NASA CR-132416

NASA CONTRACTOR REPORT

Contract N.A.S. 1-11490

Development of Improved Asbestos Reinforced Phenolic Insulating Composites (Optimization of Physical Properties as a Function of Molding Technique and Post Cure Conditions)

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Prepared for Langley Research Center
National Aeronautics and Space Administration
Langley Field
Hampton, Virginia

FOREWORD

This report was prepared by the Johns-Manville Research and Development Center, Insulations Division, Denver, Colorado under NASA Contract N.A.S. 1-11490. The work was administrated under the direction of The Langley Research Center, Mr. Melvin H. Lucy as technical representative.

The report covers work accomplished from October 1972 through September 1973 at the Johns-Manville Research & Development Center, Denver. L. M. Hedges acted as project manager and edited the report.

Contributors to the program effort are listed.

Basic Program	L. M. Hedges
Molding Procedures	L. M. Hedges
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Basic Test Program	L. M. Hedges
Basic Testing Procedures	J. F. Palochko
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Acknowledgement of Technical Support and Guidance of the following individuals is given:

J. H. Kietzman	- Fiber Division	- R&D Center
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L. W. Jenssen, Jr.	- Computer Dept.	- R&D Center
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SECTION I

INTRODUCTION

The work reported herein is primarily a data compilation with a minimum of analysis and discussion. These data will be analyzed in detail by N.A.S.A. Langley Research Center for a future report.

The objective of the work is to establish firm engineering values (physical properties) from an independent industrial source, demonstrating the effect of molding technique and post-bake time and temperature on high temperature insulating phenolic composites reinforced with glass or asbestos fibers.

Certain portions of the original "Contract Statement of Work" were deleted from the program by Contract Modification. These included (1) determination of effect on physical properties of adding "coupling agents" to the fibers, and (2) determination of the effect on physical properties of the substitution of certain "stapled fibers and fillers" to the phenolic-asbestos composites.

ABSTRACT

Detailed data is presented on phenolic-glass and phenolic-asbestos compounds which compares the effect of compression molding without degas to the effects of four variations of compression molding. These variations were designed to improve elimination of entrapped volatiles and the volatile products of the condensate reaction associated with the cure of phenolic resins. The utilization of conventional methods of degas plus degas by vacuum and directional heat flow methods are involved.

Detailed data are also presented on these same compounds, comparing the effect of changes in post-bake time, and post-bake temperature for the five molding techniques.

REFERENCES

1. Price, Howard L. and Lucy, Melvin H.; Effect of Volatile Removal During Molding on the Properties of Two Phenolic-Fiber Composites. Presented at 29th Annual Technical Conference, PPCI. ASPI, Washington D.C. February 1974

2. Ward, James C.; Low Cost Plastic Sounding Rocket Motors. Presented at A.I.A.A. 2nd Sounding Rocket Vehicle Technology Conference, Williamsburg, Virginia, December 1970

3. Hedges, Lee M. and Palochko, Joseph F.; Johns-Manville Research and Development Center Notebook No. 4350 (Press Log, Post Cure Log, Instron Test Charts)

SECTION 2

MOLDING EQUIPMENT & PROCEDURES

2.1 Molding Equipment

2.1.1 The Mold

The mold for the program in which all test panels were fabricated was furnished by Langley Research Center. Figure 1, page 3A, is a schematic or illustrative sketch of the assembled mold as mounted in the press.

The mold cavity is cut through the cavity plate and the force plug moves into the cavity from the bottom up.

The charge is inserted into the cavity from the top with the force plug in the retracted position as in Figure 1. After the charge is inserted in the cavity, the cavity insert plate or cover plate is placed with its top surface flush with the top surface of the cavity plate. It stays in place by virtue of its tapered edges which mate with a matching taper at the top of the cavity.

The cover plate contacts the mold cavity at its four rounded corners only. The sides and ends of the cover plate are machined to clear the matching taper of the cavity plate by approximately 2 to 4 mils which provides gas release slots around its periphery.

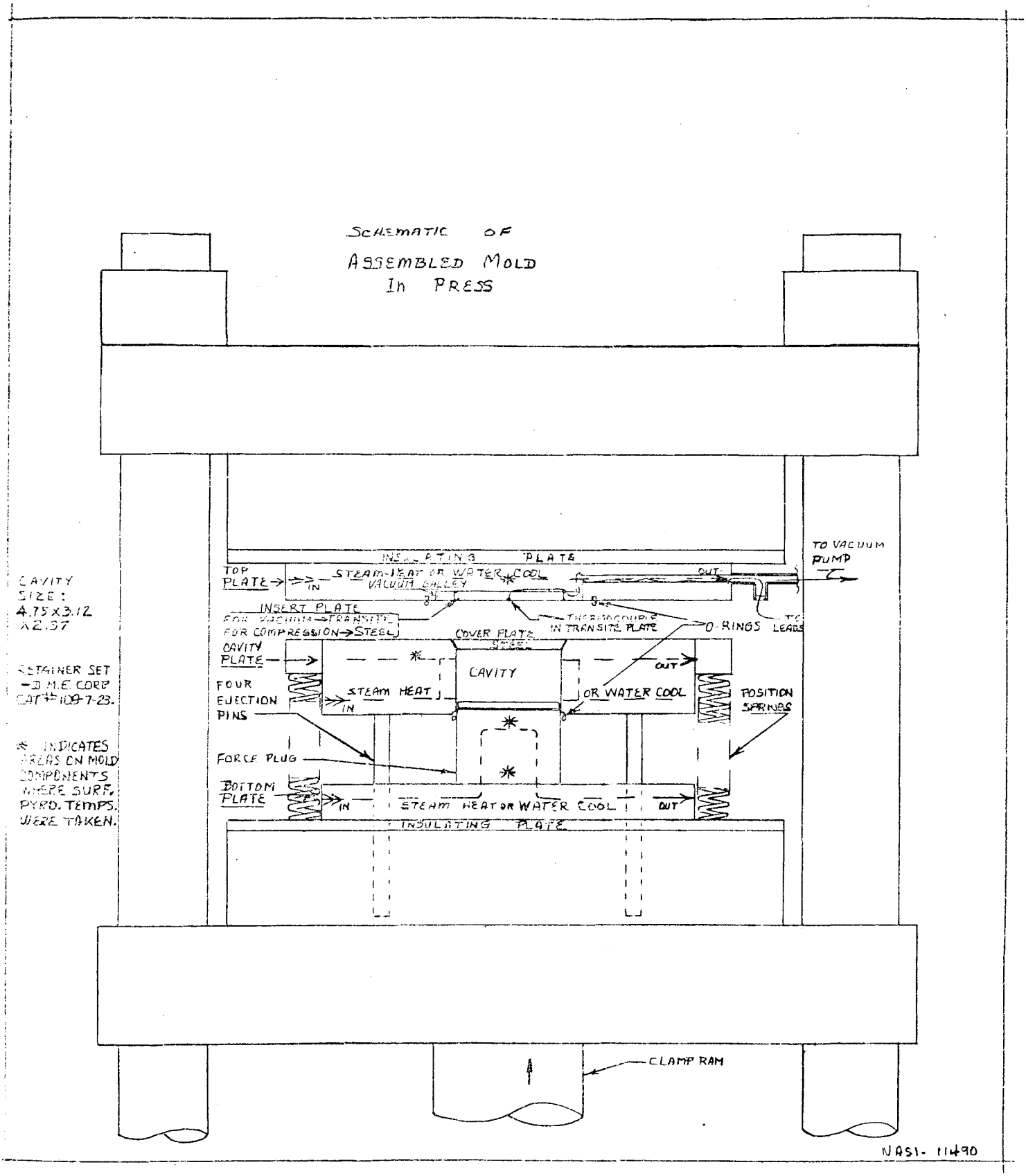
These gas release slots match with wider slots around the TRANSITE (or steel) filler (spacer) in the top plate, which are connected to vacuum.

Thus a vacuum can be applied to the charge by virtue of the seal affected by closing the mold on the 2-"0" Rings, one between the top plate and cavity plate, and one on the force plug.

The cavity insert plate (cover plate) is always kept in the same temperature range as the cavity piece. This temperature range varies with molding method.

Temperature at the top of the charge is monitored by means of the thermocouple in the TRANSITE filler plate which just contacts the cover plate. This temperature is actually monitored for directional heat molding only. All other temperatures are taken via surface pyrometer. The mold is galleyed for rapid heat-up.

Fig. 1.



The top plate with its TRANSITE filler plate, Thermocouple connections, "O" Ring and slot, and vacuum pipe is shown separately in Figure 1-1, Page 4A. The hot junction of the Thermocouple is inserted through the TRANSITE filler plate from the back or top. In this position, the temperature of the top of the charge (the cover plate) can be obtained for directional heat flow molding; or combined directional heating with vacuum.

Another top plate containing a steel filler plate, without thermocouple, was used for straight compression and straight vacuum molding.

Removal of the molded specimen is achieved by pushing it upward after the top plate is lifted from the cavity plate. An aluminum spacer plate was inserted atop the force plug under the charge so the specimen could be pushed free of the cavity for easy removal.

Figures 2 and 3, Pages 4B and 4C provide engineering detail of the mold retainer set.

2.1.2 The Press

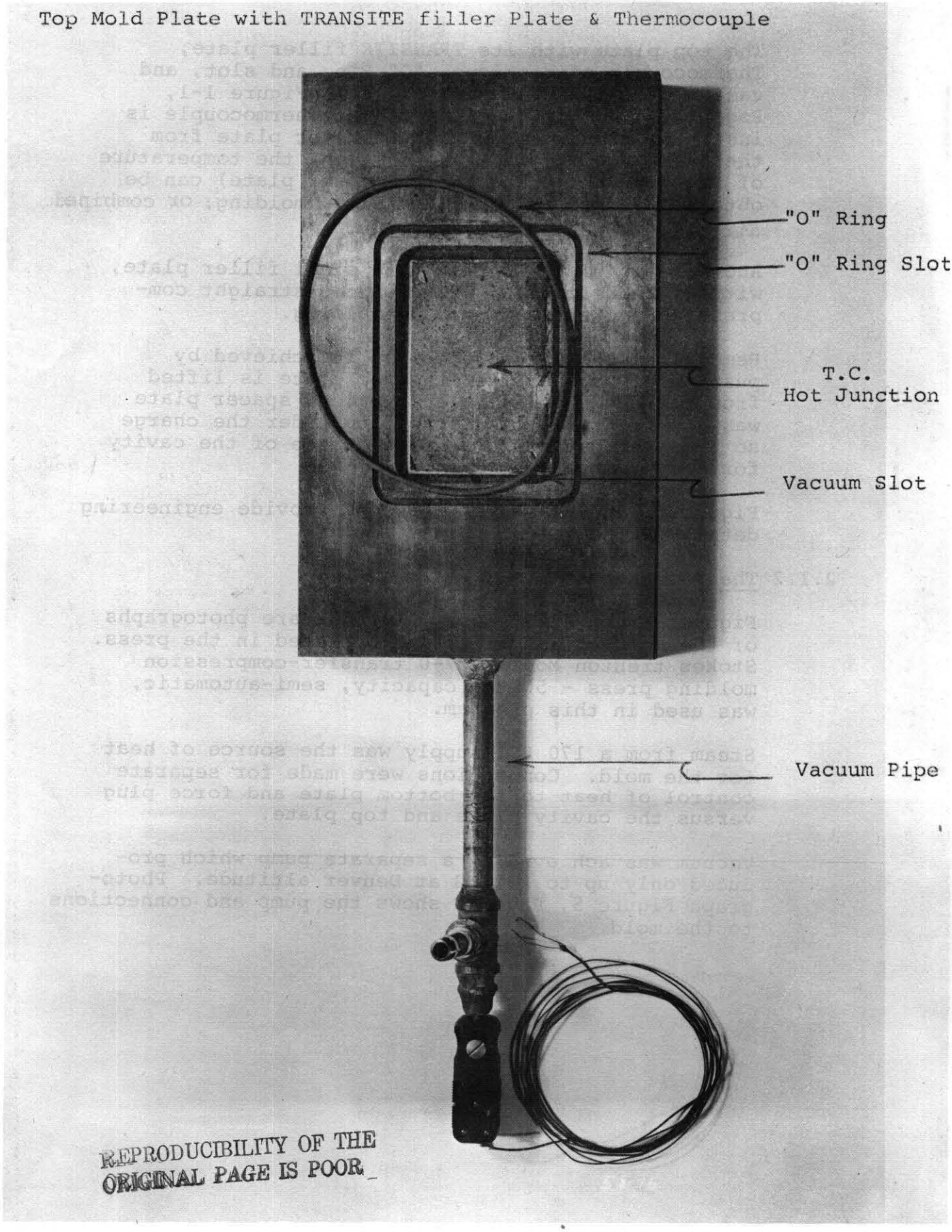
Figures 4 and 4-1, Pages 4D and 4E are photographs of the mold as installed and operated in the press. Stokes trenton Model 727-0 transfer-compression molding press - 50 ton capacity, semi-automatic, was used in this program.

Steam from a 170 PSI supply was the source of heat for the mold. Connections were made for separate control of heat to the bottom plate and force plug versus the cavity plate and top plate.

Vacuum was achieved by a separate pump which produced only up to 22" HG at Denver altitude. Photograph Figure 5, Page 4F shows the pump and connections to the mold.

Fig. 1-1

Top Mold Plate with TRANSITE filler Plate & Thermocouple



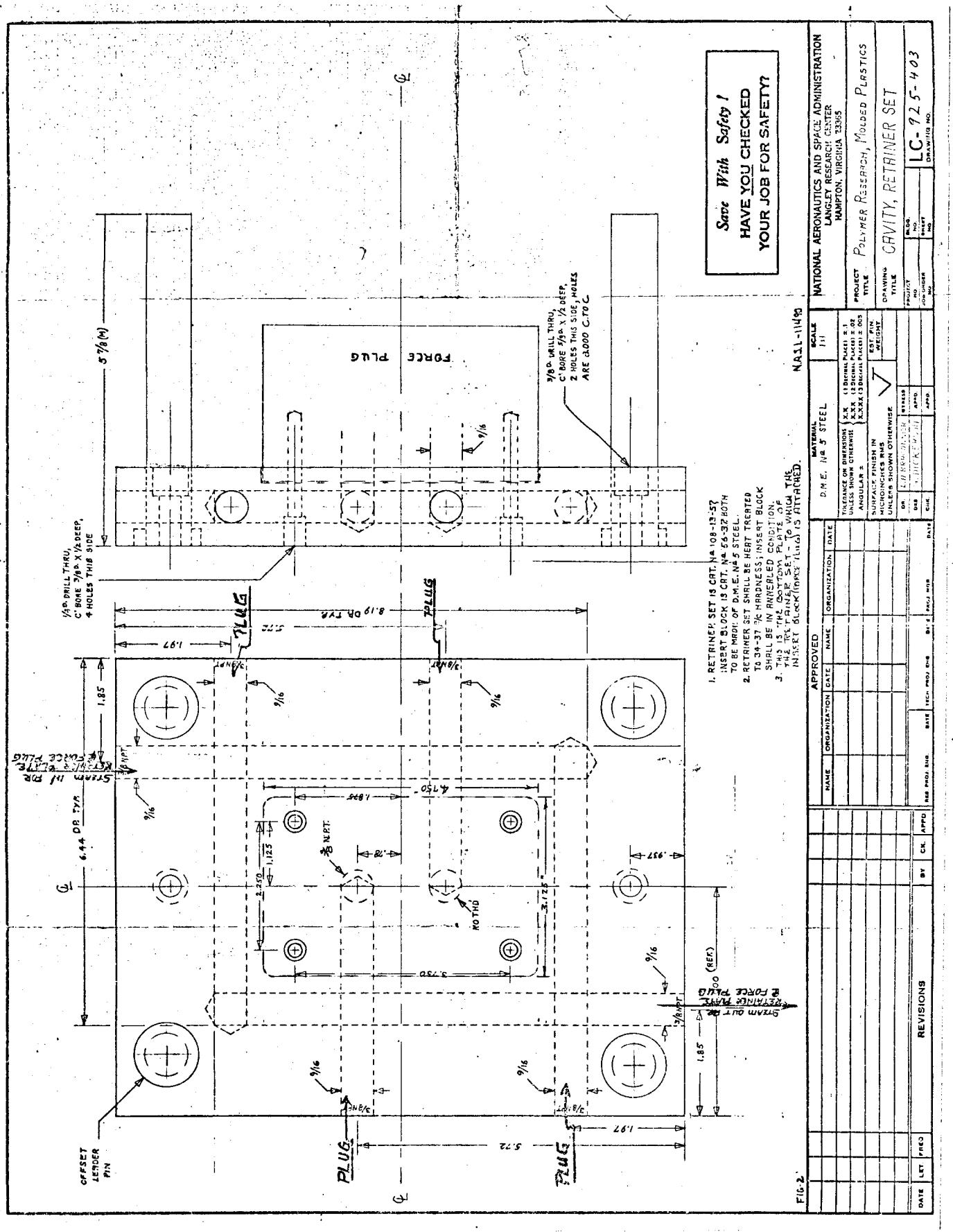
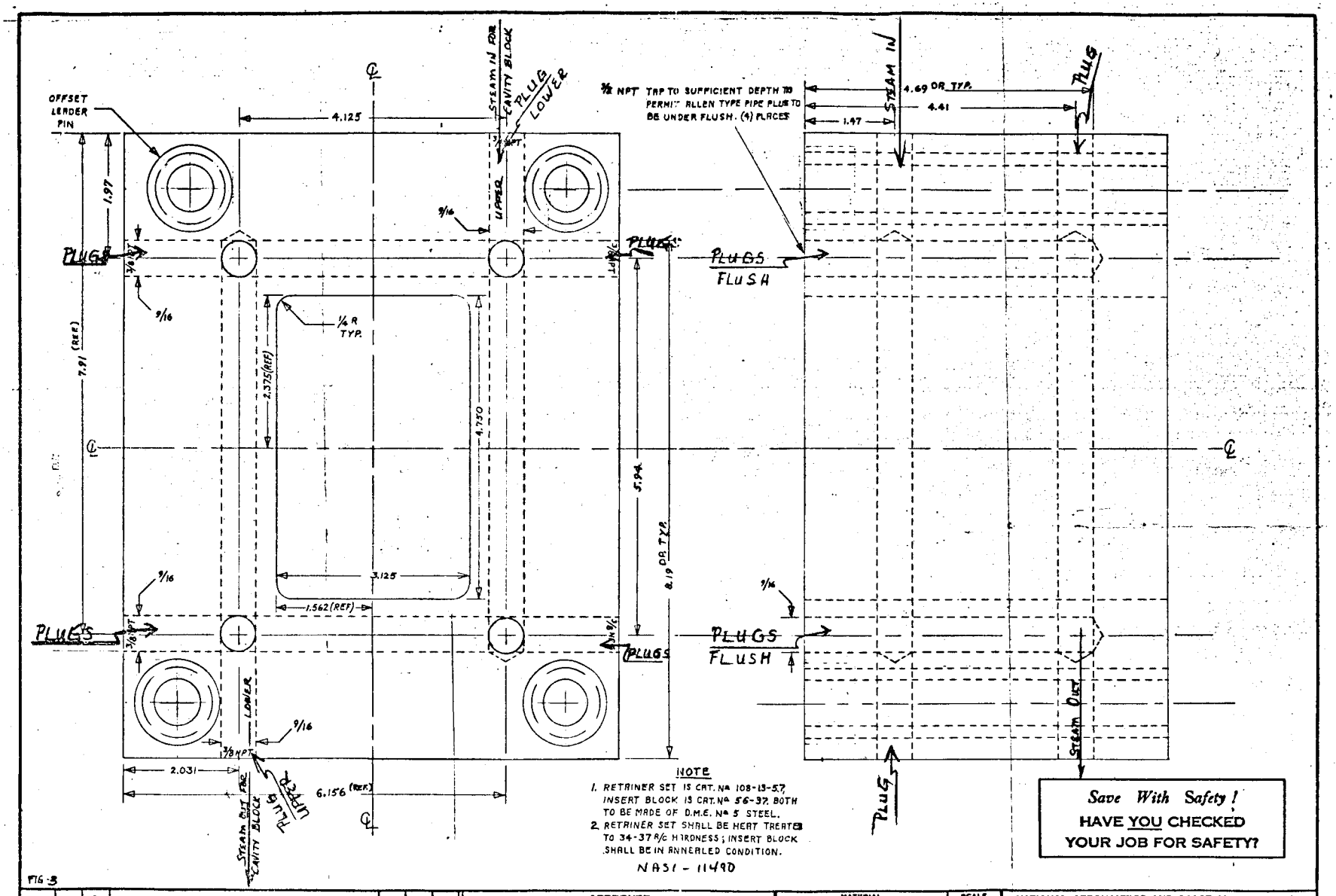


Fig. 2

Fig. 3



NOTE

1. RETAINER SET IS CAT. NO. 108-13-57, INSERT BLOCK IS CAT. NO. 56-37, BOTH TO BE MADE OF D.M.E. NO. 5 STEEL.
2. RETAINER SET SHALL BE HEAT TREATED TO 34-37 R/C HARDNESS; INSERT BLOCK SHALL BE IN ANNEALED CONDITION.

NAS1 - 1149D

Save With Safety!
HAVE YOU CHECKED YOUR JOB FOR SAFETY?

FIG-3

DATE	LET	FREQ	REVISIONS	BY	CK	APPD

APPROVED

NAME	ORGANIZATION	DATE	NAME	ORGANIZATION	DATE

MATERIAL: D.M.E. NO. 5 STEEL — SCALE: 1:1

TOLERANCE ON DIMENSIONS UNLESS SHOWN OTHERWISE: X.X (1 Decimal Place) ±.1; X.XX (2 Decimal Places) ±.02; X.XXX (3 Decimal Places) ±.005; ANGULAR ±

SURFACE FINISH IN MICROINCHES RMS UNLESS SHOWN OTHERWISE

EST. FIN. WEIGHT

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
HAMPTON, VIRGINIA 23365

PROJECT TITLE: POLYMER RESEARCH, MOLDED PLASTICS

DRAWING TITLE: CAVITY, RETAINER SET

DRAWING NO. LC-925-404

Fig. 4

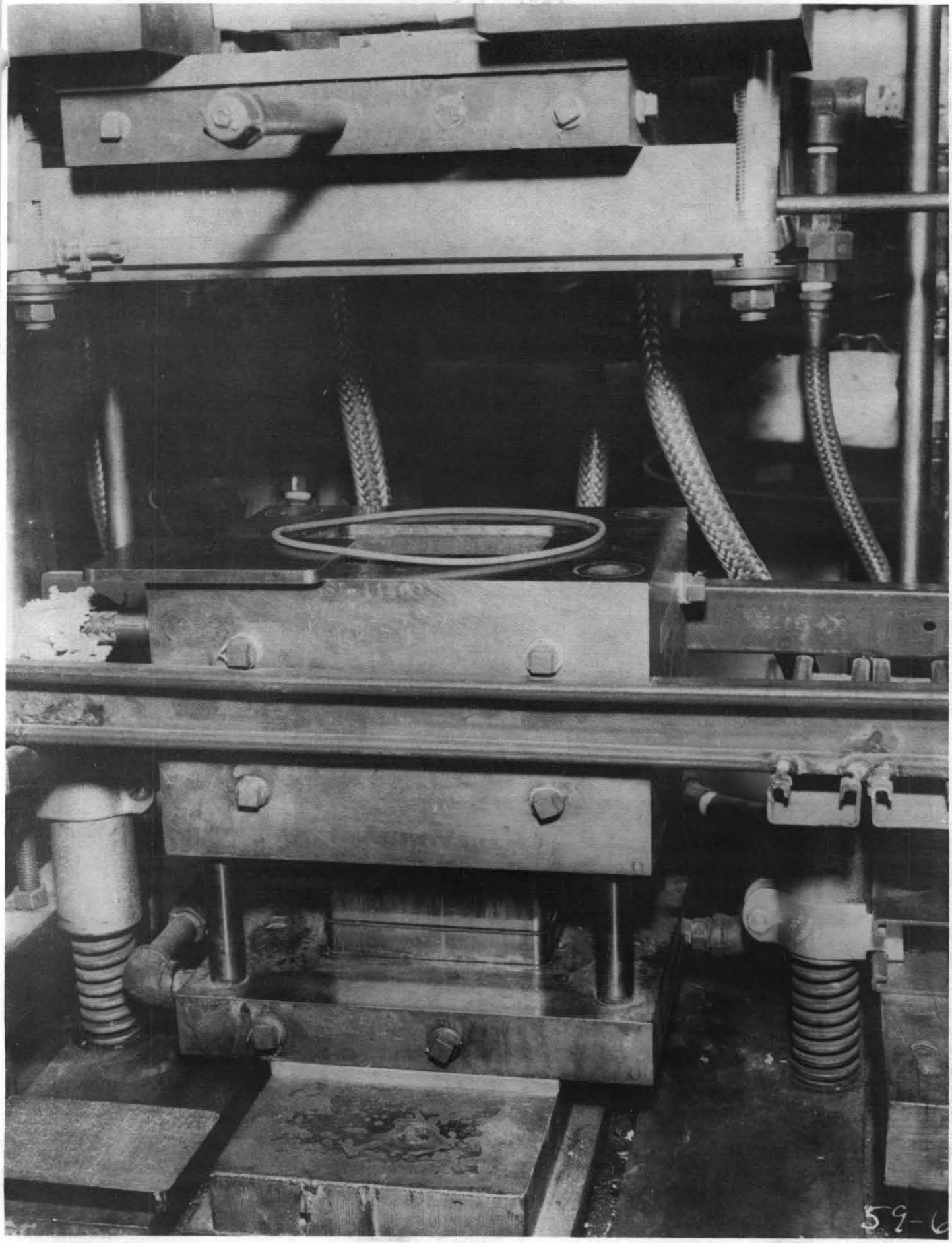


Fig. 4-1

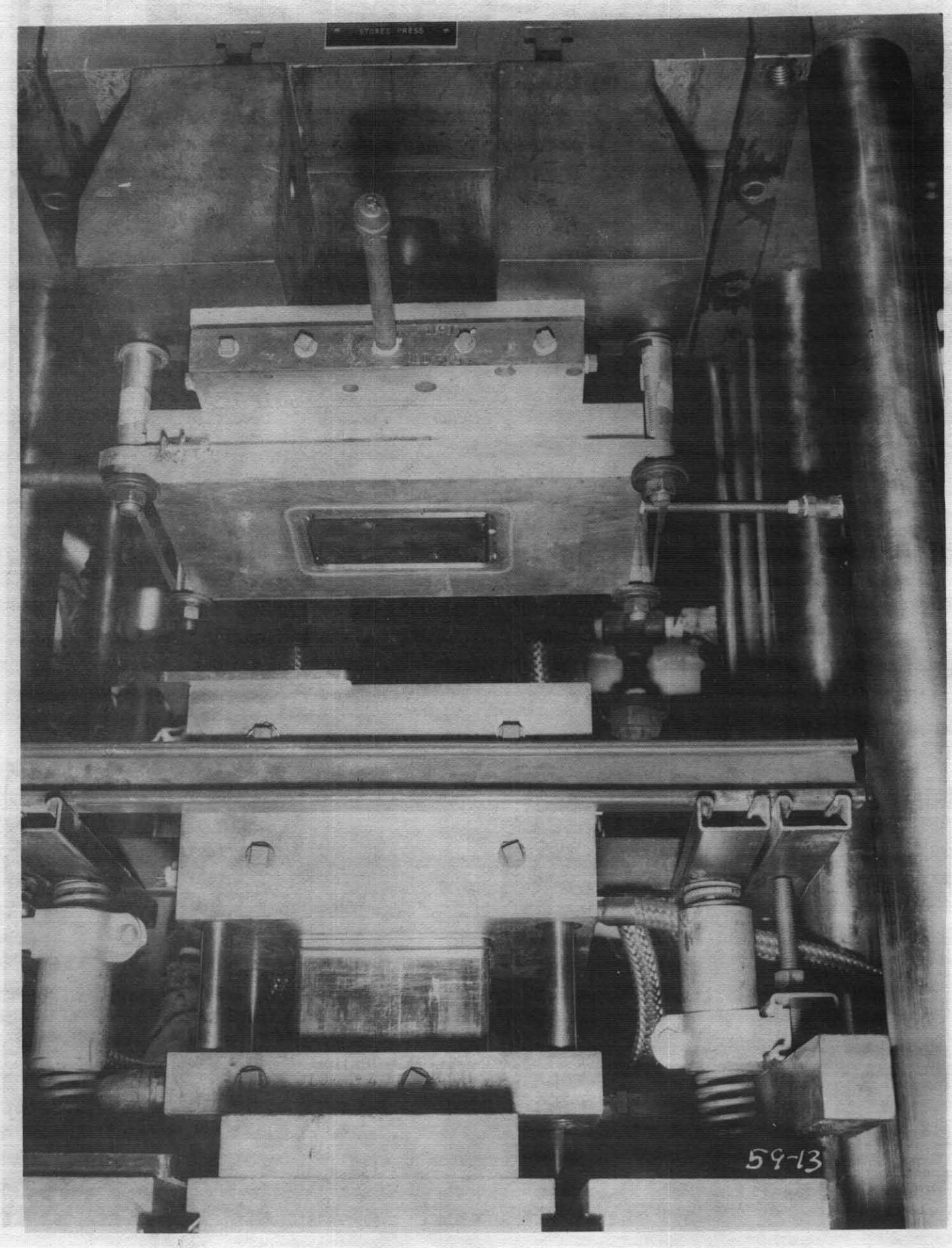
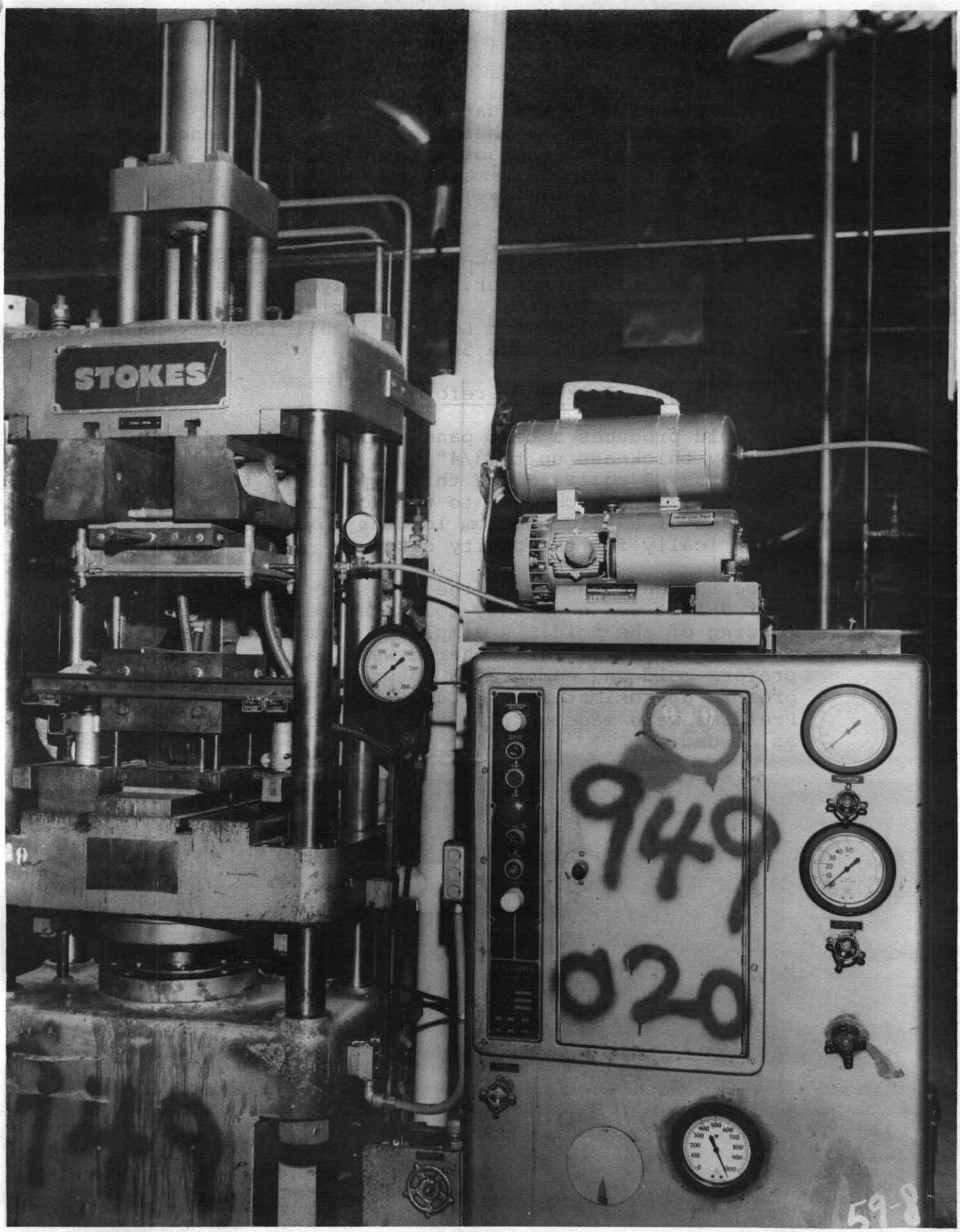


Fig. 5



2.2 Molding Procedures

2.2.1 The Materials

Two compounds were evaluated:

(1) An ablative glass-phenolic; A B-staged phenolic impregnated glass fabric, chopped into 1/2" x 1/2" squares. This material is coded by the letter "G" (for glass) in all identifying data. (Figure 6, Page 5A)

(2) An ablative asbestos-phenolic; A modified single stage phenolic powder, intimately mixed with long fiber asbestos. This material is coded by the number "16" (for Lot 16) in all identifying data (Figure 7, Page 5B)

2.2.2 Mold Charge: Bulk and Preform

The mold produces a test panel 3-1/8" wide x 4-3/4" long by thickness up to 3/4" with material of low bulk - say 5 to 1. Since this applies to the glass phenolic, it was charged to the mold in bulk form by means of a slide bottom loading box, designed specifically for the cavity size.

Since the bulk factor of the asbestos-phenolic is 8 or 9-1 it was necessary to use a preform for rapid loading of the mold. A simple preform mold 3" x 4-1/2" was used. The 270 gram charge was loaded into the preform mold and compressed to produce a low density preform approximately 3" x 4-1/2" x 1-1/2" thickness. Preforms were made up from the same lot of compound as needed.

Fig. 6

Glass-Phenolic Compound

Furnished by N.A.S.A. Langley Research Center

270 Grams Bulk

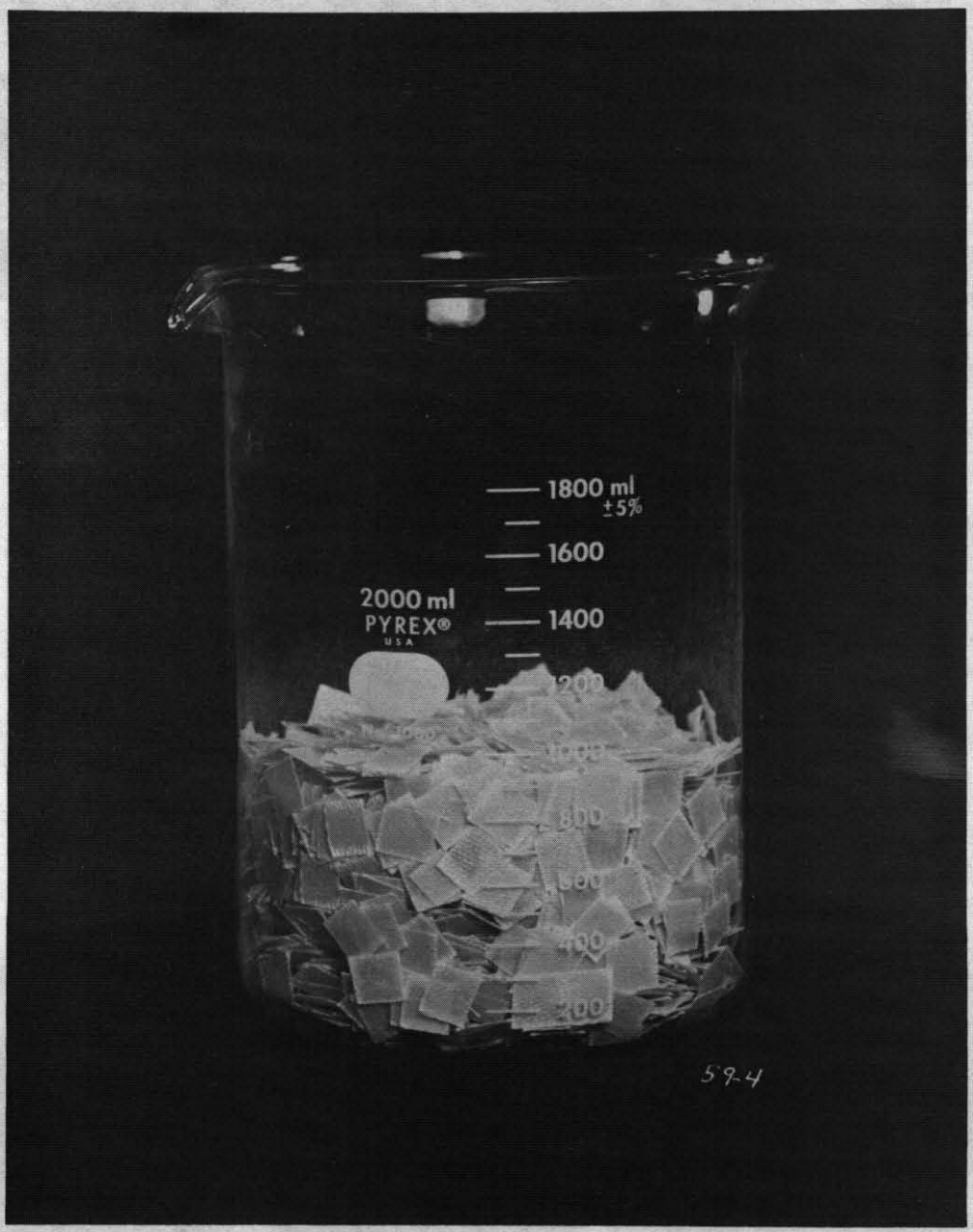
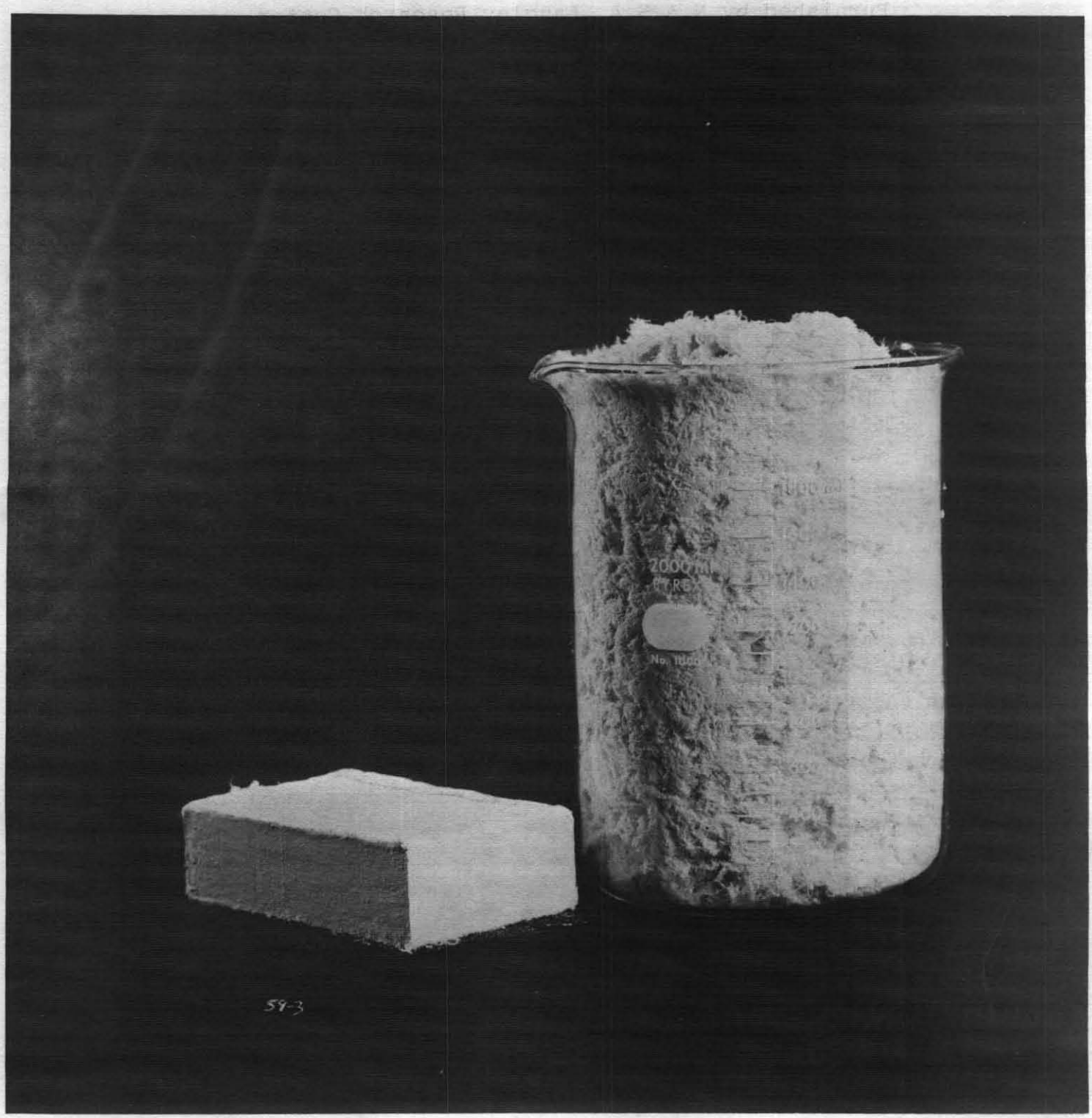


Fig. 7

Asbestos-Phenolic Compound - Johns-Manville No. 705

270 Grams - Bulk and in Low Density Preform



Section 2
(Con't)

2.2 Molding Procedures - Con't

2.2.3 Test Specimens

It was decided to make all test panels approximately 5/8" thickness allowing for surface grinding to 1/2" thickness and subsequent cutting into bars (Photograph, Figure 8, Page 6A). The test panels were surface ground before post bake, were cut into bars after post bake tests.

The test panels were weighed and measured for shrinkage and weight loss. After post-bake they were re-weighed and re-measured from which shrinkage, weight loss, and specific gravity were calculated. Hardness tests were also made. The panel was then cut into 8 test bars finished to 1/2" x 1/4" x 4-3/4".

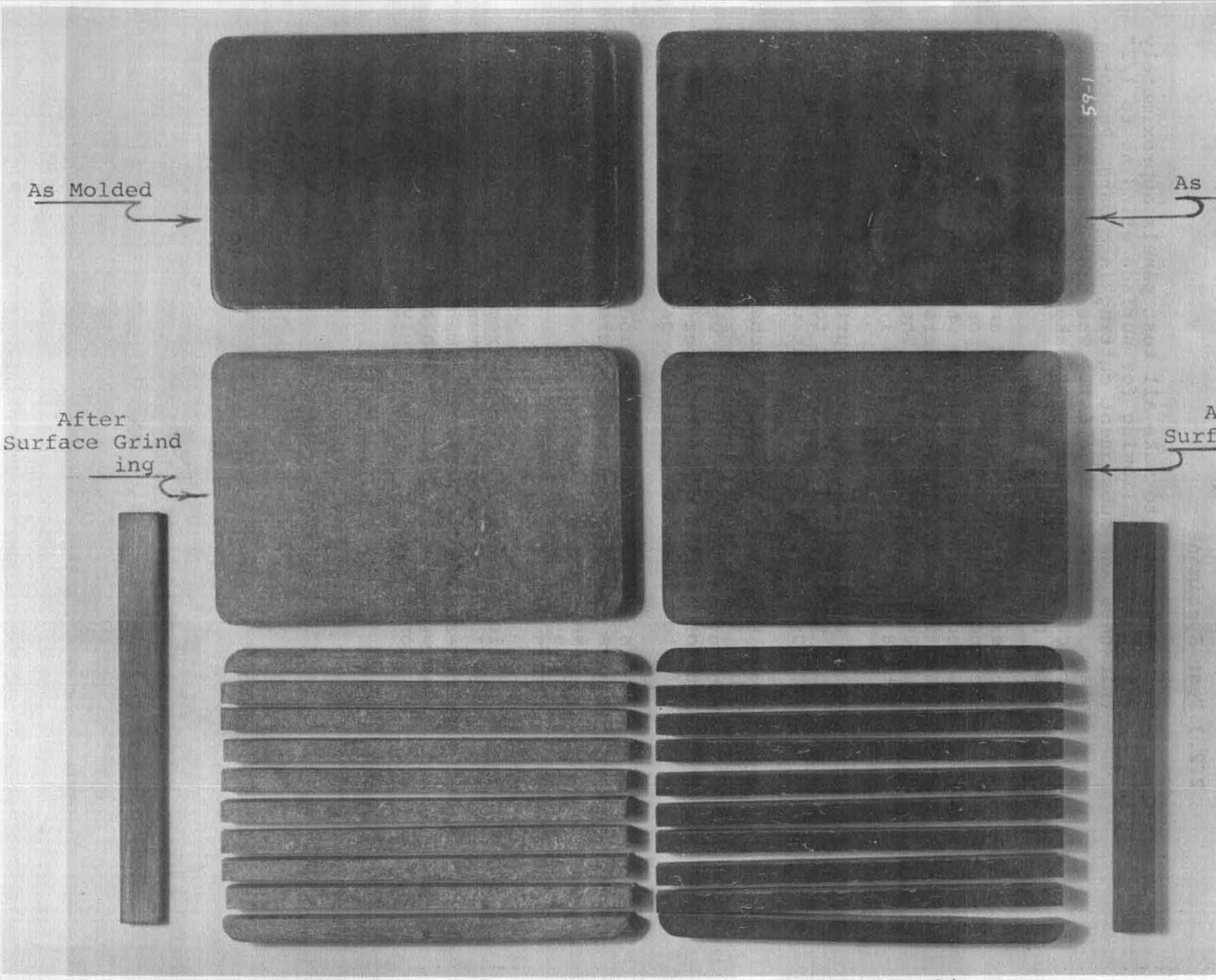
It is notable that primary surfaces of all test specimens were ground and sanded to eliminate all mold surface effects from the test values obtained.

These bars were tested for tensile and tensile modulus, flexural and flexural modulus, impact and elongation. Two test panels were allocated for each lot for a total of 16 bars per lot. Two bars were selected from each panel for each property tested:

4 bars for tensile, tensile modulus and elongation
4 bars for flexural and flexural modulus, deflection at break
4 bars for impact
4 bars as extras

Tensile specimens were cut from the 1/2" x 1/4" x 4-3/4" bar using a special "tensilcut" template for a non-standard tensile specimen. The standard tensile specimen is 9" long with a necked down flat section length of approximately 2.25".

Fig. 8



Asbestos/Phenolic Glass/Phenolic
Test Panels and Bars: Before and After Surface Grinding

The modified tensile specimen was limited to 4.75" in total length, the necked down flat section area being 1-1/2" in length (see Photograph, Figure 9 Page 7A, Tensile Cut Templates.)

2.2.4 Molding Methods

Conventional compression molding plus 4 modifications of it (designed for more positive removal of gaseous products of the reaction) were used in making the test specimens. Mold temperatures and pressures were 300 F/3000 psi - asbestos phenolic; 300 F/2000 psi - glass phenolic.

Modification No. 1 of the contract confined the investigation to (1) a determination of the differences in physical properties developed by the different molding procedures for the two compounds, and (2) the effect on physical properties of variations in post-bake temperatures and times on each of the compounds. (Refer pages 15)

(1) Conventional Compression - 15 minute cure. (Refer Para. 2.2.4.1, Page 8). All specimens identified with a (C).

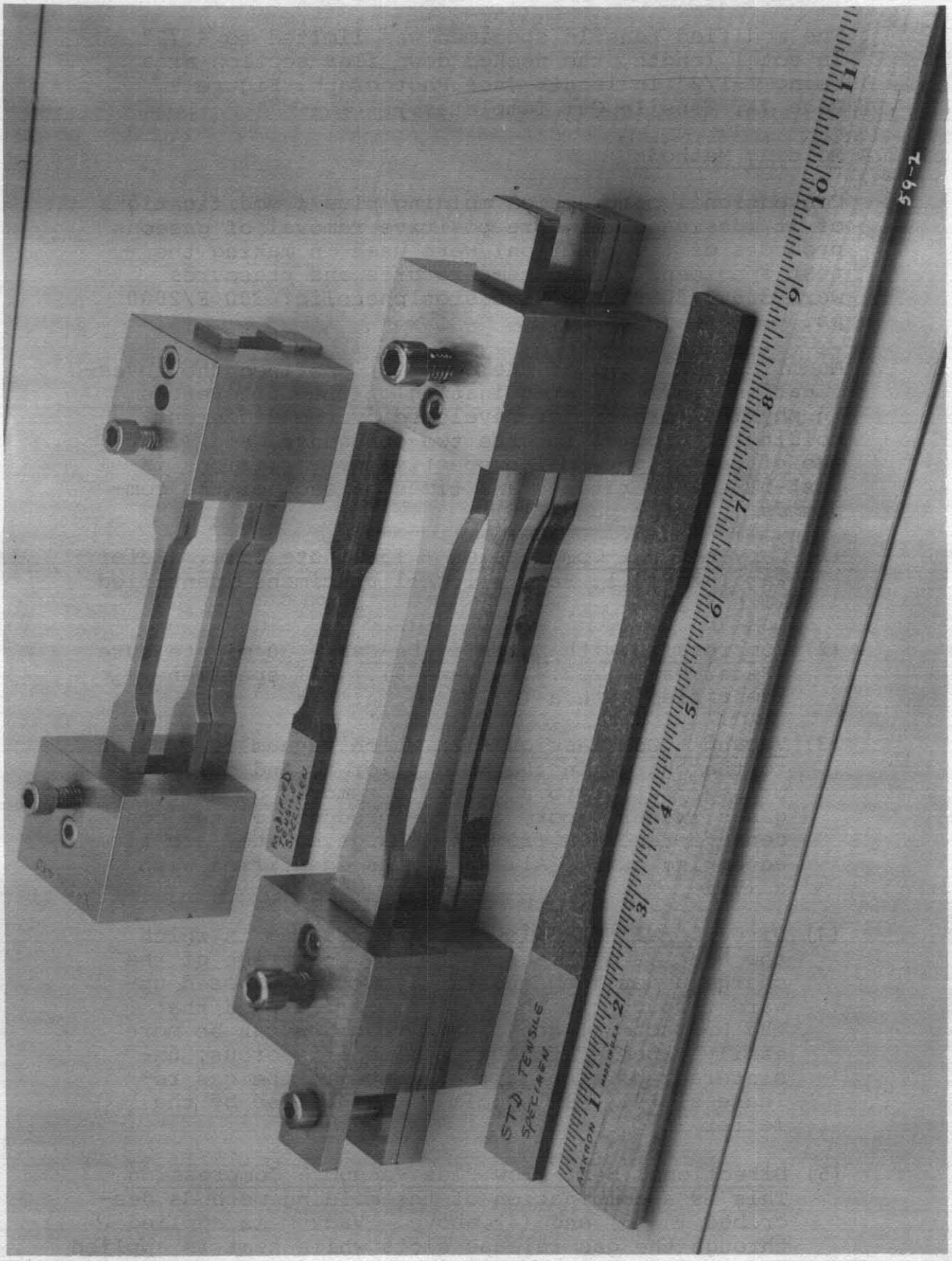
(2) Compression with Extended De-Gas - 30 minute cure. (Refer Para. 2.2.4.1, Page 9). All specimens identified with a (C-1).

(3) Vacuum - Compression - in which vacuum is applied to the charge in the mold prior to and during pressurization to accelerate removal of existing gases, water vapor, and the products of the condensate reaction from the charge as they are formed during cure. All specimens identified with a (V).

(4) Directional Heat Flow - Compression - in which the heat is applied to the lower surface of the charge under load and is allowed to proceed upward through the charge. It is reasoned that the products of condensate reaction can be more easily expelled through the upper, porous, unsintered, portion of the charge to the gas release slots. All specimens identified by the letter (D).

(5) Directional Heat Flow Plus Vacuum - Compression This is a combination of the molding methods described in (3) and (4) above. Vacuum is applied through the gas release slots while heat is applied only to the bottom surface of the pressurized charge. All specimens identified by the letters (DV).

Fig. 9



2.2.4.1 Compression Molding Procedure - Conventional and Extended De-Gas

(1) Conventional Compression

Straight compression molding is accomplished in a hot (300°F) mold. The top plate insert or filler is steel in this case, to facilitate heat transfer to the cover plate. The pre-heated mold is loaded with a pre-weighed (270 grams) preform of asbestos-phenolic, or 270 grams of bulk glass phenolic from the slide bottom loading box.

At time of molding, the mold temperatures are maintained between 290 and 310°F. Surface pyrometer temperatures are taken on (1) the force plug, (2) the cavity piece, and (3) the top plate. Temperature of the cover plate is taken via thermocouple but only for directional heat flow methods of cure. See Figure 1, page 3A for location of areas on mold components where surface temperatures were taken. After charging, the mold is closed quickly to prevent precure. The press is programed to open automatically after 15 minutes of cure. De-gassing by "bumping" or opening the mold after initial closing was not done because test panels made to establish the procedure had indicated sound moldings could be made by this molding schedule and procedure. However, it was found after cutting the post cured panels into bars that some delamination cracking due to trapped gases had developed in the compression molded panels, which would have been eliminated by a single de-gassing procedure.

Examination of the as-molded and post-baked test panels had given no indication of internal cracking or gas delamination.

(2) Compression with Extended De-Gas

The discovery of cracks in the compression molded panels was unexpected for reasons stated above. All the test panels had been molded, post-baked, and preliminary tests had been made. Discovery of the cracks occurred as the panels were cut into bars. It was decided at this point to mold another set of test panels (method C-1) using extended de-gassing procedures by opening the mold (until set occurred) for gas release. This was done for the asbestos-phenolic and provided a direct comparison with the other molding procedures.

C-1 Panels were also made from the glass phenolic but a different lot of compound was used because the supply of GFM compound Lot 2 had been exhausted and no more was available.

Since a sufficient quantity of Lot 1 material was on hand, the re-run was made with Lot 1 material. It should be noted that the government had made every effort to obtain Lot 1 and Lot 2 materials with closely matching properties. Lot 1 material had been on hand for approximately 9 months, refrigerated. Therefore, its value as a direct comparison may be questioned. It is of academic interest, however, so the data is given. The re-run compression molded test panels are identified by a "C-1" prefix in the test data and on the graphs and charts.

The "C-1" panels were compression molded at the same pressures as the "C" panels but time in the mold was increased from 15 to 30 minutes and the mold was opened 3 to 5 times during the resin flow period for de-gas.

The molded panel, after removal from the mold, is allowed to cool in air and is then ready for surface grinding and sanding (both faces) to 1/2" thickness. After surface grinding, the test panel is weighed, dimensioned and tested for hardness prior to post-bake.

A summary of the molding procedure is as follows:

1. Mold temperature - 290-310°F (steam pressure 85-90 psi).

2. The compound (270 grams) is charged quickly to the hot mold.

3. The cavity insert plate is placed over the charge and the mold is closed quickly.

4. Molding pressure is 2000 psi for glass-phenolic, 3000 psi for asbestos-phenolic.

5. Cure time - set press to open automatically.

Copies of the pertinent press log sheets, Table 1 and Table 2, Table 1A and 2A, Pages 9A-B-C-D follow.

ASBESTOS PHENOLIC
COMPRESSION MOLDING
TYPICAL PRESS LOG SHEET

TABLE II

11A

Press Log ~ "THERMOMIX" - "MICROBESTOS" Sheet (A) — Press Log "THERMOMIX" - "MICROBESTOS" Sheet (B)

PART		PREFORM			PREHEAT			IDENTIFICATION			PRESS DATA					Degas		REMARKS
Compound or Laminate	Shape or Size	Type	Shape and Size	Wt. or No. of Plies	D.C. Amps Start	D.C. Amps End	Time Seconds	Date & Time in	Sample No.		Cure Load, Tons	Cure Pressure P.S.I.	Mold Temp. at Closing	Mold Temp. at Opening	STEAM PRES:	Tons	Cycles	
TM-705 -16 (LOT 16)	4.75"x3.12" x 5/8"	—	4.5"x3.0" x 1 3/8"	270 gms.	—	—	—	3/14/73 10:20	C-16-10 (C=COMPRESSION 16=LOT 16 10=PANEL No. 10)	C-16-10	22 T.	5000	311 - TOP 300 - CAV 304 - RAM	311 309 309	TOP - BOTTOM -	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 10:40	C-16-11	C-16-11	"	"	311 TOP 301 CAV 303 RAM	311 300 305	TOP BOT.	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 10:58	C-16-12	12	"	"	310 TOP 300 CAV 300 RAM	312 302 300	TOP BOT.	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 11:15	C-16-13	13	"	"	310 TOP 301 CAV 300 RAM	311 302 302	TOP BOT	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 11:35	C-16-14	14	"	"	311 TOP 301 CAV 302 RAM	311 301 302	TOP BOT.	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 12:55	C-16-15	"	"	"	310 TOP 301 CAV 301 RAM	311 302 302	TOP BOT.	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 1:15	C-16-16	16	"	"	310 TOP 300 CAV 301 RAM	312 303 302	TOP BOT	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 1:33	C-16-17	17	"	"	310 TOP 300 CAV 304 RAM	311 300 301	TOP BOT	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 1:50	C-16-18	18	"	"	310 TOP 301 CAV 300 RAM	310 301 300	TOP BOT.	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 2:09	C-16-19	[illegible]	"	"	310 TOP 300 CAV 300 RAM	311 302 302	TOP BOT	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 2:26	C-16-20		"	"	310 TOP 300 CAV 300 RAM	311 302 301	TOP BOT.	85 PSI 90 PSI		PANEL O.K.
"	"	—	"	"	—	—	—	3/14/73 3:12	C-16-21	C-16-21	"	"	310 TOP 302 CAV 301 RAM	311 302 302	TOP BOT	85 PSI 90 PSI		PANEL O.K.

ASBESTOS-PHENOLIC
COMPRESSION MOLDING - 30 MIN CURE - 4 DEGAS CYCLES
TYPICAL PRESS LOG SHEET

TABLE IA

NAS1-11490 — STRAIGHT COMPRESSION MOLDING THERMOMIX 705-A

Press Log "THERMOMIX" - "MICROSTATOS" Sheet (A) 30 Min Cure with Degassing

Press Log "THERMOMIX" - "MICROSTATOS" Sheet (B)

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Shape and Size	PREFORM: Wt. or No. of Plies	PREHEAT: D.C. Amps Start	PREHEAT: D.C. Amps End	PREHEAT: Time Seconds	IDENTIFICATION: Date & Time In	IDENTIFICATION: Sample No.		PRESS DATA: Cure Load, Tons	PRESS DATA: Cure Pressure P.S.I.	PRESS DATA: Mold Temp. at Closing	PRESS DATA: Mold Temp. at Opening		Degas: Tons	Degas: Cycles	REMARKS
TM-705 -16	4.75 x 3.12 x 5/8	—	4.5 x 3.0 x 1 3/8	260 Gms	None			7/19/73 in@ 9:45 out@ [illegible]	C-16-42B	C-16-42B	22 Tons 30 minute Cure	3000 PSI	Top Platen — / Cavity — / Ram —	[illegible] / 311 / 312	10:12 311 / 309 / 316 (30 PSI)	Steam pres dropped on top + cavity - increased to 90 PSI at 10:10		DEGAS AT 10:06 1 min / DEGAS AT 10:07 2 min / DEGAS AT 10:08 3 min / 30 min Cure - 3 Degases
"	"		"	"	"	"		7/31/73 in@ 10:4? out@ 11:12	C-16-42B	42B	22 Tons 30 min Cure	3000 PSI	Top Platen - 312 / Cavity - 302 / Ram - 315	11:01 312 / 309 / 316	11:12 318 / 310 / 313	4 Degases at 1 min intervals 30 min Cure		DEGAS AT 10:48:45 ← Top platen up / 10:49:45 ← " " up / 10:50:45 ← " " up / 10:51:45 ← Top platen not
"	"		"	"	None			7/31/73 in@ [illegible] out@ [illegible]	C-16-42C	42C	22 Tons 30 min Cure	3000 PSI	Top Platen - 312 / Cavity - 301 / Ram - 314			5 Degases at 1 min intervals 30 min Cure		DEGAS @ 11:16:09 ← Top platen up / 11:17:05 ← " " / 11:19:05 ← Top platen [illegible] / 11:19:05 ← " " [illegible] / 11:20:05 ← " "
STRAIGHT COMPRESSION MOLDING					30 min Cure 4 degas Cycles			@ 1 min interval			THE MOLD IS OPENED AT 1-MINUTE INTERVALS AS LONG AS THE CHARGE CONTINUES TO FLOW AND LIFT THE CAVITY INSERT (COVER) PLATE. AS SOON AS THE COVER PLATE STAYS DOWN, INDICATING "GEL" IS BEGINNING, THE MOLD WAS CLOSED TO THE END OF THE CURE.							
TM-705 -16	4.75 x 3.12 x 5/8		4.5 x 3.0 x 1 3/8	260 Gms	None			7/31/73 in@ 9:08 out@ 9:56	C-16-45	16-45	22 Tons	3000 PSI	Top Platen - 307 / Cavity - 302 / Ram - 312	9:32 310 / 302 / 311	9:46 316 / 307 / 316	9:03 Steam 90 PSI for heat		DEGAS AT - 9:26 ← cover plate up / AT - 9:27 ← " / AT - 9:28 ← " / AT - 9:29 ← cover plate stays down
"	"	/	"	"	None			7/31/73 in@ 10:00 out@ 10:30	C-16-46	46	22 Tons	3000 PSI	Top Platen 311 / Cavity 309 / Ram 313 (10:02)	X	10:2? 317 / 306 / 317		Steam Pressure for heat 90 PSI	Degas AT - 12:01 ← cover plate up / AT - 10:02 ← " / AT - 10:03 ← " / AT - 10:04 ← cover plate stays down
"	"		"	"	None			7/31/73 in@ 10:35 out@ 11:25	C-16-47	47	22 Tons	3000 PSI	Top Platen 312 / Cavity 302 / Ram 317 (10:37)	—	11:40 313 / 305 / 317		Steam Pres (heat) 90 PSI	DEGAS AT - 10:36 / AT - 10:37 / AT - 10:38 / AT - 10:39
"	"		"	"	None			7/31/73 in@ 11:02 out@ 11:40	C-16-48	C-16-48	22 Tons	3000 PSI	Top Plate 308 / Cavity 298 / Ram 312 (11:09)	11:15 310 / 301 / 316	11:30 316 / 308 / 317		Steam Pressure (for heat) 90 PSI	DEGAS AT - 11:11 ← cover plate up / AT - 11:12 ← " / AT - 11:13 ← " / AT - 11:14 ← cover plate stays
"	"		"	"	None			7/31/73 in@ 1:05 PM out@ 1:35 PM	C-16-49	49	22 Tons	3000 PSI	Top Plate - 307 / Cavity - 302 / Ram - 304 (1:07)	—	1:35 313 / 308 / 315		Steam Pressure 90 PSI	DEGAS AT - 1:06 / AT - 1:07 / AT - 1:08 / AT - 1:09
"	"		"	"	None			7/31/73 in@ 1:41 out@ 2:11	C-16-50	C-16-50	22 Tons	3000 PSI	Top Plate - 307 / Cavity - 308 / Ram - 302 (1:42)	1:52 312 / 303 / 314	2:09 317 / 310 / 315		90 PSI Steam	DEGAS AT - 1:42 / AT - 1:43 / AT - 1:44 / AT - 1:45
"	"		"	"	None			7/31/73 in@ 2:15 out@ 2:15	C-16-51		22 T.	3000 PSI	Top Plate 311 / Cavity 308 / Ram 315	2:2? 313 / 309 / 314	—		90 PSI Steam	DEGAS AT - 2:16 / AT - 2:17 / AT - 2:18 / AT - 2:19
"	"		"	"	None			7/31/73 in@ 2:50 out@ 3:20	C-16-52	C-16-52	22 T	3000 PSI	Top Plate 312 / Cavity 306 / Ram 315 (2:50)	2:53 312 / 307 / 315	3:15 316 / 310 / 316		90 PSI Steam	DEGAS AT - 2:51 / AT - 2:52 / AT - 2:53 / AT - 2:54

GLASS - PHENOLIC
VACUUM-COMPRESSION & COMPRESSION MOLDING
TYPICAL PRESS LOG SHEET

TABLE 2

118 Press Log "THERMEX" - "MICROBESTOS" Sheet (A) | Press Log "THERMEX" - "MICROBESTOS" Sheet (B)

PART		PREFORM			PREHEAT			IDENTIFICATION			PRESS DATA							REMARKS
Compound or Laminate	Shape or Size	Type	Shape and Size	Wt. or No. of Plies	D.C. Amps Start	D.C. Amps End	Time Seconds	Date & Time in	Sample No.		Cure Load, Tons	Cure Pressure P.S.I.	Mold Temp. at Closing	Mold Temp. at Opening	Steam Pressure on Mold PSI	Time	Cycles	
GLASS PHENOLIC NASA GFM	4.75x3.12 x 5/8"	NONE		270 GMS. CHARGE (LOOSE) FROM BOTTOM BOX	NONE			4/3/73	C-G-11 (C=COMPRESSION G=GLASS-PHENOLIC 11=PANEL No.)	C-G-11	29,500# 15T	2000	300 TOP / 295 CAV / 300 RAM	305 / 300 / 300	CAV - / RAM -	75 PSI / 75 PSI		SET TIMER TO OPEN MOLD IN 15 MIN.
LOT #2 "	"	"		"		"		4/3/73	C-G-12	C-G-12	"	"	302 TOP / 295 CAV / 300 RAM	300 / 295 / 299	CAV / RAM	75 / 75		(PREMATURELY)
"	"	"		"		".		4/3/73	C-G-13	C-G-13	"	"	302 TOP / 298 CAV / 299 RAM	305 / 300 / 300	CAV / RAM	75 / 75		PRESS OPENED HOT [illegible] DIDN'T POP UP. CLOSED PRESS AGAIN + CONT. CURE. PANEL LOOKS OK.
"	"	"		"		"		4/3/73	C-G-14	C-G-14	"	"	300 TOP / 298 CAV / 302 RAM	305 / 292 / 300	CAV / RAM	75 / 75		
"	"	"		"		"		4/4/73	C-G-15	C-G-15	"	"	300 TOP / 295 CAV / 300 RAM	305 / 300 / 300	CAV / RAM	75 / 75		
"	"	"		"		"		4/4/73	C-G-16	C-G-16	"	"	300 TOP / 295 CAV / 300 RAM		CAV / RAM	75 / 75		
"	"	"		"		"		4/4/73	C-G-17	C-G-17	"	"	305 TOP / 295 CAV / 301 RAM	298 / 299 / 300	CAV / RAM	73 / 75		
"	"	"		"		"		4/4/73	C-G-18	C-G-18	"	"	300 TOP / 295 CAV / 300 RAM	305 / 295 / 302	CAV / RAM	75 / 75		
GLASS PHENOLIC [illegible] LOT 1	4.75x3.12 x 5/8	None		270 Gms CHARGE LOOSE FROM CHARGE BOX	VAC— / VAC— / HOLD VAC 15 min on warm	20.1" HG / 21.4 HG	COLD / HOT	7/9/73	V-G-1A	V-G-1A	29,500# 15T	2030 PSI	COLD 135 TOP / 150 CAV / 150 RAM	5 min 285 / 240 / 300	15 min 305 / 300 / 295	STEAM PRESSURE CAV - 75 PSI / RAM - 70 PSI		15 min VAC. on WARM MOLD PLUS 20 min CURE AT 300 F WITH VAC.
					CLOSED MOLD [illegible] TO SEAL [illegible] PRESSURIZE AFTER 15 min PRESSURIZE MOLD [illegible] on steam [illegible] 20 min					V-G-2A								
"	"	"		"	VAC / VAC	20.7 HG / 21.6 HG	COLD / HOT	7/9/73	V-G-2A		"	"	COLD 140 TOP / 140 CAV / 125 RAM	5 MIN 290 / 285 / 300	15 MIN 305 / 295 / 300	STEAM PRESS CAV / RAM	80 PSI / 75 PSI	
GLASS PHENOLIC NASA GFM	"	- "		"	VAC / VAC	21.1 HG / 21.6 HG	COLD / HOT	7/9/73	V-G-1	V-G-1	"	"	COLD 150 TOP / 145 CAV / 130 RAM	5 MIN 295 / 280 / 300	15 MIN 305 / 300 / 300	STEAM PRESS CAV / RAM	80 PSI / 75 PSI	PRESS OPENED 2 MINS EARLY CLOSED AGAIN FOR 3 MORE MINS. PANEL LOOKS OK.

[illegible]ITY OF THE ORIGINAL PAGE IS POOR

GLASS - PHENOLIC

COMPRESSION MOLDING - 30 Min. Cure - 4 Degas Cycles

TYPICAL PRESS LOG SHEET

TABLE 2A

NAS1-11490 SFM. GLASS-Phenolic

STRAIGHT COMPRESSION MOLDING

30 min Cure 4-5 degasses

Press Log "THERMOMIX" - "MICROTHERMICS" Sheet (A)

Press Log "THERMOMIX" - "MICROTHERMICS" Sheet (B)

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Shape and Size	PREFORM: Wt. or No. of Plies	PREHEAT: D.C. Amps Start	PREHEAT: D.C. Amps End	PREHEAT: Time Seconds	IDENTIFICATION: Date & Time in	IDENTIFICATION: Sample No.		PRESS DATA: Cure Load, Tons	PRESS DATA: Cure Pressure P.S.I.	PRESS DATA: Mold Temp. at Closing	PRESS DATA: Mold Temp. at Opening		Degas: Tons	Degas: Cycles	REMARKS
GLASS-Phenolic SFM. LAYUP	1.75" x 3.12" x 5/8" [illegible]		LOOSE FILL	260 gm chg.	NONE			8/7/73 in @ 1:49 out @ 2:19	CHG-30	30 min Cure CHG-30	15 Tons	2000 PSI	TOP PLATEN - CAVITY - RAM	1:52: 298, 294, 306; 2:01: 302, 299, 307	—	85 PSI STEAM TOP HEAT		4 Degas: DEGAS AT - 1:50 TOP PLATE [illegible] UP; AT - 1:51 " " "; AT - 1:52 " " "; AT - 1:53 " " STAY [illegible]
"	"		"		NONE			8/7/73 in @ 2:28 out @ 2:58	CHG-31	31	15 Tons	2000 PSI	TOP PLATEN - CAVITY - RAM	2:30: 301, 298, 310	—	85 PSI STEAM		5 Degas: DEGAS AT - 2:29 TOP PLATEN [illegible] FROM GAS; AT - 2:30 " " "; AT - 2:31 " " "; AT - 2:32 " " "; AT - 2:33 " " [illegible]
"	"		"	"	NONE			8/7/73 in @ [illegible] out @ [illegible]	CHG-32	32	15 Tons	2000 PSI	TOP PLATEN - CAVITY - RAM	3:15: [illegible]	—	85 PSI STEAM		5 Degas: DEGAS AT - [illegible] TOP PLATE [illegible]; AT - 3:11 " " "; AT - 3:12 " " "; AT - 3:13 " " "; AT - 3:14 TOP PLATE STAY [illegible]
"	"		"	"	NONE			8/7/73 in @ [illegible] out @ [illegible]	CHG-33	33	15 T.	2000 PSI	TOP PLATEN - CAVITY - RAM	3:51: [illegible]; 3:55: [illegible]; [illegible]: [illegible], [illegible], 304		85 PSI STEAM		4 Degas: DEGAS AT - 3:51 TOP PLATE [illegible] UP; AT - 3:52 " " "; AT - 3:53; [illegible] AT - 3:54 TOP PLATE STAY [illegible]
"	"		"	"	NONE			8/8/73 in @ 8:08 out @ 8:38	CHG-34	CHG-34	15 T.	2000 PSI	TOP PLATEN - CAVITY - RAM	8:14: 308, 302, 308; 8:35: 308, 310, 307	—	85 PSI Steam	COLD CHARGE DIRECT FROM [illegible]	DEGAS - AT - [illegible] TOP PLATE [illegible] UP; AT - [illegible] " " "; AT - [illegible] " " "; AT - 8:12 " " "; AT - [illegible] " " STAY [illegible]

2.2.4.2 Vacuum - Compression Molding Procedure

Vacuum molding is accomplished by installing "O" Ring seals on the force plug, and in a groove in the top plate which seals against the cavity plate. (See Figure 1, Page 3A and Figure 1-1, Page 4A). Vacuum applied through the top plate acts on the 270 gram charge through the gas release slots. The warm mold (120 - 160°F) is closed to the point where a vacuum can be established. Vacuum is held on the unpressurized charge for 15 minutes (to evacuate air and water vapor) before heat and pressure are applied for cure.

Cure time of 20 minutes was allowed after pressurizing the charge and applying heat. Heat up from 150°F to 300°F is rapid, i.e., 2 to 3 minutes. Cure cycle time was up to 40 minutes. Vacuum of 20" to 22" HG was attained (limited by Denver altitude).

A summary of the molding procedure is as follows:

1. Mold temperature - start, less than 150°F, 160 maximum.

2. Drop charge in warm mold - place cavity insert plate over charge - close mold but do not pressurize the charge.

3. Establish "O" Ring seal and apply vacuum. (20" HG minimum) Pull vacuum for 15 minutes.

4. After 15 minutes with vacuum, pressurize charge; 2000 psi for glass phenolic, 3000 psi for asbestos phenolic, and apply heat; 90 to 100 psi, steam.

5. Cure time 20 minutes beginning with application of heat and pressure. Set press to open automatically.

Copies of the applicable press log sheets include Table 2 and Table 3, Pages 9C and 10A.

ASBESTOS-PHENOLIC
VACUUM-COMPRESSION
TYPICAL PRESS LOG SHEET

TABLE-3

Press Log ~ "THERMOMIX" - "MICROBESTOS" Sheet (A) 12A

12A Press Log "THERMOMIX" - "MICROBESTOS" Sheet (B) 12A

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Shape and Size	PREFORM: Wt. or No. of Plies	PREHEAT: D.C. Amps Start	PREHEAT: D.C. Amps End	PREHEAT: Time Seconds	IDENTIFICATION: Date & Time in	IDENTIFICATION: Sample No.		PRESS DATA: Cure Load, Tons	PRESS DATA: Cure Pressure P.S.I.	PRESS DATA: Mold Temp. at Closing	PRESS DATA: Mold Temp. at Opening	PRESS DATA	PRESS DATA: [illegible]	PRESS DATA: [illegible]	REMARKS: 1) MOLD-TEMP.- START-UNDER 166F 2) CLOSE MOLD TO SEAL ON "O" RINGS BUT DO NOT PRESSURIZE 3) PULL VACUUM FOR 15 min - THEN 4) PRESSURIZE MOLD & TURN ON STEAM 5) CURE AT 300F FOR 20 min	
TM-705 -16	4.75 x 3.12 x 5/8"	—	4.5" x 3" x 3.5"	270 GMS.	VAC VAC	20.7 HG 21.0 HG	COLD HOT	3/20/73 3:05	V-16-6 (V=VACUUM 16=LOT 16 6=PANEL)	TM-705 V-16-6	12T	3000	COLD 150 TOP 140 CAV 125 RAM	5 MIN. HOT 305 280 300	15 MIN. 318 311 302	STEAM TOP BOTTOM	PRESSURE 100 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.7 HG 21.0 HG	COLD HOT	3/21/73 8:24	V-16-7	V-16-7	"	"	COLD 150 TOP 145 CAV 135 RAM	5 MIN HOT 302 240 300	15 MIN 320 315 305	STEAM TOP BOT	PRESS 100 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.8 HG 21.2 HG	COLD HOT	3/21/73 9:19	V-16-8	V-16-8	"	"	COLD 135 TOP 135 CAV 150 RAM	5 MIN HOT 285 290 290	15 MIN. 315 296 310	STEAM TOP BOT	PRESS 95 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.4 HG 21.0 HG	COLD HOT	3/21/73 10:29	V-16-9	V-16-9	"	"	COLD 125 TOP 125 CAV 135 RAM	5 MIN HOT 300 280 295	15 MIN 310 310 310	STEAM TOP BOT	PRESS 95 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.5 HG 21.0 HG	COLD HOT	3/21/73 11:19	V-16-10	V-16-10	"	"	COLD 125 TOP 130 CAV 130 RAM	5 MIN HOT 295 285 290	15 MIN 318 311 309	STEAM TOP BOT	PRESS 95 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.1 HG 21.0 HG	COLD HOT	3/21/73 12:45	V-16-11	V-1[illegible]	"	"	COLD 145 TOP 130 CAV 120 RAM	5 MIN HOT 240 280 275	15 MIN 305 300 305	STEAM TOP BOT	PRESS 95 PSI 90 PSI	PRESS ACCIDENTALLY OPENED AT END OF VAC PERIOD. CLOSED AGAIN - "O" RING BROKE ON RELEASE PANEL O.K.	
"	"	—	"	"	VAC VAC	20.6 HG 21.0 HG	COLD HOT	3/21/73 1:53	V-16-12	V-16-12	"	"	COLD 145 TOP 140 CAV 150 RAM	5 MIN HOT 295 280 290	15 MIN 300 309 300	STEAM TOP BOT	PRESS 100 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.7 HG 20.9 HG	COLD HOT	3/21/73 3:02	V-16-13	V-16-13	"	"	COLD 155 TOP 155 CAV 140 RAM	5 MIN HOT 300 290 295	15 MIN 311 310 300	STEAM TOP BOT	PRESS 100 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.6 HG 21.2 HG	COLD HOT	3/22/73 8:47	V-16-14	V-16-14	"	"	COLD 145 TOP 140 CAV 120 RAM	5 MIN HOT 290 280 293	15 MIN 318 310 305	STEAM TOP BOT	PRESS 100 PSI 90 PSI	INSTALLED BLEEDER VALVE ON VAC. PUMP PANEL O.K.	
"	"	—	"	"	VAC VAC	20.7 HG 21.1 HG	COLD HOT	3/22/73 9:33	V-16-15	V-16-15	"	"	COLD 115 TOP 130 CAV 120 RAM	5 MIN HOT 295 282 290	15 MIN 300 310 305	STEAM TOP BOT	PRESS 100 PSI 90 PSI	PANEL OK	
"	"	—	"	"	VAC VAC	20.5 HG 21.2 HG	COLD HOT	3/22/73 10:42	V-16-16	[illegible]	"	"	COLD 150 TOP 150 CAV 130 RAM	5 MIN HOT 295 285 278	15 MIN 310 310 309	STEAM TOP BOT	PRESS 100 PSI 90 PSI	PANEL O.K.	
"	"	—	"	"	VAC VAC	20.8 HG 21.0 HG	COLD HOT	3/22/73 12:45	V-16-17	V-16-17	"	"	COLD 150 TOP 145 CAV 150 RAM	5 MIN HOT 290 290 292	15 MIN 312 311 309	STEAM TOP BOT	PRESS 100 PSI 90 PSI	PANEL O.K.	

2.2.4.3 Directional Heat Flow - Compression Molding Procedure

This method calls for the application of the prime source of heat to the charge to be limited to its lower surface, i.e., from the force-plug. Thus it is possible to drive the heat through the charge in one direction. This facilitates movement of the reaction gases through the relatively porous, unsintered portion of the charge, to its periphery nearest the de-gas slots, where it can escape.

The insert plate in the top mold plate was changed from steel (no thermocouple) to asbestos cement, which includes a thermocouple which contacts the cover plate over the charge. The asbestos cement insert with its thermocouple allows monitoring temperature of the upper portion of the charge which indicates when the cure is complete. A 270 gram charge is placed in a warm (150°F) mold with a hot 250°F force plug.

A problem developed in this procedure in that heat being applied only through the force plug took much too long to work up through the charge since it was not only heating the charge but the other mold components as well.

Relative speed-up of the cure was accomplished by modulation of steam to the cavity plate and top plate to follow the temperature of the cover plate (thermocouple reading). These temperatures were modulated to follow, or trail, the temperature of the cover plate by a few degrees. This speeded up the cure by allowing most of the heat from the force plug to go to the charge rather than to the cavity plate and the charge. Even so the mold cycle was close to 90 minutes.

Copies of the applicable press log follow: Tables 4 and 5, Pages 11A-11B follow.

A. Summary of the Molding Procedure is as follows:

1. Mold Temperatures - Cavity Plate and Top Plate less than 150°F. Force plug (RAM), 290 to 320°F (Steam pressure 100-110 psi).

2. Drop 270 gram charge in warm mold on hot force plug. Close mold quickly and pressurize charge (no vacuum).

ASBESTOS - PHENOLIC
DIRECTIONAL HEAT FLOW-COMPRESSION
TYPICAL PRESS LOG SHEET

TABLE-4

13A DIRECTIONAL HEAT Press Log ~ "[illegible]" - "[illegible]" Sheet (A)

DIRECTIONAL HEAT Press Log "[illegible]" - "[illegible]" Sheet (B)

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Shape and Size	PREFORM: Wt. or No. of Plies	MOLD TEMP VS TIME (MINUTES) THERMO-COUPLE OVER TOP INSERT PLATE			IDENTIFICATION: Date & Time in	IDENTIFICATION: Sample No.		PRESS DATA: CURE LOAD TONS	MOLD TEMPERATURE VS TIME (MINUTES)			MOLD TEMPERATURE VS TIME (MINUTES)			REMARKS
705-16 THERMO-MIX	4.25 x 3.12 x 5/8	—	4.5 x 3.0 x 1 3/16"	260 GMS.	TEMP AT T.C. OVER CENTER TOP CAV. PLATE	0-126 5-170 10-183 15-207	40- 45-335 50-337 55.	4/25/73 DROP	D-16-4 (D=DIR.H, 16=LOT-16, 4=PANEL)	D-16-4	22 TONS 3000 PSI	RAM 0-315 5-320 10-320 15-319	CAV 170 175 190 200	TOP 160 170 180 190	RAM 45- 45 330 50 333 55-	CAV 319 315	TOP 315 320	110 PSI STEAM ON RAM 110 PSI STEAM IN CAVITY & TOP AT 30 min REMOVE PANEL AT [illegible]
						20-221 25-237 30-263 35-	60-	IN @ 3:55			110 PSI on RAM	20-320 25-321 30-322 35	225 230 275	205 225 265	60-	GOOD PANEL		SHOT OF STEAM IN TO PLATEN 30 [illegible]. TEMP SHOULD FOLLOW THE TOP T.C. 50 PSI STEAM ON CAV. @ [illegible]
"	"		"	"	TEMP 2 T.C. OVER CENTER TOP CAV. PLATE	Min °F 0 140 5 163 10 176 15-187	CAV °F 45-300 50-329 55-337	4/26/73 DROP	D-16-5	D-16-5	22 Tons 3000 PSI							STEAM ON RAM @ START [illegible] INC. TO 110 PSI AFTER [illegible] D-16-5 GOOD PANEL
						20 147 25-211 30-222 35-240 40-265	60	IN @ 8:30 AM			STEAM 110 PSI on RAM	Min RAM 0-315 5-315 10-318 15 321	CAV 175 185 190 195	TOP 150 150 160 170	RAM 45-325 50-330 55-325	CAV 305 320 328	TOP 305 325 324	
												20-320 25-320 30-320 35-320 40-320	190 205 215 225 265	175 200 205 225 265	65-			← SHOT STEAM TO TOP [illegible] ← SHOT STEAM TO TOP & CAV [illegible] ← 80 PSI STEAM TO [illegible] ← 110 PSI STEAM [illegible]
"	"		"	"		Min °F 0- 120 5- 180 10- 196 15- 203	Min °F 45- 272 50- 312 55- 326 60- 331	4/25/73	D-16-6	D-16-6	22 Tons 3000 PSI	0-318 5-310 10-318 15-315	CAV 170 175 190 195	145 170 185 190	RAM 45-322 50-329 55-329 60-325	CAV 276 308 318 320	TOP 283 312 321 325	← 110 PSI STEAM ON CAV. [illegible]
						20-211 25-217 30-230 35-245 40-250		IN @ 9:35 AM			STEAM [illegible] 110 PSI on Ram	20-320 25-324 30-325 35-326 45-320	200 207 210 228 230	195 195 211 228 230				← SHOT STEAM TO TOP & CAVITY AT 25 min ← SHOT STEAM TO TOP & CAV [illegible] ← 80 PSI STEAM TO [illegible]
"	"		"	"		Min °F 0- 123 5- 156 10- 173 15- 183 20- 193	Min °F 50 237 55 247 60 282 65-329	4/26/73	D-16-7	D-16-7	22 Tons 3000 PSI	Min RAM 0-315 5-320 10-323 15-320	CAVITY 185 190 191 195	TOP 150 155 160 170	RAM 45-325 50-325 55-326 60-325	CAV 218 226 230 300	TOP 211 222 227 295	SHOT OF STEAM TO TOP & CAV 30 MINS. SHOT OF STEAM TO TOP & CAV @ [illegible]
		FEW WHITISH SPOTS ON TOP SIDE PANEL SHOULD BE OK.				25-198 30-205 35-220 40 224 45-229	70-340	DROP IN @			STEAM PRESS 110 PSI on RAM	20-320 25-320 30-322 35-325 40-325	199 200 205 210 215	165 180 195 205 208	65-328 70-326	323 327	323 334	110 PSI STEAM ON PLAT. & CAV. @ 55 MINS. PANEL HAS FEW LIGHT [illegible] SPOTS - TOP SURFACE [illegible]
"	"	-	"	"		Min °F 0 132 5 151 10 183 15 188	Min °F 60 231 65 233 70 235	4/26/73	D-16-8	D-16-8		0 328 5 328 10 320 15 320	175 188 190 190	TOP 145 155 166 170	MIN RAM 60 328 65 329 70 328	CAV 228 235 238	TOP 213 219 220	SHOT OF STEAM TO CAV. @ 2 MINS. SHOT OF STEAM TO CAV @ 32 MINS.
	Panel OK					20 193 25 201 30 204 35 210	75 274 80 264 85-310 90-390 ← Remove	in @ 1:00 PM				20 320 25 321 30 320 35 322	195 199 200 212	175 180 187 193	75 329 80 328 85 330 90 330	232 280 310 315	290 275 310 322	80 PSI STEAM on CAV. & TOP at 75 min
						40 215 45 219 50 223 55 229						40 325 45 325 50 328 55 328	212 215 219 225	196 200 200 209				

GLASS- PHENOLIC
DIRECTIONAL HEAT FLOW-COMPRESSION
TYPICAL PRESS LOG SHEET

TABLE-5

DIRECTIONAL HEAT

[illegible] Press Log ~ "[redacted]" - "[redacted]" Sheet (1) NAS1-11493 Press Log "[redacted]" - "[redacted]" Sheet (2)

DIRECTIONAL HEAT

138

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Shape and Size	PREFORM: Wt. or No. of Plies	MOLD TEMP. VS TIME (MINUTES) THERMOCOUPLE OVER CAVITY INSERT PLATE		IDENTIFICATION: Date & Time in	IDENTIFICATION: Sample No.		PRESS DATA: CURE LOAD TONS	PRESS DATA: MOLD TEMP. VS TIME (MINUTES)			MOLD TEMP. VS. TIME (MINUTES)			REMARKS
[illegible] PHENOLIC NARMCO 9FN	[illegible] 3.12 [illegible]	—		260 Gms. (Loose)	[illegible] 0 - 1[illegible] 5 - 131 10 - 152 15 - 170	[illegible] 65 - 3[illegible] 70 - 328 75 - 338	5/15/73 DROP	D-G-8 D = DIRECTIONAL HEAT FLOW G = GLASS [illegible]		15 TONS 1900 PSI	[illegible] 0 - [illegible] 5 - 315 10 - 316 15 - 320	[illegible] 160 170 180	[illegible] 120 150 165	[illegible] 55 - 325 70 - 325 75 - 326	[illegible] 335 318 322	[illegible] 307 318 322	SHOT OF STEAM @ 21 MINS T[illegible]
					20 - 178 25 - 198 30 - 208 35 - 221			IN @ 2:33	D-G-8		20 - 320 25 - 319 30 - 320 35 - 320	190 200 202 203	152 181 193 198				D-G-8 SHUT STEAM @ 39 mins, T[illegible]
					40 - 229 45 - 238 50 - — 55 - 245						40 - 320 45 - 321 50 - — 55 - 319	212 218 — 230	215 219 — 230				" " @ 43 min [illegible] 40 PSI STEAM @ 55 MINS T[illegible] 100 PSI STEAM @ 69 MINS T[illegible]
"	"	—		"	"	[illegible] 0 - 100 5 - 147 10 - 176 15 - 183	[illegible] 65 - 246 70 - 246 75 - 246	5/16/73	D-G-9	D-G-9	15 TONS	[illegible] 0 - [illegible] 5 - 315 10 - 313 15 - 319	[illegible] 152 161 185	100 151 162 169	[illegible] 327 65 - 320 70 - 320 75 - 321	[illegible] 235 235 240	[illegible] 230 230 230	SHOT STEAM @ [illegible] MIN T[illegible] " " " [illegible] " [illegible] " " " [illegible] " " " 62 " " [illegible]
					20 - 190 25 - 196 30 - 195 35 - 21[illegible]	21 - 251 85 - 288 90 - 318 95 - 335		IN @ 7:57			20 - 319 25 - 315 30 - 319 35 - 318	186 200 205 215	172 185 186 202	80 - 321 85 - 321 90 - 320 95 - 320	260 300 310 318	255 294 312 318	50 PSI [illegible] 100 PSI " " 80 " "
					40 - 220 45 - 234 50 - 238 55 - 278	100 - 339	DROP				40 - 319 45 - 319 50 - 320 55 - 321	220 222 225 230	205 215 218 225	100 - 320	320	320	D-G-9
"	"	—		"	"	[illegible] 0 - 113 5 - 110 10 - 118 15 - 128	[illegible] 60 - [illegible] 65 - 249 70 - 273 75 - 308	5/16/73	D-G-10		15 TONS	[illegible] 0 - 319 5 - 320 10 - 310 15 - 316	[illegible] 100 145 150 160	[illegible] 98 102 105 118	[illegible] 60 - 320 65 - 319 70 - 320 75 - 320	[illegible] 290 240 265 271	[illegible] 246 275 270 290	SHOT STEAM TOP ONLY AT 21 MINUTES
					20 - 138 25 - 170 30 - 183 35 - 195	80 - 318 85 - 322 90 - 329	COOL & DROP	IN @ 9:55	D-G-10		20 - 319 25 - 320 30 - 320 35 - 320	160 178 190 194	121 155 171 179	80 - 320 85 - 321 90 - 320	295 325 305	310 312 312	SHOT STEAM @ 26 min TOP only " " " 56 " [illegible] " " " 61 " [illegible] 110 PSI STEAM @ 65 " [illegible]
					40 - 210 45 - 216 50 - 226 55 - 227						40 - 318 45 - 319 50 - 320 55 - 320	210 215 225 229	205 208 210 215				D-G-10
"	"	—		"	"	[illegible] 0 - 11[illegible] 5 - 1[illegible] 10 - 115 15 - 130	[illegible] 60 - [illegible] 65 - [illegible] 70 - 255 75 - 289	5/16/73	D-G-11	D-G-11	15 TONS	[illegible] 0 - [illegible] 5 - [illegible] 10 - 308 15 - 315	[illegible] [illegible] 145 150 160	[illegible] [illegible] 100 110 120	[illegible] 60 - 320 65 - 320 70 - 321 75 - 320	[illegible] 229 230 250 305	[illegible] 222 227 240 310	SHOT STEAM @ 21 MINS T[illegible] D-G-11
					20 - 142 25 - 172 30 - 170 35 - —	80 - 316 85 - 325 90 - 329		IN @ 11:43			20 - 313 25 - 321 30 - 320 35 - —	175 185 187 —	155 175 176 —	80 - 321 85 - 320 90 - 322	310 316 316	312 319 314	Shut steam at 42 mins Top only
					40 - 202 45 - 216 50 - 221 55 - 232						40 - 321 45 - 321 50 - 320 55 - 320	197 208 214 220	179 205 204 213				Shot steam @ 53 mins TOP [illegible] Shot steam @ 62 mins [illegible] 40 PSI STEAM 67 mins [illegible] [illegible] PSI STEAM 71 min TOP & CAVITY

3. Take temperature reading every 5 minutes at 4 points; 3 by surface pyrometer, i.e., a) Force Plug, b) Cavity Plate, c) Top Plate, d) one, via thermocouple of cavity insert plate (top of charge).

4. Modulate temperatures of cavity plate and top plate to follow (few degrees less than) the temperature of the cavity insert plate.

5. When temperature of cavity insert plate reaches 250°F increase steam pressure to 110 psi to bring temperature quickly to 320 to 330°F.

6. Open mold when cavity insert plate (top of charge) reaches 330°F.

   NOTE: It was necessary to attain 320°F min. (T.C.) at cavity insert plate to preclude imcomplete cure in this area, i.e., grey spots on top surface of panel. This applied only to directional heat flow and directional heat flow plus vacuum.

2.2.4.4 Directional Heat Flow Plus Vacuum - Compression Molding Procedure

This combines vacuum with directional heat flow. In this case, vacuum is applied to the uncompressed charge in a warm (150°F) mold to remove air and water vapor. After 10 minutes the charge is compressed to full molding pressure. At 15 minutes heat is applied to the force plug only. Heat is then modulated to the cavity plate and top plate to follow the temperature of the cover plate, as in the directional heat flow procedure of paragraph 2.2.4.3. This procedure required a mold cycle of up to 120 minutes.

Copies of pertinent press log sheets follow: Tables 6 & 7, Pages 13A-13B.

Summary of the molding procedure is as follows:

1. Mold temperatures - All mold elements less than 150°F.

2. Drop 260 - 270 gram charge into warm mold. Place cavity insert plate over charge. Close mold but do not pressurize the charge.

3. Establish "O" Ring seal and apply vacuum (20" HG minimum).

4. After 10 minutes of vacuum, pressurize the charge; 2000 psi for glass-phenolic, 3000 psi for asbestos phenolic. Apply heat after 15 minutes of vacuum; Ram or force plug only (100 - 110 psi steam).

5. Modulate temperature of cavity plate and top plate to follow (few degrees less than) the temperature of the cavity insert plate (top of charge).

6. When the temperature of the cavity insert plate reaches 250°F, increase steam pressure on sides and top of mold to 110 psi to bring temperature quickly to 320 - 330°F.

7. Open mold when cavity insert plate (top of charge) reaches 330°F. Refer note paragraph 6, Page 12.

ASBESTOS-PHENOLIC
DIRECTIONAL HEAT FLOW PLUS VACUUM COMPRESSION
TYPICAL PRESS LOG SHEET

TABLE-6

14A DIRECTIONAL HEAT + VACUUM
Press Log "[illegible]" - "[illegible]" Sheet (A)

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Sheet and Size	PREFORM: Wt. or No. of Plies	MOLD TEMP. VS. TIME (MINUTES) THERMOCOUPLE OVER TOP INSERT PLATE			IDENTIFICATION: Date & Time in	IDENTIFICATION: Sample No.	
[illegible]5-16 THERMO-MIX	475x3.12 x 5/8"	—	4.5x3.0" x 1 3/8	260 GMS.	TEMP. AT T.C. OVER CENTER TOP CAV. PLATE	[illegible] 0. [illegible] 5. 106 10. 118 15. 131	[illegible] 60. [illegible] 65. 243 70. 243 75. 250	5/2/73	DV-16-9 DV=DIR. HT FLO +VACUUM 16=LOT 16 [illegible] 9=PANEL NO. 9	DV-15-9
VACUUM 20.6 HG COLD 20.8 HG HOT		22 TONS ON MOLD @ 10 MINS HEAT ON RAM @ 15 MINS				20-147 25-178 30-199 35-216	80-276 85-316 90-330 95-335	IN @ 12:50		
						40-221 45-227 50-229 55-231	100 DROP			
705-16 THERMO-MIX	475x3.12" x 5/8"	—	4.5x3.0" x 1 3/8	260 GMS.	TEMP. AT T.C. OVER CENTER TOP CAV. PLATE	[illegible] 0. [illegible] 5. 112 10. 127 15. [illegible]	[illegible] 60. [illegible] 65. [illegible] 70. [illegible] 75. 250	5/2/73	DV-16-10	DV-16-10
VAC 20.7 HG COLD 20.8 HG HOT		22 TONS ON MOLD @ 10 MINS HEAT ON RAM @ 15 MINS.				20-[illegible] 25-165 30-182 35-190	80-[illegible] 85-315 90-334 95-336	IN @ 2:45		
						40-203 45-213 50-230 55-232	100 DROP			
[illegible]-16 [illegible]	475x3.12 x 5/8"		4.5x3.0" x 1 3/8	260 GMS.	VAC → 22 TONS → [illegible]	[illegible] 0 - [illegible] 5 - 124 10 - 136 15 - 130	[illegible] 60 230 65 232 70 241 75 243	5/3/73	DV-16-11	DV-16-11
VACUUM Cold — 20.6" HG HOT — 20.8" HG						20 138 25 155 30 156 35 181	80 249 85 280 90 320 95 331	IN @ 8:05		
						40 193 45 217 50 221 55 226	100 DROP			
705-16 THERMO-MIX	475x3.12 x 5/8"	—	4.5x3.0" x 1 3/8	260 GMS	TEMP. AT T.C. OVER CENTER TOP CAV. PLATE	[illegible] 0 - 71 5 - 118 10 - 120 15 - 119	[illegible] 60 - [illegible] 65 - 236 70 - 238 75 - 247	5/3/73	DV-16-12	DV-16-12
VAC 20.6 HG COLD 20.8 HG HOT		22 TONS ON MOLD @ 10 MINS. HEAT ON RAM @ 15 MINS.				20-136 25-163 30-180 35-190	80-253 85-281 90-314 95-326	IN @ 9:50		
		VAC. ON @ 0 MINS. VAC OFF @ 95 MINS				40-204 45-212 50-220 55-223	100-330 105-DROP			

DIRECTIONAL HEAT + VACUUM 14A
Press Log "[illegible]" - "[illegible]" Sheet (B)

PRESS DATA: Cure Load, Tons	MOLD TEMPS. VS TIME (MINUTES)			MOLD TEMPS VS. TIME (MINUTES)			REMARKS	
22 TONS	[illegible] 0 130 5 130 10 138 15 146	[illegible] 100 110 130	[illegible] 110 115 195	[illegible] 65 326 70 327 75 326	[illegible] 230 231 233	[illegible] 226 235	SHOT OF STEAM TO TOP @ 3 [illegible] " " " " " 32 [illegible] " " " " " 55 MINS " " " " " 72 MINS.	
	20 308 25 322 30 325 35 325	150 155 170 200	108 166 190 210	80 3[illegible] 85 330 90 330 95 331	240 315 319 319	283 319 322 321	110 PSI STEAM TOP & CAV. @ [illegible] VAC. OFF @ 90 MINS.	
	40 326 45 325 50 326 55 326	[illegible] 210 250 220	[illegible] 212 212 212				DV-16-9	
22 TONS	[illegible] 0 [illegible] 5 [illegible] 10 [illegible] 15 140	[illegible] 132 140 130	[illegible] 135 135	[illegible] 65 326 70 327 75 [illegible]	[illegible] 213 218 221 228	[illegible] 230 230 231 235	SHOT OF STEAM TOP @ [illegible] SHOT STEAM TOP & CAV. @ [illegible] 3rd SHOT STEAM TOP & CAV. @ [illegible] SHOT OF STEAM TOP & [illegible]	
	20 320 25 322 30 324 35 325	142 158 169 183	142 166 169 179	80 3[illegible] 85 329 90 330 95 330	292 300 310 316	[illegible] 318 321 323	" " " " " [illegible] 110 PSI STEAM TOP & [illegible] VAC. OFF @ 90 MINS.	
	40 320 45 322 50 326 55 326	201 210 219 222	200 205 219 220				DV-16-10	
22 TONS	[illegible] 0 - 128 5 - 150 10 - 140 15 - 135	CAVITY [illegible] 125 131 123	TOP [illegible] 130 120 126	[illegible] 60 326 65 326 70 326 75 326	CAVITY [illegible] [illegible] [illegible] 235	TOP [illegible] 215 290 290	SHOT OF STEAM TOP & [illegible] " " " " [illegible] " " " " @ [illegible] 110 PSI STEAM TOP & CAV. [illegible]	
	20 321 25 321 30 325 35 325	130 140 151 182	130 135 145 175	80 326 85 326 90 328 95 328	235 298 306 316	231 295 318 321	VAC. OFF @ 90 MINS.	
	40 325 45 325 50 325 55 326	195 205 205 215	185 205 205 210				DV-16-11	
22 TONS	[illegible] 0 - 135 5 - 135 10 - 130 15 - 125	[illegible] 122 122 120	[illegible] 120 120 119	[illegible] 60 [illegible] 65 325 70 324 75 325	[illegible] 223 222 225 222	[illegible] 227 220 222 235		
	20 322 25 325 30 327 35 327	150 159 171 185	149 160 161 175	80 326 85 326 90 325 95 325	238 289 305 310	240 290 305 318	SHOT STEAM @ 18 MIN TOP & CAV. " " @ 56 MIN " " " @ 71 MIN "	
	40 326 45 325 50 325 55 323	205 205 210 215	195 200 205 210	100 325	310	320	DV-16-12	

GLASS-PHENOLIC
DIRECTIONAL HEAT FLOW PLUS VACUUM- COMPRESSION
TYPICAL PRESS LOG SHEETS.

TABLE-7

DIRECTIONAL HEAT + VACUUM
Press Log "THERMONIX" - "MICROSTATICS" Sheet (A)

DIRECTIONAL HEAT + VACUUM
Press Log "THERMONIX" - "MICROSTATICS" Sheet (B)

PART: Compound or Laminate	PART: Shape or Size	PREFORM: Type	PREFORM: Shape and Size	PREFORM: Wt. or No. of Plies	MOLD TEMP VS TIME (MINUTES) THERMOCOUPLE TOP INSERT PLATE			IDENTIFICATION: Date & Time in	IDENTIFICATION: Sample No.		Cure Load, Tons	PRESS DATA: MOLD TEMPS. VS TIME (MINUTES)			MOLD TEMPS. VS TIME (MINUTES)			REMARKS
GLASS PHENOLIC SFM - NASA 1190	N.A.S.A.	NO PREFORM LOOSE FILL		260 gms	VAC-on → 15 Tons →	MIN °F 0 - 109 5 - 119 10 - 122 15 - 127	MIN °F 60 - 195 65 - 212 70 - 219 75 - [illegible]	5/22/73	DV-G 5		15 Tons	MIN TEMP 0 - 120 5 - 137 10 - 145 15 - 152	CAVITY 115 141 135 130	TOP 105 140 131 128	MIN TEMP 60 - 313 65 - 315 70 - 316 75 - 31[illegible]	CAVITY 189 203 203 222	TOP 195 210 215 228	SHOT OF BLOW-BY STEAM @ 58 Top only " " " @ 64 Top only
VACUUM COLD - 20.1" HG. HOT - 20.6" HG.					STEAM (100PSI)	20 - 134 25 - 139 30 - 146 35 - 154	80 - 271 85 - 212 90 - — 95 - —	in @ 2:40			DV-G 5 NASA 1190	20 - 306 25 - 311 30 - 312 35 - 314	135 145 155 170	135 144 152 161	80 - 319 85 - 320 90 - — 95 - —	240 250 — —	271 285 — —	" " " @ 71 Top only 40 PSI STEAM on TOP ONLY @ 74 min.
						40 - 162 45 - 172 50 - 171 55 - —	100 - 321 105 - 323 110 - 323 115	COOL TO 150 -	DROP 175			40 - 315 45 - 316 50 - 319 55 - —	178 187 196 —	170 179 183 —	100 - 320 105 - 321 110 - — 115	279 283 —	306 310 —	40 PSI STEAM CLIMBED TO 95 PSI BY 80 minute. TOP TEMP HIGHER THAN DESIRED AT 80 min. LEFT STEAM AT 95 & 100 PSI TO FINISH OUT CURE.
GLASS PHENOLIC GFM - N.A.S.A.					VAC-ON 15 Tons [illegible]	MIN °F 0 - 111 5 - 117 10 - 122 15 - 122	MIN °F 60 - 171 65 - 178 70 - 180 75 - 212	5/23/73	DV-G 6		15 Tons DV-G 6	MIN TEMP 0 - 100 5 - 120 10 - 120 15 - 123	CAVITY 100 106 100 109	TOP 120 121 121 [illegible]	MIN TEMP 60 - 317 65 - 317 70 - 317 75 - 319	CAVITY 189 187 191 226	TOP 174 180 183 [illegible]	SHOT OF BLOW-BY STEAM at [illegible] " " " " @ 77 [illegible]
VACUUM COLD - 20.5" HG HOT - 20.6" HG		NO PREFORM LOOSE FILL		260 GMS	STEAM (100PSI)	20 - 123 25 - — 30 - — 35 - 145	80 - 225 85 - 252 90 - 289 95 - 305	in @ 8:05 A.M.				20 - 307 25 - — 30 — 35 - 318	115 — — 165	119 — — 150	80 - 317 85 - 317 90 - 319 95 - 319	212 243 260 267	222 250 262 300	40 PSI STEAM, on TOP ONLY @ 81 min 100 PSI STEAM on TOP ONLY @ 87 min
						40 - 152 45 - 160 50 - 165 55 —	100 - 312 105 - 312 110 - 115 -	COOL & DROP 150-175				40 - 318 45 - 314 50 - 316 55 - —	165 181 181 —	152 163 171 —	100 - 319 105 - 319 110 - 115 -	270 295	301 308	
GLASS PHENOLIC GFM - N.A.S.A.					VAC-ON → 15 Tons → [illegible]	0 - 105 5 - 112 10 - 125 15 - 130	60 - [illegible] 65 - 162 70 - 172 75 - 215	5/23/73	DV-G 7		15 Tons	MIN TEMP 0 - 140 5 - 140 10 - 142 15 - 139	CAVITY 145 135 138 133	TOP 150 132 133 133	MIN TEMP 60 - 318 65 - 318 70 - 319 75 - [illegible]	CAVITY 203 209 208 217	TOP 170 193 199 221	SHOT OF BLOW-BY STEAM on TOP ONLY @ 71 min " " " " " " @ 81 min
VACUUM COLD - 20.5" HG HOT - 20.7" HG		NO PREFORM LOOSE FILL		260 GMS	STEAM (100PSI)	20 - 130 25 - — 30 - — 35 - —	80 - 212 85 - 221 90 - 251 95 - 293	in @ 10:08			DV-G 7	20 - 300 25 - — 30 - — 35 - —	137 — — —	134 — — —	80 - 317 85 - 319 90 - 320 95 - 320	222 235 259 262	241 273 290 296	40 PSI STEAM AT 87 min TOP ONLY 100 PSI STEAM TOP ONLY @ 92 min " " " [illegible] @ 100 min
						40 - 163 45 - 167 50 - 173 55 - 175	100 - [illegible] 105 - 312 110 - 314 115 -	COOL AND GO 150-175 & DROP			→	40 - 316 45 - 317 50 - 318 55 - 318	186 188 193 198	168 173 182 183	100 - 321 105 - 320 110 - 320 115 -	276 280 279	296 302 308	
GLASS PHENOLIC GFM - N.A.S.A.					VAC ON → 15 Tons →	MIN °F 0 - 110 5 - 113 10 - 120 15 - 1[illegible]	MIN °F 60 - 136 65 - 179 70 - [illegible] 75 - [illegible]	5/23/73	DV-G 8		15 Tons	MIN TEMP 0 - 132 5 - 130 10 - 120 15 - 123	CAVITY 120 120 123 127	TOP 105 135 139 143	MIN TEMP 60 - 318 65 - 317 70 - 320 75 - 320	CAVITY 200 204 209 213	TOP 196 193 205 216	SHOT OF BLOW-BY STEAM ON TOP ONLY @ 69 min " " " " " " @ 77 min
VACUUM COLD - 20.1" HG HOT - 20.6" HG		NO PREFORM LOOSE FILL		260 GMS	STEAM (100PSI)	20 - 138 25 - 142 30 - 149 35 - 154	80 - 232 85 - 255 90 - 295 95 - 315	in @ 12:16 PM			DV-G 8	20 - 310 25 - 312 30 - 312 35 - 315	140 151 160 173	144 151 153 162	80 - 320 85 - 320 90 - 320 95 - 321	224 249 264 270	237 248 291 303	40 PSI STEAM ON TOP ONLY @ 83 min 100 PSI STEAM AT 86 min TOP ONLY
						40 - 162 45 - — 50 - 175 55 - 182	100 - 319 105 - 319 110 - 115 -	← COOL TO (150-175) DROP				40 - 315 45 - — 50 - 316 55 - 316	180 — 188 155	164 — 178 182	100 - 321 105 - 322 110 - 115 -	275 278	305 308	

SECTION 3

POST BAKE EQUIPMENT AND PROCEDURES

3.1 Post Bake Equipment

3.1.1 Ovens

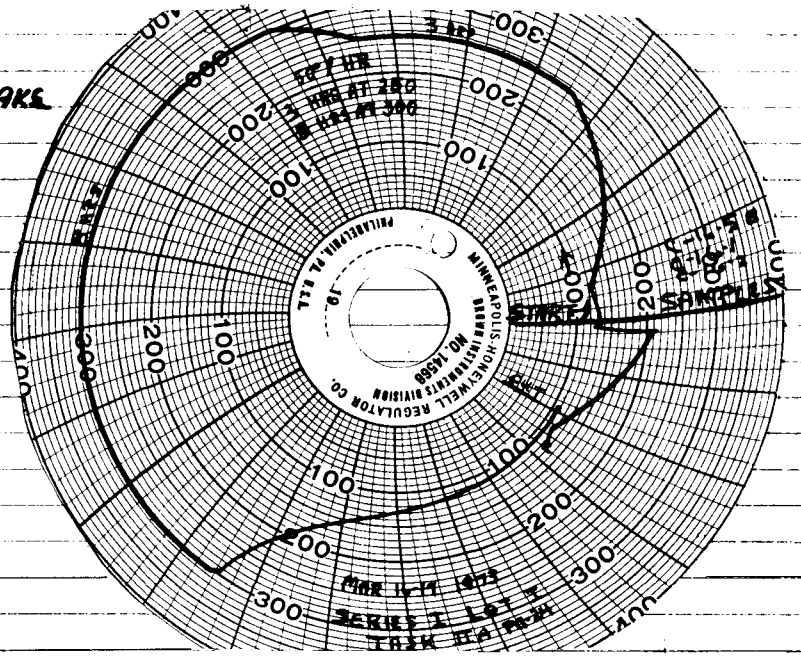
The post bake ovens used are Lydon Electric, fan circulating cross flow cam controlled, for temperatures to 1000°F. Two identical ovens were used (these ovens are shown in the photograph, Figure 10, page 14A. Cams were made to follow the temperature:time schedule closely. Charts of every post bake run were made and retained for the record. Typical charts are shown Figures 11, 12, 13 Pages 14B, C, and D.

Fig. 10

FIGURE 11

TASK IIA

TYPICAL POST-BAKE OVEN CHARTS FOR SERIES I SCHEDULES ASBESTOS-PHENOLIC



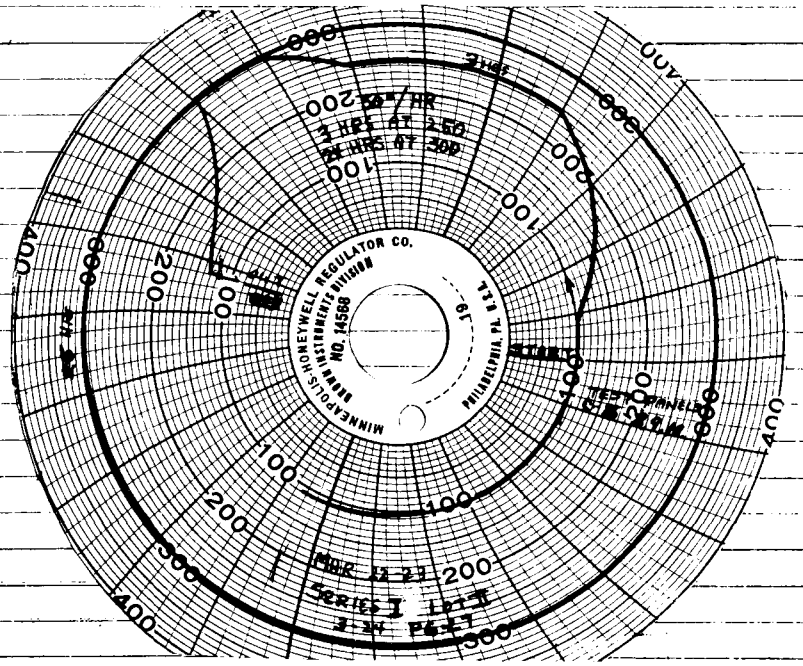


FIGURE - 12

TASK II A.

TYPICAL POST-BAKE OVEN CHARTS FOR SERIES II SCHEDULES. ASBESTOS-PHENOLIC

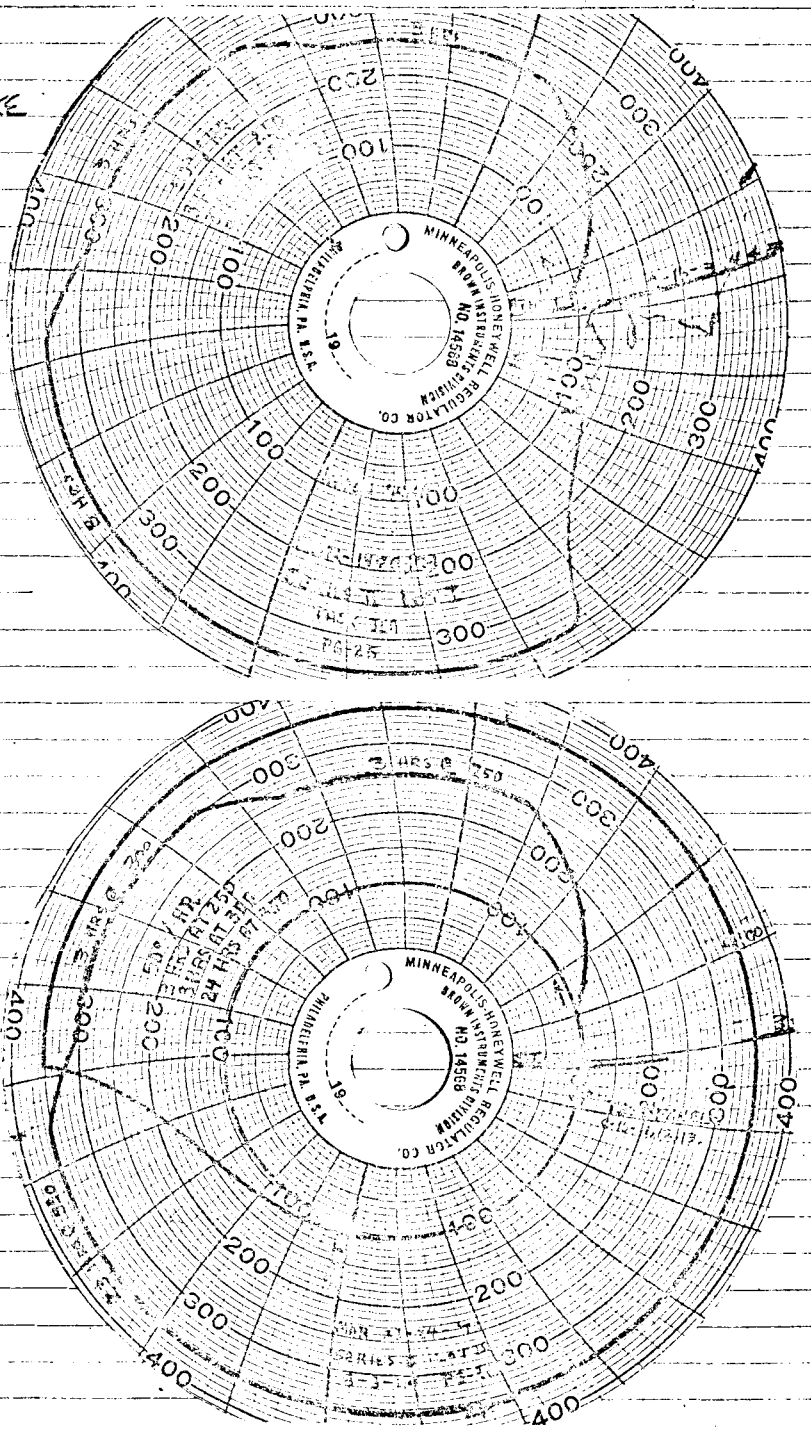
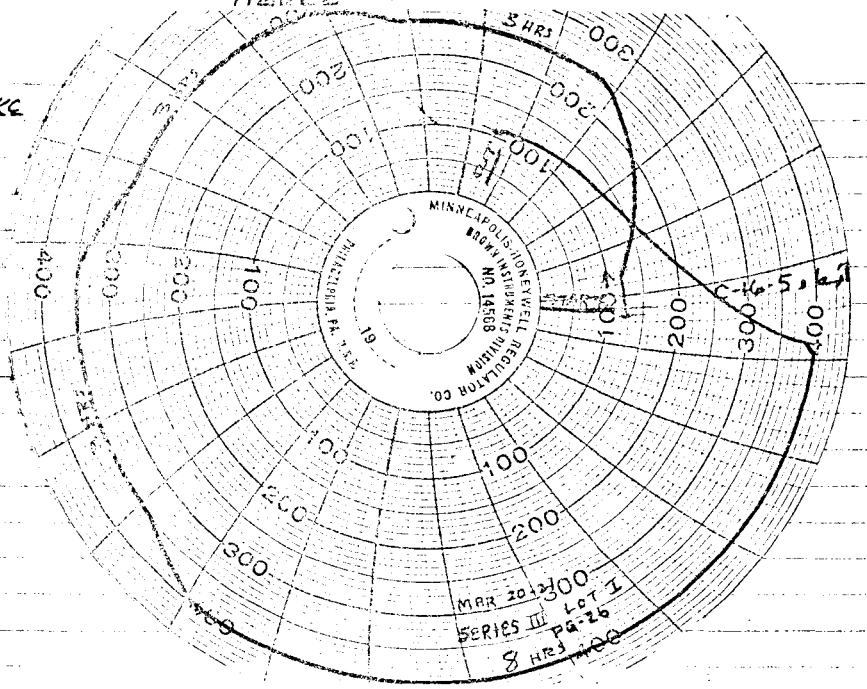
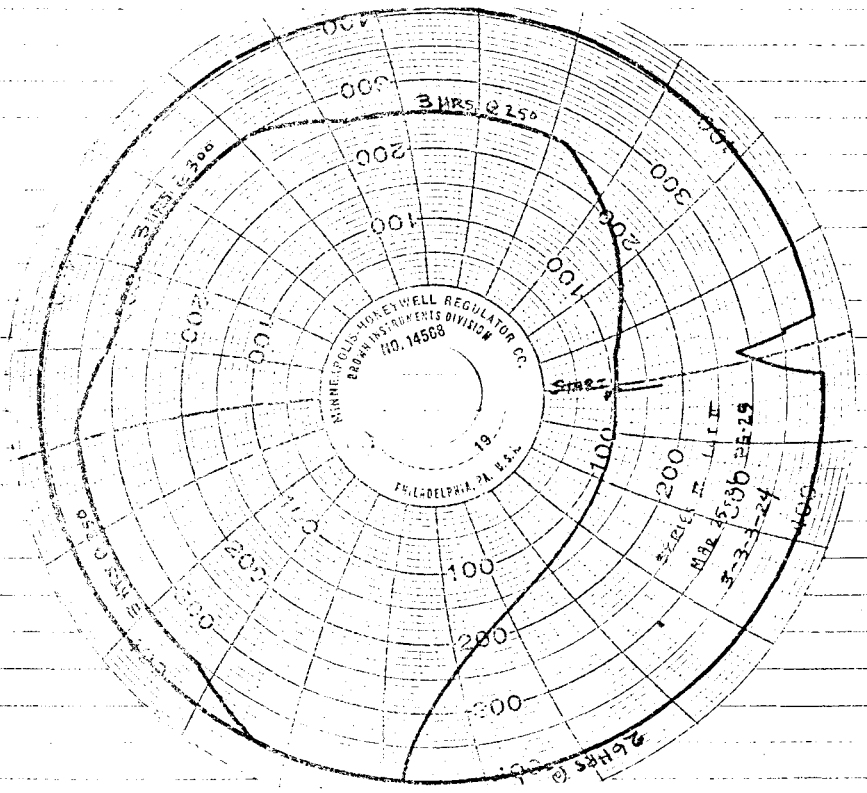


FIGURE 13

TASK II A

TYPICAL POST-BAKE OVEN CHARTS FOR SERIES III SCHEDULES ASBESTOS-PHENOLIC





3.2 Post Bake Procedures

3.2.1 Oven Schedules

Post bake schedules for the glass phenolic and asbestos phenolic materials are given in Figures 14 and 15 pages 15A and 15B.

The test panels were rested on edge on the oven shelf (screen), about 1/2 to 1" apart, with the space between adjacent panels lined up with the cross flow of heated air in the ovens. Actual oven temperatures at the sample level were checked with a thermocouple and chart and control adjustments were made where necessary.

Figure 14

Post Bake Schedule

Task No. 1
Glass-Phenolic

Series No.	Lot No.	Post Cure Hrs @ Indicated Temp. (F) 200	250	300	350
I	1	3	8	24	-
	2	3	8	48	-
	3	3	8	96	-
II	1	3	8	8	24
	2	3	8	8	48
	3	3	8	8	96

Two series of Post Cure Schedules; Three lots per series. Two test panels per lot (cut into 8 Bars each - total 16 Bars)
Tests to include Flex. and Flex. Mod. on 4 Bars: Impact on 4 Bars; Tensile, Tensile Mod., and Elongation on 4 Bars leaving 4 Bars as extras. Shrinkage, Sp. Gr., Hardness, and Wgt Loss, obtained from the uncut test panels.

Run (1) Straight compression molding and maximum de-gas compression molding, on all series. Repeat for (2) Vacuum-Compression (3) Directional Thermal-Transfer-Compression and (4) Vacuum in combination with directional thermal-transfer-compression.

Task I The manufacturer's post-cure recommendations for Glass-Phenolic - run complete series of 6 lots for each of five molding methods - totals - 30 lots, 60 panels, 480 Bars.

Figure 15

Post Bake Schedule

Task No. IIA
Asbestos-Phenolic

Series No.	Lot No.	Post Cure Hrs @ Indicated Temp. 250	300	350	400
I	1	3	8	-	-
	2	3	24	-	-
	3	3	48	-	-
	4	3	96	-	-
II	1	3	3	8	-
	2	3	3	24	-
	3	3	3	48	-
	4	3	3	96	-
III	1	3	3	3	8
	2	3	3	3	24
	3	3	3	3	48
	4	3	3	3	96

Three series of Post Cure Schedules; Four lots per series; Two test panels per lot (cut into 8 Bars each - Total 16 Bars)
Tests to include Flex. and Flex. Mod. on 4 Bars; Impact on 4 Bars; Tensile, Tensile Mod. and Elongation on 4 Bars, leaving 4 Bars as extras. Shrinkage, Sp. Gr., Hardness, and Wgt. Loss, obtained from the uncut test panels.

Run (1) Straight compression molding and maximum degas compression molding, on all 3 series. Repeat for (2) Vacuum-Compression (3) Directional Thermal-Transfer-Compression and (4) Vacuum in combination with directional thermal-transfer-compression.

Task IIA - Thermomix 705 - Run complete series of 12 lots - for each of 5 molding methods. Totals - up to 60 lots, 120 panels, 960 Bars.

SECTION 4

PREPARATION AND TEST EQUIPMENT AND PROCEDURES

4.1 Preparation of Specimens for Test

4.1.1 The preparation and test sequence of the "as molded" test panels is as follows: see Figure 16, Page 16A

4.1.1.1 As Molded Panel

Grind to Near Thickness
Roll Grinder

Sand to Final Thickness
Belt Sander

Desiccate - Weight and Measure
Test for Surface Hardness

Post Bake (Test Panels)

Cool and Desiccate
Weight and Measure
Test for Surface Hardness

4.1.1.2 Test Bars

Slit from Post Cured Test Panels
2 Edge Trim Pieces +8 Bars
Size 1/2" x 5/16" (Approx.) x 4-3/4" Long

Grind to Near Thickness
Roll Grinder

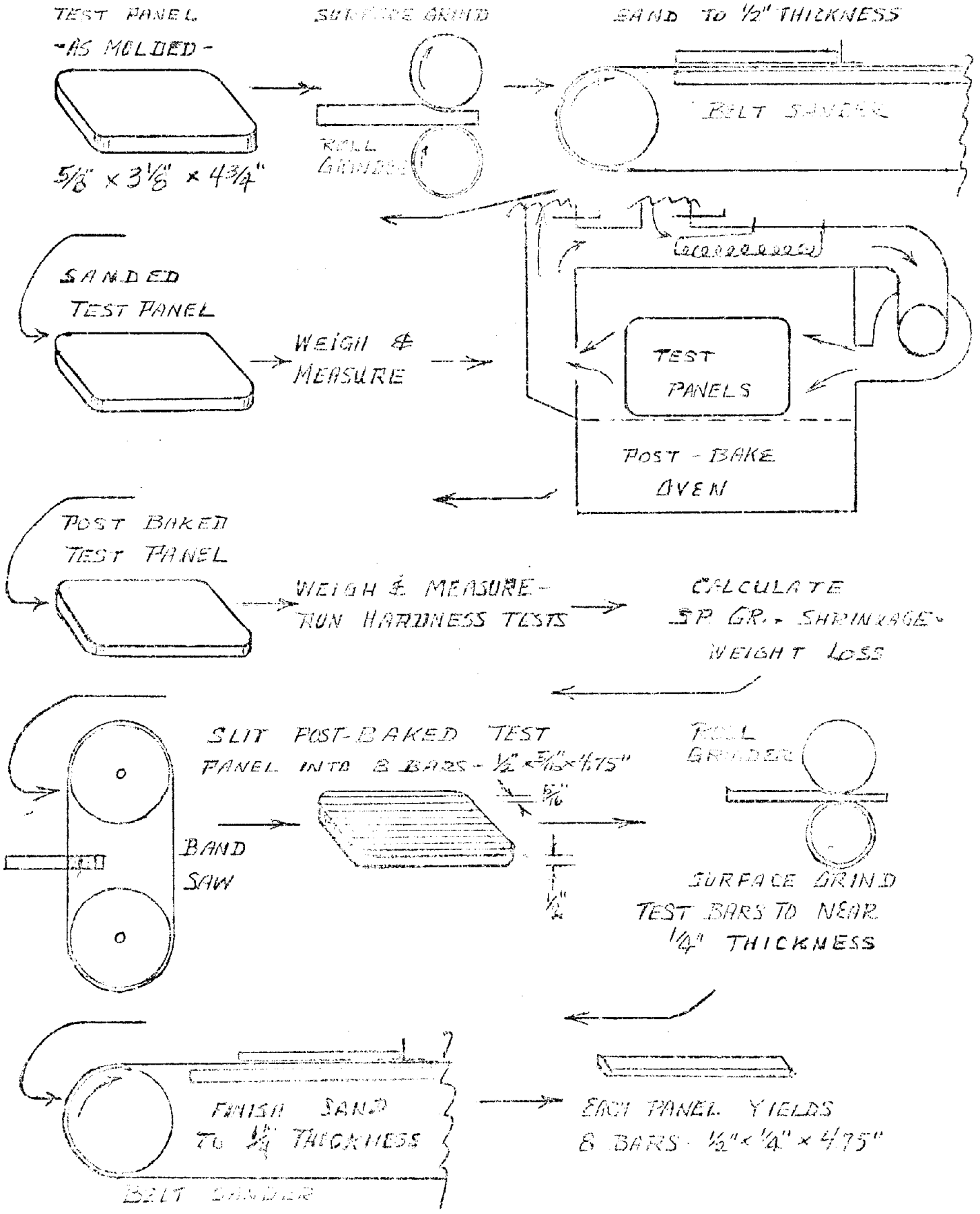
Sand to Final Thickness
Belt Sander

Tensile, Tensile Modulus, Elongation
Select 4 Bars from Each Lot (2 Panels)
Cut Tensile Specimens

Izod Impact, Notched and No Notch
Select 4 Bars from Each Lot, Cut to Length
Notch End of Each for Notched Impact
(Other End for No Notch Impact)

Fig. 16

SAMPLE PREPARATION SEQUENCE



Flexural Strength, Flex. Modulus
Select 4 Bars from Each Lot

Four Bars Remain for Discard
or as Extras

4.2 Preparation Equipment

4.2.1 Roll Grinder

This machine was used to reduce the test panels and the bars to near thickness by grinding between a top abrasive roll and a bottom rubber faced feed roll. The panel or bar was fed between the rolls, preset to take off a small amount each time the specimen was passed through. The specimen was turned over to take off approximately equal amounts from each face on successive passes through the machine. This machine maintained parallelism between faces.

Figure 17, Page 17A is a photograph of this machine.

4.2.2 Belt Sander

This is an industrial type machine, 14" belt, medium grit, and was used to finish size the test panels and test bars to final thickness. Successive cuts were taken and checked with a caliper to achieve final size and maintain parallelism.

Figure 18, Page 17B, is a photograph of this machine.

4.2.3 Band Saw

This machine, a variable speed "Do All", was used to slit the 1/2" thick test panels into test bars 1/2" wide (panel thickness) x 5/16" thickness (rough-cut). Remington Tungsten Carbide Bands were used and performed very well. Two bands were used to cut approximately 180 panels into 1440 bars. (See Photograph Figure 19, Page 17C.)

4.2.4 Izod Impact Notcher

This is the standard "Izod" notcher with single tooth milling wheel. Care was exercized to achieve a steady and solid feed to assure clean and properly dimensioned notches. (See Photograph Figure 20, Page 17D.)

Fig. 17

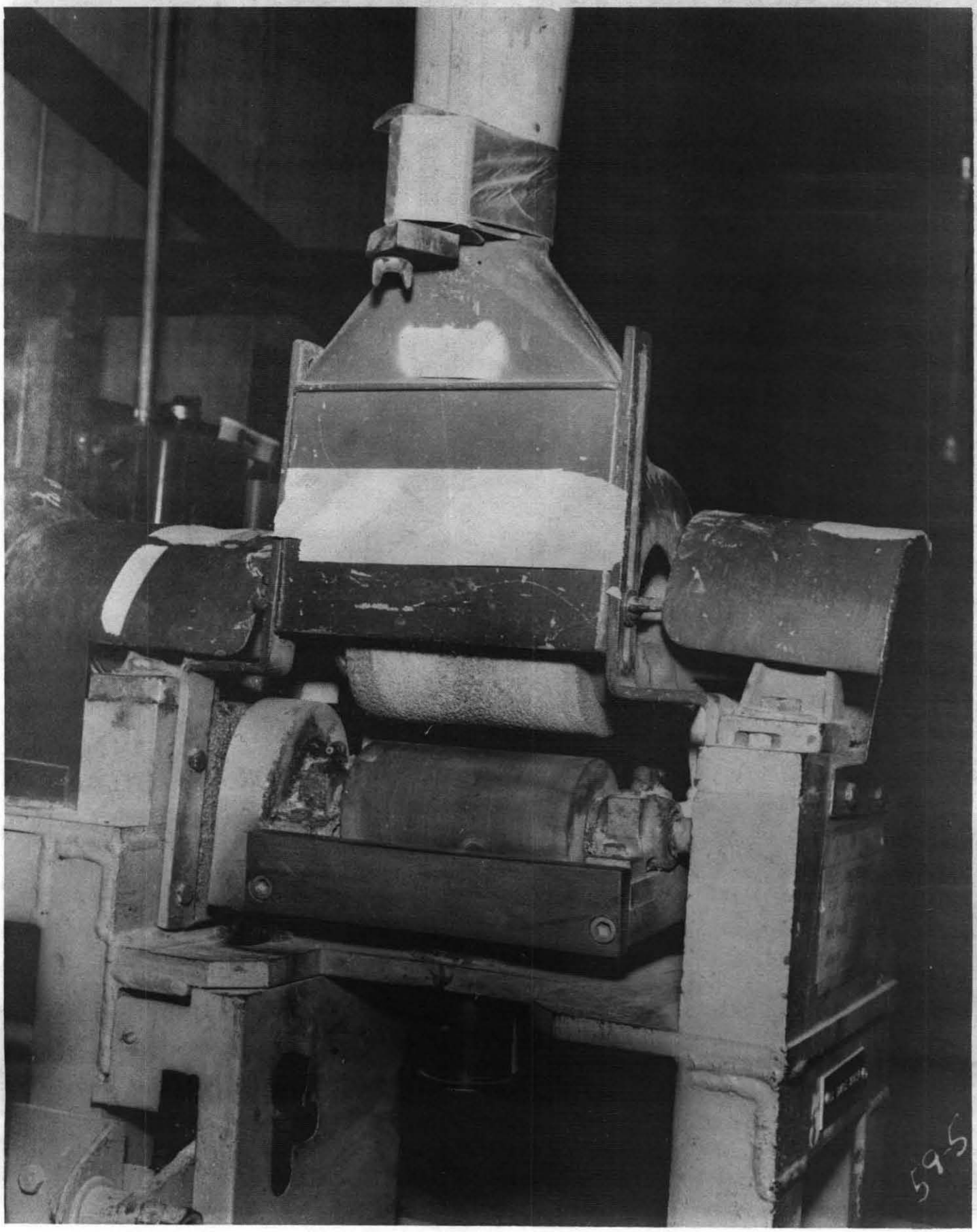


Fig. 18

Fig. 19

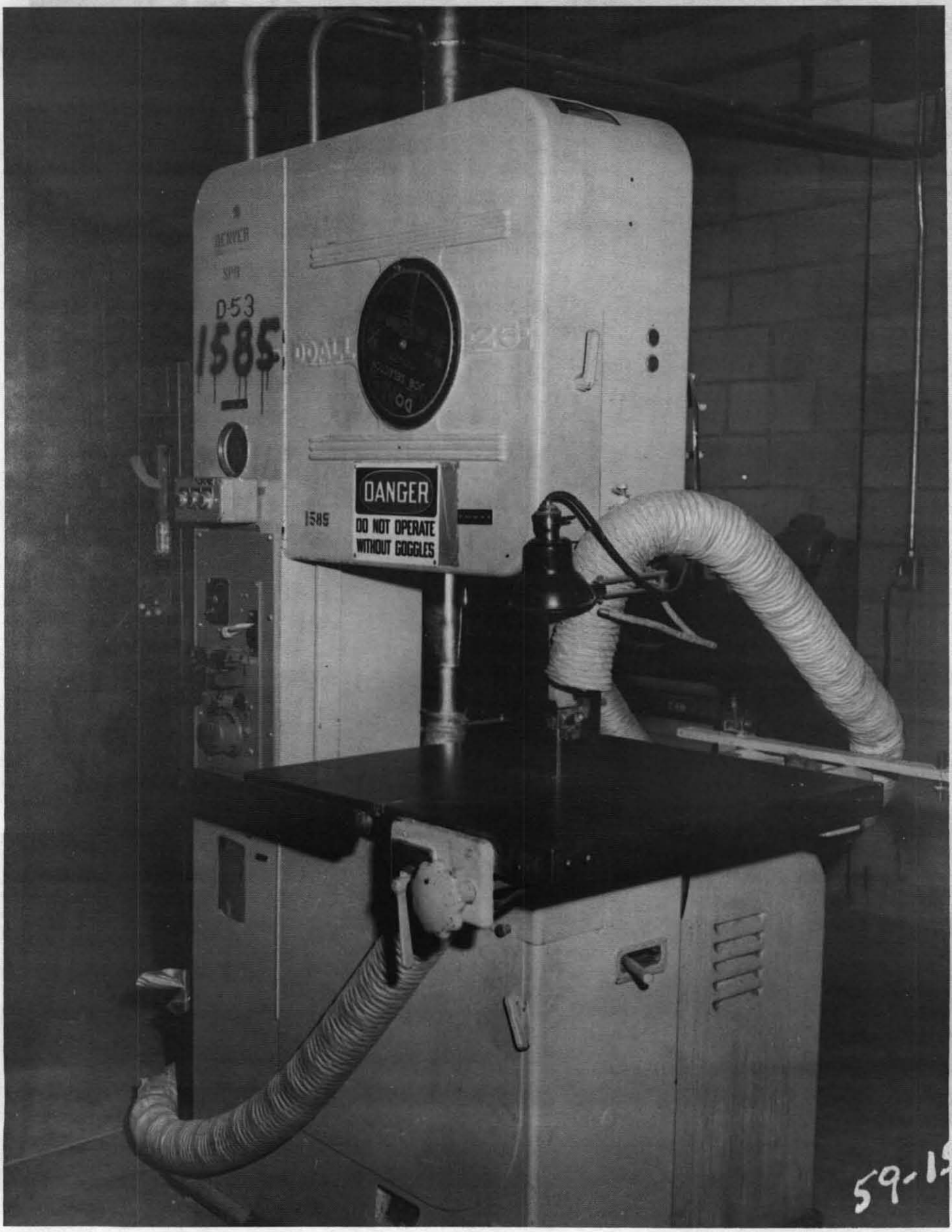
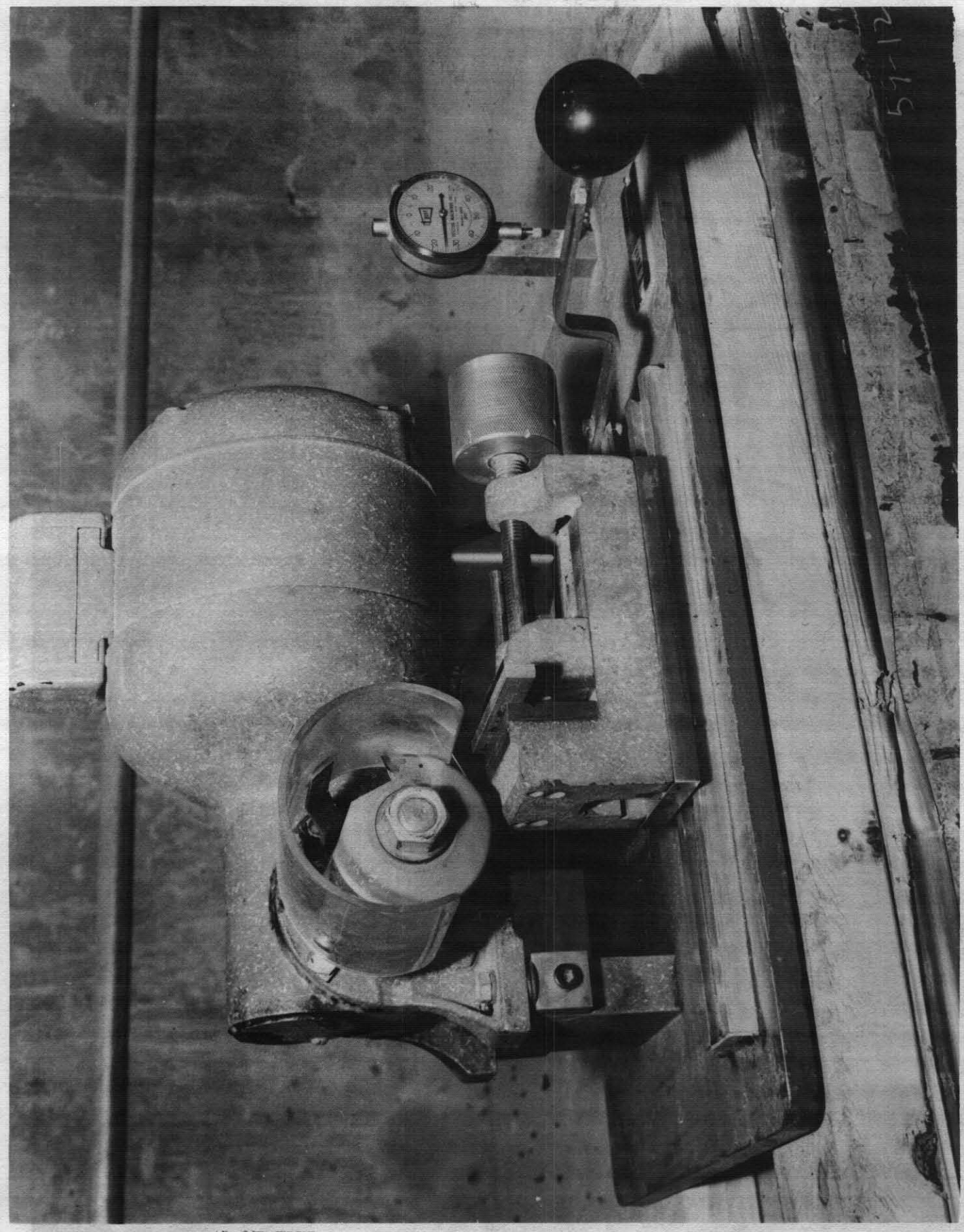


Fig. 20



REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

4.2.5 "Tensilkut" Lathe and Template

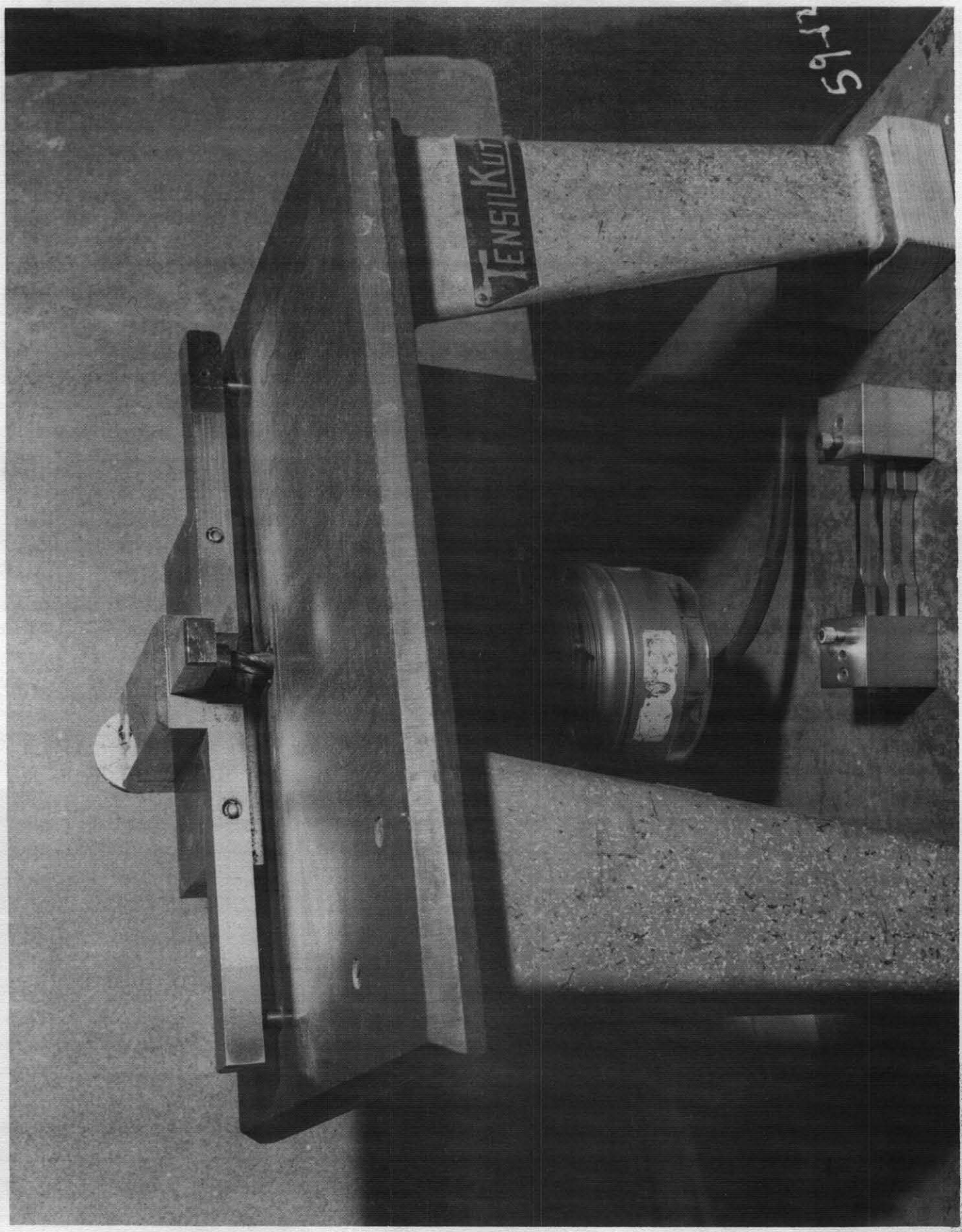
The standard Tensile Specimen Template, for use with the "Tensilkut" Lathe, is designed for a 3/4" wide by approximately 9" long specimen and could not be used for Bars 4.75" in length.

A special template was ordered which cut a tensile specimen with a flat section length of 1-1/2" allowing a gage length of 1" to 1-1/4". This allowed only 1-3/8" x 1/2" for gripping area and was recognized as being inadequate. Heavy clamping pressures were necessary to prevent slippage. Even so a considerable percentage of breaks occurred in or too near the necked areas.

Figure 9, Page 7A illustrates the template and tensile specimens.

Figure 21, Page 18A is a photograph of the Tensilkut Lathe.

Fig. 21



4.3 Test Equipment and Procedures

4.3.1 Weight Loss, Specific Gravity and Shrinkage

These properties were taken on the uncut panels.

The molded test panels, ground and sanded to 1/2 in. thickness, were desiccated and weighed to the nearest .001 gram.

Points across the width and across the length were marked on the panel and measurements of length and width, one dimension each were recorded. Thickness, at the two width points were taken and recorded.

These weights and measurements were repeated on the desiccated panels after post-bake at the same points.

4.3.2 Hardness, Procedure A, (ASTM-D785-65)

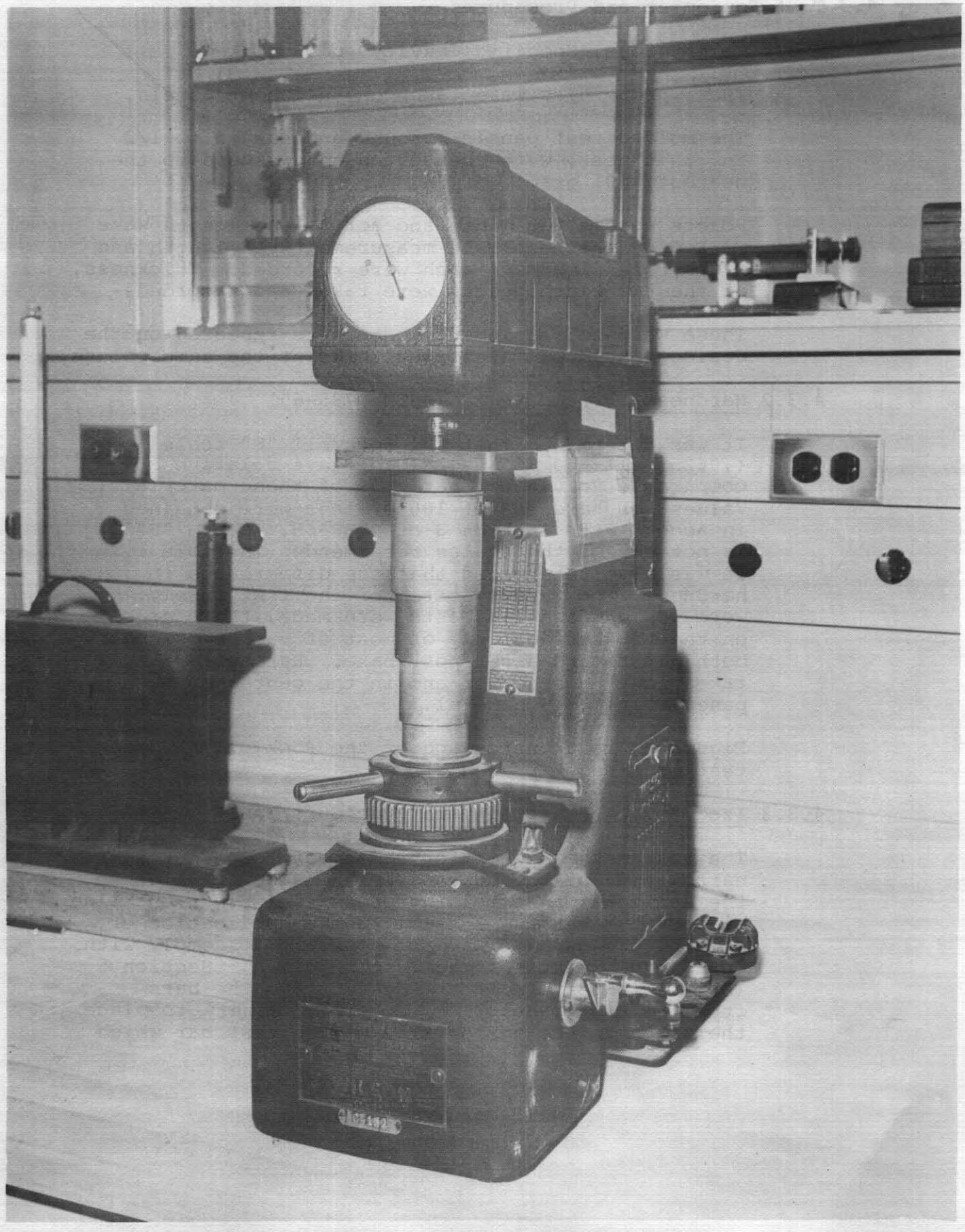
It was determined that the Rockwell "F" scale (.0625 ball--60 KG major load) gave relative and comparable values for hardness of these materials. Values for hardness of 100 or less were obtained in accord with Section 3 of D785-65. Scale "F" is not one of the scales recommended in Table 1. It was also determined that the differences in hardness, top versus bottom of the test panel, were insignificant. Tests were made, therefore, on the top surface only of most of the test panels, both before and after post-bake. Hardness was taken near each corner and in the center of each panel, five points total.

Figure 22 is a photograph of the Rockwell hardness test machine. (page 19A)

4.3.3 Izod Impact Equipment and Procedure (ASTM-D256-56)

The test method calls for the notch to be cut in a narrow side of the bar and in the side parallel to the application of molding pressure. Since the wide side of the bar is parallel to the application of molding pressure it was not possible to comply with both requirements of the test specimen, Section 5 (b). This resulted from edge cutting the bars from the test panel. It was necessary to place the notch in the narrow side of the test bar which

Fig. 22



was perpendicular to the application of molding pressure.

One test bar was used to obtain both notched Izod impact and plain (no-notch) Izod impact. Plain impact was taken on the unnotched end of the test bar. The broken bar was then up ended in the holder and notched impact was taken. The test bar dimension was 3-5/8 in. x 1/2 in. x 1/4 in. The notch was cut 1-3/16 in. from one end. A photograph of the standard Izod impact test machine is shown in Figure 23, page 20A. Capacity of the impact tester using 3 different pendulums is 1, 3, and 10 ft. lbs. The striking speed is 11 ft/sec.

The notcher is shown Figure 17, Page 17D.

4.3.4 Flexural Strength and Flexural Modulus (D790-66) Procedure A

The bar cross-section is 1/2 in. wide x 1/4 in. thickness span was 4 in. (16 to 1 span to depth ratio) and the cross head motion was .10 in./min.

An "Instron" test machine was used which charted cross-head movement versus the load. Modulus was calculated from the chart.

The "Instron" test machine is shown in photograph, Figure 24, Page 20B.

A typical chart showing load at break and the plot for modulus is shown in Figure 25, Page 20C.

4.3.5 Tensile Strength, Tensile Modulus, Elongation ASTM (D638-64T)

In the case of tensile tests, considerable deviation from the dimensions specified in D-638-64T was necessary. Due to mold size the panel and bar length was limited to 4.75 in.

It was decided to use a 1/4 in. x 1/4 in. flat or gage section. The ASTM method calls for a test bar .75 in. wide and 9.2 in. long with a flat

Fig. 23

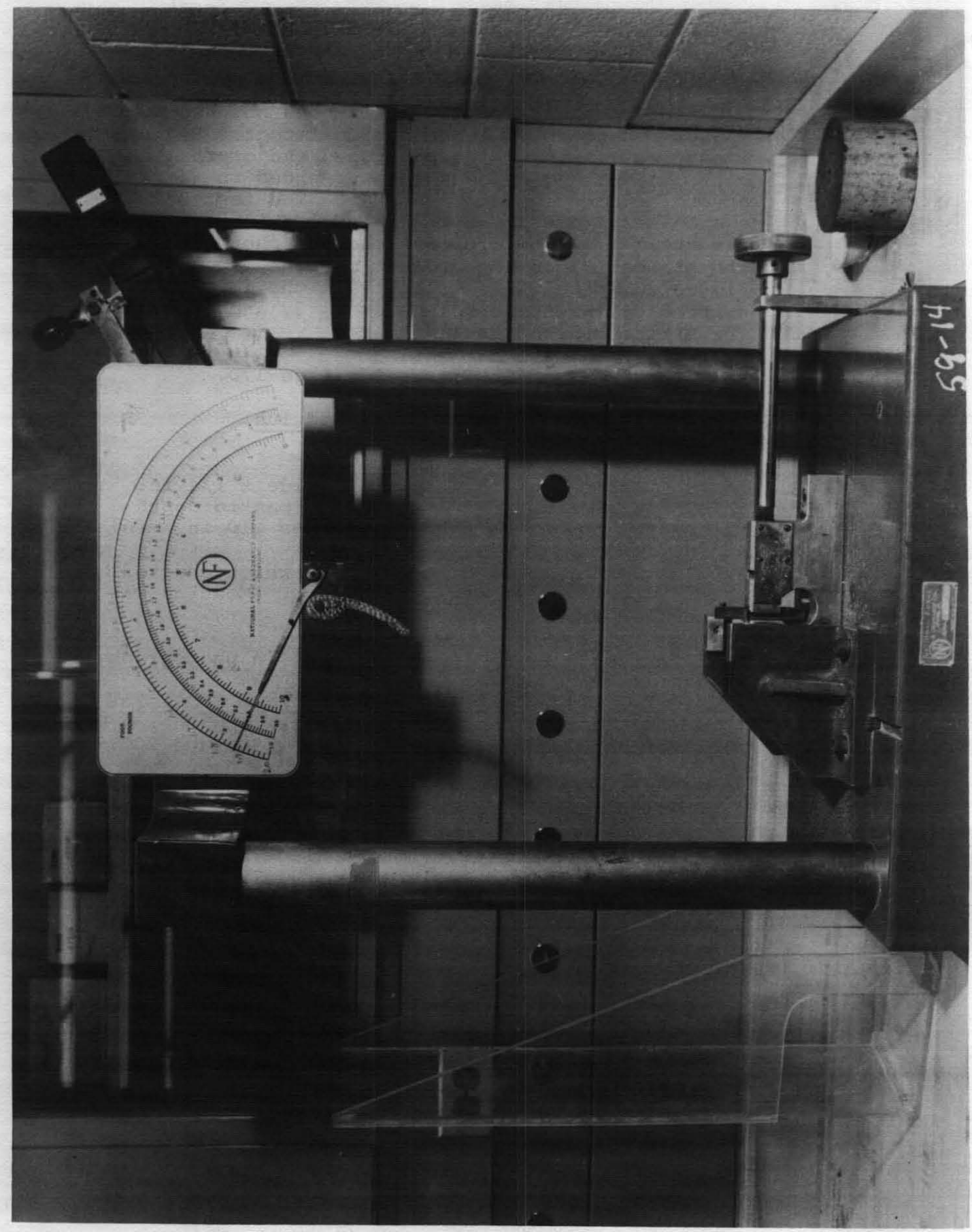


Fig. 24

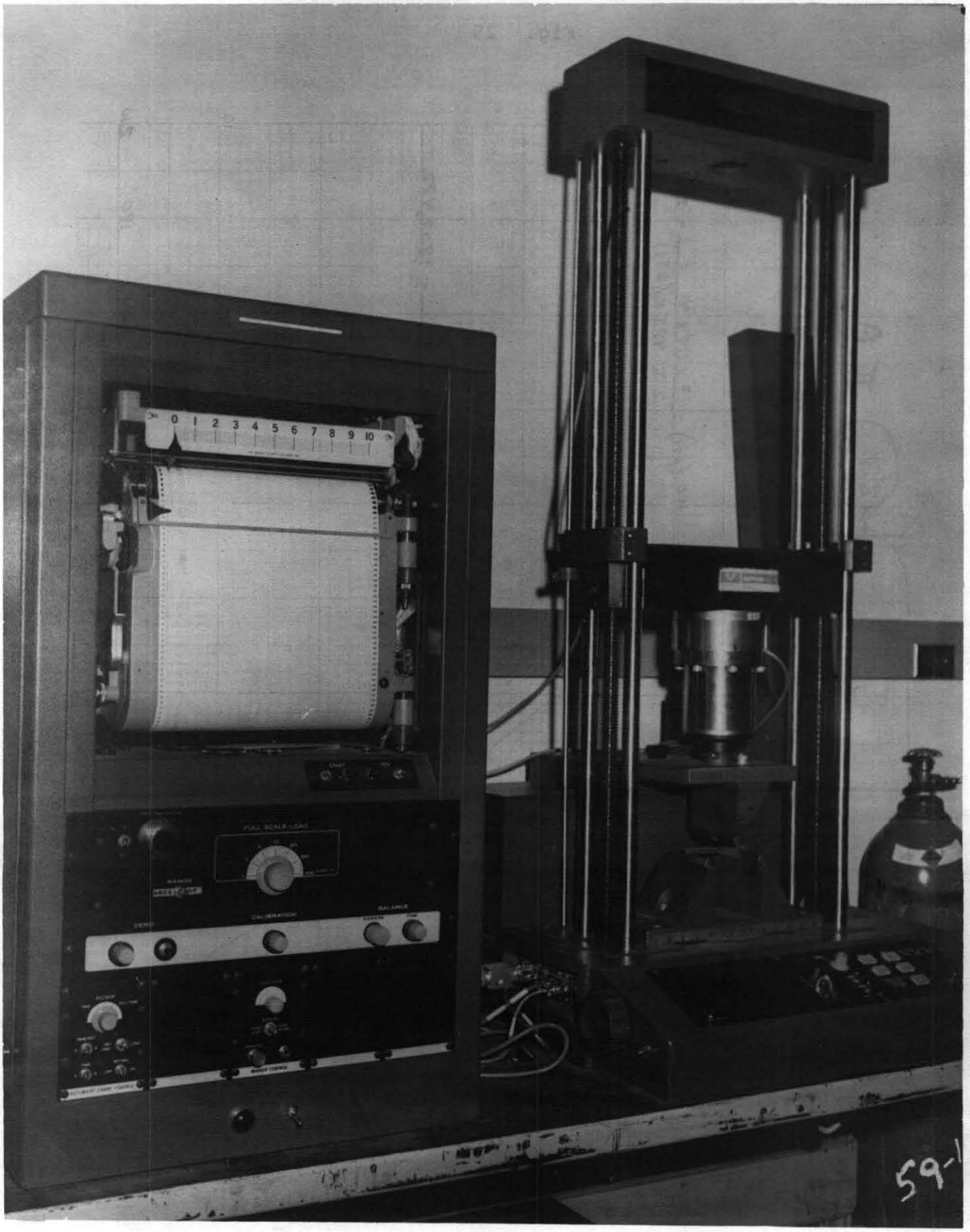
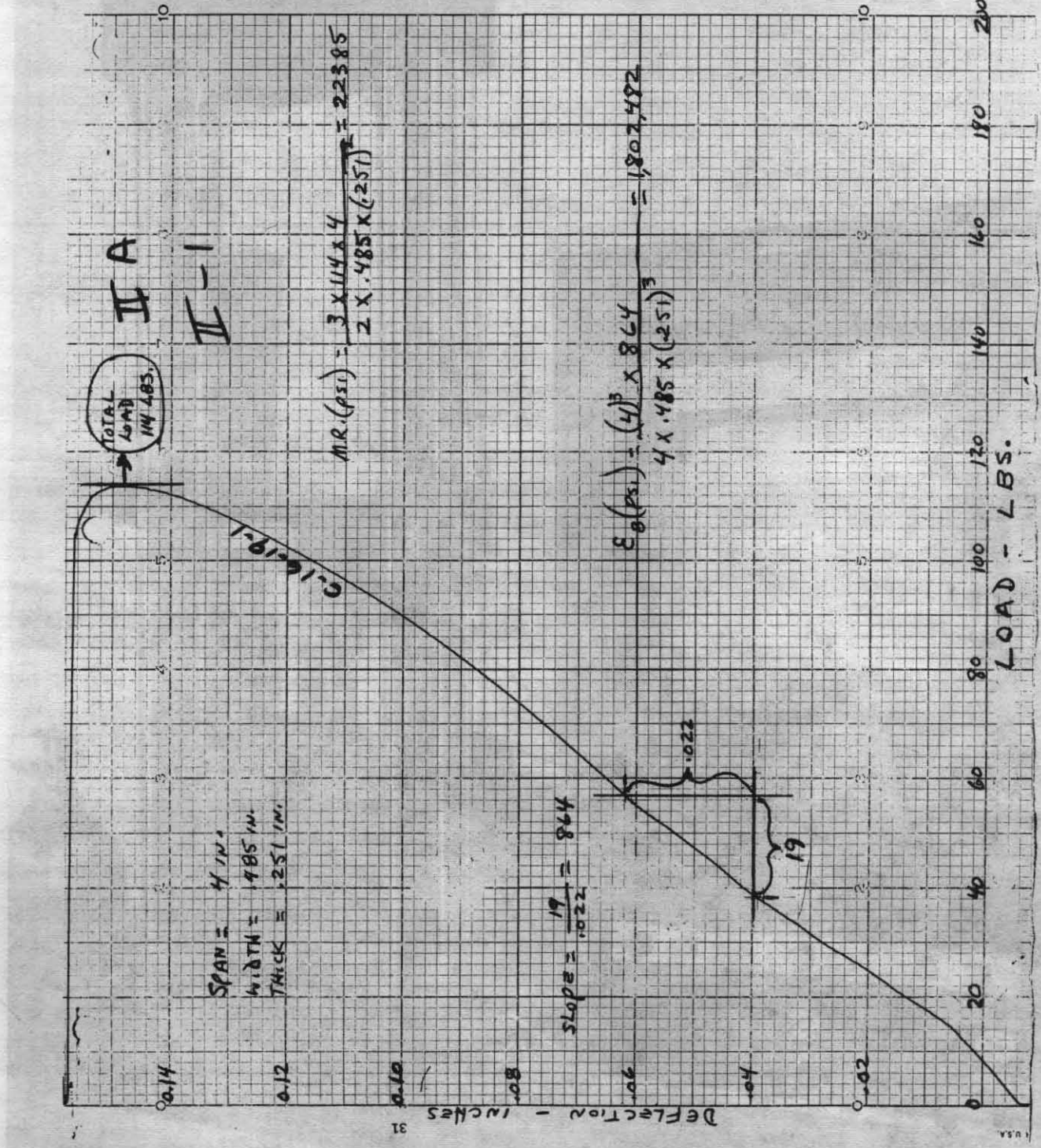


Fig. 25


II A
II-1
TOTAL LOAD IN LBS.
SPAN = 4 IN.
WIDTH = .485 IN.
THICK = .251 IN.
MR.(PSI) = 3 X 114.4 / 2 X .485 X (.251)² = 22385
E_θ(PSI) = (4)³ X 864 / 4 X .485 X (.251)³ = 1,802,482
SLOPE = 19 / .022 = 864
.022
19
LOAD - LBS.
DEFLECTION - INCHES
0
20
40
60
80
100
120
140
160
180
200
.02
.04
.06
.08
.10
.12
.14

section 2.25 in. long (for 1/4 in. x 1/4 in.). The most practical tensile bar possible, from a maximum 4.75 in. length yielded a flat section of only 1-1/2 in. length and a clamping area only 1-1/2 in. x 1/2 in.

We were able to increase clamping pressures to the point where slippage did not occur. Approximately 25 percent of the breaks occurred in the necked or shoulder area and 2.8 percent failed under the clamps. Reasonable test values were recorded and none were rejected simply because the break did not occur in the flat or gage area.

These data are considered valid in this study, i.e., a comparison of molding methods and the effect of changes in post-brake times and temperatures.

The gage distance for modulus and elongation data was 1.0 in. The data from the extensometer was read and recorded manually and elongation and modulus calculated there from. The extensometer used was not Instron, but one manufactured by F. F. Metzger and Son, Philadelphia. Extension was read from a dial gage to the nearest .0001".

Cross head rate was in accordance with speed "A" of ASTM D-638, i.e., 0.05"/minute.

SECTION 5

TEST DATA

5.1 Computer Print-Out Sheets. (Appendix I)

All measurements, weights, test values and calculations are given on these sheets.

5.1.1 Panel Data

This series of read-out sheets contains original data and calculations leading to specific gravity, shrinkage, weight loss and hardness of as-molded vs. post-baked test panels.

For glass phenolic, Task I, there is a sheet for each of 3 lots (identifying time in oven) in two series (identifying oven temp.) Each of the 6 sheets contain data on the 5 molding methods. For asbestos phenolic, Task IIA, there is a sheet for 4 lots per series in 3 series. Each of the 12 sheets contain (comparative) data on 4 or 5 molding methods.

5.1.2 Bar Data

This series of read-out sheets contains original data and calculations for flexural strength and flexural modulus; tensile strength and tensile modulus; elongation; and izod impact strength, both notched and plain.

In this case there is a sheet for each of 3 lots per series, in two series, for each of 5 different molding methods for glass phenolic (30 sheets), and for each of 4 lots/series in 3 series, for each of 4 to 5 molding methods for asbestos phenolic (55 sheets).

5.1.3 Lot and Series Identification

Each computer print-out sheet is headed by Lot and series identification. A clarification summary is given as follows:

Glass Phenolic (Repeated for 5 molding methods)		Oven Temperatures 200	250	300	350
Lot 1, Series I	Post	3	8	24	0
Lot 2, Series I	Bake	3	8	48	0
Lot 3, Series I	Time (Hours)	3	8	96	0
Lot 1, Series II	Post	3	8	8	24
Lot 2, Series II	Bake	3	8	8	48
Lot 3, Series II	Time (Hours)	3	8	8	96

Asbestos Phenolic (Repeated for 4 or 5 molding methods)		Oven Temperatures 250	300	350	400
Lot 1, Series I,	Post	3	8	0	0
Lot 2, Series I	Bake	3	24	0	0
Lot 3, Series I	Time (Hours)	3	48	0	0
Lot 4, Series I		3	96	0	0

Test Data
(Continued)

		Oven Temp			
		250	300	350	400
Lot 1, Series II,	Post	3	3	8	0
Lot 2, Series II	Bake	3	3	24	0
Lot 3, Series II	Time (Hours)	3	3	48	0
Lot 4, Series II		3	3	96	0
Lot 1, Series III	Post	3	3	3	8
Lot 2, Series III	Bake	3	3	3	24
Lot 3, Series III	Time (Hours)	3	3	3	48
Lot 4, Series III		3	3	3	96

TEST DATA

5.1.4 Panel and Bar Identification

Typical identification is as follows:

Panel	C-G-08	C-16-08
Bar	C-G-08-1	C-16-08-1
	C-G-08-2	C-16-08-2

Each panel and bar contained:

a. Molding Method Identification in the First Position:
C = Compression Molding
C-1= Compression Molding with Extended De-Gas
D = Compression with Directional Heat Flow
V = Compression with Vacuum
DV = Compression with Combined Directional Heat Flow and Vacuum

b. Material Identification in Second Positions

G = Glass Phenolic
16 = Asbestos Phenolic (Lot 16)

c. Panel Number (as molded) in Third Position:

Start with Panel 1 (up to 58)

d. Bar Number in the Fourth Position:

There were 16 Bars from 2 panels for each series of mechanical tests, including 4 Bars for flex and flex modulus, 4 for tensile and tensile modulus, 4 for elongation and 4 for impact. Elongation was obtained from the tensile modulus data so 4 spare Bars were available. For computer card simplification, the numbers one and two only identified the Bars. These 2 Bars were tied on to the test and to a certain panel and could thus be followed in the testing and calculations.

TEST DATA

5.1.5 Data Summaries; Panel Data; Thermal Properties

Data from the computer print-out (Appendix I) of panel tests is summarized in Tables and Charts 8 through 11.

These Data compare the effect of Molding Method and Post Bake Temperatures on thermal properties; Chart Group A. Comparison of effect of post bake Time and Temperature on thermal properties is shown in Chart Group B.

The thermal properties tested included:

1. Shrinkage on post cure
2. Specific Gravity as molded and post cured
3. Hardness - as molded and post cured
4. Weight loss during post cure

Conclusions and observations concerning these data will be given in Section 6.

As can be seen from the tables, data for Chart Group A was obtained by averaging the test results from each molding method vs. post-bake oven temperature (series). Time in the oven is handled as constant in order to obtain a comparison of the effect on properties of molding method, material, and molding temperature.

In Chart Group B an attempt is made to determine the effect of changes in cure schedule and temperature for each material, regardless of molding method. Test results were averaged for all molding methods (not including C-1 Method) at each oven time schedule (Lot No) for the scheduled oven temperature (Series No.) This gives us a look at what happens to the properties for each material as the time in the oven and oven temperature is changed.

It is recognized the above methods of handling the data to arrive at our objective can be questioned. For these reasons the raw data (computer print out) is included. The reader can thus plot and handle it otherwise if desired.

908A - Buff
908A - Green
708A - White

Table No. 8 — THERMAL PROPERTIES — Page No. 25A

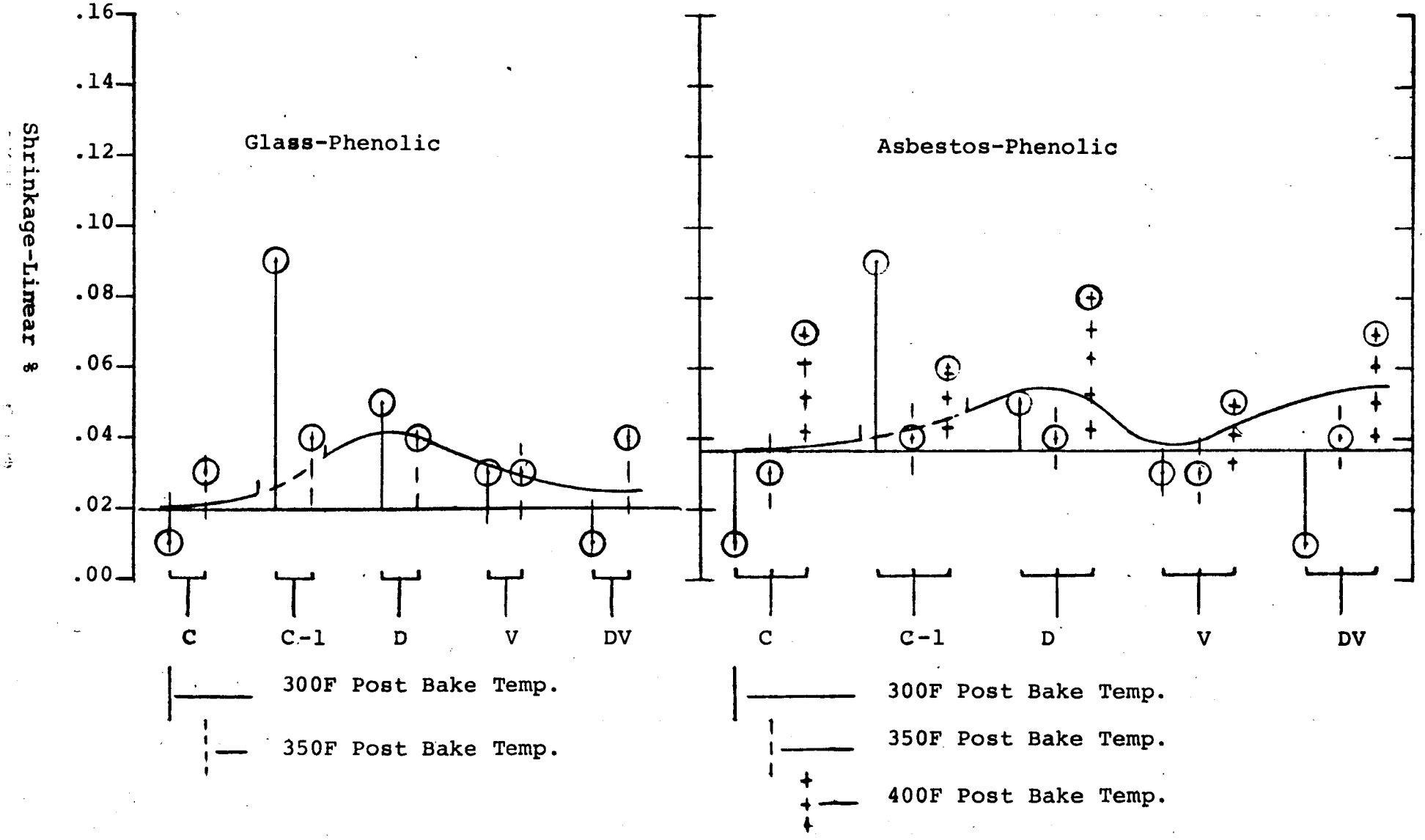
SHRINKAGE DURING P. BAKE - % — PANEL DATA — * Does Not Include C-1 Values

Molding Meth	Series No. And P.Bake Temp.	1 Asbestos Lot No.	1 Post Bake Hours	2 Phenolic Computer: Panel Avg. Lin.	2 Vol.	3 Task IIA Avg.-Each Lot * Lin.	3 Vol.	4 Avg.-Each Mold Meth. Lin.	4 Vol.	5 Glass - Phenolic Lot No.	5 Post Bake Hours	6 Task I Computer: Panel-Avg. Lin.	6 Vol.	7 Avg.-Each Lot * Lin.	7 Vol.	8 Avg.-Each Mold Meth. Lin.	8 Vol.
C	1	1	8	.01	.12	DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A						DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A	
C-1	300 F			--	--												
D				.00	.55	.01	.51										
V				.04	.62												
DV				.01	.75												
C		2	24	.00	.91					1	24	.03	.16				
C-1				.09	1.41							.08	1.23				
D				.04	1.03	.00	.90					.01	.65	.02	.45		
V				.01	.62							.05	.73				
DV				.03	1.02							.07	.58				
C		3	48	.01	1.16			.01	.83C	2	48	.06	.40			.02	.20 C
C-1				.09	1.52			.09	1.47C-1			.06	.59			.06	.83 C-1
D				.05	1.73	.02	1.22	.05	1.18D			.03	1.01	.08	.76	.06	.93 D
V				.01	.82			.03	.83V			.15	.89			.11	.75 V
DV				.01	1.17			.01	1.07DV			.08	.74			.07	.61 DV
C		4	96	.03	1.13					3	96	.04	.37				
C-1				--	--							.05	.68				
D				.12	1.16	.07	1.22					.15	1.12	.10	.66		
V				.07	1.27							.13	.64				
DV				.06	1.33							.06	.51				
C	2	1	8	.01	.13												
C-1	350 F			.07	.54												
D				.01	.62	.02	.48										
V				.04	.77												
DV				.02	.67												
C		2	24	.03	.40					1	24	.05	.49				
C-1				.02	1.45							.09	.16				
D				.05	1.19	.03	.84					.06	.60	.06	.52		
V				.02	.74							.06	.58				
DV				.03	1.02							.07	.41				
C		3	48	.02	.97			.03	.61C	2	48	.05	.31			.08	.47 C
C-1				.06	.58			.04	1.13C-1			.05	.43			.08	.49 C-1
D				.04	1.39	.02	1.19	.04	1.20D			.15	.98	.11	.67	.13	.93 D
V				.00	1.02			.03	.97V			.15	.87			.13	.92 V
DV				.02	1.37			.04	1.07DV			.07	.53			.07	.62 DV
C		4	96	.04	1.20					3	96	.15	.61				
C-1				--	--							.11	.87				
D				.09	1.61	.07	1.34					.19	1.20	.15	1.00		
V				.07	1.34							.17	1.32				
DV				.07	1.22							.08	.86				
C	3	1	8	.02	.57												
C-1	400 F			.07	--												
D				.07	.46												
V				.02	.64	.03	.54										
DV				-.01	.47												
C		2	24	.09	-.04												
C-1				.05	.02												
D				.05	.60	.05	.64										
V				.02	.93												
DV				.03	1.07												
C		3	48	.07	.85			.07	.39 C								
C-1				.11	.39			.06	.21C-1								
D				.08	1.01	.08	.82	.08	.86 D								
V				.07	.81			.05	.89 V								
DV				.08	.62			.07	.88 DV								
C		4	96	.08	.17												
C-1				--	--												
D				.11	1.36	.12	1.02										
V				.10	1.18												
DV				.17	1.35												

SHRINKAGE - LINEAR %
During Post Bake

Chart No. 8A Vs: Molding Method & P. Bake Temp. Page No. 25A-1

Chart Group A
Panel Data - Thermal Properties

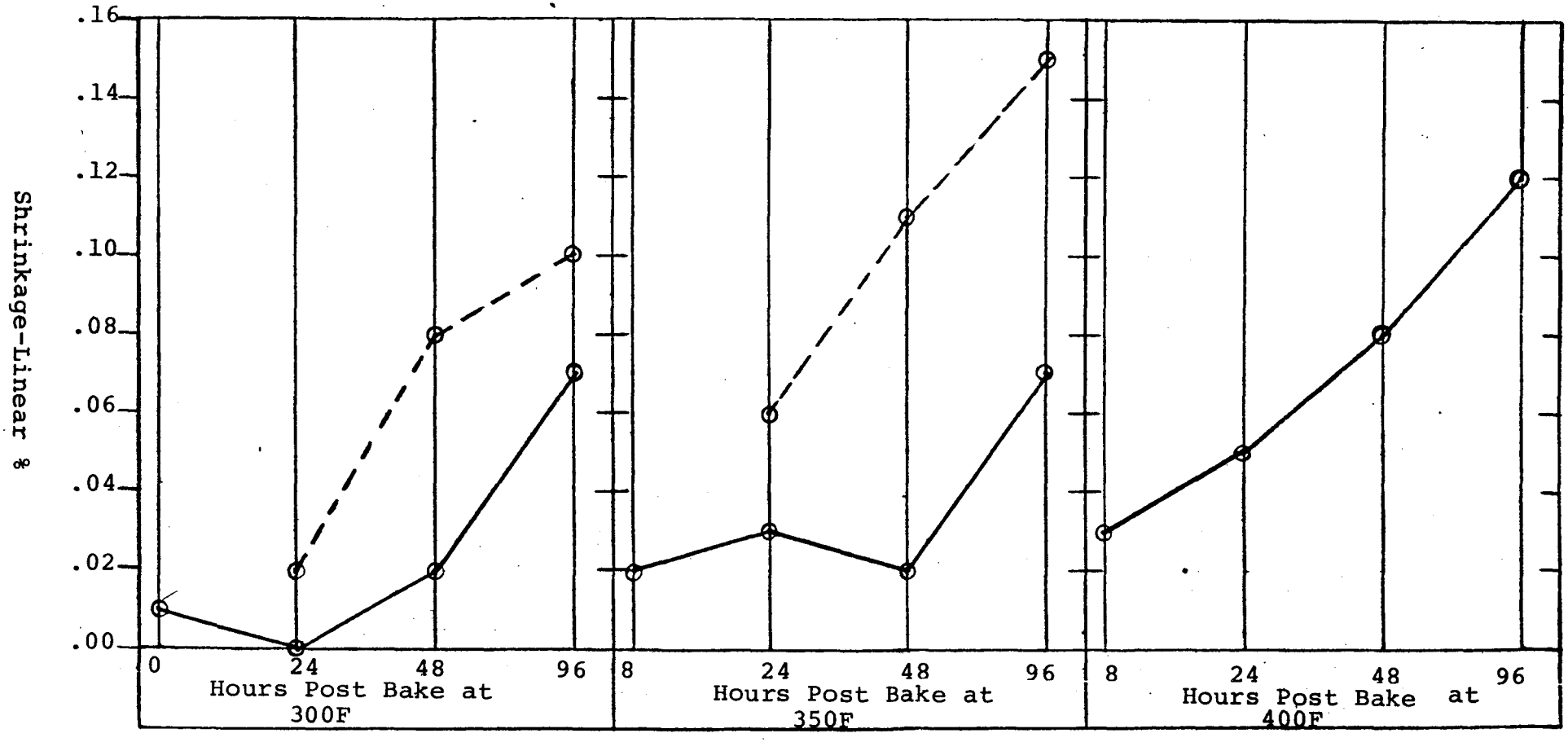


SHRINKAGE - LINEAR - %
During Post Bake

Chart No. 8B

Vs: Average of all panels
at indicated Post-Bake Time & Temp.

Chart Group B
Panel Data - Thermal Properties



KOBA Buff
KOBA Green
KOBA White

Table No. 9 — THERMAL PROPERTIES — Page No. 25B

SPECIFIC GRAVITY — PANEL DATA — *Does Not Include C-1 Values

	Molding Meth	Series No. And P.Bake Temp.	Asbestos - Lot No.	Asbestos - Post Bake Hours	2 Phenolic - Computer: Panel-Avg. As Mold	2 Phenolic - Computer: Panel-Avg. Post Bake	3 Task IIA Avg.-Each Lot * As Mold	3 Task IIA Avg.-Each Lot * Post Bake	4 Avg.-Each Mold Meth. As Mold	4 Avg.-Each Mold Meth. Post Bake	5 Glass - Lot No.	5 Glass - Post Bake Hours	6 Phenolic - Task I Computer: Panel-Avg. As Mold	6 Phenolic - Task I Computer: Panel-Avg. Post Bake	7 Phenolic - Task I Avg.-Each Lot * As Mold	7 Phenolic - Task I Avg.-Each Lot * Post Bake	8 Avg. Each Mold Meth. As Mold	8 Avg. Each Mold Meth. Post Bake
	C	1	1	8	1.870	1.861	DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A						DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A	
	C-1	300 F			--	--												
	D				1.882	1.880	1.878	1.876										
	V				1.873	1.874												
	DV				1.887	1.890												
○-AS MOLDED ◐-P. BAKED	C		2	24	1.875	1.873	○	◐	○	◐	1	24	1.859	1.845	○	◐		
	C-1				1.888	1.889							1.888	1.898				
	D				1.887	1.887	1.886	1.885					1.858	1.857	1.857	1.854		
	V				1.890	1.885							1.854	1.859				
	DV				1.893	1.894							1.857	1.856				
	C		3	48	1.872	1.868			1872	1865C	2	48	1.853	1.846			1858	1847C
	C-1				1.887	1.890			1888	1890C-1			1.892	1.891			1895	1880C-1
	D				1.875	1.880	1.881	1.879	1882	1878D			1.856	1.859	1.858	1.858	1852	1851D
	V				1.884	1.879			1882	1878 V			1.867	1.871			1862	1864V
	DV				1.892	1.890			1892	1891DV			1.857	1.857			1861	1857DV
	C		4	96	1.871	1.859					3	96	1.863	1.851				
	C-1				--	--							1.906	1.903				
	D				1.882	1.866	1.883	1.872					1.841	1.837	1.860	1.858		
	V				1.881	1.875							1.866	1.861				
	DV				1.895	1.889							1.870	1.859				
	C	2	1	8	1.878	1.848												
	C-1	350 F			1.893	1.885												
	D				1.878	1.868	1.880	1.868										
	V				1.872	1.868												
	DV				1.898	1.887												
	C		2	24	1.868	1.837					1	24	1.860	1.855				
	C-1				1.903	1.904							1.904	1.894				
	D				1.887	1.879	1.883	1.868					1.858	1.851	1.859	1.852		
	V				1.886	1.874							1.854	1.849				
	DV				1.892	1.883							1.864	1.854				
	C		3	48	1.875	1.885			1873	1854C	2	48	1.866	1.846			1860	1848C
	C-1				1.895	1.876			1900	1888C-1			1.907	1.897			1903	1893C-1
	D				1.886	1.870	1.884	1.876	1881	1870D			1.860	1.852	1.861	1.851	1858	1849D
	V				1.885	1.870			1881	1868V			1.853	1.848			1850	1847V
	DV				1.895	1.880			1899	1877DV			1.873	1.852			1867	1851DV
	C		4	96	1.869	1.844					3	96	1.861	1.844				
	C-1				--	--							1.897	1.889				
	D				1.881	1.861	1.879	1.865					1.857	1.844	1.867	1.847		
	V				1.881	1.858							1.845	1.843				
	DV				1.884	1.868							1.865	1.850				
	C	3	1	8	1.870	1.858												
	C-1	400 F			--	--												
	D				1.881	1.864	1.884	1.870										
	V				1.881	1.870												
	DV				1.886	1.868												
	C		2	24	1.872	1.854												
	C-1				1.900	1.883												
	D				1.880	1.864	1.885	1.865										
	V				1.879	1.859												
	DV				1.884	1.865												
	C		3	48	1.875	1.859			1872	1827C								
	C-1				1.900	1.883			1901	1863C-1								
	D				1.890	1.869	1.885	1.865	1887	1869D								
	V				1.886	1.869			1883	1861V								
	DV				1.897	1.865			1896	1875DV								
	C		4	96	1.874	1.854												
	C-1				--	--												
	D				1.888	1.856	1.884	1.847										
	V				1.886	1.854												
	DV				1.888	1.861												

Chart No. 9A

SPECIFIC GRAVITY VS MOLDING METHOD & POST BAKE TEMP.

Chart Group A
Panel Data - Thermal Properties

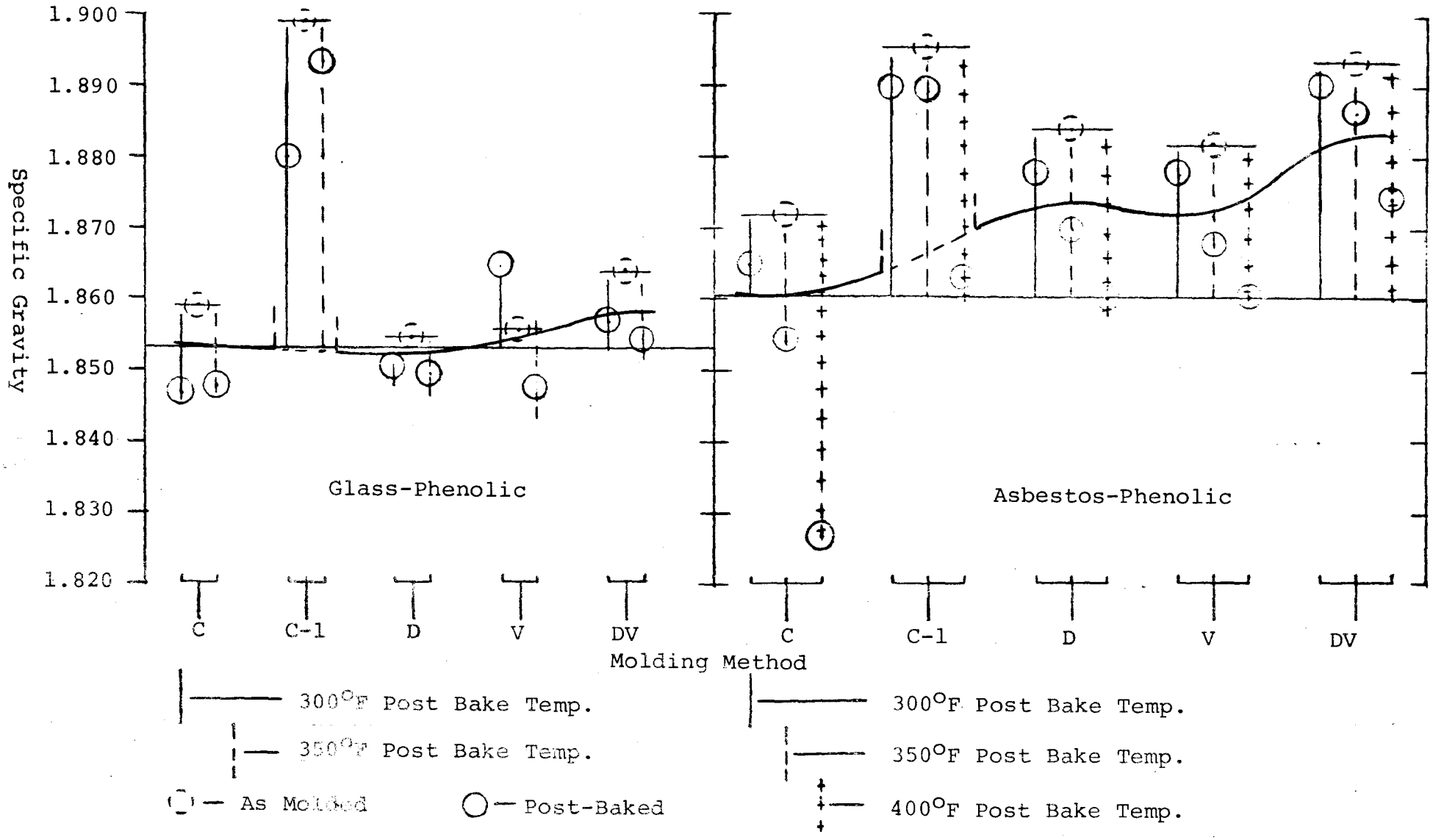
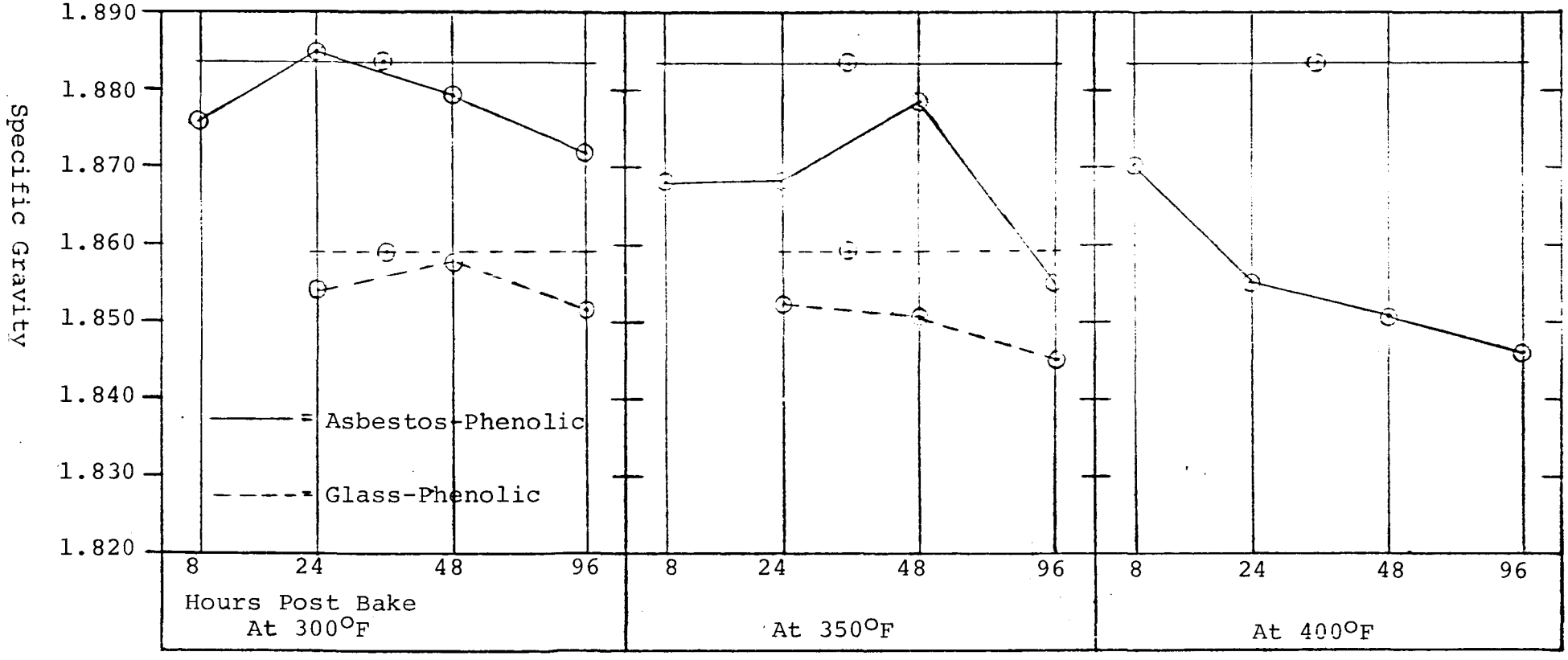


Chart No. 9B

SPECIFIC GRAVITY
VS AVERAGE OF ALL PANELS AT INDICATED
POST-BAKE TIME & TEMP.

Chart Group B
Panel Data - Thermal Properties



- As Molded

o - Post-Baked

KOBA - Buff
KOBA - Green
KOBA - White

Table No. 10 — THERMAL PROPERTIES — Page No. 25C

rockwell hardness (F-SCALE) — PANEL DATA — *Does Not Include C-1 Values

	Mold Meth od	Series No. And P. Bake Temp.	1 Asbestos - Lot No.	Post Bake Hours	2 Phenolic Computer : Panel Avg. As Mold	P.Bake	3 Task IIA Avg. Each Lot * As Mold	P.Bake	4 Avg. - Each Mold Meth. As Mold	P.Bake	5 Glass - Lot No.	Post Bake Hours	6 Phenolic Computer : Panel Avg. As Mold	Post Bake	7 Task I Avg. Each Lot * As Mold	Post Bake	8 Avg. - Each Mold Meth. As Mold	Post Bake
	C	1	1	8	79	88	DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A						DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A	
	C-1	300 F			--	--												
	D				74	85	77	85										
	V				77	87												
	DV				76	83												
I-AS MOLDED O-P. BAKED	C		2	24	76	85					1	24	94	110				
	C-1				79	91							101	109				
	D				76	86	77	87					95	108	96	109		
	V				80	88							98	109				
	DV				77	87							96	107				
	C		3	48	72	87			76	88 C	2	48	96	107			96	108C
	C-1				80	93			80	92 C-1			99	109			100	109C-1
	D				75	87	77	89	75	86 D			94	110	96	109	94	109D
	V				82	92			80	90 V			98	108			98	109V
	DV				77	89			76	87 DV			94	108			94	108DV
	C		4	96	77	90					3	96	97	108				
	C-1				--	--							100	110				
	D				74	87	77	90					94	109	95	109		
	V				80	92							98	110				
	DV				75	89							91	109				
	C	2	1	8	76	89												
	C-1	350 F			81	91												
	D				73	88	76	89										
	V				79	91												
	DV				75	89												
	C		2	24	76	88					1	24	98	108				
	C-1				78	92							101	109				
	D				74	89	75	89					95	111	95	110		
	V				76	91							98	111				
	DV				73	89							92	111				
	C		3	48	77	90			76	90 C	2	48	97	109			95	109C
	C-1				80	94			80	92 C-1			99	106			101	108C-1
	D				70	88	75	91	73	89 D			94	109	95	109	95	111D
	V				82	92			78	92 V			97	108			97	110V
	DV				72	92			74	91 DV			91	109			91	110DV
	C		4	96	75	93					3	96	95	110				
	C-1				--	--							102	109				
	D				73	91	75	93					95	112	94	111		
	V				75	94							96	112				
	DV				74	93							89	111				
	C	3	1	8	74	89												
	C-1	400 F			--	--												
	D				74	91	75	91										
	V				73	90												
	DV				79	92												
	C		2	24	73	91												
	C-1				80	94												
	D				75	93	76	93										
	V				78	94												
	DV				79	94												
	C		3	48	74	94			74	92 C								
	C-1				81	96			81	95 C-1								
	D				73	95	75	95	74	94 D								
	V				78	95			75	94 V								
	DV				76	95			78	94 DV								
	C		4	96	74	94												
	C-1				--	--												
	D				75	95	74	96										
	V				72	98												
	DV				76	96												

Chart No. 10A

ROCKWELL HARDNESS - F SCALE VS MOLDING METHOD & PAST BAKE TEMP.

Chart Group A
Panel Data - Thermal Properties

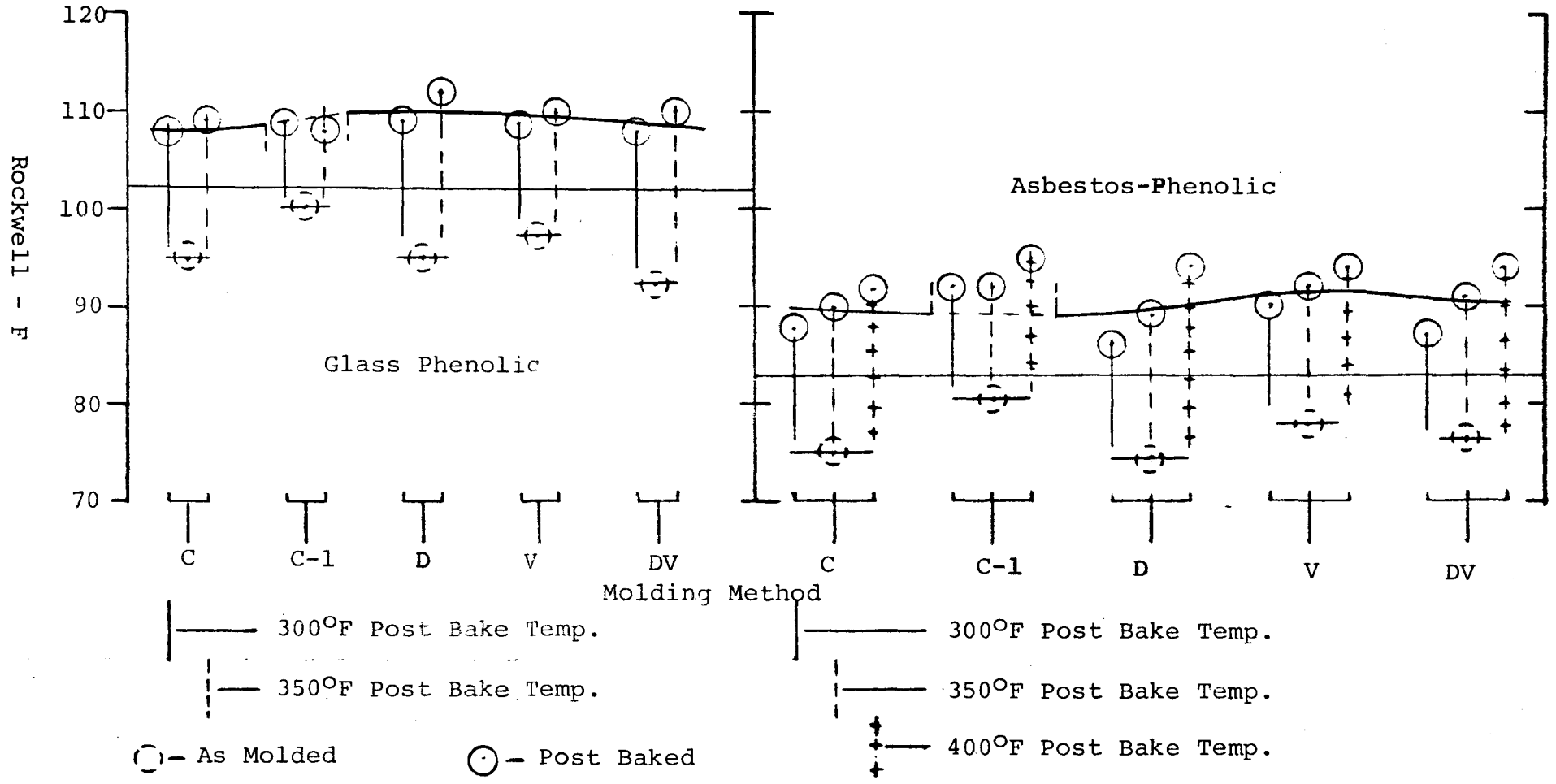
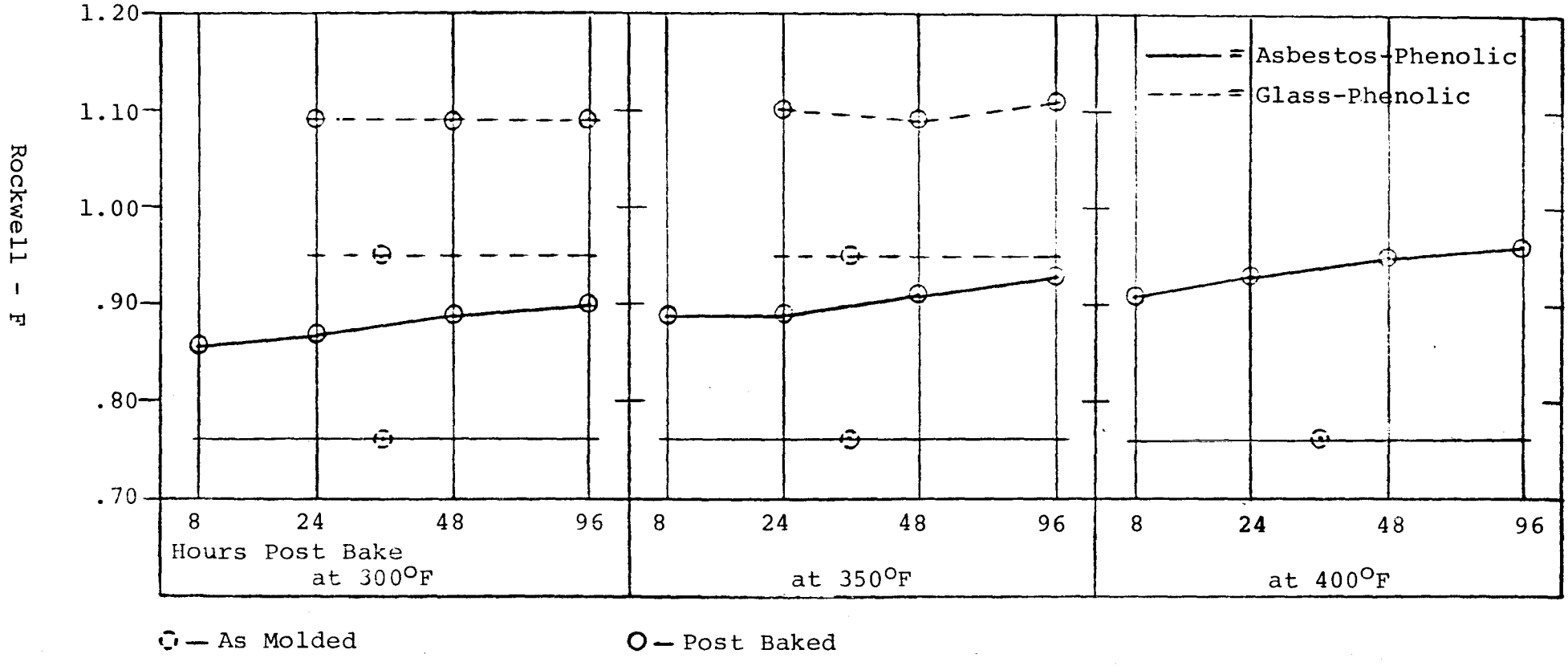


Chart No. 10B

Page No. 25C-2

ROCKWELL HARDNESS - F-SCALE
VS AVERAGE OF ALL PANELS AT INDICATED
POST-BAKE TIME & TEMP.

Chart Group B
Panel Data - Thermal Properties



A Buff
A Green
A White

Table No. 11 — THERMAL PROPERTIES — Page No. 25D

WEIGHT LOSS (%) (ON P. BAKE) — PANEL DATA — *Does Not Include C-1 Values

		1	2	3	4	5	6	7	8
Molding Meth	Series No. And P.Bake Temp.	Asbestos - Lot No.	Asbestos - Post Bake Hours	Phenolic - Computer: Panel-Avg. As Mold	Task IIA Avg. - Each Lot * As Mold P.Bake	Avg.-Each Mold Meth As Mold P.Bake	Glass - Lot No.	Glass - Post Bake Hours	Phenolic - Computer Panel-Avg. As Mold	Phenolic - Computer Panel-Avg. As Post Bake	Task I Avg. - Each Lot * As Mold	Task I Avg. - Each Lot * As Post Bake	Avg. - Each Mold Meth As Mold	Avg. - Each Mold Meth As Post Bake
C	1	1	8	.60	DATA FOR CHART GRP. - B	DATA FOR CHART GRP. - A					DATA FOR CHART GRP. - B		DATA FOR CHART GRP. - A	
C-1	300 F			--										
D				.68	.61									
V				.58										
DV				.59										
C		2	24	1.01			1	24	.55					
C-1				1.37					.67					
D				1.06	.98				.70	.58				
V				.87					.45					
DV				.97					.60					
C		3	48	1.34		1.18C	2	48	.79				.80 C	
C-1				1.39		1.38C-1			.64				.73C-1	
D				1.44	1.29	1.29D			.83	.77			.95 D	
V				1.13		1.04V			.69				.68 V	
DV				1.26		1.11DV			.78				.82 DV	
C		4	96	1.75			3	96	1.05					
C-1				--					.88					
D				1.96	1.37				1.33	1.09				
V				1.58					.90					
DV				1.70					1.09					
C	2	1	8	1.43										
C-1	350 F			.91										
D				1.13	1.13									
V				.99										
DV				.96										
C		2	24	2.03			1	24	.82					
C-1				1.40					.70					
D				1.56	1.62				.99	.88				
V				1.18					.78					
DV				1.50					.94					
C		3	48	2.01		2.01C	2	48	1.14				1.15 C	
C-1				1.92		1.41C-1			.95				.98C-1	
D				2.19	1.99	1.89D			1.36	1.20			1.42 D	
V				1.82		1.69V			1.06				1.10 V	
DV				1.93		1.74DV			1.24				1.28 DV	
C		4	96	2.55			3	96	1.49					
C-1				--					1.28					
D				2.66	2.59				1.91	1.63				
V				2.55					1.45					
DV				2.58					1.66					
C	3	1	8	1.51										
C-1	400 F			--										
D				1.40	1.31									
V				1.25										
DV				1.37										
C		2	24	3.06										
C-1				1.91										
D				2.10	2.23									
V				1.94										
DV				1.83										
C		3	48	3.28		2.79C								
C-1				2.36		2.14C-1								
D				2.66	2.61	2.31D								
V				2.32		2.05V								
DV				2.27		2.04DV								
C		4	96	3.29										
C-1				--										
D				3.07										
V				2.79	3.03									
DV				2.97										

Chart No. 11A

WEIGHT LOSS DURING POST-BAKE - % VS MOLDING METHOD & POST-BAKE TEMP.

Chart Group A
Panel Data - Thermal Properties

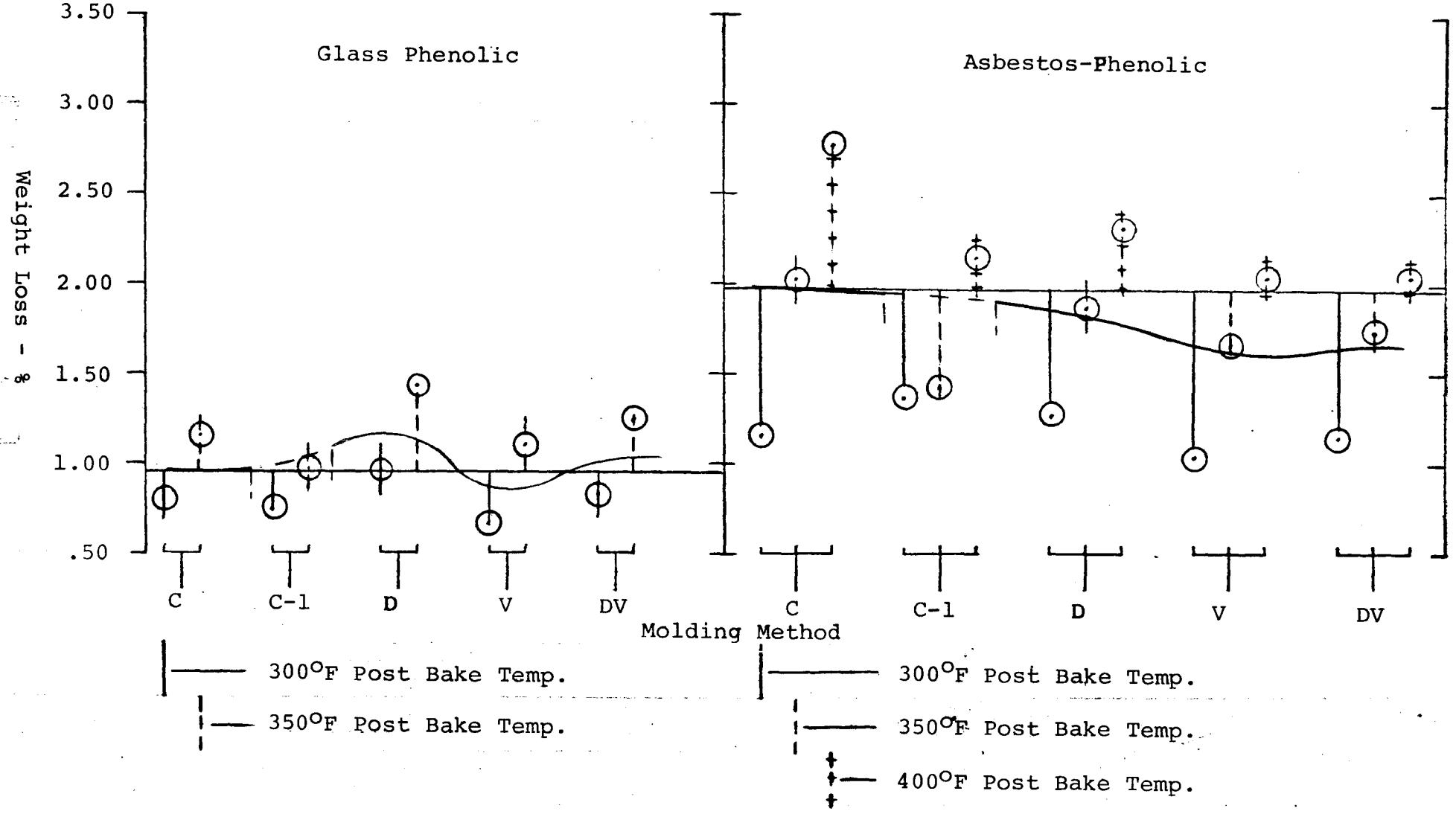
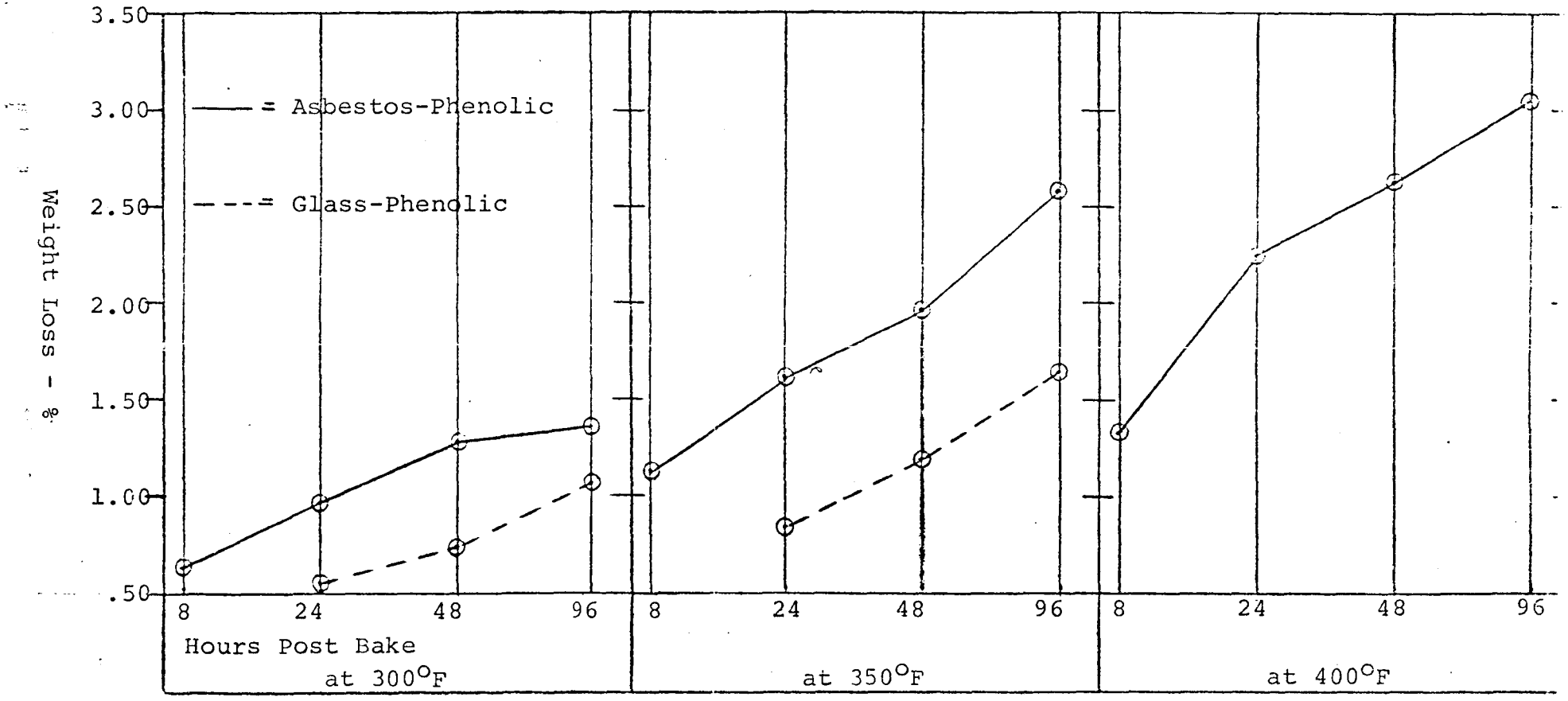


Chart No. 11B

WEIGHT LOSS DURING POST BAKE - %
VS AVERAGE OF ALL PANELS AT INDICATED
POST-BAKE TIME & TEMP.

Chart Group B
Panel Data - Thermal Properties



5.1.5 (Con't) Horizontal "Reference Lines" on charts of Group "A" were arbitrarily located by drawing them through the average of the data points for conventional compression molding.

The wavy "Trend Lines" on Charts of Group "A" were established by drawing a smooth curve through the averages of the data points for each mold method. These lines may help to assess the effect of each molding method on the property in question. This line is not drawn through the averages of the Cl method because the results are from a different material lot number in the case of the Glass-Phenolic.

5.1.6 Data Summaries: Bar Data: Mechanical Properties

Data from the computer print-out of tests of Bars cut from the panels under 5.1.5 is summarized in Tables and Charts 12 through 18. These data compare the effect of Molding Method and Post Bake Temperatures on mechanical properties, Chart Group A. In Chart Group B a comparison of the effect of Post Bake Time and Temperature on mechanical properties is made.

The remarks in Paragraph 5.1.5, Thermal Properties, concerning the means of arriving at the data for Chart Group A and Chart Group B apply also to Paragraph 5.1.6, Mechanical Properties.

A - Buff
A - Green
A - White

Table No. 12 — MECHANICAL PROPERTIES — Page No. 26A

FLEXURAL STRENGTH - P.S.I. — BAR DATA — *Does Not Include C-1 Values

	1	2	3	4	5	6	7	8
	Series No. &	Asbestos-Phenolic - Task IIA				Glass-Phenolic - Task I		
Mold Metn-	P.Bake Temp.	Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Ea. Mold Meth.	Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Ea. Mold Meth.
C	1	1	8	24534	Data For Chart GRP. B	Data For Chart GRP. A					
C-1	300°F			---							
I				22422	23665						
V				24808							
DV				22898							
C		2	24	24600			1	24	25680	Data for Chart GRP. B	Data for Chart GRP. A
C-1				30679					29688		
D				24139	24832				20543	22475	
V				25395					21617		
DV				25189					21061		
C		3	48	24816		25147 C	2	48	20678		22643 C
C-1				32200		31439 C-1			27969		27300 C-1
D				19867	23590	22108 D			20113	20925	19667 D
V				25941		24897 V			26846		23250 V
DV				23731		23527 DV			15996		17125 DV
C		4	96	26448			3	96	21573		
C-1				---					24242		
D				22003	23525				18376	18900	
V				23372					21288		
DV				22290					14364		
C	2	1	8	23558							
C-1	350°F			27388							
D				23616	23361						
V				23464							
DV				22708							
C		2	24	26725			1	24	15886		
C-1				27620					27185		
D				25717	26477				20490	17500	
V				25329					18871		
DV				25129					14683		
C		3	48	26863		25651 C	2	48	20302		18229 C
C-1				27721		27578 C-1			21520		24925 C-1
D				27497	27480	25981 D			18273	17750	19141 D
V				28249		26786 V			17211		18200 V
DV				27308		25827 DV			15222		16074 DV
C		4	96	25459			3	96	18499		
C-1				---					26072		
D				27096	26955				18666	18500	
V				30102					18518		
DV				25163					18318		
C	3	1	8	25024							
C-1	400°F			---							
D				26112	25732						
V				25612							
DV				26194							
C		2	24	25589							
C-1				30113							
D				26789	26285						
V				28049							
DV				24713							
C		3	48	26059		25268 C					
C-1				30253		30183 C-1					
D				25291	26652	26551 D					
V				30015		27952 V					
DV				25251		25701 DV					
C		4	96	24401							
C-1				---							
D				28013	26797						
V				28130							
DV				26646							

Chart No. 12A

vs. - FLEXURAL STRENGTH - P.S.I.
MOLDING METHOD & POST BAKE TEMP.

CHART GROUP A

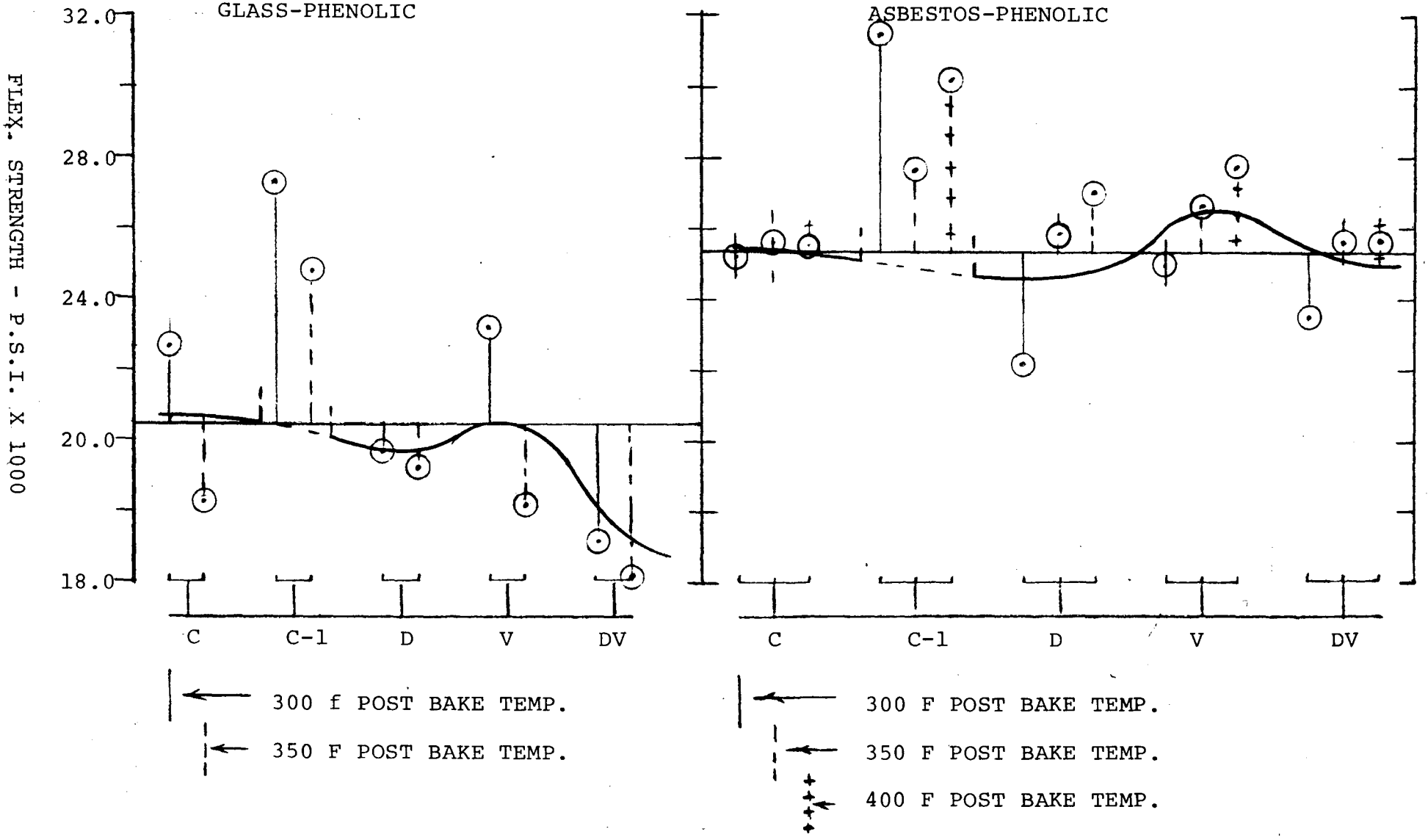


Chart No. 12B

FLEXURAL STRENGTH

VS. - AVG. OF ALL BARS AT INDICATED POST BAKE TIME & TEMP.

CHART GROUP B

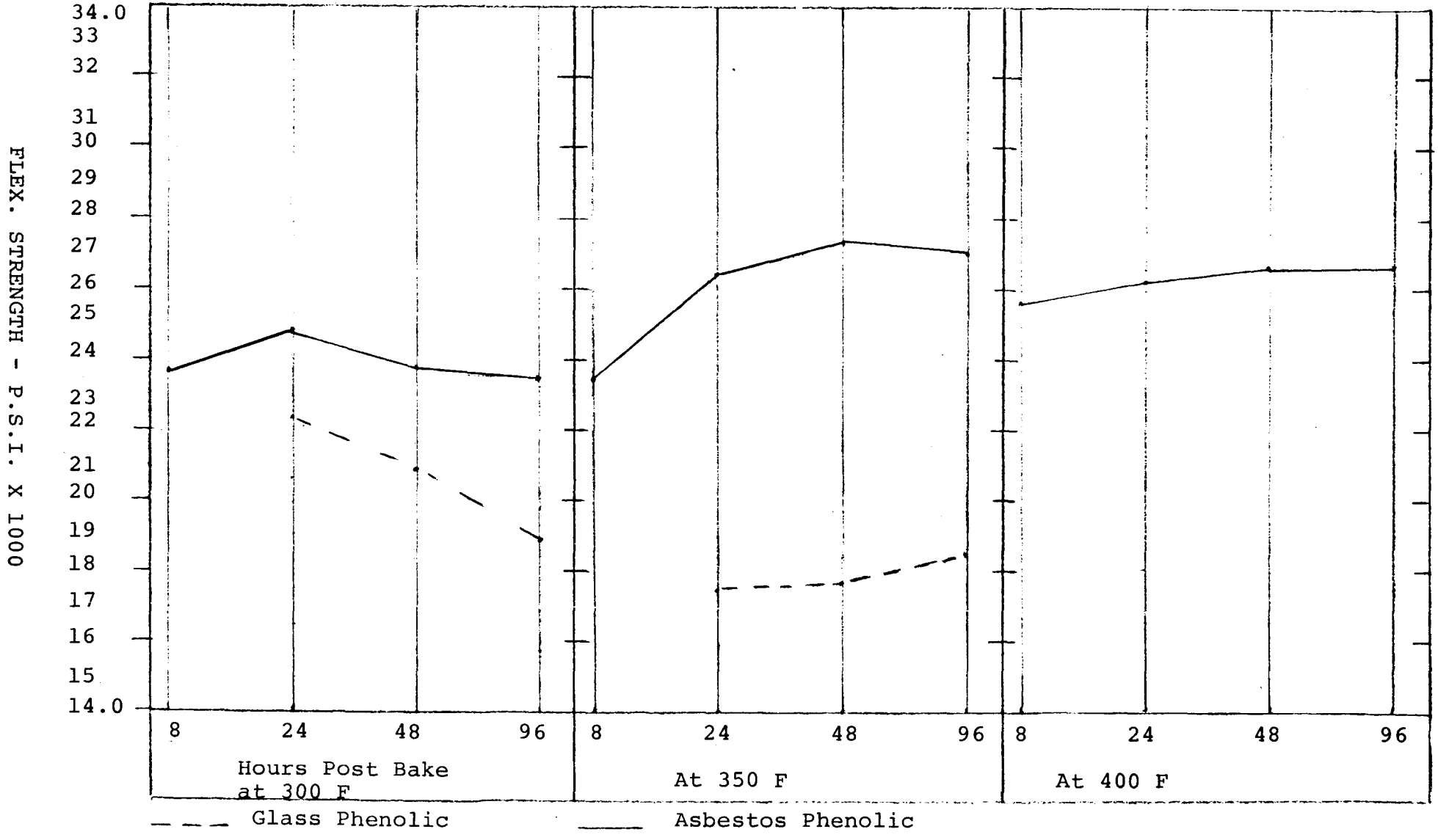


Table No. 13 — **MECHANICAL PROPERTIES** — Page No. 26B

FLEXURAL MODULUS OF ELASTICITY - PSI X 10^6 BAR DATA * Does not include "C-1" Values

		1		2	3	4		5		6	7	8	
Mold Method	Series No And P. Bake Temp.	Asbestos Lot No.	Post Bake Hours	Phenolic Computer Bar Average	Task IIA Average Ea. Lot *	Avg. Each Mold Meth.		Glass-Phenolic - Task I Lot No.	Post Bake Hours	Computer Bar Averages	Average Ea. Lot *	Avg. Each Mold Meth.	
C	1	1	8	2.34	DATA FOR CHART GRP. - B 2.17	DATA FOR CHART GRP. - A							
C-1	300 F			--									
D				2.17									
V				2.21									
DV				1.95									
C		2	24	1.80				1	24	1.98	DATA FOR CHART GRP. - B 1.82	DATA FOR CHART GRP. - A	
C-1				2.38						2.19			
D				1.89	1.85					1.70			
V				1.86						1.76			
DV				1.76						1.62			
C		3	48	1.87		1.95	C	2	48	1.85		1.88	C
C-1				2.51		2.44	C-1			2.03		2.14	C-1
D				1.58	1.71	1.82	D			1.83	1.79	1.73	D
V				1.74		1.94	V			1.94		1.86	V
DV				1.63		1.79	DV			1.56		1.78	DV
C		4	96	1.80				3	96	1.80			
C-1				--						2.19			
D				1.66	1.81					1.66	1.82		
V				1.94						1.87			
DV				1.82						1.96			
C	2	1	8	1.59									
C-1	350 F			2.09									
D				1.78	1.67								
V				1.77									
DV				1.54									
C		2	24	1.98				1	24	1.80			
C-1				1.99						2.31			
D				2.02	1.96					1.83	1.78		
V				1.88						1.88			
DV				1.98						1.62			
C		3	48	2.32		2.02	C	2	48	1.88		1.79	C
C-1				2.69		2.25	C-1			1.80		2.01	C-1
D				2.22	2.26	2.11	D			1.51	1.62	1.63	D
V				2.39		2.21	V			1.63		1.76	V
DV				2.21		1.99				1.45		1.56	DV
C		4	96	2.21				3	96	1.68			
C-1				--						1.93			
D				2.40	2.41					1.62	1.67		
V				2.79						1.76			
DV				2.24						1.61			
C	3	1	8	1.80									
C-1	400 F			--									
D				2.16	2.07								
V				2.32									
DV				2.09									
C		2	24	1.89									
C-1				2.08									
D				1.87	1.94								
V				1.95									
DV				1.97									
C		3	48	1.79		1.85	C						
C-1				2.00		2.34	C-1						
D				1.88	1.92	1.99	D						
V				2.03		2.06	V						
DV				1.99		2.13	DV						
C		4	96	1.90									
C-1				--									
D				2.04	2.01								
V				2.02									
DV				2.06									

Chart No. 13A

FLEXURAL MODULUS OF ELASTICITY - P.S.I.
VS. - MOLDING METHOD & POST BAKE TEMPERATURE

Page No.26B-1

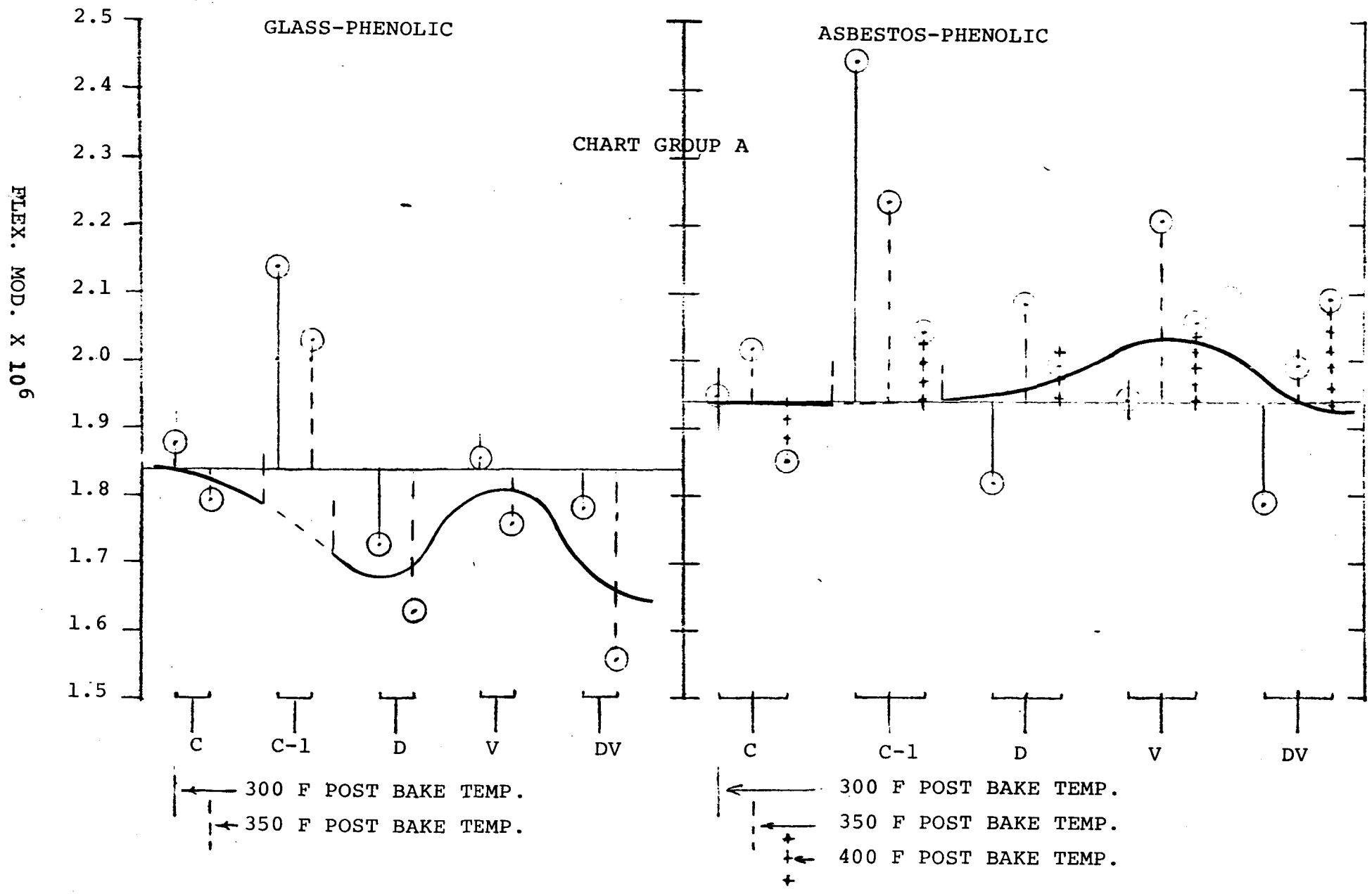


Chart No. 13B

FLEXURAL MODULUS OF ELASTICITY
VS. AVERAGE OF ALL BARS AT INDICATES POST BAKE TIME & TEMP.

CHART GROUP B

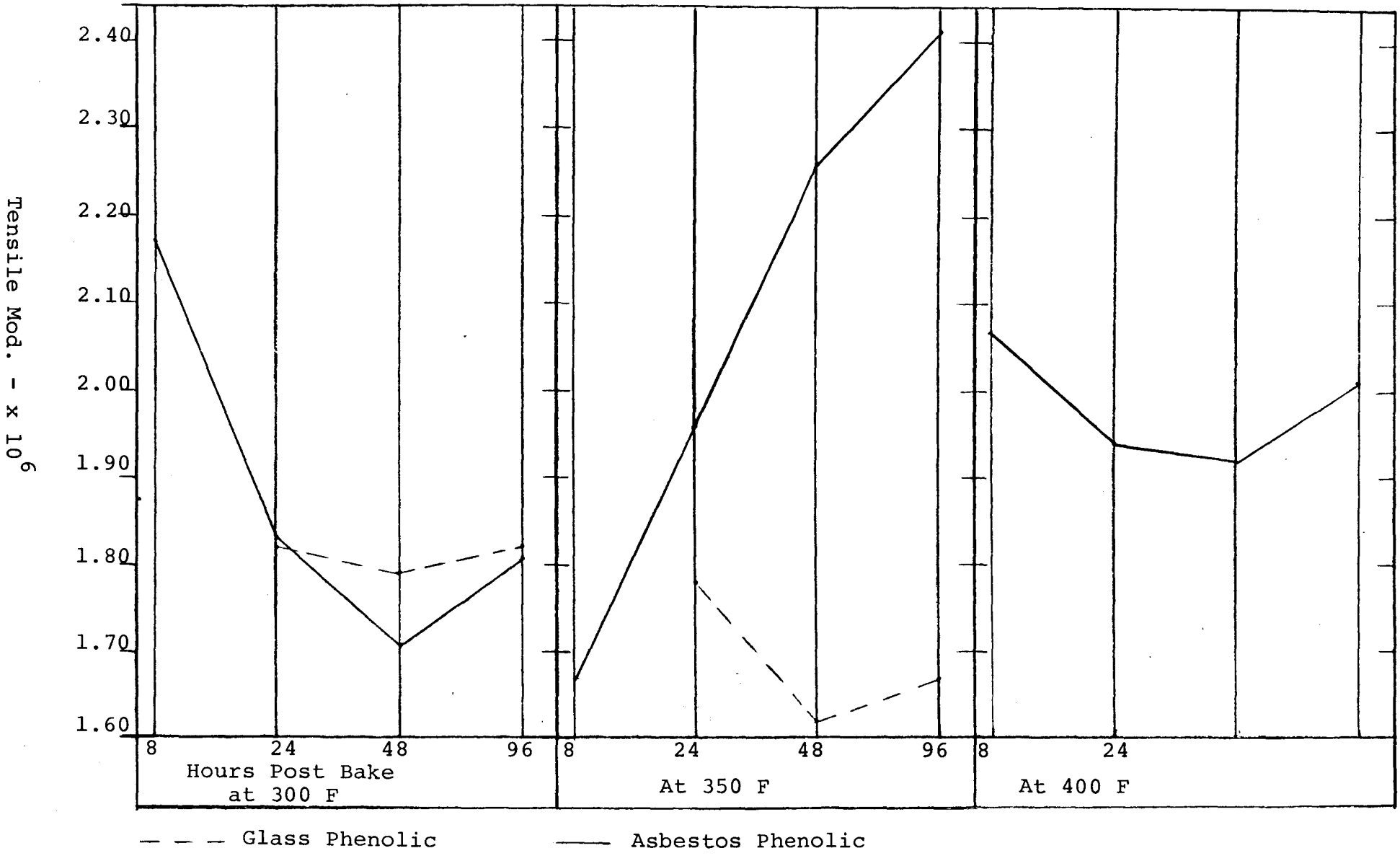
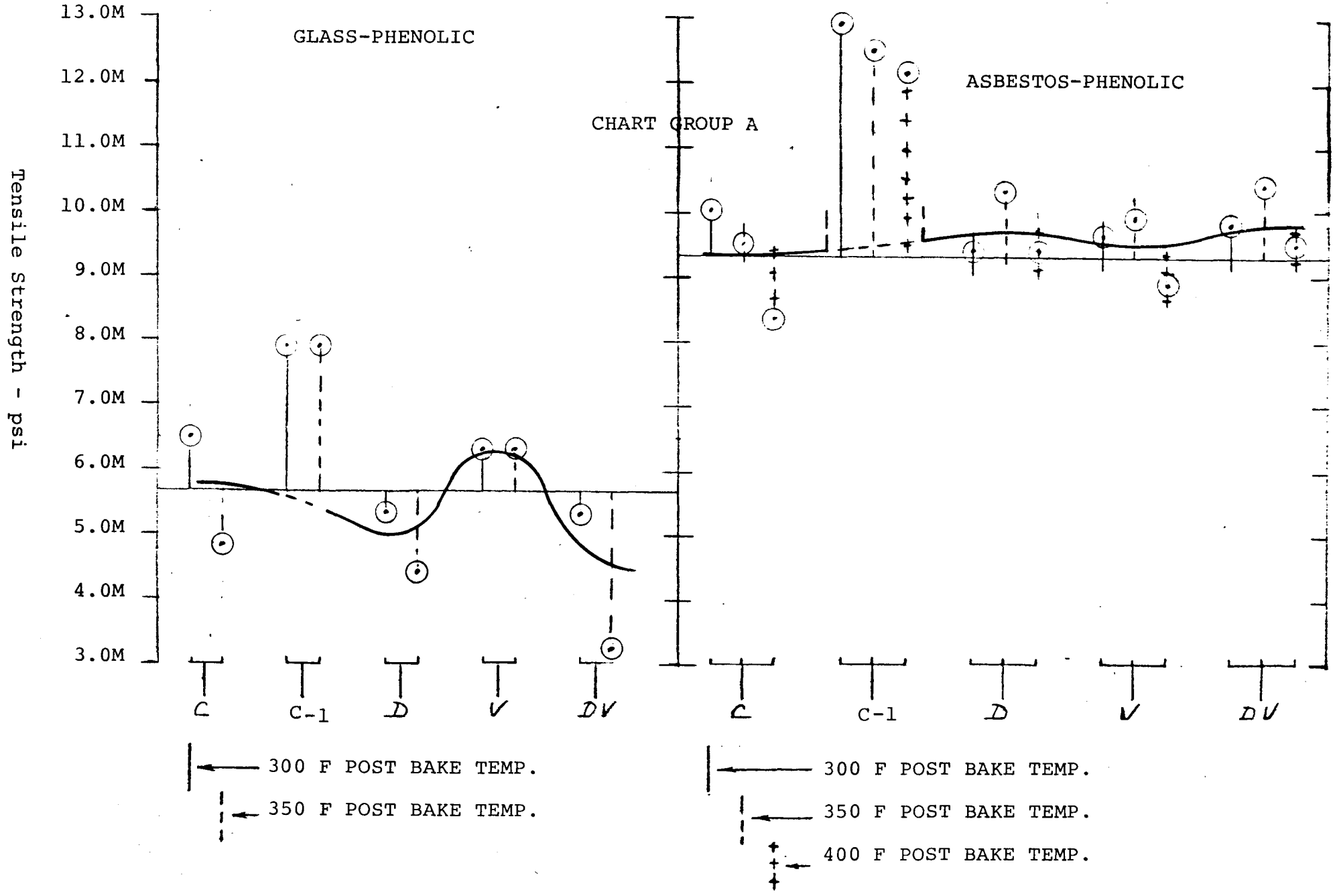


Table No. 14 — MECHANICAL PROPERTIES — Page No. 26C

Tensile Strength--psi — BAR DATA — *Does not Include "C-1" Values

	1	2	3	4	5	6	7	8
	Asbestos-Phenolic - Task IIA					Glass Phenolic - Task II		
Mold Method	Series No. & Bake Temp.	Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Ea. Mold Meth.	Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Ea. Mold Meth.
C	1	1	8	10366	Data for Chart GRP-B	Data For Chart GRP-A					
C-1	300°F			-----							
D				8560	9281						
V				8686							
DV				9413							
C		2	24	10138			1	24	8386	Data for Chart GRP-B	Data for Chart GRP-A
C-1				12844					8961		
D				9676	10150				6576	7130	
V				10136					6471		
DV				10650					7086		
C		3	48	9670		10128C	2	48	5513		6495C
C-1				12970		12907C1			7556		19115C1
D				8781	8647	9397D			4010	5610	3256D
V				8252		9385V			7295		6314V
DV				7886		9875DV			5519		5872DV
C		4	96	10338			3	96	5588		
C-1				------					7219		
D				10472	10702				5183	4765	
V				10467					5477		
DV				11533					3110		
C	2	1	8	9591							
C-1	350°F			11880							
D				8934	9630						
V				9948							
DV				10046							
C		2	24	9402			1	24	4563		
C-1				13027					7471		
D				10975	9956				4696	4247	
V				10375					5526		
DV				9073					2203		
C		3	48	9082		9496C	2	48	5724		4807C
C-1				12680		12529C1			7595		19999C1
D				8801	10111	9282D			4720	5205	4392D
V				10486		9935V			7407		6351V
DV				12076		10403DV			2970		3211DV
C		4	96	9908			3	96	4135		
C-1				------					8932		
D				8419	9419				3761	4617	
V				8932					6121		
DV				10417					4460		
C		1	8	9687							
C-1	3			-----							
D	400°F			8092	9154						
V				8585							
DV				10253							
C		2	24	7720							
C-1				11884							
D				9495	8885						
V				9984							
DV				8141							
C		3	48	8095		8431C					
C-1				12492		12188C1					
D				9821	9119	9430D					
V				8482		8970V					
DV				10078		9536DV					
C		4	96	7823							
C-1				-----							
D				10111	9108						
V				8829							
DV				9670							

TENSILE STRENGTH - P.S.I. VS. MOLD METH. & POST BAKE TEMP.



TENSILE STRENGTH
VS. - AVERAGE OF ALL BARS AT INDICATED POST BAKE TIME & TEMP.

Chart No. 14B

Page No. 26C-2

CHART GROUP B

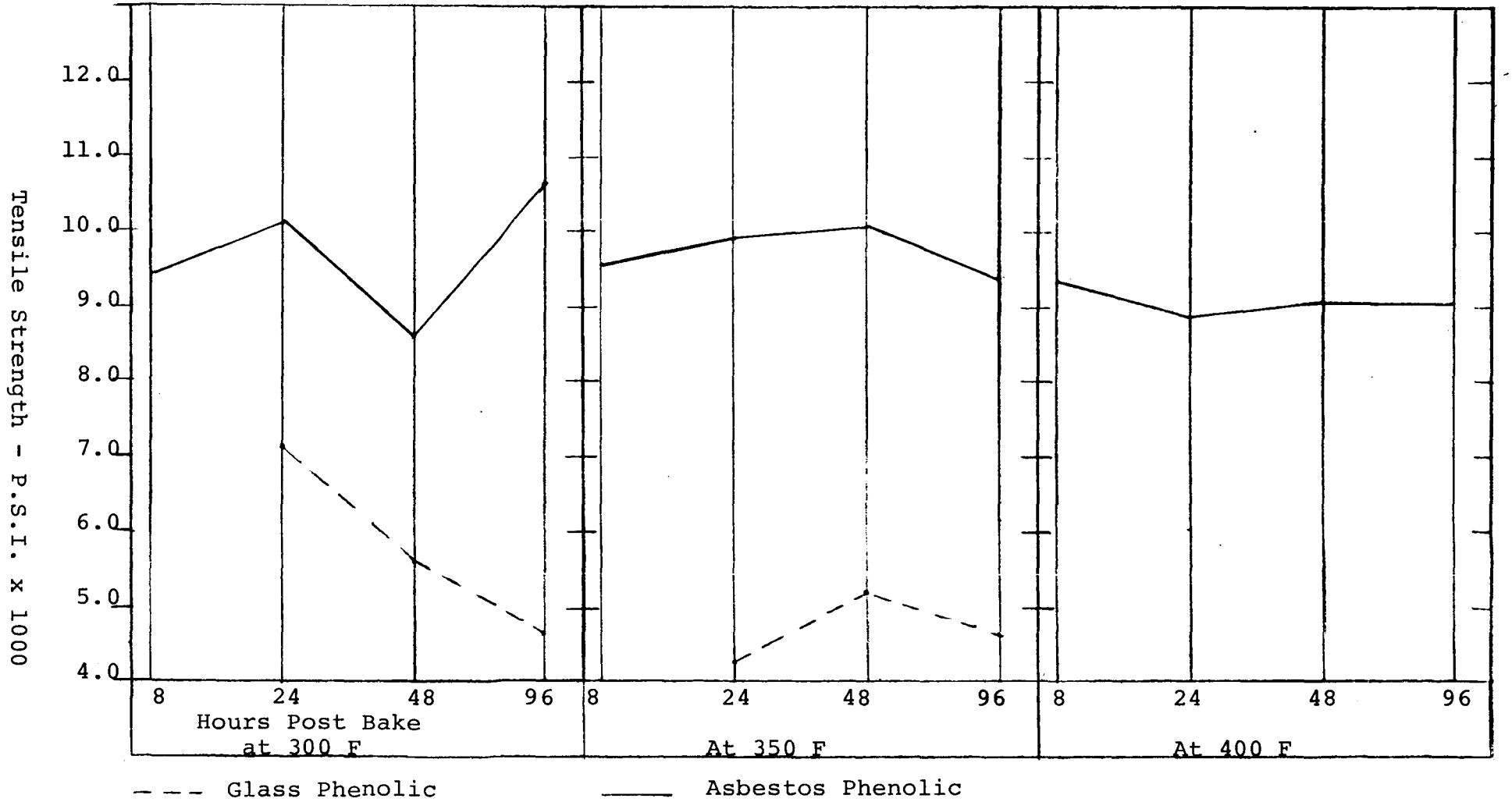


Table No. 15 — MECHANICAL PROPERTIES — Page No. 26D

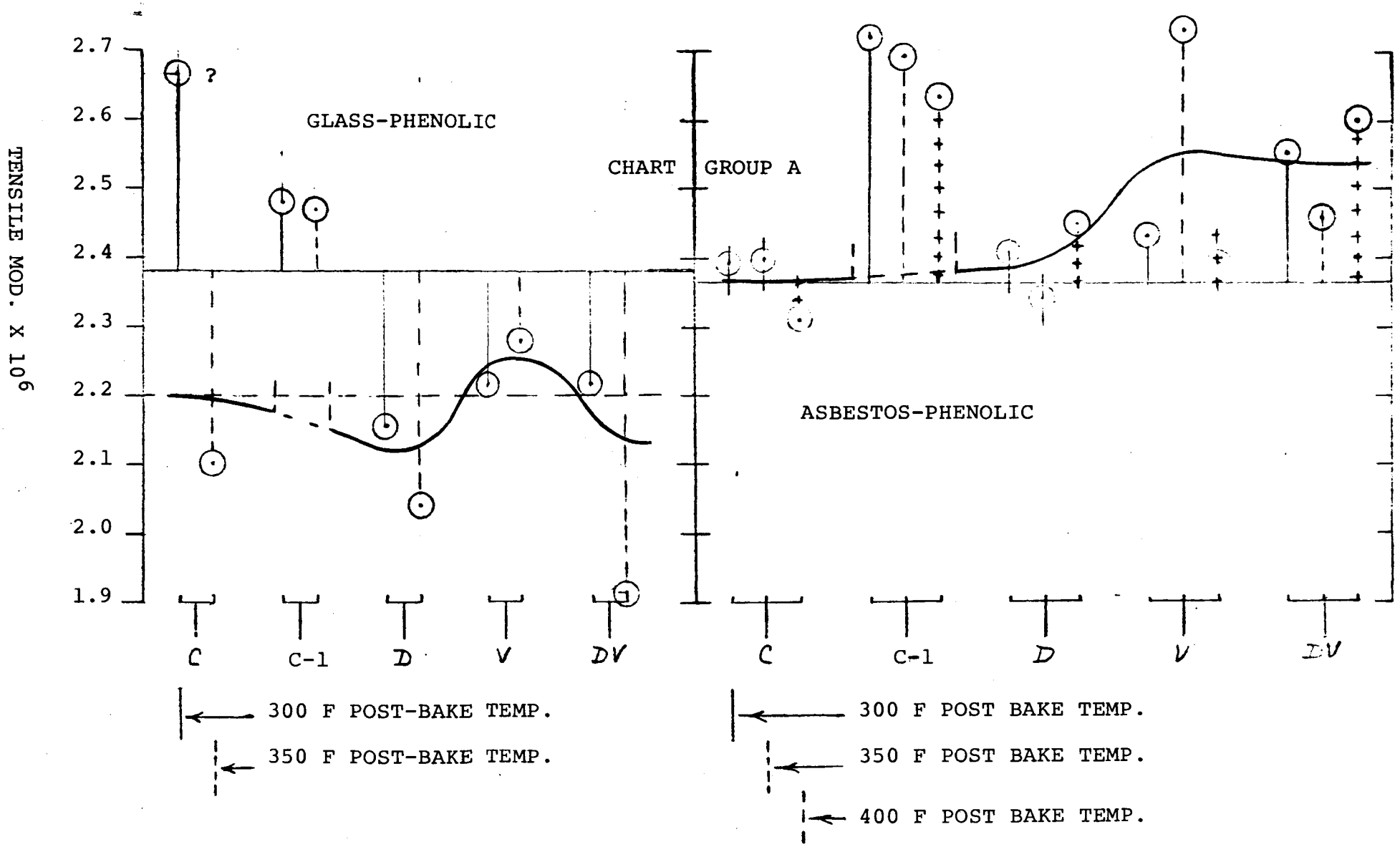
TENSILE MODULUS OF ELASTICITY - PSI X 10^6 BAR DATA — * Does not include "C-1" values

	1		2	3	4		5		6	7	8	
Mold Meth	Series No. And P. Bake Temp.	Asbestos Lot No.	Asbestos Post Bake Hours	Phenolic Computer Bar Averages	Task IIA Average Ea. Lot *	Avg. Each Mold Meth.		Glass-Phenolic - Task Lot No.	Post Bake Hours	Computer Bar Averages	I Average Each Lot *	Avg. Each Mold Meth.	
C	1	1	8	2.307	DATA FOR CHART GRP. - B	DATA FOR CHART GRP. - A							
C-1	300 F			--									
D				2.158	2.345								
V				2.367									
DV				2.537									
C		2	24	2.196				1	24	2.722	DATA FOR CHART GRP. - B	DATA FOR CHART GRP. - A	
C-1				2.777						2.497			
D				2.486	2.494					2.078	2.349		
V				2.752						2.202			
DV				2.542						2.397			
C		3	48	2.573		2.384	C	2	48	2.985		2.666	C
C-1				2.665		2.721	C-1			2.557		2.481	C-1
D				2.396	2.370	2.412	D			2.011	2.439	2.157	D
V				2.265		2.431	V			2.390		2.218	V
DV				2.258		2.553	DV			2.370		2.215	DV
C		4	96	2.461				3	96	2.493			
C-1				--						2.188			
D				2.601	2.571					2.382	2.154		
V				2.342						2.064			
DV				2.874						1.879			
C	2	1	8	2.303									
C-1	350 F			2.400									
D				2.359	2.440								
V				2.675									
DV				2.413									
C		2	24	2.244				1	24	2.280			
C-1				2.713						2.530			
D				2.389	2.425					1.941	2.098		
V				2.689						2.074			
DV				2.379						---			
C		3	48	2.313		2.408	C	2	48	2.059		2.105	C
C-1				2.856		2.659	C-1			2.350		2.469	C-1
D				2.196	2.390	2.338	D			2.000	2.085	2.046	D
V				2.448		2.726	V			2.581		2.284	V
DV				2.603		2.459	DV			1.700		1.913	DV
C		4	96	2.752				3	96	1.976			
C-1				--						2.528			
D				2.400	2.671					2.189	2.122		
V				3.091						2.199			
DV				2.443						2.125			
C	3	1	8	2.330									
C-1	400 F			--									
D				2.317	2.410								
V				2.312									
DV				2.680									
C		2	24	2.455									
C-1				2.819									
D				2.554	2.526								
V				2.542									
DV				2.544									
C		3	48	2.090		2.396	C						
C-1				2.496		2.667	C-1						
D				2.382	2.367	2.474	D						
V				2.370		2.386	V						
DV				2.627		2.604	DV						
C		4	96	2.342									
C-1				--									
D				2.644	2.462								
V				2.319									
DV				2.565									

Chart No. 15A

TENSILE MODULUS OF ELASTICITY - P.S.I.
VS. MOLDING METHOD & POST BAKE TEMP.

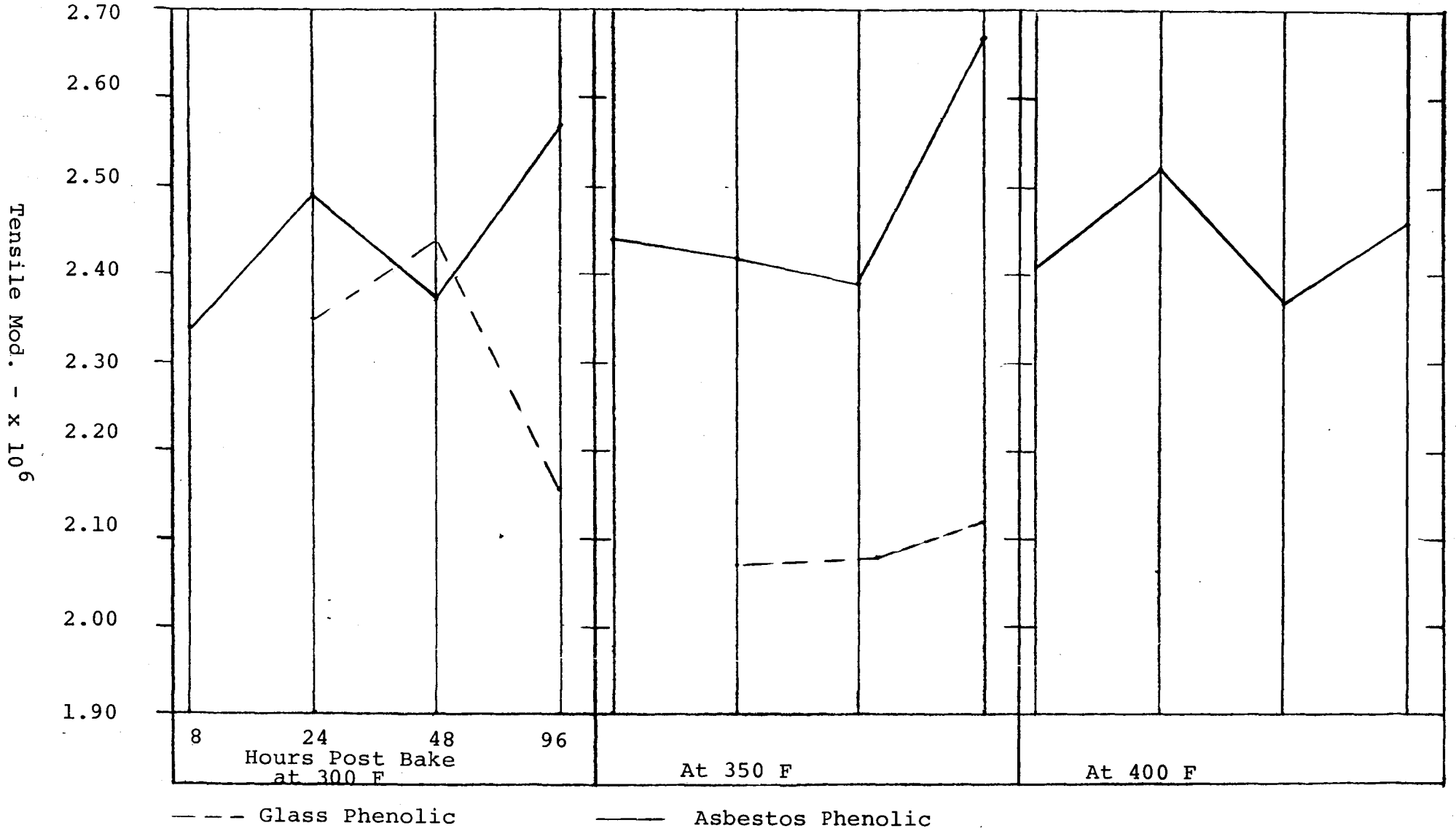
Page No. 26D-1



TENSILE MODULUS OF ELASTICITY
VS. - AVERAGE OF ALL BARS AT INDICATED POST BAKE TIME & TEMP.

Chart No. 15B

CHART GROUP B



IBA - Buff
IBA - Green
IBA - White

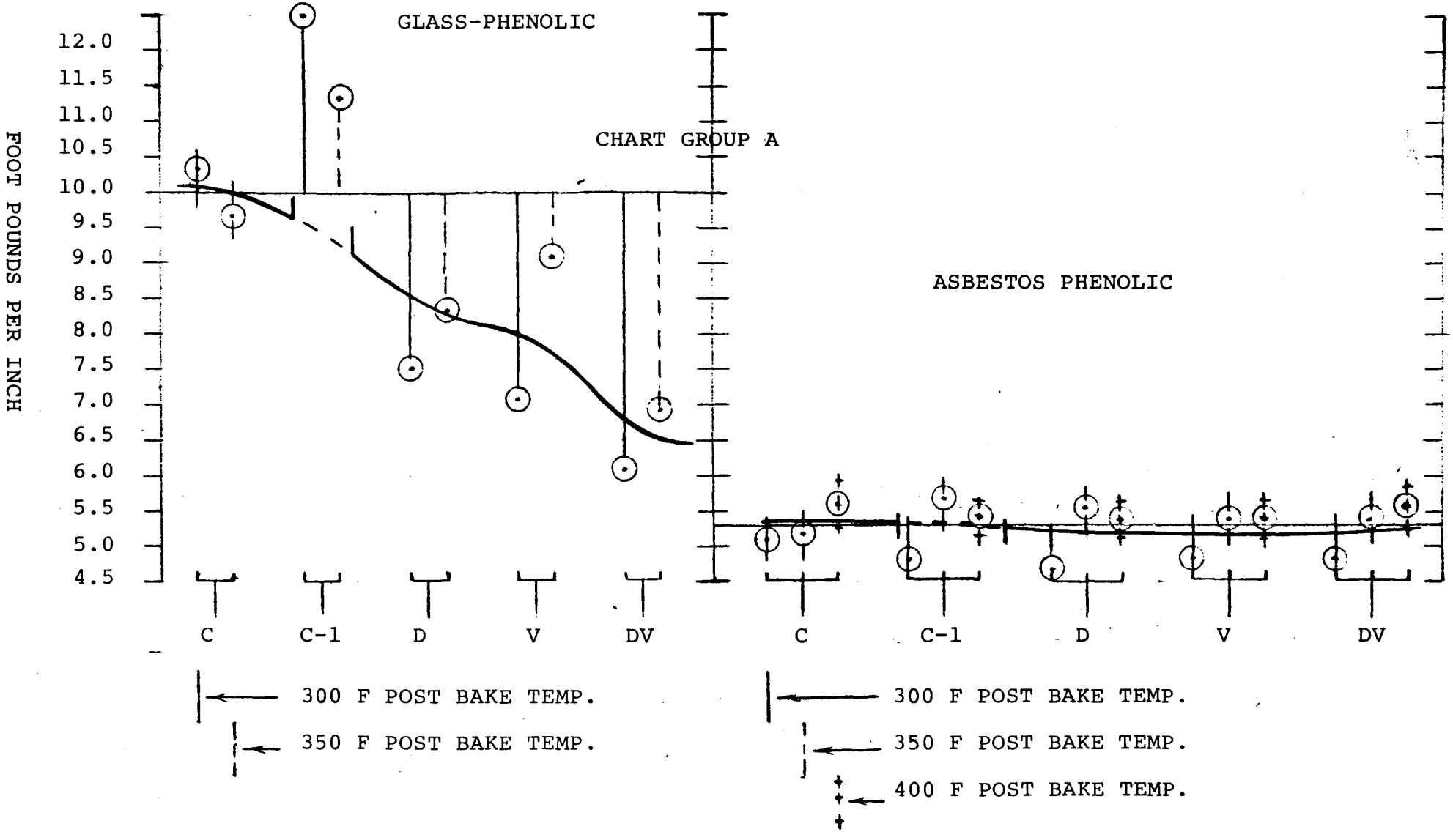
Table No. 16 — MECHANICAL PROPERTIES — Page No. 26E

Izod Impact--FT LB/Inch (notched) — BAR DATA — *Does Not Include "C-1" Values

	1	2	3	4	5	6	7	8
Mold Meth-	Series No. & Bake Temp.	Asbestos-Phenolic - Task IIA: Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Bar Mold Meth.	Lot No.	Post-Bake Hours	Glass Phenolic - Task I: Computer: Bar Averages	Average Each Lot*	Avg.-Bar Mold Meth.
C	1	1	8	498	Data For Chart GRP-B	Data For Chart GRP-A					
C-1	300°F			---							
D				467	449						
V				440							
DV				393							
C		2	24	505			1	24	1031	Data For Chart GRP-B	Data For Chart GRP-A
C-1				469					1426		
D				475	501				676	721	
V				473					600		
DV				553					578		
C		3	48	486		501 C	2	48	1122		1024 C
C-1				485		477 C1			1213		1243 C1
D				435	484	473 D			727	837	757 D
V				516		480 V			787		728 V
DV				500		479 DV			712		621 DV
C		4	96	514			3	96	920		
C-1				---					1089		
D				516	498				869	791	
V				498					798		
DV				472					574		
C	2	1	8	518							
C-1	350°F			527							
D				484	529						
V				605							
DV				510							
C		2	24	536			1	24	866		
C-1				580					1008		
D				571	547				789	788	
V				528					825		
DV				547					673		
C		3	48	543		519 C	2	48	1107		976 C
C-1				515		541 C1			1188		1105 C1
D				504	491	526 D			882	865	824 D
V				472		509 V			888		902 V
DV				425		513 DV			582		682 DV
C		4	96	479			3	96	955		
C-1				---					1119		
D				546	501				803	885	
V				431					992		
DV				550					790		
C	3	1	8	510							
C-1	400°F			---							
L				541	512						
V				494							
DV				504							
C		2	24	547							
C-1				496							
D				525	551						
V				500							
DV				633							
C		3	48	555		565 C					
C-1				529		542 C1					
D				489	528	514 D					
V				563		515 V					
DV				506		538 DV					
C		4	96	649							
C-1				---							
D				501	541						
V				504							
DV				520							

Chart No. 16A

IZOD IMPACT - FT. LBS. PER INCH NOTCHED VS. MOLDING METHOD & POST BAKE TEMP.



IZOD IMPACT - NOTCHED

Chart No. 16B VS. - AVG. ALL BARS AT INDICATED POST BAKE TIME & TEMP.

CHART GROUP B

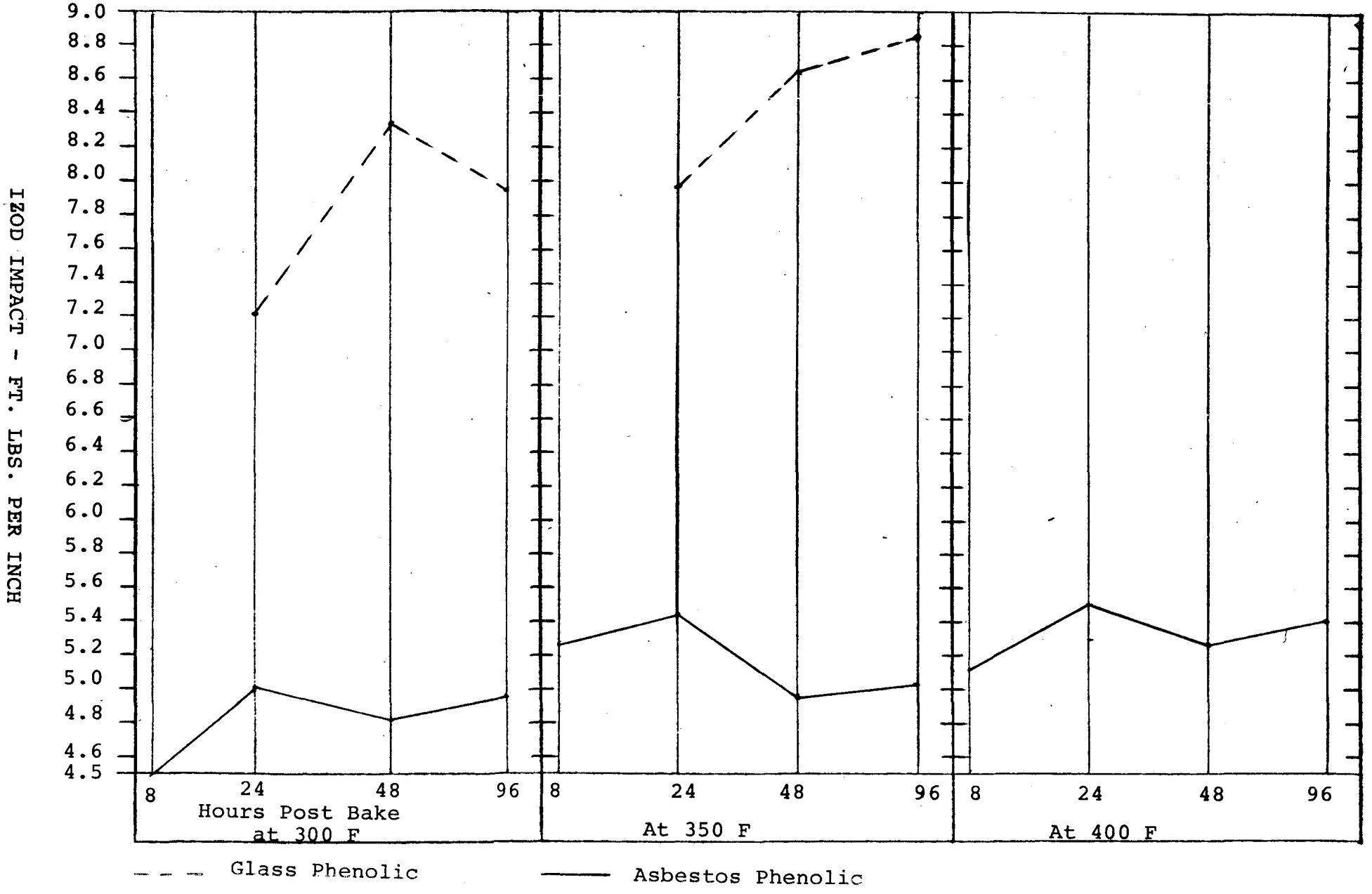


Table No. 17 — MECHANICAL PROPERTIES — Page No. 26 F

IZOD IMPACT - FT. LBS/IN. (PLAIN) — BAR DATA — *Does Not Include "C-1" Values

1				2	3	4		5	6	7	8
Mold Meth	Series No. And P. Bake Temp.	Asbestos - Lot No.	Post Bake Hours	Phenolic Computer Bar Averages	Task IIA Average Each Lot #	Avg. Each Mold Meth		Glass - Phenolic - Task I Lot No.	Post Bake Hours	Computer Bar Averages	Average Each Lot #	Avg. Each Mold Meth.	
C	1	1	8	5.58	DATA FOR CHART GRP. - B	DATA FOR CHART GRP. - A							
C-1	300 F			--	5.88								
D				5.97									
V				6.08									
DV				5.89									
C		2	24	6.58				1	24	9.70	DATA FOR CHART GRP. - B	DATA FOR CHART GRP. - A	
C-1				5.85						12.67	9.05		
D				6.66	6.81					9.45			
V				7.00						10.20			
DV				7.00						6.86			
C		3	48	6.71		6.27	C	2	48	13.27		10.35	C
C-1				6.28		6.06	C-1			14.28		14.33	C-1
D				7.62	6.98	6.70	C			11.95	10.08	10.32	D
V				6.82		6.76	V			7.27		8.43	V
DV				6.77		6.49	DV			7.85		7.71	DV
C		4	96	6.20				3	96	7.78			
C-1				--						16.65			
D				6.54	6.54					9.56	8.40		
V				7.13						7.83			
DV				6.81						8.42			
C	2	1	8	6.67									
C-1	350 F			6.54									
D				6.47	6.56								
V				6.16									
DV				6.95									
C		2	24	8.50				2	24	7.93			
C-1				6.07						13.58			
D				7.25	7.50					8.17	8.32		
V				6.89						7.71			
DV				7.87						9.48			
C		3	48	6.21		7.06	C	2	48	10.79		10.11	C
C-1				5.63		6.08	C-1			14.21		14.04	C-1
D				7.59	7.02	6.84	D			9.23	10.67	9.18	D
V				7.74		6.80	V			12.96		9.91	V
DV				6.55		6.90	DV			9.71		8.62	DV
C		4	96	6.87				3	96	11.62			
C-1				--						14.33			
D				6.03	6.51					10.15	9.38		
V				6.40						9.07			
DV				6.74						6.68			
C	3	1	8	7.23									
C-1	400 F			--									
D				6.48	6.74								
V				6.75									
DV				6.49									
C		2	24	8.58									
C-1				5.95									
D				6.87	7.37								
V				6.63									
DV				7.40									
C		3	48	7.89		7.97	C						
C-1				6.04		5.99	C-1						
D				6.30	6.74	6.40	D						
V				6.18		6.44	V						
DV				6.60		6.83	DV						
C		4	96	8.17									
C-1				--									
D				5.94	6.78								
V				6.19									
DV				6.83									

C-2

Chart No. 17A

IZOD IMPACT - FT. LBS. PER INCH
PLAIN
VS. MOLDING METHOD & POST BAKE TEMPERATURE

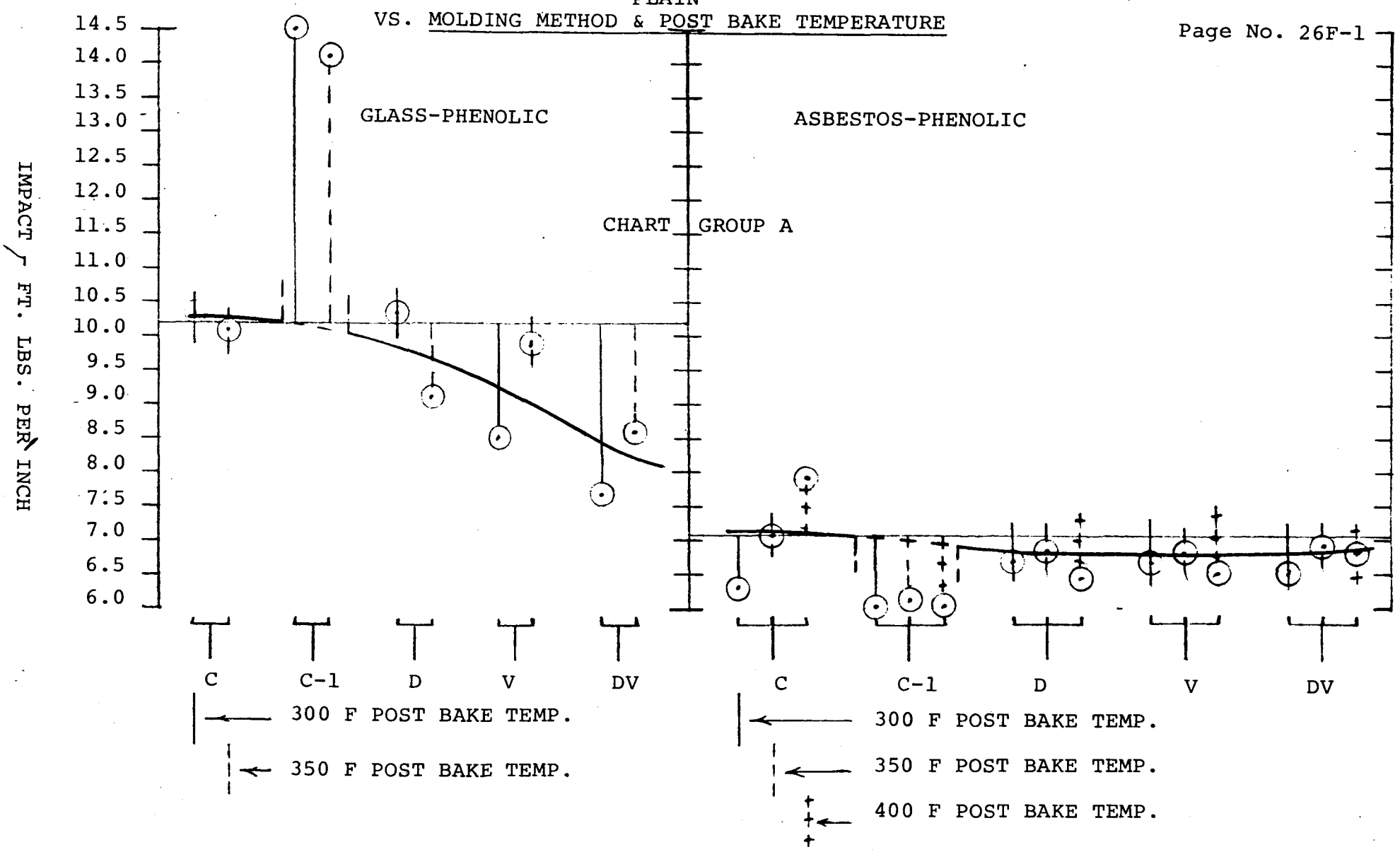


Chart No. 17B

IZOD IMPACT - PLAIN - VS. AVG. ALL BARS AT INDICATED POST BAKE TIME & TEMP.

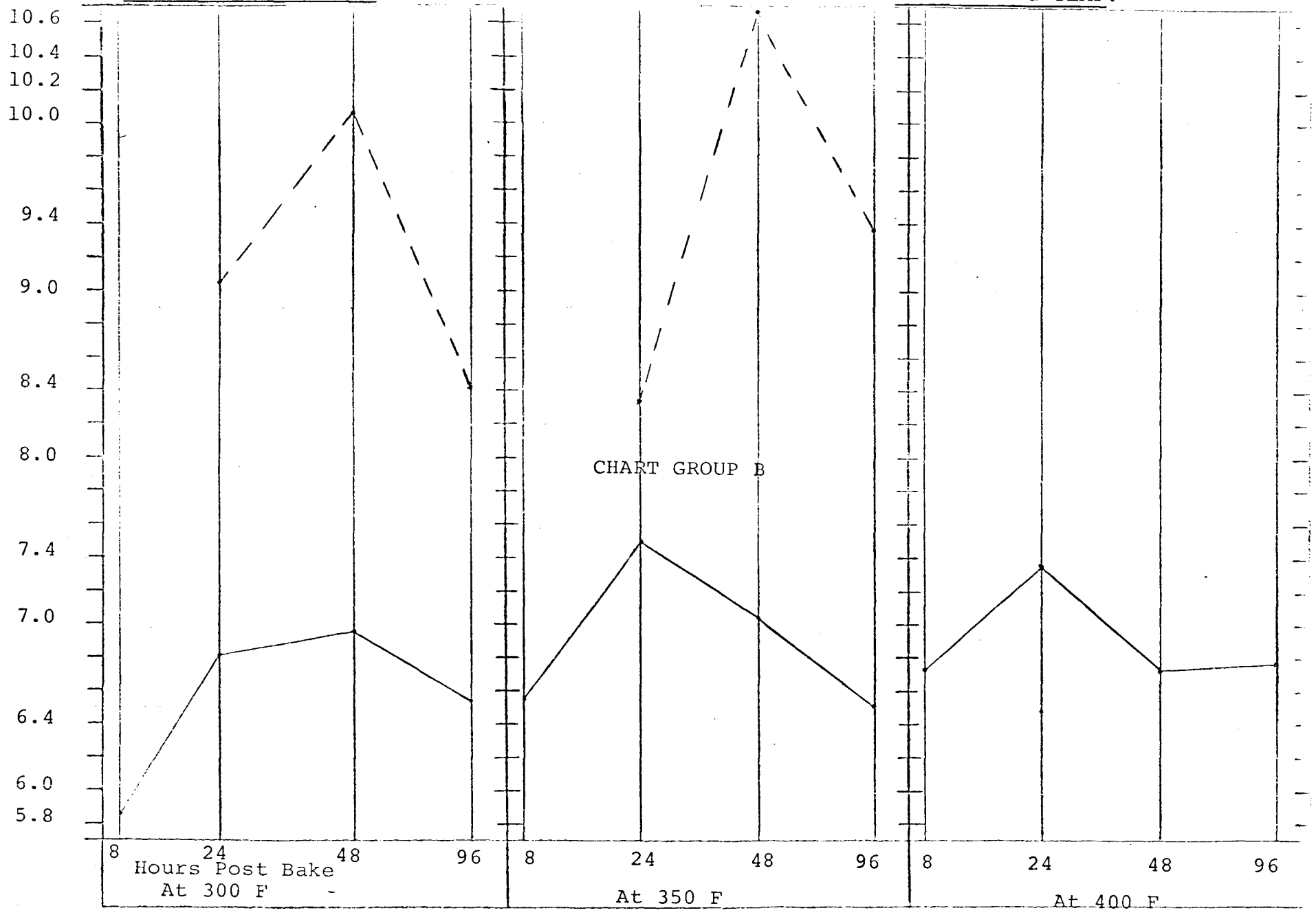


Table No. 18 — MECHANICAL PROPERTIES — Page No. 26G

Elongation - % — BAR DATA — *Does Not Include "C-1" Values

		1	2	3	4	5	6	7	8
		Asbestos-Phenolic - Task IIIA					Glass Phenolic - Task I		
Mold Meth-	Series No. & Bake Temp.	Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Ea. Mold Meth.	Lot No.	Post-Bake Hours	Computer: Bar Averages	Average Each Lot*	Avg.-Ea. Mold Meth.
C	1	1	8	.55	Data For Chart GRP-B	Data For Chart GRP-A					
C-1	300°F			--							
D				.41	.44						
V				.39							
DV				.40							
C		2	24	.39			1	24	.30	Data For Chart GRP-B	Data For Chart GRP-A
C-1				.49					.31		
D				.41	.42				.36	.32	
V				.40					.25		
DV				.49					.34		
C		3	48	.37		.45 C	2	48	.23		.25 C
C-1				.50		.50 C1			.28		.29 C1
D				.41	.37	.42 D			.25	.26	.26 D
V				.36		.40 V			.32		.28 V
DV				.34		.41 DV			.24		.25 DV
C		4	96	.49			3	96	.22		
C-1				--					.29		
D				.46	.45				.19	.21	
V				.45					.27		
DV				.39					.16		
C	2	1	8	.54							
C-1	350°F			.47							
D				.36	.44						
V				.39							
DV				.46							
C		2	24	.38			1	24	.32		
C-1				.52					.33		
D				.48	.42				.21	.26	
V				.42					.26		
DV				.40					--		
C		3	48	.39		.42 C	2	48	.25		.26 C
C-1				.45		.48 C1			.32		.34 C1
D				.39	.42	.40 D			.23	.26	.24 D
V				.40		.38 V			.30		.29 V
DV				.51		.44 DV			--		.20 DV
C		4	96	.37			3	96	.20		
C-1				—					.36		
D				.37	.37				.27	.24	
V				.32					.29		
DV				.41					.20		
C	3	1	8	.46							
C-1	400°F			--							
D				.34	.41						
V				.38							
DV				.44							
C		2	24	.34							
C-1				.45							
D				.40	.37						
V				.39							
DV				.34							
C		3	48	.39		.39 C					
C-1				.48		.47 C1					
D				.48	.42	.40 D					
V				.34		.37 V					
DV				.47		.41 DV					
C		4	96	.37							
C-1				—							
D				.39	.39						
V				.39							
DV				.40							

Chart No. 18A

ELONGATION - %
VS MOLDING METHOD & POST BAKE TEMP.

Page No. 26G-1

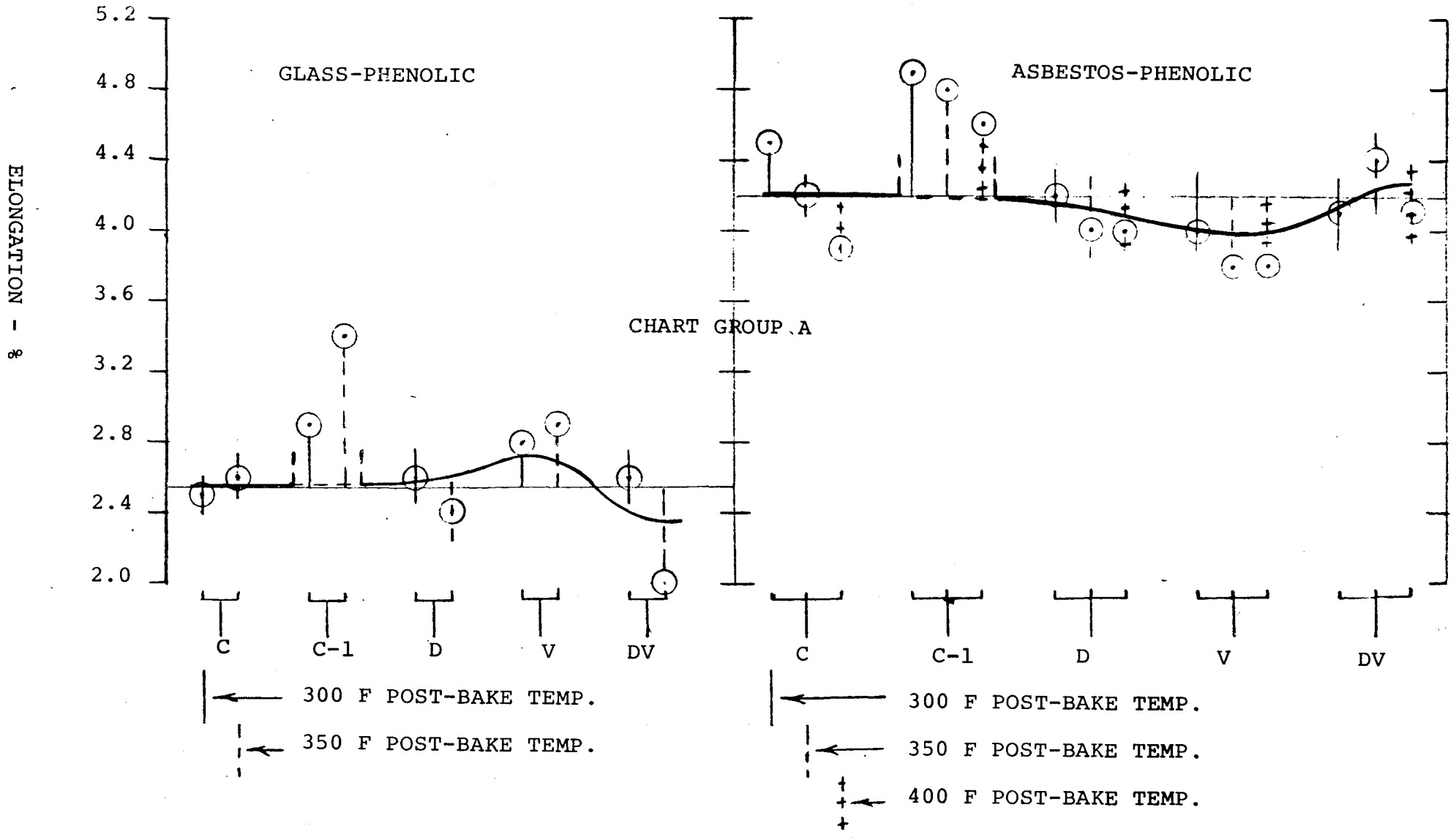
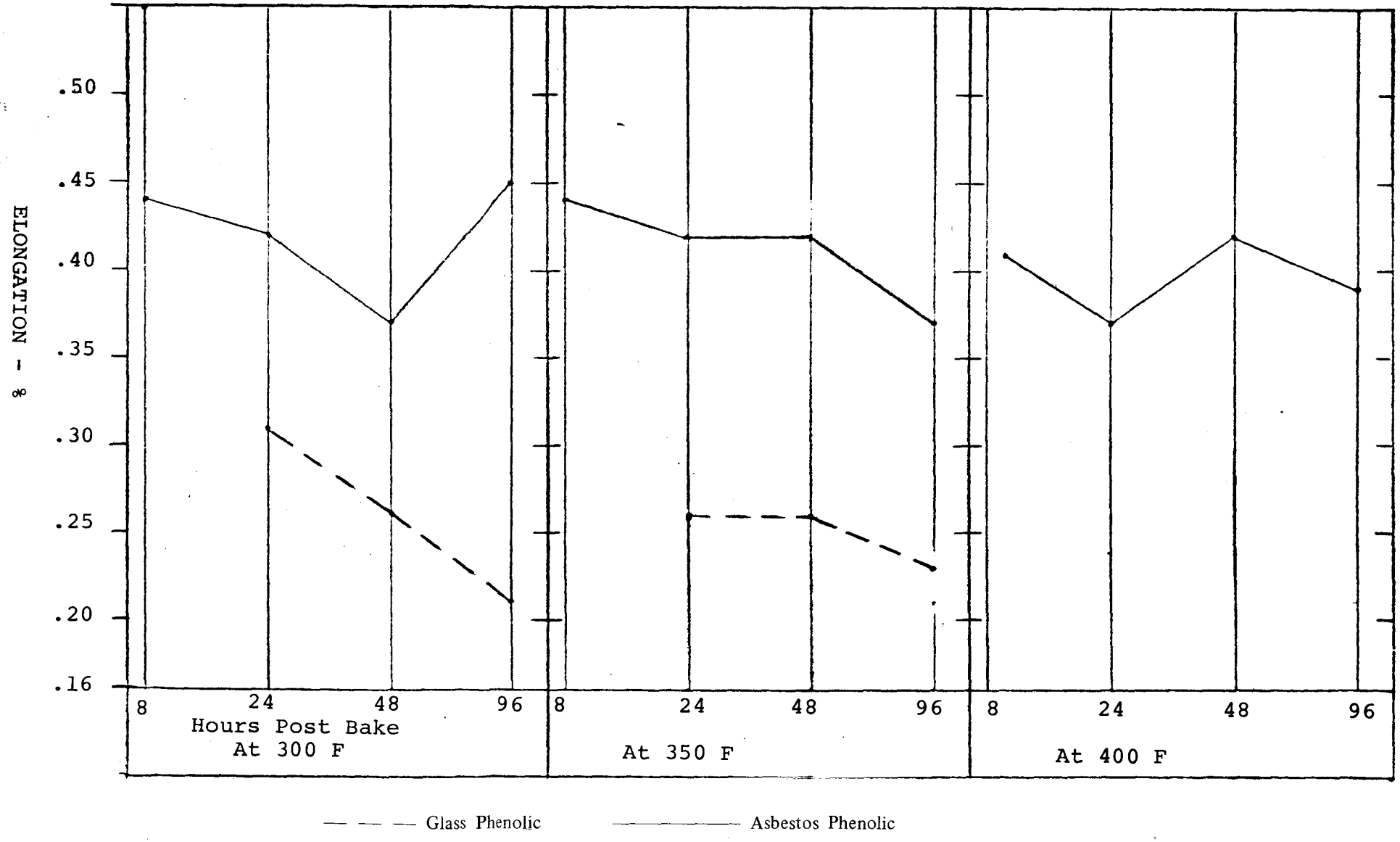


Chart No. 18B

ELONGATION - PERCENT
VS. - AVG. OF ALL BARS AT INDICATED POST BAKE TIME & TEMP.

CHART GROUP B -



5.2 Photographs of All Bars Tested (Mechanical Properties)

Appendix II includes photographs of the broken bars from all molding methods for both materials for flexural strength, tensile strength, and impact.

As mentioned in Paragraph 2.2.3 the size of the test panel limited bar size and orientation such that deviation from ASTM requirements was necessary in the case of tensile and impact properties.

The influence of these deviations was probably greatest on tensile properties (Paragraph 4.3.5).

The photographs clearly show the type and location of the breaks in the tensile and impact bars.

Break and failure in flex occurred conclusively but seldom as a definite parting line on the surfaces of the bar. The majority of the parting lines that are indicated in the photographs were made on the broken bar by completing the break after test by hand. This was done to ascertain the true nature and orientation of the break.

Section 6

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS

6.1 Discussion

6.1.1 Denver Atmospheric Pressure and Humidity

The altitude at the J-M Research & Development Center is 5730 feet and normal atmospheric pressure is 24.25" HG. The work done at N.A.S.A. Langley Research & Development is practically sea level with a normal atmospheric pressure of 30.00" HG.

Refer to (1) "Effect of Volatile Removal During Molding of Phenolic-Fiber Composites" by Price and Lucy - presented at the 29th Annual Technical Conference RPCI and SPI Washington, D.C. February 1974, and (2) "Low Cost Plastic Sounding Rocket Motors" by J. C. Ward - AIAA 2nd Sounding Rocket Vehicle Technology Conference, Williamsburg, Virginia, December 1970.

Normal relative humidity levels are low in Denver running from 49 through 54% in the spring and summer months when the test panels were molded, yearly average is 51%. Average humidity in Virginia (N.A.S.A. Langley Research Center) runs from 62 to 73 with yearly averages of 68%.

This means that moisture levels in the compound before molding will tend to be higher in Virginia and higher vacuums are possible than in Denver. It could be argued that both factors would tend to produce a greater effect in Virginia than in Denver when using the special molding methods studied in this contract.

We were able to achieve partial pressures of 2" to 4" HG in the cavity, from vacuums in the order of 20 to 22" HG while molding the test panels. Similar moldings made at Langley were evacuated at up to 29" HG with a 1" partial pressure in the cavity.

6.1.2 Effect of Preforms on Gas Release

We doubt there would be any detectable differences in ability to de-gas and de-moisturize the mold charge because of preforming or solidifying the mold charge. It was necessary to preform the bulky asbestos-phenolic in order to charge the mold. The charge, cold pressed at 1000 psi so it could be easily handled as a unit for placing in the mold, was reduced as a preform to 1-1/2" to 1-3/4" thickness for all molding methods except vacuum. In this case

preforms 3-1/2" thickness were pressed at 350 psi. They were barely handleable for charging to the mold in one piece. The compound was made up in March 1973 and refrigerated in poly bags. It was pressed into preforms as needed. Preforms were stored in individual poly bags and refrigerated if not used the same day.

The glass phenolic was not preformed but was charged as a loose fill. This could be done because of a low bulk factor. Also, it is a difficult material to preform. The 270 gram charges were pre-weighed as needed from a refrigerated supply. Each 270 gram charge was placed in a poly bag and refrigerated if not used the same day.

6.1.3 Compression Molding Techniques; "C" vs. "C-1" Samples

As mentioned in Section 2 (paragraph 2.2.4.1) the "C" method (no de-gas by opening and closing the mold during the resin flow period) produced superficially sound test panels. However, when cut into bars evidence of gas delamination was apparent. (See Bar photos Appendix II). A comparison of strength data of obviously delaminated to obviously clear bars was made. The effect on physical properties was less than expected in most cases. Where the effect was obvious the test values were not used. All bars with evidence of gas delamination were marked in the print-out data (Appendix I).

In the "C-1" method, the degassing procedure (by intermittent opening and closing of the mold during the resin flow period) was carried to extremes. It was continued up to 5 times (at 60 second intervals) until clear evidence of incipient resin set occurred. This procedure (a 5th molding procedure) was not a part of the contract work plan. However, physical properties developed by this molding procedure exceed the other methods in most cases, and is quite evident on the Group "A" charts. The Data from the "C-1" method was not used in the averages for the Charts of Group B (different glass-phenolic compound lot) and it was ignored in drawing the solid wavy trend lines on charts of Group A.

However, this data appears to be very informative. It tells us:

1. Moldings that appear to be perfectly sound, superficially, can indeed contain gas delamination.

2. The effect can be minimal as in the majority of the "C" test panels or strongly deleterious as in a few of the "C" test panels.

3. The traditional de-gassing procedure of opening and closing the mold, "bumping", if continued to the maximum, i.e., up to the time of initial resin set, was strongly beneficial for these two compounds.

4. Any means that can be used during molding to remove the volatile material, either adsorbed or from the chemical reaction, is beneficial.

6.2 Conclusions

6.2.1 Panel Data - Thermal Properties

The prime reason for this work is to develop data that will help determine a best or optimum molding technique for reinforced ablative phenolics. Secondary objectives of the work are development of optimum post bake schedules.

The thermal data from test panels (pages 25A-25D) is more or less supportive and can be used to assess or modify conclusions drawn from the mechanical data. Some conclusions from the thermal data alone, from which specific gravity weight loss, shrinkage, and hardness values were developed, are as follows:

Specific Gravity - Weight Loss and Shrinkage

Specific gravity, an inherent property of the combined materials, is changed by post baking. It is effected by weight loss due to volatiles, to oxidation, to shrinkage and porosity (not measured).

In general, specific gravity decreases from the "as molded" condition to the "post-baked" condition. It also decreases with increased temperature and time at temperature for both materials (Charts Pgs. 25B). The normal spread appears to be from 1.845 to 1.900 with one set of values for asbestos phenolic (C Method) dropping to 1.827, found to be due to gas delaminations. The specific gravity of the asbestos-phenolic is higher.

Since we expect increased volatile removal during molding with the special molding techniques we would expect the resulting specific gravities to be higher than the conventionally molded materials. Although the tendency is slight, (except for compression molding with extended degas) it is nevertheless apparent in both materials.

Hardness increases, from as molded to post bake, increases slightly with increased post bake time and temperature (Chart Group B, Pg.25C-2) The glass-phenolic is harder than the asbestos phenolic. The differences in hardness attributed to different molding methods appear to be minimal.

6.2.2 Bar Data - Mechanical Properties

Mechanical properties appear in the tables and are plotted on the charts on pages 26A-26G. Properties of flexural strength, tensile strength, and impact were studied.

Flexural properties were run in accord with the ASTM test methods. Tensile and impact tests were modified due to size of test panel.

Tensile properties were obtained from non-standard - short bars - limited by the length of the test panel or slab and the mold. Data for elongation and modulus of elasticity was obtained from extensometer readings taken as the bar was being broken under tension.

Plain impact strengths were run as an extra - simply by preparing the test bar so that it could be reversed in the clamp and broken at the plain end as well as the notched end. The cross-section length of the plain sample, as a result, was longer by the depth of the notch.

6.2.2.1 Flexural Strength - Flexural Modulus

The data and charts were tabulated and plotted as described in Section 5 paragraphs 5.1.5 and 5.1.6.

Here again data points from conventional compression molding were arbitrarily chosen to locate a "reference line" on chart Group "A". The solid wavy trend lines were also used to assess the effect of molding method.

Flexural strength and modulus is generally improved by use of the special molding methods for asbestos-phenolic but not so for glass phenolic. The exception is the "C-1"method which appears to be quite strongly beneficial for both materials. The vacuum method appears to result in slightly better strengths than either directional or directional plus vacuum.

The best post bake temperatures appear to be 300F for glass phenolic and 350F for asbestos phenolic.

Best time in oven appears to be in the range of 24 hours for glass phenolic and 48 hours for asbestos phenolic. The asbestos phenolic is stronger in flex. and flex. modulus than the glass phenolic.

6.2.2.2 Tensile Strength and Tensile Modulus

There appears to be a slight tensile strength improvement over conventional (C) molding for the special molding methods. Modulus improvement is more marked for the vacuum (V) and directional plus vacuum (DV) methods. However, the C-1method results in the best strengths, i.e., 12 to 13 m psi vs. 9-10 m psi for asbestos phenolic and 7-8 m psi vs. 5-6 m psi for glass phenolic. This is a substantial improvement. Modulus trends follow the same pattern.

As is noted on the tensile modulus charts, the reference line for glass phenolic has been dropped below the average of the "C" samples. This was done because the data point (Chart Group A) at 300 F appears to be high. In-depth study of the back up data and work sheets does not explain the apparent displacement of this data point.

Here again 300F and 24 hours for glass phenolic and 350 and 48 hours for asbestos phenolic appear to be satisfactory post bake schedules.

6.2.2.3 Impact Strength, Notched and Plain

For the glass phenolic, the special molding methods caused lower impact strengths than conventional "C" molding. The "C-1"molding produced the highest impact strengths.

Impact strengths of the asbestos phenolic did not seem to be influenced greatly by molding method.

As noted from the reference lines and trend lines on the group A charts, the glass phenolic is stronger in impact than asbestos phenolic. The relationship is approximately as follows:

	Notched	Plain
Glass Phenolic	8.86	10.3
Asbestos Phenolic	5.11	6.6

The Group B charts indicate better impact strengths are developed at 350°F for glass phenolic. Best flexural and tensile properties were developed at 300F. Also impact strength by vacuum molding is more strongly influenced for the better by 350F post-bake temperatures.

For the asbestos phenolic 350°F still seems to be the best post-bake temperature.

6.2.2.4 Elongation

Elongation is not strongly influenced by the molding method except for the "C-1" method. The elongation is slightly above the trend line for both materials for the "C-1"method.

Post bake at 300F 24 hours is better for glass phenolic and 350F is slightly better for asbestos phenolic.

6.3 Recommendations and Observations

6.3.1 "C" Method vs. "C-1"Method

The 2 methods of so-called conventional compression molding probably represent extremes, from no degas ("bumping" - opening and closing mold), to maximum degas, i.e., "bumping" until positive evidence of initial "set" occurs.

Unexpectedly, the specimens produced by the "C-1" method were generally superior to those from all the other methods studied.

The extent of gas delamination in the "C" specimens was unexpected as well as the generally small effect on strength. Happily, it appears that the extremes of barely passable to nearly the best properties to be expected from these particular phenolics were obtained. This serves to more positively place and compare the special molding methods with respect to conventional compression molding methods.

6.3.2 General Observations

6.3.2.1 The Mold

It appears to this observer the present design of the vacuum mold cannot be fully effective without the use of breather mats. The flow of the molten material into the vent slots may close them at the very time when the reaction gases are being generated. In order to fairly determine the beneficial effects of vacuum and directional heat flow molding, this work should be repeated using breather mats.

6.3.2.2 Directional Heat Flow; Directional Heat Flow Plus Vacuum

In spite of the relatively poor showing of the directional heat flow method in this work it is known from personal experience, the method can be a very effective special technique. Satisfactory thick, large billets of asbestos phenolic (as large as 18" x 18" x 6" thick) were made by this method.

Other attempts to produce a sound molding of this size and thickness had failed. The photograph Appendix III, taken February 8, 1974, is a section of one such billet, molded in July 1970 by directional heat flow--size 18" x 18" x 4-3/16". This billet was post cured in the mold - no pressure - 48 hours at 250 to 300F.

Slight post cure checks are evident. A higher post cure temperature should have been used on this billet.

A 6" thick billet was made by similar techniques at about the same time with similar results. Those who have attempted molding billets of this size will be familiar with the problems. (Refer Appendix III Photographs 2-3-4).

6.3.2.3 Curing Polyimides by Vacuum Molding

The N.A.S.A. vacuum mold was used successfully to mold a polyimide-graphite laminate. Normally this is accomplished via vacuum bag-autoclave procedure. By allowing room in the mold for resin bleed-off and breather mat the vacuum mold accomplishes the same task plus being able to apply much higher molding pressures.

6.3.2.4 Degassing Phenolic Thermosets

This work indicates that degassing the charge in the mold (after heat is applied) by whatever means is beneficial.

Degassing by opening and closing the mold (bumping) can be more extensive than one would suspect, and can be quite beneficial.

Although it was not proven in this work, degassing by vacuum and vacuum plus directional heat flow should be just as effective. The use of breather mat or other means to keep the vent slots open appears to be the "key".

There are cases where application of vacuum could be very important and effective.

A. Removal of gas pockets during molding of intricate shapes

B. Assisting flow to difficult areas in intricate moldings

C. Control of blisters and under surface gas checks

D. Cure of high gas reaction resins such as polyimides

E. Elimination of gas delaminations

APPENDICES

APPENDIX I

Computer Print-Out Sheets

Panel Data

Length, Width and Thickness dimensions are inches.

Weight determinations are grams.

Rockwell Hardness F-Scale (Hard)

PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

	MOLDED					CURED				
SAMPLE	L	W	T	WEIGHT	HARD	L	W	T	WEIGHT	HARD
C-16-17	4.820	3.190	0.486	227.800	078	4.820	3.191	0.485	226.440	086
C-16-18	4.820	3.188	0.494	233.894	080	4.821	3.192	0.493	232.492	089
D-16-01	4.820	3.191	0.484	228.710	075	4.819	3.191	0.481	227.160	085
D-16-02	4.819	3.191	0.480	228.511	072	4.820	3.189	0.478	226.984	084
V-16-01	4.821	3.190	0.487	229.182	074	4.820	3.189	0.484	227.763	086
V-16-02	4.822	3.192	0.487	230.736	081	4.819	3.189	0.485	229.479	087
DV-16-01	4.822	3.190	0.485	230.549	077	4.821	3.188	0.482	229.169	084
DV-16-02	4.821	3.188	0.484	230.076	075	4.821	3.189	0.480	228.749	082

CALCULATED DATA

	MOLDED		CURED		SHRINKAGE (PCT)				
SAMPLE	SP GR	VOL	SP GR	VOL	LEN	WID	THK	VOL	WT LOSS
C-16-17	1.860	7.473	1.852	7.460	0.00	-0.03	0.21	0.17	0.60
C-16-18	1.880	7.591	1.870	7.587	-0.02	-0.13	0.20	0.06	0.60
D-16-01	1.875	7.444	1.874	7.397	0.02	0.00	0.62	0.64	0.68
D-16-02	1.889	7.381	1.885	7.347	-0.02	0.06	0.42	0.46	0.57
V-16-01	1.867	7.490	1.868	7.440	0.02	0.03	0.62	0.67	0.62
V-16-02	1.878	7.496	1.879	7.453	0.06	0.09	0.41	0.57	0.54
DV-16-01	1.886	7.460	1.888	7.408	0.02	0.06	0.62	0.70	0.60
DV-16-02	1.887	7.439	1.891	7.380	0.00	-0.03	0.83	0.80	0.58

PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-25	4.820	3.189	0.482	227.205	077	4.819	3.190	0.478	224.919	085
C-16-26	4.820	3.188	0.490	231.677	075	4.821	3.188	0.485	229.335	084
C1-16-45	4.823	3.193	0.502	238.824	081	4.818	3.187	0.495	235.639	091
C1-16-46	4.823	3.193	0.499	238.150	077	4.819	3.185	0.495	234.789	090
D-16-10	4.821	3.189	0.490	232.506	077	4.819	3.188	0.485	230.070	085
D-16-11	4.821	3.192	0.497	232.200	074	4.819	3.189	0.483	229.743	086
V-16-09	4.819	3.189	0.479	227.834	082	4.818	3.190	0.476	225.889	089
V-16-10	4.818	3.188	0.483	229.932	078	4.820	3.187	0.480	227.918	086
DV-16-09	4.819	3.188	0.486	231.753	074	4.821	3.188	0.481	229.418	086
DV-16-10	4.819	3.191	0.488	232.573	080	4.820	3.190	0.483	230.398	087

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-25	1.871	7.409	1.868	7.348	0.02	-0.03	0.83	0.82	1.01
C-16-26	1.878	7.529	1.877	7.454	-0.02	0.00	1.02	1.00	1.01
C1-16-45	1.885	7.731	1.892	7.601	0.10	0.19	1.39	1.68	1.33
C1-16-46	1.891	7.685	1.886	7.598	0.08	0.25	0.80	1.13	1.41
D-16-10	1.883	7.533	1.884	7.451	0.04	0.03	1.02	1.09	1.05
D-16-11	1.891	7.494	1.889	7.423	0.04	0.09	0.82	0.96	1.06
V-16-09	1.889	7.361	1.884	7.316	0.02	-0.03	0.63	0.62	0.85
V-16-10	1.891	7.419	1.886	7.373	-0.04	0.03	0.62	0.61	0.88
DV-16-09	1.894	7.466	1.894	7.393	-0.04	0.00	1.03	0.99	1.01
DV-16-10	1.891	7.504	1.893	7.427	-0.02	0.03	1.02	1.04	0.94

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PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-29	4.818	3.188	0.483	227.253	069	4.818	3.186	0.477	224.187	086
C-16-30	4.820	3.189	0.486	229.323	075	4.819	3.189	0.481	226.293	088
C1-16-47	4.823	3.193	0.499	237.824	081	4.818	3.190	0.492	234.576	092
C1-16-48	4.823	3.193	0.498	236.961	079	4.819	3.188	0.492	233.615	093
D-16-14	4.821	3.192	0.487	229.124	077	4.819	3.188	0.477	226.083	089
D-16-15	4.820	3.191	0.489	232.061	072	4.817	3.186	0.484	228.477	085
V-16-13	4.819	3.189	0.488	230.734	081	4.819	3.185	0.484	227.969	092
V-16-14	4.820	3.190	0.486	231.544	082	4.819	3.188	0.483	229.115	092
DV-16-13	4.820	3.189	0.490	232.496	076	4.820	3.187	0.483	229.455	089
DV-16-14	4.820	3.189	0.486	232.496	077	4.819	3.189	0.482	229.699	088

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-29	1.869	7.419	1.868	7.322	0.00	0.06	1.24	1.30	1.35
C-16-30	1.874	7.468	1.868	7.392	0.02	-0.03	1.03	1.02	1.32
C1-16-47	1.888	7.685	1.893	7.562	0.10	0.09	1.40	1.60	1.37
C1-16-48	1.885	7.669	1.886	7.559	0.08	0.16	1.20	1.44	1.41
D-16-14	1.866	7.494	1.883	7.328	0.04	0.13	2.05	2.22	1.33
D-16-15	1.883	7.521	1.877	7.428	0.06	0.16	1.02	1.24	1.54
V-16-13	1.877	7.499	1.873	7.429	0.00	0.13	0.82	0.94	1.20
V-16-14	1.891	7.473	1.884	7.420	0.02	0.06	0.62	0.70	1.05
DV-16-13	1.884	7.532	1.887	7.420	0.00	0.06	1.43	1.49	1.31
DV-16-14	1.899	7.470	1.892	7.407	0.02	0.00	0.82	0.84	1.20

PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 4 TIME IN OVEN 3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-21	4.819	3.186	0.490	230.066	076	4.820	3.186	0.484	226.078	089
C-16-22	4.820	3.187	0.487	229.951	078	4.816	3.189	0.482	225.884	091
D-16-05	4.825	3.191	0.480	227.946	072	4.818	3.188	0.476	223.439	085
D-16-06	4.823	3.191	0.480	227.766	076	4.819	3.187	0.475	223.340	088
V-16-05	4.819	3.190	0.491	232.692	078	4.816	3.188	0.486	228.957	092
V-16-06	4.819	3.190	0.477	226.072	081	4.815	3.188	0.471	222.558	092
DV-16-05	4.820	3.189	0.483	231.049	077	4.816	3.187	0.476	227.112	090
DV-16-06	4.820	3.190	0.489	233.248	073	4.818	3.190	0.484	229.273	087

CALCULATED DATA

SAMPLE	MOLDED SP GR	MOLDED VOL	CURED SP GR	CURED VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-21	1.866	7.523	1.856	7.433	-0.02	0.00	1.22	1.20	1.73
C-16-22	1.876	7.481	1.862	7.403	0.08	-0.06	1.03	1.05	1.77
D-16-05	1.882	7.390	1.865	7.311	0.15	0.09	0.83	1.07	1.98
D-16-06	1.881	7.387	1.868	7.295	0.08	0.13	1.04	1.25	1.94
V-16-05	1.881	7.548	1.872	7.462	0.06	0.06	1.02	1.14	1.61
V-16-06	1.881	7.333	1.878	7.230	0.08	0.06	1.26	1.40	1.55
DV-16-05	1.899	7.424	1.897	7.306	0.08	0.06	1.45	1.59	1.70
DV-16-06	1.893	7.519	1.881	7.439	0.04	0.00	1.02	1.06	1.70

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-19	4.819	3.188	0.486	229.664	079	4.820	3.192	0.485	227.336	090
C-16-20	4.819	3.188	0.488	230.785	072	4.817	3.186	0.490	226.508	087
C1-16-49	4.823	3.191	0.498	237.466	082	4.819	3.189	0.496	235.355	090
C1-16-50	4.823	3.191	0.496	236.929	080	4.820	3.189	0.494	234.733	091
D-16-03	4.820	3.191	0.482	228.299	073	4.820	3.188	0.479	225.810	087
D-16-04	4.820	3.192	0.481	227.483	073	4.821	3.188	0.479	224.815	088
V-16-03	4.820	3.191	0.487	229.667	079	4.818	3.188	0.484	227.413	092
V-16-04	4.820	3.190	0.487	229.897	079	4.818	3.186	0.484	227.608	090
DV-16-03	4.828	3.190	0.484	230.748	076	4.822	3.189	0.481	228.511	090
DV-16-04	4.819	3.190	0.487	232.294	073	4.819	3.188	0.484	230.086	089

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-19	1.877	7.466	1.859	7.462	-0.02	-0.13	0.21	0.06	1.01
C-16-20	1.878	7.497	1.838	7.520	0.04	0.06	-0.41	-0.31	1.85
C1-16-49	1.891	7.564	1.884	7.622	0.08	0.06	0.40	0.55	0.89
C1-16-50	1.894	7.634	1.886	7.593	0.06	0.06	0.40	0.53	0.93
D-16-03	1.879	7.413	1.872	7.360	0.00	0.09	0.62	0.72	1.09
D-16-04	1.876	7.400	1.863	7.362	-0.02	0.13	0.42	0.52	1.17
V-16-03	1.871	7.490	1.867	7.434	0.04	0.09	0.62	0.75	0.98
V-16-04	1.873	7.488	1.869	7.429	0.04	0.13	0.62	0.78	1.00
DV-16-03	1.891	7.447	1.885	7.397	0.02	0.03	0.62	0.67	0.97
DV-16-04	1.894	7.485	1.888	7.436	-0.02	0.06	0.62	0.66	0.95

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-27	4.819	3.188	0.486	226.929	073	4.816	3.184	0.487	221.312	086
C-16-28	4.819	3.188	0.486	230.000	078	4.819	3.188	0.482	226.378	090
C1-16-51	4.823	3.190	0.497	238.807	079	4.820	3.188	0.485	235.567	093
C1-16-52	4.822	3.190	0.497	237.878	077	4.823	3.191	0.495	234.448	091
D-16-12	4.822	3.192	0.488	231.758	074	4.819	3.188	0.483	228.137	090
D-16-13	4.821	3.190	0.489	232.884	074	4.819	3.187	0.484	229.284	087
V-16-11	4.820	3.190	0.474	226.006	079	4.819	3.193	0.471	223.045	091
V-16-12	4.819	3.191	0.478	226.381	073	4.818	3.189	0.474	223.106	091
DV-16-11	4.819	3.188	0.486	231.656	072	4.818	3.186	0.481	228.028	089
DV-16-12	4.820	3.189	0.488	232.054	074	4.818	3.187	0.484	228.769	089

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-27	1.855	7.466	1.808	7.468	0.06	0.13	-0.21	-0.02	2.48
C-16-28	1.880	7.466	1.865	7.405	0.00	0.00	0.82	0.82	1.57
C1-16-51	1.906	7.647	1.929	7.453	0.06	0.06	2.41	2.54	1.36
C1-16-52	1.899	7.645	1.878	7.618	-0.02	-0.03	0.40	0.35	1.44
D-16-12	1.883	7.511	1.876	7.420	0.06	0.13	1.02	1.21	1.56
D-16-13	1.890	7.520	1.882	7.433	0.04	0.09	1.02	1.16	1.55
V-16-11	1.892	7.288	1.878	7.247	0.02	-0.09	0.63	0.56	1.31
V-16-12	1.879	7.350	1.869	7.283	0.02	0.06	0.84	0.92	1.45
DV-16-11	1.893	7.466	1.885	7.383	0.02	0.06	1.03	1.11	1.57
DV-16-12	1.888	7.501	1.878	7.432	0.04	0.06	0.82	0.92	1.42

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

	MOLDED					CURED				
SAMPLE	L	W	T	WEIGHT	HARD	L	W	T	WEIGHT	HARD
C-16-31	4.819	3.188	0.493	232.281	076	4.818	3.188	0.488	227.644	090
C-16-32	4.819	3.189	0.484	228.863	078	4.818	3.187	0.480	224.255	090
C1-16-53	4.820	3.190	0.495	237.747	080	4.819	3.190	0.494	233.353	093
C1-16-54	4.822	3.193	0.496	237.363	079	4.817	3.186	0.493	232.669	095
D-16-16	4.823	3.194	0.487	232.537	068	4.820	3.186	0.483	227.604	089
D-16-17	4.821	3.192	0.488	231.337	072	4.820	3.186	0.481	226.125	087
V-16-15	4.820	3.191	0.493	234.298	081	4.821	3.188	0.488	230.055	092
V-16-16	4.820	3.191	0.487	231.264	083	4.819	3.188	0.483	227.032	092
DV-16-15	4.821	3.190	0.488	231.977	070	4.820	3.189	0.480	227.349	092
DV-16-16	4.819	3.188	0.486	231.984	074	4.818	3.188	0.481	227.665	092

CALCULATED DATA

	MOLDED		CURED		SHRINKAGE (PCT)				
SAMPLE	SP GR	VOL	SP GR	VOL	LEN	WID	THK	VOL	WT LOSS
C-16-31	1.871	7.574	1.853	7.496	0.02	0.00	1.01	1.03	2.00
C-16-32	1.878	7.438	1.857	7.370	0.02	0.06	0.83	0.91	2.01
C1-16-53	1.906	7.611	1.875	7.594	0.02	0.00	0.20	0.22	1.85
C1-16-54	1.897	7.637	1.876	7.566	0.10	0.22	0.60	0.93	1.98
D-16-16	1.891	7.502	1.872	7.417	0.06	0.25	0.82	1.13	2.12
D-16-17	1.880	7.510	1.868	7.386	0.02	0.19	1.43	1.64	2.25
V-16-15	1.885	7.583	1.872	7.500	-0.02	0.09	1.01	1.09	1.81
V-16-16	1.884	7.490	1.867	7.420	0.02	0.09	0.82	0.94	1.83
DV-16-15	1.886	7.505	1.880	7.378	0.02	0.03	1.64	1.69	2.00
DV-16-16	1.896	7.466	1.880	7.388	0.02	0.00	1.03	1.05	1.86

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 4 TIME IN OVEN 3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

	MOLDED					CURED				
SAMPLE	L	W	T	WEIGHT	HARD	L	W	T	WEIGHT	HARD
C-16-23	4.819	3.188	0.496	233.812	074	4.817	3.187	0.491	227.880	092
C-16-24	4.820	3.189	0.493	231.767	076	4.818	3.187	0.487	225.845	094
D-16-08	4.822	3.193	0.491	233.481	072	4.818	3.188	0.484	227.370	092
D-16-09	4.823	3.192	0.488	231.099	074	4.818	3.185	0.482	224.856	090
V-16-07	4.819	3.191	0.489	230.750	073	4.815	3.185	0.483	224.726	095
V-16-08	4.818	3.189	0.478	226.263	074	4.815	3.185	0.473	220.506	092
DV-16-07	4.822	3.189	0.487	231.718	074	4.818	3.186	0.482	225.679	093
DV-16-08	4.820	3.191	0.487	231.951	076	4.817	3.188	0.482	226.195	093

CALCULATED DATA

	MOLDED		CURED		SHRINKAGE (PCT)				
SAMPLE	SP GR	VOL	SP GR	VOL	LEN	WID	THK	VOL	WT LOSS
C-16-23	1.872	7.620	1.845	7.538	0.04	0.03	1.01	1.08	2.54
C-16-24	1.866	7.578	1.843	7.478	0.04	0.06	1.22	1.32	2.56
D-16-08	1.885	7.560	1.866	7.434	0.08	0.16	1.43	1.66	2.62
D-16-09	1.877	7.513	1.855	7.396	0.10	0.22	1.23	1.55	2.70
V-16-07	1.872	7.520	1.851	7.407	0.08	0.19	1.23	1.49	2.61
V-16-08	1.880	7.344	1.855	7.254	0.06	0.13	1.05	1.23	2.54
DV-16-07	1.888	7.489	1.861	7.399	0.08	0.09	1.03	1.20	2.61
DV-16-08	1.890	7.490	1.865	7.402	0.06	0.09	1.03	1.18	2.48

PANEL DATA 01/11/74

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 1 TIME IN OVEN 3+3+3+ 8 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	MOLDED W	MOLDED T	MOLDED WEIGHT	MOLDED HARD	CURED L	CURED W	CURED T	CURED WEIGHT	CURED HARD
C-16-33	4.820	3.189	0.482	227.258	075	4.818	3.187	0.479	223.300	087
C-16-34	4.820	3.189	0.493	233.442	072	4.820	3.189	0.491	230.476	091
D-16-18	4.822	3.193	0.487	231.162	074	4.820	3.190	0.488	227.935	089
D-16-19	4.825	3.191	0.487	231.115	073	4.820	3.189	0.483	227.904	092
V-16-17	4.820	3.190	0.492	233.353	074	4.818	3.186	0.490	230.561	091
V-16-18	4.819	3.190	0.484	229.259	071	4.819	3.187	0.481	226.293	089
DV-16-17	4.819	3.188	0.494	230.769	078	4.820	3.188	0.488	228.296	093
DV-16-18	4.822	3.193	0.485	232.983	079	4.822	3.189	0.482	230.495	090

CALCULATED DATA

SAMPLE	MOLDED SP GR	MOLDED VOL	CURED SP GR	CURED VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-33	1.872	7.409	1.853	7.355	0.04	0.06	0.62	0.73	1.74
C-16-34	1.880	7.578	1.863	7.547	0.00	0.00	0.41	0.41	1.27
D-16-18	1.881	7.498	1.854	7.503	0.04	0.09	-0.21	-0.07	1.40
D-16-19	1.881	7.498	1.873	7.424	0.10	0.06	0.82	0.99	1.39
V-16-17	1.882	7.565	1.870	7.522	0.04	0.13	0.41	0.57	1.20
V-16-18	1.880	7.440	1.869	7.387	0.00	0.09	0.62	0.71	1.29
DV-16-17	1.894	7.436	1.877	7.422	-0.02	0.00	0.21	0.19	1.07
DV-16-18	1.904	7.467	1.898	7.412	0.00	0.13	0.62	0.74	1.07

PANEL DATA 01/11/74

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 2 TIME IN OVEN 3+3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-35	4.819	3.189	0.485	229.098	074	4.815	3.184	0.485	221.899	091
C-16-36	4.820	3.189	0.490	230.495	071	4.815	3.183	0.493	223.650	091
C1-16-55	4.821	3.192	0.496	237.018	079	4.819	3.189	0.496	232.363	094
C1-16-56	4.822	3.191	0.495	237.620	081	4.819	3.190	0.496	233.189	094
D-16-20	4.823	3.194	0.487	232.218	074	4.820	3.189	0.486	227.351	093
D-16-21	4.821	3.191	0.489	233.000	075	4.819	3.187	0.486	228.130	093
V-16-19	4.821	3.190	0.488	230.926	081	4.818	3.187	0.484	226.505	094
V-16-20	4.821	3.191	0.487	230.644	075	4.822	3.188	0.483	226.125	094
DV-16-19	4.820	3.191	0.482	230.912	078	4.820	3.187	0.477	226.616	094
DV-16-20	4.821	3.191	0.486	232.558	080	4.818	3.188	0.482	228.370	094

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-35	1.876	7.453	1.821	7.436	0.08	0.16	0.00	0.24	3.14
C-16-36	1.867	7.532	1.806	7.556	0.10	0.19	-0.61	-0.32	2.97
C1-16-55	1.895	7.633	1.860	7.622	0.04	0.09	0.00	0.14	1.96
C1-16-56	1.904	7.617	1.866	7.625	0.06	0.03	-0.20	-0.11	1.86
D-16-20	1.889	7.502	1.857	7.470	0.06	0.16	0.21	0.42	2.10
D-16-21	1.890	7.523	1.865	7.464	0.04	0.13	0.61	0.78	2.09
V-16-19	1.878	7.505	1.860	7.432	0.06	0.09	0.82	0.97	1.91
V-16-20	1.879	7.492	1.858	7.425	-0.02	0.09	0.82	0.89	1.96
DV-16-19	1.901	7.413	1.887	7.327	0.00	0.13	1.04	1.16	1.86
DV-16-20	1.898	7.477	1.882	7.403	0.06	0.09	0.82	0.98	1.80

PANEL DATA 01/11/74

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 3 TIME IN OVEN 3+3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-37	4.819	3.188	0.479	224.076	074	4.816	3.184	0.477	216.783	094
C-16-38	4.819	3.189	0.487	229.642	073	4.815	3.183	0.483	222.032	094
C1-16-57	4.821	3.191	0.497	238.928	082	4.818	3.189	0.495	233.878	096
C1-16-58	4.821	3.191	0.495	236.351	079	4.817	3.186	0.495	230.216	096
D-16-22	4.821	3.190	0.488	232.802	072	4.816	3.188	0.485	226.625	094
D-16-23	4.822	3.192	0.489	232.733	074	4.819	3.187	0.484	226.540	095
V-16-21	4.820	3.191	0.489	233.280	080	4.818	3.188	0.486	228.306	097
V-16-22	4.820	3.191	0.488	231.159	075	4.815	3.186	0.485	225.821	092
DV-16-21	4.821	3.191	0.483	230.729	074	4.817	3.187	0.481	225.299	095
DV-16-22	4.822	3.192	0.482	230.722	078	4.818	3.186	0.480	225.672	095

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-37	1.858	7.359	1.808	7.314	0.06	0.13	0.42	0.60	3.25
C-16-38	1.872	7.484	1.830	7.403	0.08	0.19	0.82	1.09	3.31
C1-16-57	1.907	7.646	1.876	7.605	0.06	0.06	0.40	0.53	2.11
C1-16-58	1.894	7.615	1.849	7.597	0.08	0.16	0.00	0.24	2.60
D-16-22	1.893	7.505	1.857	7.446	0.10	0.06	0.61	0.78	2.65
D-16-23	1.887	7.527	1.860	7.433	0.06	0.16	1.02	1.24	2.66
V-16-21	1.893	7.521	1.866	7.465	0.04	0.09	0.61	0.75	2.13
V-16-22	1.879	7.506	1.852	7.440	0.10	0.16	0.61	0.87	2.31
DV-16-21	1.895	7.430	1.862	7.384	0.08	0.13	0.41	0.62	2.35
DV-16-22	1.898	7.419	1.868	7.373	0.08	0.13	0.41	0.62	2.19

PANEL DATA 01/11/74

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 4 TIME IN OVEN 3+3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-16-39	4.819	3.188	0.488	230.334	074	4.816	3.182	0.489	222.909	094
C-16-40	4.819	3.188	0.491	231.576	073	4.814	3.182	0.491	223.787	094
D-16-24	4.822	3.191	0.491	234.058	074	4.815	3.188	0.485	226.927	095
D-16-2A	4.821	3.192	0.481	228.785	075	4.818	3.187	0.476	221.749	095
V-16-23	4.819	3.190	0.482	228.852	072	4.813	3.185	0.477	222.456	097
V-16-24	4.819	3.191	0.483	229.334	072	4.815	3.187	0.479	222.967	099
DV-16-23	4.823	3.190	0.483	231.348	076	4.815	3.187	0.479	224.348	097
DV-16-24	4.822	3.194	0.492	233.931	075	4.814	3.187	0.486	227.135	095

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-16-39	1.875	7.497	1.815	7.494	0.06	0.19	-0.20	0.05	3.22
C-16-40	1.873	7.543	1.816	7.521	0.10	0.19	0.00	0.29	3.36
D-16-24	1.890	7.555	1.860	7.445	0.15	0.09	1.22	1.46	3.05
D-16-2A	1.886	7.402	1.851	7.309	0.06	0.16	1.04	1.26	3.08
V-16-23	1.885	7.410	1.856	7.312	0.12	0.16	1.04	1.32	2.79
V-16-24	1.884	7.427	1.851	7.350	0.08	0.13	0.83	1.03	2.78
DV-16-23	1.900	7.431	1.862	7.350	0.17	0.09	0.83	1.09	3.03
DV-16-24	1.884	7.578	1.859	7.456	0.17	0.22	1.22	1.60	2.91

PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8+24 HOURS
TASK 01 GLASS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-G-02	4.812	3.185	0.485	226.821	094	4.813	3.188	0.486	225.577	110
C-G-03	4.812	3.183	0.482	224.373	094	4.814	3.188	0.481	223.138	109
C1-G-24	4.818	3.189	0.497	235.978	101	4.815	3.185	0.492	234.412	109
C1-G-25	4.817	3.188	0.498	236.692	101	4.812	3.183	0.493	235.100	108
D-G-01	4.813	3.187	0.485	225.687	094	4.812	3.183	0.483	224.256	108
D-G-02	4.813	3.189	0.491	230.320	095	4.815	3.184	0.488	228.572	107
V-G-01	4.815	3.186	0.499	232.847	096	4.812	3.185	0.496	231.825	109
V-G-03	4.814	3.183	0.477	221.716	099	4.812	3.180	0.474	220.686	109
DV-G-02	4.814	3.185	0.485	226.236	097	4.811	3.182	0.483	224.813	107
DV-G-03	4.815	3.185	0.480	224.016	095	4.811	3.182	0.478	222.732	107

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-G-02	1.862	7.433	1.846	7.457	-0.02	-0.09	-0.21	-0.32	0.55
C-G-03	1.855	7.383	1.844	7.382	-0.04	-0.16	0.21	0.01	0.55
C1-G-24	1.886	7.636	1.896	7.545	0.06	0.13	1.01	1.19	0.66
C1-G-25	1.889	7.648	1.900	7.551	0.10	0.16	1.00	1.26	0.67
D-G-01	1.851	7.439	1.850	7.398	0.02	0.13	0.41	0.56	0.63
D-G-02	1.865	7.536	1.864	7.482	-0.04	0.16	0.61	0.73	0.76
V-G-01	1.856	7.655	1.861	7.602	0.06	0.03	0.60	0.69	0.44
V-G-03	1.851	7.309	1.857	7.253	0.04	0.09	0.63	0.76	0.46
DV-G-02	1.856	7.436	1.855	7.394	0.06	0.09	0.41	0.57	0.63
DV-G-03	1.857	7.361	1.857	7.318	0.08	0.09	0.42	0.59	0.57

PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+8+48 HOURS
TASK 01 GLASS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-G-05	4.812	3.183	0.484	224.972	096	4.810	3.185	0.483	223.337	106
C-G-06	4.811	3.182	0.486	225.873	096	4.807	3.182	0.483	223.946	107
C1-G-22	4.818	3.189	0.497	237.291	102	4.816	3.185	0.494	235.829	109
C1-G-23	4.817	3.189	0.497	236.125	096	4.813	3.185	0.496	234.575	108
D-G-03	4.813	3.189	0.489	228.199	095	4.811	3.184	0.485	226.382	110
D-G-04	4.813	3.185	0.487	227.148	093	4.812	3.180	0.483	225.192	109
V-G-05	4.813	3.184	0.487	227.284	097	4.807	3.181	0.484	225.775	108
V-G-06	4.813	3.185	0.488	230.004	099	4.805	3.180	0.485	228.377	107
DV-G-04	4.816	3.185	0.486	225.417	092	4.810	3.180	0.484	223.598	108
DV-G-05	4.812	3.184	0.486	228.090	095	4.810	3.180	0.483	226.385	108

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-G-05	1.852	7.413	1.842	7.399	0.04	-0.06	0.21	0.19	0.73
C-G-06	1.853	7.440	1.850	7.388	0.08	0.00	0.62	0.70	0.85
C1-G-22	1.896	7.636	1.899	7.577	0.04	0.13	0.60	0.77	0.62
C1-G-23	1.887	7.635	1.883	7.603	0.08	0.13	0.20	0.41	0.66
D-G-03	1.855	7.505	1.859	7.429	0.04	0.16	0.82	1.01	0.80
D-G-04	1.857	7.465	1.859	7.391	0.02	0.16	0.82	1.00	0.86
V-G-05	1.858	7.463	1.861	7.401	0.12	0.09	0.62	0.83	0.66
V-G-06	1.876	7.481	1.880	7.411	0.17	0.16	0.61	0.94	0.71
DV-G-04	1.845	7.455	1.843	7.403	0.12	0.16	0.41	0.69	0.81
DV-G-05	1.869	7.446	1.870	7.388	0.04	0.13	0.62	0.78	0.75

PANEL DATA 01/11/74

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+8+96 HOURS
TASK 01 GLASS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-G-08	4.812	3.185	0.480	225.054	097	4.809	3.186	0.478	222.732	107
C-G-09	4.811	3.182	0.478	222.984	096	4.810	3.180	0.477	220.613	109
C1-G-26	4.816	3.189	0.496	237.588	099	4.812	3.183	0.493	235.494	110
C1-G-27	4.815	3.184	0.493	236.482	100	4.814	3.182	0.491	234.408	109
D-G-05	4.815	3.185	0.488	229.128	093	4.806	3.179	0.485	226.355	109
D-G-06	4.811	3.186	0.490	223.264	094	4.806	3.182	0.485	220.056	108
V-G-07	4.815	3.185	0.497	233.422	099	4.808	3.181	0.496	231.288	110
V-G-09	4.813	3.184	0.499	233.510	096	4.808	3.181	0.496	231.426	109
DV-G-06	4.811	3.183	0.489	228.928	089	4.810	3.179	0.487	226.417	109
DV-G-07	4.810	3.184	0.483	227.178	092	4.805	3.179	0.482	224.716	109

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-G-08	1.867	7.357	1.856	7.324	0.06	-0.03	0.42	0.45	1.03
C-G-09	1.859	7.318	1.845	7.296	0.02	0.06	0.21	0.29	1.06
C1-G-26	1.903	7.618	1.903	7.551	0.08	0.19	0.60	0.87	0.88
C1-G-27	1.909	7.558	1.902	7.521	0.02	0.06	0.41	0.49	0.88
D-G-05	1.868	7.484	1.864	7.410	0.19	0.19	0.61	0.99	1.21
D-G-06	1.814	7.511	1.810	7.417	0.10	0.13	1.02	1.25	1.44
V-G-07	1.869	7.622	1.860	7.586	0.15	0.13	0.20	0.47	0.91
V-G-09	1.863	7.647	1.862	7.586	0.10	0.09	0.60	0.80	0.89
DV-G-06	1.865	7.488	1.855	7.447	0.02	0.13	0.41	0.55	1.10
DV-G-07	1.874	7.397	1.862	7.363	0.10	0.16	0.21	0.47	1.08

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+8+8+24 HOURS
TASK 01 GLASS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-G-10	4.812	3.185	0.480	224.163	095	4.810	3.184	0.478	222.382	106
C-G-11	4.812	3.185	0.473	221.131	091	4.809	3.185	0.471	219.267	109
C1-G-28	4.815	3.187	0.493	236.298	100	4.812	3.187	0.494	234.642	108
C1-G-29	4.817	3.189	0.493	236.015	102	4.811	3.185	0.492	234.352	109
D-G-07	4.813	3.186	0.494	230.196	093	4.809	3.182	0.492	228.102	110
D-G-08	4.814	3.186	0.486	227.306	096	4.812	3.182	0.484	224.891	111
V-G-10	4.814	3.187	0.498	232.419	098	4.811	3.184	0.498	230.654	110
V-G-11	4.814	3.185	0.500	232.244	097	4.811	3.181	0.496	230.414	111
DV-G-08	4.812	3.184	0.483	226.674	092	4.807	3.180	0.482	224.587	111
DV-G-09	4.811	3.186	0.476	222.194	091	4.809	3.182	0.475	220.085	110

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-G-10	1.859	7.357	1.854	7.321	0.04	0.03	0.42	0.49	0.79
C-G-11	1.861	7.249	1.855	7.214	0.06	0.00	0.42	0.48	0.84
C1-G-28	1.906	7.565	1.890	7.576	0.06	0.00	-0.20	-0.14	0.70
C1-G-29	1.902	7.573	1.897	7.539	0.12	0.13	0.20	0.45	0.70
D-G-07	1.854	7.575	1.849	7.529	0.08	0.13	0.40	0.61	0.91
D-G-08	1.861	7.454	1.852	7.411	0.04	0.13	0.41	0.58	1.06
V-G-10	1.856	7.640	1.845	7.628	0.06	0.09	0.00	0.16	0.76
V-G-11	1.849	7.666	1.852	7.591	0.06	0.13	0.80	0.99	0.79
DV-G-08	1.869	7.400	1.860	7.368	0.10	0.13	0.21	0.44	0.92
DV-G-09	1.858	7.296	1.848	7.269	0.04	0.13	0.21	0.38	0.95

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+8+8+48 HOURS
TASK 01 GLASS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-G-12	4.813	3.183	0.479	223.460	099	4.810	3.183	0.478	220.915	109
C-G-13	4.813	3.185	0.479	223.980	095	4.811	3.182	0.478	221.425	109
C1-G-30	4.816	3.187	0.493	236.229	099	4.814	3.181	0.492	234.031	106
C1-G-31	4.815	3.188	0.492	236.278	099	4.812	3.183	0.491	233.994	106
D-G-09	4.812	3.189	0.489	228.425	093	4.804	3.180	0.486	225.231	108
D-G-10	4.814	3.186	0.488	228.362	094	4.808	3.181	0.485	225.373	110
V-G-12	4.811	3.187	0.496	229.272	097	4.803	3.183	0.494	226.801	107
V-G-13	4.815	3.185	0.497	232.725	096	4.809	3.181	0.493	230.331	109
DV-G-10	4.812	3.183	0.488	229.488	091	4.813	3.180	0.487	226.530	108
DV-G-11	4.812	3.183	0.489	229.633	090	4.805	3.176	0.487	226.894	109

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-G-12	1.858	7.338	1.842	7.318	0.06	0.00	0.21	0.27	1.14
C-G-13	1.861	7.343	1.846	7.318	0.04	0.09	0.21	0.34	1.14
C1-G-30	1.905	7.567	1.895	7.534	0.04	0.19	0.20	0.43	0.93
C1-G-31	1.909	7.552	1.899	7.520	0.06	0.16	0.20	0.42	0.97
D-G-09	1.857	7.504	1.851	7.424	0.17	0.28	0.61	1.06	1.40
D-G-10	1.862	7.485	1.854	7.418	0.12	0.16	0.61	0.89	1.31
V-G-12	1.840	7.605	1.832	7.552	0.17	0.13	0.40	0.69	1.08
V-G-13	1.863	7.622	1.864	7.542	0.12	0.13	0.80	1.05	1.03
DV-G-10	1.873	7.474	1.854	7.454	-0.02	0.09	0.20	0.28	1.29
DV-G-11	1.871	7.490	1.863	7.432	0.15	0.22	0.41	0.77	1.19

PANEL DATA 01/11/74

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+8+8+96 HOURS
TASK 01 GLASS/PHENOLIC

ORIGINAL DATA

SAMPLE	MOLDED L	W	T	WEIGHT	HARD	CURED L	W	T	WEIGHT	HARD
C-G-17	4.811	3.183	0.470	218.988	096	4.804	3.179	0.468	215.765	110
C-G-18	4.812	3.184	0.478	223.809	093	4.805	3.179	0.477	220.418	110
C1-G-32	4.817	3.188	0.494	236.048	102	4.811	3.184	0.491	233.054	109
C1-G-33	4.817	3.189	0.494	235.675	102	4.812	3.184	0.491	232.658	109
D-G-11	4.816	3.185	0.491	229.396	095	4.805	3.180	0.488	224.850	111
D-G-12	4.815	3.189	0.490	228.754	094	4.808	3.181	0.485	224.554	112
V-G-14	4.816	3.186	0.496	227.767	095	4.808	3.182	0.491	224.322	112
V-G-17	4.814	3.185	0.491	229.941	096	4.806	3.180	0.486	226.760	111
DV-G-12	4.810	3.183	0.485	227.698	092	4.808	3.179	0.482	223.918	111
DV-G-13	4.813	3.184	0.484	225.826	085	4.807	3.178	0.481	222.110	111

CALCULATED DATA

SAMPLE	MOLDED SP GR	VOL	CURED SP GR	VOL	SHRINKAGE (PCT) LEN	WID	THK	VOL	WT LOSS
C-G-17	1.857	7.197	1.842	7.147	0.15	0.13	0.43	0.70	1.47
C-G-18	1.865	7.324	1.846	7.286	0.15	0.16	0.21	0.51	1.51
C1-G-32	1.899	7.586	1.891	7.521	0.12	0.13	0.61	0.86	1.27
C1-G-33	1.895	7.589	1.887	7.523	0.10	0.16	0.61	0.87	1.28
D-G-11	1.859	7.531	1.840	7.457	0.23	0.16	0.61	0.99	1.98
D-G-12	1.855	7.524	1.847	7.418	0.15	0.25	1.02	1.41	1.84
V-G-14	1.826	7.611	1.822	7.512	0.17	0.13	1.01	1.30	1.51
V-G-17	1.864	7.528	1.863	7.428	0.17	0.16	1.02	1.34	1.38
DV-G-12	1.871	7.425	1.855	7.367	0.04	0.13	0.62	0.78	1.66
DV-G-13	1.858	7.417	1.844	7.348	0.12	0.19	0.62	0.93	1.65

APPENDICES (Continued)

APPENDIX I

COMPUTER PRINT-OUT SHEETS

Bar Data

NOTATIONS, ABBREVIATIONS, ETC.

C	=	Cracked or Checked Sample
S	=	Break Occurring in Shoulder Area
J	=	Break Occurring under Jaw of Clamp
NS	=	Insufficient Data - Unable to Obtain Slope Data - No Slope
SD	=	Suspect Data, Data Not Used

Width and Thickness Dimensions are in Inches

Load is in Pounds

Elongation (ELONG or ELG) is in Inches or Percent

Deflection to Break Point (DFLCT) is in Inches

Tensile is in P.S.I.

Mod. of Elas. or Elas. Mod. is in P.S.I.

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT.
C-16-17-1	0.4860	0.2480	109.0	969.0	21879.	2091474.	0.123
C-16-17-2	0.4860	0.2410	116.0	1000.0	24656.	2351975.	0.174
C-16-18-1	0.4970	0.2480	129.0	1111.0	26373.	2492687.	0.163
C-16-18-2	0.4990	0.2470	128.0	1142.0	25227.	2429936.	0.172

AVERAGE MR(PSI)= 24534.
AVERAGE MOD OF ELAS(PSI)= 2341505.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-17-1		0.232	0.249	530.	100000.	0.0050	9174.	1791062.	0.50
C-16-17-2	S	0.240	0.251	524.	166500.	0.0041	8698.	2763945.	0.40
C-16-18-1		0.231	0.248	705.	143000.	0.0069	12306.	2496160.	0.69
C-16-18-2		0.226	0.247	630.	125000.	0.0059	11285.	2239261.	0.59

AVERAGE TENSILE(PSI) 10366.
AVERAGE ELASTIC MOD(PSI) 2307607.
AVERAGE ELONGATION(PER CENT) 0.5475

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-17-1	0.2490	1.08	4.33	0.2510	1.35	5.37
C-16-17-2	0.2470	1.18	4.77	0.2460	1.57	6.38
C-16-18-1	0.2460	1.48	6.01	0.2440	1.30	5.32
C-16-18-2	0.2450	1.18	4.81	0.2480	1.30	5.24

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.98
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.58

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT.
D-16-01-1	0.4860	0.2520	125.0	1000.0	24300.	2057227.	0.162
D-16-01-2	0.4860	0.2520	99.0	954.0	19051.	1962595.	0.132
D-16-02-1	0.4830	0.2470	120.0	1200.0	24433.	2637931.	0.134
D-16-02-2	0.4860	0.2490	110.0	955.0	21903.	2036522.	0.154

AVERAGE MR(PSI)= 22422.
AVERAGE MOD OF ELAS(PSI)= 2173569.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	FLAS MOD	PCT ELG
D-16-01-1	S	0.232	0.246	465.	129000.	0.0035	8180.	2199156.	0.35
D-16-01-2	S	0.231	0.252	505.	[illegible]	0.0040	9362.	[illegible].SD	0.39
D-16-02-1	S	0.235	0.246	555.	133300.	0.0059	11330.	2305830.	0.59
D-16-02-2		0.229	0.246	325.	111000.	0.0031	5769.	1970391.	0.31

AVERAGE TENSILE(PSI) 8660.
AVERAGE PLASTIC MOD(PSI) [illegible].2158459
AVERAGE ELONGATION(PER CENT) 0.4124

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-01-1	0.2470	1.12	4.53	0.2510	1.30	5.17
D-16-01-2	0.2490	1.09	4.44	0.2440	1.43	5.86
D-16-02-1	0.2470	1.27	5.14	0.2460	1.46	5.93
D-16-02-2	0.2450	1.12	4.57	0.2460	1.70	6.93

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.67
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.97

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-01-1	0.4860	0.2450	118.0	888.0	24269.	1987918.	0.148
V-16-01-2	0.4850	0.2460	113.0	919.0	23100.	2036519.	0.154
V-16-02-1	0.4870	0.2490	136.0	1315.0	27024.	2798458.	0.154
V-16-02-2	0.4870	0.2480	124.0	938.0	24539.	2020407.	0.168

AVERAGE MR(PSI)= 24808.
AVERAGE MOD OF ELAS(PSI)= 2210825.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-01-1	0.226	0.250	530.	143000.	0.0029	9380.	2530974.	0.29
V-16-01-2	0.220	0.249	585.	125000.	0.0050	10679.	2281955.	0.50
V-16-02-1	0.226	0.247	460.	133300.	0.0039	8240.	2387948.	0.39
V-16-02-2	0.223	0.247	355.	125000.	0.0038	6445.	2269385.	0.37

AVERAGE TENSILE(PSI) 8686.
AVERAGE ELASTIC MOD(PSI) 2367540.
AVERAGE ELONGATION(PER CENT) 0.3899

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-01-1	0.2490	1.13	4.53	0.2490	1.37	5.50
V-16-01-2	0.2460	1.22	4.95	0.2500	1.40	5.60
V-16-02-1	0.2490	1.14	4.57	0.2500	1.48	5.92
V-16-02-2	0.2480	0.88	3.54	0.2460	1.80	7.31

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.40
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.08

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 348 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-01-1	0.4870	0.2460	127.0	1115.0	25855.	2460711.	0.162
DV-16-01-2	0.4900	0.2490	107.0	847.0	21131.	1791469.	0.146
DV-16-02-1	0.4850	0.2480	120.0	818.0	24137.	1769198.	0.148
DV-16-02-2	0.4870	0.2490	103.0	850.0	20467.	1808889.	0.128

AVERAGE MR(PSI)= 22898.
AVERAGE MOD OF ELAS(PSI)= 1957567.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-01-1	0.226	0.245	530.	166700.	0.0038	11378.	3010656.	0.37
DV-16-01-2	0.226	0.247	560.	N.S.0.	[illegible]	10031.	N.S. 0.	SD [illegible]
DV-16-02-1	0.223	0.242	415.	N.S.0.	[illegible]	7690.	N.S. 0.	SD [illegible]
DV-16-02-2	0.226	0.238	460.	111000.	0.0043	8552.	2063657.	0.42

AVERAGE TENSILE(PSI) 9413.
AVERAGE ELASTIC MOD(PSI) [illegible].2,537,157
AVERAGE ELONGATION(PER CENT) [illegible] 0.395

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-01-1	0.2480	0.96	3.87	0.2490	1.46	5.86
DV-16-01-2	0.2440	0.98	4.01	0.2440	1.58	6.47
DV-16-02-1	0.2460	0.97	3.94	0.2450	1.34	5.46
DV-16-02-2	0.2500	0.98	3.92	0.2500	1.44	5.76

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 3.93
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.89

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-25-1	0.4810	0.2500	140.0	909.0	27941.	1935168.	0.170
C-16-25-2	0.4840	0.2410	98.0	692.0	20916.	1634292.	0.144
C-16-26-1	0.4920	0.2410	132.0	856.0	27715.	1984738.	0.170
C-16-26-2	0.4900	0.2450	107.0	755.0	21827.	1676381.	0.154

AVERAGE MR(PSI)= 24600.
AVERAGE MOD OF ELAS(PSI)= 1808644.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-25-1	S	0.241	0.249	450.	125000.	0.0028	7498.	2083021.	0.28
C-16-25-2		0.250	0.247	620.	136000.	0.0027	10040.	2202429.	0.26
C-16-26-1		0.239	0.247	680.	125000.	0.0048	11518.	2117460.	0.47
C-16-26-2	S	0.244	0.246	690.	143000.	0.0055	11495.	2382381.	0.55

AVERAGE TENSILE(PSI) 10138.
AVERAGE ELASTIC MOD(PSI) 2195322.
AVERAGE ELONGATION(PER CENT) 0.3949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-25-1	0.2490	1.30	5.22	0.2500	1.48	5.92
C-16-25-2	0.2480	1.06	4.27	0.2460	2.17	8.82
C-16-26-1	0.2480	1.32	5.32	0.2450	1.36	5.55
C-16-26-2	0.2450	1.32	5.38	0.2450	1.48	6.04

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.05
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.58

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-45-1	0.5000	0.2460	138.0	1200.0	27364.	2579443.	0.132
C1-16-45-2	0.4990	0.2480	147.0	1165.0	28738.	2449009.	0.194
C1-16-46-1	0.4970	0.2390	154.0	812.0	32821.	1939049.	0.218
C1-16-46-2	0.4940	0.2450	167.0	1170.0	33791.	2576801.	0.230

AVERAGE MR(PSI)= 30679.
AVERAGE MOD OF ELAS(PSI)= 2386075.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-16-45-1	0.215	0.246	780.	143000.	0.0060	14747.	2703725.	0.60
C1-16-45-2	0.213	0.240	690.	125000.	0.0052	12323.	2445227.	0.51
C1-16-46-1	0.214	0.246	580.	160000.	0.0034	11017.	3039283.	0.34
C1-16-46-2	0.215	0.245	700.	154000.	0.0052	13289.	2923589.	0.51

AVERAGE TENSILE(PSI) 12844.
AVERAGE ELASTIC MOD(PSI) 2777956.
AVERAGE ELONGATION(PER CENT) 0.4949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-45-1	0.2460	1.20	4.87	0.2420	1.70	7.02
C1-16-45-2	0.2480	1.02	4.11	0.2480	1.35	5.44
C1-16-46-1	0.2460	1.09	4.43	0.2470	1.31	5.30
C1-16-46-2	0.2470	1.32	5.34	0.2470	1.40	5.66

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.69
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.85

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-10-1	0.4890	0.2490	131.0	945.0	25924.	2002834.	0.164
D-16-10-2	0.4910	0.2500	126.0	871.0	24635.	1816505.	0.166
D-16-11-1	0.4870	0.2470	115.0	866.0	23223.	1888070.	0.134
D-16-11-2	0.4890	0.2500	116.0	900.0	22773.	1884662.	0.138

AVERAGE MR(PSI)= 24139.
AVERAGE MOD OF ELAS(PSI)= 1898018.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-10-1	S	0.239	0.250	525.	166700.	0.0038	8786.	2789958.	0.37
D-16-10-2		0.238	0.248	640.	154300.	0.0042	10843.	2609108.	0.41
D-16-11-1		0.238	0.244	515.	125000.	0.0035	8868.	2152501.	0.35
D-16-11-2		0.239	0.250	610.	143000.	0.0048	10209.	2393306.	0.47

AVERAGE TENSILE(PSI) 9676.
AVERAGE ELASTIC MOD(PSI) 2486218.
AVERAGE ELONGATION(PER CENT) 0.4074

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-10-1	0.2490	1.18	4.73	0.2510	1.50	5.97
D-16-10-2	0.2480	1.12	4.51	0.2490	1.65	6.62
D-16-11-1	0.2490	1.22	4.89	0.2500	2.10	8.40
D-16-11-2	0.2460	1.20	4.87	0.2510	1.42	5.65

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.75
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.66

RAP DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-09-1	0.4800	0.2520	121.0	892.0	23817.	1774667.	0.132
V-16-09-2	0.4800	0.2460	123.0	723.0	25406.	1618869.	0.152
V-16-10-1	0.4820	0.2470	144.0	937.0	29381.	2064057.	0.162
V-16-10-2	0.4820	0.2430	109.0	863.0	22978.	1996480.	0.138

AVERAGE MR(PSI)= 25395.
AVERAGE MOD OF ELAS(PSI)= 1863518.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-09-1	0.241	0.251	400.	182000.	0.0033	8100.	3008712.	0.33
V-16-09-2	S0.240	0.250	710.	182000.	0.0047	11833.	3033334.	0.46
V-16-10-1	0.241	0.250	510.	154000.	0.0031	8464.	2556017.	0.31
V-16-10-2	0.240	0.247	720.	143000.	0.0051	12145.	2412281.	0.50

AVERAGE TENSILE(PSI) 10136.
AVERAGE ELASTIC MOD(PSI) 2752585.
AVERAGE ELONGATION(PER CENT) 0.4049

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-09-1	0.2500	1.22	4.88	0.2500	1.85	7.40
V-16-09-2	0.2470	1.15	4.65	0.2480	2.00	8.06
V-16-10-1	0.2420	1.14	4.71	0.2450	1.57	6.40
V-16-10-2	0.2420	1.14	4.71	0.2470	1.52	6.15

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.73
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.00

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3-24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-09-1	0.4860	0.2460	141.0	870.0	28764.	1923967.	0.188
DV-16-09-2	0.4880	0.2490	124.0	880.0	24589.	1868895.	0.164
DV-16-10-1	0.4870	0.2480	131.0	760.0	26241.	1637003.	0.164
DV-16-10-2	0.4880	0.2470	105.0	743.0	21160.	1616584.	0.150

AVERAGE MR(PSI)= 25189.
AVERAGE MOD OF ELAS(PSI)= 1761612.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-09-1	S0.240	0.245	705.	166700.	0.0052	11989.	2335035.	0.51
DV-16-09-2	0.240	0.247	595.	166700.	0.0035	10037.	2812079.	0.35
DV-16-10-1	S0.240	0.248	645.	125000.	0.0050	10836.	2100135.	0.50
DV-16-10-2	J0.240	0.246	575.	142000.	0.0059	9739.	2422087.	0.59

AVERAGE TENSILE(PSI) 10650.
AVERAGE ELASTIC MOD(PSI) 2542334.
AVERAGE ELONGATION(PER CENT) 0.4899

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-09-1	0.2490	1.55	6.22	0.2530	2.14	8.45
DV-16-09-2	0.2440	1.31	5.36	0.2480	1.65	6.65
DV-16-10-1	0.2480	1.46	5.88	0.2490	1.36	5.46
DV-16-10-2	0.2490	1.16	4.65	0.2490	1.85	7.42

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.53
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.00

PAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-29-1	0.4810	0.2450	124.0	909.0	25768.	2056083.	0.160
C-16-29-2	0.4820	0.2450	116.0	778.0	24056.	1756121.	0.166
C-16-30-1	0.4840	0.2490	121.0	795.0	24193.	1580917.	0.178
C-16-30-2	0.4830	0.2440	121.0	876.0	25247.	1997595.	0.164

AVERAGE MR(PSI)= 24816.
AVERAGE MOD OF ELAS(PSI)= 1872679.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	FLAS MOD	PCT ELG
C-16-29-1	S0.247	0.252	720.	136500.	0.0045	11567.	2674957.	0.44
C-16-29-2	S0.240	0.247	510.	125000.	0.0029	8603.	2108637.	0.39
C-16-30-1	0.239	0.250	665.	176500.	0.0039	10794.	2953975.	0.39
C-16-30-2	0.241	0.250	465.	154000.	0.0027	7717.	2556017.	0.26

AVERAGE TENSILE(PSI) 9670.
AVERAGE PLASTIC MOD(PSI) 2573396.
AVERAGE ELONGATION(PER CENT) 0.3749

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-29-1	0.2550	1.11	4.35	0.2520	1.68	6.66
C-16-29-2	0.2510	1.32	5.25	0.2500	2.10	8.40
C-16-30-1	0.2510	1.27	5.05	0.2530	1.57	6.20
C-16-30-2	0.2400	1.15	4.79	0.2410	1.35	5.60

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.86
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.71

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RAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3*48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-47-1	0.4980	0.2470	173.0	1500.0	34164.	3198094.	0.176
C1-16-47-2	0.4980	0.2460	147.0	1110.0	29266.	2395567.	0.200
C1-16-48-1	0.4960	0.2480	176.0	1060.0	34616.	2241760.	0.186
C1-16-48-2	0.4980	0.2480	157.0	1060.0	30755.	2232757.	0.178

AVERAGE MR(PSI)= 32200.
AVERAGE MOD OF ELAS(PSI)= 2517044.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-16-47-1	0.217	0.243	650.	133300.	0.0043	12326.	2527925.	0.42
C1-16-47-2	S0.219	0.243	770.	133300.	0.0059	14469.	2504839.	0.59
C1-16-48-1	S0.215	0.247	660.	154000.	0.0047	12428.	2899916.	0.46
C1-16-48-2	S0.220	0.246	685.	150000.	0.0051	12657.	2771619.	0.50

AVERAGE TENSILE(PSI) 12970.
AVERAGE ELASTIC MOD(PSI) 2676074.
AVERAGE ELONGATION(PER CENT) 0.4999

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-47-1	0.2430	1.13	4.65	0.2440	1.30	5.32
C1-16-47-2	0.2430	1.22	5.02	0.2440	1.36	5.57
C1-16-48-1	0.2460	1.20	4.87	0.2460	1.72	6.99
C1-16-48-2	0.2430	1.18	4.85	0.2450	1.78	7.26

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.85
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.28

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3-4R HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-14-1	0.4860	0.2450	110.0	834.0	22670.	1870881.	0.144
D-16-14-2	0.4820	0.2520	124.0	776.0	24306.	1609656.	0.172
D-16-15-1	0.4910	0.2440	78.0	600.0	16009.	1345923.	0.136
D-16-15-2	0.4910	0.2420	79.0	655.0	16484.	1506030.	0.128

AVERAGE MR(PSI)= 19867.
AVERAGE MOD OF ELAS(PSI)= 1583122.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-14-1	S0.240	0.244	660.	167000.	0.0041	11270.	2851776.	0.40
D-16-14-2	S0.240	0.252	760.	167000.	0.0062	13723.	2761244.	0.62
D-16-15-1	0.243	0.248	360.	95000.	0.0037	5837.	1576397.	0.37
D-16-15-2	0.240	0.241	260.	464000.	0.0026	4322.	2666518.SD	0.26

AVERAGE TENSILE(PSI) 8781.
AVERAGE ELASTIC MOD(PSI) 2396472
AVERAGE ELONGATION(PER CENT) 0.4149

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-14-1	0.2490	1.27	5.10	0.2500	2.21	8.84
D-16-14-2	0.2510	1.13	4.50	0.2500	1.52	6.08
D-16-15-1	0.2520	1.10	4.36	0.2480	1.77	7.13
D-16-15-2	0.2430	0.84	3.45	0.2470	2.09	8.46

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.35
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.62

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-13-1	0.4880	0.2480	116.0	689.0	23589.	1481032.	0.181
V-16-13-2	0.4840	0.2530	133.0	805.0	25758.	1704511.	0.146
V-16-14-1	0.4840	0.2520	137.0	889.0	26743.	1836432.	0.156
V-16-14-2	0.4840	0.2450	134.0	875.0	27574.	1966910.	0.164

AVERAGE MR(PSI)= 25941.
AVERAGE MOD OF ELAS(PSI)= 1747221.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-13-1	S	0.243	0.247	630.	187000.	0.0044	10496.	2282535.	0.44
V-16-13-2		0.240	0.249	470.	143000.	0.0035	7864.	2292905.	0.35
V-16-14-1		0.240	0.245	400.	125000.	0.0030	6802.	2125451.	0.30
V-16-14-2		0.239	0.248	466.	134000.	0.0036	7845.	2260764.	0.36

AVERAGE TENSILE(PSI) 8252.
AVERAGE ELASTIC MOD(PSI) 2265413.
AVERAGE ELONGATION(PER CENT) 0.3625

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-13-1	0.2540	1.22	4.80	0.2520	1.50	5.95
V-16-13-2	0.2420	1.03	4.25	0.2480	1.51	6.08
V-16-14-1	0.2520	1.77	7.02	0.2530	1.77	6.99
V-16-14-2	0.2480	1.14	4.59	0.2500	2.07	8.28

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.16
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.82

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3-48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-13-1	0.4880	0.2500	122.0	824.0	24000.	1729049.	0.138
DV-16-13-2	0.4880	0.2500	129.0	753.0	25377.	1535098.	0.148
DV-16-14-1	0.4950	0.2500	112.0	750.0	22169.	1583505.	0.151
DV-16-14-2	0.4940	0.2480	116.0	780.0	23380.	1690496.	0.156

AVERAGE MR(PSI)= 23731.
AVERAGE MOD OF ELAS(PSI)= 1633287.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-13-1	S0.250	0.252	445.	154000.	0.0031	7063.	2444445.	0.31
DV-16-13-2	S0.240	0.249	355.	133300.	0.0025	5940.	2230589.	0.25
DV-16-14-1	0.239	0.247	435.	133300.	0.0031	7368.	2258059.	0.31
DV-16-14-2	S0.240	0.248	365.	125000.	0.0049	11172.	2100135.	0.48

AVERAGE TENSILE(PSI) 7636.
AVERAGE ELASTIC MOD(PSI) 2258307.
AVERAGE ELONGATION(PER CENT) 0.3399

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-13-1	0.2460	1.33	5.40	0.2510	1.88	7.49
DV-16-13-2	0.2540	1.15	4.52	0.2550	1.82	7.13
DV-16-14-1	0.2500	1.16	4.64	0.2520	1.43	5.67
DV-16-14-2	0.2530	1.38	5.45	0.2530	1.72	6.79

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.00
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.77

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BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 4 TIME IN OVEN 3-96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-21-1	0.4870	0.2450	131.0	800.0	26688.	1787240.	0.176
C-16-21-2	0.4860	0.2490	132.0	917.0	26283.	1955488.	0.160
C-16-22-1	0.4830	0.2510	122.0	920.0	24055.	1927297.	0.164
C-16-22-2	0.4820	0.2470	140.0	700.0	28565.	1541995.	0.182

AVERAGE MR(PSI)= 26448.
AVERAGE MOD OF ELAS(PSI)= 1802992.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT ELG
C-16-21-1	0.240	0.249	595.	142500.	0.0050	9956.	2384539.	0.50
C-16-21-2	0.241	0.250	540.	142500.	0.0050	8962.	2265145.	0.50
C-16-22-1	S0.241	0.253	690.	166500.	0.0045	11316.	2730717.	0.44
C-16-22-2	0.243	0.246	670.	142500.	0.0057	11117.	2364596.	0.51

AVERAGE TENSILE(PSI) 10338.
AVERAGE ELASTIC MOD(PSI) 2461249.
AVERAGE ELONGATION(PER CENT) 0.4924

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-21-1	0.2530	1.37	5.41	0.2540	1.48	5.82
C-16-21-2	0.2530	1.22	4.82	0.2510	1.45	5.77
C-16-22-1	0.2500	1.27	5.08	0.2450	1.68	6.85
C-16-22-2	0.2510	1.32	5.25	0.2480	1.56	6.37

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.14
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.20

R&P DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 4 TIME IN OVEN 3496 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-05-1	0.4820	0.2490	117.0	846.0	23490.	1819053.	0.164
D-16-05-2	0.4820	0.2490	108.0	763.0	20679.	1640388.	0.140
D-16-06-1	0.4830	0.2490	120.0	760.0	24042.	1630754.	0.160
D-16-06-2	0.4800	0.2500	99.0	736.0	19800.	1570138.	0.140

AVERAGE MR(PSI)= 22003.
AVERAGE MOD OF ELAS(PSI)= 1665132.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-05-1	0.241	0.255	540.	138300.	0.0040	8786.	2169067.	0.39
D-16-05-2	0.242	0.251	545.	154000.	0.0046	8972.	2635314.	0.45
D-16-06-1	J0.242	0.248	675.	376000.	0.0044	11247.	2932552.	0.44
D-16-06-2	0.241	0.248	770.	167000.	0.0054	12883.	2794137.	0.53

AVERAGE TENSILE(PSI) 10472.
AVERAGE ELASTIC MOD(PSI) 2607767.
AVERAGE ELONGATION(PER CENT) 0.4599

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-05-1	0.2530	1.33	5.25	0.2550	1.81	7.09
D-16-05-2	0.2490	1.12	4.49	0.2500	1.57	6.28
D-16-06-1	0.2520	1.41	5.59	0.2500	1.42	5.68
D-16-06-2	0.2490	1.32	5.30	0.2480	1.77	7.13

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.16
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.54

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 4 TIME IN OVEN 3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-05-1	0.4880	0.2530	111.0	917.0	21321.	1856556.	0.140
V-16-05-2	0.4880	0.2490	110.0	847.0	21813.	1798811.	0.140
V-16-06-1	0.4740	0.2460	118.0	850.0	24682.	1927326.	0.140
V-16-06-2	0.4750	0.2450	122.0	952.0	25673.	2180546.	0.136

AVERAGE MR(PSI)= 23372.
AVERAGE MOD OF ELAS(PSI)= 1940810.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-05-1	0.240	0.257	675.	136000.	0.0051	10943.	2204929.	0.50
V-16-05-2	0.242	0.257	590.	129000.	0.0047	9486.	2074155.	0.46
V-16-06-1	S0.240	0.250	630.	143000.	0.0043	10500.	2383334.	0.42
V-16-06-2	S0.242	0.255	675.	167000.	0.0040	10938.	2706207.	0.39

AVERAGE TENSILE(PSI) 10467.
AVERAGE ELASTIC MOD(PSI) 2342156.
AVERAGE ELONGATION(PER CENT) 0.4524

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-05-1	0.2480	1.48	5.96	0.2450	1.90	7.75
V-16-05-2	0.2490	1.12	4.49	0.2420	2.40	9.91
V-16-06-1	0.2530	1.13	4.46	0.2550	1.27	4.98
V-16-06-2	0.2480	1.18	4.75	0.2500	1.47	5.88

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.92
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.13

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 4 TIME IN OVEN 3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-05-1	0.4840	0.2490	110.0	846.0	21993.	1811536.	0.146
DV-16-05-2	0.4810	0.2520	100.0	833.0	19642.	1731484.	0.128
DV-16-06-1	0.4880	0.2480	108.0	872.0	21589.	1874397.	0.138
DV-16-06-2	0.4890	0.2480	130.0	869.0	25934.	1864129.	0.166

AVERAGE MR(PSI)= 22290.
AVERAGE MOD OF ELAS(PSI)= 1820386.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-05-1	S0.242	0.254	680.	214000.	0.0031	11062.	3481487.	0.31
DV-16-05-2	0.243	0.254	550.	154000.	0.0038	8910.	2495059.	0.37
DV-16-06-1	0.242	0.255	655.	133300.	0.0052	10614.	2160104.	0.51
DV-16-06-2	S0.240	0.248	930.	200000.	0.0037	15625.	3360215.	0.37

AVERAGE TENSILE(PSI) 11553.
AVERAGE ELASTIC MOD(PSI) 2874216.
AVERAGE ELONGATION(PER CENT) 0.3949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-05-1	0.2490	1.12	4.49	0.2500	1.43	5.72
DV-16-05-2	0.2500	1.23	4.92	0.2510	1.48	5.89
DV-16-06-1	0.2470	1.16	4.69	0.2480	1.67	6.73
DV-16-06-2	0.2510	1.20	4.78	0.2500	1.73	6.92

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.72
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.31

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-19-1		0.4850	0.2510	114.0	864.0	22385.	1802482.	0.154
C-16-19-2		0.4890	0.2520	128.0	889.0	24731.	1817655.	0.162
C-16-20-1	C	0.5010	0.2500	92.0	792.0	~~17628~~.	1618778.	0.128
C-16-20-2	C	0.5110	0.2600	106.0	632.0	~~18411~~.	1125890.	0.142

AVERAGE MR(PSI)= ~~#0789~~. 23558
AVERAGE MOD OF ELAS(PSI)= 1591201.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-19-1		0.239	0.254	700.	158000.	0.0059	11530.	2602709.	0.59
C-16-19-2	S	0.240	0.254	690.	143000.	0.0057	11318.	2345801.	0.57
C-16-20-1	C	0.248	0.257	490.	125000.	0.0040	7687.	1961215.	0.39
C-16-20-2	C-S	0.246	0.257	495.	~~94000~~.	0.0059	7829.	~~1~~*~~8~~~~8~~~~24~~.SD	0.59

AVERAGE TENSILE(PSI) 9591.
AVERAGE ELASTIC MOD(PSI) ~~2999137~~.2303242
AVERAGE ELONGATION(PER CENT) 0.5375

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-19-1		0.2420	1.14	4.71	0.2450	1.54	6.28
C-16-19-2		0.2470	1.12	4.53	0.2470	1.65	6.68
C-16-20-1	C	0.2540	1.38	5.43	0.2560	1.61	6.28
C-16-20-2	C	0.2500	1.52	6.08	0.2520	1.88	7.46

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.18
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.67

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-49-1	0.5000	0.2480	134.0	945.0	26144.	1982562.	0.188
C1-16-49-2	0.5030	0.2440	127.0	900.0	25445.	1970721.	0.178
C1-16-50-1	0.5020	0.2410	142.0	955.0	29221.	2174546.	0.182
C1-16-50-2	0.4990	0.2420	140.0	1000.0	28744.	2262421.	0.170

AVERAGE MR(PSI)= 27388.
AVERAGE MOD OF ELAS(PSI)= 2097562.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-16-49-1	J0.219	0.245	535.	125000.	0.0042	9971.	2329699.	0.41
C1-16-49-2	0.216	0.246	630.	115500.	0.0052	11856.	2173668.	0.51
C1-16-50-1	0.215	0.240	760.	143000.	0.0049	14728.	2771318.	0.48
C1-16-50-2	S0.213	0.244	570.	121000.	0.0046	10967.	2328177.	0.45

AVERAGE TENSILE(PSI) 11880.
AVERAGE ELASTIC MOD(PSI) 2400715.
AVERAGE ELONGATION(PER CENT) 0.4724

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-49-1	0.2450	1.13	4.61	0.2460	1.39	5.65
C1-16-49-2	0.2480	1.56	6.29	0.2460	1.47	5.97
C1-16-50-1	0.2440	1.15	4.71	0.2400	1.48	6.16
C1-16-50-2	0.2400	1.32	5.50	0.2410	2.02	8.38

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.27
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.54

PAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-03-1	0.4860	0.2510	115.0	880.0	22535.	1832084.	0.148
D-16-03-2	0.4860	0.2530	130.0	900.0	25073.	1829637.	0.177
D-16-04-1	0.4870	0.2520	116.0	846.0	22505.	1736840.	0.154
D-16-04-2	0.4950	0.2530	126.0	864.0	24352.	1760073.	0.167

AVERAGE MR(PSI)= 23616.
AVERAGE MOD OF ELAS(PSI)= 1789658.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-03-1	S	0.241	0.251	560.	154000.	0.0034	9257.	2543833.	0.34
D-16-03-2		0.242	0.254	540.	136500.	0.0038	8785.	2220668.	0.37
D-16-04-1	S	0.243	0.252	645.	154000.	0.0041	10533.	2514861.	0.40
D-16-04-2		0.241	0.252	435.	133400.	0.0032	7162.	2196535.	0.31

AVERAGE TENSILE(PSI) 8934.
AVERAGE ELASTIC MOD(PSI) 2369474.
AVERAGE ELONGATION(PER CENT) 0.3624

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-03-1	0.2530	1.17	4.62	0.2530	1.70	6.71
D-16-03-2	0.2520	1.20	4.76	0.2510	1.70	6.77
D-16-04-1	0.2520	1.20	4.76	0.2510	1.56	6.21
D-16-04-2	0.2430	1.27	5.22	0.2460	1.52	6.17

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.84
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.47

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-03-1	0.4980	0.2570	116.0	777.0	21593.	1500797.	0.148
V-16-03-2	0.4880	0.2560	128.0	883.0	24013.	1725604.	0.166
V-16-04-1	0.4880	0.2500	119.0	870.0	23409.	1825574.	0.156
V-16-04-2	0.4870	0.2480	124.0	948.0	24839.	2041946.	0.148

AVERAGE MR(PSI)= 23464.
AVERAGE MOD OF ELAS(PSI)= 1773480.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-03-1		0.240	0.255	490.	158000.	0.0032	8006.	2581700.	0.31
V-16-03-2	J	0.241	0.258	625.	136000.	0.0047	10051.	2187269.	0.46
V-16-04-1	S	0.245	0.250	640.	160000.	0.0041	10448.	2612245.	0.40
V-16-04-2	S	0.240	0.251	680.	200000.	0.0038	11288.	3320054.	0.37

AVERAGE TENSILE(PSI) 9948.
AVERAGE ELASTIC MOD(PSI) 2675317.
AVERAGE ELONGATION(PER CENT) 0.3949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-03-1	0.2570	1.42	5.52	0.2580	1.63	6.31
V-16-03-2	0.2560	1.33	5.19	0.2570	1.15	4.47
V-16-04-1	0.2480	1.97	7.94	0.2460	1.55	6.30
V-16-04-2	0.2490	1.38	5.54	0.2430	1.84	7.57

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 6.05
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.16

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-03-1	0.4880	0.2520	106.0	722.0	20522.	1479230.	0.146
DV-16-03-2	0.4870	0.2510	116.0	700.0	22684.	1454347.	0.152
DV-16-04-1	0.4910	0.2450	118.0	800.0	24022.	1772680.	0.171
DV-16-04-2	0.4870	0.2450	115.0	667.0	23604.	1490111.	0.154

AVERAGE MR(PSI)= 22708.
AVERAGE MOD OF ELAS(PSI)= 1549092.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-03-1 S	0.242	0.248	650.	166500.	0.0042	10830.	2774260.	0.41
DV-16-03-2 J	0.239	0.250	635.	130000.	0.0052	10627.	2175732.	0.51
DV-16-04-1	0.240	0.243	465.	143000.	0.0039	7973.	2451990.	0.39
DV-16-04-2	0.240	0.246	635.	133000.	0.0050	10755.	2252710.	0.50

AVERAGE TENSILE(PSI) 10046.
AVERAGE ELASTIC MOD(PSI) 2413673.
AVERAGE ELONGATION(PER CENT) 0.4574

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-03-1	0.2490	1.20	4.81	0.2480	1.70	6.85
DV-16-03-2	0.2470	1.66	6.72	0.2500	1.66	6.64
DV-16-04-1	0.2500	1.17	4.68	0.2500	1.98	7.92
DV-16-04-2	0.2470	1.04	4.21	0.2460	1.58	6.42

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.10
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.95

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BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-27-1	C	0.5000	0.2460	124.0	828.0	24588.	1779815.	0.157
C-16-27-2		0.4860	0.2470	127.0	1040.0	25699.	2272094.	0.162
C-16-28-1		0.4880	0.2470	145.0	875.0	29221.	1903783.	0.183
C-16-28-2		0.4850	0.2460	134.0	900.0	27393.	1994415.	0.158

AVERAGE MR(PSI)= 26725.
AVERAGE MOD OF ELAS(PSI)= 1987526.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-27-1	C	0.245	0.247	475.	115500.	0.0038	7849.	1908618.	0.37
C-16-27-2	C	0.244	0.248	425.	~~111000~~.	0.0021	7023.	~~1834947~~.SD	0.20
C-16-28-1	J	0.240	0.248	690.	130000.	0.0047	11592.	2184140.	0.46
C-16-28-2		0.240	0.243	650.	154000.	0.0046	11145.	2640604.	0.45

AVERAGE TENSILE(PSI) 9402.
AVERAGE ELASTIC MOD(PSI) ~~2141227~~.2244454
AVERAGE ELONGATION(PER CENT) 0.3799

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-27-1	C	0.2520	0.95	3.76	0.2490	2.84	11.40
C-16-27-2	C	0.2470	1.46	5.91	0.2480	1.95	7.86
C-16-28-1		0.2490	1.57	6.30	0.2510	2.20	8.76
C-16-28-2		0.2480	1.36	5.48	0.2500	1.50	6.00

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.36
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 8.50

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BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-51-1	0.5000	0.2440	144.0	1000.0	29024.	2202828.	0.176
C1-16-51-2	0.5000	0.2440	156.0	862.0	31443.	1898837.	0.216
C1-16-52-1	0.5010	0.2460	134.0	854.0	26518.	1832040.	0.196
C1-16-52-2	0.5020	0.2450	118.0	941.0	23496.	2039425.	0.159

AVERAGE MR(PSI)= 27620.
AVERAGE MOD OF ELAS(PSI)= 1993282.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT FLG
C1-16-51-1	S0.215	0.240	665.	143000.	0.0047	12887.	2771318.	0.46
C1-16-51-2	S0.208	0.242	720.	150000.	0.0054	14303.	2979976.	0.53
C1-16-52-1	S0.214	0.244	640.	121000.	0.0055	12256.	2317298.	0.55
C1-16-52-2	0.213	0.241	650.	143000.	0.0051	12662.	2785732.	0.50

AVERAGE TENSILE(PSI) 13027.
AVERAGE ELASTIC MOD(PSI) 2713581.
AVERAGE ELONGATION(PER CENT) 0.5174

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-51-1	0.2430	1.23	5.06	0.2420	1.40	5.78
C1-16-51-2	0.2430	1.35	5.55	0.2430	1.58	6.50
C1-16-52-1	0.2390	1.74	7.28	0.2400	1.43	5.95
C1-16-52-2	0.2410	1.28	5.31	0.2400	1.45	6.04

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.80
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.07

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-12-1	0.4890	0.2490	135.0	959.0	26716.	2032506.	0.150
D-16-12-2	0.4910	0.2440	128.0	931.0	26272.	2083424.	0.160
D-16-13-1	0.4890	0.2530	134.0	945.0	25686.	1909332.	0.148
D-16-13-2	0.4920	0.2510	125.0	1000.0	24196.	2056524.	0.130

AVERAGE MR(PSI)= 25717.
AVERAGE MOD OF ELAS(PSI)= 2021696.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-12-1		0.244	0.249	660.	133000.	0.0050	10863.	2189084.	0.50
D-16-12-2		0.242	0.247	655.	167000.	0.0044	10957.	2793857.	0.44
D-16-13-1	S	0.244	0.250	700.	143000.	0.0054	11475.	2344262.	0.53
D-16-13-2	S	0.241	0.225	575.	121000.	0.0045	10603.	2231443.	0.44

AVERAGE TENSILE(PSI) 10975.
AVERAGE ELASTIC MOD(PSI) 2389662.
AVERAGE ELONGATION(PER CENT) 0.4824

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-12-1	0.2430	1.28	5.26	0.2480	1.58	6.37
D-16-12-2	0.2510	1.40	5.57	0.2530	1.87	7.39
D-16-13-1	0.2500	1.46	5.84	0.2540	1.87	7.36
D-16-13-2	0.2460	1.52	6.17	0.2440	1.93	7.90

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.71
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.25

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-11-1	0.4750	0.2460	139.0	950.0	29013.	2149536.	0.166
V-16-11-2	0.4730	0.2480	129.0	900.0	26605.	1995935.	0.154
V-16-12-1	0.4760	0.2490	117.0	700.0	23786.	1524099.	0.132
V-16-12-2	0.4770	0.2490	108.0	857.0	21910.	1862020.	0.124

AVERAGE MR(PSI)= 25329.
AVERAGE MOD OF ELAS(PSI)= 1882897.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	FLAS MOD	PCT ELG
V-16-11-1 J	0.242	0.247	670.	154000.	0.0041	11208.	2576371.	0.40
V-16-11-2	0.240	0.244	610.	166700.	0.0040	10416.	2846653.	0.39
V-16-12-1	0.241	0.249	645.	166700.	0.0045	10748.	2777917.	0.44
V-16-12-2 J	0.243	0.248	550.	154000.	0.0043	9126.	2555423.	0.42

AVERAGE TENSILE(PSI) 10375.
AVERAGE ELASTIC MOD(PSI) 2689091.
AVERAGE ELONGATION(PER CENT) 0.4224

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-11-1	0.2470	1.27	5.14	0.2520	1.74	6.90
V-16-11-2	0.2480	1.77	7.13	0.2470	1.68	6.80
V-16-12-1	0.2500	0.97	3.88	0.2490	1.66	6.66
V-16-12-2	0.2480	1.24	5.00	0.2430	1.75	7.20

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.28
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.89

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-11-1	0.4860	0.2430	135.0	875.0	28225.	2007581.	0.170
DV-16-11-2	0.4880	0.2420	136.0	900.0	28552.	2082076.	0.161
DV-16-12-1	0.4860	0.2440	137.0	866.0	28409.	1962602.	0.164
DV-16-12-2	0.4870	0.2430	131.0	823.0	27332.	1884396.	0.169

AVERAGE MR(PSI)= 28129.
AVERAGE MOD OF ELAS(PSI)= 1984164.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-11-1	0.243	0.248	495.	125000.	0.0037	8213.	2074207.	0.37
DV-16-11-2	S0.242	0.248	520.	181500.	0.0031	8664.	3024194.	0.31
DV-16-12-1	0.243	0.246	505.	133000.	0.0041	8447.	2224899.	0.40
DV-16-12-2	0.242	0.243	645.	129000.	0.0052	10968.	2193654.	0.51

AVERAGE TENSILE(PSI) 9073.
AVERAGE ELASTIC MOD(PSI) 2379238.
AVERAGE ELONGATION(PER CENT) 0.4024

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-11-1	0.2440	1.43	5.86	0.2440	1.92	7.86
DV-16-11-2	0.2460	1.64	6.66	0.2440	1.78	7.29
DV-16-12-1	0.2390	0.93	3.89	0.2490	1.57	6.30
DV-16-12-2	0.2460	1.35	5.48	0.2500	2.01	8.04

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.47
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.37

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-31-1	0.4910	0.2500	144.0	1200.0	28154.	2502648.	0.152
C-16-31-2	0.4930	0.2480	125.0	1050.0	24734.	2234124.	0.157
C-16-32-1	0.4930	0.2470	152.0	1250.0	30321.	2692107.	0.163
C-16-32-2	0.4830	0.2490	121.0	875.0	24243.	1877513.	0.152

AVERAGE MR(PSI)= 26863.
AVERAGE MOD OF ELAS(PSI)= 2326598.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-31-1		0.242	0.247	615.	160000.	0.0044	10288.	2676749.	0.44
C-16-31-2	S	0.244	0.252	590.	125000.	0.0042	9595.	2032917.	0.41
C-16-32-1	S	0.243	0.249	535.	125000.	0.0042	8841.	2065877.	0.41
C-16-32-2	S	0.242	0.250	460.	150000.	0.0027	7603.	2479339.	0.26

AVERAGE TENSILE(PSI) 9082.
AVERAGE ELASTIC MOD(PSI) 2313721.
AVERAGE ELONGATION(PER CENT) 0.3874

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-31-1	0.2520	1.36	5.39	0.2500	1.37	5.48
C-16-31-2	0.2500	1.17	4.68	0.2530	1.58	6.24
C-16-32-1	0.2490	1.44	5.78	0.2510	1.59	6.33
C-16-32-2	0.2470	1.45	5.87	0.2470	1.68	6.80

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.43
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.21

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-53-1	0.4980	0.2460	136.0	1400.0	27076.	3021436.	0.160
C1-16-53-2	0.4980	0.2450	126.0	1285.0	25290.	2807344.	0.155
C1-16-54-1	0.4950	0.2420	150.0	1230.0	31046.	2805265.	0.191
C1-16-54-2	0.4980	0.2460	138.0	1000.0	27474.	2158169.	0.171

AVERAGE MR(PSI)= 27721.
AVERAGE MOD OF ELAS(PSI)= 2698053.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT ELG
C1-16-53-1	J0.215	0.241	580.	154000.	0.0033	11193.	2972113.	0.33
C1-16-53-2	S0.214	0.242	675.	166700.	0.0042	13033.	3218893.	0.41
C1-16-54-1	0.216	0.241	650.	154000.	0.0047	12486.	2958353.	0.46
C1-16-54-2	S0.213	0.243	725.	120000.	0.0060	14007.	2318438.	0.60

AVERAGE TENSILE(PSI) 12680.
AVERAGE ELASTIC MOD(PSI) 2866948.
AVERAGE ELONGATION(PER CENT) 0.4549

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-53-1	0.2420	1.10	4.54	0.2420	1.26	5.20
C1-16-53-2	0.2440	1.17	4.79	0.2430	1.34	5.51
C1-16-54-1	0.2410	1.34	5.56	0.2430	1.50	6.17
C1-16-54-2	0.2410	1.38	5.72	0.2420	1.37	5.66

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.15
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.63

RAP DATA

SERIES 2 POST-RAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-16-1	0.4850	0.2480	164.0	1350.0	32987.	2919826.	0.162
D-16-16-2	0.4980	0.2520	132.0	1100.0	25043.	2208421.	0.150
D-16-17-1	0.4880	0.2480	128.0	900.0	25588.	1934584.	0.166
D-16-17-2	0.4850	0.2460	129.0	824.0	26371.	1825997.	0.150

AVERAGE MR(PSI)= 27497.
AVERAGE MOD OF ELAS(PSI)= 2222207.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-16-1 S	0.245	0.253	570.	133400.	0.0038	9195.	2152134.	0.37
D-16-16-2	0.243	0.251	640.	143000.	0.0057	10493.	2344532.	0.57
D-16-17-1	0.241	0.250	400.	125000.	0.0026	6639.	2074689.	0.25
D-16-17-2 S	0.243	0.248	535.	133400.	0.0036	8877.	2213594.	0.36

AVERAGE TENSILE(PSI) 8801.
AVERAGE ELASTIC MOD(PSI) 2196237.
AVERAGE ELONGATION(PER CENT) 0.3924

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-16-1	0.2460	1.22	4.95	0.2500	2.50	10.00
D-16-16-2	0.2490	1.21	4.85	0.2450	1.78	7.26
D-16-17-1	0.2520	1.38	5.47	0.2530	1.80	7.11
D-16-17-2	0.2560	1.25	4.88	0.2460	1.48	6.01

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.04
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.59

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-15-1	0.4930	0.2470	148.0	947.0	29523.	2039540.	0.168
V-16-15-2	0.4930	0.2460	157.0	1250.0	31574.	2725071.	0.175
V-16-16-1	0.4860	0.2460	117.0	1111.0	23868.	2456929.	0.126
V-16-16-2	0.4850	0.2450	136.0	1050.0	28029.	2355426.	0.164

AVERAGE MR(PSI)= 28249.
AVERAGE MOD OF ELAS(PSI)= 2394241.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-15-1	0.243	0.250	510.	143000.	0.0035	8395.	2353910.	0.35
V-16-15-2	0.243	0.250	835.	167000.	0.0041	13744.	2748972.	0.40
V-16-16-1	0.242	0.243	550.	136300.	0.0041	9352.	2317791.	0.40
V-16-16-2	0.242	0.249	630.	143000.	0.0044	10455.	2373129.	0.44

AVERAGE TENSILE(PSI) 10486.
AVERAGE ELASTIC MOD(PSI) 2448450.
AVERAGE ELONGATION(PER CENT) 0.4024

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-15-1	0.2500	1.28	5.12	0.2530	1.80	7.11
V-16-15-2	0.2520	1.18	4.68	0.2500	2.14	8.56
V-16-16-1	0.2430	1.25	5.14	0.2500	1.73	6.92
V-16-16-2	0.2430	0.96	3.95	0.2410	2.02	8.38

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.72
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.74

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-15-1	0.4850	0.2480	106.0	833.0	21321.	1801641.	0.132
DV-16-15-2	0.4850	0.2470	131.0	846.0	26563.	1852072.	0.160
DV-16-16-1	0.4850	0.2490	153.0	1250.0	30528.	2671101.	0.163
DV-16-16-2	0.4850	0.2470	152.0	1150.0	30821.	2517592.	0.178

AVERAGE MR(PSI)= 27308.
AVERAGE MOD OF ELAS(PSI)= 2210602.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT FLG
DV-16-15-1	S0.246	0.252	785.	150000.	0.0054	12662.	2419667.	0.53
DV-16-15-2	0.243	0.250	615.	187500.	0.0040	10123.	3086420.	0.39
DV-16-16-1	0.242	0.248	715.	143000.	0.0052	11913.	2382698.	0.51
DV-16-16-2	0.245	0.249	830.	154000.	0.0057	13605.	2524384.	0.57

AVERAGE TENSILE(PSI) 12076.
AVERAGE ELASTIC MOD(PSI) 2603292.
AVERAGE ELONGATION(PER CENT) 0.5074

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-15-1	0.2500	1.27	5.08	0.2500	1.67	6.68
DV-16-15-2	0.2500	1.17	4.68	0.2500	1.28	5.12
DV-16-16-1	0.2460	1.12	4.55	0.2480	1.86	7.50
DV-16-16-2	0.2380	0.83	3.48	0.2430	1.68	6.91

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.45
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.55

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 4 TIME IN OVEN 3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-23-1	0.4950	0.2480	123.0	1200.0	24240.	2542969.	0.138
C-16-23-2	0.4960	0.2460	119.0	1070.0	23787.	2318552.	0.136
C-16-24-1	0.4920	0.2470	122.0	900.0	24386.	1942257.	0.144
C-16-24-2	0.4920	0.2460	146.0	950.0	29421.	2075263.	0.171

AVERAGE MR(PSI)= 25459.
AVERAGE MOD OF ELAS(PSI)= 2219760.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-23-1	S	0.243	0.248	600.	182000.	0.0040	9956.	3020046.	0.39
C-16-23-2	S	0.245	0.250	580.	182000.	0.0037	9469.	2971429.	0.37
C-16-24-1	S	0.245	0.249	630.	154000.	0.0037	10327.	2524384.	0.37
C-16-24-2		0.244	0.253	610.	154000.	0.0035	9881.	2494655.	0.35

AVERAGE TENSILE(PSI) 9908.
AVERAGE ELASTIC MOD(PSI) 2752628.
AVERAGE ELONGATION(PER CENT) 0.3724

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-23-1	0.2460	1.34	5.44	0.2470	1.56	6.31
C-16-23-2	0.2500	1.11	4.44	0.2520	1.70	6.74
C-16-24-1	0.2500	1.14	4.56	0.2500	1.67	6.68
C-16-24-2	0.2500	1.18	4.72	0.2500	1.94	7.76

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.79
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.87

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 4 TIME IN OVEN 3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-08-1	0.4910	0.2490	143.0	1150.0	28184.	2427383.	0.156
D-16-08-2	0.4910	0.2410	132.0	1060.0	27772.	2467705.	0.158
D-16-09-1	0.4850	0.2530	139.0	1150.0	26864.	2342690.	0.136
D-16-09-2	0.4880	0.2510	131.0	1140.0	25565.	2363654.	0.151

AVERAGE MR(PSI)= 27096.
AVERAGE MOD OF ELAS(PSI)= 2400358.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-08-1		0.242	0.252	595.	143000.	0.0042	9756.	2344878.	0.41
D-16-08-2	S	0.245	0.247	505.	143000.	0.0039	8345.	2363051.	0.39
D-16-09-1		0.246	0.254	445.	136500.	0.0036	7121.	2184560.	0.36
D-16-09-2	S	0.245	0.251	520.	166700.	0.0030	8455.	2710790.	0.30

AVERAGE TENSILE(PSI) 8419.
AVERAGE ELASTIC MOD(PSI) 2400819.
AVERAGE ELONGATION(PER CENT) 0.3674

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-08-1	0.2500	1.22	4.88	0.2470	1.76	7.12
D-16-08-2	0.2450	1.20	4.89	0.2460	1.60	6.50
D-16-09-1	0.2420	1.56	6.44	0.2500	1.23	4.92
D-16-09-2	0.2440	1.38	5.65	0.2450	1.37	5.59

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.46
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.03

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 4 TIME IN OVEN 3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-07-1	0.4850	0.2470	150.0	1285.0	30416.	2813136.	0.151
V-16-07-2	0.4860	0.2480	134.0	1200.0	26897.	2590061.	0.139
V-16-08-1	0.4760	0.2470	161.0	1350.0	33264.	3011314.	0.154
V-16-08-2	0.4780	0.2470	145.0	1250.0	29833.	2776588.	0.152

AVERAGE MR(PSI)= 30102.
AVERAGE MOD OF ELAS(PSI)= 2797774.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-07-1	S	0.245	0.253	620.	182000.	0.0037	10002.	2936195.	0.37
V-16-07-2	S	0.245	0.246	535.	166700.	0.0031	8876.	2765887.	0.31
V-16-08-1		0.245	0.243	585.	200000.	0.0034	9826.	3359369.	0.34
V-16-08-2		0.245	0.247	425.	200000.	0.0026	7023.	3304966.	0.25

AVERAGE TENSILE(PSI) 8932.
AVERAGE ELASTIC MOD(PSI) 3091604.
AVERAGE ELONGATION(PER CENT) 0.3199

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-07-1	0.2450	1.29	5.26	0.2450	1.42	5.79
V-16-07-2	0.2460	1.03	4.18	0.2450	1.72	7.02
V-16-08-1	0.2440	0.64	2.62	0.2460	1.61	6.54
V-16-08-2	0.2470	1.28	5.18	0.2460	1.54	6.26

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.31
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.40

PAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 4 TIME IN OVEN 3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-07-1	0.4870	0.2500	136.0	1150.0	26809.	2418070.	0.147
DV-16-07-2	0.4890	0.2460	117.0	1000.0	23722.	2197890.	0.138
DV-16-08-1	0.4850	0.2450	128.0	1100.0	26380.	2467589.	0.136
DV-16-08-2	0.4870	0.2400	111.0	800.0	23742.	1901286.	0.145

AVERAGE MR(PSI)= 25163.
AVERAGE MOD OF ELAS(PSI)= 2246208.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-07-1	0.246	0.249	550.	143000.	0.0034	8979.	2334542.	0.34
DV-16-07-2	0.242	0.243	625.	143000.	0.0041	10628.	2431725.	0.40
DV-16-08-1	0.244	0.248	610.	143000.	0.0045	10080.	2363168.	0.44
DV-16-08-2 S	0.242	0.250	725.	160000.	0.0046	11983.	2644628.	0.45

AVERAGE TENSILE(PSI) 10417.
AVERAGE ELASTIC MOD(PSI) 2443515.
AVERAGE ELONGATION(PER CENT) 0.4149

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-07-1	0.2480	1.29	5.20	0.2450	1.72	7.02
DV-16-07-2	0.2500	1.47	5.88	0.2440	1.73	7.09
DV-16-08-1	0.2450	1.30	5.30	0.2440	1.62	6.63
DV-16-08-2	0.2430	1.37	5.63	0.2450	1.53	6.24

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.50
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.74

RAP DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 1 TIME IN OVEN 3+3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-33-1	C	0.4990	0.2460	121.0	790.0	24041.	1701536.	0.179
C-16-33-2	C	0.4990	0.2500	116.0	842.0	22316.	1727872.	0.157
C-16-34-1		0.4970	0.2420	133.0	842.0	27416.	1912624.	0.173
C-16-34-2		0.4960	0.2500	136.0	900.0	26322.	1858064.	0.168

AVERAGE MR(PSI)= 25024.
AVERAGE MOD OF ELAS(PSI)= 1800024.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-33-1		0.243	0.253	575.	125000.	0.0059	9352.	2033215.	0.59
C-16-33-2	C	0.245	0.250	415.	143000.	0.0026	6775.	2334694.	0.25
C-16-34-1		0.246	0.252	700.	135000.	0.0052	11291.	2177701.	0.51
C-16-34-2	S	0.243	0.247	680.	166700.	0.0047	11329.	2777362.	0.46

AVERAGE TENSILE(PSI) 9687.
AVERAGE ELASTIC MOD(PSI) 2330743.
AVERAGE ELONGATION(PER CENT) 0.4599

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-33-1	C	0.2460	1.29	5.24	0.2490	2.12	8.51
C-16-33-2		0.2490	1.22	4.89	0.2500	1.81	7.24
C-16-34-1		0.2440	1.30	5.32	0.2460	1.82	7.39
C-16-34-2		0.2470	1.22	4.93	0.2500	1.45	5.80

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.10
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.23

BAR DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 1 TIME IN OVEN 3+3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-18-1	0.4890	0.2500	129.0	950.0	25325.	1989365.	0.172
D-16-18-2	0.4890	0.2490	114.0	842.0	22560.	1784536.	0.145
D-16-19-1	0.4860	0.2450	137.0	1100.0	28177.	2462512.	0.170
D-16-19-2	0.4870	0.2500	144.0	1160.0	28386.	2439097.	0.160

AVERAGE MR(PSI)= 26112.
AVERAGE MOD OF ELAS(PSI)= 2168877.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-18-1		0.244	0.253	480.	143000.	0.0032	7775.	2316465.	0.31
D-16-18-2	S	0.243	0.253	460.	136500.	0.0031	7482.	2220271.	0.31
D-16-19-1	S	0.245	0.251	475.	136500.	0.0038	7724.	2219693.	0.37
D-16-19-2		0.244	0.251	575.	154000.	0.0034	9388.	2514532.	0.34

AVERAGE TENSILE(PSI) 8092.
AVERAGE ELASTIC MOD(PSI) 2317740.
AVERAGE ELONGATION(PER CENT) 0.3374

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-18-1	0.2500	1.39	5.56	0.2500	1.41	5.64
D-16-18-2	0.2460	1.27	5.16	0.2530	1.85	7.31
D-16-19-1	0.2480	1.28	5.16	0.2480	1.31	5.28
D-16-19-2	0.2460	1.42	5.77	0.2500	1.93	7.72

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.41
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.48

BAR DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 1 TIME IN OVEN 3+3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-17-1	0.4940	0.2500	85.0	1000.0	16518.	2072874.	0.103
V-16-17-2	0.4930	0.2550	173.0	1200.0	32379.	2348734.	0.178
V-16-18-1	0.4870	0.2480	151.0	1260.0	30247.	2713979.	0.163
V-16-18-2	0.4890	0.2450	114.0	800.0	23303.	1779930.	0.143

AVERAGE MR(PSI)= 25612.
AVERAGE MOD OF ELAS(PSI)= 2228879.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-17-1		0.242	0.252	485.	125000.	0.0048	7952.	2049718.	0.47
V-16-17-2		0.245	0.253	705.	143000.	0.0049	11373.	2307010.	0.48
V-16-18-1	S	0.244	0.254	395.	133300.	0.0028	6373.	2150833.	0.28
V-16-18-2		0.243	0.250	525.	166700.	0.0028	8641.	2744033.	0.28

AVERAGE TENSILE(PSI) 8585.
AVERAGE FLASTIC MOD(PSI) 2312899.
AVERAGE ELONGATION(PER CENT) 0.3824

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-17-1	0.2500	1.40	5.60	0.2500	2.13	8.52
V-16-17-2	0.2500	1.15	4.60	0.2540	1.62	6.37
V-16-18-1	0.2530	1.35	5.33	0.2530	1.80	7.11
V-16-18-2	0.2480	1.05	4.23	0.2530	1.27	5.01

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.94
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.75

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 1 TIME IN OVEN 3+3+3+8 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-17-1	0.4880	0.2490	130.0	900.0	25779.	1911370.	0.138
DV-16-17-2	0.4860	0.2490	136.0	888.0	27080.	1893646.	0.171
DV-16-18-1	0.4880	0.2490	126.0	1100.0	24986.	2336119.	0.142
DV-16-18-2	0.4890	0.2480	135.0	1050.0	26932.	2252400.	0.164

AVERAGE MR(PSI)= 26194.
AVERAGE MOD OF ELAS(PSI)= 2098383.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	FLAS MOD	PCT ELG
DV-16-17-1	0.242	0.241	470.	166700.	0.0030	8058.	2858270.	0.30
DV-16-17-2	0.243	0.252	835.	166700.	0.0054	13635.	2722255.	0.53
DV-16-18-1	0.245	0.250	535.	166700.	0.0044	8734.	2721633.	0.44
DV-16-18-2	0.243	0.243	625.	143000.	0.0050	10584.	2421718.	0.50

AVERAGE TENSILE(PSI) 10253.
AVERAGE ELASTIC MOD(PSI) 2680969.
AVERAGE ELONGATION(PER CENT) 0.4449

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-17-1	0.2460	1.07	4.34	0.2480	1.67	6.73
DV-16-17-2	0.2470	1.20	4.85	0.2490	1.61	6.46
DV-16-18-1	0.2450	1.28	5.22	0.2490	1.52	6.10
DV-16-18-2	0.2460	1.41	5.73	0.2450	1.64	6.69

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.04
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.49

BAR DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 2 TIME IN OVEN 3+3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-35-1 C	0.4930	0.2440	139.0	800.0	28414.	1787284.	0.168
C-16-35-2 C	0.4910	0.2450	126.0	875.0	25651.	1938869.	0.160
C-16-36-1 C	0.4970	0.2420	111.0	850.0	22881.	1930796.	0.162
C-16-36-2 C	0.4960	0.2410	122.0	842.0	25409.	1940436.	0.154

AVERAGE MR(PSI)= 25589.
AVERAGE MOD OF ELAS(PSI)= 1899346.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-35-1 C	0.245	0.248	545.	176500.	0.0033	8969.	2904872.	0.33
C-16-35-2 C	0.244	0.245	385.	143000.	0.0036	6440.	2392105.	0.36
C-16-36-1 C	0.245	0.245	490.	~~[illegible]~~.	0.0023	8163.	~~[illegible]~~. SD	0.22
C-16-36-2 C	0.247	0.241	435.	125000.	0.0046	7307.	2099888.	0.45

AVERAGE TENSILE(PSI) 7720.
AVERAGE ELASTIC MOD(PSI) ~~2543510~~.2465622
AVERAGE ELONGATION(PER CENT) 0.3449

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-35-1 C	0.2480	1.95	7.86	0.2450	2.24	9.14
C-16-35-2 C	0.2510	1.16	4.62	0.2480	2.05	8.26
C-16-36-1 C	0.2410	1.14	4.73	0.2470	1.86	7.53
C-16-36-2 C	0.2470	1.16	4.69	0.2500	2.35	9.40

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.47
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 8.58

RAP DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 2 TIME IN OVEN 3+3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-55-1	0.5020	0.2440	150.0	1082.0	30113.	2373964.	0.188
C1-16-55-2	0.5010	0.2440	149.0	916.0	29972.	2013763.	0.195
C1-16-56-1	0.5000	0.2460	154.0	944.0	30537.	2029162.	0.190
C1-16-56-2	0.5000	0.2440	148.0	875.0	29830.	1927474.	0.168

AVERAGE MR(PSI)= 30113.
AVERAGE MOD OF ELAS(PSI)= 2086090.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-16-55-1	0.218	0.243	660.	182000.	0.0050	12458.	3435648.	0.50
C1-16-55-2	S0.220	0.240	635.	143000.	0.0041	12026.	2708334.	0.40
C1-16-56-1	0.220	0.244	650.	125000.	0.0048	12108.	2328614.	0.47
C1-16-56-2	0.220	0.243	585.	150000.	0.0042	10942.	2805836.	0.41

AVERAGE TENSILE(PSI) 11884.
AVERAGE ELASTIC MOD(PSI) 2819608.
AVERAGE ELONGATION(PER CENT) 0.4524

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-55-1	0.2460	1.20	4.87	0.2460	1.98	8.04
C1-16-55-2	0.2470	1.41	5.70	0.2430	1.55	6.37
C1-16-56-1	0.2460	1.19	4.83	0.2470	1.13	4.57
C1-16-56-2	0.2450	1.09	4.44	0.2450	1.18	4.81

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.96
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.95

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 2 TIME IN OVEN 3+3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-20-1	0.4890	0.2470	125.0	895.0	25139.	1943316.	0.150
D-16-20-2	0.4900	0.2450	130.0	900.0	26519.	1998335.	0.160
D-16-21-1	0.4910	0.2470	126.0	778.0	25237.	1682392.	0.163
D-16-21-2	0.4900	0.2480	152.0	867.0	30261.	1856043.	0.172

AVERAGE MR(PSI)= 26789.
AVERAGE MOD OF ELAS(PSI)= 1870021.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-20-1	S	0.244	0.245	780.	182000.	0.0046	13047.	3044497.	0.45
D-16-20-2		0.243	0.245	435.	166700.	0.0022	7306.	2800034.	0.22
D-16-21-1		0.243	0.250	525.	133500.	0.0037	8641.	2197531.	0.37
D-16-21-2		0.242	0.247	585.	130000.	0.0055	9786.	2174859.	0.55

AVERAGE TENSILE(PSI) 9695.
AVERAGE ELASTIC MOD(PSI) 2554230.
AVERAGE ELONGATION(PER CENT) 0.3999

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-20-1	0.2450	1.37	5.59	0.2470	1.80	7.28
D-16-20-2	0.2440	1.14	4.67	0.2450	1.56	6.36
D-16-21-1	0.2460	1.37	5.56	0.2470	1.58	6.39
D-16-21-2	0.2440	1.27	5.20	0.2480	1.85	7.45

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.25
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.87

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RAP DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 2 TIME IN OVEN 3+3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-19-1	0.4880	0.2430	133.0	850.0	27693.	1942229.	0.175
V-16-19-2	0.4880	0.2490	133.0	850.0	26374.	1805182.	0.163
V-16-20-1	0.4880	0.2400	131.0	842.0	27962.	1997002.	0..82
V-16-20-2	0.4850	0.2430	144.0	910.0	30168.	2092189.	0.171

AVERAGE MR(PSI)= 28049.
AVERAGE MOD OF ELAS(PSI)= 1959151.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT ELG
V-16-19-1		0.242	0.247	525.	138000.	0.0037	8783.	2308696.	0.37
V-16-19-2	S	0.244	0.243	730.	166700.	0.0050	12311.	2811510.	0.50
V-16-20-1	S	0.242	0.244	525.	150000.	0.0037	8891.	2540306.	0.37
V-16-20-2		0.244	0.245	595.	150000.	0.0034	9953.	2509201.	0.34

AVERAGE TENSILE(PSI) 9984.
AVERAGE ELASTIC MOD(PSI) 2542428.
AVERAGE ELONGATION(PER CENT) 0.3949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-19-1	0.2480	1.26	5.08	0.2460	1.82	7.39
V-16-19-2	0.2510	1.25	4.98	0.2520	1.66	6.58
V-16-20-1	0.2490	1.24	4.97	0.2470	1.56	6.31
V-16-20-2	0.2450	1.22	4.97	0.2490	1.55	6.22

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.00
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.63

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 2 TIME IN OVEN 3+3+3+24 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-19-1	0.4860	0.2470	115.0	833.0	23271.	1819860.	0.144
DV-16-19-2	0.4840	0.2430	123.0	880.0	25822.	2027396.	0.159
DV-16-20-1	0.4880	0.2480	116.0	800.0	23189.	1719630.	0.153
DV-16-20-2	0.4880	0.2490	134.0	1100.0	26572.	2336119.	0.154

AVERAGE MR(PSI)= 24713.
AVERAGE MOD OF ELAS(PSI)= 1975751.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-19-1	0.244	0.240	445.	143000.	0.0029	7599.	2441940.	0.29
DV-16-19-2	0.243	0.249	270.	143000.	0.0018	4462.	2363363.	0.18
DV-16-20-1	S0.242	0.243	710.	154000.	0.0045	12073.	2618781.	0.44
DV-16-20-2	0.241	0.251	510.	166700.	0.0045	8431.	2755782.	0.44

AVERAGE TENSILE(PSI) 8141.
AVERAGE ELASTIC MOD(PSI) 2544966.
AVERAGE ELONGATION(PER CENT) 0.3424

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-19-1	0.2450	1.41	5.75	0.2460	2.08	8.45
DV-16-19-2	0.2430	1.50	6.17	0.2470	1.92	7.77
DV-16-20-1	0.2520	1.64	6.50	0.2530	1.86	7.35
DV-16-20-2	0.2430	1.68	6.91	0.2490	1.50	6.02

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 6.33
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.40

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B1B DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 3 TIME IN OVEN 3+3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-37-1	0.4810	0.2500	148.0	890.0	29538.	1894719.	0.170
C-16-37-2 C	0.4820	0.2500	137.0	750.0	27286.	1593361.	0.181
C-16-38-1 C	0.5000	0.2440	121.0	850.0	24388.	1872403.	0.158
C-16-38-2 C	0.5040	0.2330	105.0	725.0	23024.	1819532.	0.156

AVERAGE MR(PSI)= 26059.
AVERAGE MOD OF ELAS(PSI)= 1795004.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-37-1 C	0.244	0.248	590.	125000.	0.0042	9750.	2065706.	0.41
C-16-37-2C-S	0.245	0.257	540.	166700.	0.0035	8576.	2647503.	0.35
C-16-38-1C-S	0.244	0.238	445.	100000.	0.0044	7662.	1722000.	0.44
C-16-38-2C-S	0.246	0.248	390.	117500.	0.0034	6392.	1925977.	0.34

AVERAGE TENSILE(PSI) 8095.
AVERAGE ELASTIC MOD(PSI) 2090296.
AVERAGE ELONGATION(PER CENT) 0.3874

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-37-1 C	0.2460	1.25	5.08	0.2450	2.16	8.81
C-16-37-2 C	0.2500	1.18	4.72	0.2550	1.90	7.45
C-16-38-1 C	0.2430	1.68	6.91	0.2430	1.92	7.90
C-16-38-2 C	0.2420	1.33	5.49	0.2450	1.82	7.42

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.55
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.89

RUN DATE

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 3 TIME IN OVEN 3+3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-16-57-1	0.5000	0.2450	162.0	1140.0	32386.	2480600.	0.177
C1-16-57-2	0.5010	0.2480	142.0	885.0	27650.	1852979.	0.166
C1-16-58-1	0.4980	0.2470	158.0	912.0	31202.	1944441.	0.171
C1-16-58-2	0.4980	0.2480	152.0	834.0	29775.	1756716.	0.182

AVERAGE MR(PSI)= 30253.
AVERAGE MOD OF ELAS(PSI)= 2008683.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-16-57-1	0.224	0.247	730.	136000.	0.0053	13194.	2458069.	0.52
C1-16-57-2	S0.214	0.246	630.	125000.	0.0047	11967.	2374440.	0.46
C1-16-58-1	S0.217	0.247	670.	133400.	0.0045	12500.	2488853.	0.44
C1-16-58-2	S0.218	0.246	660.	143000.	0.0048	12307.	2666518.	0.47

AVERAGE TENSILE(PSI) 12492.
AVERAGE ELASTIC MOD(PSI) 2496969.
AVERAGE ELONGATION(PER CENT) 0.4824

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-16-57-1	0.2470	1.41	5.70	0.2470	1.76	7.12
C1-16-57-2	0.2440	1.34	5.49	0.2450	1.66	6.77
C1-16-58-1	0.2480	1.26	5.08	0.2490	1.29	5.18
C1-16-58-2	0.2420	1.19	4.91	0.2450	1.25	5.10

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.29
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.04

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 3 TIME IN OVEN 3+3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-22-1	0.4920	0.2490	126.0	785.0	24783.	1653585.	0.144
D-16-22-2	0.4930	0.2530	132.0	900.0	25097.	1803658.	0.145
D-16-23-1	0.4930	0.2520	131.0	1100.0	25105.	2230819.	0.162
D-16-23-2	0.4920	0.2590	144.0	1000.0	26178.	1871784.	0.153

AVERAGE MR(PSI)= 25291.
AVERAGE MOD OF ELAS(PSI)= 1889961.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-16-22-1		0.242	0.247	630.	166700.	0.0044	10539.	2788838.	0.44
D-16-22-2		0.243	0.250	515.	133000.	0.0062	8477.	2189301.	0.62
D-16-23-1		0.243	0.248	645.	133000.	0.0046	10702.	2206956.	0.45
D-16-23-2	S	0.243	0.228	530.	130000.	0.0039	9566.	2346401.	0.39

AVERAGE TENSILE(PSI) 9821.
AVERAGE ELASTIC MOD(PSI) 2382874.
AVERAGE ELONGATION(PER CENT) 0.4774

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-22-1	0.2470	1.20	4.85	0.2450	1.36	5.55
D-16-22-2	0.2480	1.16	4.67	0.2460	1.36	5.52
D-16-23-1	0.2470	1.29	5.22	0.2490	1.92	7.71
D-16-23-2	0.2490	1.20	4.81	0.2490	1.60	6.42

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 4.89
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.30

RAP DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 3 TIME IN OVEN 3+3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-21-1	0.4920	0.2490	148.0	778.0	29110.	1638840.	0.166
V-16-21-2	0.4910	0.2500	136.0	785.0	26590.	1637148.	0.160
V-16-22-1	0.4910	0.2480	168.0	1330.0	33379.	2841418.	0.180
V-16-22-2	0.4910	0.2520	161.0	1000.0	30980.	2036277.	0.175

AVERAGE MR(PSI)= 30015.
AVERAGE MOD OF ELAS(PSI)= 2038420.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-21-1	S	0.244	0.247	490.	133300.	0.0031	8130.	2211788.	0.31
V-16-21-2		0.245	0.248	445.	136300.	0.0034	7323.	2243252.	0.34
V-16-22-1	S	0.243	0.249	590.	166700.	0.0034	9750.	2755054.	0.34
V-16-22-2		0.244	0.249	530.	138000.	0.0037	8723.	2271381.	0.37

AVERAGE TENSILE(PSI) 8482.
AVERAGE ELASTIC MOD(PSI) 2370368.
AVERAGE ELONGATION(PER CENT) 0.3399

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-21-1	0.2460	1.40	5.69	0.2460	1.58	6.42
V-16-21-2	0.2500	1.34	5.36	0.2520	1.50	5.95
V-16-22-1	0.2490	1.63	6.54	0.2470	1.34	5.42
V-16-22-2	0.2460	1.22	4.95	0.2480	1.72	6.93

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.63
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.18

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 3 TIME IN OVEN 3+3+3+48 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-21-1	0.4880	0.2520	106.0	1000.0	20522.	2048796.	0.106
DV-16-21-2	0.4870	0.2500	105.0	875.0	20698.	1839836.	0.118
DV-16-22-1	0.4850	0.2490	152.0	890.0	30328.	1901824.	0.167
DV-16-22-2	0.4850	0.2390	136.0	900.0	29454.	2174839.	0.166

AVERAGE MR(PSI)= 25251.
AVERAGE MOD OF ELAS(PSI)= 1991323.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-21-1	0.244	0.247	470.	136300.	0.0055	7798.	2261565.	0.55
DV-16-21-2	0.245	0.241	515.	166700.	0.0039	8722.	2823271.	0.39
DV-16-22-1	S0.247	0.241	560.	158000.	0.0034	9407.	2654258.	0.34
DV-16-22-2	0.245	0.227	800.	154000.	0.0060	14384.	2769037.	0.60

AVERAGE TENSILE(PSI) 10078.
AVERAGE ELASTIC MOD(PSI) 2627033.
AVERAGE ELONGATION(PER CENT) 0.4699

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-21-1	0.2430	1.22	5.02	0.2430	1.71	7.03
DV-16-21-2	0.2450	1.26	5.14	0.2470	1.35	5.46
DV-16-22-1	0.2440	1.28	5.24	0.2540	1.85	7.28
DV-16-22-2	0.2480	1.20	4.83	0.2540	1.68	6.61

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.06
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.60

BAR DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 4 TIME IN OVEN 3+3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-16-39-1 C	0.4980	0.2500	126.0	900.0	24289.	1850602.	0.138
C-16-39-2 C	0.5050	0.2480	120.0	850.0	23181.	1765601.	0.153
C-16-40-1 C	0.5000	0.2490	139.0	950.0	26902.	1969135.	0.155
C-16-40-2 C	0.5000	0.2500	121.0	1000.0	23232.	2048000.	0.138

AVERAGE MR(PSI)= 24401.
AVERAGE MOD OF ELAS(PSI)= 1908334.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-16-39-1 C	0.245	0.246	460.	148000.	0.0050	7632.	2372657.	0.50
C-16-39-2 C	0.246	0.249	530.	133300.	0.0039	8652.	2176185.	0.39
C-16-40-1 C	0.245	0.248	420.	~~2~~~~0~~~~0~~~~0~~.	0.0027	6912.	~~3~~29~~1~~640.SD	0.26
C-16-40-2 C	0.249	0.248	490.	150000.	0.0034	8098.	2479052.	0.34

AVERAGE TENSILE(PSI) 7823.
AVERAGE ELASTIC MOD(PSI) ~~2~~~~6~~~~7~~~~9~~~~8~~~~8~~~~3~~.2342631
AVERAGE ELONGATION(PER CENT) 0.3749

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-16-39-1 C	0.2430	1.42	5.84	0.2460	1.80	7.31
C-16-39-2 C	0.2360	1.10	4.66	0.2370	1.55	6.54
C-16-40-1 C	0.2380	1.68	7.05	0.2470	2.25	9.10
C-16-40-2 C	0.2450	2.06	8.40	0.2450	2.38	9.71

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 6.49
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 8.17

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 4 TIME IN OVEN 3+3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-16-24-1	0.4930	0.2490	142.0	940.0	27873.	1976073.	0.152
D-16-24-2	0.4930	0.2450	146.0	1000.0	29602.	2206861.	0.148
D-16-2A-1	0.4830	0.2450	141.0	900.0	29180.	2027296.	0.168
D-16-2A-2	0.4840	0.2480	126.0	900.0	25396.	1950572.	0.151

AVERAGE MR(PSI)= 28013.
AVERAGE MOD OF ELAS(PSI)= 2040200.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT FLG
D-16-24-1		0.244	0.245	745.	182000.	0.0041	12462.	3044497.	0.40
D-16-24-2	S	0.249	0.249	565.	148000.	0.0037	9112.	2387059.	0.37
D-16-2A-1		0.245	0.244	565.	143000.	0.0042	9451.	2392105.	0.41
D-16-2A-2		0.245	0.247	570.	166700.	0.0036	9419.	2764689.	0.36

AVERAGE TENSILE(PSI) 10111.
AVERAGE ELASTIC MOD(PSI) 2644587.
AVERAGE ELONGATION(PER CENT) 0.3899

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-16-24-1	0.2480	1.22	4.91	0.2520	1.50	5.95
D-16-24-2	0.2470	1.30	5.26	0.2500	1.47	5.88
D-16-2A-1	0.2470	1.20	4.85	0.2480	1.64	6.61
D-16-2A-2	0.2440	1.22	5.00	0.2440	1.30	5.32

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.01
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.94

-///-

RAW DATA

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 4 TIME IN OVEN 3+3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-16-23-1	0.4830	0.2440	134.0	1000.0	27959.	2280360.	0.140
V-16-23-2	0.4820	0.2500	135.0	800.0	26887.	1699585.	0.142
V-16-24-1	0.4940	0.2450	156.0	1000.0	31565.	2202894.	0.163
V-16-24-2	0.4820	0.2480	129.0	888.0	26109.	1932550.	0.147

AVERAGE MR(PSI)= 28130.
AVERAGE MOD OF ELAS(PSI)= 2028722.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-16-23-1	S	0.242	0.253	710.	166700.	0.0046	11596.	2722700.	0.45
V-16-23-2	S	0.245	0.237	545.	133400.	0.0043	9386.	2297426.	0.42
V-16-24-1		0.243	0.245	480.	136400.	0.0036	8062.	2291090.	0.36
V-16-24-2		0.245	0.244	375.	117500.	0.0032	6273.	1965540.	0.31

AVERAGE TENSILE(PSI) 8829.
AVERAGE ELASTIC MOD(PSI) 2319189.
AVERAGE ELONGATION(PER CENT) 0.3924

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-16-23-1	0.2470	1.08	4.37	0.2460	1.63	6.62
V-16-23-2	0.2410	1.58	6.55	0.2430	1.64	6.74
V-16-24-1	0.2460	1.09	4.43	0.2440	1.42	5.81
V-16-24-2	0.2410	1.16	4.81	0.2440	1.36	5.57

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.04
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.19

SERIES 3 POST-BAKE STEP CURE TO 400F
LOT 4 TIME IN OVEN 3+3+3+96 HOURS
TASK 2A ASBESTOS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-16-23-1	0.4810	0.2440	116.0	1000.0	24304.	2289842.	0.109
DV-16-23-2	0.4850	0.2460	111.0	800.0	22691.	1772813.	0.140
DV-16-24-1	0.4910	0.2480	159.0	1000.0	31591.	2136404.	0.163
DV-16-24-2	0.4940	0.2420	135.0	900.0	27998.	2056788.	0.163

AVERAGE MR(PSI)= 26646.
AVERAGE MOD OF ELAS(PSI)= 2063962.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-16-23-1	0.244	0.245	550.	148000.	0.0036	9200.	2475745.	0.36
DV-16-23-2	0.242	0.245	495.	182000.	0.0030	8348.	3069658.	0.30
DV-16-24-1 S	0.244	0.250	540.	143000.	0.0039	8852.	2344262.	0.39
DV-16-24-2	0.243	0.248	740.	143000.	0.0056	12279.	2372893.	0.56

AVERAGE TENSILE(PSI) 9670.
AVERAGE ELASTIC MOD(PSI) 2565639.
AVERAGE ELONGATION(PER CENT) 0.4024

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-16-23-1	0.2470	1.07	4.33	0.2480	1.24	5.00
DV-16-23-2	0.2490	1.46	5.86	0.2500	1.37	5.48
DV-16-24-1	0.2450	1.10	4.48	0.2450	2.07	8.44
DV-16-24-2	0.2440	1.40	5.73	0.2430	2.04	8.39

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.10
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 5.83

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-G-02-1	0.4860	0.2420	139.0	900.0	29302.	2090645.	0.148
C-G-02-2	0.4860	0.2300	92.0	736.0	21470.	1991490.	0.128
C-G-03-1	0.4820	0.2480	120.0	834.0	24287.	1815030.	0.157
C-G-03-2	0.4820	0.2400	128.0	850.0	27662.	2041071.	0.162

AVERAGE MR(PSI)= 25680.
AVERAGE MOD OF ELAS(PSI)= 1984559.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-G-02-1		0.241	0.247	520.	150000.	0.0030	8735.	2519865.	0.30
C-G-02-2		0.242	0.241	540.	154000.	0.0033	9258.	2640513.	0.33
C-G-03-1	J	0.243	0.239	435.	166700.	0.0028	7490.	2870328.	0.28
C-G-03-2	S	0.244	0.239	470.	166700.	0.0030	8059.	2858564.	0.30

AVERAGE TENSILE(PSI) 8386.
AVERAGE ELASTIC MOD(PSI) 2722317.
AVERAGE ELONGATION(PER CENT) 0.3025

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-G-02-1	0.2420	2.46	10.16	0.2400	2.10	8.75
C-G-02-2	0.2390	1.17	4.91	0.2330	2.24	9.61
C-G-03-1	0.2390	2.52	10.54	0.0000	0.00	No BRK 0.00
C-G-03-2	0.2400	3.75	15.62	0.2420	2.60	10.74

AVERAGE STRENGTH(NOTCHED)FT.LB/IN10.31
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN ~~7.27~~ 9.70

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-G-24-1	0.4960	0.2460	136.0	1000.0	27185.	2166871.	0.143
C1-G-24-2	0.4950	0.2440	140.0	1000.0	28503.	2225079.	0.173
C1-G-25-1	0.4960	0.2430	167.0	948.0	34211.	2131219.	0.192
C1-G-25-2	0.4970	0.2480	147.0	1060.0	28854.	2237250.	0.156

AVERAGE MR(PSI)= 29688.
AVERAGE MOD OF ELAS(PSI)= 2190104.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-G-24-1		0.217	0.244	580.	133000.	0.0039	10954.	2511899.	0.39
C1-G-24-2	S	0.210	0.245	335.	133000.	0.0023	6511.	2585035.	0.22
C1-G-25-1	S	0.214	0.248	570.	133000.	0.0034	10740.	2506030.	0.34
C1-G-25-2	S	0.212	0.247	400.	125000.	0.0028	7638.	2387137.	0.28

AVERAGE TENSILE(PSI) 8961.
AVERAGE ELASTIC MOD(PSI) 2497525.
AVERAGE ELONGATION(PER CENT) 0.3100

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-G-24-1	0.2430	4.10	16.87	0.2440	3.80	15.57
C1-G-24-2	0.2430	3.60	14.81	0.2410	2.60	10.78
C1-G-25-1	0.2400	3.40	14.16	0.2430	2.00	8.23
C1-G-25-2	0.2410	2.70	11.20	0.2390	3.85	16.10

AVERAGE STRENGTH(NOTCHED)FT.LB/IN14.26
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN12.67

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-G-01-1	0.4840	0.2430	80.0	600.0	16795.	1382315.	0.104
D-G-01-2	0.4890	0.2510	102.0	800.0	19865.	1655312.	0.140
D-G-02-1	0.4900	0.2420	118.0	850.0	24672.	1958379.	0.147
D-G-02-2	0.4920	0.2370	96.0	750.0	20843.	1832193.	0.138

AVERAGE MR(PSI)= 20543.
AVERAGE MOD OF ELAS(PSI)= 1707050.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-G-01-1	0.242	0.243	355.	100000.	0.0044	6036.	1700507.	0.44
D-G-01-2	0.247	0.232	295.	100000.	0.0030	5147.	1745079.	0.30
D-G-02-1	0.243	0.244	475.	136000.	0.0037	8011.	2293733.	0.37
D-G-02-2	0.245	0.244	425.	154000.	0.0033	7109.	2576113.	0.33

AVERAGE TENSILE(PSI) 6576.
AVERAGE ELASTIC MOD(PSI) 2078858.
AVERAGE ELONGATION(PER CENT) 0.3599

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-G-01-1	0.2410	1.60	6.63	0.2430	2.40	9.87
D-G-01-2	0.2300	1.40	6.08	0.2290	2.00	8.73
D-G-02-1	0.2410	1.35	5.60	0.2410	2.10	8.71
D-G-02-2	0.2400	2.10	8.75	0.2380	2.50	10.50

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 6.76
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 9.45

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-G-01-1	0.4980	0.2340	92.0	750.0	20243.	1880634.	0.123
V-G-01-2	0.4980	0.2450	139.0	1000.0	27900.	2184704.	0.153
V-G-03-1	0.4800	0.2440	96.0	700.0	20155.	1606229.	0.152
V-G-03-2	0.4770	0.2440	86.0	600.0	18169.	1385426.	0.126

AVERAGE MR(PSI)= 21617.
AVERAGE MOD OF ELAS(PSI)= 1764248.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-G-01-1	0.243	0.245	455.	166700.	0.0025	7642.	2800034.	0.25
V-G-01-2	0.242	0.243	520.	166700.	0.0037	8842.	2834745.	0.37
V-G-03-1	0.244	0.242	355.	117500.	0.0025	6012.	1989907.	0.25
V-G-03-2	0.244	0.242	200.	70000.	0.0013	3387.	1185476.	0.12

AVERAGE TENSILE(PSI) 6471.
AVERAGE ELASTIC MOD(PSI) 2202540.
AVERAGE ELONGATION(PER CENT) 0.2499

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-G-01-1	0.2460	1.45	5.89	0.2460	1.45	5.89
V-G-01-2	0.2450	1.00	4.08	0.2460	2.60	10.56
V-G-03-1	0.2400	0.80	3.33	0.2430	1.95	8.02
V-G-03-2	0.2380	2.55	10.71	0.2390	3.90	16.31

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 6.00
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN10.20

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 1 TIME IN OVEN 3+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-G-02-1	0.4830	0.2400	111.0	750.0	23938.	1797217.	0.153
DV-G-02-2	0.4810	0.2420	69.0	750.0	14696.	1760314.	0.103
DV-G-03-1	0.4780	0.2430	124.0	850.0	26359.	1982861.	0.164
DV-G-03-2	0.4790	0.2420	90.0	750.0	19249.	1767664.	0.131

AVERAGE MR(PSI)= 21061.
AVERAGE MOD OF ELAS(PSI)= 1827014.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-G-02-1		0.243	0.244	375.	117500.	0.0035	6324.	1981718.	0.35
DV-G-02-2	S	0.242	0.241	260.	125000.	0.0019	4458.	2143274.	S.D~~0.18~~
DV-G-03-1	S	0.243	0.243	460.	166700.	0.0030	7790.	2823080.	0.30
DV-G-03-2	S	0.242	0.241	570.	154000.	0.0037	9773.	2640513.	0.37

AVERAGE TENSILE(PSI) 7086.
AVERAGE ELASTIC MOD(PSI) 2397146.
AVERAGE ELONGATION(PER CENT) ~~0.3024~~ 0.340

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-G-02-1	0.2400	1.60	6.66	0.2430	1.55	6.37
DV-G-02-2	0.2420	0.65	2.68	0.2440	1.55	6.35
DV-G-03-1	0.2380	1.15	4.83	0.2400	1.75	7.29
DV-G-03-2	0.2400	2.15	8.95	0.2420	1.80	7.43

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.78
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.86

RAW DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-G-05-1		0.4880	0.2400	94.0	819.0	20064.	1942453.	0.127
C-G-05-2	C	0.4890	0.2410	95.0	700.0	20069.	1636282.	0.133
C-G-06-1		0.4860	0.2380	95.0	800.0	20705.	1953633.	0.122
C-G-06-2		0.4850	0.2460	107.0	850.0	21873.	1883614.	0.126

AVERAGE MR(PSI)= 20678.
AVERAGE MOD OF ELAS(PSI)= 1853995.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT FLG
C-G-05-1	C	0.240	0.240	225.	NS 0.	0.0021	3906.	NS 0.	0.20
C-G-05-2	C	0.247	0.244	320.	NS 0.	0.0012	5309.	NS 0.	S.D
C-G-06-1		0.245	0.240	360.	182000.	0.0021	6122.	3095239.	0.20
C-G-06-2	S	0.244	0.238	390.	167000.	0.0026	6715.	2875741.	0.25

AVERAGE TENSILE(PSI) 5513.
AVERAGE ELASTIC MOD(PSI) [illegible].2985490
AVERAGE ELONGATION(PER CENT) [illegible] 0.227

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-G-05-1	C	0.2470	2.55	10.32	0.2460	2.95	11.99
C-G-05-2	C	0.2420	2.85	11.77	0.2440	2.70	11.06
C-G-06-1		0.2380	2.65	11.13	0.2400	4.20	17.50
C-G-06-2		0.2440	2.85	11.68	0.2430	3.05	12.55

AVERAGE STRENGTH(NOTCHED)FT.LB/IN11.22
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN13.27

RAD DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+8+48 HOURS.
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-G-22-1	0.5000	0.2200	116.0	687.0	28760.	2064613.	0.177
C1-G-22-2	0.4990	0.2140	105.0	625.0	27568.	2044835.	0.180
C1-G-23-1	0.4970	0.2450	125.0	922.0	25140.	2018349.	0.141
C1-G-23-2	0.4960	0.2410	146.0	866.0	30408.	1995745.	0.166

AVERAGE MR(PSI)= 27969.
AVERAGE MOD OF ELAS(PSI)= 2030885.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-G-22-1	0.214	0.216	490.	133000.	0.0043	10600.	2877293.	0.42
C1-G-22-2	0.210	0.220	355.	100000.	0.0030	7683.	2164502.	0.30
C1-G-23-1	0.212	0.234	285.	110000.	0.0022	5745.	2217385.	0.22
C1-G-23-2	0.203	0.237	300.	143000.	0.0018	6235.	2972294.	0.18

AVERAGE TENSILE(PSI) 7566.
AVERAGE ELASTIC MOD(PSI) 2557868.
AVERAGE ELONGATION(PER CENT) 0.2824

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-G-22-1	0.2270	2.70	11.89	0.2270	4.40	19.38
C1-G-22-2	0.2220	3.20	14.41	0.2200	2.50	11.36
C1-G-23-1	0.2440	2.30	9.42	0.2430	2.50	10.28
C1-G-23-2	0.2420	3.10	12.80	0.2450	3.95	16.12

AVERAGE STRENGTH(NOTCHED)FT.LB/IN12.13
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN14.28

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-G-03-1	0.4850	0.2380	98.0	750.0	21403.	1835307.	0.132
D-G-03-2	0.4860	0.2440	85.0	800.0	17626.	1813027.	0.107
D-G-04-1	0.4930	0.2480	115.0	900.0	22756.	1914964.	0.137
D-G-04-2	0.4910	0.2400	88.0	750.0	18669.	1767934.	0.120

AVERAGE MR(PSI)= 20113.
AVERAGE MOD OF ELAS(PSI)= 1832808.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-G-03-1	0.245	0.241	150.	N.S.0.	0.0035	2540.	N.S.0.	0.35
D-G-03-2	0.247	0.234	170.	N.S.0.	0.0020	2941.	N.S.0.	0.19
D-G-04-1	0.244	0.242	200.	100000.	0.0016	3387.	1693537.	0.15
D-G-04-2	0.242	0.242	420.	136500.	0.0030	7171.	2330784.	0.30

AVERAGE TENSILE(PSI) 4010.
AVERAGE ELASTIC MOD(PSI) ~~1004080.~~ 2012160
AVERAGE ELONGATION(PER CENT) 0.2524

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-G-03-1	0.2430	1.60	6.58	0.2430	2.60	10.69
D-G-03-2	0.2460	1.70	6.91	0.2450	3.15	12.85
D-G-04-1	0.2450	1.95	7.95	0.2450	3.70	15.10
D-G-04-2	0.2420	1.85	7.64	0.2400	2.20	9.16

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 7.27
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN11.95

RAP DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-G-05-1	0.4950	0.2450	139.0	858.0	28069.	1885836.	0.165
V-G-05-2	0.4920	0.2410	118.0	800.0	24776.	1858633.	0.138
V-G-06-1	0.4880	0.2470	135.0	900.0	27206.	1958177.	0.150
V-G-06-2	0.4910	0.2420	131.0	900.0	27334.	2069355.	0.151

AVERAGE MR(PSI)= 26846.
AVERAGE MOD OF ELAS(PSI)= 1943000.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-G-05-1	J	0.246	0.248	450.	131000.	0.0031	7376.	2147259.	0.31
V-G-05-2	S	0.242	0.245	435.	150000.	0.0028	7336.	2529938.	0.28
V-G-06-1		0.243	0.244	425.	166700.	0.0040	7167.	2811510.	0.39
V-G-06-2		0.243	0.248	440.	125000.	0.0028	7301.	2074207.	0.28

AVERAGE TENSILE(PSI) 7295.
AVERAGE ELASTIC MOD(PSI) 2390728.
AVERAGE ELONGATION(PER CENT) 0.3174

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-G-05-1	0.2460	1.20	4.87	0.2450	2.15	8.77
V-G-05-2	0.2450	2.60	10.61	0.2440	1.35	5.53
V-G-06-1	0.2470	1.85	7.48	0.2480	1.55	6.25
V-G-06-2	0.2460	2.10	8.53	0.2460	2.10	8.53

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 7.87
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.27

RAP DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 2 TIME IN OVEN 3+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-G-04-1	0.4940	0.2460	96.0	700.0	19267.	1522950.	0.121
DV-G-04-2	0.4850	0.2450	88.0	736.0	18136.	1651041.	0.112
DV-G-05-1	0.4860	0.2490	56.0	750.0	11150.	1599363.	0.076
DV-G-05-2	0.4860	0.2400	72.0	625.0	15432.	1488436.	0.112

AVERAGE MR(PSI)= 15996.
AVERAGE MOD OF ELAS(PSI)= 1565447.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-G-04-1	0.244	0.250	380.	166700.	0.0024	6229.	2732787.	0.23
DV-G-04-2	0.243	0.246	385.	117500.	0.0025	6440.	1965606.	0.25
DV-G-05-1	0.242	0.239	320.	166700.	0.0028	5555.	2894299.	0.28
DV-G-05-2	0.245	0.240	250.	111000.	0.0018	4251.	1987755.	0.18

AVERAGE TENSILE(PSI) 5619.
AVERAGE ELASTIC MOD(PSI) 2370112.
AVERAGE ELONGATION(PER CENT) 0.2374

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-G-04-1	0.2500	2.10	8.40	0.2480	2.20	8.87
DV-G-04-2	0.2460	2.35	9.55	0.2490	1.25	5.02
DV-G-05-1	0.2400	1.65	6.87	0.2430	1.45	5.96
DV-G-05-2	0.2450	0.90	3.67	0.2420	2.80	11.57

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 7.12
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.85

RAW DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-G-08-1	0.4790	0.2500	92.0	769.0	18438.	1643958.	0.109
C-G-08-2	0.4790	0.2490	128.0	900.0	25859.	1947283.	0.151
C-G-09-1	0.4780	0.2380	112.0	800.0	24819.	1986330.	0.149
C-G-09-2	0.4810	0.2470	84.0	750.0	17174.	1655562.	0.108

AVERAGE MR(PSI)= 21573.
AVERAGE MOD OF ELAS(PSI)= 1808283.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-G-08-1		0.244	0.246	460.	154000.	0.0028	7663.	2565641.	0.28
C-G-08-2		0.245	0.245	335.	166700.	0.0022	5581.	2777177.	0.22
C-G-09-1	C	0.243	0.243	300.	125000.	0.0019	5080.	2116886.	0.18
C-G-09-2	C	0.244	0.239	235.	100000.	0.0020	4029.	1714795.	0.19

AVERAGE TENSILE(PSI) 5588.
AVERAGE ELASTIC MOD(PSI) 2293625.
AVERAGE ELONGATION(PER CENT) 0.2224

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-G-08-1		0.2400	2.30	9.58	0.2420	1.85	7.64
C-G-08-2		0.2470	2.00	8.09	0.2470	2.80	11.33
C-G-09-1	C	0.2360	2.20	9.32	0.2390	2.30	9.62
C-G-09-2	C	0.2390	2.35	9.83	0.2380	0.60	2.52

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 9.20
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.78

PAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-G-26-1	0.4980	0.2480	136.0	1000.0	26641.	2106375.	0.155
C1-G-26-2	0.5010	0.2460	123.0	1000.0	24341.	2145246.	0.148
C1-G-27-1	0.4980	0.2430	123.0	1000.0	25096.	2239092.	0.152
C1-G-27-2	0.4950	0.2480	106.0	1075.0	20890.	2278076.	0.126

AVERAGE MR(PSI)= 24242.
AVERAGE MOD OF ELAS(PSI)= 2192197.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-G-26-1	0.216	0.242	220.	111000.	0.0025	4208.	2123508.	0.25
C1-G-26-2	0.213	0.242	425.	111000.	0.0031	8245.	2153417.	0.31
C1-G-27-1	0.214	0.245	525.	143000.	0.0036	9972.	2716359.	0.36
C1-G-27-2	0.212	0.245	335.	133000.	0.0026	6449.	2560647.	0.25

AVERAGE TENSILE(PSI) 7219.
AVERAGE FLASTIC MOD(PSI) 2388483.
AVERAGE ELONGATION(PER CENT) 0.2949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-G-26-1	0.2420	2.80	11.57	0.2400	2.70	11.25
C1-G-26-2	0.2440	3.00	12.29	0.2420	3.35	13.84
C1-G-27-1	0.2420	2.30	9.50	0.2400	3.65	15.20
C1-G-27-2	0.2450	2.50	10.20	0.2430	6.40	26.33

AVERAGE STRENGTH(NOTCHED)FT.LB/IN10.89
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN16.65

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-G-05-1	0.4880	0.2360	70.0	650.0	15452.	1621353.	0.105
D-G-05-2	0.4880	0.2400	96.0	762.0	20491.	1807264.	0.125
D-G-06-1	0.4870	0.2430	89.0	750.0	18569.	1717250.	0.134
D-G-06-2	0.4880	0.2480	95.0	700.0	18991.	1504676.	0.130

AVERAGE MR(PSI)= 18376.
AVERAGE MOD OF ELAS(PSI)= 1662636.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-G-05-1	S	0.243	0.238	350.	143000.	0.0021	6051.	2472595.	0.20
D-G-05-2		0.243	0.238	290.	125000.	0.0023	5014.	2161359.	0.22
D-G-06-1		0.245	0.241	375.	166700.	0.0015	6351.	2823271.	0.15
D-G-06-2		0.245	0.246	200.	125000.	0.0018	3318.	2074000.	0.18

AVERAGE TENSILE(PSI) 5183.
AVERAGE ELASTIC MOD(PSI) 2382806.
AVERAGE ELONGATION(PER CENT) 0.1924

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-G-05-1	0.2420	1.55	6.40	0.2430	2.65	10.90
D-G-05-2	0.2430	2.90	11.93	0.2430	1.70	6.99
D-G-06-1	0.2460	2.25	9.14	0.2450	1.75	7.14
D-G-06-2	0.2470	1.80	7.28	0.2460	3.25	13.21

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 8.69
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 9.56

BAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-G-07-1	0.4980	0.2410	85.0	700.0	17632.	1606710.	0.112
V-G-07-2	0.4960	0.2380	105.0	770.0	22423.	1842461.	0.147
V-G-09-1	0.4980	0.2440	111.0	947.0	22462.	2094456.	0.130
V-G-09-2	0.4990	0.2450	113.0	900.0	22635.	1962293.	0.137

AVERAGE MR(PSI)= 21288.
AVERAGE MOD OF ELAS(PSI)= 1876480.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-G-07-1	0.245	0.246	255.	125000.	0.0026	4230.	2074000.	0.25
V-G-07-2	0.243	0.245	250.	100000.	0.0027	4199.	1679684.	0.26
V-G-09-1	0.244	0.245	360.	133000.	~~0.0055~~	6022.	2224825.	S.D.~~0.58~~
V-G-09-2	0.243	0.240	365.	133000.	0.0028	6258.	2280522.	0.28

AVERAGE TENSILE(PSI) 5177.
AVERAGE ELASTIC MOD(PSI) 2064757.
AVERAGE ELONGATION(PER CENT) ~~0.3474~~ 0.270

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-G-07-1	0.2460	1.30	5.28	0.2470	1.55	6.27
V-G-07-2	0.2450	1.35	5.51	0.2460	2.75	11.17
V-G-09-1	0.2490	3.05	12.24	0.2470	1.30	5.26
V-G-09-2	0.2420	2.15	8.88	0.2440	2.10	8.60

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 7.98
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.83

RAR DATA

SERIES 1 POST-BAKE STEP CURE TO 300F
LOT 3 TIME IN OVEN 3+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-G-06-1	0.4870	0.2410	56.0	750.0	11878.	1760359.	0.092
DV-G-06-2	0.4880	0.2430	61.0	750.0	12701.	1713731.	0.111
DV-G-07-1	0.4820	0.2350	73.0	916.0	16454.	2342960.	0.110
DV-G-07-2	0.4820	0.2400	76.0	857.0	16424.	2057880.	0.114

AVERAGE MR(PSI)= 14364.
AVERAGE MOD OF ELAS(PSI)= 1968732.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-G-06-1		0.244	0.242	165.	N.S. 0.	0.0018	2794.	N.S.0.	0.18
DV-G-06-2		0.245	0.248	210.	N.S. 0.	0.0016	3456.	N.S.0.	0.15
DV-G-07-1	S	0.242	0.244	250.	111000.	0.0019	4233.	1879827.	0.18
DV-G-07-2		0.245	0.240	115.	N.S. 0.	0.0013	1955.	N.S.0.	0.12

AVERAGE TENSILE(PSI) 3110.
AVERAGE ELASTIC MOD(PSI) ~~669956.~~ 1879827
AVERAGE ELONGATION(PER CENT) 0.1649

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-G-06-1	0.2450	1.45	5.91	0.2460	2.60	10.56
DV-G-06-2	0.2470	0.65	2.63	0.2480	1.95	7.86
DV-G-07-1	0.2460	1.70	6.91	0.2480	1.60	6.45
DV-G-07-2	0.2460	1.85	7.52	0.2490	2.20	8.83

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.74
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 8.42

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BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+8+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-G-10-1	0.4810	0.2460	64.0	900.0	13192.	2011000.	0.085
C-G-10-2	0.4830	0.2450	68.0	778.0	14072.	1752485.	0.087
C-G-11-1	0.4730	0.2400	79.0	650.0	17397.	1590519.	0.124
C-G-11-2	0.4720	0.2420	87.0	778.0	18884.	1860851.	0.118

AVERAGE MR(PSI)= 15886.
AVERAGE MOD OF ELAS(PSI)= 1803713.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT ELG
C-G-10-1		0.245	0.248	425.	143000.	0.0029	6994.	2353522.	0.29
C-G-10-2		0.245	0.246	335.	133000.	0.0035	5558.	2206737.	0.35
C-G-11-1	C	0.244	0.244	185.	N.S.	[illegible]SD3107.		N.S. 0.	SD [illegible]
C-G-11-2	C	0.245	0.244	155.	N.S.	[illegible]SD2592.		N.S. 0.	SD [illegible]

AVERAGE TENSILE(PSI) 4563.
AVERAGE ELASTIC MOD(PSI) [illegible].2280129
AVERAGE ELONGATION(PER CENT) [illegible] 0.320

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-G-10-1		0.2420	2.05	8.47	0.2480	1.35	5.44
C-G-10-2		0.2460	1.65	6.70	0.2470	2.70	10.93
C-G-11-1	C	0.2470	2.00	8.09	0.2470	2.00	8.09
C-G-11-2	C	0.2460	2.80	11.38	0.2480	1.80	7.25

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 8.66
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.93

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+8+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-G-28-1	0.4990	0.2480	124.0	1150.0	24242.	2417477.	0.142
C1-G-28-2	0.4970	0.2400	161.0	1085.0	33744.	2526735.	0.197
C1-G-29-1	0.4980	0.2470	140.0	1110.0	27647.	2366589.	0.176
C1-G-29-2	0.5020	0.2460	117.0	909.0	23108.	1946143.	0.165

AVERAGE MR(PSI)= 27185.
AVERAGE MOD OF ELAS(PSI)= 2314236.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-G-28-1	0.213	0.238	570.	143000.	0.0055	11243.	2820847.	0.55
C1-G-28-2	0.210	0.246	230.	100000.	0.0020	4452.	1935734.	0.19
C1-G-29-1	0.209	0.246	335.	143000.	0.0023	6515.	2781344.	0.22
C1-G-29-2	0.211	0.244	395.	133000.	0.0033	7672.	2583327.	0.33

AVERAGE TENSILE(PSI) 7471.
AVERAGE ELASTIC MOD(PSI) 2530313.
AVERAGE ELONGATION(PER CENT) 0.3274

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-G-28-1	0.2490	2.85	11.44	0.2470	3.80	15.38
C1-G-28-2	0.2360	2.10	8.89	0.2380	2.75	11.55
C1-G-29-1	0.2430	2.20	9.05	0.2440	3.65	14.95
C1-G-29-2	0.2470	2.70	10.93	0.2450	3.05	12.44

AVERAGE STRENGTH(NOTCHED)FT.LB/IN10.08
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN13.58

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+8+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-G-07-1	0.4950	0.2360	98.0	850.0	21327.	2090248.	0.128
D-G-07-2	0.4960	0.2480	85.0	750.0	16718.	1586151.	0.107
D-G-08-1	0.4860	0.2410	110.0	800.0	23381.	1881580.	0.144
D-G-08-2	0.4870	0.2400	96.0	750.0	20533.	1782455.	0.128

AVERAGE MR(PSI)= 20490.
AVERAGE MOD OF ELAS(PSI)= 1835108.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-G-07-1		0.243	0.246	300.	111000.	0.0019	5018.	1856870.	0.18
D-G-07-2		0.245	0.246	245.	100000.	0.0023	4065.	1659200.	0.22
D-G-08-1	S	0.245	0.244	230.	143000.	0.0016	3847.	2392105.	0.15
D-G-08-2		0.244	0.245	350.	111000.	0.0027	5854.	1956808.	0.26

AVERAGE TENSILE(PSI) 4696.
AVERAGE ELASTIC MOD(PSI) 1941246.
AVERAGE ELONGATION(PER CENT) 0.2124

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-G-07-1	0.2450	1.80	7.34	0.2460	2.75	11.17
D-G-07-2	0.2410	1.45	6.01	0.2460	1.60	6.50
D-G-08-1	0.2440	2.35	9.63	0.2460	1.65	6.70
D-G-08-2	0.2450	2.10	8.57	0.2470	2.05	8.29

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 7.89
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 8.17

RUN DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+8+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-G-10-1	0.5020	0.2440	87.0	889.0	17465.	1950512.	0.118
V-G-10-2	0.5000	0.2420	91.0	813.0	18546.	1835669.	0.121
V-G-11-1	0.4980	0.2430	110.0	900.0	22444.	2015183.	0.144
V-G-11-2	0.5060	0.2440	85.0	800.0	16929.	1741366.	0.106

AVERAGE MR(PSI)= 18871.
AVERAGE MOD OF ELAS(PSI)= 1885682.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT ELG
V-G-10-1	C	0.245	0.244	245.	100000.	~~0.0067~~	4098.	1672800.	SD ~~0.67~~
V-G-10-2		0.243	0.242	380.	111000.	0.0027	6461.	1887563.	0.26
V-G-11-1		0.242	0.243	400.	154000.	0.0031	6802.	2615781.	0.31
V-G-11-2		0.242	0.244	280.	125000.	0.0022	4741.	2116922.	0.22

AVERAGE TENSILE(PSI) 5526.
AVERAGE ELASTIC MOD(PSI) 2074016.
AVERAGE ELONGATION(PER CENT) ~~0.3674~~ 0.2633

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-G-10-1	0.2440	2.55	10.45	0.2440	2.50	10.24
V-G-10-2	0.2450	1.05	4.28	0.2490	2.30	9.23
V-G-11-1	0.2480	2.00	8.06	0.2470	1.20	4.85
V-G-11-2	0.2450	2.50	10.20	0.2460	1.60	6.50

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 8.25
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 7.71

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 1 TIME IN OVEN 3+8+8+24 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-G-08-1	0.4830	0.2450	72.0	700.0	14900.	1576786.	0.115
DV-G-08-2	0.4830	0.2460	70.0	770.0	14369.	1713398.	0.102
DV-G-09-1	0.4800	0.2430	60.0	727.0	12701.	1688863.	0.087
DV-G-09-2	0.4770	0.2450	80.0	667.0	16764.	1521350.	0.119

AVERAGE MR(PSI)= 14683.
AVERAGE MOD OF ELAS(PSI)= 1625099.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	FLAS MOD	PCT ELG
DV-G-08-1	0.245	0.244	170.	N.S.	[illegible]	2843.	N.S. 0.	[illegible]
DV-G-08-2	0.246	0.244	150.	N.S.	[illegible]	2499.	N.S. 0.	S.D. [illegible]
DV-G-09-1	0.245	0.239	75.	N.S.	[illegible]	1280.	N.S. 0.	[illegible]
DV-G-09-2	0.244	0.234	125.	N.S.	[illegible]	2189.	N.S. 0.	[illegible]

AVERAGE TENSILE(PSI) 2203.
AVERAGE ELASTIC MOD(PSI) 0.
AVERAGE ELONGATION(PER CENT) [illegible]

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-G-08-1	0.2430	1.60	6.58	0.2450	2.05	8.36
DV-G-08-2	0.2440	1.40	5.73	0.2490	2.75	11.04
DV-G-09-1	0.2400	2.00	8.33	0.2460	1.80	7.31
DV-G-09-2	0.2380	1.50	6.30	0.2410	2.70	11.20

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 6.73
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 9.48

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+8+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-G-12-1	0.4790	0.2480	73.0	750.0	14867.	1642444.	0.099
C-G-12-2	0.4800	0.2470	91.0	875.0	18644.	1935513.	0.110
C-G-13-1	0.4810	0.2500	115.0	950.0	22952.	2022453.	0.135
C-G-13-2	0.4810	0.2490	123.0	900.0	24746.	1939186.	0.138

AVERAGE MR(PSI)= 20302.
AVERAGE MOD OF ELAS(PSI)= 1884899.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-G-12-1		0.245	0.250	365.	133000.	0.0025	5959.	2171429.	0.25
C-G-12-2		0.244	0.250	300.	111000.	0.0033	4918.	1819672.	0.33
C-G-13-1	S	0.243	0.249	395.	133000.	0.0024	6528.	2198093.	0.23
C-G-13-2	C	0.247	0.247	335.	125000.	0.0019	5490.	2048878.	0.18

AVERAGE TENSILE(PSI) 5724.
AVERAGE ELASTIC MOD(PSI) 2059518.
AVERAGE ELONGATION(PER CENT) 0.2524

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-G-12-1	C	0.2500	2.20	8.80	0.2510	3.00	11.95
C-G-12-2	C	0.2500	2.30	9.20	0.2520	2.05	8.13
C-G-13-1	C	0.2470	2.95	11.94	0.2490	2.60	10.44
C-G-13-2	C	0.2510	3.60	14.34	0.2490	3.15	12.65

AVERAGE STRENGTH(NOTCHED)FT.LB/IN11.07
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN10.79

RAE DATA

SERIES 2 POST-RAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+8+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-G-30-1	0.4950	0.2470	70.0	834.0	13907.	1788917.	0.097
C1-G-30-2	0.4970	0.2480	140.0	1035.0	27480.	2184484.	0.170
C1-G-31-1	0.4970	0.2480	125.0	818.0	24535.	1726481.	0.168
C1-G-31-2	0.4930	0.2420	97.0	668.0	20157.	1529690.	0.130

AVERAGE MR(PSI)= 21520.
AVERAGE MOD OF ELAS(PSI)= 1807393.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-G-30-1	S	0.210	0.245	355.	143000.	0.0023	6899.	2779398.	0.22
C1-G-30-2		0.213	0.242	460.	117500.	0.0047	8924.	2279517.	0.46
C1-G-31-1	S	0.213	0.247	320.	111000.	0.0028	6082.	2109825.	0.28
C1-G-31-2		0.213	0.247	446.	117500.	0.0030	8477.	2283373.	0.30

AVERAGE TENSILE(PSI) 7595.
AVERAGE ELASTIC MOD(PSI) 2350528.
AVERAGE ELONGATION(PER CENT) 0.3199

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-G-30-1	0.2420	3.00	12.39	0.2420	3.05	12.60
C1-G-30-2	0.2500	2.85	11.40	0.2500	3.05	12.20
C1-G-31-1	0.2490	3.00	12.04	0.2500	4.20	16.80
C1-G-31-2	0.2480	2.90	11.69	0.2490	3.80	15.26

AVERAGE STRENGTH(NOTCHED)FT.LB/IN11.88
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN14.21

RAP DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+8+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-G-09-1	0.4890	0.2380	87.0	650.0	18845.	1577588.	0.128
D-G-09-2	0.4880	0.2460	95.0	700.0	19301.	1541675.	0.132
D-G-10-1	0.4870	0.2400	78.0	600.0	16683.	1425964.	0.128
D-G-10-2	0.4880	0.2420	87.0	650.0	18265.	1503722.	0.117

AVERAGE MR(PSI)= 18273.
AVERAGE MOD OF ELAS(PSI)= 1512237.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
D-G-09-1		0.245	0.239	270.	125000.	0.0025	4611.	2134745.	0.25
D-G-09-2		0.246	0.241	300.	125000.	0.0022	5060.	2108424.	0.22
D-G-10-1		0.245	0.243	340.	111000.	0.0025	5710.	1864450.	0.25
D-G-10-2	S	0.244	0.240	205.	111000.	0.0019	3500.	1895492.	0.18

AVERAGE TENSILE(PSI) 4720.
AVERAGE ELASTIC MOD(PSI) 2000777.
AVERAGE ELONGATION(PER CENT) 0.2274

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-G-09-1	0.2430	2.10	8.64	0.2480	1.90	7.66
D-G-09-2	0.2480	1.85	7.45	0.2490	2.15	8.66
D-G-10-1	0.2470	2.30	9.31	0.2490	2.55	10.24
D-G-10-2	0.2430	2.40	9.87	0.2460	2.55	10.36

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 8.82
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 9.23

BAR DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+8+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-G-12-1	0.4980	0.2460	104.0	916.0	20705.	1976882.	0.133
V-G-12-2	0.4980	0.2480	90.0	750.0	17630.	1579781.	0.122
V-G-13-1	0.4990	0.2500	72.0	625.0	13851.	1282565.	0.094
V-G-13-2	0.5000	0.2460	84.0	785.0	16656.	1587385.	0.109

AVERAGE MR(PSI)= 17211.
AVERAGE MOD OF ELAS(PSI)= 1631653.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-G-12-1	S	0.248	0.248	510.	166700.	0.0033	8292.	2710393.	0.33
V-G-12-2	S	0.243	0.248	425.	166700.	0.0028	7052.	2756163.	0.28
V-G-13-1		0.244	0.250	445.	143000.	0.0033	7295.	2344262.	0.33
V-G-13-2	S	0.246	0.250	430.	154000.	0.0025	6991.	2504065.	0.25

AVERAGE TENSILE(PSI) 7407.
AVERAGE ELASTIC MOD(PSI) 2581221.
AVERAGE ELONGATION(PER CENT) 0.2974

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-G-12-1	0.2500	3.10	12.40	0.2510	2.05	8.16
V-G-12-2	0.2490	2.25	9.03	0.2480	2.25	9.07
V-G-13-1	0.2470	2.40	9.71	0.2470	4.50	18.21
V-G-13-2	0.2510	1.10	4.38	0.2500	4.10	16.40

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 8.88
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN12.96

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 2 TIME IN OVEN 3+8+8+48 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-G-10-1	0.4850	0.2400	74.0	591.0	15893.	1410367.	0.120
DV-G-10-2	0.4860	0.2410	60.0	650.0	12753.	1528783.	0.104
DV-G-11-1	0.4920	0.2420	76.0	600.0	15825.	1376766.	0.110
DV-G-11-2	0.4890	0.2430	79.0	667.0	16415.	1520962.	0.117

AVERAGE MR(PSI)= 15222.
AVERAGE MOD OF ELAS(PSI)= 1459219.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
DV-G-10-1	0.245	0.243	160.	N.S.O.	[illegible]	2687.	N.S.O.	[illegible]
DV-G-10-2	0.245	0.240	180.	N.S.O.	[illegible]	3061.	N.S.O.	S.D. [illegible]
DV-G-11-1	0.243	0.241	160.	N.S.O.	[illegible]	2732.	N.S.O.	[illegible]
DV-G-11-2	0.245	0.240	200.	100000.	[illegible]	3401.	1700680.	[illegible]

AVERAGE TENSILE(PSI) 2970.
AVERAGE ELASTIC MOD(PSI) [illegible].1700680
AVERAGE ELONGATION(PER CENT) [illegible]

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-G-10-1	0.2440	1.90	7.78	0.2440	2.10	8.60
DV-G-10-2	0.2420	1.60	6.61	0.2440	1.80	7.37
DV-G-11-1	0.2450	0.90	3.67	0.2470	2.35	9.51
DV-G-11-2	0.2400	1.25	5.20.	0.2430	3.25	13.37

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 5.82
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 9.71

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RAP DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+8+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C-G-17-1	0.4860	0.2460	94.0	750.0	19176.	1658592.	0.116
C-G-17-2	0.4700	0.2460	92.0	750.0	19407.	1715055.	0.120
C-G-18-1	0.4780	0.2500	92.0	812.0	18476.	1739514.	0.113
C-G-18-2	0.4780	0.2510	85.0	768.0	16935.	1625669.	0.109

AVERAGE MR(PSI)= 18499.
AVERAGE MOD OF ELAS(PSI)= 1684708.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C-G-17-1	0.245	0.248	300.	133000.	0.0024	5018.	2224999.	0.23
C-G-17-2	0.245	0.248	130.	N.S.0.	0.0011	2139.	N.S. 0.	0.11
C-G-18-1	0.244	0.248	290.	125000.	~~0.0095~~	4792.	2065706.	S.D.~~0.94~~
C-G-18-2	0.246	0.248	280.	100000.	0.0023	4589.	1639129.	0.25

AVERAGE TENSILE(PSI) 4135.
AVERAGE ELASTIC MOD(PSI) ~~1.000000~~.1976578
AVERAGE ELONGATION(PER CENT) ~~0.0034~~ 0.200

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C-G-17-1	C	0.2460	2.95	11.99	0.2470	2.75	11.13
C-G-17-2	C	0.2520	1.45	5.75	0.2500	2.95	11.80
C-G-18-1	C	0.2480	2.10	8.46	0.2490	2.15	8.63
C-G-18-2		0.2460	2.95	11.99	0.2510	3.75	14.94

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 9.55
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN11.62

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+8+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
C1-G-32-1	0.4950	0.2480	152.0	857.0	29956.	1816103.	0.182
C1-G-32-2	0.4950	0.2480	120.0	1000.0	23649.	2119141.	0.158
C1-G-33-1	0.4950	0.2450	129.0	737.0	26049.	1619885.	0.159
C1-G-33-2	0.4950	0.2450	122.0	1000.0	24636.	2197944.	0.149

AVERAGE MR(PSI)= 26072.
AVERAGE MOD OF ELAS(PSI)= 1938268.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
C1-G-32-1		0.216	0.245	575.	129000.	0.0045	10865.	2437642.	0.44
C1-G-32-2	S	0.217	0.248	635.	154000.	0.0045	11799.	2861603.	0.44
C1-G-33-1	S	0.209	0.248	310.	117500.	0.0026	5980.	2266939.	0.25
C1-G-33-2		0.214	0.244	370.	133000.	0.0029	7085.	2547112.	0.29

AVERAGE TENSILE(PSI) 8932.
AVERAGE ELASTIC MOD(PSI) 2528324.
AVERAGE ELONGATION(PER CENT) 0.3629

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
C1-G-32-1	0.2460	3.35	13.61	0.2450	3.30	13.46
C1-G-32-2	0.2460	3.40	13.82	0.2440	3.80	15.57
C1-G-33-1	0.2430	2.70	11.11	0.2420	2.75	11.36
C1-G-33-2	0.2490	1.55	6.22	0.2480	4.20	16.93

AVERAGE STRENGTH(NOTCHED)FT.LB/IN11.19
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN14.33

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+8+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
D-G-11-1	0.4890	0.2420	94.0	700.0	19694.	1616081.	0.151
D-G-11-2	0.4890	0.2450	86.0	700.0	17579.	1557439.	0.118
D-G-12-1	0.4870	0.2460	66.0	567.0	13436.	1472013.	0.096
D-G-12-2	0.4930	0.2460	119.0	850.0	23932.	1853048.	0.151

AVERAGE MR(PSI)= 18660.
AVERAGE MOD OF ELAS(PSI)= 1624645.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	FLAS MOD	PCT ELG
D-G-11-1		0.246	0.245	270.	111000.	0.0022	4479.	1841712.	0.22
D-G-11-2		0.244	0.250	160.	N.S. 0.	0.0035	2622.	N.S. 0.	0.35
D-G-12-1	C	0.244	0.241	175.	N.S. ~~0.0000~~		2975.	N.S. 0.	~~0.00~~
D-G-12-2		0.245	0.230	280.	143000.	0.0024	4968.	2537711.	0.23

AVERAGE TENSILE(PSI) 3761.
AVERAGE ELASTIC MOD(PSI) ~~1000~~54.2189712
AVERAGE ELONGATION(PER CENT) ~~0.0000~~ 0.2667

IZOD IMPACT DATA

		NOTCHED			UNNOTCHED		
SAMPLE		THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
D-G-11-1		0.2430	1.70	6.99	0.2470	2.95	11.94
D-G-11-2		0.2430	2.05	8.43	0.2460	1.50	6.09
D-G-12-1	C	0.2340	1.80	7.69	0.2370	3.25	13.71
D-G-12-2		0.2330	2.10	9.01	0.2420	2.15	8.88

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 8.03
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN10.15

RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+8+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
V-G-14-1	0.4950	0.2400	94.0	650.0	19781.	1519928.	0.138
V-G-14-2	0.4930	0.2430	65.0	850.0	13396.	1922631.	0.096
V-G-17-1	0.4900	0.2450	90.0	800.0	18359.	1776298.	0.119
V-G-17-2	0.4960	0.2430	110.0	823.0	22534.	1850203.	0.135

AVERAGE MR(PSI)= 18518.
AVERAGE MOD OF ELAS(PSI)= 1767215.

TENSILE DATA

SAMPLE		WIDTH	THICK	LOAD	SLOPE	ELONG	TENSILE	ELAS MOD	PCT ELG
V-G-14-1	S	0.242	0.243	300.	111000.	0.0021	5101.	1887563.	0.20
V-G-14-2		0.253	0.242	355.	143000.	0.0037	5798.	2335610.	0.37
V-G-17-1		0.245	0.240	325.	143000.	0.0023	5527.	2431973.	0.22
V-G-17-2		0.244	0.239	470.	125000.	0.0037	8059.	2143494.	0.37

AVERAGE TENSILE(PSI) 6121.
AVERAGE ELASTIC MOD(PSI) 2199660.
AVERAGE ELONGATION(PER CENT) 0.2949

IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
V-G-14-1	0.2360	2.45	10.38	0.2430	2.25	9.25
V-G-14-2	0.2440	2.35	9.63	0.2450	2.25	9.18
V-G-17-1	0.2340	1.55	6.62	0.2420	1.70	7.02
V-G-17-2	0.2410	3.15	13.07	0.2400	2.60	10.83

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 9.92
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 9.07

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RAW DATA

SERIES 2 POST-BAKE STEP CURE TO 350F
LOT 3 TIME IN OVEN 3+8+8+96 HOURS
TASK 1 GLASS/PHENOLIC

FLEX DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	MR(PSI)	MOD OF ELAS	DFLCT
DV-G-12-1	0.4820	0.2470	80.0	700.0	16323.	1541985.	0.110
DV-G-12-2	0.4820	0.2430	80.0	750.0	16864.	1735064.	0.114
DV-G-13-1	0.4830	0.2380	96.0	700.0	21053.	1720046.	0.147
DV-G-13-2	0.4960	0.2470	96.0	683.0	19034.	1462070.	0.132

AVERAGE MR(PSI)= 18318.
AVERAGE MOD OF ELAS(PSI)= 1614791.

TENSILE DATA

SAMPLE	WIDTH	THICK	LOAD	SLOPE	FLONG	TENSILE	ELAS MOD	PCT ELG
DV-G-12-1	0.245	0.242	310.	143000.	0.0017	5228.	2411874.	0.17
DV-G-12-2	0.242	0.242	250.	125000.	0.0020	4268.	2134417.	0.19
DV-G-13-1	0.247	0.245	195.	125000.	0.0017	3222.	2065604.	0.17
DV-G-13-2	0.245	0.239	300.	111000.	0.0028	5123.	1895654.	0.28

AVERAGE TENSILE(PSI) 4460.
AVERAGE ELASTIC MOD(PSI) 2126887.
AVERAGE ELONGATION(PER CENT) 0.2049

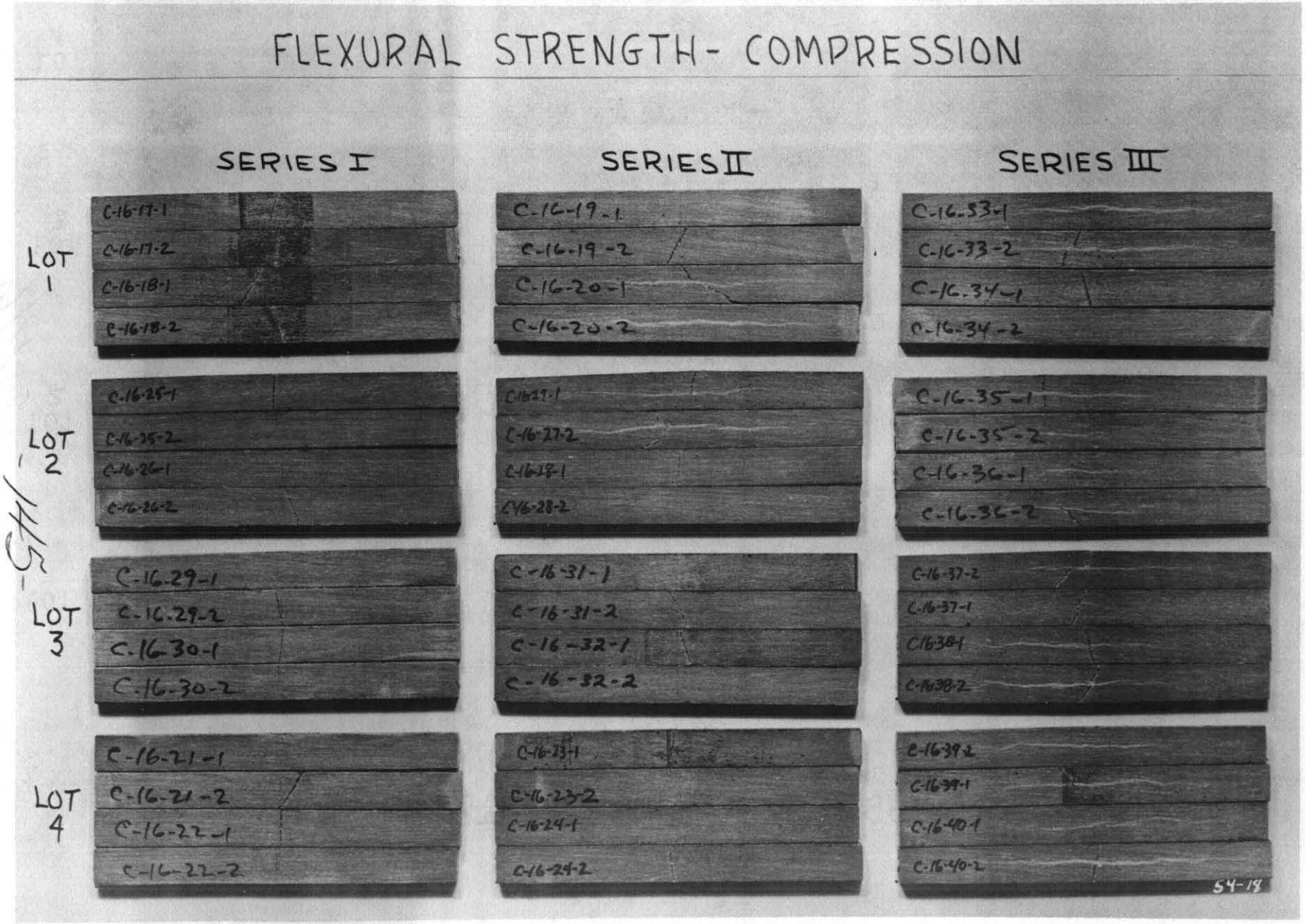
IZOD IMPACT DATA

	NOTCHED			UNNOTCHED		
SAMPLE	THICK	FT.LB	FT.LB/IN	THICK	FT.LB	FT.LB/IN
DV-G-12-1	0.2440	1.65	6.76	0.2480	1.60	6.45
DV-G-12-2	0.2490	1.10	4.41	0.2480	1.40	5.64
DV-G-13-1	0.2410	2.65	10.99	0.2470	1.75	7.08
DV-G-13-2	0.2440	2.30	9.42	0.2450	1.85	7.55

AVERAGE STRENGTH(NOTCHED)FT.LB/IN 7.90
AVERAGE STRENGTH(UNNOTCHED)FT.LB/IN 6.68

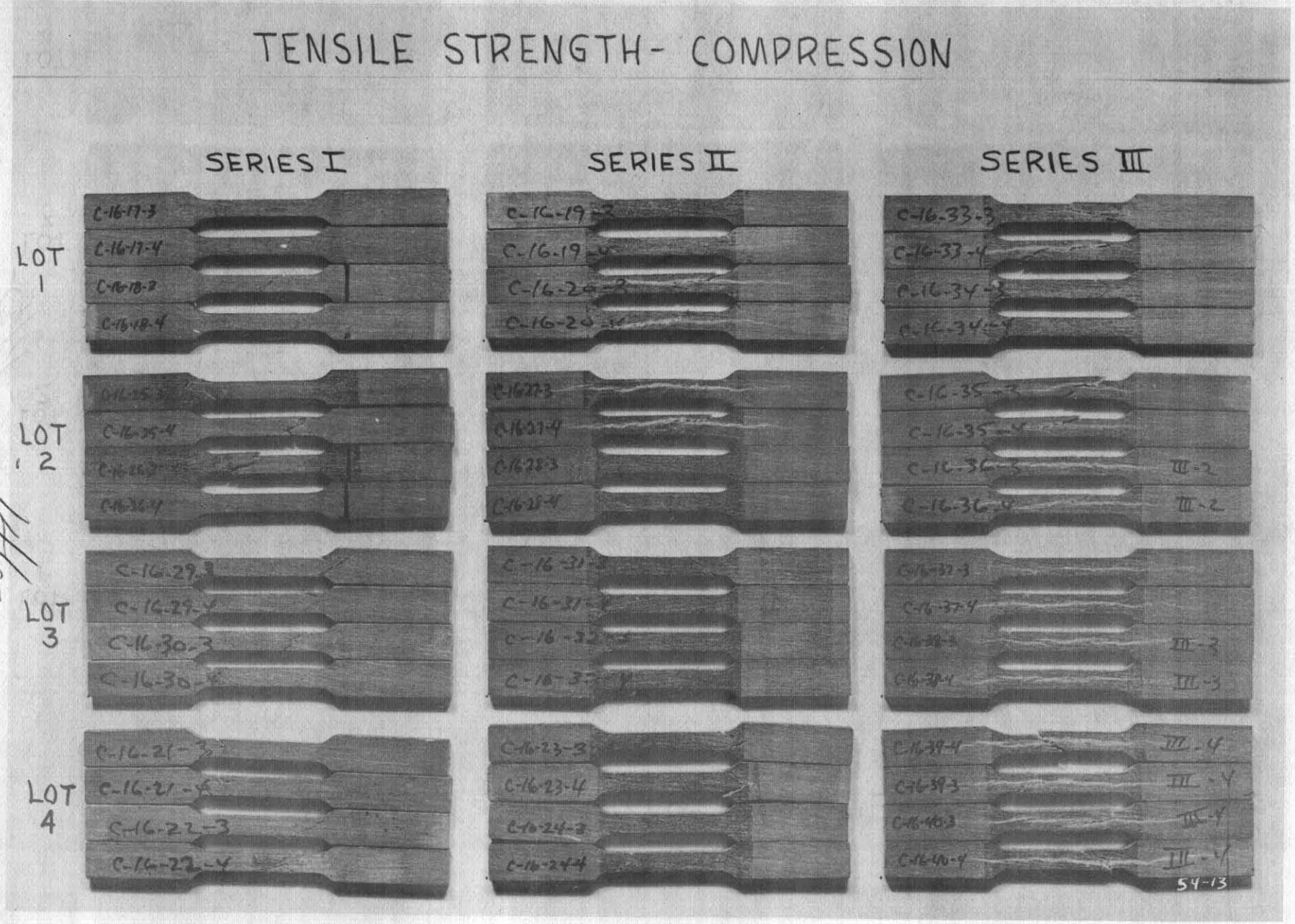
APPENDIX II

Photographs of All Test Bars After Test

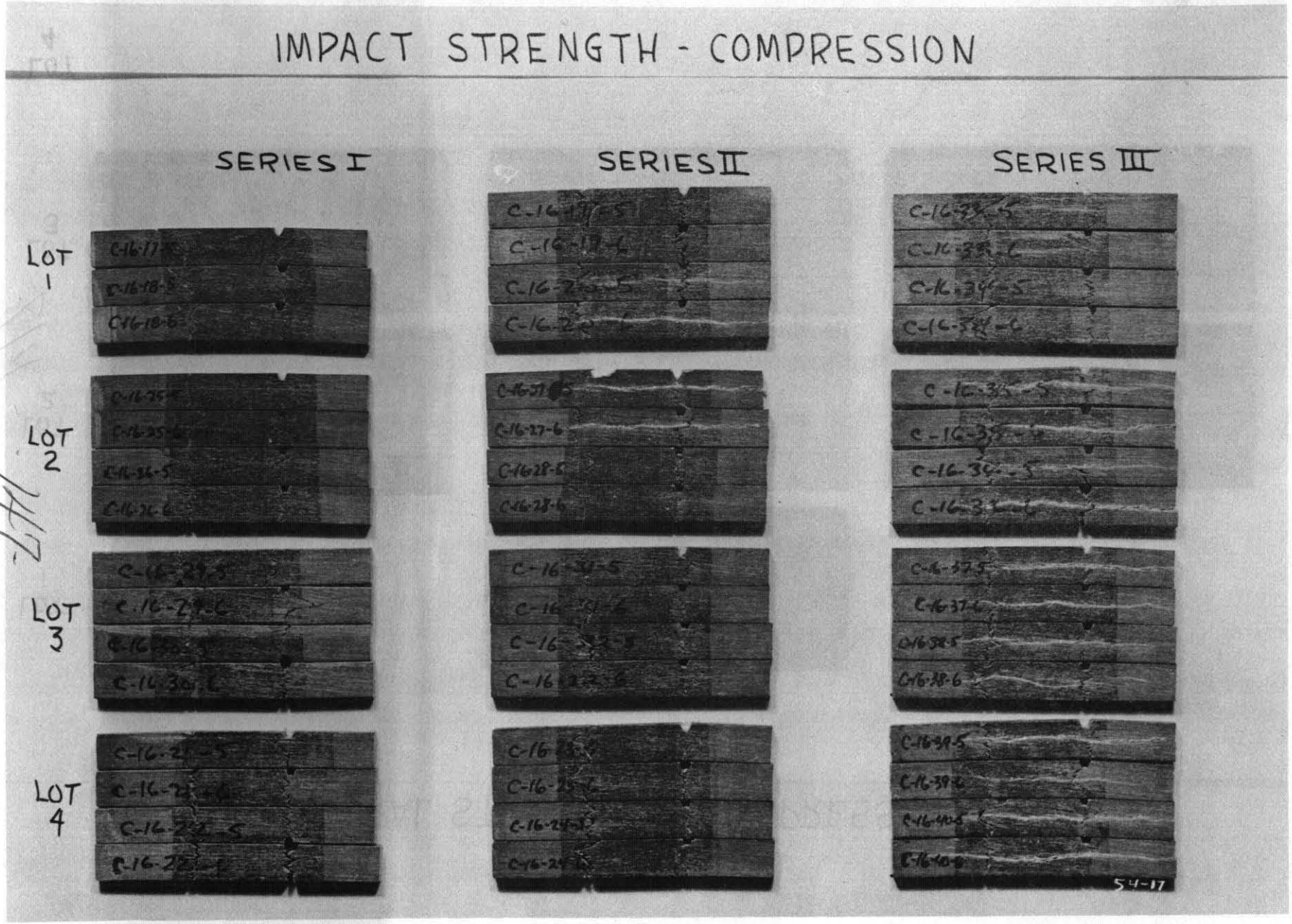

FLEXURAL STRENGTH- COMPRESSION
SERIES I
SERIES II
SERIES III
LOT 1
C-16-17-1
C-16-17-2
C-16-18-1
C-16-18-2
C-16-19-1
C-16-19-2
C-16-20-1
C-16-20-2
C-16-33-1
C-16-33-2
C-16-34-1
C-16-34-2
LOT 2
C-16-25-1
C-16-25-2
C-16-26-1
C-16-26-2
C-16-27-1
C-16-27-2
C-16-28-1
C-16-28-2
C-16-35-1
C-16-35-2
C-16-36-1
C-16-36-2
LOT 3
C-16-29-1
C-16-29-2
C-16-30-1
C-16-30-2
C-16-31-1
C-16-31-2
C-16-32-1
C-16-32-2
C-16-37-2
C-16-37-1
C-16-38-1
C-16-38-2
LOT 4
C-16-21-1
C-16-21-2
C-16-22-1
C-16-22-2
C-16-23-1
C-16-23-2
C-16-24-1
C-16-24-2
C-16-39-2
C-16-39-1
C-16-40-1
C-16-40-2
54-19

-1145-

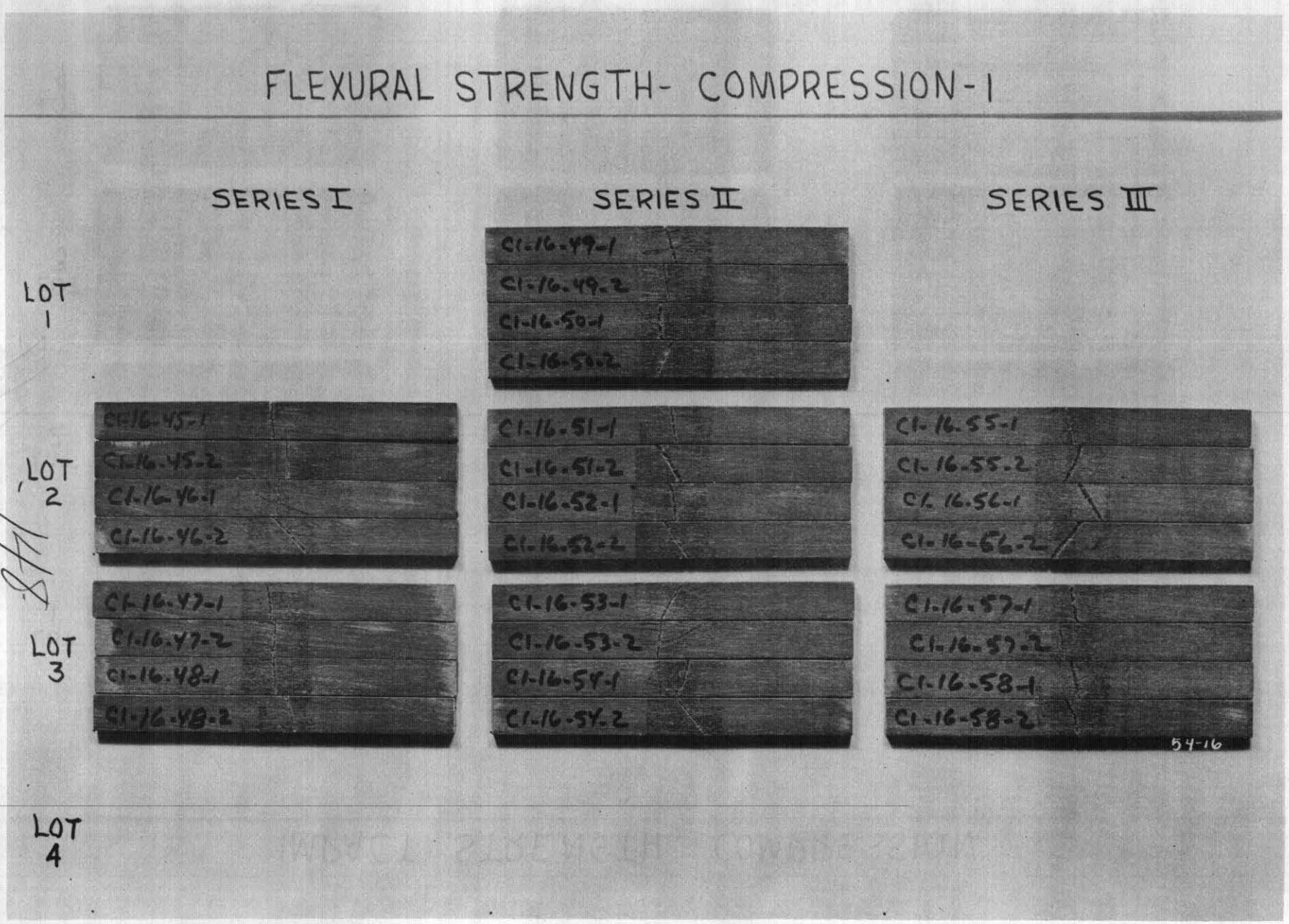
TENSILE STRENGTH- COMPRESSION

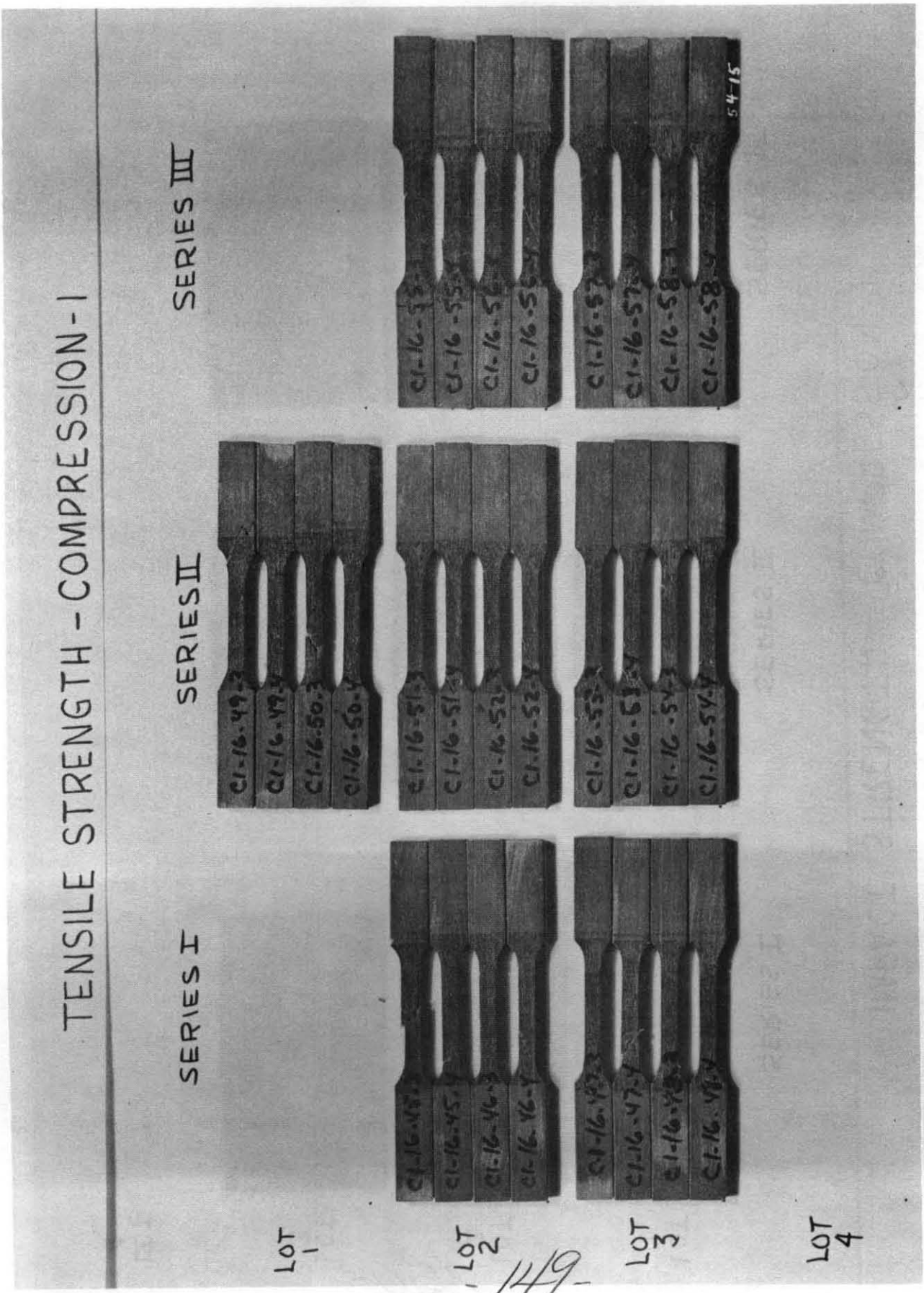


IMPACT STRENGTH - COMPRESSION

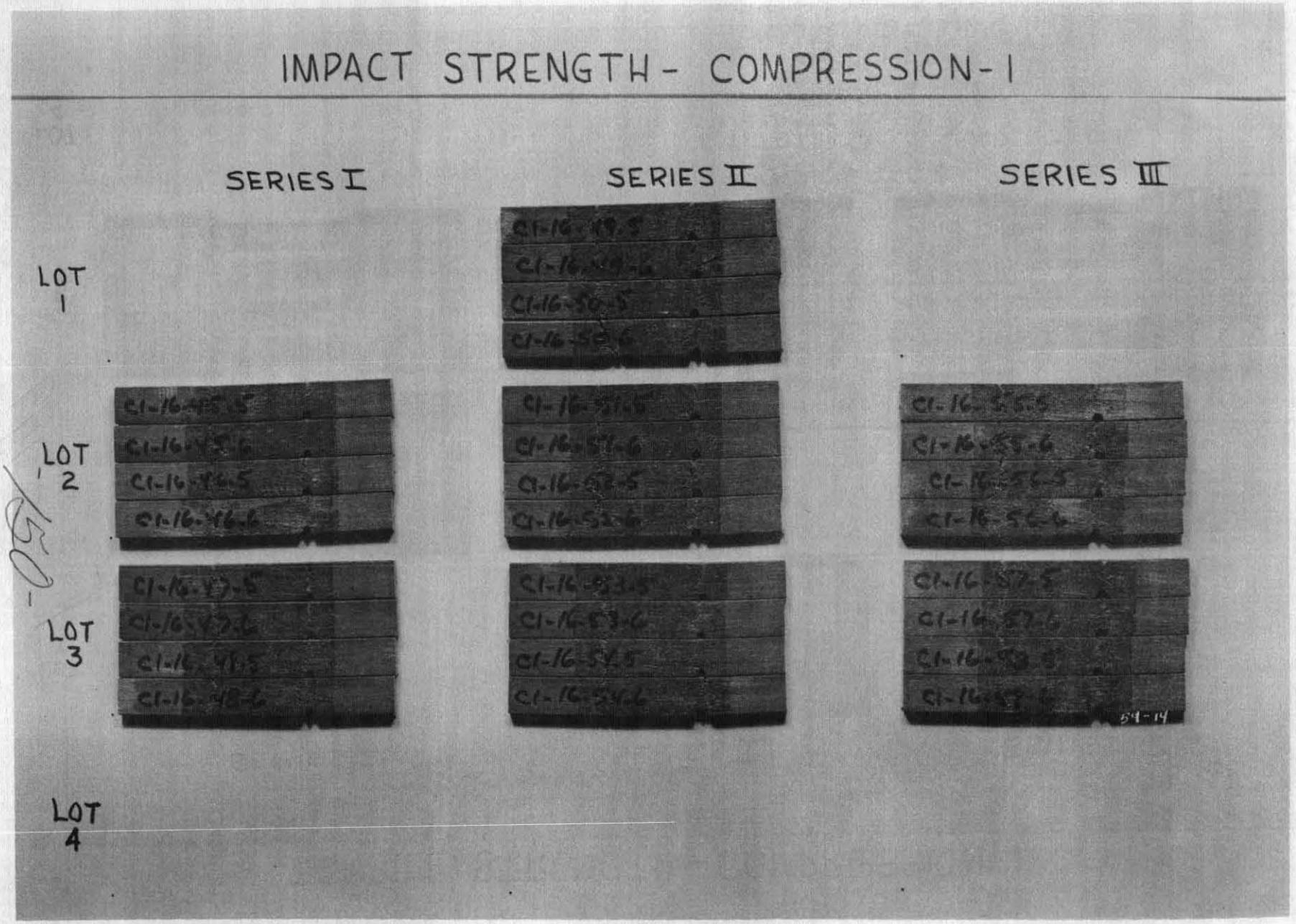


FLEXURAL STRENGTH- COMPRESSION-I



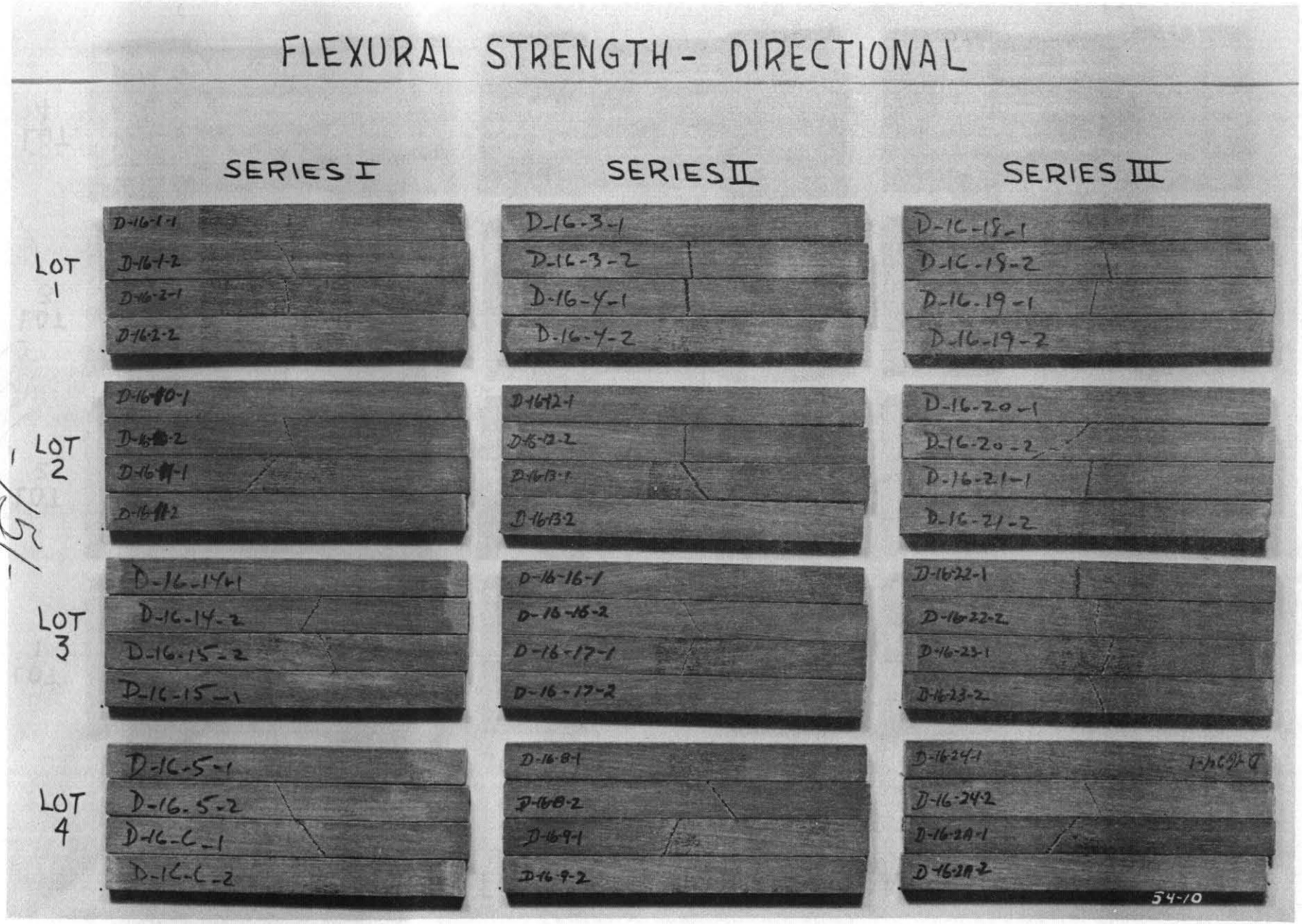

TENSILE STRENGTH - COMPRESSION-I
SERIES I
SERIES II
SERIES III
LOT 1
LOT 2
LOT 3
LOT 4
C1-16-49.2
C1-16-49.5
C1-16-50.3
C1-16-50.4
C1-16-51.2
C1-16-51.3
C1-16-52.2
C1-16-52.3
C1-16-53.2
C1-16-51.2
C1-16-54.3
C1-16-54.4
C1-16-52.2
C1-16-52.3
C1-16-58.3
54-15

IMPACT STRENGTH - COMPRESSION - I



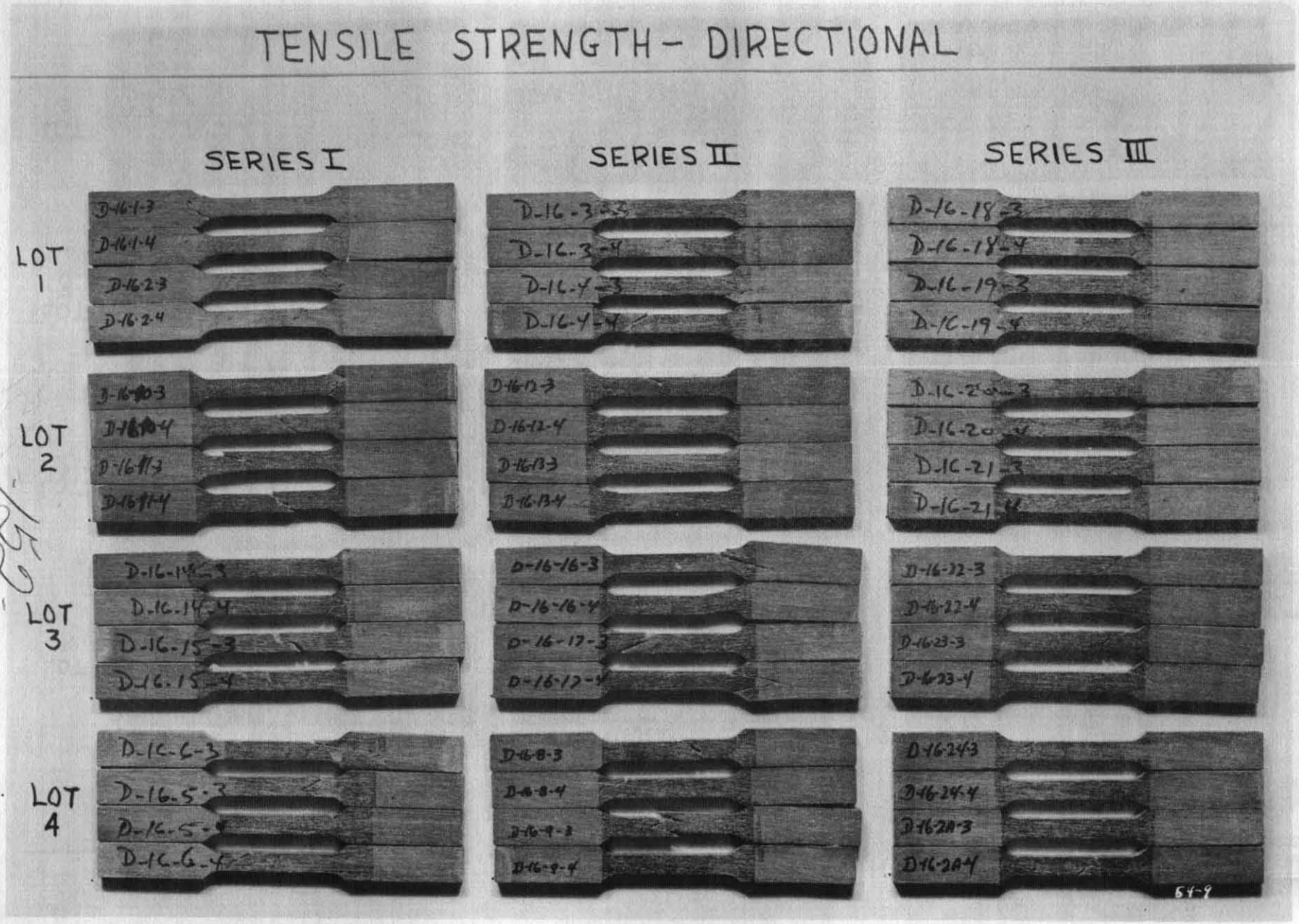
-120-

FLEXURAL STRENGTH - DIRECTIONAL



-15-

TENSILE STRENGTH - DIRECTIONAL



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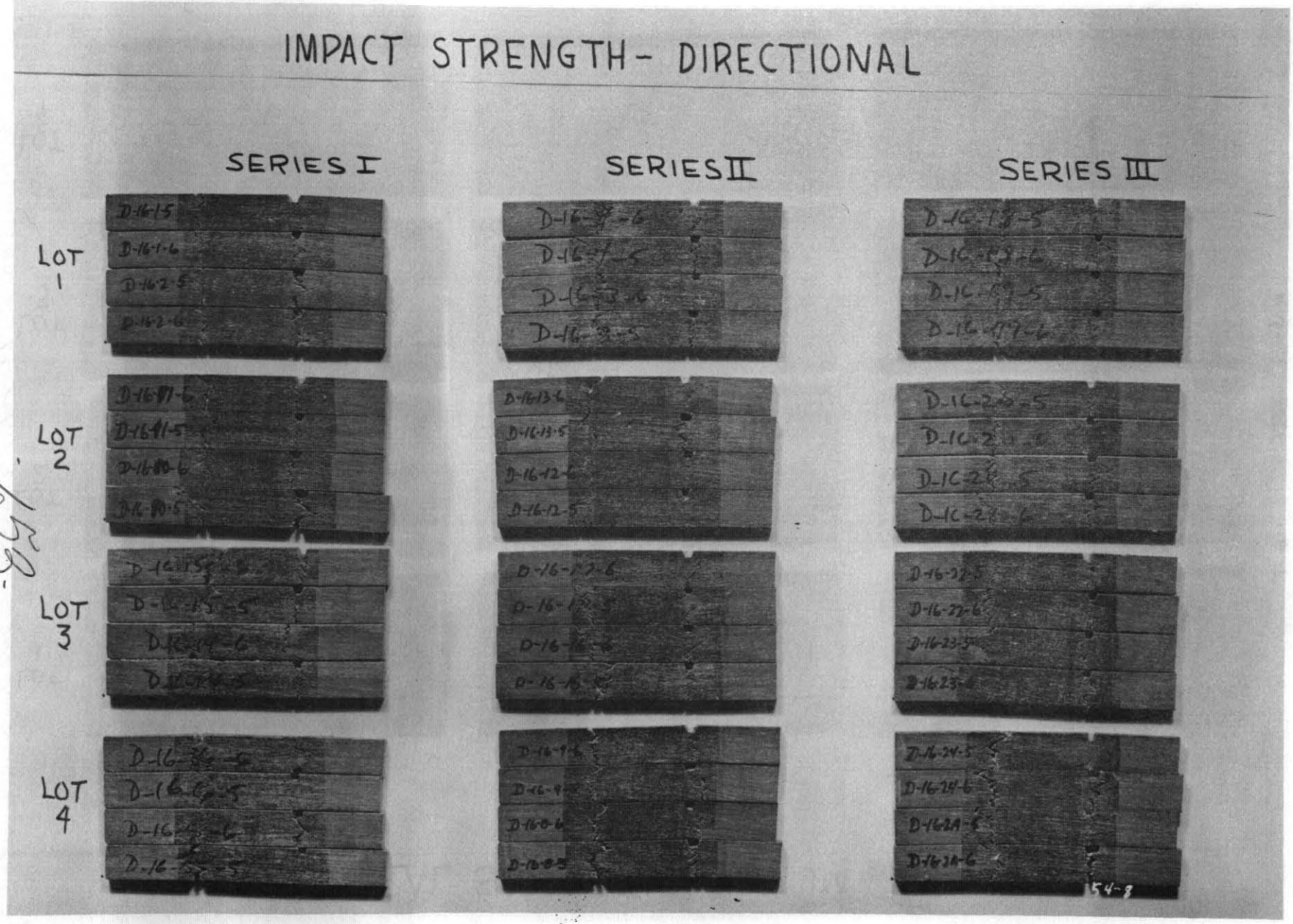
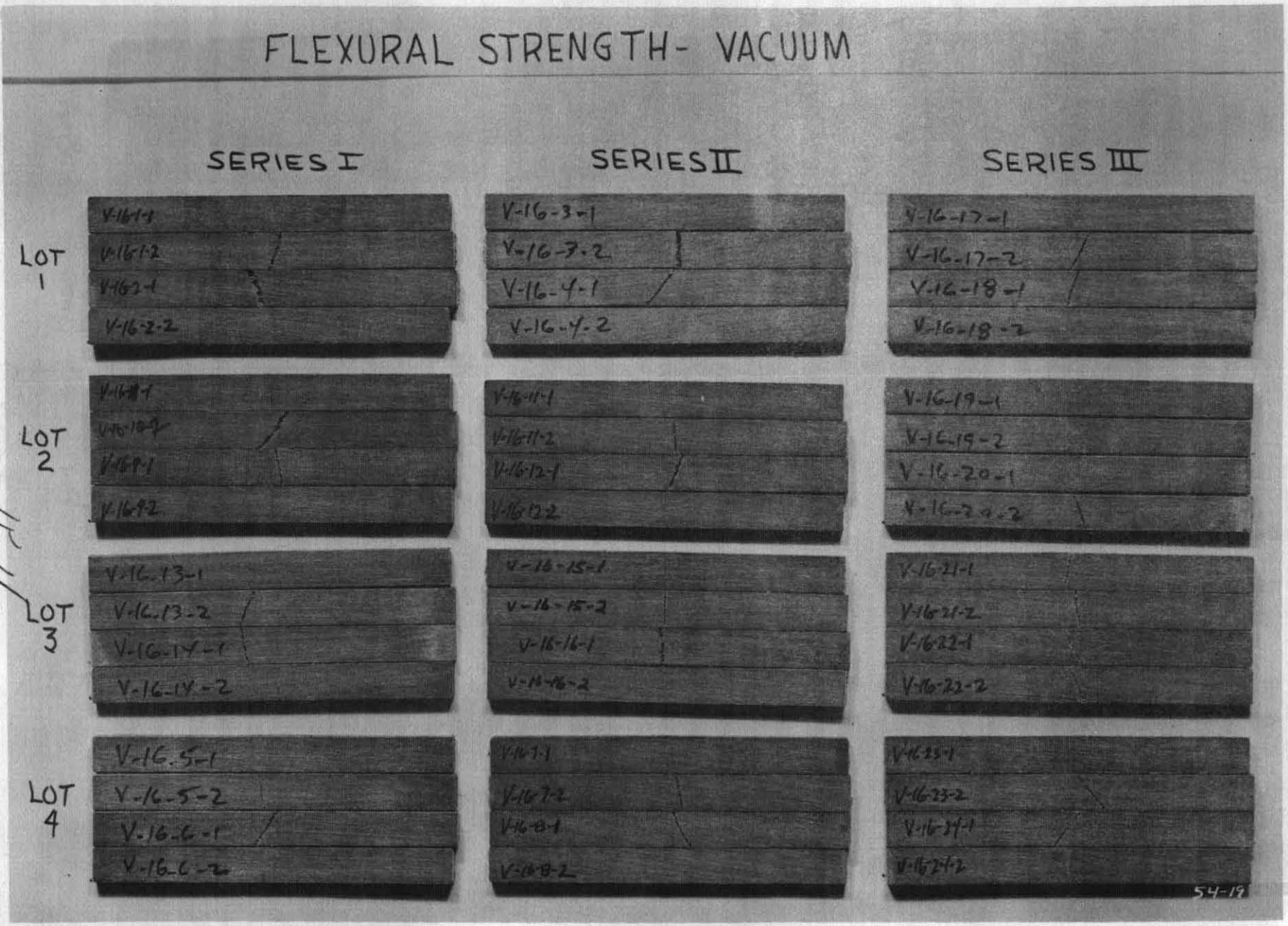
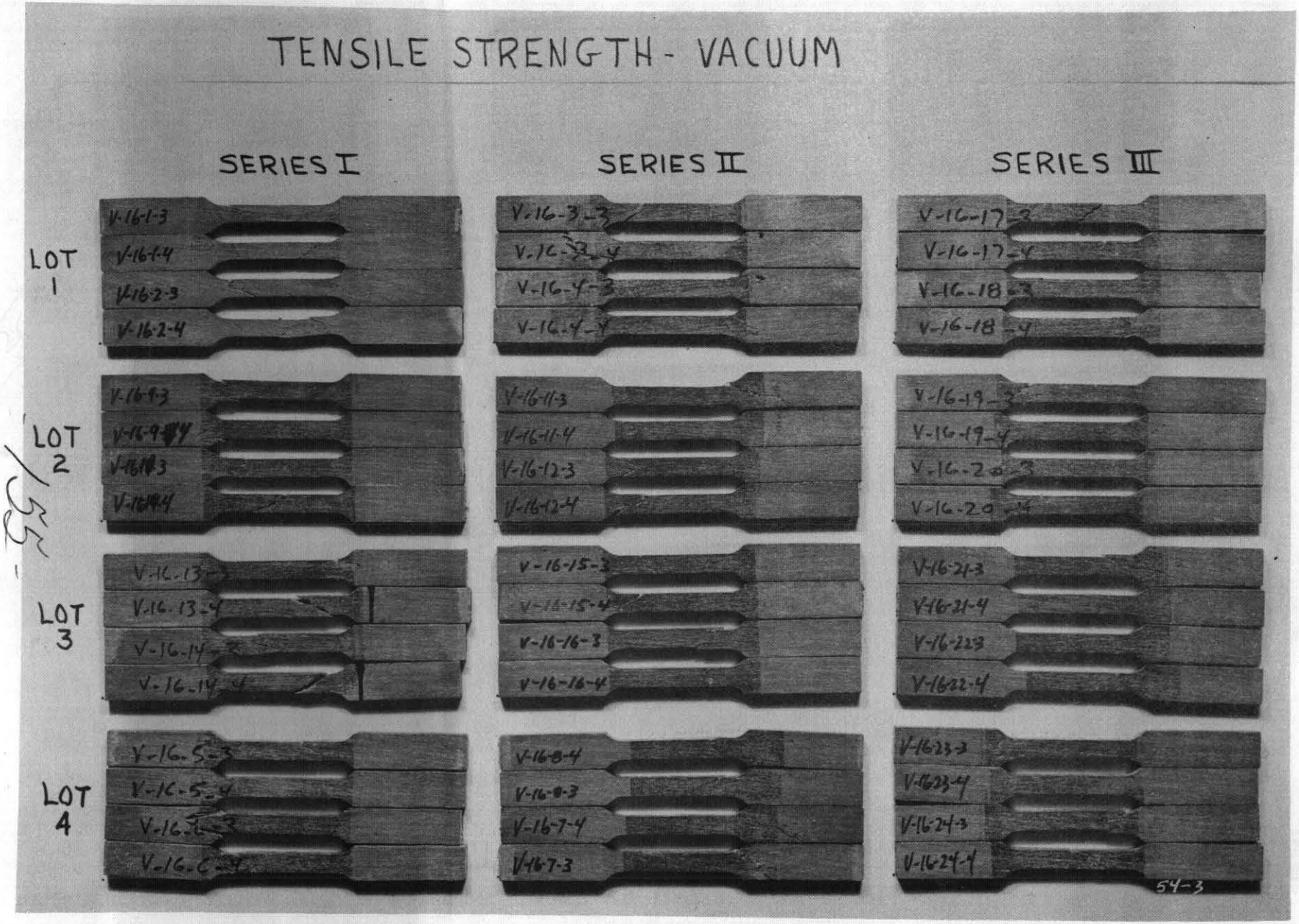
IMPACT STRENGTH- DIRECTIONAL



FLEXURAL STRENGTH- VACUUM



151


TENSILE STRENGTH - VACUUM
SERIES I
SERIES II
SERIES III
LOT 1
V-16-1-3
V-16-1-4
V-16-2-3
V-16-2-4
V-16-3-3
V-16-3-4
V-16-4-3
V-16-4-4
V-16-17-3
V-16-17-4
V-16-18-3
V-16-18-4
LOT 2
V-16-9-3
V-16-9-4
V-16-10-3
V-16-10-4
V-16-11-3
V-16-11-4
V-16-12-3
V-16-12-4
V-16-19-3
V-16-19-4
V-16-20-3
V-16-20-4
LOT 3
V-16-13-3
V-16-13-4
V-16-14-3
V-16-14-4
V-16-15-3
V-16-15-4
V-16-16-3
V-16-16-4
V-16-21-3
V-16-21-4
V-16-22-3
V-16-22-4
LOT 4
V-16-5-3
V-16-5-4
V-16-6-3
V-16-6-4
V-16-8-4
V-16-8-3
V-16-7-4
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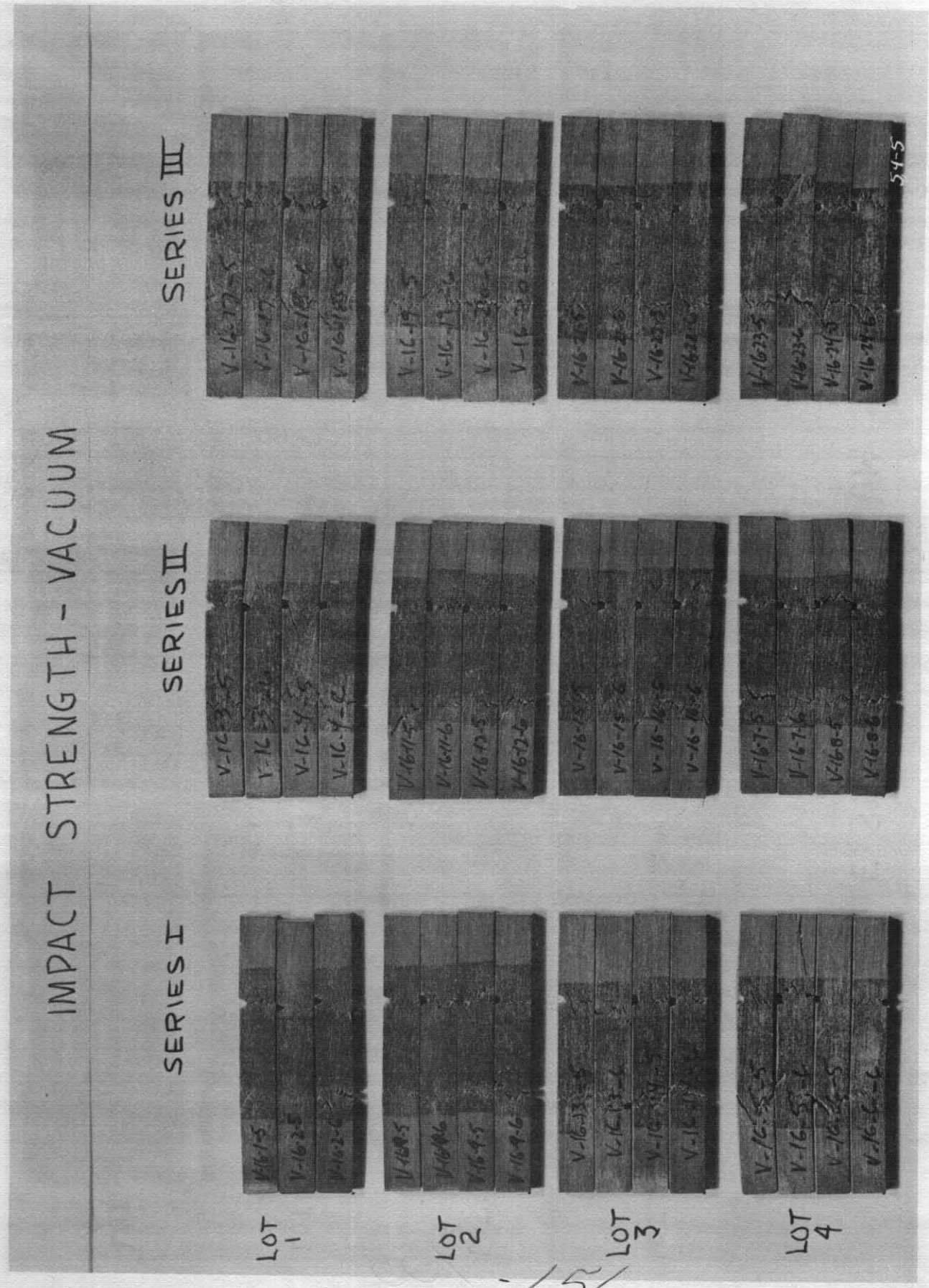
V-16-24-3
V-16-24-4
54-3


IMPACT STRENGTH - VACUUM
SERIES I
SERIES II
SERIES III
LOT 1
LOT 2
LOT 3
LOT 4


FLEXURAL STRENGTH - VACUUM DIRECTIONAL
SERIES I
SERIES II
SERIES III
LOT 1
LOT 2
LOT 3
LOT 4
DV-16-1-1
DV-16-1-2
DV-16-2-1
DV-16-2-2
DV-16-3-1
DV-16-3-2
DV-16-4-1
DV-16-4-2
DV-16-17-1
DV-16-17-2
DV-16-18-1
DV-16-18-2
DV-16-9-1
DV-16-9-2
DV-16-10-1
DV-16-10-2
DV-16-11-1
DV-16-11-2
DV-16-12-1
DV-16-12-2
DV-16-19-1
DV-16-19-2
DV-16-20-1
DV-16-20-2
DV-16-13-1
DV-16-13-2
DV-16-14-1
DV-16-14-2
DV-16-15-1
DV-16-15-2
DV-16-16-1
DV-16-16-2
DV-16-21-1
DV-16-21-2
DV-16-22-1
DV-16-22-2
DV-16-5-1
DV-16-5-2
DV-16-6-1
DV-16-6-2
DV-16-7-1
DV-16-8-1
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DV-16-24-1
DV-16-24-2
5-1-52

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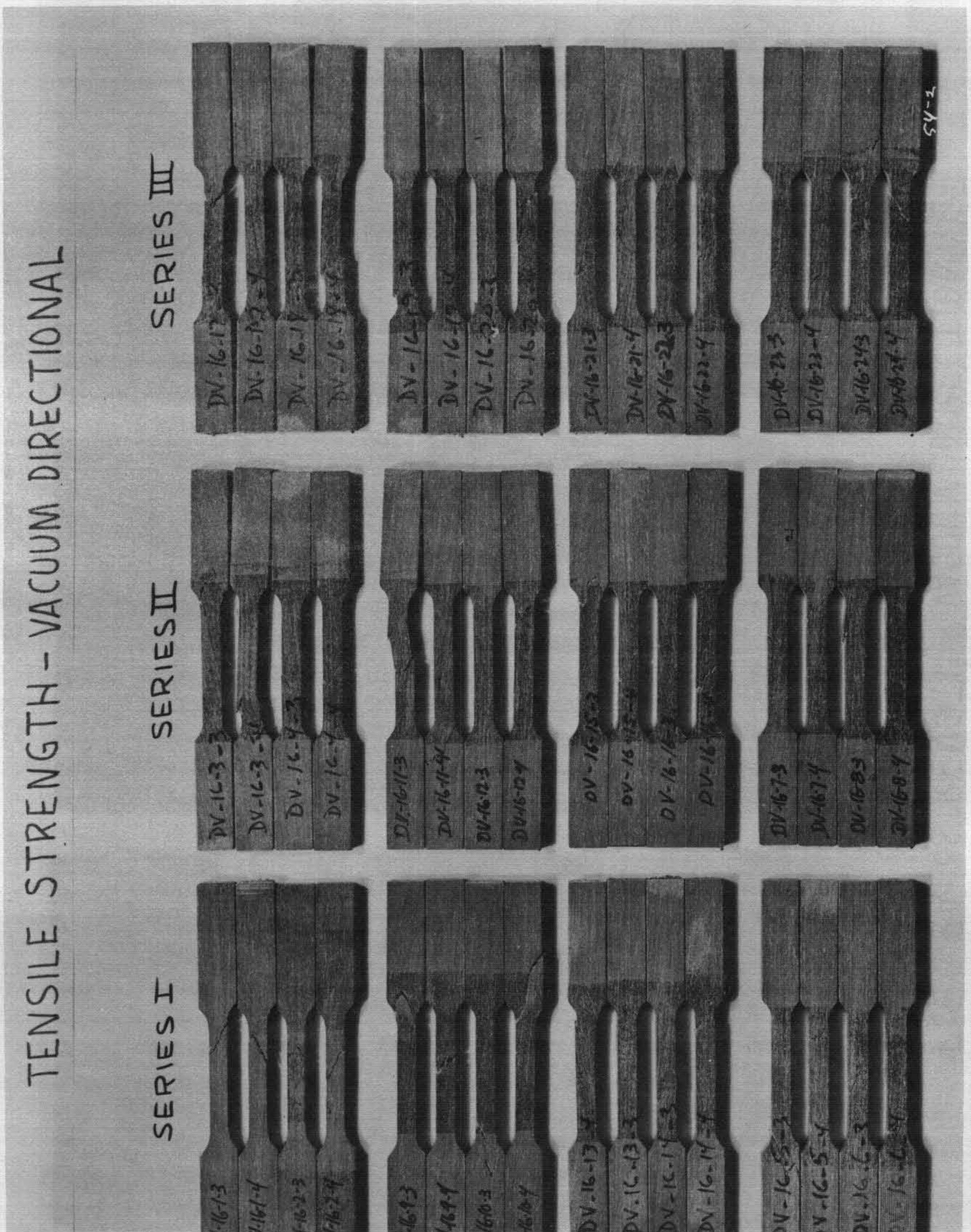
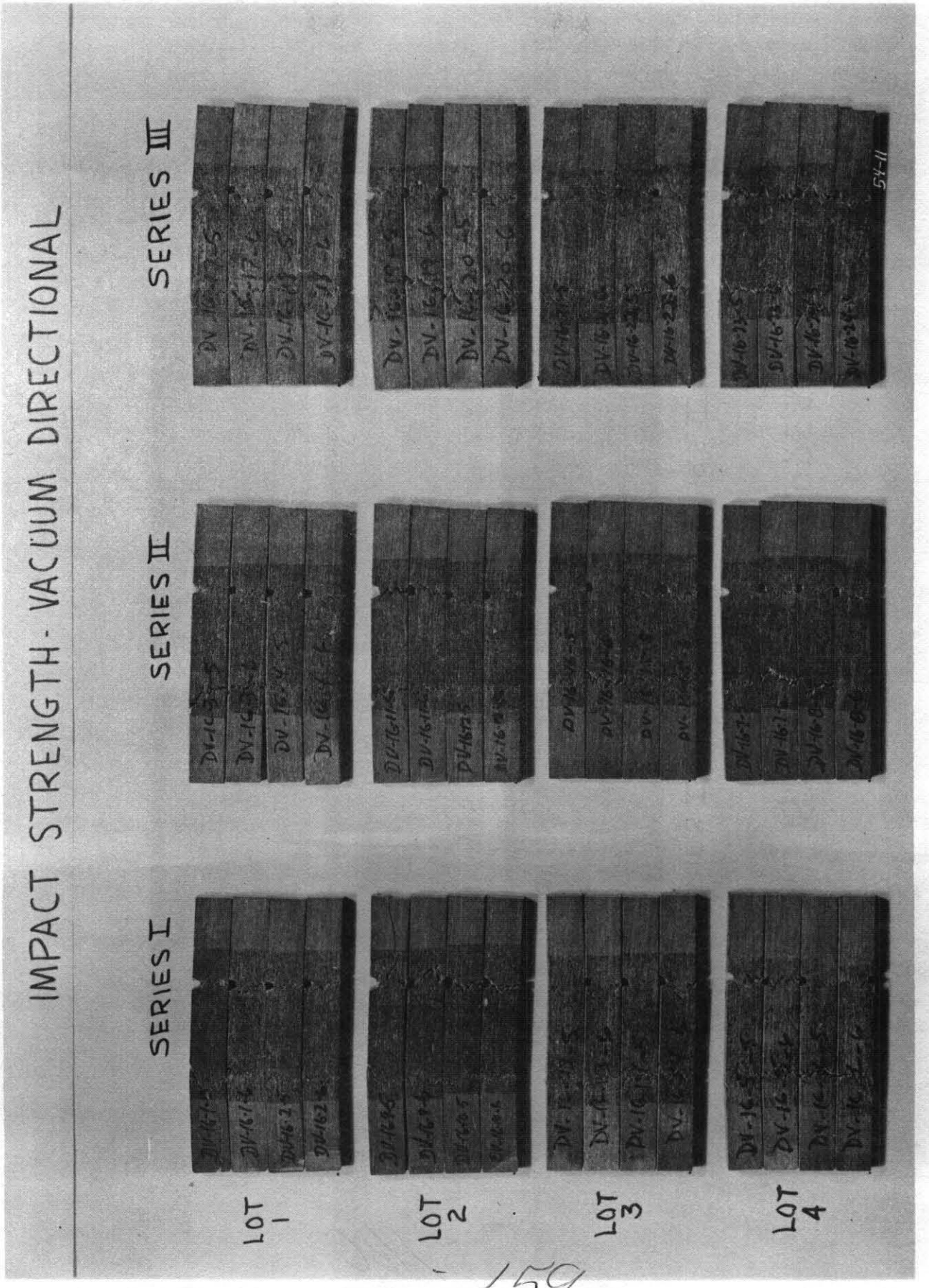


LOT 1

LOT 2

LOT 3

LOT 4


IMPACT STRENGTH- VACUUM DIRECTIONAL
SERIES I
SERIES II
SERIES III
LOT 1
LOT 2
LOT 3
LOT 4

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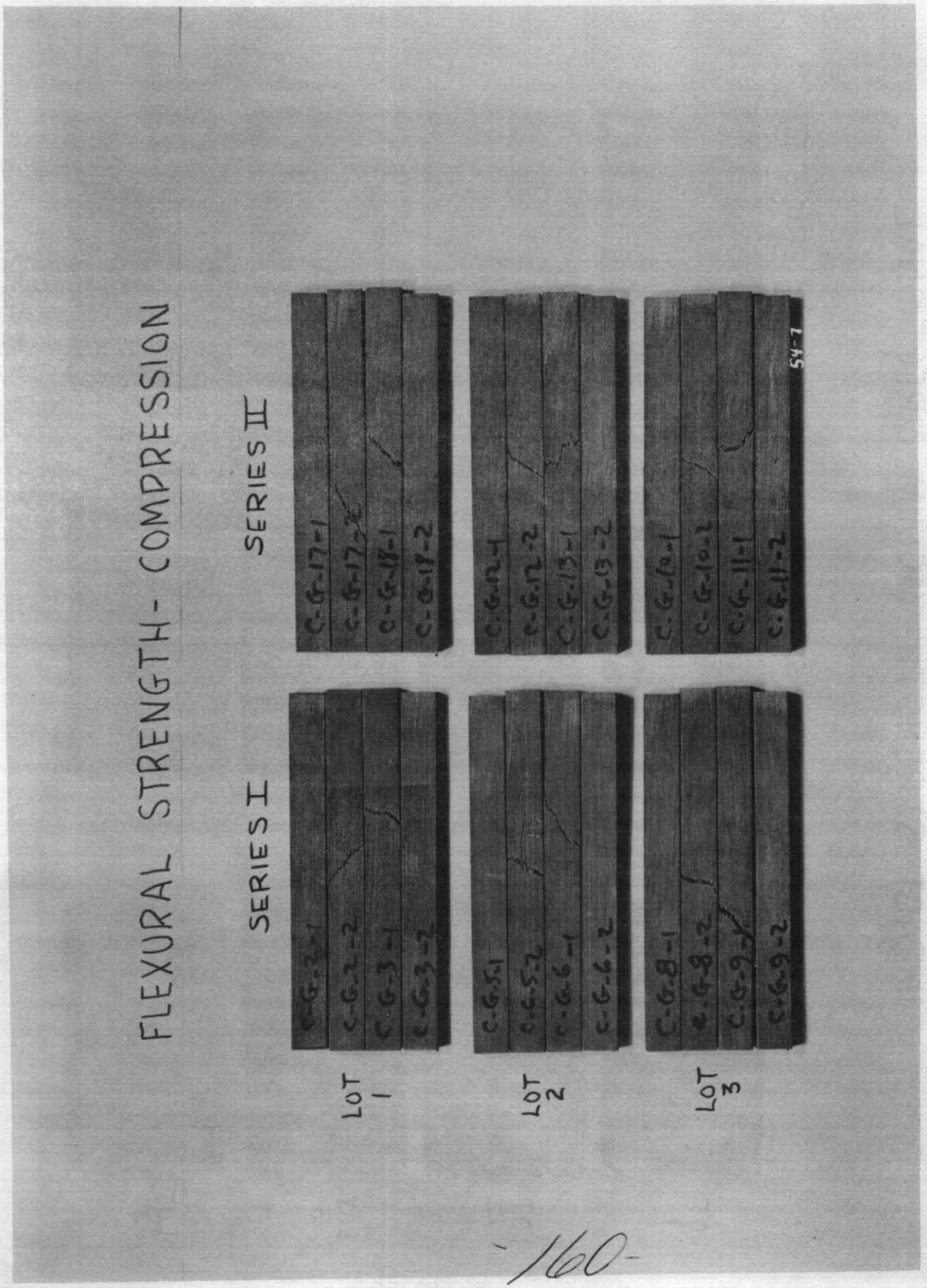
FLEXURAL STRENGTH- COMPRESSION
SERIES II
SERIES II
LOT 1
LOT 2
LOT 3
C-G-2-1
C-G-2-2
C-G-3-1
C-G-3-2
C-G-5-1
C-G-5-2
C-G-6-1
C-G-6-2
C-G-8-1
C-G-8-2
C-G-9-1
C-G-9-2
C-G-17-1
C-G-17-2
C-G-18-1
C-G-18-2
C-G-12-1
C-G-12-2
C-G-13-1
C-G-13-2
C-G-10-1
C-G-10-2
C-G-11-1
C-G-11-2
54-1

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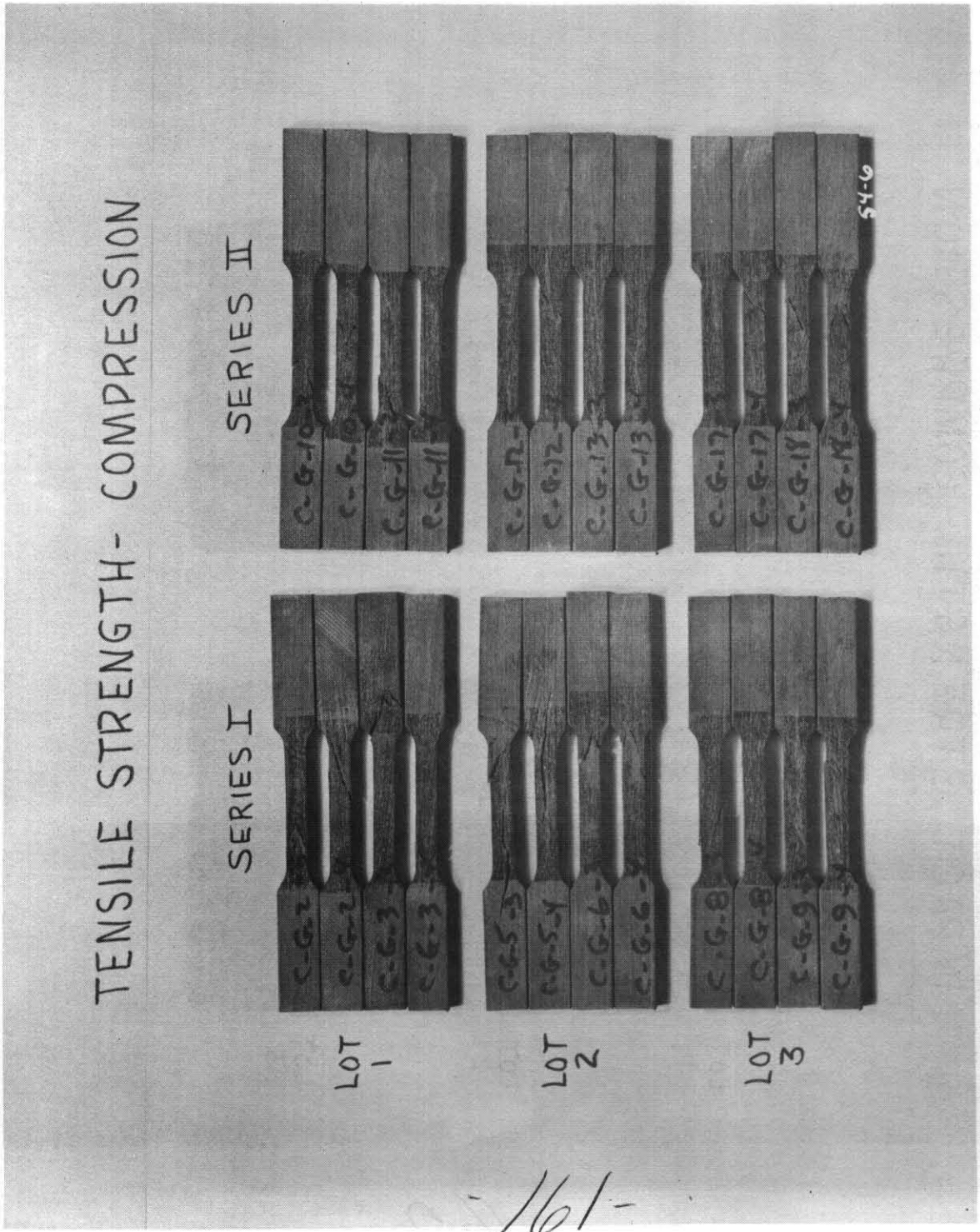
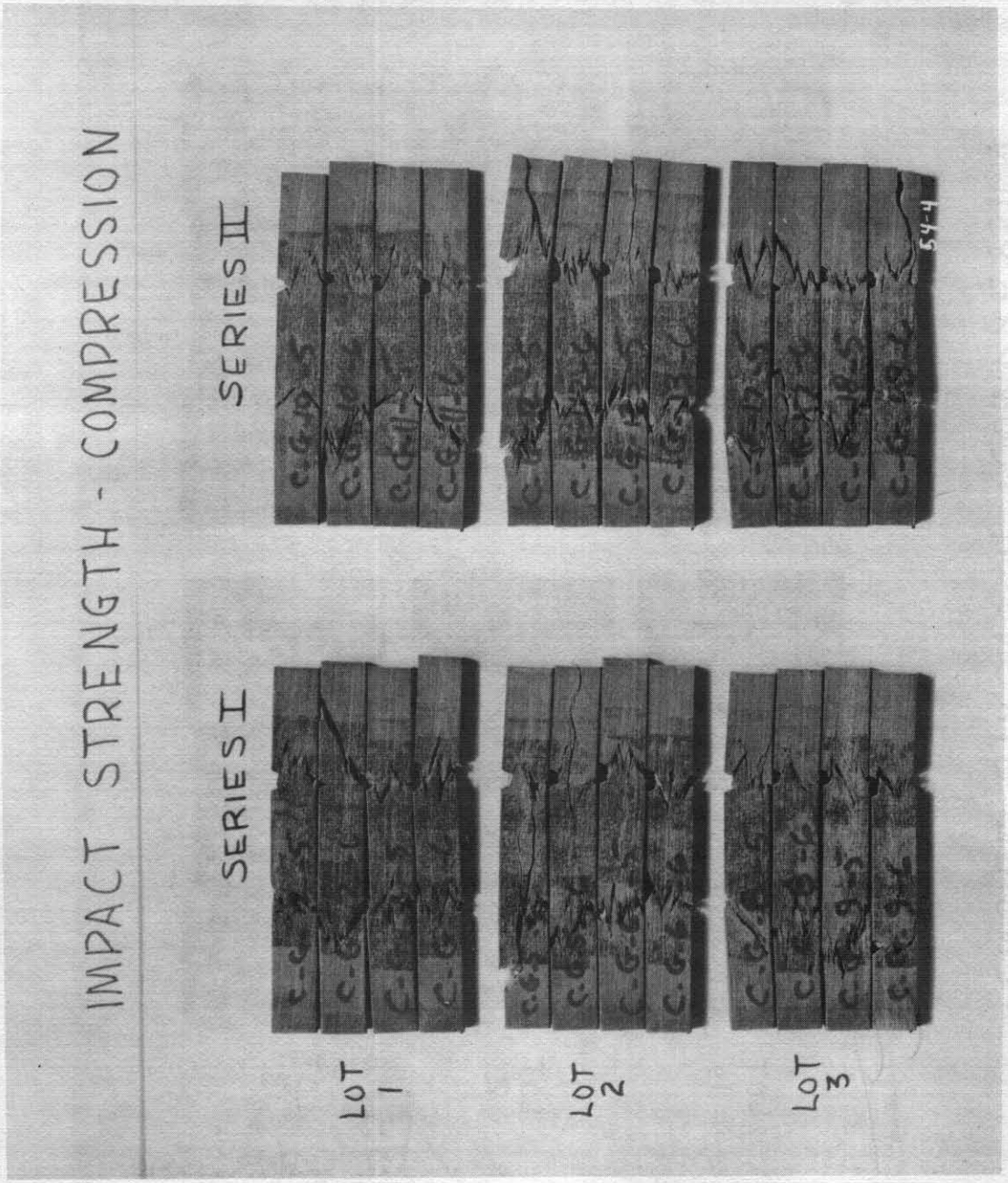
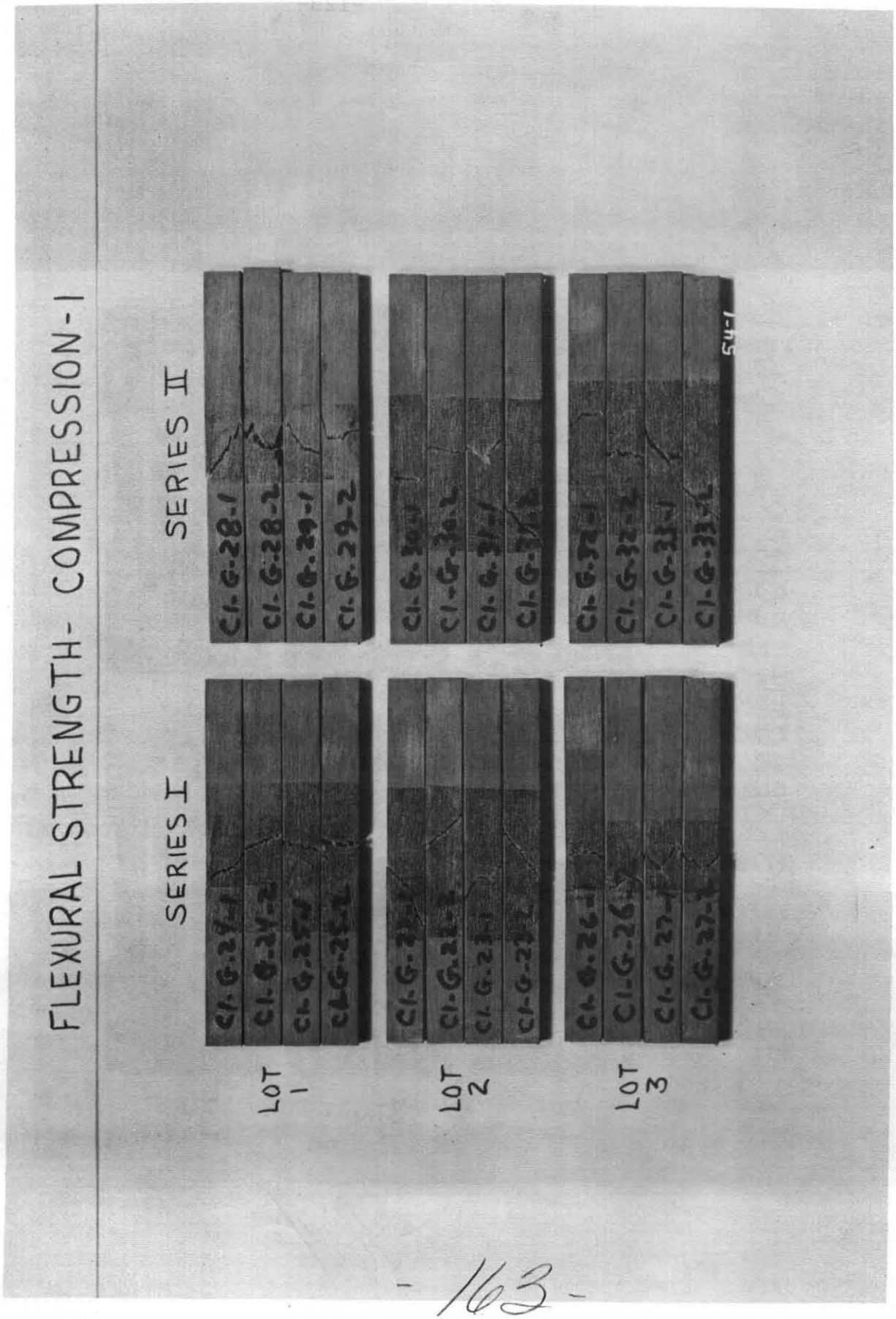
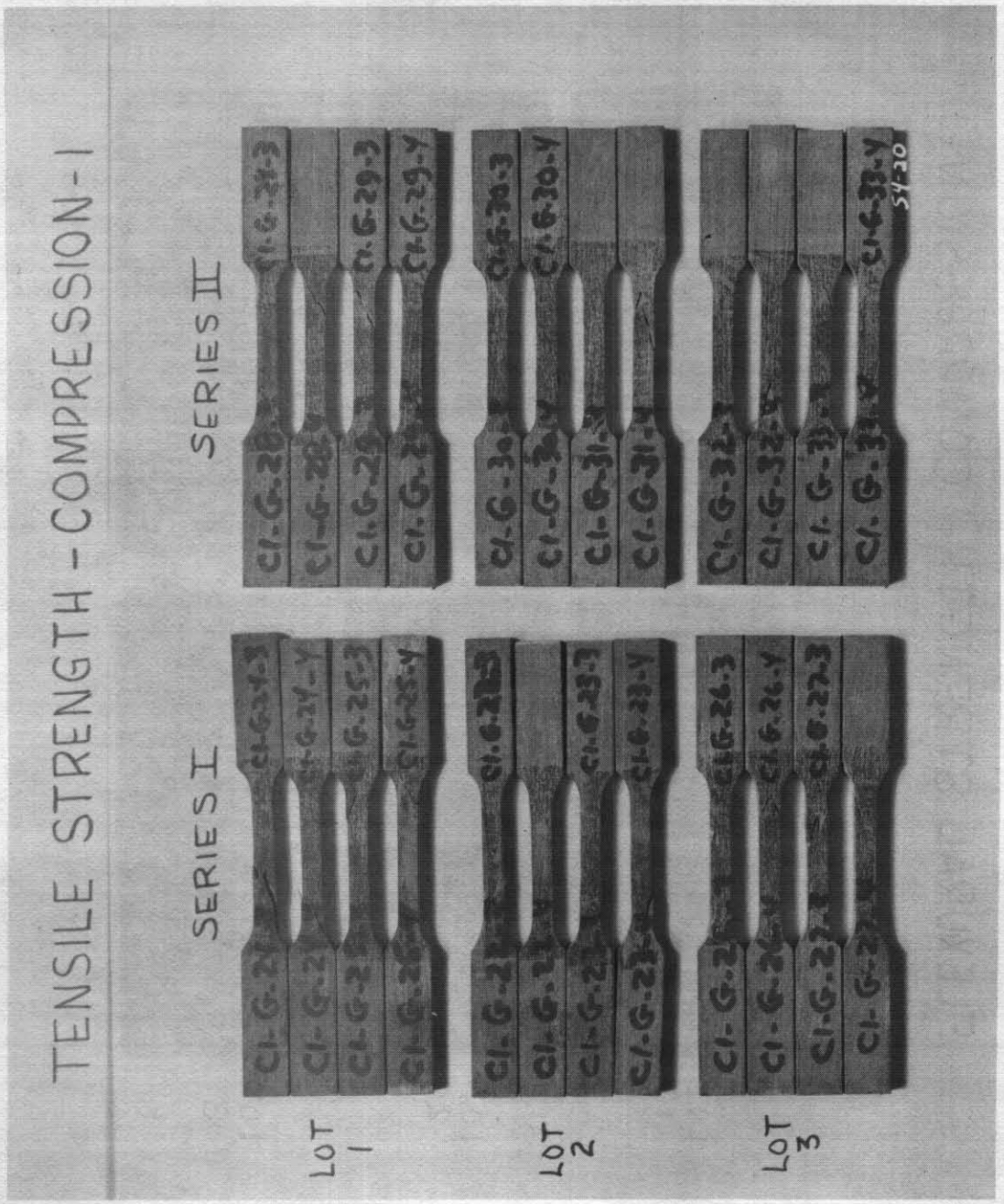

TENSILE STRENGTH- COMPRESSION
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3
C-G-2
C-G-3
C-G-5-3
C-G-5-4
C-G-6-3
C-G-6-4
C-G-8
C-G-9
C-G-10
C-G-11
C-G-12
C-G-13
C-G-17
C-G-18
54-6


IMPACT STRENGTH - COMPRESSION
SERIES II
SERIES I
LOT 1
LOT 2
LOT 3


FLEXURAL STRENGTH- COMPRESSION-I
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3


TENSILE STRENGTH - COMPRESSION-I
SERIES II
SERIES II
LOT 1
LOT 2
LOT 3
S4-20

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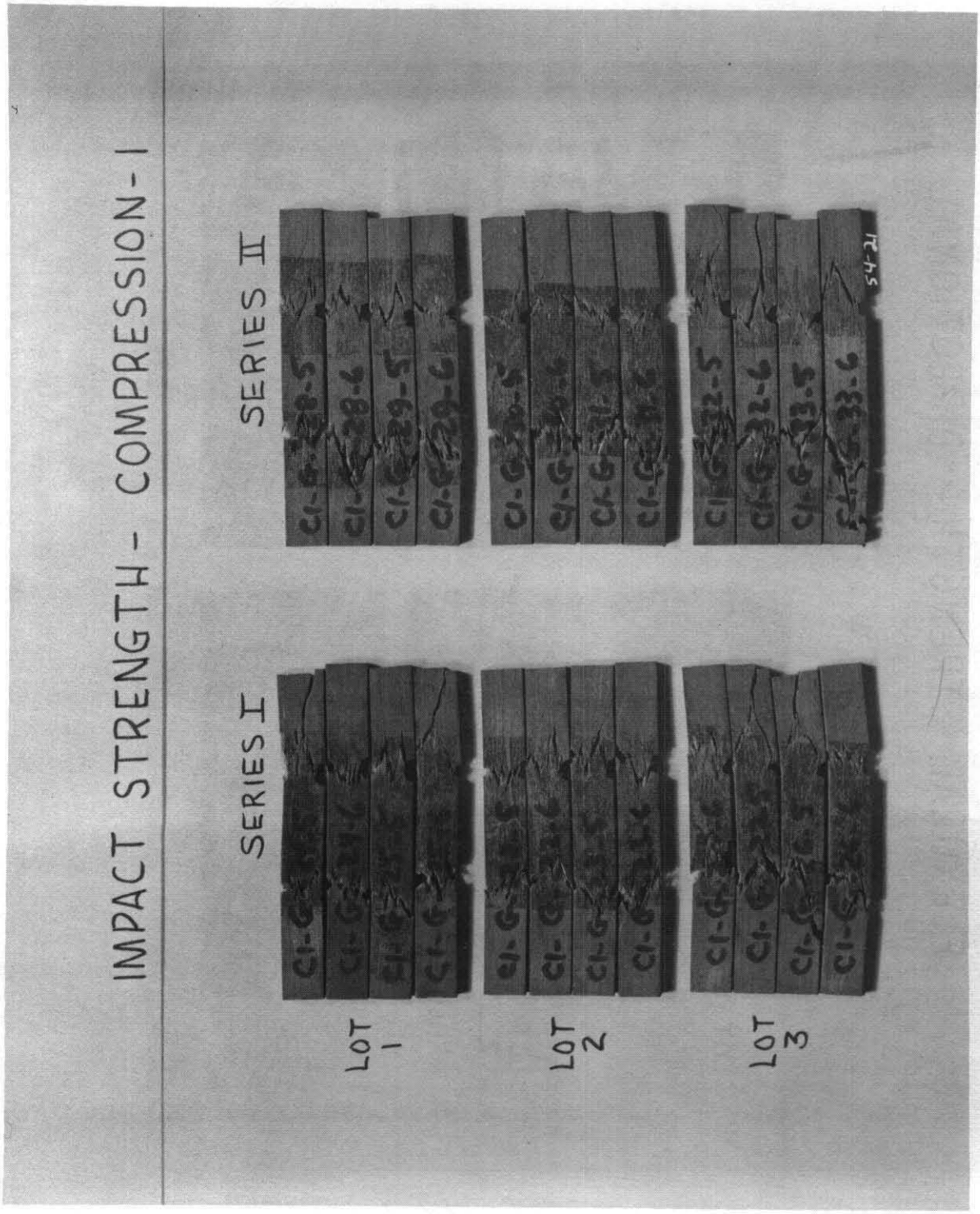
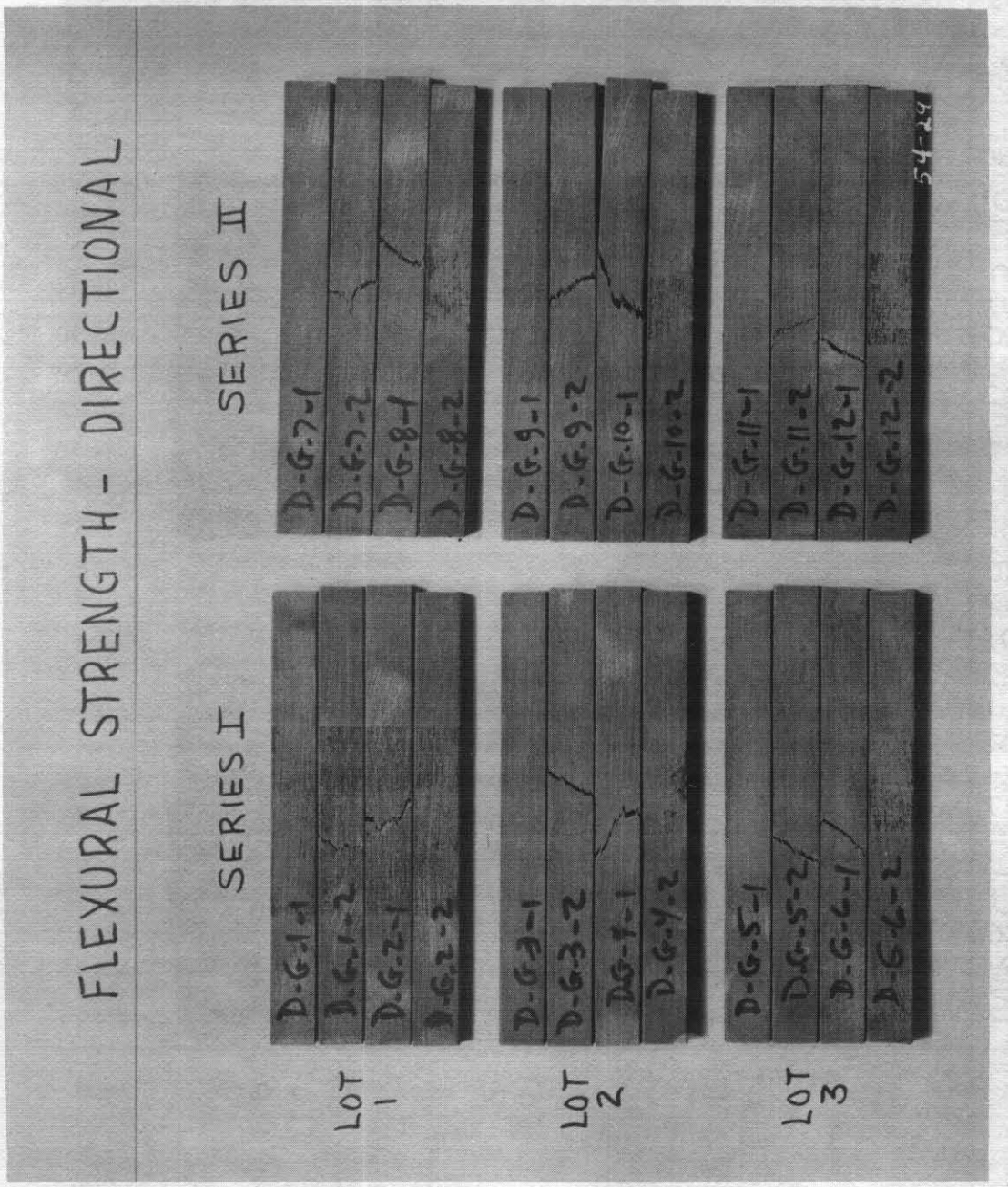
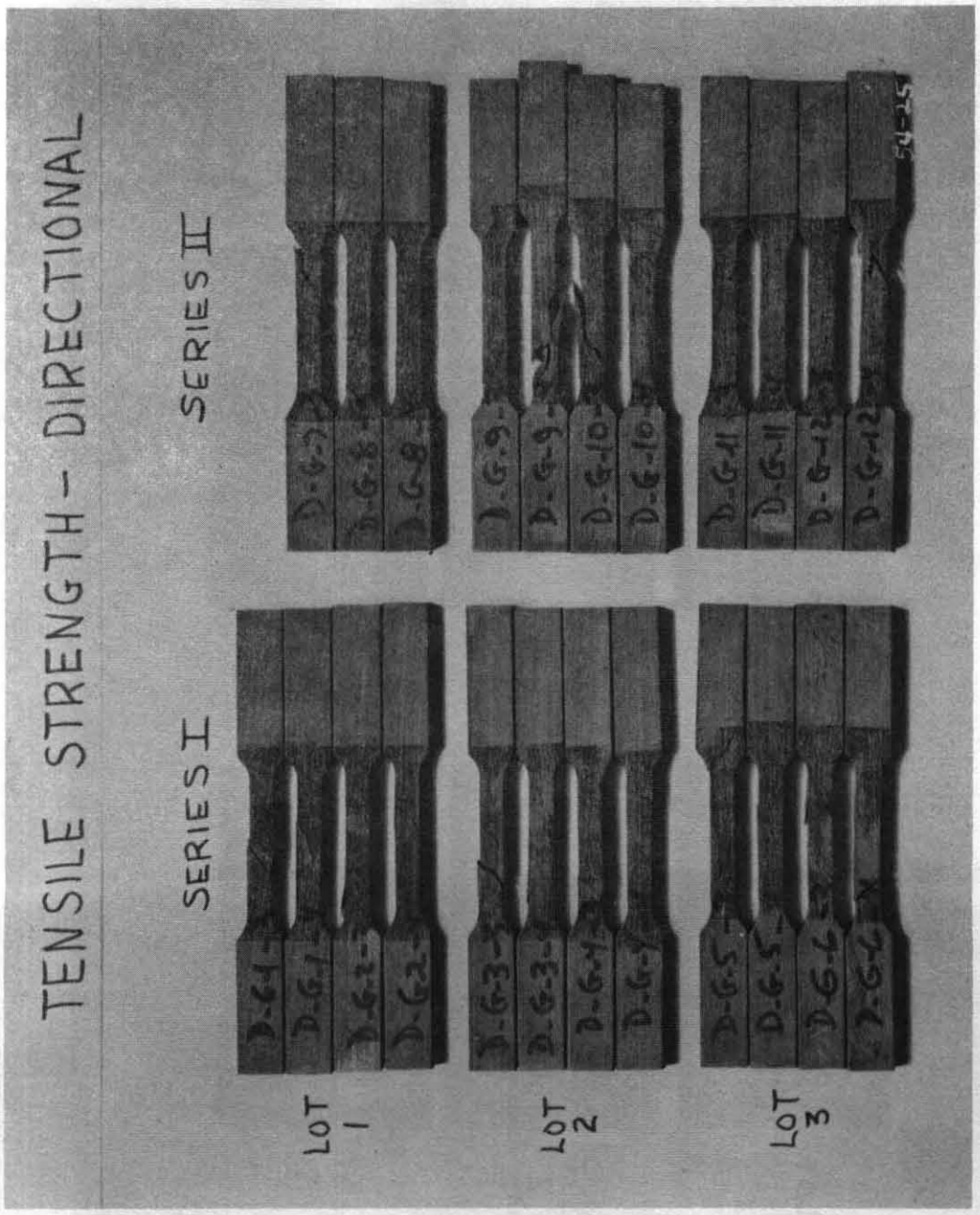
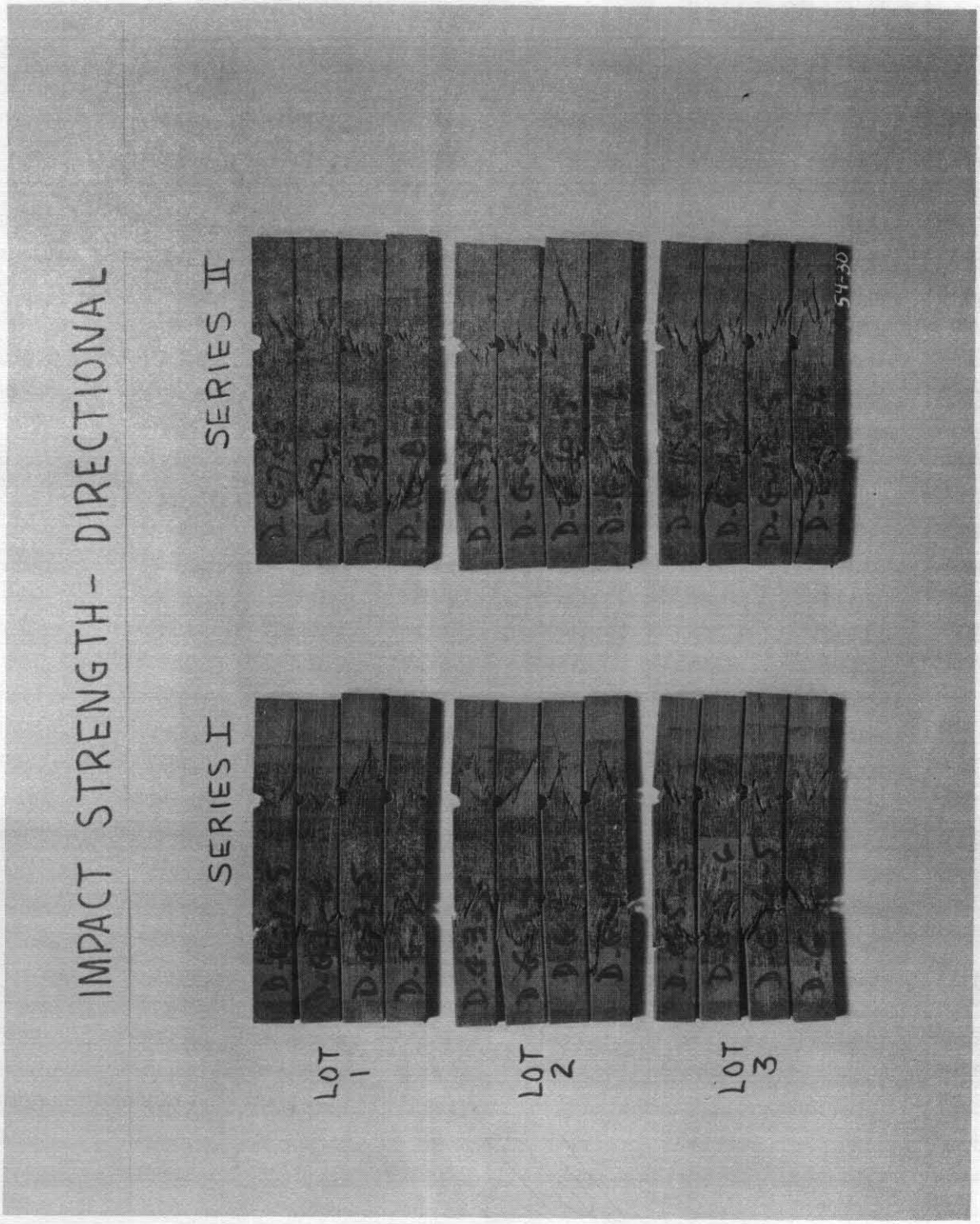
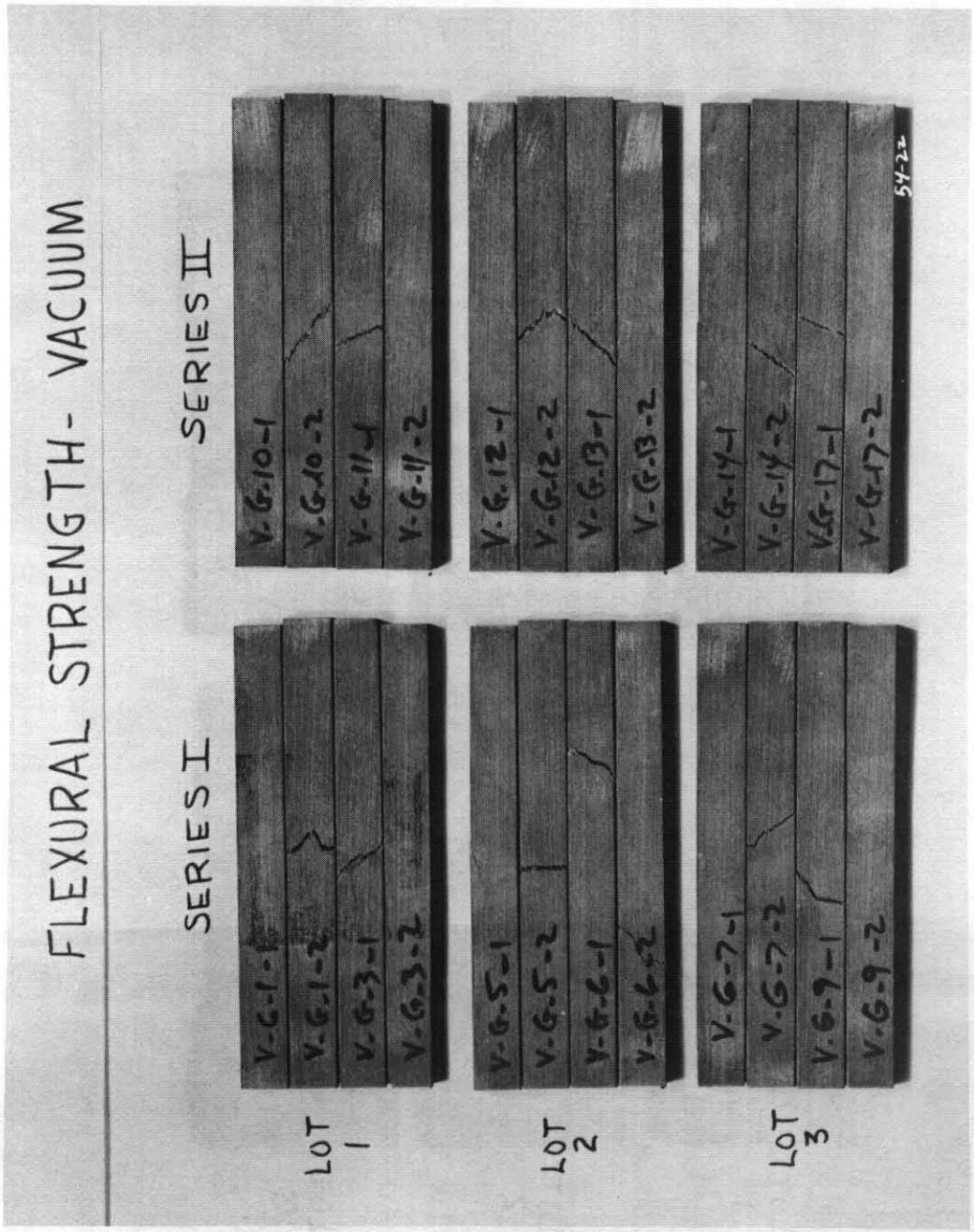
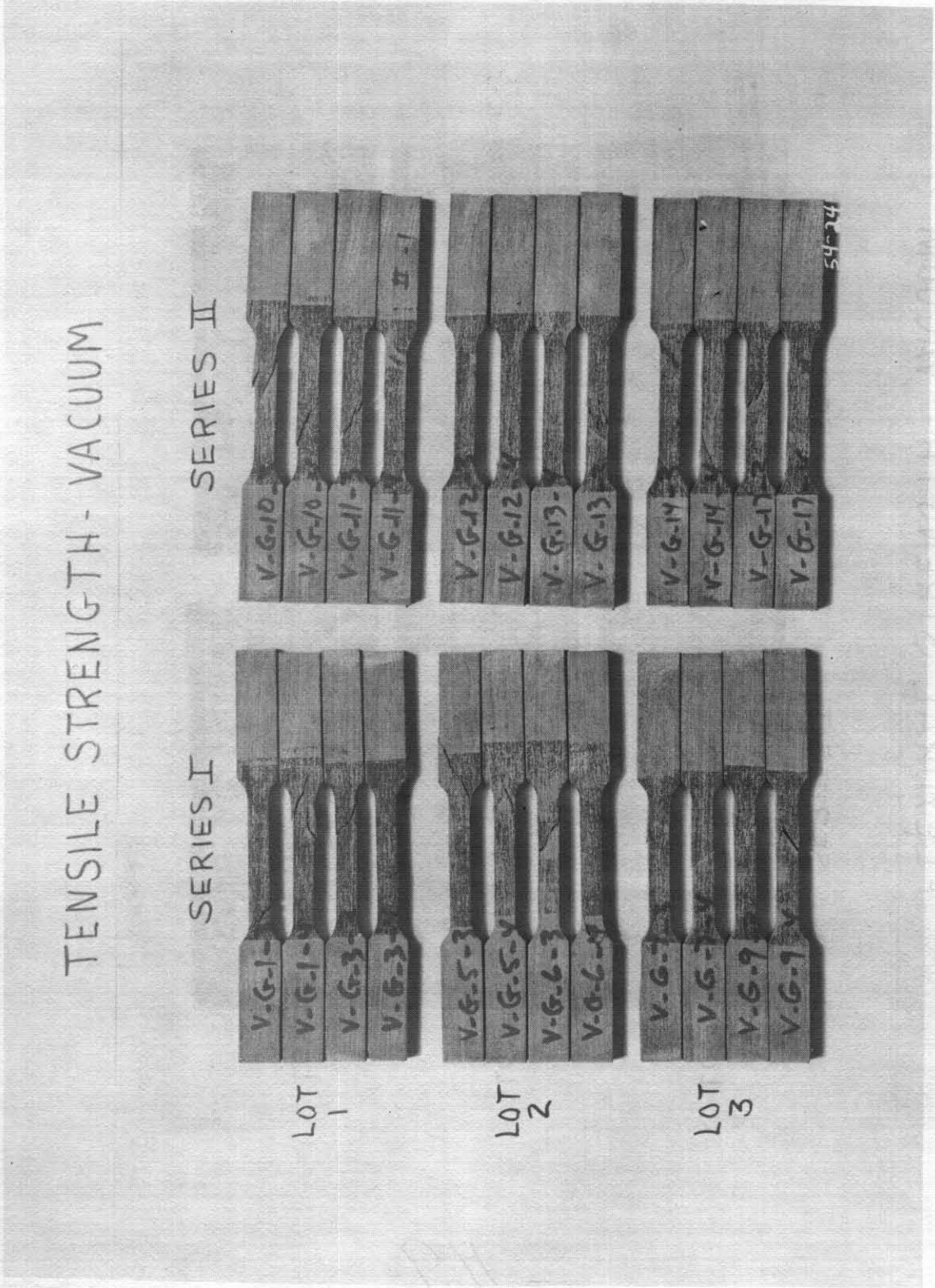

IMPACT STRENGTH - COMPRESSION-I
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3

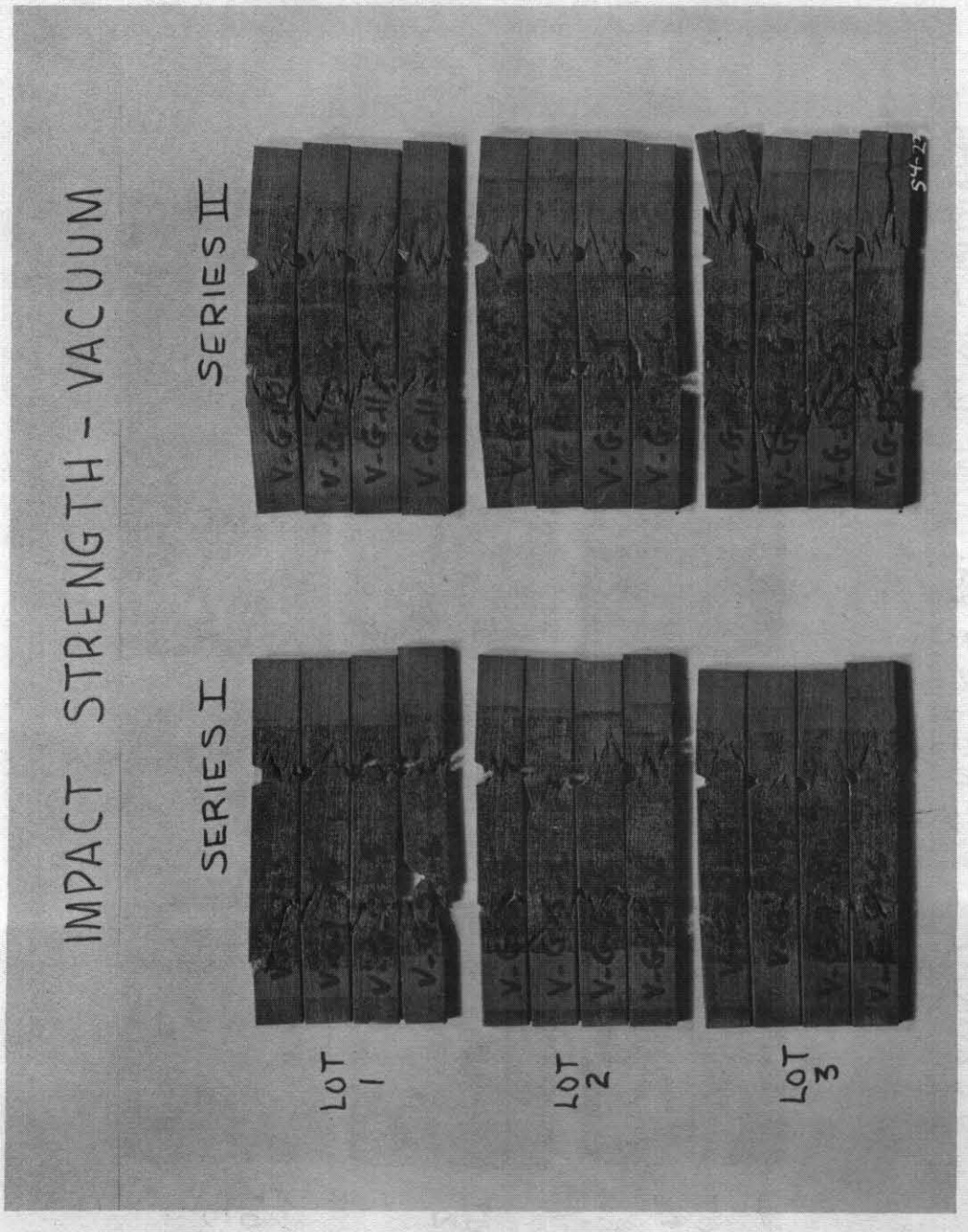

FLEXURAL STRENGTH - DIRECTIONAL
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3
D-G-1-1
D-G-1-2
D-G-2-1
D-G-2-2
D-G-3-1
D-G-3-2
D-G-4-1
D-G-4-2
D-G-5-1
D-G-5-2
D-G-6-1
D-G-6-2
D-G-7-1
D-G-7-2
D-G-8-1
D-G-8-2
D-G-9-1
D-G-9-2
D-G-10-1
D-G-10-2
D-G-11-1
D-G-11-2
D-G-12-1
D-G-12-2

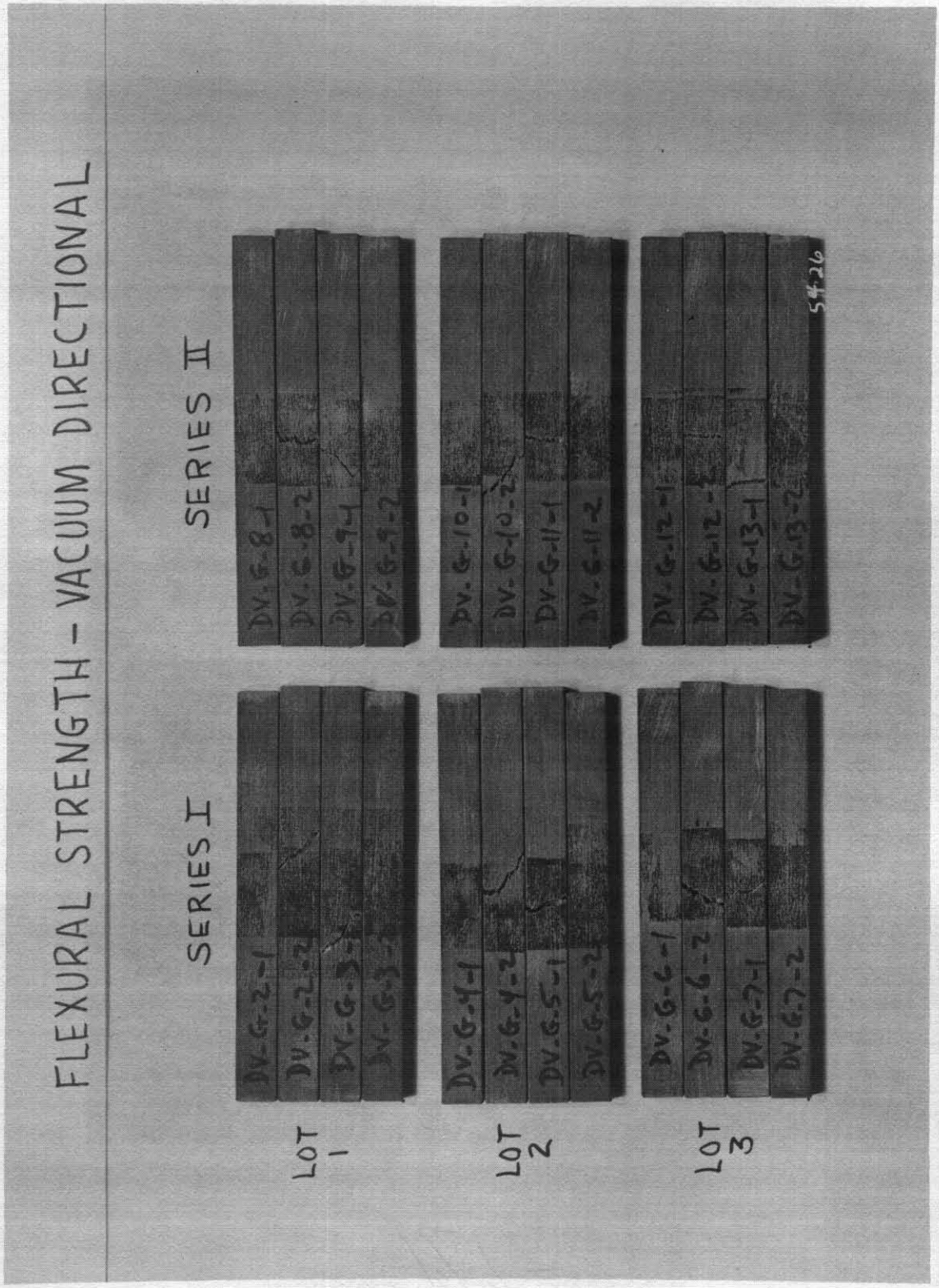

TENSILE STRENGTH- DIRECTIONAL
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3


IMPACT STRENGTH- DIRECTIONAL
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3


FLEXURAL STRENGTH- VACUUM
SERIES II
SERIES II
LOT 1
LOT 2
LOT 3
V-G-1-1
V-G-1-2
V-G-3-1
V-G-3-2
V-G-5-1
V-G-5-2
V-G-6-1
V-G-6-2
V-G-7-1
V-G-7-2
V-G-9-1
V-G-9-2
V-G-10-1
V-G-10-2
V-G-11-1
V-G-11-2
V-G-12-1
V-G-12-2
V-G-13-1
V-G-13-2
V-G-17-1
V-G-17-2
V-G-17-1
V-G-17-2
54-22


TENSILE STRENGTH- VACUUM
SERIES II
SERIES I
LOT 1
LOT 2
LOT 3


IMPACT STRENGTH - VACUUM
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3


FLEXURAL STRENGTH - VACUUM DIRECTIONAL
SERIES I
SERIES II
LOT 1
LOT 2
LOT 3
DV-G-2-1
DV-G-2-2
DV-G-3-1
DV-G-3-2
DV-G-4-1
DV-G-4-2
DV-G-5-1
DV-G-5-2
DV-G-6-1
DV-G-6-2
DV-G-7-1
DV-G-7-2
DV-G-8-1
DV-G-8-2
DV-G-9-1
DV-G-9-2
DV-G-10-1
DV-G-10-2
DV-G-11-1
DV-G-11-2
DV-G-12-1
DV-G-12-2
DV-G-13-1
DV-G-13-2
5#-26

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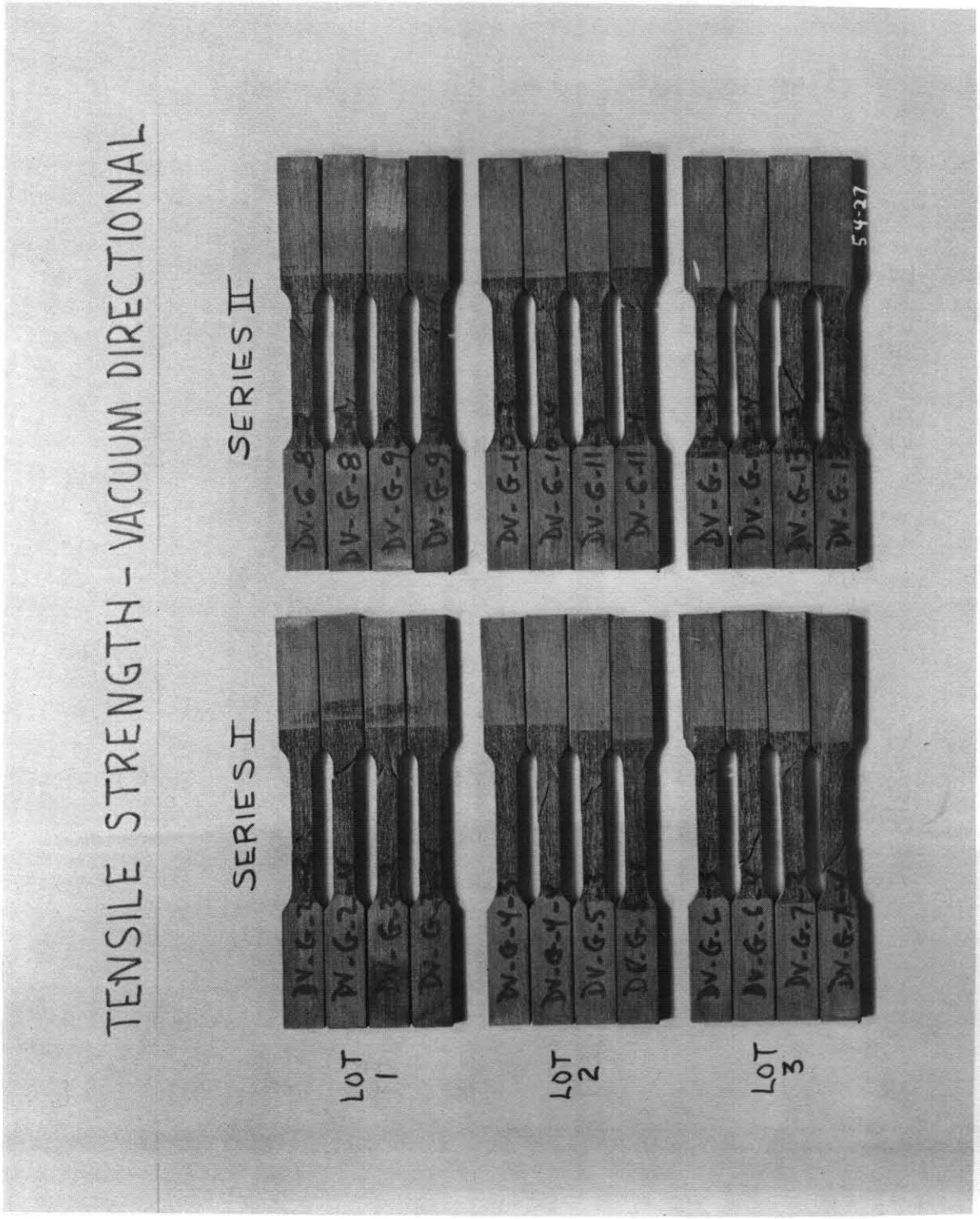
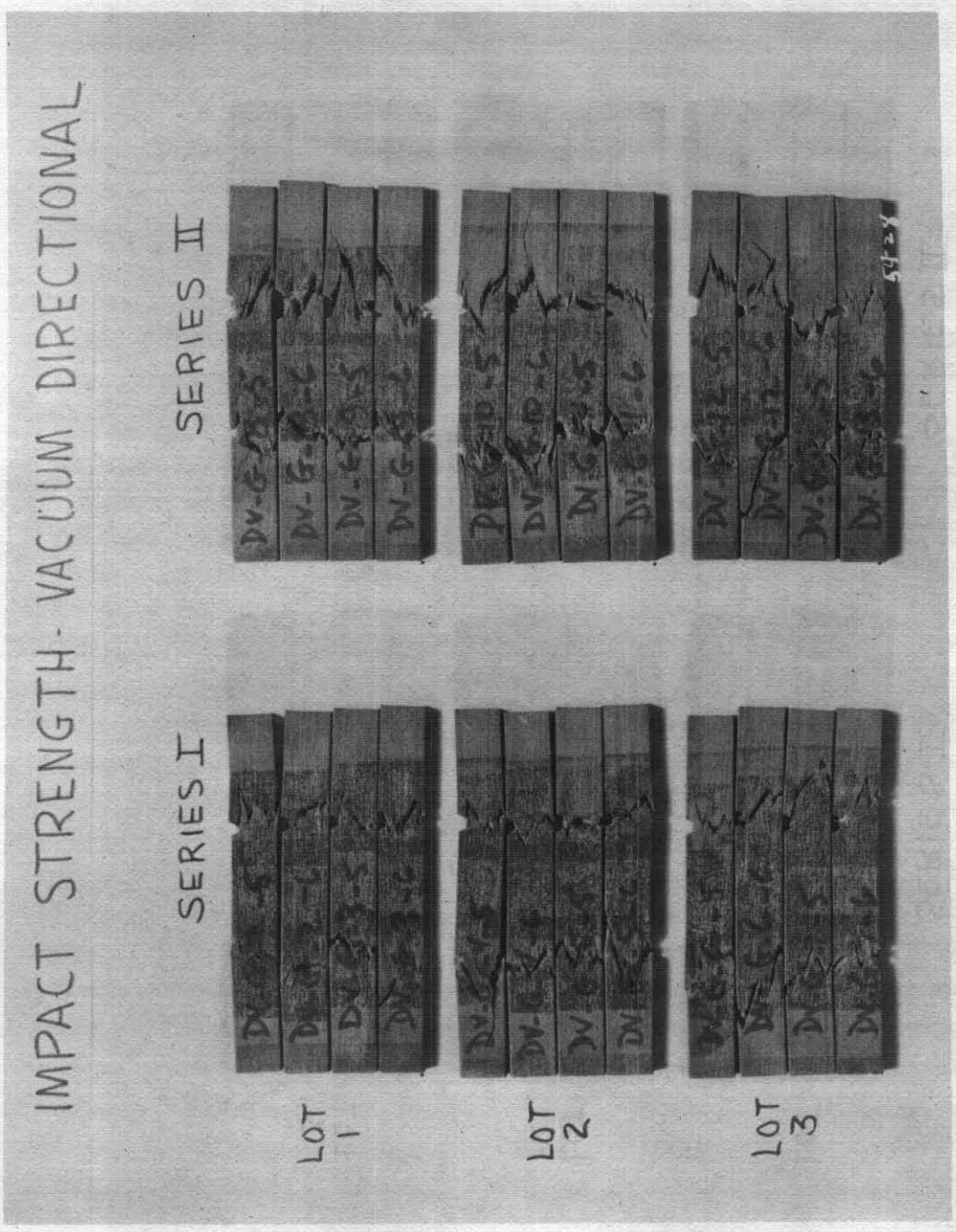

TENSILE STRENGTH - VACUUM DIRECTIONAL
SERIES II
SERIES II
LOT 1
LOT 2
LOT 3
54-27


IMPACT STRENGTH- VACUUM DIRECTIONAL
SERIES II
SERIES I
LOT 1
LOT 2
LOT 3

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APPENDIX III

Photo No. 1 - 4-1/4" Thick Asbestos Phenolic Billet after 3 Years Shelf Life. Shop Conditions

Photo No. 2 - 6-1/16" x 18" x 18" Asbestos Phenolic Billet Molded October 1970

Photo No. 3 - 6-1/16" x 18" x 18" Asbestos Phenolic Billet Cut into 6 Pieces October 1970

Photo No. 4 - Piece (A) From 6-1/16" x 18" x 18" Billet. After 3 Years Shelf Life - Shop Conditions - Sanded Surface

Photo No. 1

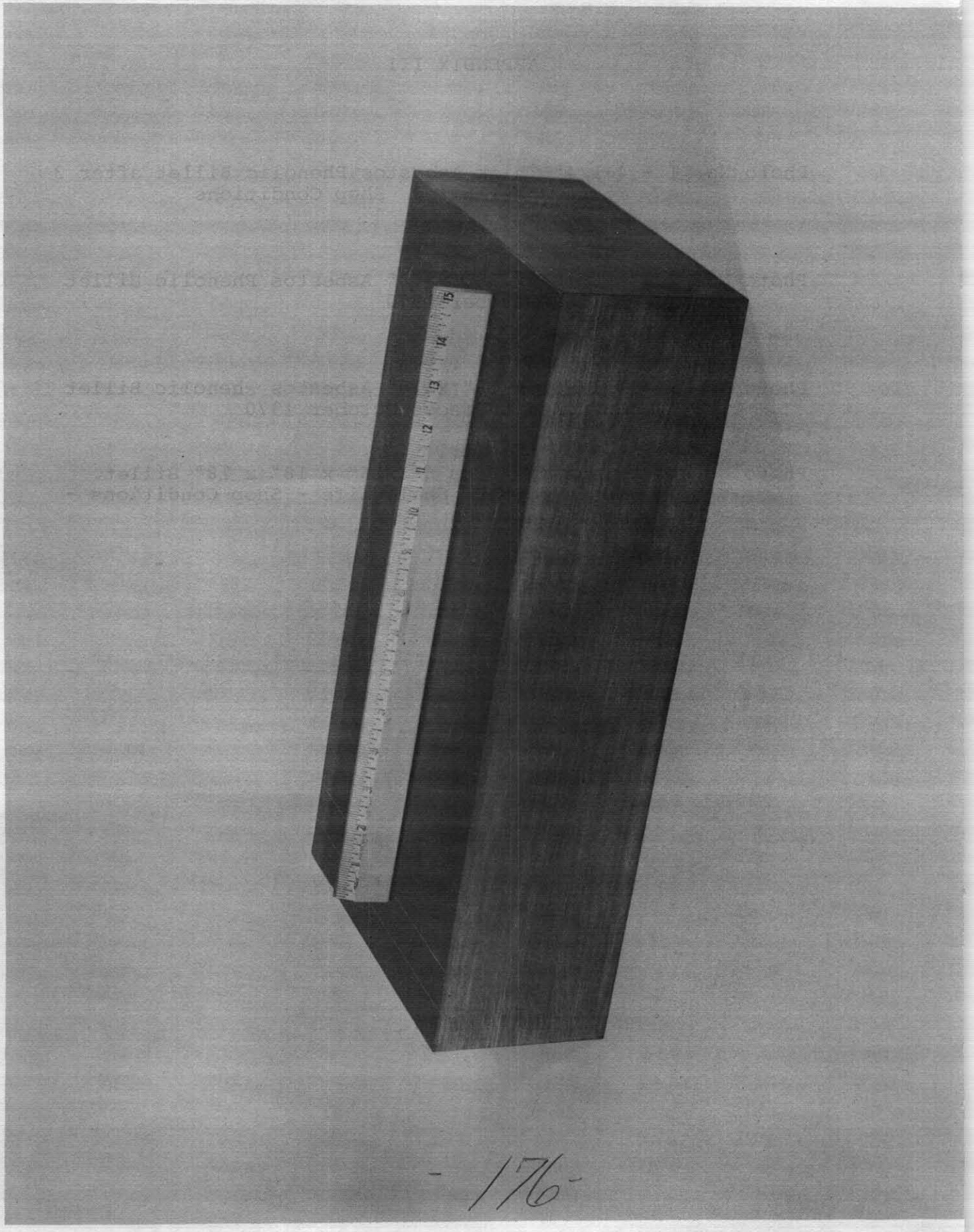

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Photo No. 2

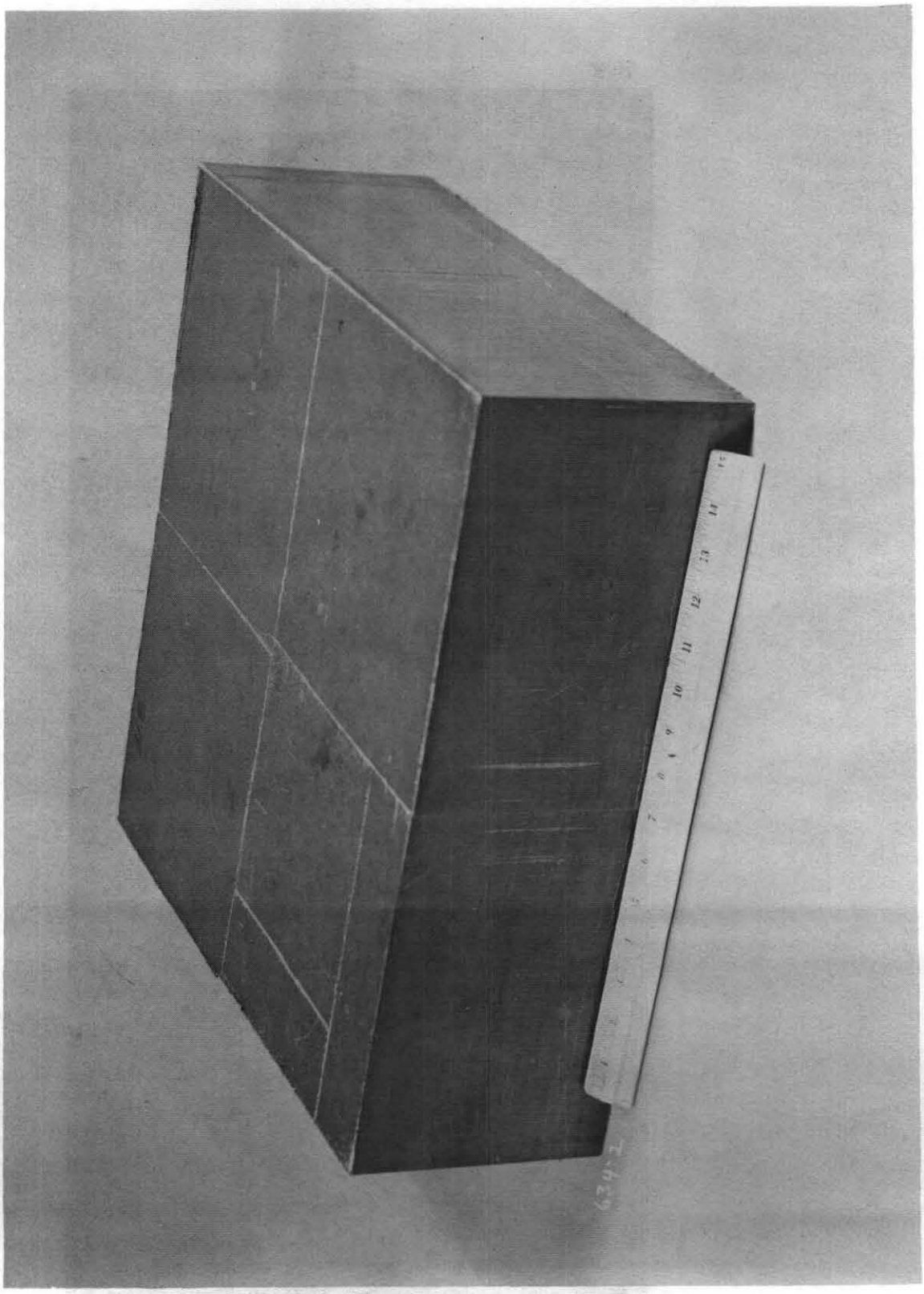

Photo No. 3

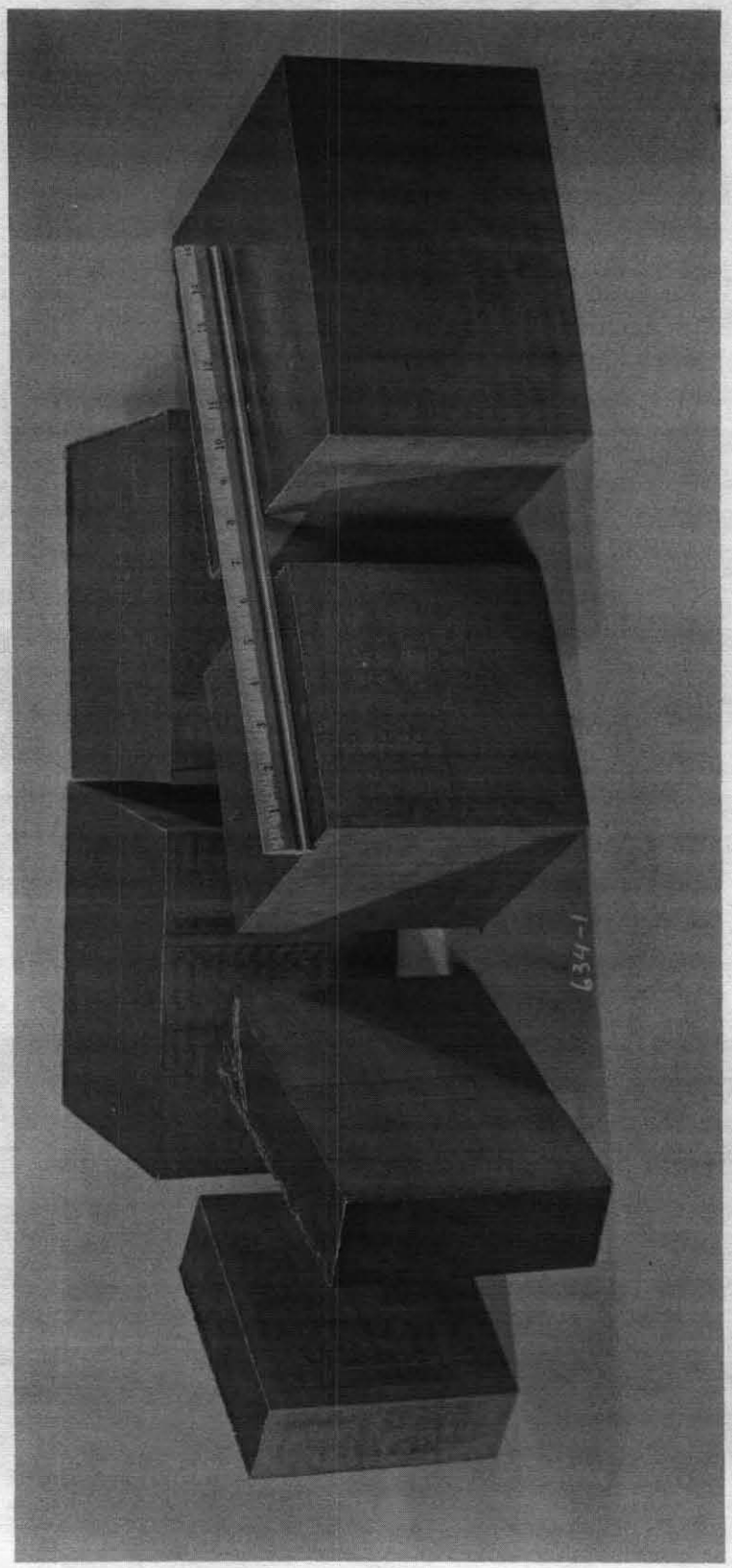

Photo. No. 4