters
Liquid pints (U.S.)	0.473166	Liters
Quarts (U.S.)	*946.358	Cubic centimeters
Quarts (U.S.)	*0.946331	Liters
Gallons (U.S.)	*3,785.43	Cubic centimeters
Gallons (U.S.)	3.78543	Cubic decimeters
Gallons (U.S.)	3.78533	Liters
Gallons (U.S.)	*0.00378543	Cubic meters
Gallons (U.K.)	4.54609	Cubic decimeters
Gallons (U.K.)	4.54596	Liters
Cubic feet	28.3160	Liters
Cubic yards	*764.55	Liters
Acre-feet	*1,233.5	Cubic meters
Acre-feet	*1,233,500	Liters

Table II

QUANTITIES AND UNITS OF MECHANICS

Multiply	By	To obtain
MASS		
Grains (1/7,000 lb)	64.79891 (exactly)	Milligrams
Troy ounces (480 grains)	31.1035	Grams
Ounces (avdp)	28.3495	Grams
Pounds (avdp)	0.45359237 (exactly)	Kilograms
Short tons (2,000 lb)	907.185	Kilograms
Short tons (2,000 lb)	0.907185	Metric tons
Long tons (2,240 lb)	1,016.05	Kilograms
FORCE/AREA		
Pounds per square inch	0.070307	Kilograms per square centimeter
Pounds per square inch	0.689476	Newtons per square centimeter
Pounds per square foot	4.88243	Kilograms per square meter
Pounds per square foot	47.8803	Newtons per square meter
MASS/VOLUME (DENSITY)		
Ounces per cubic inch	1.72999	Grams per cubic centimeter
Pounds per cubic foot	16.0185	Kilograms per cubic meter
Pounds per cubic foot	0.0160185	Grams per cubic centimeter
Tons (long) per cubic yard	1.32894	Grams per cubic centimeter
MASS/CAPACITY		
Ounces per gallon (U.S.)	7.4893	Grams per liter
Ounces per gallon (U.K.)	6.2362	Grams per liter
Pounds per gallon (U.S.)	119.829	Grams per liter
Pounds per gallon (U.K.)	99.779	Grams per liter
BENDING MOMENT OR TORQUE		
Inch-pounds	0.011521	Meter-kilograms
Inch-pounds	1.12985×10^6	Centimeter-dynes
Foot-pounds	0.138255	Meter-kilograms
Foot-pounds	1.35582×10^7	Centimeter-dynes
Foot-pounds per inch	5.4431	Centimeter-kilograms per centimeter
Ounce-inches	72.008	Gram-centimeters
VELOCITY		
Feet per second	30.48 (exactly)	Centimeters per second
Feet per second	0.3048 (exactly)*	Meters per second
Feet per year	$*0.965873 \times 10^{-6}$	Centimeters per second
Miles per hour	1.609344 (exactly)	Kilometers per hour
Miles per hour	0.44704 (exactly)	Meters per second
ACCELERATION*		
Feet per second^2	*0.3048	Meters per second^2
FLOW		
Cubic feet per second (second-feet)	*0.028317	Cubic meters per second
Cubic feet per minute	0.4719	Liters per second
Gallons (U.S.) per minute	0.06309	Liters per second
FORCE*		
Pounds	*0.453592	Kilograms
Pounds	*4.4482	Newtons
Pounds	$*4.4482 \times 10^5$	Dynes

Table II—Continued

Multiply	By	To obtain
WORK AND ENERGY*		
British thermal units (Btu)	*0.252	Kilogram calories
British thermal units (Btu)	1,055.06	Joules
Btu per pound	2.326 (exactly)	Joules per gram
Foot-pounds	*1.35582	Joules
POWER		
Horsepower	745.700	Watts
Btu per hour	0.293071	Watts
Foot-pounds per second	1.35582	Watts
HEAT TRANSFER		
Btu in./hr ft^2 degree F (k, thermal conductivity)	1.442	Milliwatts/cm degree C
Btu in./hr ft^2 degree F (k, thermal conductivity)	0.1240	Kg cal/hr m degree C
Btu ft/hr ft^2 degree F	*1.4880	Kg cal m/hr m^2 degree C
Btu/hr ft^2 degree F (C, thermal conductance)	0.568	Milliwatts/cm^2 degree C
Btu/hr ft^2 degree F (C, thermal conductance)	4.882	Kg cal/hr m^2 degree C
Degree F hr ft^2/Btu (R, thermal resistance)	1.761	Degree C cm^2/milliwatt
Btu/lb degree F (c, heat capacity)	4.1868	J/g degree C
Btu/lb degree F	*1.000	Cal/gram degree C
Ft^2/hr (thermal diffusivity)	0.2581	Cm^2/sec
Ft^2/hr (thermal diffusivity)	*0.09290	M^2/hr
WATER VAPOR TRANSMISSION		
Grains/hr ft^2 (water vapor) transmission)	16.7	Grams/24 hr m^2
Perms (permeance)	0.659	Metric perms
Perm-inches (permeability)	1.67	Metric perm-centimeters

Table III

OTHER QUANTITIES AND UNITS

Multiply	By	To obtain
Cubic feet per square foot per day (seepage)	*304.8	Liters per square meter per day
Pound-seconds per square foot (viscosity)	*4.8824	Kilogram second per square meter
Square feet per second (viscosity)	*0.092903	Square meters per second
Fahrenheit degrees (change)*	5/9 exactly	Celsius or Kelvin degrees (change)*
Volts per mil	0.03937	Kilovolts per millimeter
Lumens per square foot (foot-candles)	10.764	Lumens per square meter
Ohm-circular mils per foot	0.001662	Ohm-square millimeters per meter
Millicuries per cubic foot	*35.3147	Millicuries per cubic meter
Milliamps per square foot	*10.7639	Milliamps per square meter
Gallons per square yard	*4.527219	Liters per square meter
Pounds per inch	*0.17858	Kilograms per centimeter

GPO 835 - 188

ABSTRACT

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REC-ERC-73-13
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Bur Reclam Rep REC-ERC-73-13, Div Gen Res, Apr 1973. Bureau of Reclamation, Denver, 138 p, 12 fig, 19 tab

Descriptors—/ concretes/ sea water/ rubber/ elastomers/ polymers/ water stops/ saline water/ *protective coatings/ durability/ plastics/ brines/ *demineralization/ mastics/ polyethylene/ *performance tests/ *sealing compounds/ high temperature research/ environmental tests/ epoxy resins/ temperature/ paints/ concrete linings/ product evaluation
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