

TEST REPORT

FOR

EVALUATION

OF

PROSCENIUM CURTAIN
TYPE 1210 ZETEXPLUS
WITH & WITHOUT WIRE

NUMBER # 93-1164-2-TR1

PREPARED FOR

NEWTEX INDUSTRIES, INC.
8050 Victor-Menden Road
Victor, New York 14564

BY

ENTERPRISE ENGINEERING LABORATORY, INC.
1550 Dell Avenue
Campbell, California 95008
Phone (408) 866-7800

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SIGNATURE PAGE

I CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS THE RESULT OF COMPLETE AND CAREFULLY CONDUCTED INSPECTION TESTS AND IS TO THE BEST OF MY KNOWLEDGE TRUE AND CORRECT IN ALL RESPECTS.



B. C. ROBNETT - GENERAL MANAGER
ENTERPRISE ENGINEERING LABORATORY, INC.

4-19-93

DATE

The use of this report complete or in part for advertising or publicity must have our written approval. This report does not imply general approval, but applies only to the investigation reported and does not constitute evidence of follow-up service and/or labeling.

ADMINISTRATIVE DATA

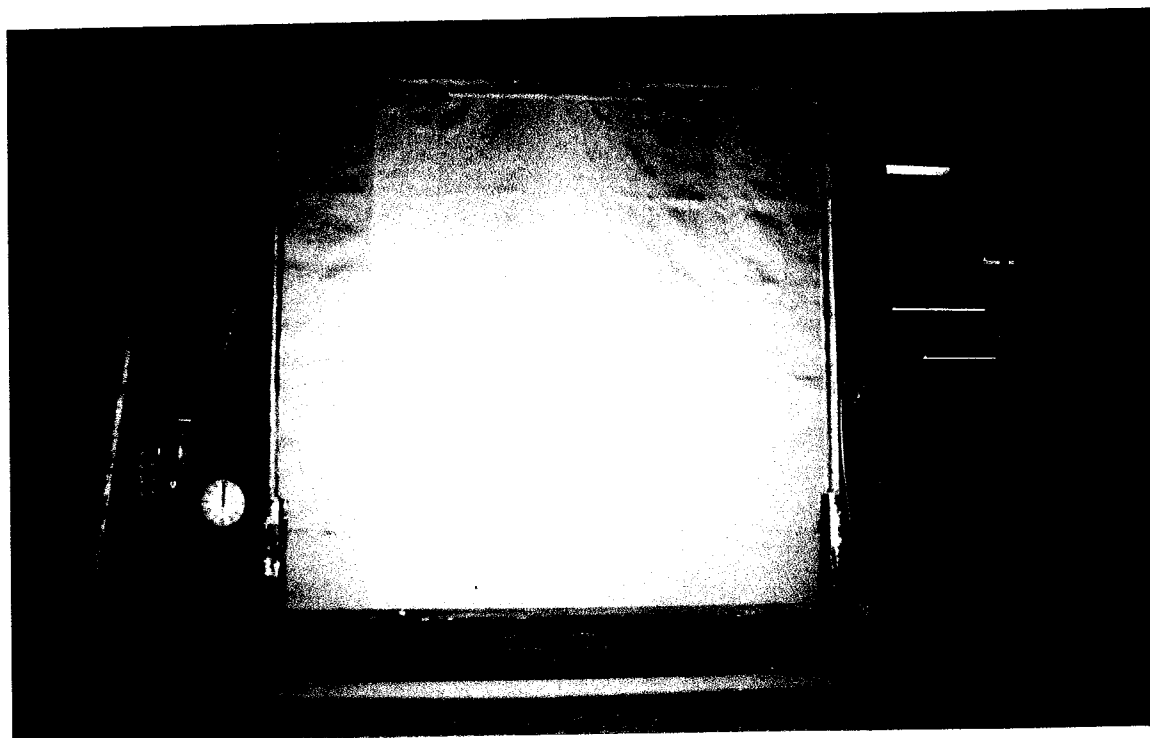
Purpose of Evaluation	Verification of compliance to Section 3903(d) of Uniform Building Code (1991 Edition) & Uniform Building Code Standard # 6-1 (1991 Edition)
Listee	Newtex Industries, Inc. Victor, New York
Manufacturer	Newtex Industries, Inc. Victor, New York
Nomenclature	Proscenium Curtain
Part/Model Number	Type 1210 ZetexPlus Without Wire Type 1220 W/W ZetexPlus With Wire
Test Agency	Enterprise Engineering Lab. Campbell, California 95008
Authorization	Newtex Industries, Inc. Purchase Order # P920996

LIST OF PHOTOGRAPHS

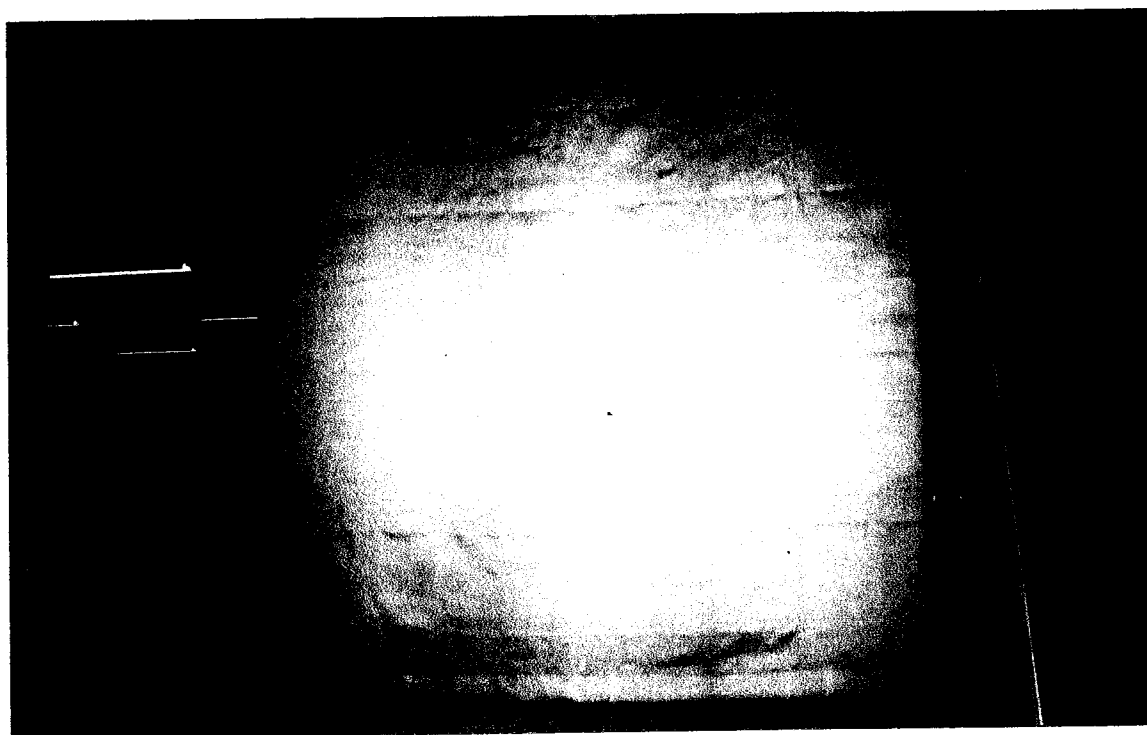
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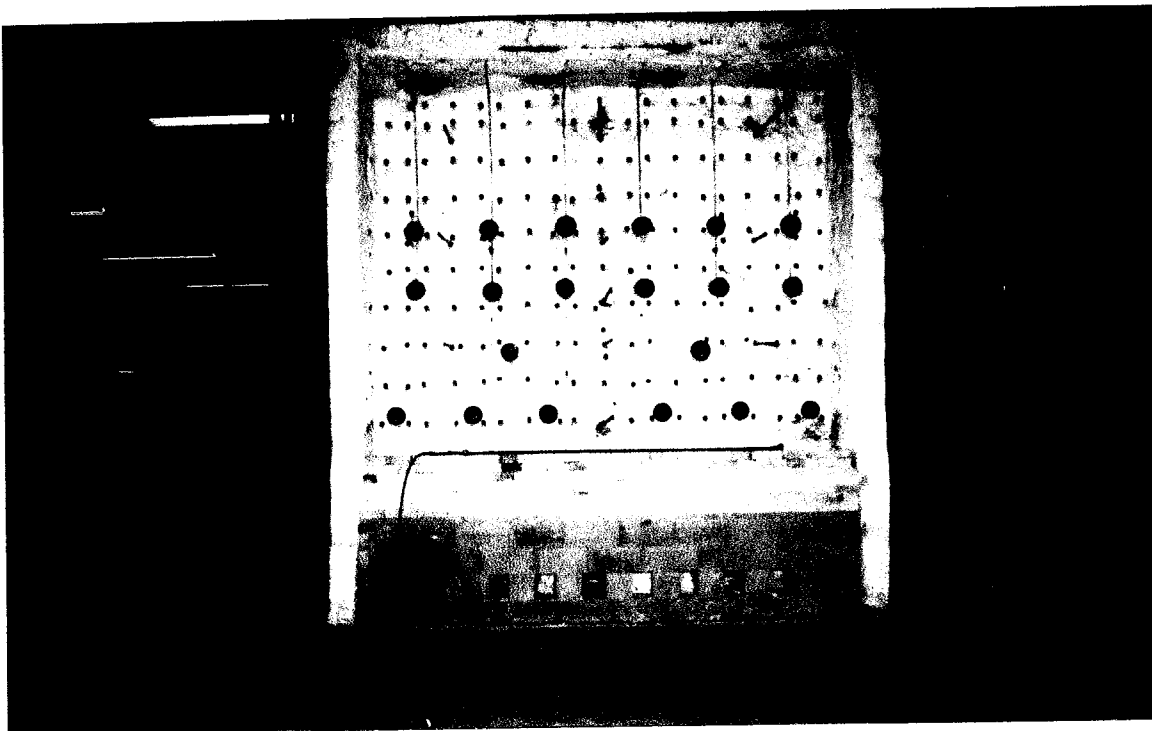
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PRE-FIRE ENDURANCE TEST



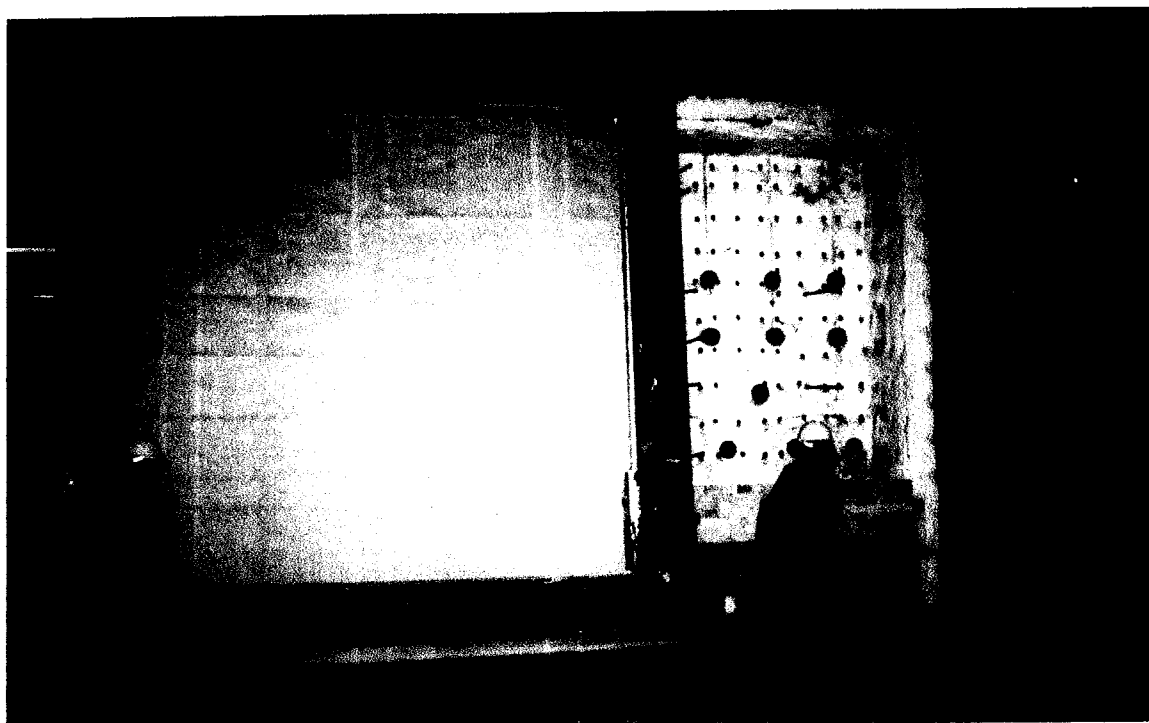
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PRE-FIRE ENDURANCE TEST



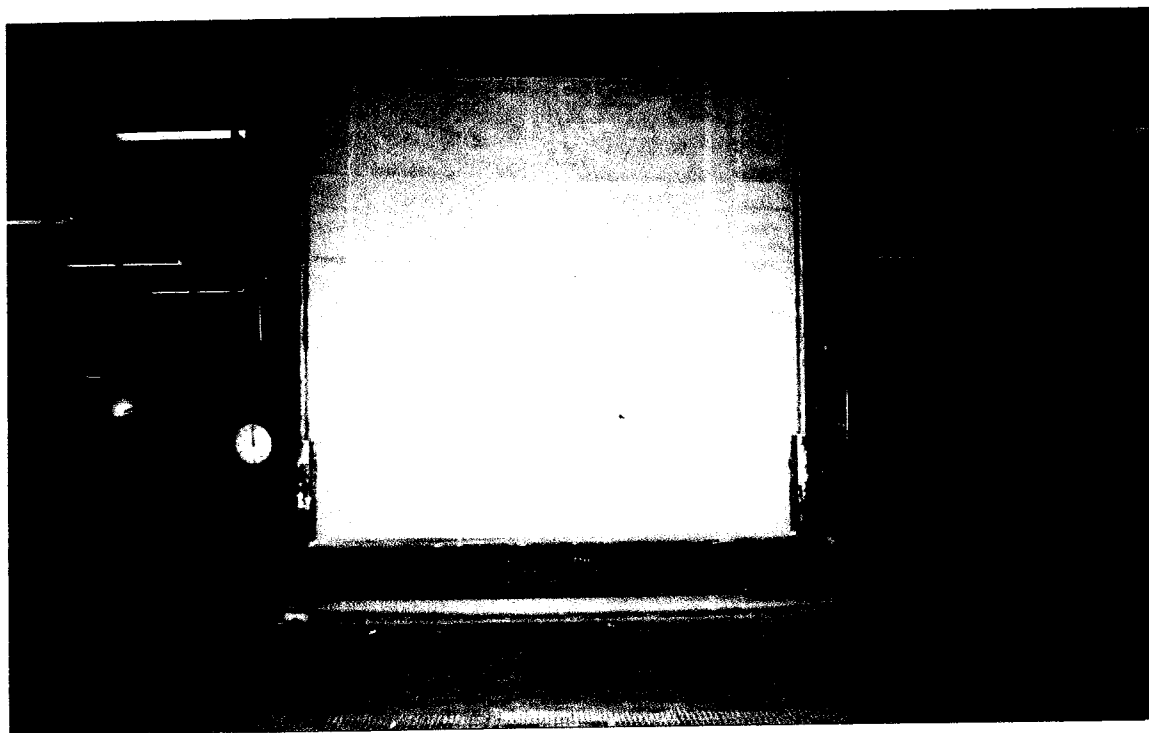
PHOTOGRAPH C
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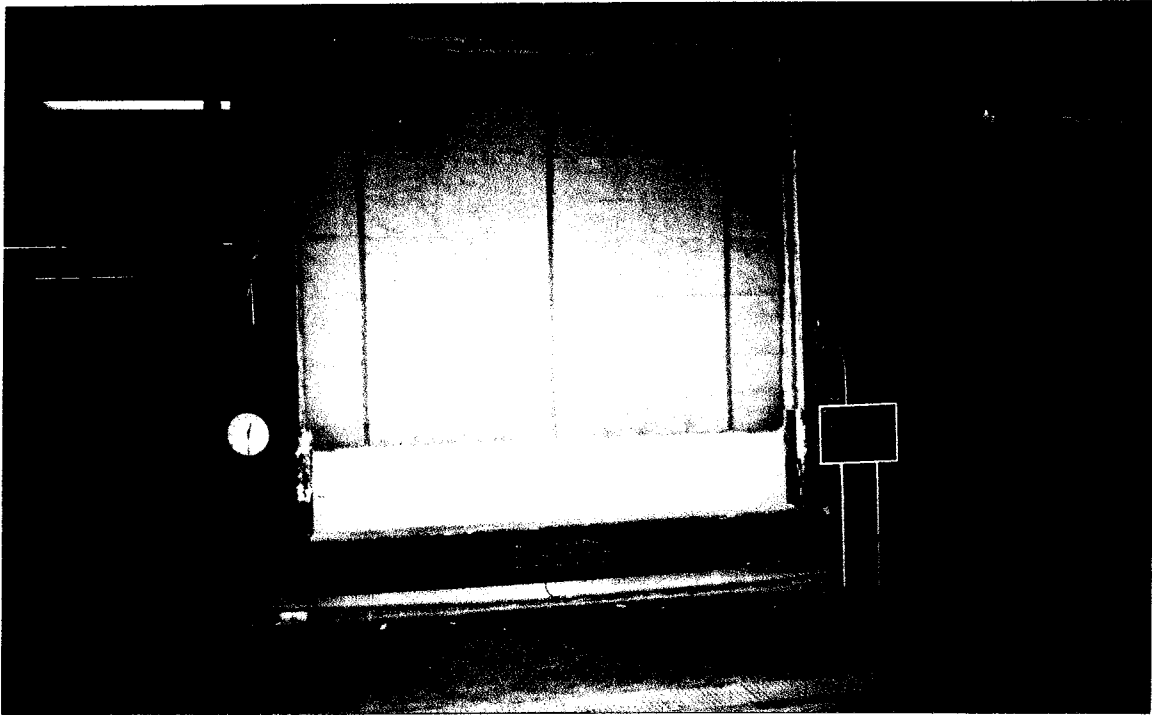
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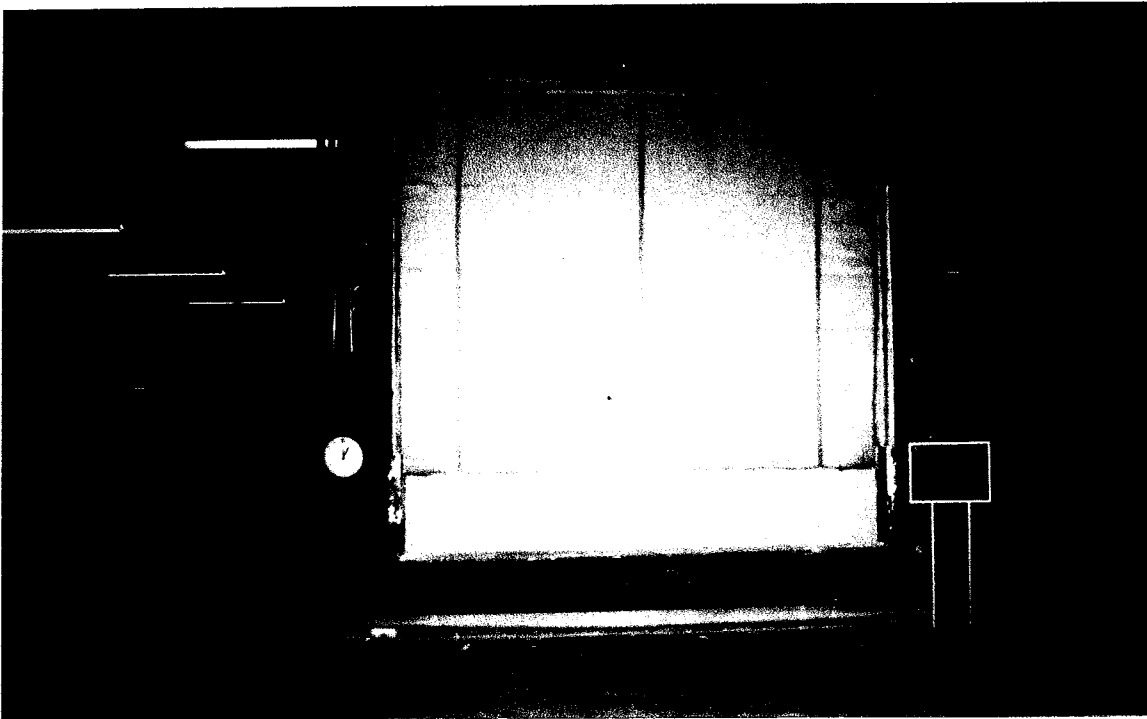
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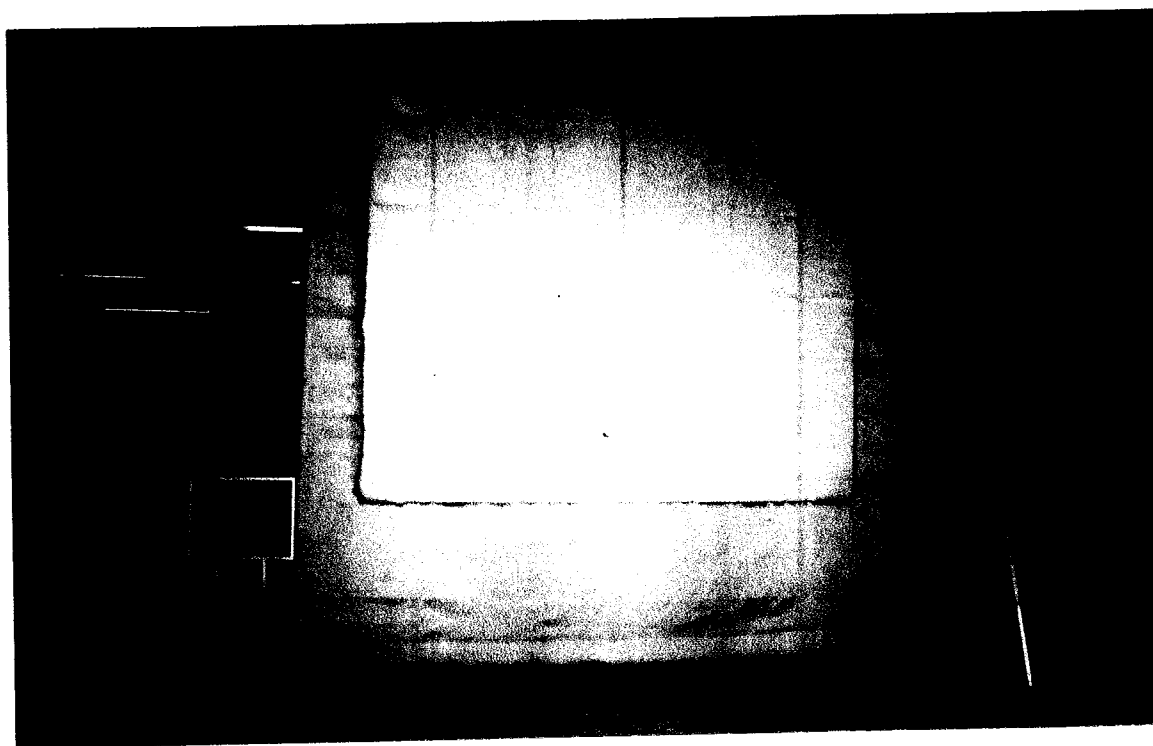
PHOTOGRAPH G
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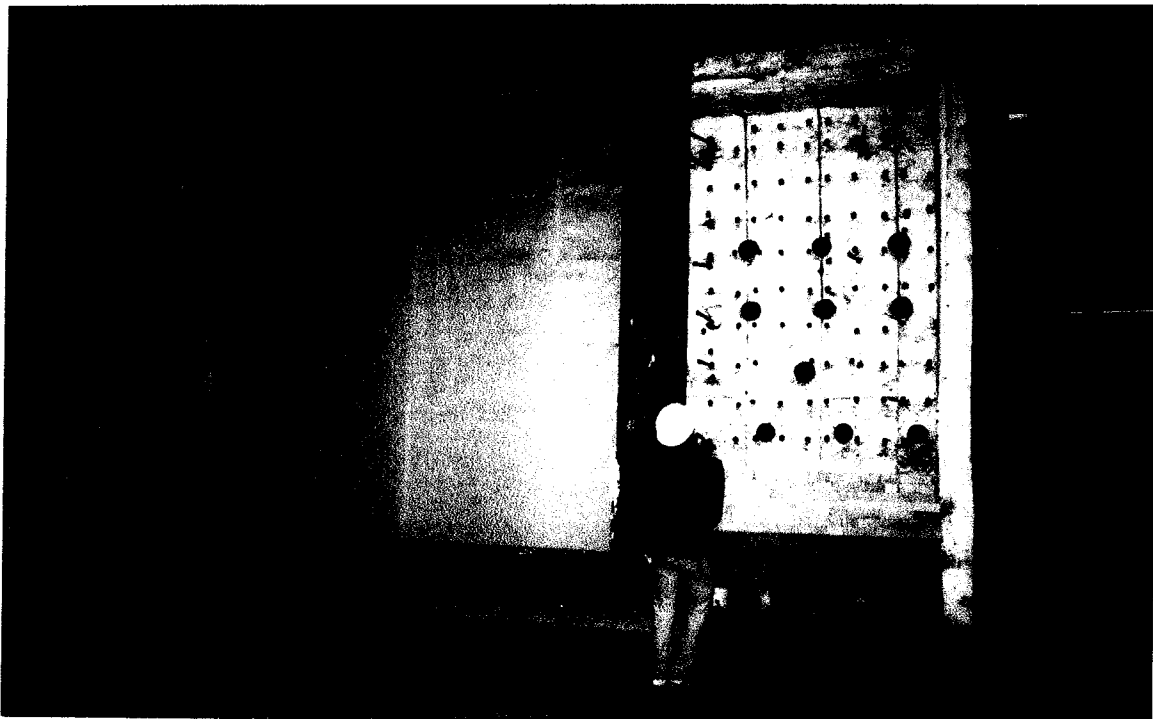
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TYPE 1210 ZETEXPLUS - WITH WIRE
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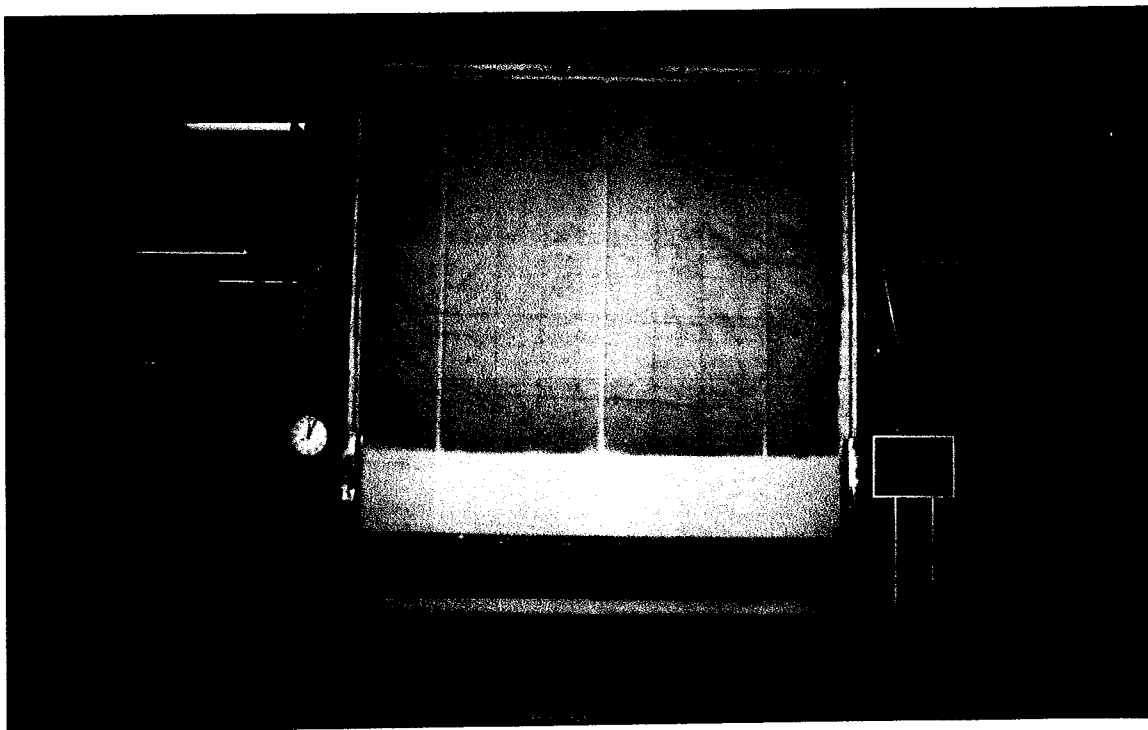
PHOTOGRAPH I
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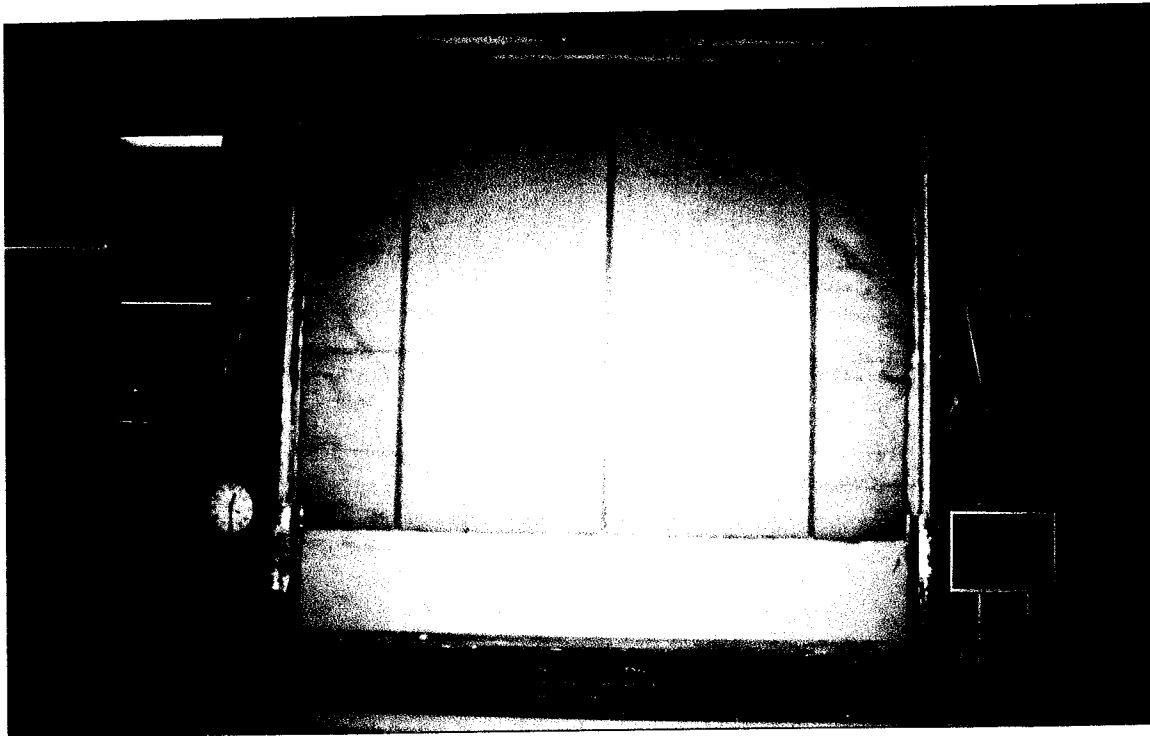
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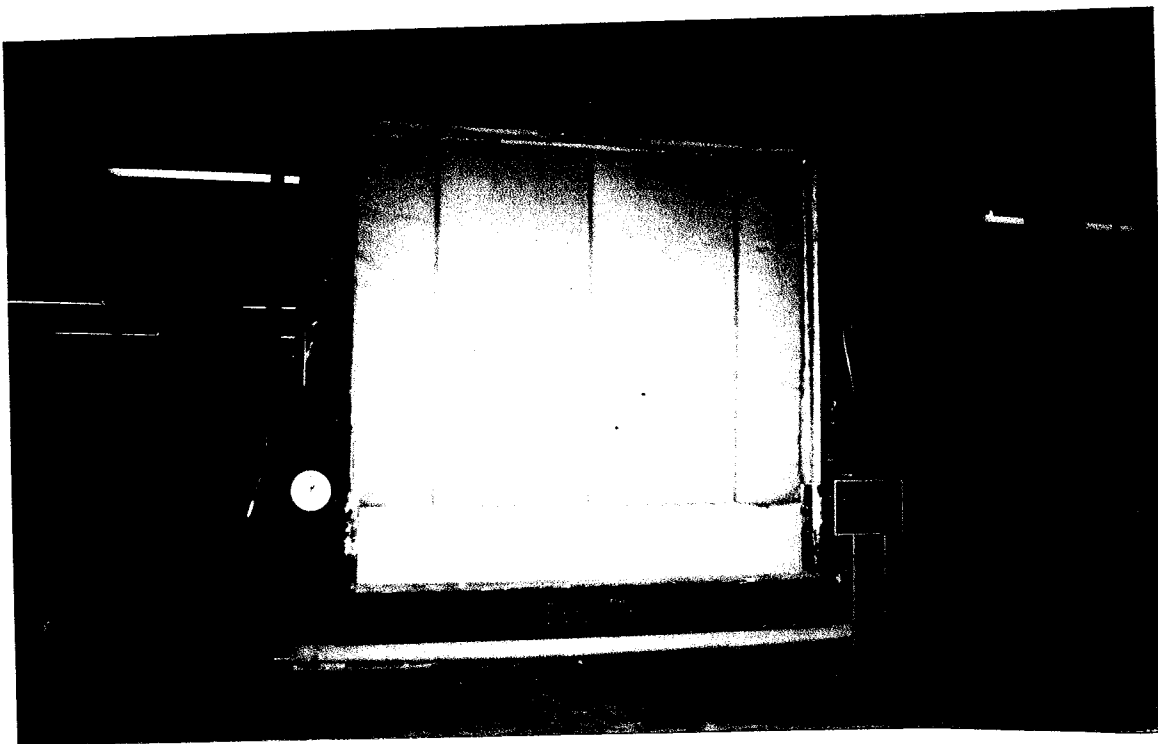
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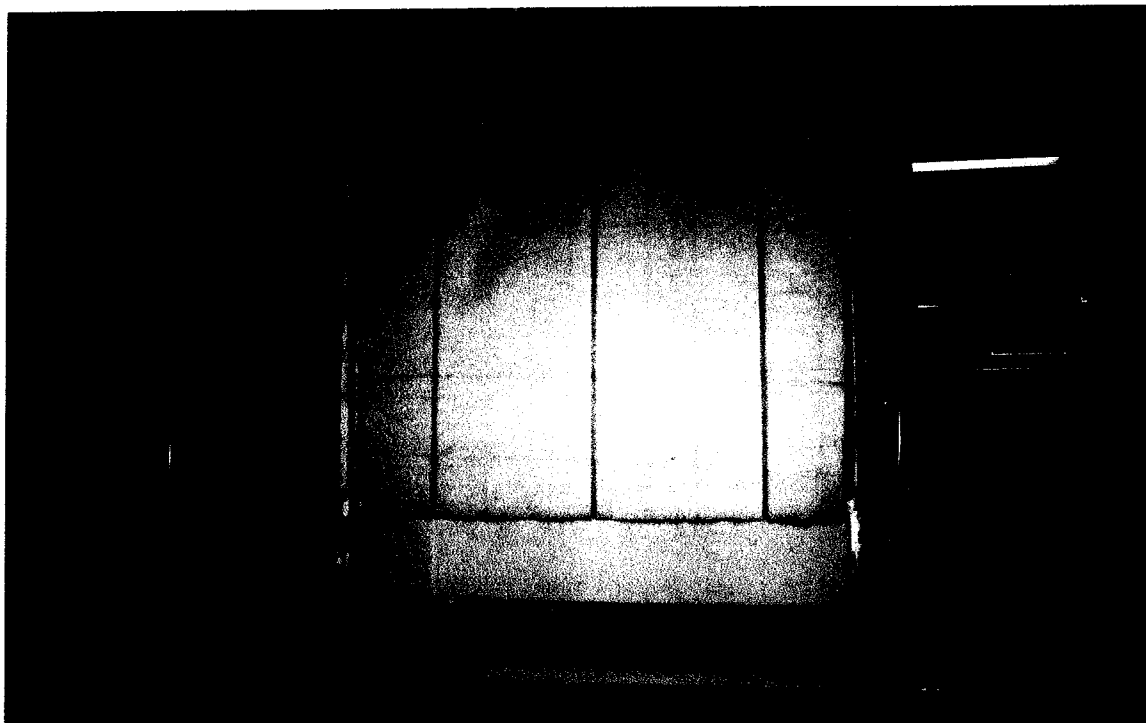
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TYPE 1210 ZETEXPLUS - WITHOUT WIRE
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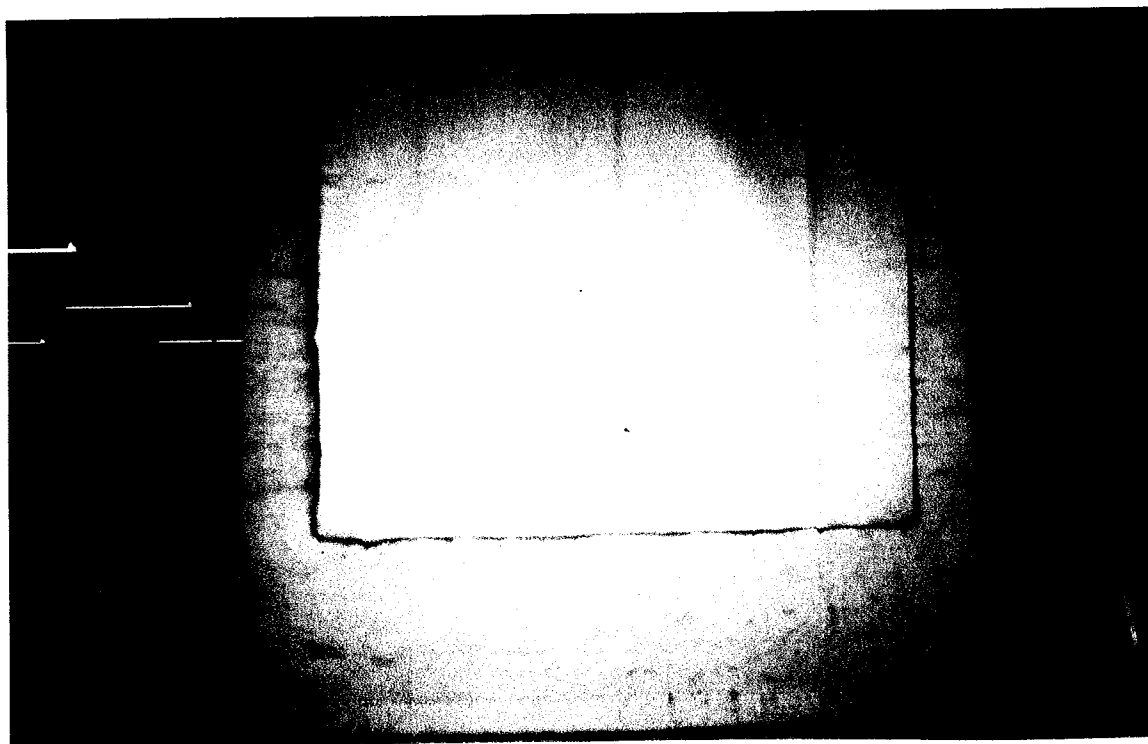
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TYPE 1210 ZETEXPLUS - WITHOUT WIRE
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PHOTOGRAPH O
TYPE 1210 ZETEXPLUS - WITHOUT WIRE
UNEXPOSED SIDE AFTER 60 MINUTES FIRE ENDURANCE TEST



PHOTOGRAPH P
TYPE 1210 ZETEXPLUS - WITHOUT WIRE
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1.0 INTRODUCTION:

This document is the report of engineering evaluation and testing performed by Enterprise Engineering Laboratory, Inc. on the Type 1210 ZetexPlus, (with and without wire) Proscenium Curtain for Newtex Industries Inc., Victor, New York 14564.

The purpose of the engineering evaluation and testing was to establish compliance of the Proscenium Curtain to Section 3903 (d) of Uniform Building Code (1991 Edition) and Uniform Building Code Standard No. 6-1 (1991 Edition).

2.0 GENERAL:

2.1 Characteristics: The Type 1210 ZetexPlus, Proscenium Curtain was fabricated from woven fiberglass material, composed of texturized silica based yarns and coated with a silicate mineral slurry. The curtain is composed of a number of full length panels sewn together using lap (French) type seams and a dual line of stitching. The fiberglass yarns may or may not be reinforced with 0.045 inch diameter 304 stainless steel wire.

2.2 Use: The Type 1210 ZetexPlus, Proscenium Curtain is intended for use as a proscenium curtain in theaters, auditoriums, and public halls as required by the Uniform Building Code.

3.0 DETAILS OF CONSTRUCTION:

The Type 1210 ZetexPlus Proscenium Curtain was constructed as shown in Photographs A through , Manufacturer's Specification Sheets Figure 1 and 2 which are included as part of this report, and as described in the following paragraphs:

3.1 Marking:

- a) Identification - Label with the following information:

Proscenium Curtain
Type 1210 ZetexPlus
With Wire
Without Wire

Newtex Industries Inc.
8050 Victor-Menton Road
Victor, New York 14564

TO BE INSTALLED IN ACCORDANCE
WITH UBC STANDARD 6-1 (1991)
RATED 30 MINUTES

(Listing Number & Seals)
Label Serial Number XXX

- 3.2 Material: Woven fiberglass, 40 oz./square yard, approximately 0.070 to 0.080 inch thick, texturized silica fibers averaging 6.3 micron in diameter. Constructed with a plain weave of 12 warp ends/inch, and 7 picks/inch in fill, or 10 warp ends/inch and 8 picks/inch in fill when yarns are reinforced with 0.045 inch diameter 304 stainless steel wire. Dip coated with silicate mineral slurry (approximately 12% to 15% by weight) Type HTS Microlite, manufactured by W. R. Grace & Co. See Manufacturer's Sheets Figures 1 through 3 of this report.

- 3.3 Seams: Lap type, approximately 1.6 inches wide. Fabricated with twin needle (approximately 1 inch apart) type sewing machine using a beta fiberglass type thread with a breaking strength of approximately 32 lbs.

4.0 TEST RECORD:

Sample Proscenium Curtain material constructed as described in the preceding paragraphs of this report and representative of current production was subjected to the following tests in accordance with Section 3903 (d) of the Uniform Building Code (1991 Edition) and Uniform Building Code Standard No. 6.1 (1991 Edition).

4.1 Flame Spread Test: (Reference UBC Standard 6-1, Section 6.103 (f))

- 4.1.1 Test Method: a) UBC Standard 42-1, 1991 Edition
 b) ASTM E84-89

Test samples of the material (Newtex 1210 ZetexPlus), approximately two (2) feet by twenty-four (24) feet were prepared by Enterprise Engineering Laboratory Inc. and transported to United States Testing Company, Inc., Los Angeles, California for performance of the "Smoke Test" required in Section 6.103 (f) of UBC Standard 6-1 (1991 Edition). For test details and results see United States Testing Company, Inc., Test Reports # 187738-1 and # 187738-2, dated March 9, 1993, which are included as Appendix "D" and "E" of this report.

4.1.2 Test Results: The following results were noted and comply with the requirement that Smoke Density be no greater than 25.

<u>MATERIAL</u>	<u>FLAME SPREAD</u>	<u>SMOKE DENSITY</u>
a) 1210 ZetexPlus (without wire)	5	0
b) 1210 ZetexPlus (with wire)	5	0

4.2 Tensile Strength Test: (Reference UBC Standard 6-1, Section 6.103 (c))

- 4.2.1 Test Method a) ASTM D-1682-64 (1975)

Test samples of the material (Newtex 1210 ZetexPlus), were prepared by Enterprise Engineering Laboratory Inc. and shipped to United States Testing Laboratory Inc., Hoboken, Jersey for performance of the "Tensile Strength Test" (Breaking Strength) required in Section 6.103 (c) of UBC Standard 6-1 (1991 Edition). For test details and results see United States Testing Company, Inc., Test Report # 020066, dated January 15, 1993, which is included as Appendix "C" of this report.

- 4.2.2 Test Results: The following results were noted and comply with the requirement that Tensile Strength be no less than 400 pounds per inch in both the warp and file directions.

	<u>MATERIAL</u>	<u>WARP</u>	<u>FILL</u>
a)	1210 ZetexPlus (without wire)	588 lbs.	486 lbs.
b)	1210 ZetexPlus (with wire)	590 lbs.	531 lbs.

- 4.3 Fire Test: (Reference UBC Standard 6-1, Section 6.103 (e))

- 4.3.1 Test Method: a) UBC Standard 43.1, 1991 Edition
b) CSFM Test Standard 12-43.1

Sample proscenium curtains (approximately 15' by 15') fabricated from Newtex 1210 ZetexPlus material, both with and without wire, were transported by Enterprise Engineering Laboratory, Inc. to Warnock Hersey Inc., Pittsburg, California for performance of the "Fire Test" required in Section 6.103 (e) of UBC Standard 6-1 (1991 Edition). Each sample curtain was mounted in a test frame assembly by supporting them from a standard wood 2" by 4" attached along the top of the test frame. This allowed the curtain to hang down over the front of the test frame. Each test curtain was mounted with the three (3) seams running vertical and with a test load of 9.2 lbs. per linear foot in the bottom pocket. The furnace burners were lite, the test frame assembly moved into position, and the furnace temperatures controlled per the standard time/temperature curve specified in UBC Standard 43-1 (1991 Edition). For test details and results see Warnock Hersey Inc., Test Reports # WHI-495-1218, dated 12/11/92 and # WHI-495-1219, dated 12/14/92, which are included as Appendix "A" and "B" of this report.

4.3.2 Test Results: The unexposed side of the test curtain was continuously observed during the required 30 minute exposure period and at no time did it glow, nor was there any passage of flame or smoke through the curtain. After the required 30 minute exposure period, the test curtain was subjected to an additional 30 minutes exposure for a total exposure of 60 minutes. After completion of the 60 minute exposure, the furnace was shut down and the test frame assembly moved aside for inspection of the curtain. The proscenium curtain passed the 60 minute fire endurance test in accordance with the performance criteria specified in UBC 6-1 (1991 Edition), Section 6.103 (e).

For detailed observations see Warnock Hersey Inc., Test Reports # WHI-495-1218, dated 12/11/92 and # WHI-495-1219, dated 12/14/92, which are included as Appendix "A" and "B" of this report.

5.0 CONCLUSION:

Enterprise Engineering Laboratory, Inc. conclusion, drawn from examination and testing of the Proscenium Curtain is that it does comply with the present requirements for this type equipment under Section 3903 (d) of Uniform Building Code (1991 Edition) and Uniform Building Code Standard No. 6-1 (1991 Edition).

The use of this report complete or in part for advertising or publicity must have our written approval. This report does not imply general approval, but applies only to the investigation reported and does not constitute evidence of follow-up service and/or labeling.

APPENDIX "A"

Warnock Hersey International Inc.
Test Report
WHI-495-1218



WARNOCK HERSEY, INC.
3240 Lone Tree Way, Suite 100
Antioch, CA 94509
Tel (510) 706-4090 • Fax (510) 706-2195

REPORT OF THE FIRE ENDURANCE TESTING OF A PROSCENIUM CURTAIN
ZETEX PLUS 1210 (WITH WIRE).

CLIENT

ENTERPRISE ENGINEERING LABORATORY INC.
1550 DELL AVENUE
CAMPBELL, CALIFORNIA 95008
U.S.A

REPORTED BY

WARNOCK HERSEY INTERNATIONAL, INC.
530 GARCIA AVENUE
PITTSBURG, CALIFORNIA 94565
U.S.A.

FILE NO.: WHI-495-1218

JOB NO.: 50611-C7-043140

TEST DATE: DECEMBER 11, 1992

THIS REPORT IS FOR THE EXCLUSIVE USE OF THE CLIENT NAMED HEREIN. WARNOCK HERSEY INTERNATIONAL, INC., AUTHORIZES THE CLIENT NAMED HEREIN TO REPRODUCE THIS REPORT. IT MUST BE REPRODUCED IN ITS ENTIRETY. THIS REPORT DOES NOT IMPLY PRODUCT CERTIFICATION BY WARNOCK HERSEY. PRODUCTS MUST BEAR LABELS WITH THE WARNOCK HERSEY LOGO TO DEMONSTRATE CERTIFICATION BY WARNOCK HERSEY. ANY USE OF THE WARNOCK HERSEY LOGO FOR ADVERTISING MATERIAL MUST BE APPROVED IN ADVANCE BY WARNOCK HERSEY.



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INTRODUCTION

On December 11, 1992 the Pittsburg, California fire testing laboratory of Warnock Hersey International, Inc. conducted a 61 minute endurance test on a proscenium curtain.

The test was conducted in accordance with the criteria specified in UBC 6-1 (1991), Section 6.103(e).

The proscenium curtain as described herein and submitted to WHI by the client, has met the fire endurance test performance requirements in accordance with the criteria specified in the standard.

The test was conducted for Enterprise Engineering Laboratory, Inc. of Campbell, California.



TEST MATERIALS

PROSCENIUM CURTAIN: 15'-0" wide by 15'-0" high by 0.080" thick 1210 ZETEX PLUS, with wire, proscenium curtain (see Figures #1 and #3). The curtain contained 3 vertically oriented French seams.



TEST ASSEMBLY CONSTRUCTION

The 15'-0" x 15'-0" proscenium curtain was installed in the furnace frame as shown in Figures #1 and #2 and as described below.

The proscenium curtain was placed over the edge of a 16'-0" long wood 2 x 4 (nominal) and attached with 1" screws and 2" diameter flat washers spaced 12" on center (see Figure #2). The 2 x 4 was then attached to the top of the furnace test frame with the curtain hanging down in front of the frame opening.

A test load of 9.2 pounds per lineal foot was placed in the bottom pocket of the curtain.



THE FIRE TEST

The fire test was started after igniting the burners and moving the test assembly into position in front of the furnace opening. Temperatures within the furnace were monitored using 9 thermocouples attached to automatic recording equipment. The furnace temperatures were controlled to follow the time/temperature curve specified in the test standards. These temperatures and the time temperature curve are included with this report as Figure #4 - Furnace Temperatures.

Periodic observations were made of the exposed and unexposed faces of the proscenium curtain during the fire endurance test. These observations were recorded and are included with this report.

Three pressure taps were installed through the furnace wall along the vertical center line at the top, midheight, and bottom elevations to measure furnace pressures. The pressure taps were attached to pressure gauges. Readings from these gauges were monitored for controlling furnace pressure by adjusting dampers in the furnace exhaust stacks. Periodic readings were recorded and are included with this report as Table #1 - Furnace Pressures.

The fire endurance portion of this test was conducted for 30 minutes and continued for an additional 31 minutes, for a total test time of 61 minutes. The furnace was then extinguished and the furnace frame containing the test assembly was moved into position for cooling, photographs and examination.



FIRE TEST OBSERVATIONS

<u>ELAPSED TIME</u> (min:sec)	<u>EXPOSED SURFACE</u>
5:00	The curtain is blackened. There is no glow visible at any location.
10:00	We are getting a very uniform reddish glow all over the curtain. It is a little more brilliantly red on the seams.
26:00	The entire surface is a uniform orange glow with a little bit more of a brilliant glow at the seams. There appears to be no separation at any location.
30:00	A brilliant orange glow covers the entire exposed surface of the curtain, with a little more brilliant glow at each of the seam locations. There is no visible separation at any of the seams.
35:00	No visible changes that are evident.
45:00	No visible changes that are evident.
50:00	No visible changes are evident.
55:00	The entire surface of the screen has a brilliant orange glow that is very uniform, a little bit more brilliant at the seams than it is in the field of the fabric.
60:00	No visible changes are evident.

The fire in the furnace was extinguished at 61 minutes elapsed time and the test assembly was moved aside for cooling, photographs, and examination.



FIRE TEST OBSERVATIONS, CONTINUED

<u>ELAPSED TIME</u> (min:sec)	<u>UNEXPOSED SURFACE</u>
3:00	A small amount of smoke has issued from the curtain.
5:00	All the smoke has fully receded leaving a black color on the curtain. It is a little bit darker in the field of the curtain than it is in the seams. No glow is visible at any location.
12:45	No visible changes are evident. There is no glow visible at any location. All the seams are holding intact without any separations.
26:00	The seams are all holding intact. Some of the soot is beginning to leave the surface so it is turning a little bit lighter color.
30:00	We have no visible changes that are evident and no glow at any location.
35:00	No visible changes are evident.
45:00	We are beginning to get a little reddish translucency, very uniform on the surface of the curtain. All the seams are holding intact. No through openings or glowing spots are visible at any location.
50:00	No visible changes are evident.
60:00	No visible changes are evident.

The fire in the furnace was extinguished at 61 minutes elapsed time and the test assembly was moved aside for cooling, photographs, and examination.



CONCLUSIONS

The proscenium curtain described in this report passed a 60 minute fire endurance test in accordance with the fire endurance test performance criteria specified in UBC 6-1 (1991), Section 6.103(e).



SIGNATURES

SUBMITTED BY:

Billy D. Brittain

Billy D. Brittain, Ch.E.
Manager, Fire Testing Laboratory
Date: 12 MAR 93

REVIEWED BY:

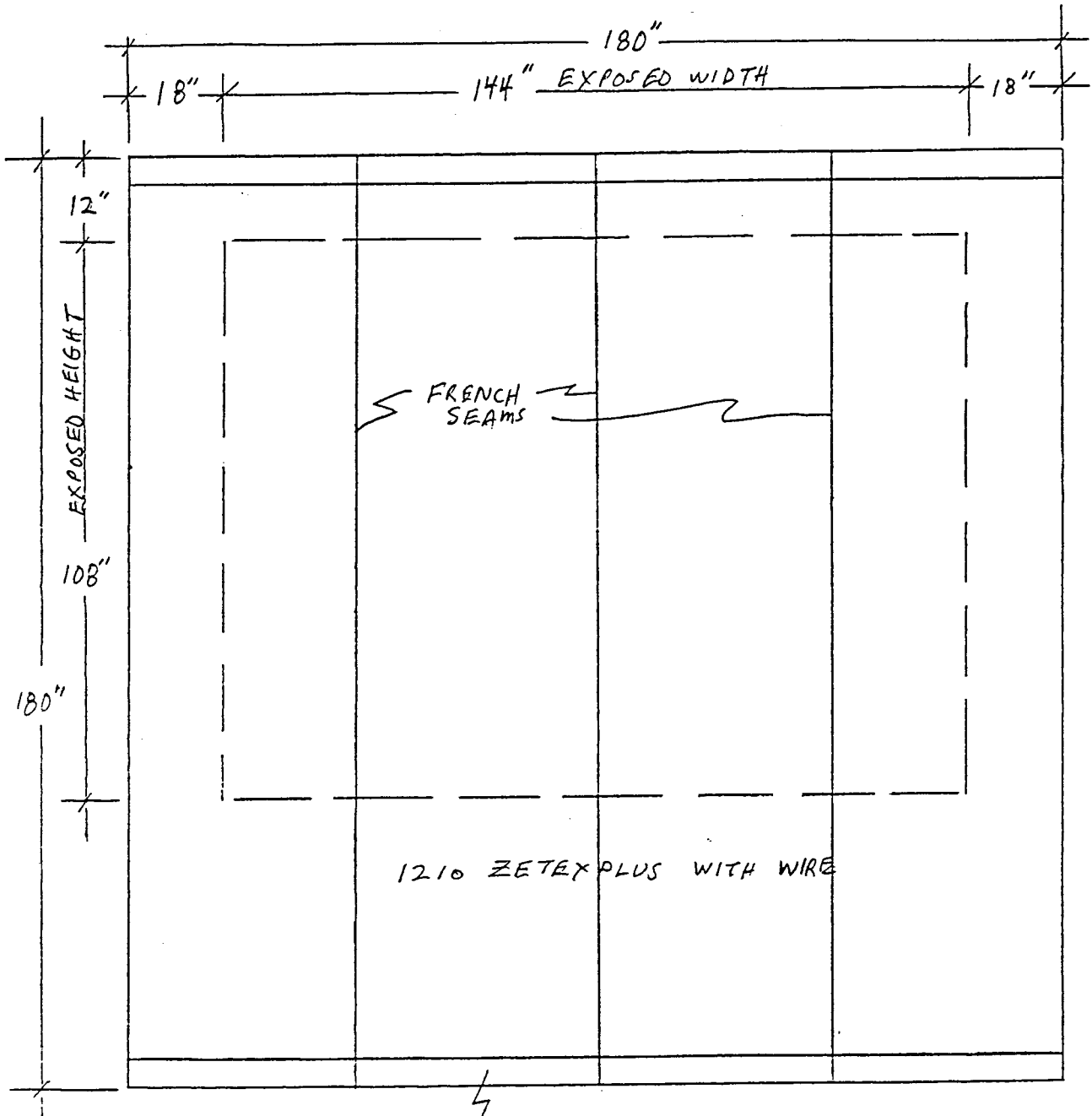
George E. Meyer

George E. Meyer, P.E.
Vice President, International Operations
Date: 16 March 93





FIGURE #1
TEST ASSEMBLY CONSTRUCTION



⚡
BOTTOM POCKET WEIGHTED WITH
9.2 lbs. per ft.



FIGURE #2
ASSEMBLY CONSTRUCTION DETAIL AT TOP

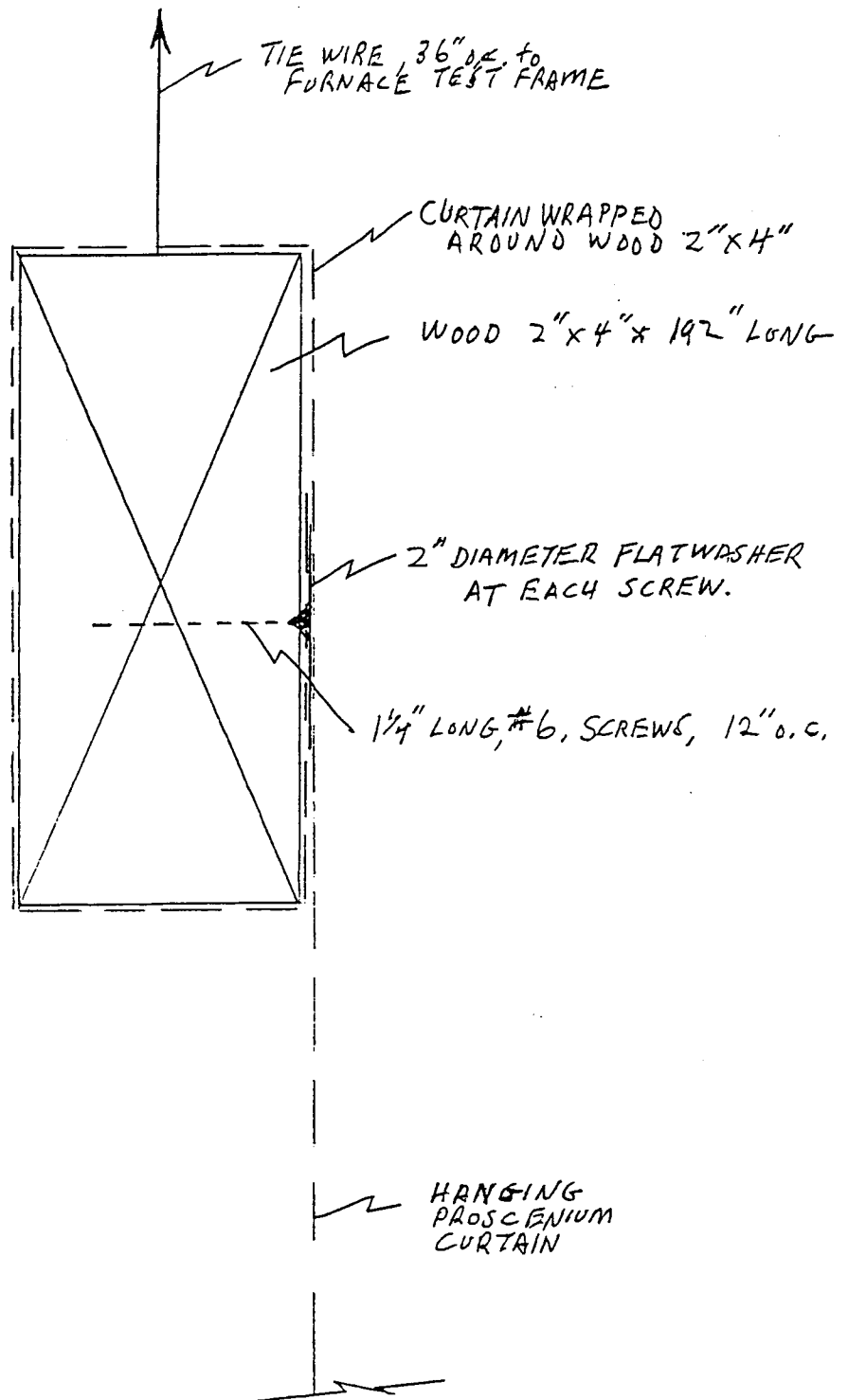




FIGURE #3
MANUFACTURER'S LITERATURE

ZETEX ALL OF THE PROTECTION BUT NONE OF THE HEALTH HAZARDS OF ASBESTOS	PRODUCT SPECIFICATION STYLE 1210 W/W ZP
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GENERAL DESCRIPTION: ZETEXPLUS 1210 W/W fabric is made from highly texturized silica based yarn. Each yarn is reinforced with .0045" diameter 304 stainless steel wire. ZETEXPLUS is coated with a highly proprietary treatment. ZETEXPLUS is free of any asbestos.

APPLICATIONS: Typical applications include curtains, blankets, shields, high temperature expansion joints, and gasketing.

Recommended for extremely severe applications requiring molten metal splash resistance and resistance to elevated temperatures.

Typical industries include power generation and turbine insulation, steel, aluminum copper, and other basic metals groups, construction industry, chemical processing plants, petroleum refineries, heat treating and stress relieving, automotive, industrial maintenance, etc.

PHYSICAL PROPERTIES:

Weight Oz./Square Yard:	40
Construction:	10 x 8
Thickness:	0.060"
Service Temperature:	Continuous temperature to 1500°F (816°C) and higher short duration temperatures.
Breaking Strength: (minimum)	Warp - 650+ Fill - 850+

Chemical Resistance: Resists most acids, alkalies and solvents (with the exception of hydrofluoric acid and corrosive environments at elevated temperatures).

The coating used provides outstanding abrasion resistance, ability to cut, sew and handle the product, higher temperature capability and better molten metal splash resistance. It reduces airborne fiber emission and unraveling significantly.

ORDERING INFORMATION: Length of Roll: 50 Yards



FIGURE #4
FURNACE TEMPERATURES

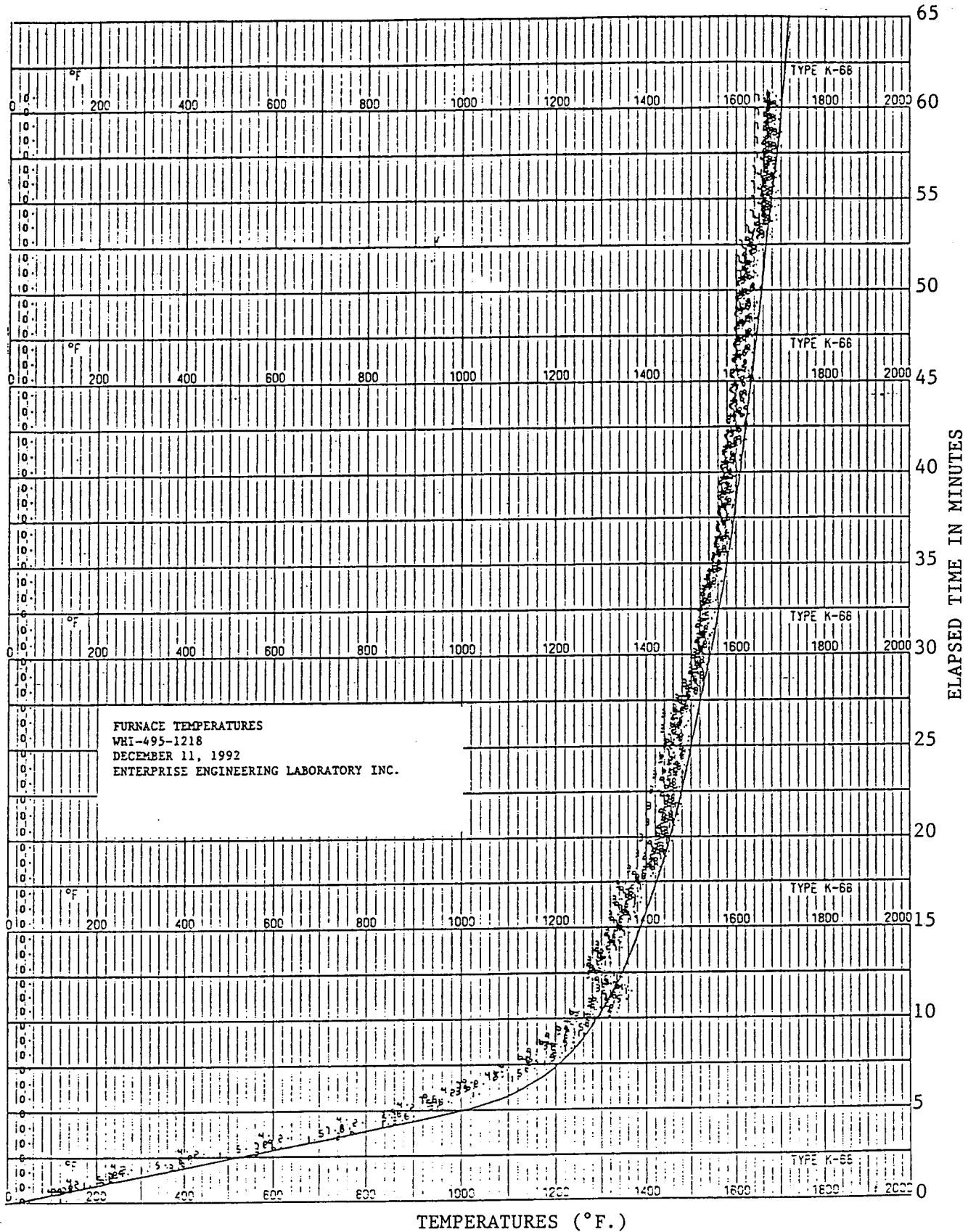




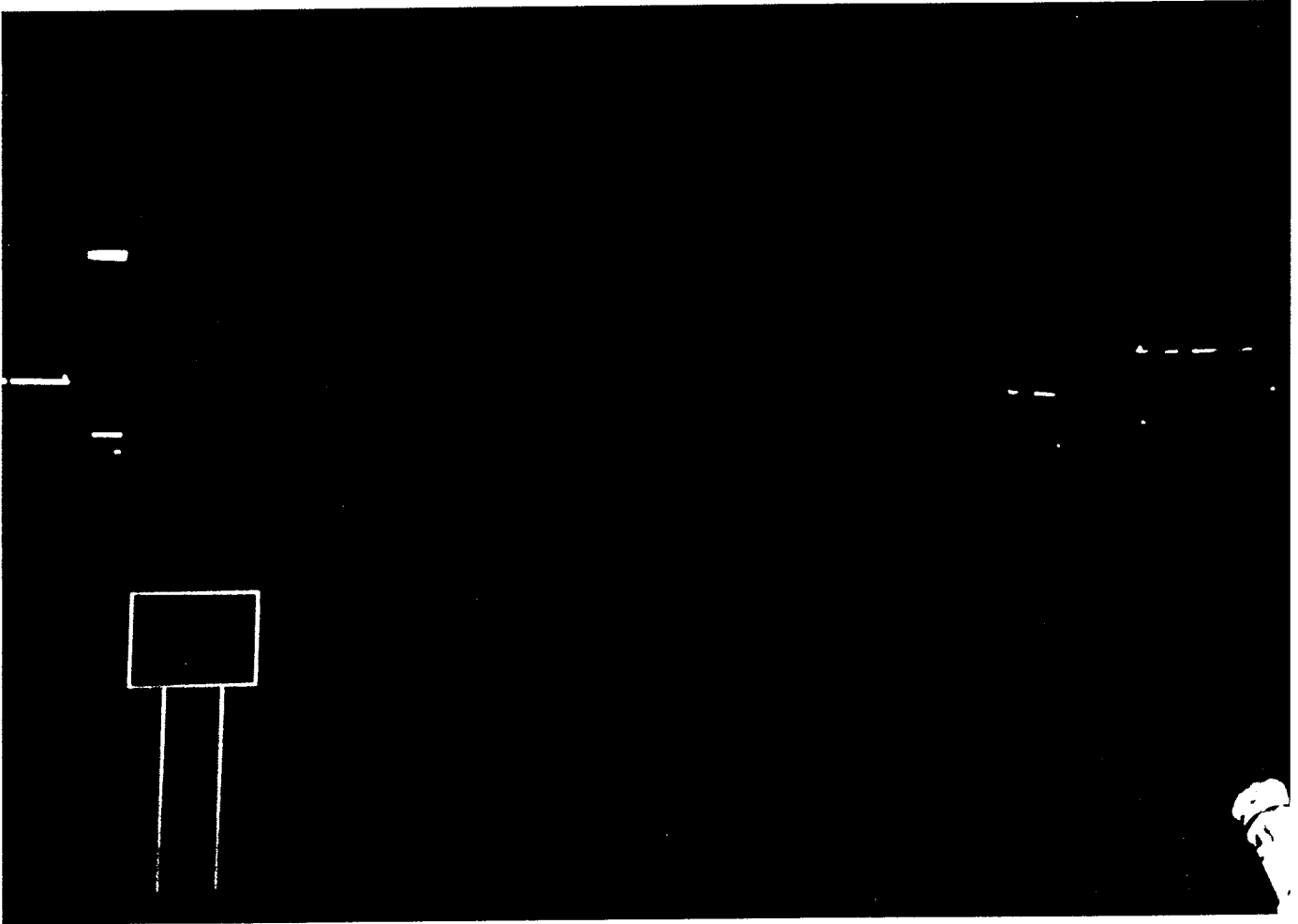
TABLE #1

FURNACE PRESSURES

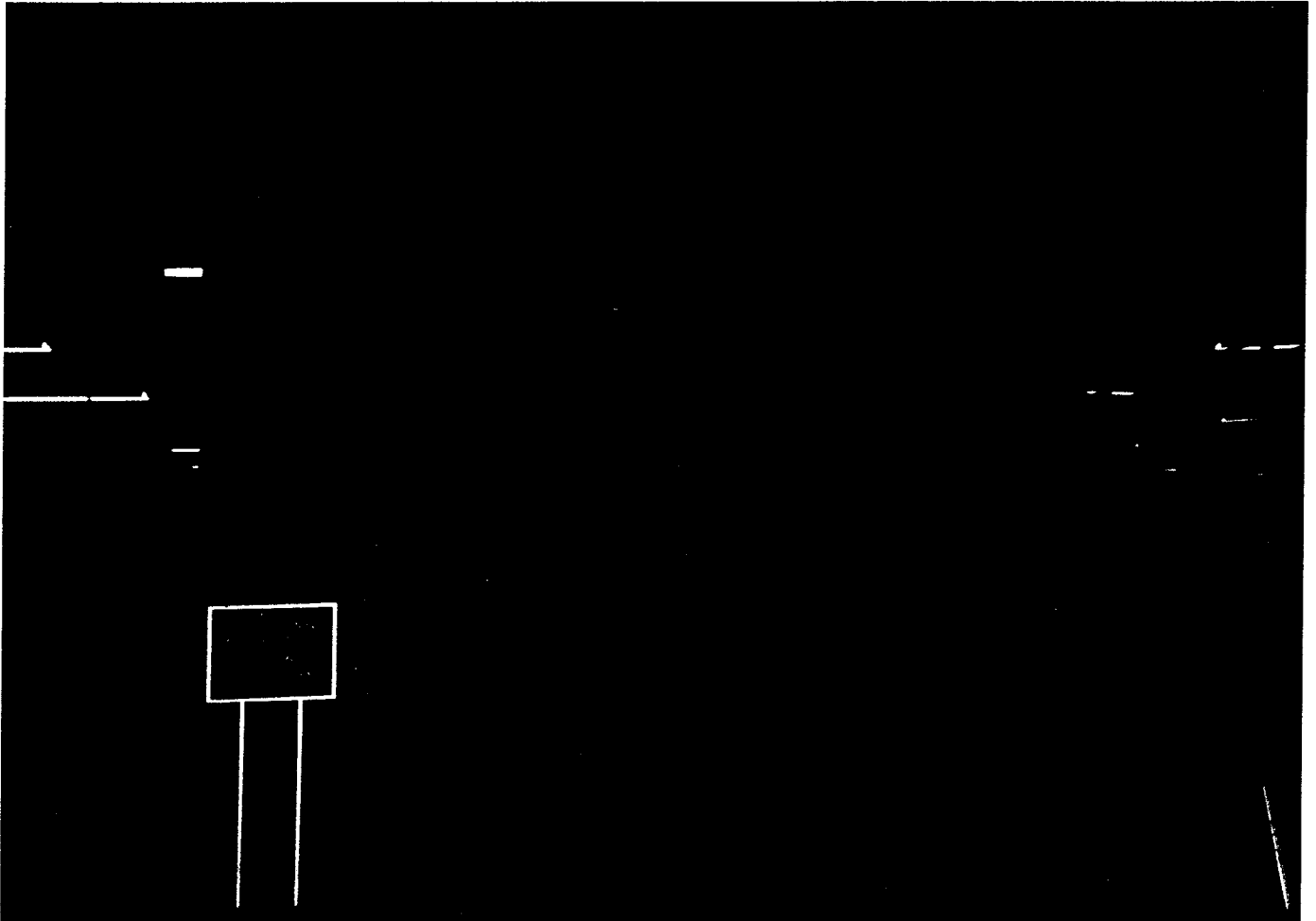
ELAPSED TIME IN MINUTES	FURNACE PRESSURES		
	TOP	MIDHEIGHT	BOTTOM
5	+.045	-.005	-.036
15	+.050	-.010	-.042
25	+.050	-.005	-.041
35	+.047	-.009	-.047
45	+.046	-.010	-.051
55	+.042	-.014	-.051
60	+.045	-.010	-.050



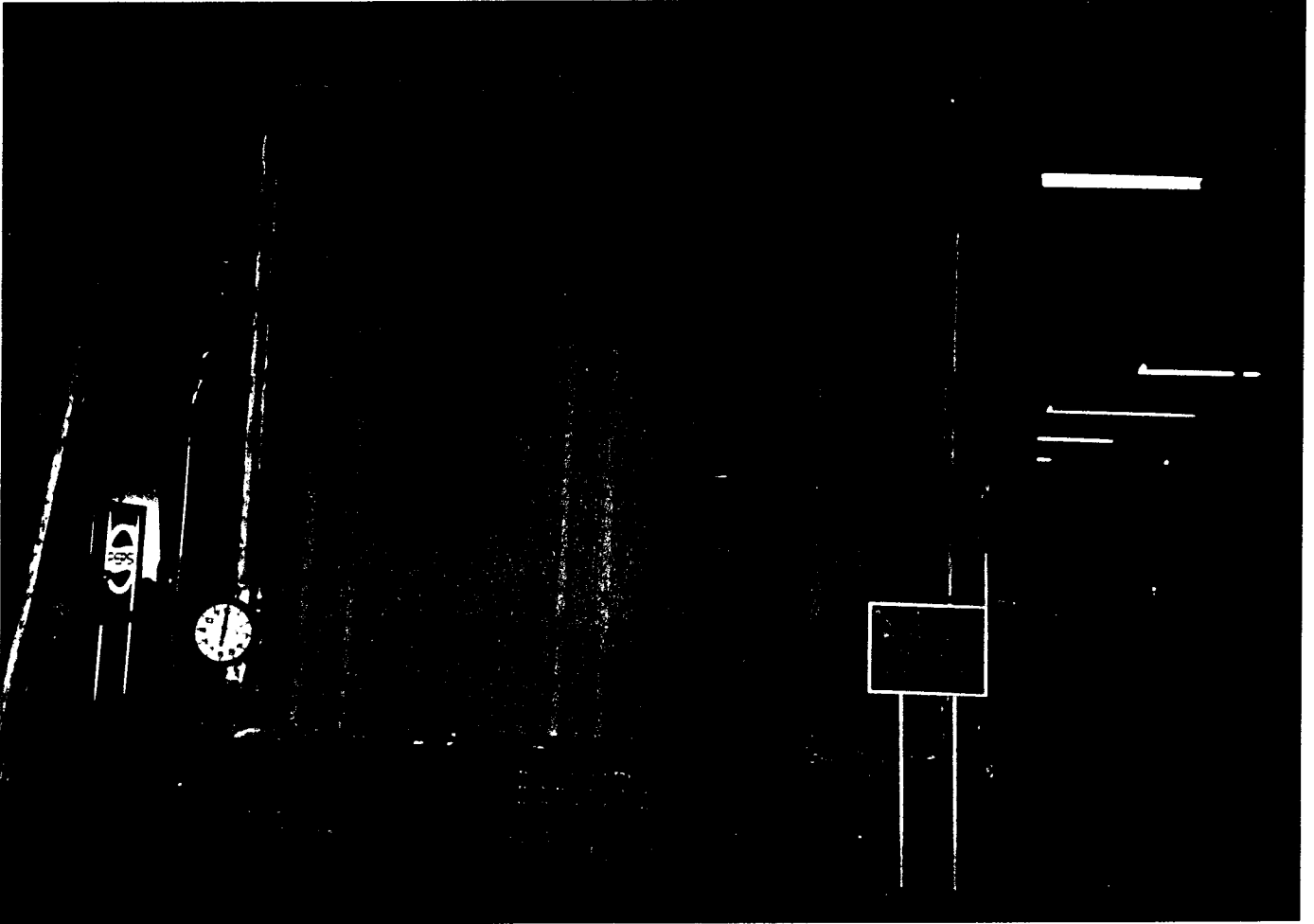
PHOTOGRAPH #1
THE EXPOSED FACE BEFORE THE START OF THE TEST



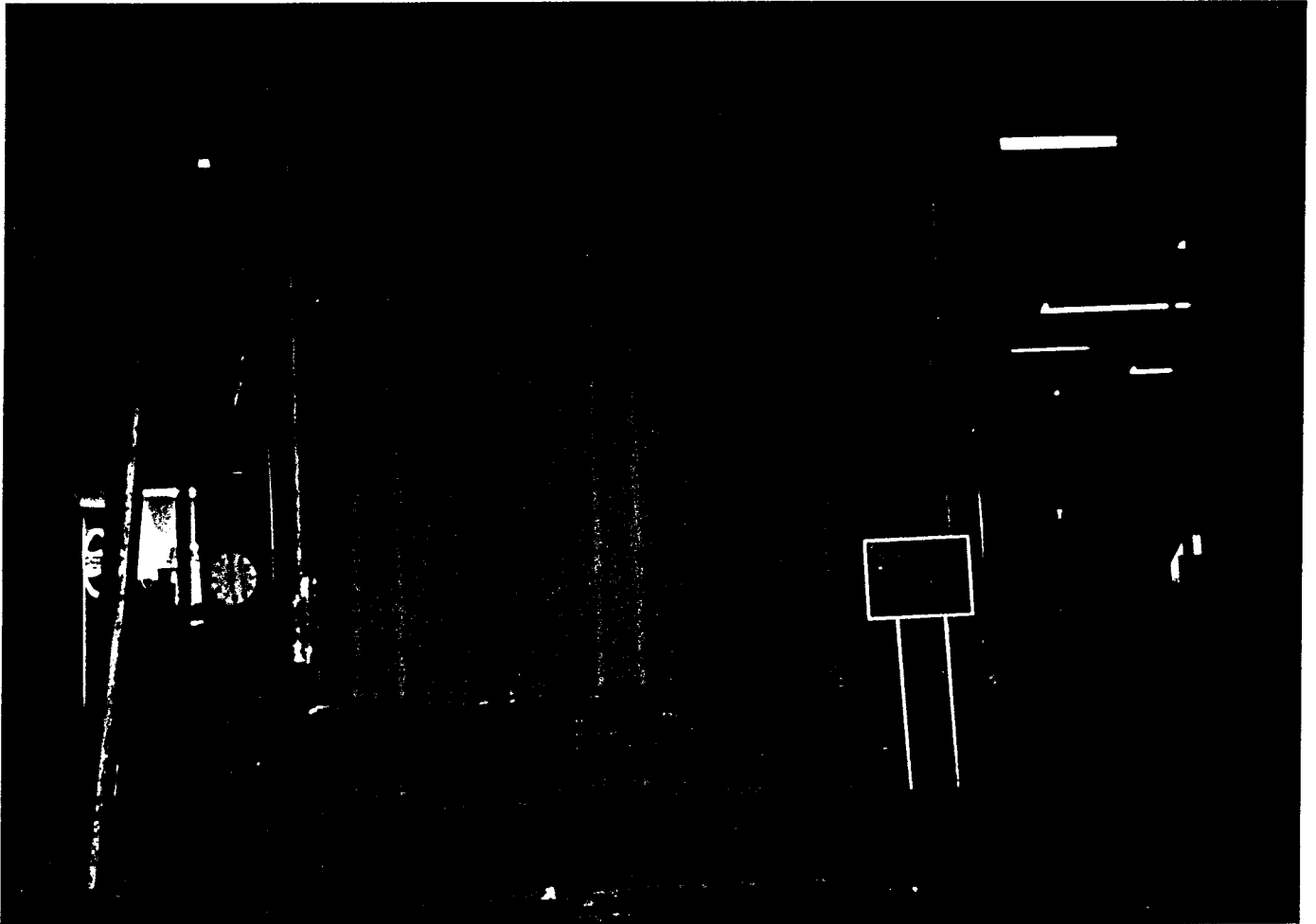
PHOTOGRAPH #2
A SECOND VIEW OF THE EXPOSED FACE BEFORE THE START OF THE TEST



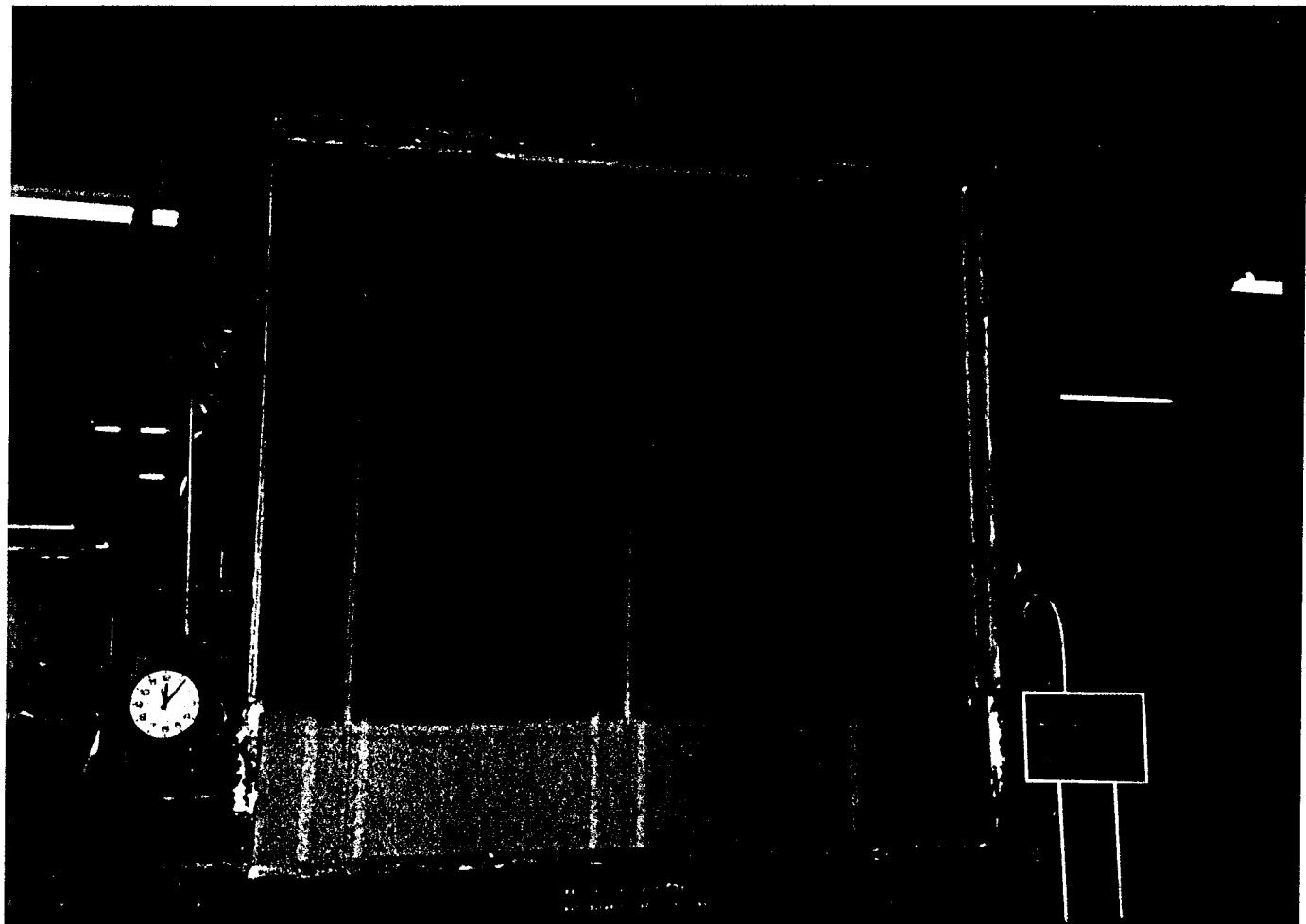
PHOTOGRAPH #3
THE THIRD VIEW OF THE EXPOSED FACE
BEFORE THE START OF THE TEST



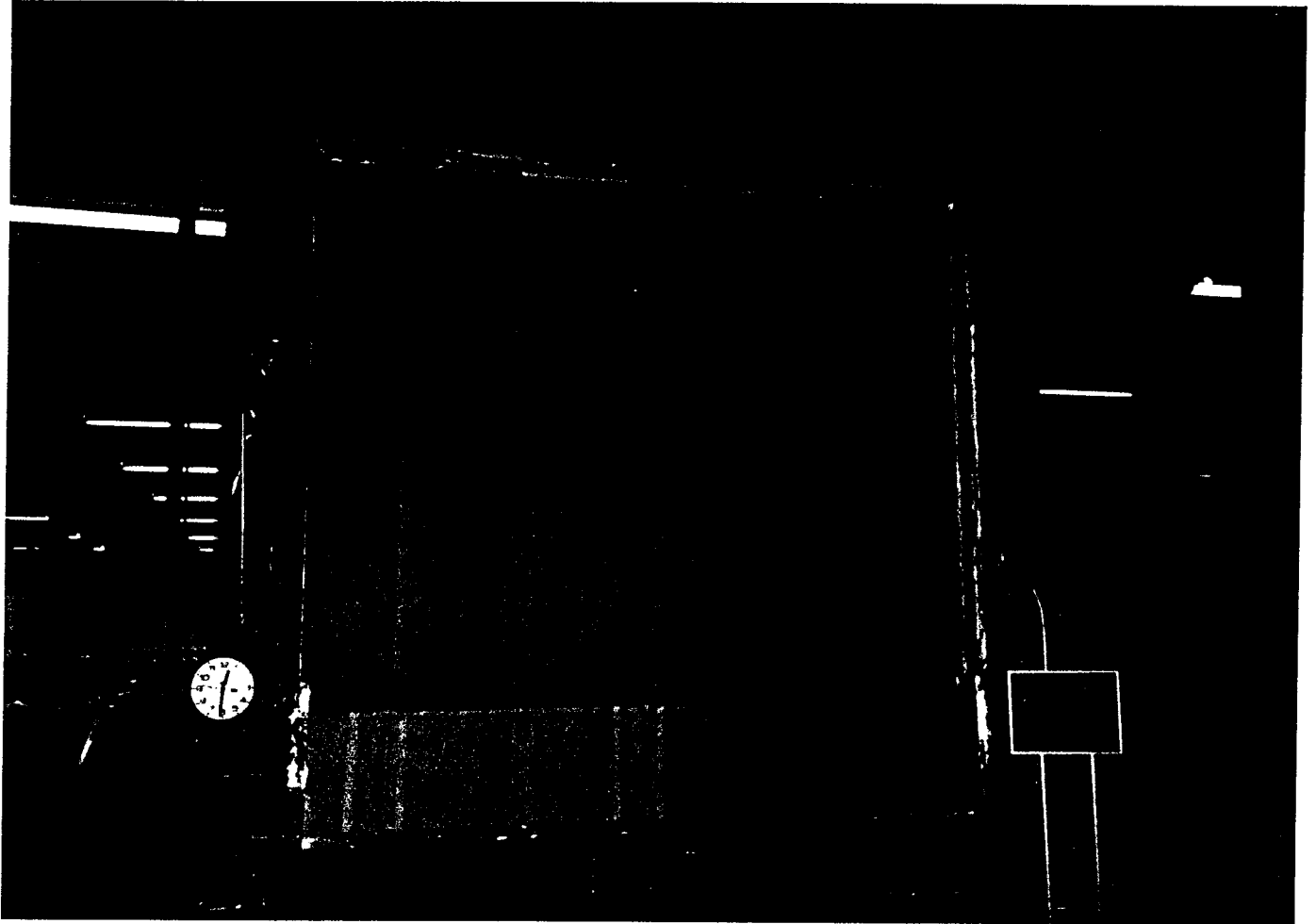
PHOTOGRAPH #4
THE UNEXPOSED FACE BEFORE THE START OF THE TEST



PHOTOGRAPH #5
ANOTHER VIEW OF THE UNEXPOSED FACE
BEFORE THE START OF THE TEST



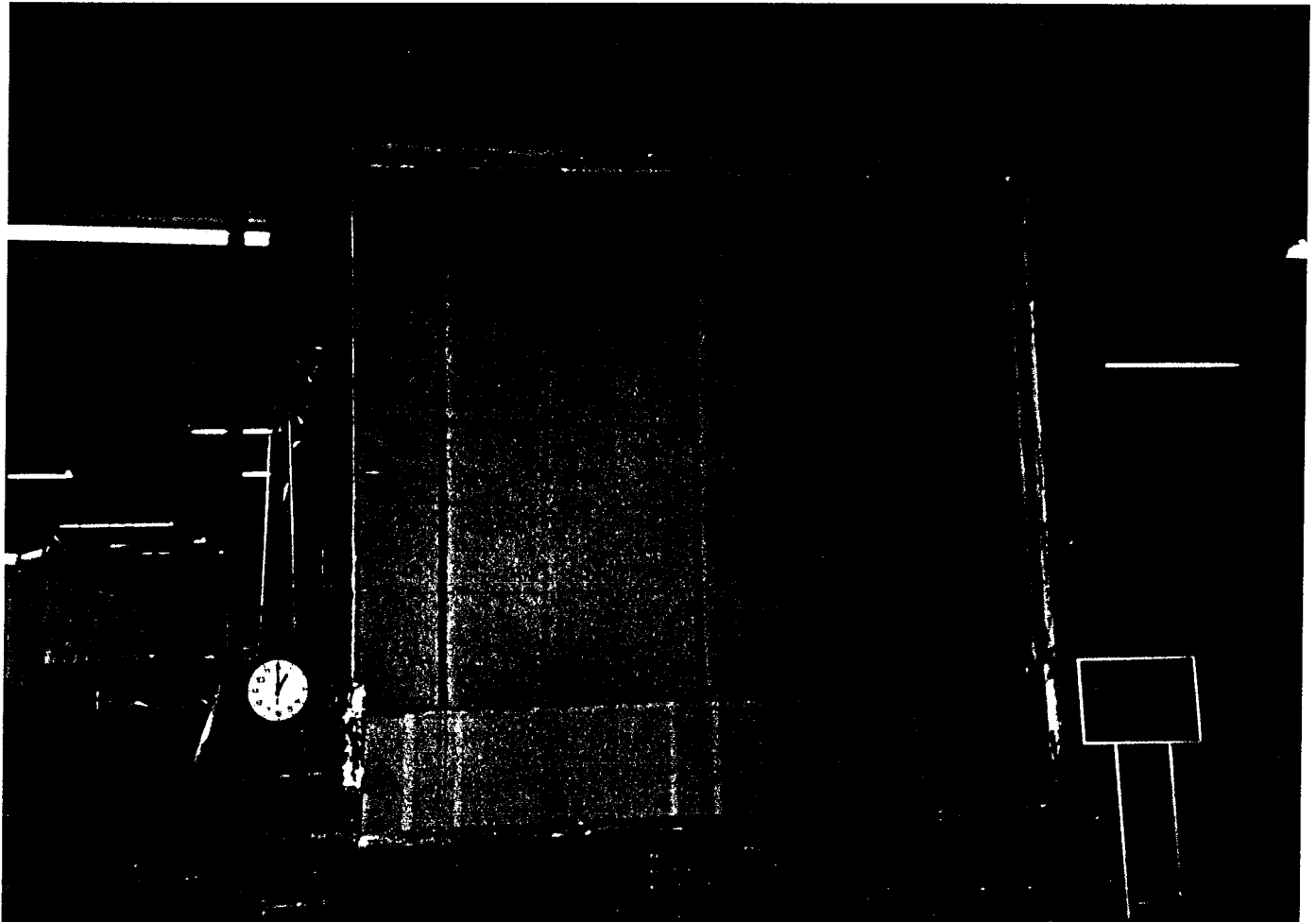
PHOTOGRAPH #6
THE UNEXPOSED FACE AT 6 MINUTES ELAPSED TIME



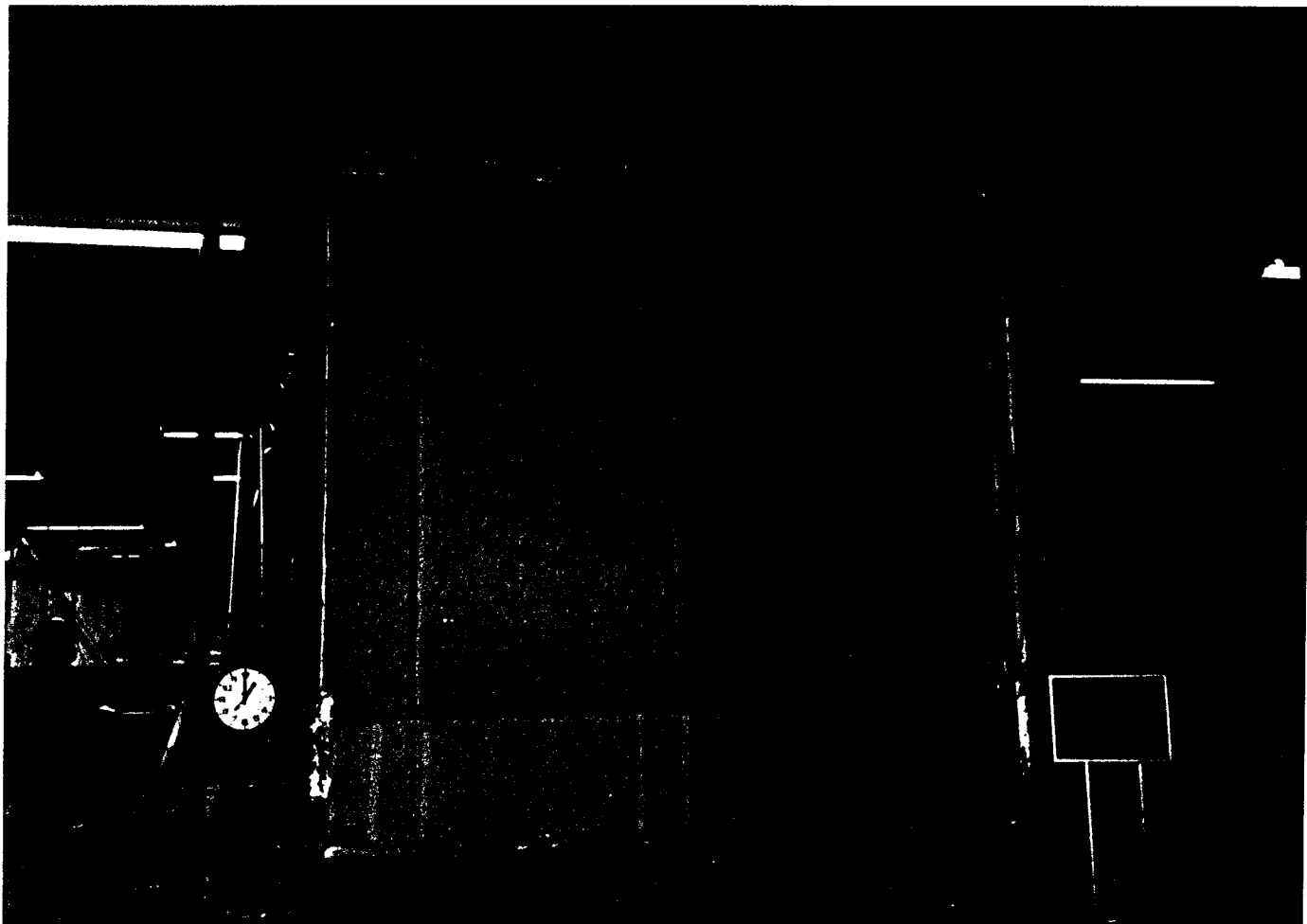
PHOTOGRAPH #7
THE UNEXPOSED FACE AT 31 MINUTES ELAPSED TIME



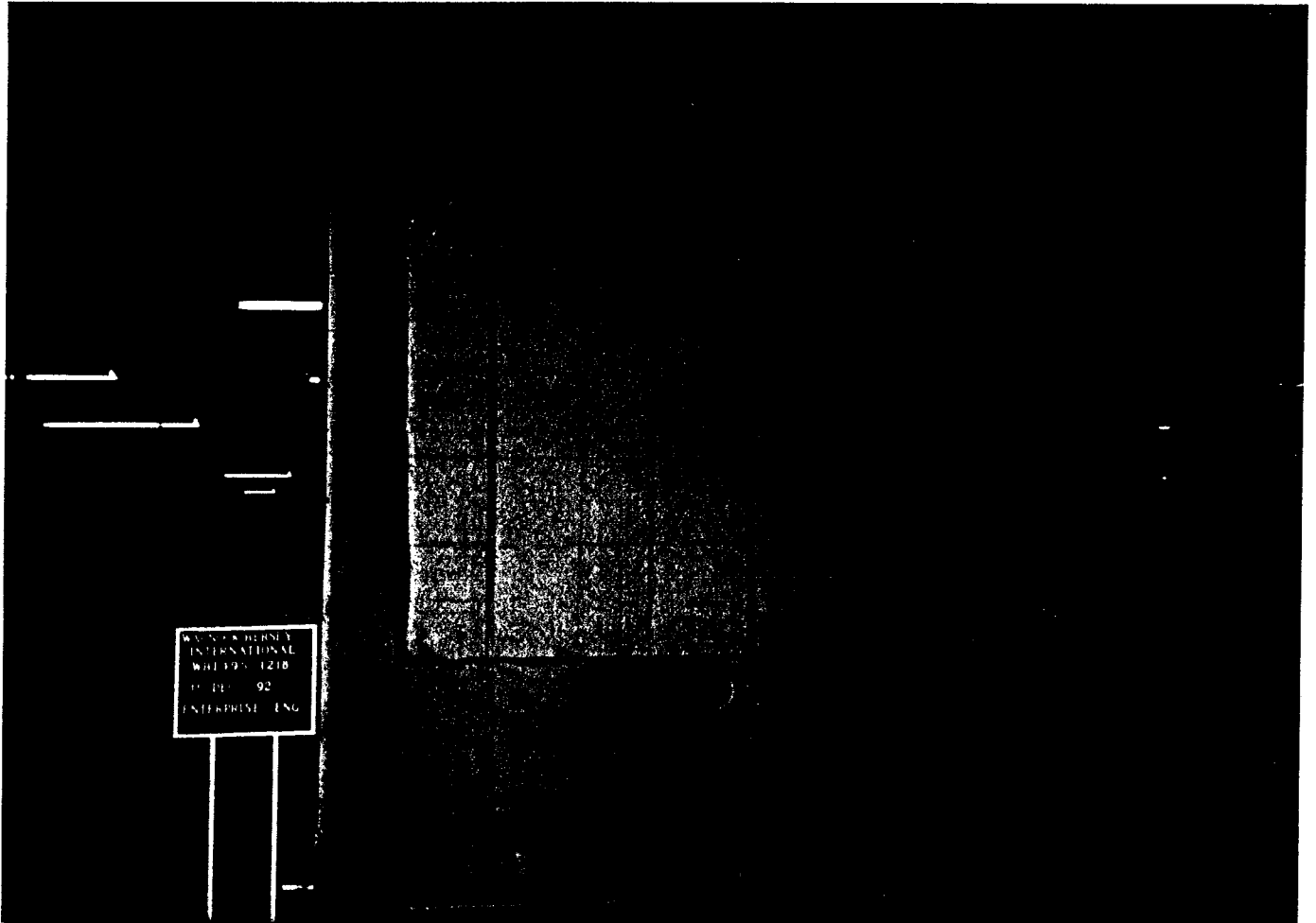
PHOTOGRAPH #8
THE UNEXPOSED FACE AT 51 MINUTES ELAPSED TIME



PHOTOGRAPH #9
THE UNEXPOSED FACE AT 60 MINUTES ELAPSED TIME



PHOTOGRAPH #10
ANOTHER VIEW OF THE UNEXPOSED FACE AT 60 MINUTES ELAPSED TIME



PHOTOGRAPH #11
THE EXPOSED FACE AFTER THE TEST WAS COMPLETED

APPENDIX "B"

Warnock Hersey International Inc.
Test Report
WHI-495-1219



WARNOCK HERSEY, INC.
3240 Lone Tree Way, Suite 100
Antioch, CA 94509
Tel (510) 706-4090 • Fax (510) 706-2195

REPORT OF THE FIRE ENDURANCE TESTING OF A PROSCENIUM CURTAIN
ZETEX PLUS 1210 (WITHOUT WIRE).

CLIENT

ENTERPRISE ENGINEERING LABORATORY INC.
1550 DELL AVENUE
CAMPBELL, CALIFORNIA 95008
U.S.A

REPORTED BY

WARNOCK HERSEY INTERNATIONAL, INC.
530 GARCIA AVENUE
PITTSBURG, CALIFORNIA 94565
U.S.A.

FILE NO.: WHI-495-1219

JOB NO.: 50611-C7-043140

TEST DATE: DECEMBER 14, 1992

THIS REPORT IS FOR THE EXCLUSIVE USE OF THE CLIENT NAMED HEREIN. WARNOCK HERSEY INTERNATIONAL, INC., AUTHORIZES THE CLIENT NAMED HEREIN TO REPRODUCE THIS REPORT. IT MUST BE REPRODUCED IN ITS ENTIRETY. THIS REPORT DOES NOT IMPLY PRODUCT CERTIFICATION BY WARNOCK HERSEY. PRODUCTS MUST BEAR LABELS WITH THE WARNOCK HERSEY LOGO TO DEMONSTRATE CERTIFICATION BY WARNOCK HERSEY. ANY USE OF THE WARNOCK HERSEY LOGO FOR ADVERTISING MATERIAL MUST BE APPROVED IN ADVANCE BY WARNOCK HERSEY.



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INTRODUCTION

On December 14, 1992 the Pittsburg, California fire testing laboratory of Warnock Hersey International, Inc. conducted a 61 minute endurance test on a proscenium curtain.

The test was conducted in accordance with the criteria specified in UBC 6-1 (1991), Section 6.103(e).

The proscenium curtain described herein and submitted to WHI by the client, has met the fire endurance test performance requirements in accordance with the criteria specified in the standard.

The test was conducted for Enterprise Engineering Laboratory, Inc. of Campbell, California.



TEST MATERIALS

PROSCENIUM CURTAIN: 15'-0" wide by 15'-0" high by 0.080" thick 1210 ZETEX PLUS, without wire, proscenium curtain (see Figure #3). The curtain contained 3 vertically oriented, French seams.



TEST ASSEMBLY CONSTRUCTION

The 15'-0" x 15'-0" proscenium curtain was installed in the furnace frame as shown in Figures #1 and #2 and as described below.

The proscenium curtain was placed over the edge of a 160" long wood 2 x 4 (nominal) and attached with 1" screws and 2" diameter flat washers spaced 12" on center (see Figure #2). The 2 x 4 was then attached to the top of the furnace test frame with the curtain hanging down in front of the frame opening.

A test load of 9.2 pounds per lineal foot was placed in the bottom pocket of the curtain.



THE FIRE TEST

The fire test was started after igniting the burners and moving the test assembly into position in front of the 12'-0" wide by 9'-0" high furnace opening. Temperatures within the furnace were monitored using 9 thermocouples attached to automatic recording equipment. The furnace temperatures were controlled to follow the time/temperature curve specified in the test standards. These temperatures and the time temperature curve are included with this report as Figure #4 - Furnace Temperatures.

Periodic observations were made of the exposed and unexposed faces of the proscenium curtain during the fire endurance test. These observations were recorded and are included with this report.

Three pressure taps were installed through the furnace wall along the vertical center line at the top, midheight, and bottom elevations to measure furnace pressures. The pressure taps were attached to pressure gauges. Readings from these gauges were monitored for controlling furnace pressure by adjusting dampers in the furnace exhaust stacks. Periodic readings were recorded and are included with this report as Table #1 - Furnace Pressures.

The fire endurance portion of this test was conducted for 30 minutes and continued for an additional 31 minutes, for a total test time of 61 minutes. The furnace was then extinguished and the furnace frame containing the test assembly was moved into position for cooling, photographs and examination.



FIRE TEST OBSERVATIONS

<u>ELAPSED TIME</u> (min:sec)	<u>EXPOSED SURFACE</u>
2:00	The surface of the fabric is very dark and uniform.
5:00	The surface has a uniform red glow. No other visible changes are evident.
10:00	The entire curtain has a uniform red glow with a little bit more brilliant glow at each of the seams.
25:00	No visible changes are evident. There is no indication of tearing at any of the seams.
30:00	The curtain is a uniform orange glow, with the exception of a more brilliant glow at the seam locations.
45:00	No visible changes are evident. All seams are holding intact.
55:00	The curtain is a uniform, brilliant orange color. There is less difference in color between the seams and the curtain fabric at this time.
60:00	No visible changes are evident.

The fire in the furnace was extinguished at 61 minutes elapsed time and the test assembly was moved aside for cooling, photographs, and examination.



FIRE TEST OBSERVATIONS, CONTINUED

<u>ELAPSED TIME</u> (min:sec)	<u>UNEXPOSED SURFACE</u>
0:30	A small amount of smoke is beginning to issue from the fabric of the curtain.
2:00	Almost all the smoking from the fabric has fully receded. Small amounts of smoke are being issued from the seams.
3:00	No visible changes are evident. Small amounts of smoke are still issuing from along the seams of the fabric.
5:00	Smoke from the curtain has stopped. There is no glow at any location.
10:00	Most of the seams are now the same dark color as the field of the fabric.
25:00	No visible changes are evident.
30:00	There is no evidence of glow or translucency at any location. All the seams are intact, tight, a little bit darker color at the seams than there is in the basic fabric which is beginning to turn a little bit lighter color. No other visible changes are evident.
45:00	No visible changes are evident.
55:00	A translucency is beginning to develop that is very uniform over the entire surface. There is no glow visible at any location. All the seams are still tightly sewn together.
60:00	No visible changes are evident.

The fire in the furnace was extinguished at 61 minutes elapsed time and the test assembly was moved aside for cooling, photographs, and examination.



CONCLUSIONS

The proscenium curtain described in this report passed a 60 minute fire endurance in accordance with the fire endurance test performance criteria specified in UBC 6-1 (1991), Section 6.103(e).



SIGNATURES

SUBMITTED BY:

Billy D. Brittain

Billy D. Brittain, Ch.E.
Manager, Fire Testing Laboratory
Date: 12 MAR '93

REVIEWED BY:

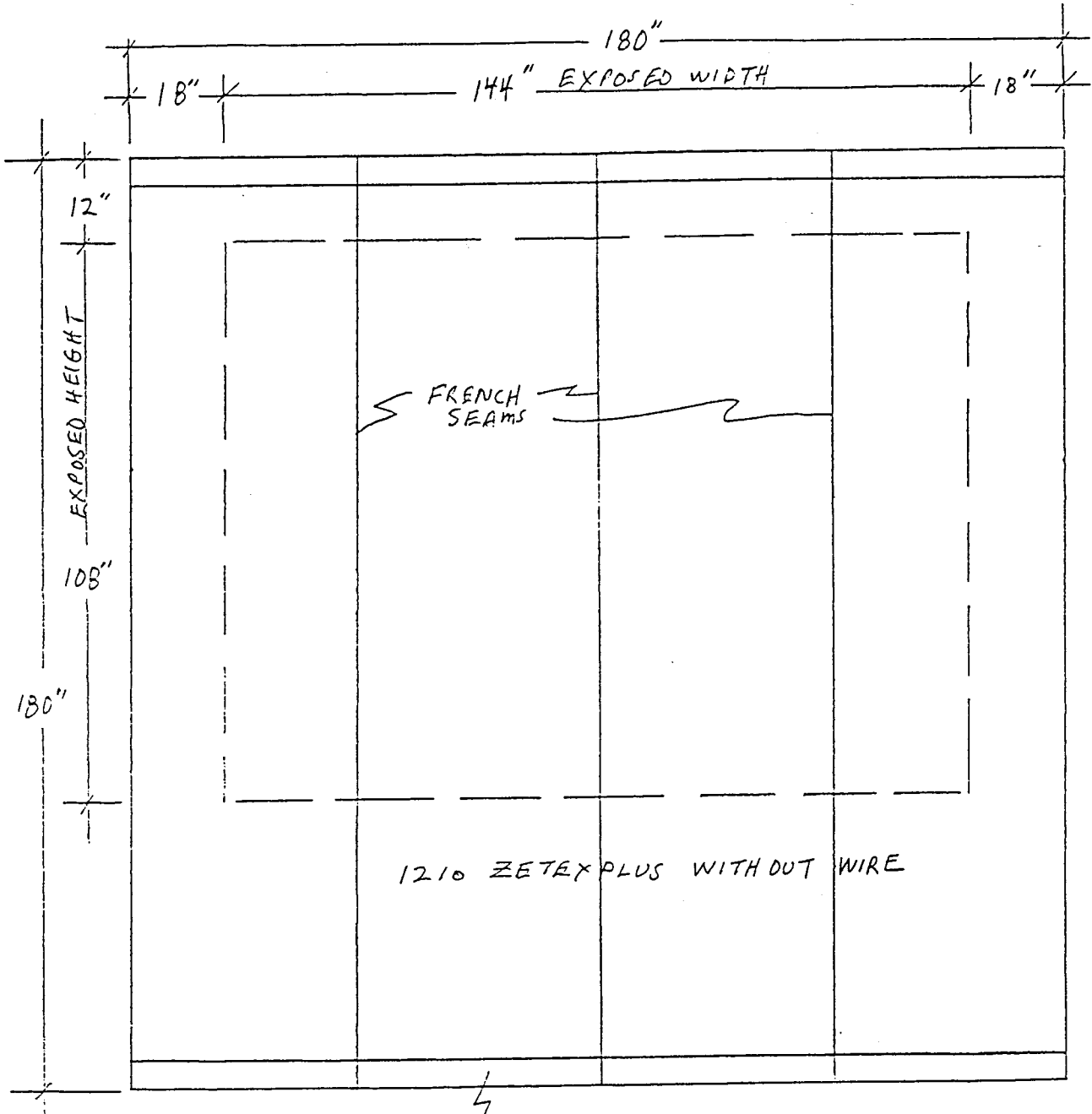
George E. Meyer

George E. Meyer, P.E.
Vice President, International Operations
Date: 16 March 93





FIGURE #1
TEST ASSEMBLY CONSTRUCTION



⚡
BOTTOM POCKET WEIGHTED WITH
9.2 lbs. per ft.



FIGURE #2
ASSEMBLY CONSTRUCTION DETAIL AT TOP

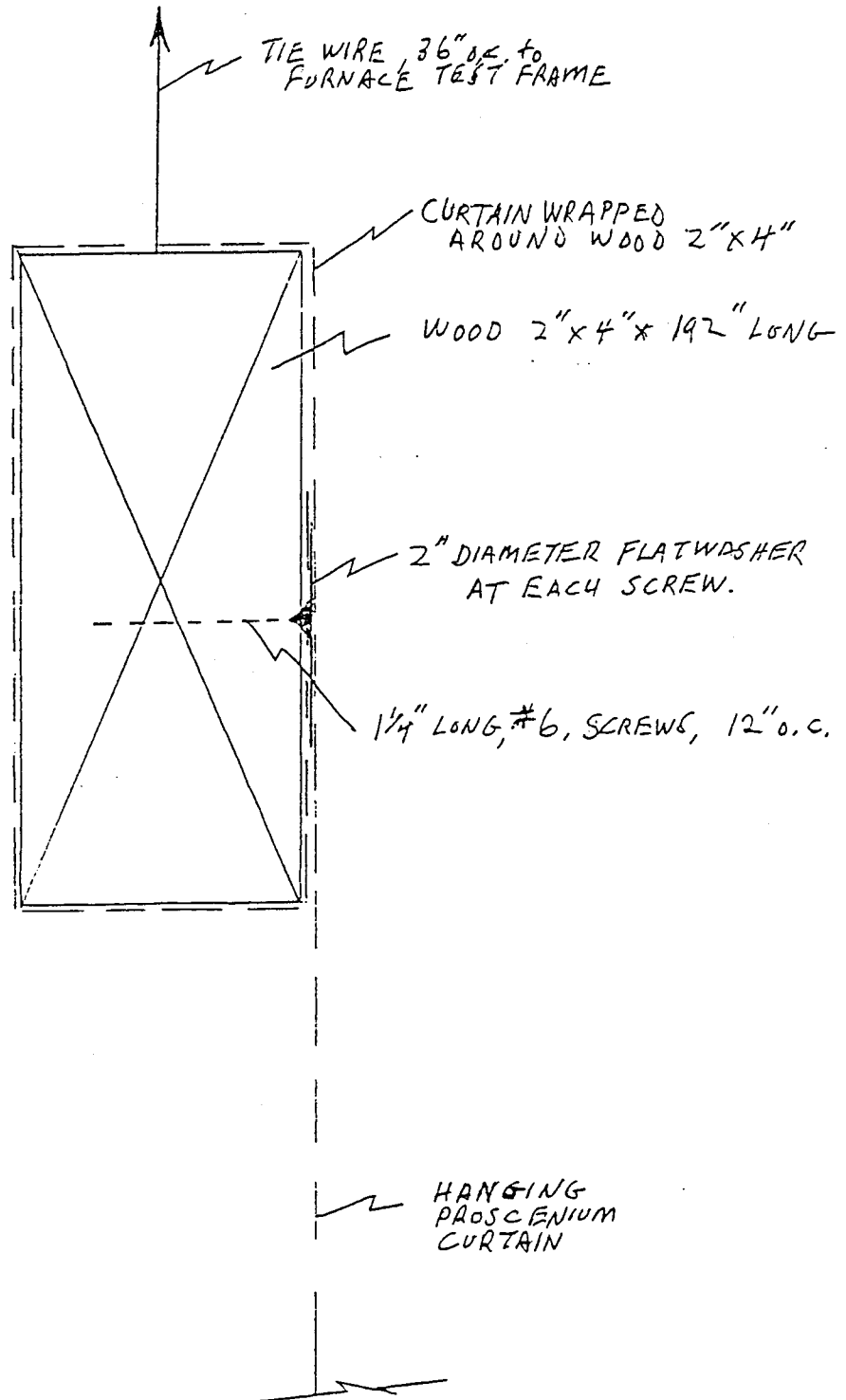




FIGURE #3
MANUFACTURER'S LITERATURE

ZETEX

ALL OF THE PROTECTION BUT NONE OF THE HEALTH HAZARDS OF ASBESTOS

PRODUCT SPECIFICATION

STYLE 1210 ZETEXPLUS™

GENERAL DESCRIPTION: ZETEXPLUS 1210 fabric is made from highly texturized silica based yarns. The higher temperature capability is the result of a specialized manufacturing process. ZETEXPLUS fabrics are free of any asbestos, are softer than asbestos fabrics of the same weight and have almost five times their abrasion resistance.

APPLICATIONS: Typical applications include curtains, blankets, drop cloth for medium to heavy industrial applications, high temperature expansion joints, flue ducts, turbine insulation and gasketing.

Typical industries include thermal and nuclear power plants, refineries and petro-chemical industries, steel, aluminum, copper and other basic metal industries, turbine insulation, heat treating stress relieving, automotive and industrial maintenance.

PHYSICAL PROPERTIES:

Weight Oz./Square Yard:	40
Construction:	12 x 7
* Thickness:	0.080"
Weave:	Plain
Breaking Strength: (minimum)	Warp - 425 Fill - 425
* K Factor (Heat Conductivity for Style 1210 fabric):	0.3385
Service Temperature:	Continuous Temperature up to 1500°F.(816°C) and higher short duration temperatures.

* For fabric before treatment



FIGURE #4
FURNACE TEMPERATURES

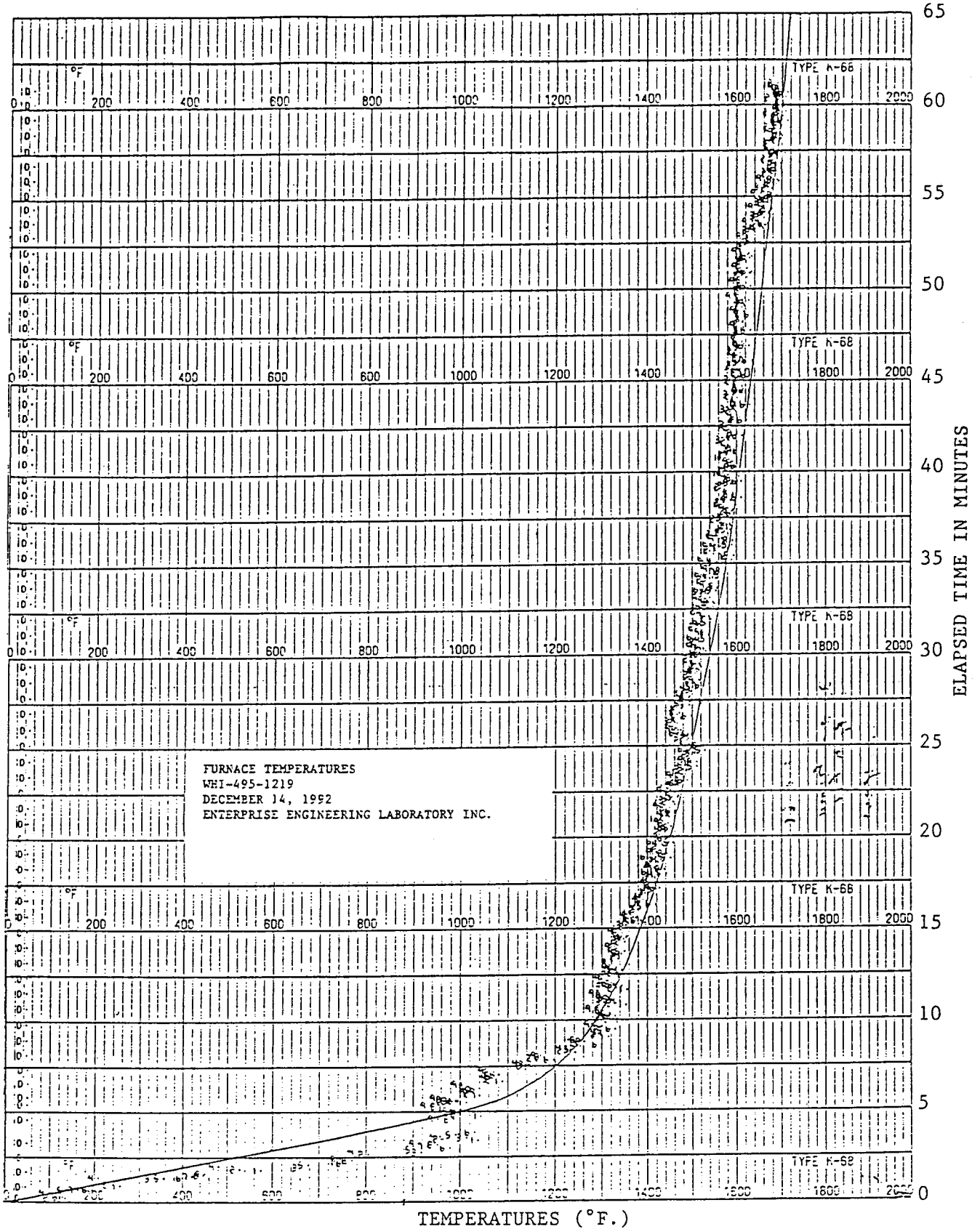
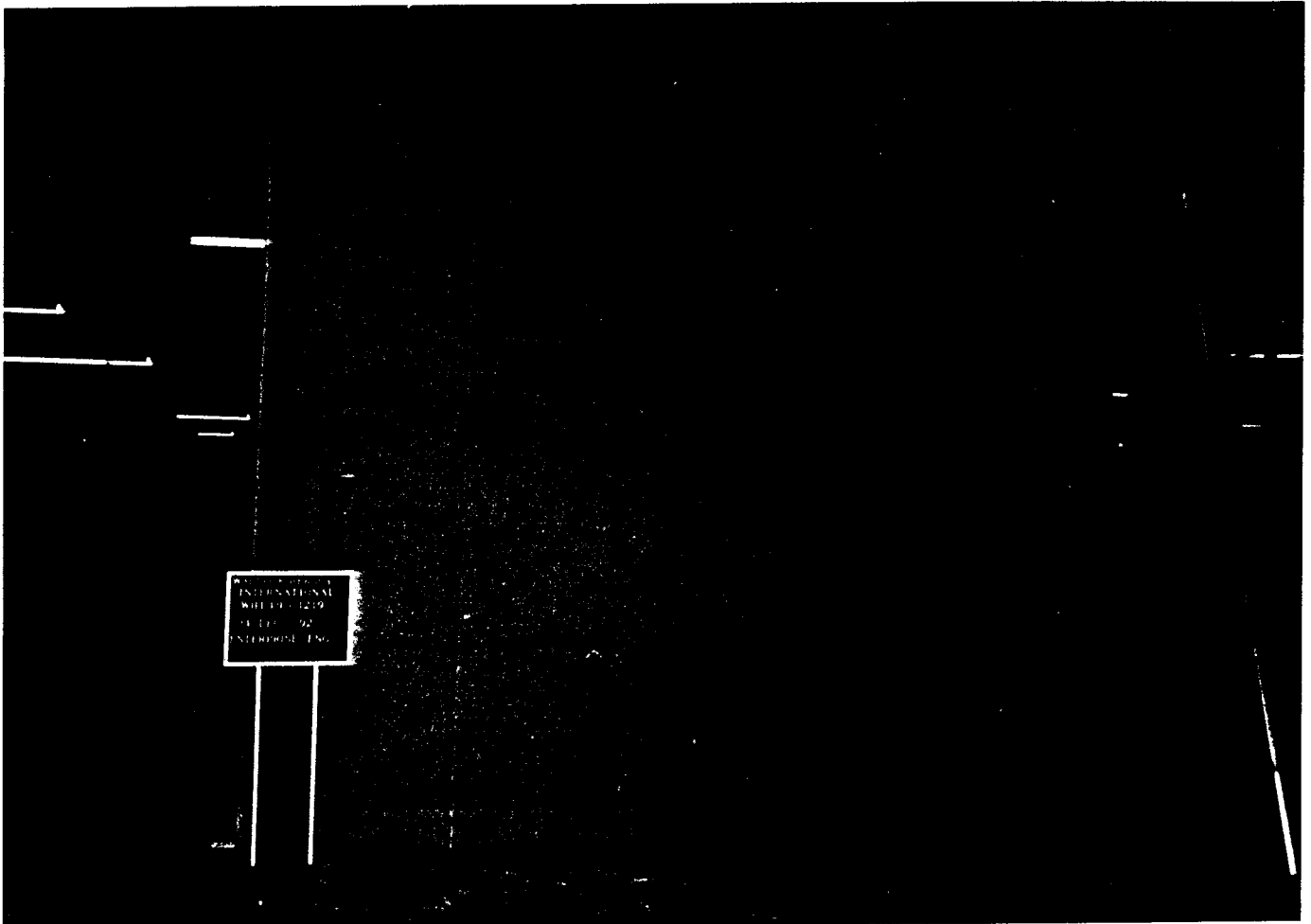




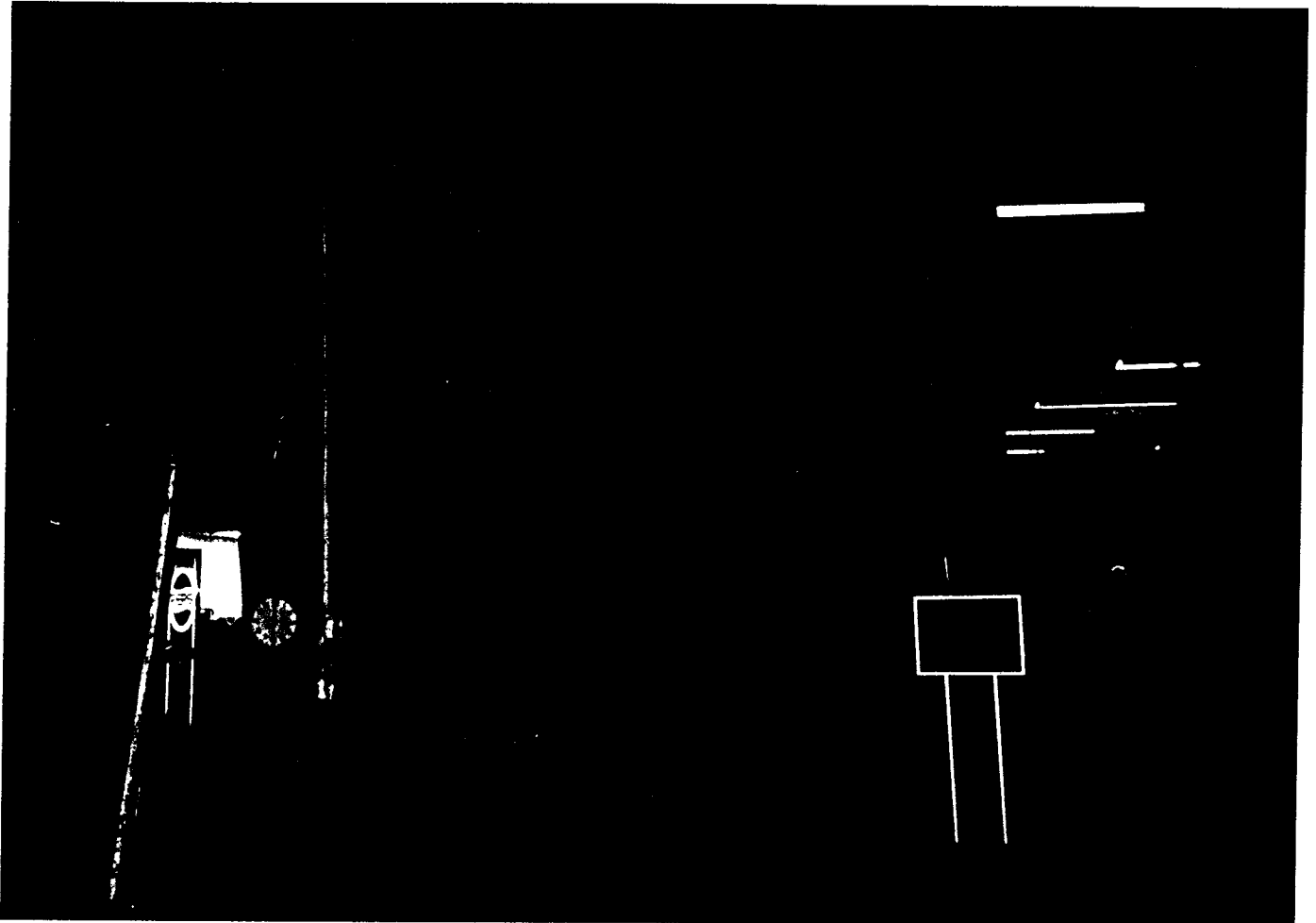
TABLE #1

FURNACE PRESSURES

ELAPSED TIME IN MINUTES	FURNACE PRESSURES		
	TOP	MIDHEIGHT	BOTTOM
5	+.050	.000	-.040
15	+.052	.000	-.038
25	+.053	+.005	-.033
35	+.056	+.003	-.034
45	+.054	+.001	-.037
55	+.053	.000	-.038
60	+.053	+.002	-.036



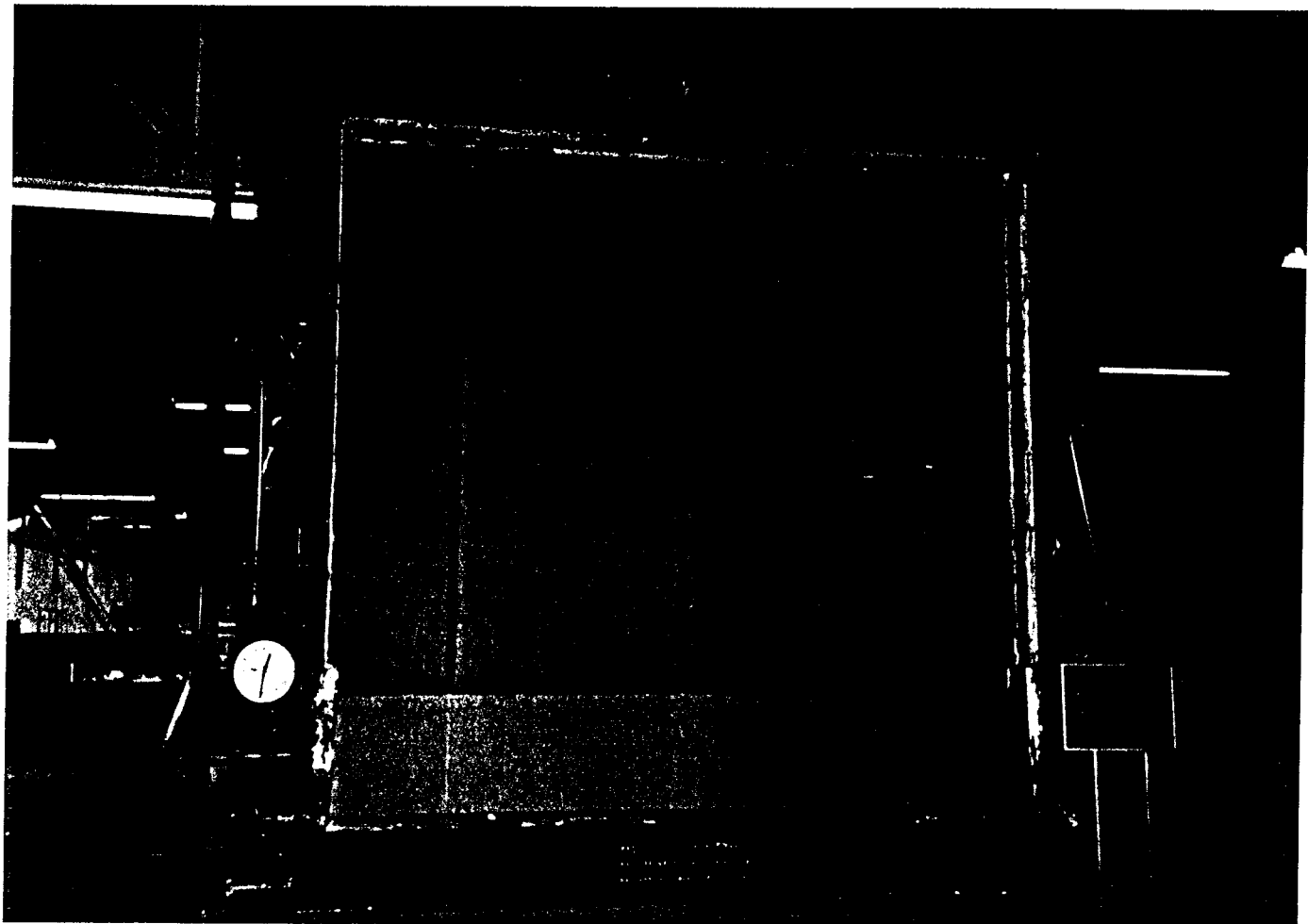
PHOTOGRAPH #1
THE EXPOSED FACE BEFORE THE START OF THE TEST



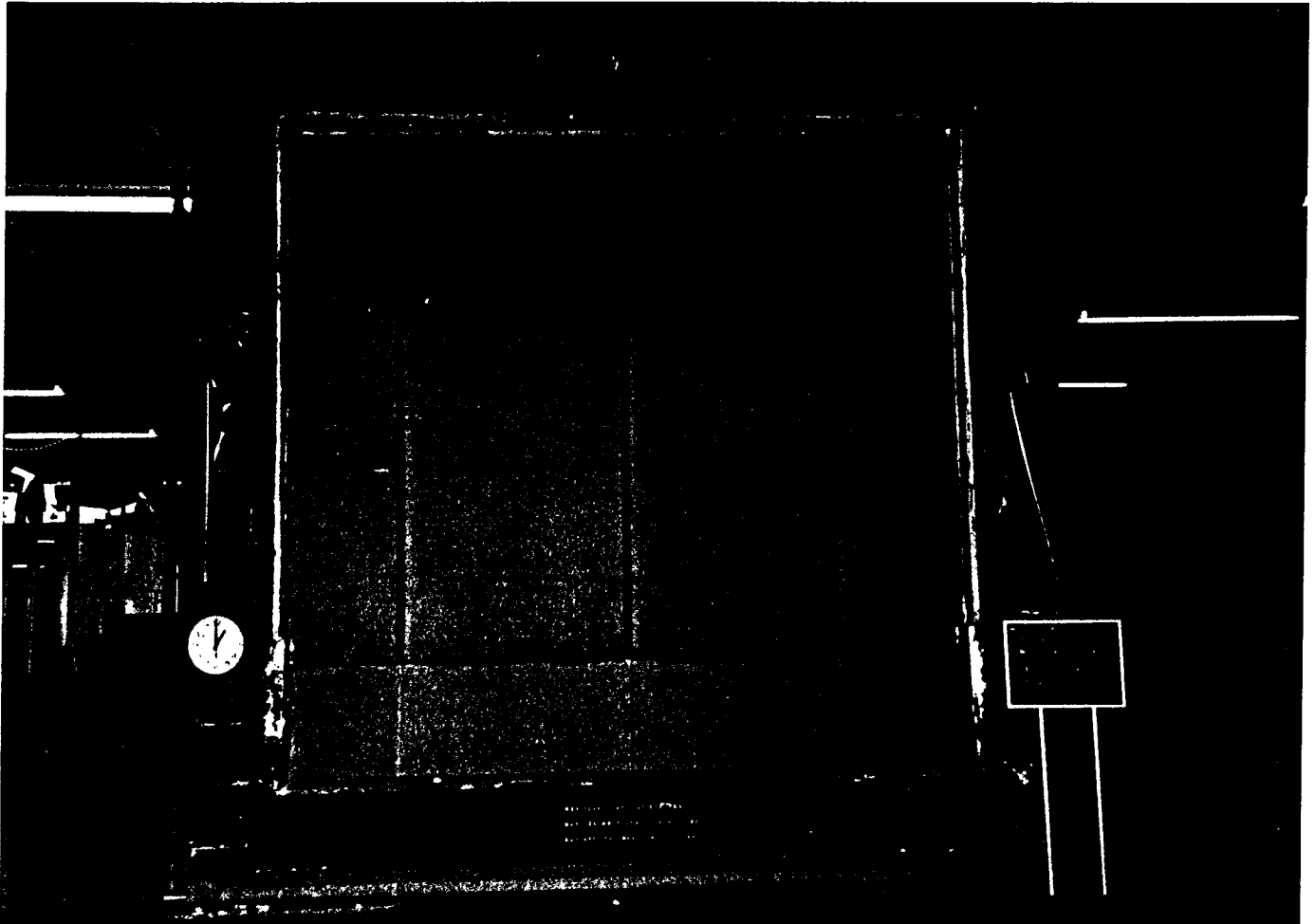
PHOTOGRAPH #2
THE UNEXPOSED FACE BEFORE THE START OF THE TEST



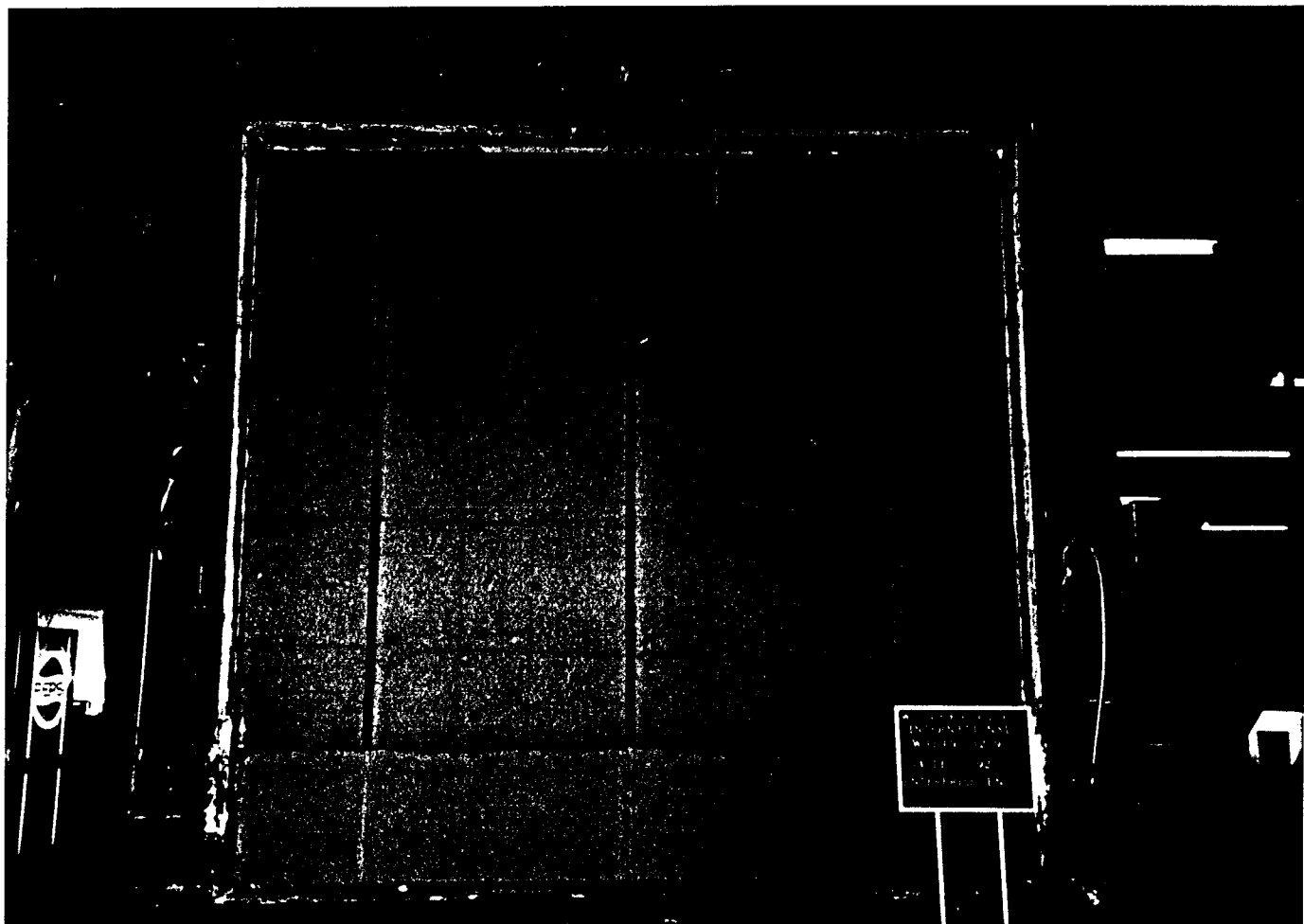
PHOTOGRAPH #3
THE UNEXPOSED FACE AT 4 MINUTES ELAPSED TIME



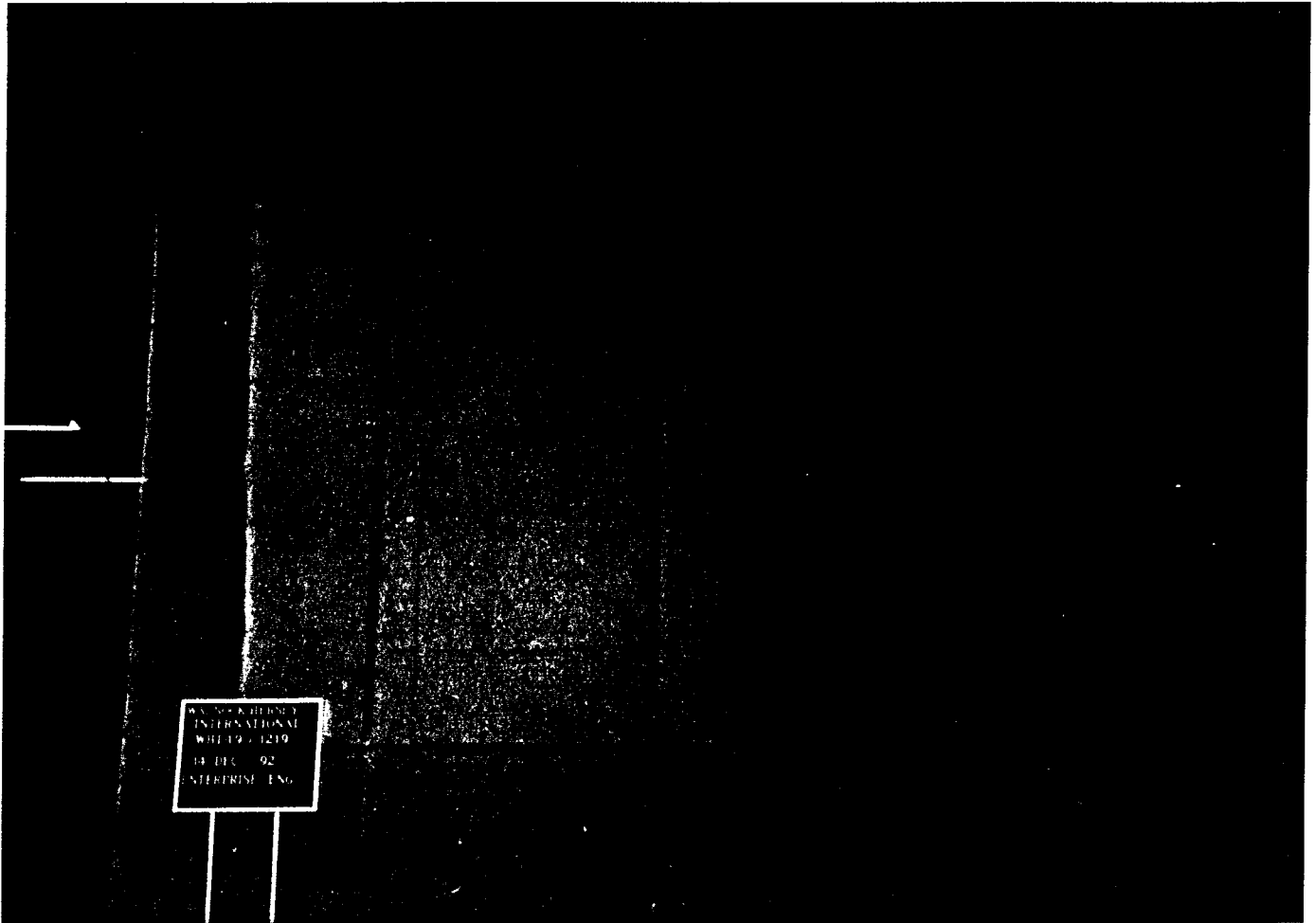
PHOTOGRAPH #4
THE UNEXPOSED FACE AT 31 MINUTES ELAPSED TIME



PHOTOGRAPH #5
THE UNEXPOSED FACE AT 60 MINUTES ELAPSED TIME



PHOTOGRAPH #6
THE UNEXPOSED FACE AFTER THE CURTAIN HAD COOLED



PHOTOGRAPH #7
THE EXPOSED FACE AFTER THE CURTAIN HAD COOLED



United States Testing Company, Inc.

1415 PARK AVENUE • HOBOKEN, NEW JERSEY 07030 • 201-792-2400 • Fax: 201-656-0636

REPORT OF TEST

REPORT#: 020066
DATE: 01/15/93
PAGE: 1 of 1

CLIENT: Newtex Industries Inc.
8050 Victor Menden Rd.
Victor, NY 14564

REFERENCE:

Newtex Industries Inc., Purchase Order No. P922087 dated December 21, 1992.

SAMPLE IDENTIFICATION:

Two (2) samples of material submitted and identified by Enterprise Engineering Laboratory as:

- A - 1210 ZP With Wire
- B - 1210 ZP Without Wire

TEST PERFORMED AND RESULTS:

Breaking Strength: lbs.
ASTM D-1682 (Grab)

		<u>Results</u>				<u>Average</u>	
A	Warp	520	620	600	610	600	590
	Filling	550	530	540	520	515	531
B	Warp	570	620	600	570	580	588
	Filling	450	475	450	500	550	486

Testing Supervised by:

M. D. O'Regan
Supervisor - Physical
Textile Services

MDO'R/its

SIGNED FOR THE COMPANY BY:

Dominick A. Martucci
Technical Director
Textile Services



Member of the SGS Group (Société Générale de Surveillance)

• Biology • Chemistry • Environmental • Materials • Facilities in Principal Cities •

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APPENDIX "C"

United States Testing Co.
Test Report
020066

APPENDIX "D"

United States Testing Co.
Test Report
187738-1



United States Testing Company, Inc.

5555 Telegraph Road
Los Angeles, CA 90040
Tel: 213-723-7181
Fax: 213-722-8251

REPORT OF TEST

ENTERPRISE ENGINEERING LABORATORY, INC.
1550 Dell Avenue
Campbell, CA 95008

FLAME SPREAD CLASSIFICATION AND
SMOKE DENSITY DEVELOPED

NEXTEX INDUSTRIES INC. HIGH
TEMPERATURE FIBERGLASS FABRIC,
STYLE ZETEXPLUS #1210 WITH WIRE

February 23, 1993
Revised March 9, 1993


Brian Ortega
Test Technician


Diane Fayerweather
Test Technician

TEST REPORT NO. 187738-1

SIGNED FOR THE COMPANY

BY


Michael S. Elliott
Director/Fire Tech. Dept.

REFERENCES

1. Client's Letter and File #1164 dated February 3, 1993.
2. Our confirmation to the Client dated February 9, 1993.

TEST REQUEST

Perform standard flame spread and smoke density developed classification tests on the fabric supplied by the Client in accordance with ASTM Designation E-84, "Standard Method of Test for Surface Burning Characteristics of Building Materials".

SAMPLE IDENTIFICATION

The sample tested was submitted and identified by the Client as:
Nextex Industries Inc. high temperature fiberglass fabric, style
ZetexPlus #1210 with wire

Thickness: 0.080" Nominal

PREPARATION AND CONDITIONING

The fabric was submitted in one piece, 2' wide by 24' long conforming to test chamber specifications. The sample was supported during testing by 2" hexagonal mesh poultry netting running the length of the test chamber and 1/4" round metal rods placed at two foot intervals across the width.

Prior to testing, the samples were placed in the conditioning room (maintained at $73.4 \pm 5^{\circ}\text{F}$ and a relative humidity of $50 \pm 5\%$) and allowed to reach moisture equilibrium.

TEST PROCEDURE

The sample was tested following calibration and preheating of the test chamber. The evaluation was performed in conformance with the specifications set forth in ASTM Designation E-84, "Standard Method of Test for Surface Burning Characteristics of Building Materials", both as to equipment and test procedure. Test procedure and apparatus have been accredited (Lab. No. 106) under the National Institute of Standards and Technology/NVLAP Program. The foregoing test procedure is comparable to UL 723, NFPA No. 255, and UBC No. 42-1.

SUMMARY OF ASTM E84 RESULTS

Because of the possible variations in reproducibility, the results are adjusted to the nearest figure divisible by 5.

<u>SAMPLE IDENTIFICATION</u>	<u>FLAME SPREAD</u>	<u>SMOKE DENSITY</u>
Nextex Industries Inc. high temperature fiberglass fabrics, style ZetexPlus #1210 with wire	5*	0

In order to obtain the Flame Spread Classification, the above results should be compared to the following table:

<u>NFPA CLASS</u>	<u>UBC CLASS</u>	<u>FLAME SPREAD</u>
A	I	0 through 25
B	II	26 through 75
C	III	76 through 200

BUILDING CODES CITED

1. National Fire Protection Association, NFPA No. 101, "Life Safety Code", 1988 Edition.
2. Uniform Building Code, 1988 Edition, Part VII, "Fire Resistive Standard for Fire Protection", Sections 4201-4203.

* ASTM E-84-89a, "Standard Test Method for Surface Burning Characteristics of Building Materials", Appendix XI. Guide to mounting Methods, Note II. The use of galvanized steel screening normally lowers the flame spread index values obtained for some materials that are tested in this manner and, therefore, the results do not necessarily relate directly to values obtained for other materials mounted without galvanized steel screening.

E-84 TEST DATA SHEET

CLIENT: Enterprise Engineering Laboratory, Inc. DATE: 2/17/93

SAMPLE: Nextex Industries Inc., high temperature fiberglass
fabric, style ZetexPlus #1210 with wire

OVERALL WEIGHT: N/A

THICKNESS: 0.080" Nominal

FLAME SPREAD:

IGNITION: 1 minute, 5 seconds

FLAME FRONT: 1 foot maximum

TIME TO MAXIMUM SPREAD: 1 minute, 37 seconds

TEST DURATION: 10 minutes

CALCULATION: 8.65 x 0.515 = 4.45

SUMMARY

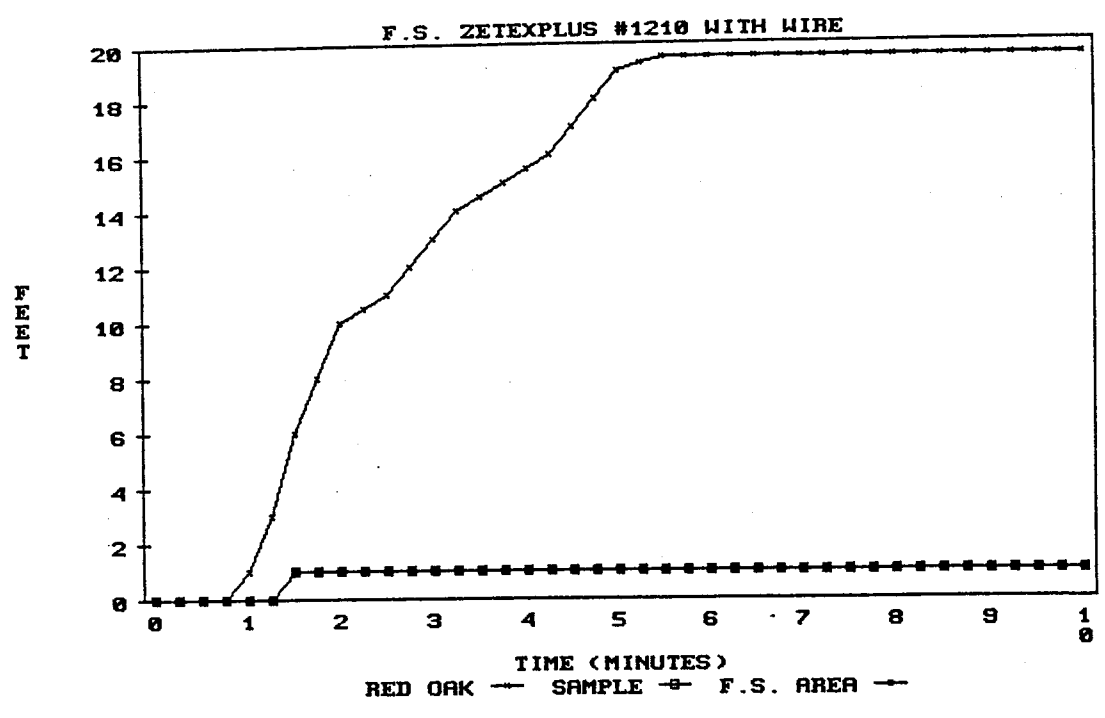
FLAME SPREAD: 5

SMOKE DENSITY: 0

OBSERVATIONS

Discoloration and charring of the sample surface was noted in the direct flame impingement area prior to ignition at 1 minute, 5 seconds. Following sample ignition, the flame front advanced a total of 1 foot in 1 minute, 37 seconds. No afterburning or glowing of the sample surface was observed at the conclusion of the test.

Appr'd by ME



APPENDIX "E"

United States Testing Co.
Test Report
187738-2



United States Testing Company, Inc.

5555 Telegraph Road
Los Angeles, CA 90040
Tel: 213-723-7181
Fax: 213-722-8251

REPORT OF TEST

ENTERPRISE ENGINEERING LABORATORY, INC.
1550 Dell Avenue
Campbell, CA 95008

FLAME SPREAD CLASSIFICATION AND
SMOKE DENSITY DEVELOPED

NEXTEX INDUSTRIES INC. HIGH
TEMPERATURE FIBERGLASS FABRIC,
STYLE ZETEXPLUS #1210 WITHOUT WIRE

February 23, 1993

Revised March 9, 1993


Brian Ortega
Test Technician

TEST REPORT NO. 187738-2

SIGNED FOR THE COMPANY


Diane Fayerweather
Test Technician

BY 
Michael S. Elliott
Director/Fire Tech. Dept.



REFERENCES

1. Client's Letter and File #1164 dated February 3, 1993.
2. Our confirmation to the Client dated February 9, 1993.

TEST REQUEST

Perform standard flame spread and smoke density developed classification tests on the fabric supplied by the Client in accordance with ASTM Designation E-84, "Standard Method of Test for Surface Burning Characteristics of Building Materials".

SAMPLE IDENTIFICATION

The sample tested was submitted and identified by the Client as:
Nextex Industries Inc. high temperature fiberglass fabric, style
ZetexPlus #1210 without wire

Thickness: 0.080" Nominal

PREPARATION AND CONDITIONING

The fabric was submitted in one piece, 2' wide by 24' long conforming to test chamber specifications. The sample was supported during testing by 2" hexagonal mesh poultry netting running the length of the test chamber and 1/4" round metal rods placed at two foot intervals across the width.

Prior to testing, the samples were placed in the conditioning room (maintained at $73.4 \pm 5^{\circ}\text{F}$ and a relative humidity of $50 \pm 5\%$) and allowed to reach moisture equilibrium.

TEST PROCEDURE

The sample was tested following calibration and preheating of the test chamber. The evaluation was performed in conformance with the specifications set forth in ASTM Designation E-84, "Standard Method of Test for Surface Burning Characteristics of Building Materials", both as to equipment and test procedure. Test procedure and apparatus have been accredited (Lab. No. 106) under the National Institute of Standards and Technology/NVLAP Program. The foregoing test procedure is comparable to UL 723, NFPA No. 255, and UBC No. 42-1.

SUMMARY OF ASTM E84 RESULTS

Because of the possible variations in reproducibility, the results are adjusted to the nearest figure divisible by 5.

<u>SAMPLE IDENTIFICATION</u>	<u>FLAME SPREAD</u>	<u>SMOKE DENSITY</u>
Nextex Industries Inc. high temperature fiberglass fabrics, style ZetexPlus #1210 without wire	5*	0

In order to obtain the Flame Spread Classification, the above results should be compared to the following table:

<u>NFPA CLASS</u>	<u>UBC CLASS</u>	<u>FLAME SPREAD</u>
A	I	0 through 25
B	II	26 through 75
C	III	76 through 200

BUILDING CODES CITED

1. National Fire Protection Association, NFPA No. 101, "Life Safety Code", 1988 Edition.
2. Uniform Building Code, 1988 Edition, Part VII, "Fire Resistive Standard for Fire Protection", Sections 4201-4203.

* ASTM E-84-89a, "Standard Test Method for Surface Burning Characteristics of Building Materials", Appendix XI. Guide to mounting Methods, Note II. The use of galvanized steel screening normally lowers the flame spread index values obtained for some materials that are tested in this manner and, therefore, the results do not necessarily relate directly to values obtained for other materials mounted without galvanized steel screening.

E-84 TEST DATA SHEET

CLIENT: Enterprise Engineering Laboratory, Inc. DATE: 2/17/93

SAMPLE: Nextex Industries Inc., high temperature fiberglass
fabric, style ZetexPlus #1210 without wire

OVERALL WEIGHT: N/A

THICKNESS: 0.080" Nominal

FLAME SPREAD:

IGNITION: 32 seconds

FLAME FRONT: 1 foot maximum

TIME TO MAXIMUM SPREAD: 50 seconds

TEST DURATION: 10 minutes

CALCULATION: 9.32 x 0.515 = 4.80

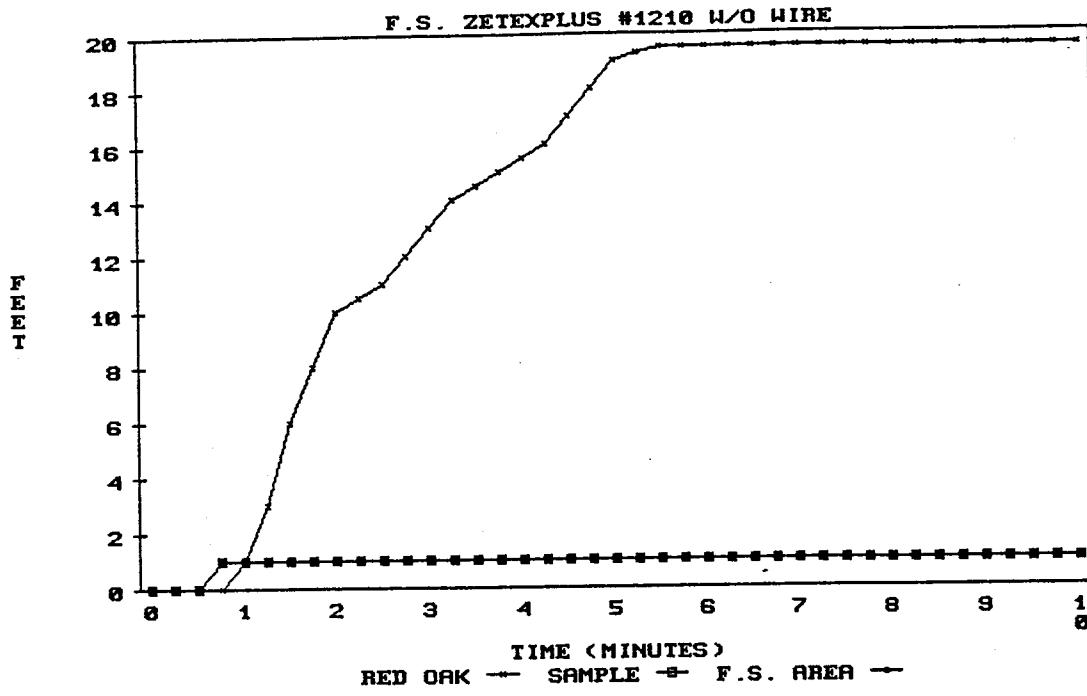
SUMMARY

FLAME SPREAD: 5
SMOKE DENSITY: 0

OBSERVATIONS

Discoloration of the sample surface was noted in the direct flame impingement area prior to ignition at 32 seconds. Following sample ignition, the flame front advanced a total of 1 foot in 50 seconds. No afterburning or glowing of the sample surface was observed at the conclusion of the test.

Appr'd by *ME*



MANUFACTURER'S DATA

NEWTEX THEATRE CURTAINS

Newtex theatre curtains are being used as a replacement for asbestos curtains. The basic fabric styles are 1100; 1110; 1200; 1200 O.G.; 1210 W/W. The predominant styles used are 1200 O.G. and 1210 W/W (spec. sheet enclosed).

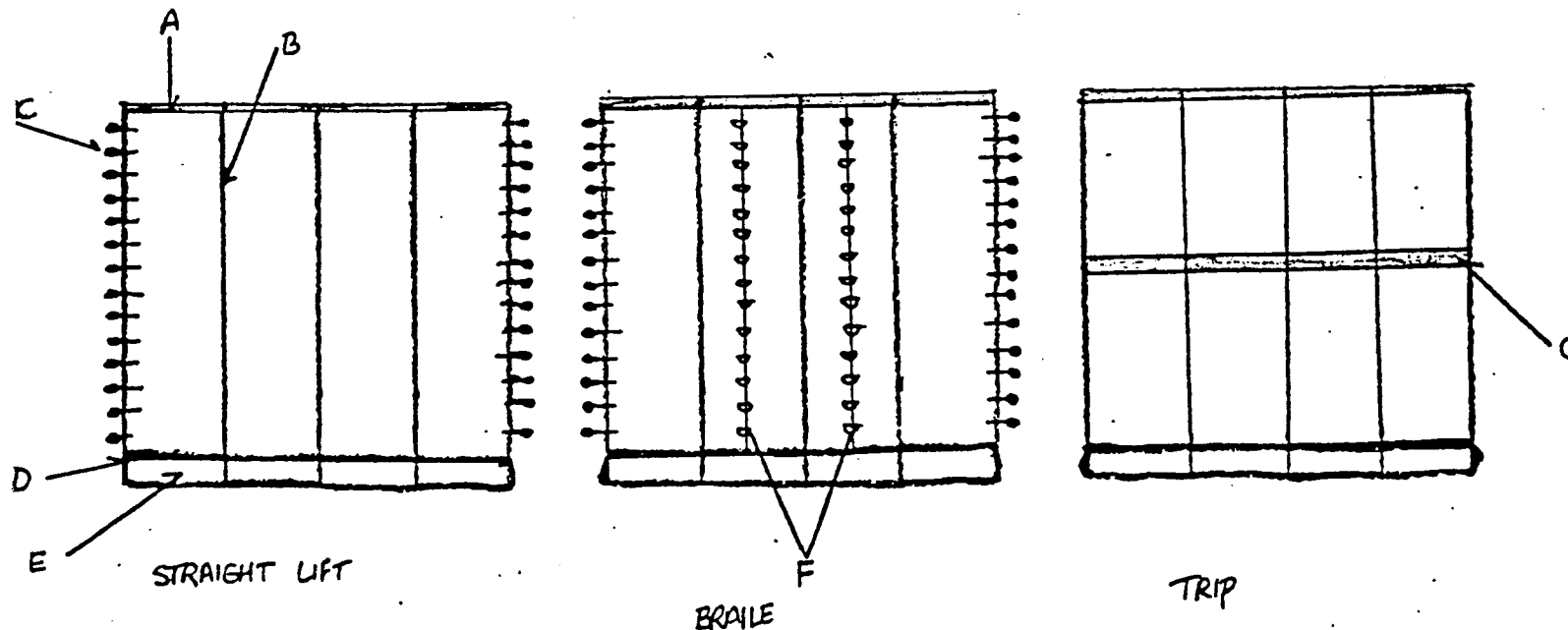
Newtex provides two different coatings for the above fabrics. Our Zetex™ curtains are coated on one side only, to create a better bond and lock of the weave. Our ZetexPlus™ curtains are 2-sided coated and not only lock and bond the weave, but also raise the temperature rating of the basic fabric from 1100°F to 1800°F on a continuous exposure. All of the above styles used to fabricate theatre curtains are UL approved.

The Quality Assurance Program used during the manufacturing process is designed to meet the requirements as specified in MIL-I-45208A. This program is available for review and can be found in Newtex Industries' Quality Control Manual.

Fabric used in the fabrication of theatre curtains is only first quality. No sub-standard material is accepted.

Newtex fabricates three types of theatre curtains: straight lift, braile and trip (shown in Diagram #1).

DIAGRAM #1



A - Top Pocket
B - Center Seam
C - Side Bracket
D - Bottom Pocket

E - YIELD PAD
F - "D" RINGS
G - TRIP POCKET

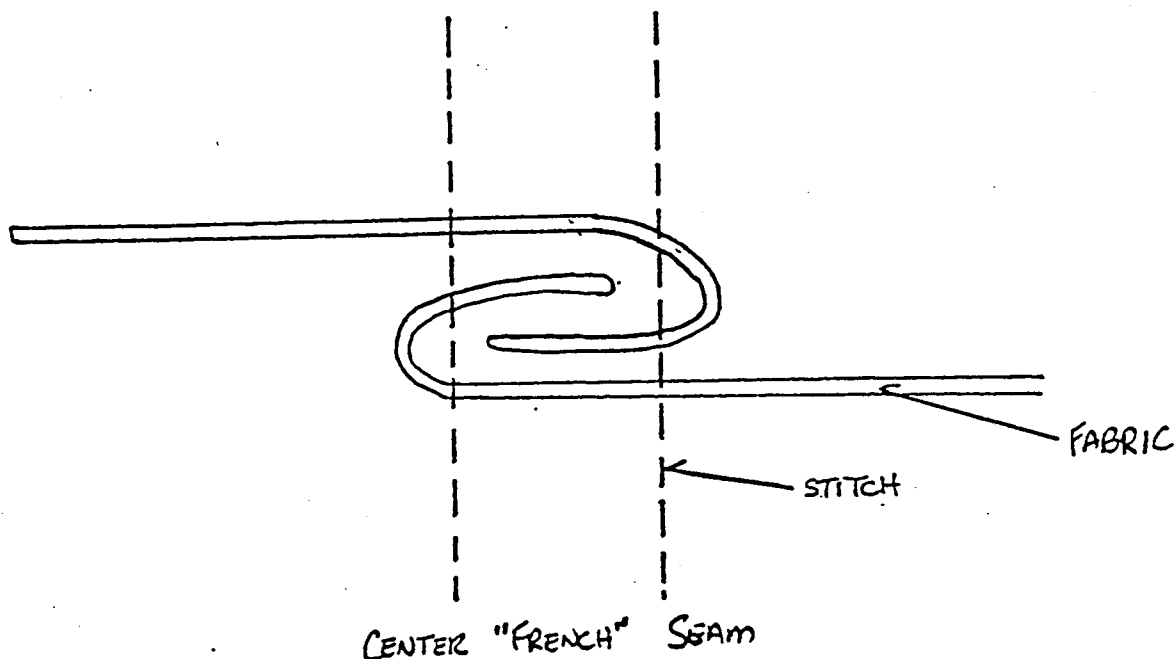
Braille type curtains will always have brackets, while straight lift and trip may or may not have them.

All curtains have a top pocket (top pipe pocket) which may be 6 or 8 inches wide, depending upon the customer's request.

All side seams are 6 inches wide, unless specified otherwise by customer.

All center seams are manufactured using a fold which creates a "French seam" (shown in Diagram #2).

DIAGRAM #2



All center seams are double stitched for added strength and reliability. The distance between the two seams is one inch. All seams run vertically.

All curtains have a bottom pocket (bottom pipe pocket) which may be 6 or 8 inches wide, depending upon the customer's request. This pipe pocket contains weight to control the speed of descent of the curtain.

Located underneath this pocket is another pocket opening which contains the yield pad. The prime function of the yield pad is to act as a sealer when the curtain is in the down position. Standard yield pad size is three inches. Other sizes are available at customer's request.

All thread used in the fabrication of theatre curtains is teflon coated Beta fiberglass yarn. Minimum number of stitches per inch will be eight.

Side brackets used are for guiding the theatre curtain up and down. There are two types available, wood and metal, with metal brackets being most commonly used. Placement is normally 18 inches center starting within a minimum distance of 8 inches from the top. They are attached to the curtain with screws and nuts.

In the case of braille curtains, along the width travelling vertically are guides which are in the shape of a "D" and are called "D rings". These rings are sewn to a fiberglass tape 1-1/2 inches wide and .060 thick. The D rings are spaced the same distance as the side brackets. The D rings are spaced along the width per customer's instructions. The D rings on the tape are sewn directly onto the curtain panel using a double seam.

Before start of a curtain, all fabric is inspected as it is being rolled out and cut into panels. If there are any questions regarding quality of fabric, the sewers will alert our quality assurance department for their approval or disapproval. If disapproved, material is rejected and scrapped.

During the sewing operation, the sewer has the prime responsibility to ensure that the two panels are attached together, as shown in Diagram #2. Width measurements of each panel is checked and recorded as each panel is completed by the sewer. This procedure helps ensure that the final width dimensions required by the customer are met.

Once all panels are attached, the top pocket is sewn. The curtain is then laid out for height markings. After this is complete, the bottom pipe pocket and the yield pad pockets are fabricated.

The curtain is again laid out for insertion of yield pad and attachment of side brackets, if required, and then final measurements by Quality Assurance is documented.

The yield pad consists of either a 3-inch 100% fiberglass braided tubing or, if the size of the yield pad is more than 3 inches, then a fabric weighing a minimum of 18 oz/yd is used to fabricate the outer shell. The inside of the yield pad is filled with 100% fiberglass material.

At the final measurement, Quality Assurance completes a curtain specification check sheet (Newtex QC 3C). On this sheet, the customer's required dimensions are noted, along with a tolerance level of +1%-1/2%. Measurements are made from left of curtain (label side) to right every ten feet, or part thereof, for height. Width measurements are made from bottom of yield pad to top of curtain every ten feet, or part thereof. A diagonal measurement is recorded for internal check of curtain squareness.

All theatre curtains must have a label, whether it is a Zetex or ZetexPlus curtain. If it is a Zetex curtain, then a regular Zetex label is sewn in the bottom left corner of the curtain. If it is a ZetexPlus curtain, then the California State Fire Marshall's Approval label is attached in the same manner. This CSFM label is also numbered and documented in the Newtex Theatre Curtain Log Book.

If, for any reason, the label is damaged or the curtain fabricated is returned, the label will be destroyed and a record of this destroyed label will be documented in the Theatre Curtain Log Book.

All theatre curtains are enveloped with plastic to prevent any abrasion damage during shipping. The plastic covered curtain is placed into a cardboard box onto a skid.

SD:SM/dl

AMENDMENT 1

If there is any damage to the curtain either during shipment or, placement whereas a hole occurs, the following procedure is recommended to ensure fire safety demands are met:

A piece of fabric using the same style material as the curtain is used to cover and extend at least 2 inches all around the damaged area. The material is hand sewn using teflon coated fiberglass thread. Minimum stitches per inch must be at least 8. Testing of this type of repair has yielded results where the repair section is as strong as the original area.

AMENDMENT 2

If, during sewing of the center seam, not all of the fabric is folded and sewn (as shown in Diagram #2), the fabricator must then fold and hand sew that particular section. Again, teflon coated fiberglass thread must be used at a minimum of 8 stitches per inch.



OF THE PROTECTION BUT NONE OF THE HEALTH HAZARDS OF ASBESTOS

PRODUCT SPECIFICATION

STYLE 1210 ZETEXPLUS™

GENERAL DESCRIPTION: ZETEXPLUS 1200 fabric is made from highly texturized silica based yarns. The higher temperature capability is the result of a specialized manufacturing process. ZETEXPLUS fabrics are free of any asbestos, are softer than asbestos fabrics of the same weight and have almost five times their abrasion resistance.

APPLICATIONS: Typical applications include curtains, blankets, drop cloth for medium to heavy industrial applications, high temperature expansion joints, flue ducts, turbine insulation and gasketing.

Typical industries include thermal and nuclear power plants, refineries and petro-chemical industries, steel, aluminum, copper and other basic metal industries, turbine insulation, heat treating stress relieving, automotive and industrial maintenance.

PHYSICAL PROPERTIES:

Weight Oz./Square Yard:	40
Construction:	12 x 7
* Thickness:	0.080"
Weave:	Plain
Breaking Strength: (minimum)	Warp - 425 Fill - 425
* K Factor (Heat Conductivity for Style 1200 fabric):	0.3385
Service Temperature:	Continuous Temperature up to 1500°F (816°C) and higher short duration temperatures.

* For fabric before treatment

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Test Report # 93-1164-2-TR1
Figure 2



OF THE PROTECTION BUT NONE OF THE HEALTH HAZARDS OF ASBESTOS

PRODUCT SPECIFICATION

STYLE 1210 W/W ZP

GENERAL DESCRIPTION: ZETEXPLUS 1210 W/W fabric is made from highly texturized silica based yarn. Each yarn is reinforced with .0045" diameter 304 stainless steel wire. ZETEXPLUS is coated with a highly proprietary treatment. ZETEXPLUS is free of any asbestos.

APPLICATIONS: Typical applications include curtains, blankets, shields, high temperature expansion joints, and gasketing.

Recommended for extremely severe applications requiring molten metal splash resistance and resistance to elevated temperatures.

Typical industries include power generation and turbine insulation, steel, aluminum copper, and other basic metals groups, construction industry, chemical processing plants, petroleum refineries, heat treating and stress relieving, automotive, industrial maintenance, etc.

PHYSICAL PROPERTIES:

Weight Oz./Square Yard:	40
Construction:	10 x 8
Thickness:	0.070"
Service Temperature:	Continuous temperature to 1500°F (816°C) and higher short duration temperatures.
Breaking Strength: (minimum)	Warp - 650+ Fill - 850+

Chemical Resistance: Resists most acids, alkalies and solvents (with the exception of hydrofluoric acid and corrosive environments at elevated temperatures).

The coating used provides outstanding abrasion resistance, ability to cut, sew and handle the product, higher temperature capability and better molten metal splash resistance. It reduces airborne fiber emission and unraveling significantly.

ORDERING INFORMATION: Length of Roll: 50 Yards

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Figure 3