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SUMMARY REPORT

Reaction Propagation Test

Evaluation of the Behavior of Nonmetallic Materials in Hydrogen

MANNED SPACECRAFT CENTER

WHITE SANDS TEST FACILITY

LAS CRUCES, NEW MEXICO

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SUMMARY REPORT

Reaction Propagation Test
Evaluation of the Behavior of Nonmetallic Materials in Hydrogen

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1.0 INTRODUCTION

This test report is the first in a series of reports describing the results of tests conducted to evaluate the behavior of nonmetallic materials in hydrogen. This report summarizes the results of the reaction propagation test (Test E) outlined in Test Plan TP-WSTF-196. The reaction propagation test simulates the conditions resulting from the interaction of an electrical wire in an overload condition in contact with a material in the test medium. The test is based upon MSC-PA-D-67-13 Test Number 8 which is designed to evaluate the behavior of a material subjected to an energy input (usually heat) sufficient to cause a reaction which propagates to consume larger quantities of the material. In this study performed for the NASA Aerospace Safety Research and Data Institute (ASRDI) and NASA WSTF, ten nonmetallic materials were evaluated to establish baseline data on the behavior of nonmetallic materials in hydrogen and to characterize, on an initial basis, one mode of material failure considered to be a factor pertinent to the safe use of a material in hydrogen.

2.0 SUMMARY

During the period December 1971 through March 1972 ten nonmetallic materials were subjected to the reaction propagation test. The tests were conducted following the procedure outlined in the test directive, TD-MIS-006, Revision B, using both GHe (baseline) and GH_2 as the test medium at an initial pressure of 200 psia. Comparison of the test data and post-test visual examination of the specimens indicated that the following materials exhibited a reaction in gaseous hydrogen:

a. RTV-90
b. FEP Teflon
c. TFE Teflon
d. 15% glass-filled TFE Teflon

Visual examination of the specimens indicated that each was altered in some manner by the GH_2 tests. The RTV-90 and the 15% glass-filled TFE Teflon specimens from the GH_2 tests were reduced to a black powder in the areas subjected to heating and are considered to have failed the reaction propagation test. None of the specimens indicated that the reaction propagated to consume the entire specimen; however, each of the four materials listed above was physically altered by the test conducted in GH_2.

3.0 TEST MATERIALS

3.1 Test Specimens: The following nonmetallic materials were examined by the reaction propagation test:

WSTF Identification No.	Material
71-2992	FEP Teflon
71-3071	TFE Teflon
71-3072	15% Glass-Filled TFE Teflon
71-3073	High Density Polyethylene
71-3977	RTV-90 Silicone Rubber
72-3393	
71-3070	Viton A
71-3074	Nylon 6
71-2978	PRC Polyurethane
71-3075	Polyvinyl Chloride
71-3198	Cellulose Acetate Butyrate

3.2 Test Gases: The test gases utilized in this series of tests conformed to the following requirements:

Gas	Requirement
Helium	MSFC Spec 364B
Nitrogen (purge gas)	MSFC Spec 234A
Hydrogen	High Purity Grade (99.9%)

4.0 TEST FIXTURE/SPECIMEN DESCRIPTION

The test fixture consists of a precision cleaned 304 stainless steel flanged assembly. The top of half of the assembly includes inlet and outlet ports for purging and filling the test fixture with the test medium and measurement of test fixture pressure. Ports are also provided for the ignitor terminal penetrations and temperature measurement. A burst disk on the lower half of the assembly is utilized to prevent destruction of the test fixture during testing. Figure 1 shows the test fixture installed in the test facility.

The test specimens are configured as bars ¼" deep (as-received thickness) x ½" wide x 2" long. All materials except RTV-90 and PRC polyurethane specimens are cleaned to the requirements of MSC-00066, Method CP-5, to reduce or minimize particulate and hydrocarbon contamination prior to assembly in the test fixture. The specimens are wrapped with an 11 inch

section of 20 AGW nichrome ignitor wire in a fixed manner as illustrated in Figure 2 to insure repeatable placement of the nichrome wire around the test specimens. Figure 2 also illustrates the location of the two thermocouples within the test fixture used to measure (1) test specimen temperature and (2) test medium temperature approximately one inch from the test specimen. The test medium pressure is measured by a transducer located in the test facility system approximately eight feet downstream of the test fixture in the vent system.

5.0 GENERAL TEST PROCEDURE

The tests were conducted in duplicate using both GHe (baseline) and GH_2 as the test medium. The test procedure consisted of the following basic steps (refer to Appendix A for the detailed test procedure):

a. Install the test fixture in the test facility connecting the fill and vent lines, thermocouple probes, and ignitor electrical connections.

b. Verify ignitor resistance is less than 1 OHM.

c. Purge the test fixture with GHe to remove residual air.

d. Pressurize the test fixture and perform a leak check.

e. Purge the test fixture with the test medium (either GHe or GH_2 as required by the test being conducted).

f. Pressurize the test fixture to 200 psia (test pressure).

g. Start the instrumentation recorder and verify satisfactory operation.

h. Turn on the current limiting power supply and initiate current flow through the ignitor wire. Increase the current at the rate of 2 amps per minute until the ignitor wire fuses or a reaction is noted.

i. At the end of the test monitor test fixture temperature and pressure until a decrease is noted.

j. Terminate instrumentation recording and vent the test fixture.

k. Purge the test fixture with GHe.

l. Remove the test specimen from the test fixture and visually examine for indications of a reaction.

6.0 TEST RESULTS

Figures 3 through 12 illustrate typical test medium temperature (approximately one inch from the test specimen) and test fixture pressure data recorded during the tests conducted in both GHe and GH_2 on all ten nonmetallic materials. A complete tabulation of the test data appears in Appendix B. The test specimen temperature recorded during the tests was found to be highly influenced by the proximity of the nichrome wire wrapped around the test specimens (refer to Figure 2) and was not plotted. A review of the data does not indicate a reaction occurred during the tests. Post-test visual examination of the specimens; however, indicates that four of the materials did react differently in hydrogen than they did in helium under the same test conditions. Figures 14 through 16 illustrate the specimens from typical GHe and GH_2 tests conducted on specimens on the four materials that reacted in hydrogen. The four materials are:

a. RTV-90 Silicone Rubber
b. TFE Teflon
c. 15% Glass-filled TFE Teflon
d. FEP Teflon

The photographs clearly indicate that each material behaved differently in GH_2 than it did in GHe. Specimens of RTV-90 and 15% Glass-Filled TFE Teflon (Figures 13 and 14) show that the hydrogen tests reduced these materials to a (soft) black powder in the areas subjected to intense heating. Figure 15 illustrates the samples of FEP Teflon and TFE Teflon which appear to have reacted in GH_2. The hydrogen test produced a white FEP Teflon powder which was found all over the inside of the test fixture and suggest that the specimen erupted upon reaction spraying FEP Teflon powder. The reactions observed did not propagate to consume the entire specimen in any of the tests exhibiting a reaction.

Figures 16 and 17 illustrate the digital data recorded during the GH_2 tests conducted on specimens of TFE Teflon and 15% glass-filled TFE Teflon. The test fixture pressure and test medium temperature data shown in these two plots indicate a marked increase in value at the approximate time of ignitor

wire fusion and suggest that these two materials probably reacted when the ignitor wire fused.

Figures 18 and 19 illustrate similar digital data from the hydrogen tests conducted on specimens of RTV-90 and FEP Teflon. Neither of these data plots indicate a significant pressure or temperature rise coincident with the ignitor wire fusion and suggest that these two materials probably reacted with the hydrogen during the course of the test prior to ignitor wire fusion. The four data plots shown in Figures 16 through 18 suggest that hydrogen reactions occur under different conditions and modes as suggested by the presence of the powder FEP Teflon. Table 1 lists end of test gas medium temperature and test fixture pressure rise rate data, final ignitor wire amperage and voltage readings, and test time on a comparison basis for all of the tests conducted in both test mediums.

A review of the tabular data indicates that the time, and subsequently the amperage and temperature, required to achieve ignitor wire fusion in hydrogen with specimens of TFE Teflon and 15% glass-filled TFE Teflon was significantly less than required in GHe under the same test conditions. The test data for all of the remaining tests appears to be comparable for the tests conducted in either helium or hydrogen. In particular, the test data from the RTV-90 and FEP Teflon tests is similar in both test media while visual examination of the specimens after the tests clearly indicate that a reaction occurred.

Table I also indicates that similar results were obtained on two different batches of RTV-90. The material identified as 71-2977 was formed at WSTF and contained numerous bubbles. The second batch tested, WSTF Identification Number 72-3393, was purchased in sheet form free from bubbles.

As noted in Table I a number of the specimens were found on the burst disk at the bottom of the test fixture at the end of the test.

Visual examination of these specimens indicates that they melted and fell to the bottom of the test fixture away from the nichrome ignitor wire, sometime prior to the end of the test. This fact, in conjunction with a review of the test data listed in Appendix B for the test specimen temperature recorded during the tests, suggests that these materials may not have been adequately subjected to the test. The energy required to melt these materials may not be sufficient to bring the material to a reactive state.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The test data, in conjunction with post test visual examination of the specimens, indicate that four of the ten nonmetallic materials tested reacted with GH_2. Two of the four materials, RTV-90 and 15% glass-filled TFE Teflon, were totally destroyed in the heated zone and are considered to have failed the reaction propagation test. The other two materials exhibiting reactions in hydrogen, TFE Teflon and FEP Teflon, were less physically altered by the reaction and did not indicate a propagating reaction. The tests suggest that the reactions observed occur at different times during the test and probably through different hydrogen interaction modes. The tests also indicate the need for an improved specimen mounting technique that will retain the specimen in contact with both the test medium and the ignitor wire.

A second series of tests are recommended using a test fixture designed (1) to retain the test specimen in contact with both the test medium and the ignitor wire at all times and (2) to permit observation of the test specimen using infrared imaging or other appropriate techniques during the test to ascertain the apparently different modes of reaction with hydrogen. The first portion of the second series of tests should re-evaluate the behavior of the materials found on the burst disk at the end of the test. This group of materials include:

a. PRC Polyurethane
b. High Density Polyethylene
c. Nylon 6
d. Cellulose Acetate Butyrate

This group of tests should be performed in both GHe and GH_2 to ascertain the effects due solely to heat apart from hydrogen. A second portion of the tests should investigate the mode of hydrogen reaction of TFE Teflon, FEP Teflon, 15% glass-filled TFE Teflon, and RTV-90 using an infrared imaging or other appropriate techniques. This phase of testing should be designed to learn the mechanism of the reactions, i.e., does the material slowly react or does it react through a series of small violent explosions? A third portion of the second series of tests may investigate the role of heat application on the reaction of the four materials observed to react in hydrogen. The group of tests could use a combination of different gage nichrome wires and various amperages to induce different heating rates to the test materials.

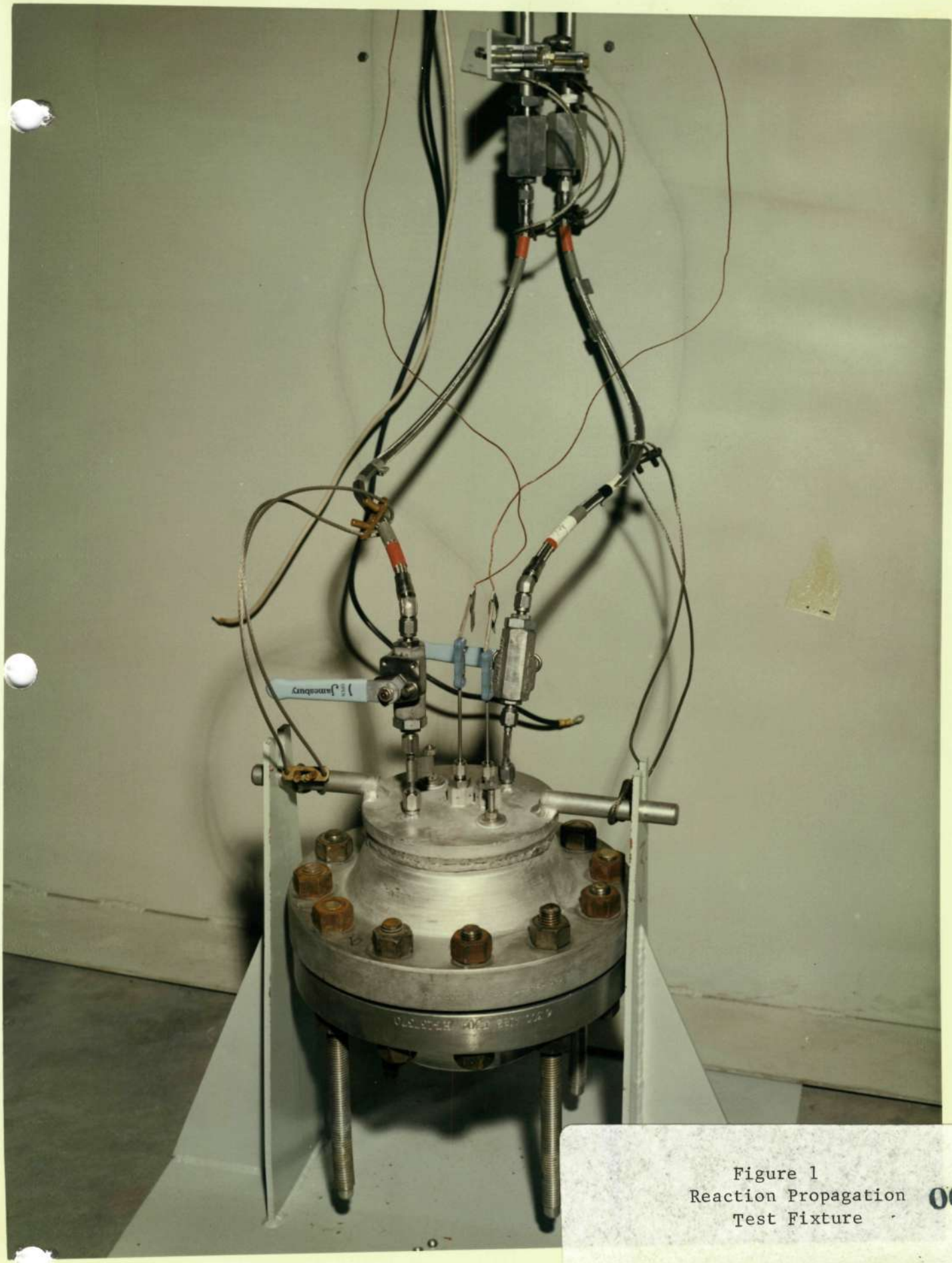

Figure 1
Reaction Propagation
Test Fixture

Figure 2
Interior of Reaction Propagation Test Fixture
(RTV-90 Sample Installed)

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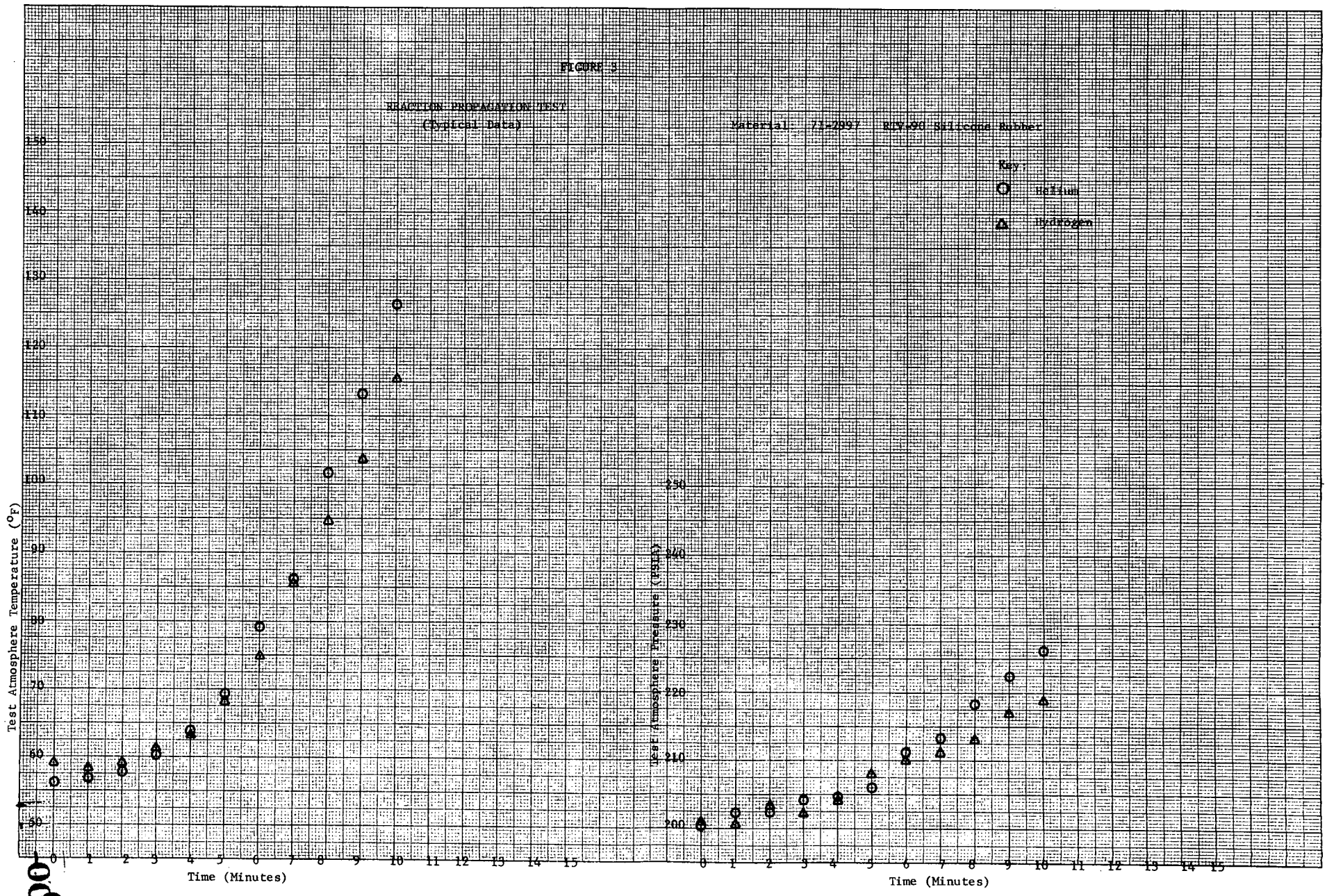
NASA-WSTF
0372-0229

FIGURE 3

REACTION PROPAGATION TEST
(Typical Data)

Material: 71-2997 RTV-90 Silicone Rubber



KEUFFEL & ESSER CO.

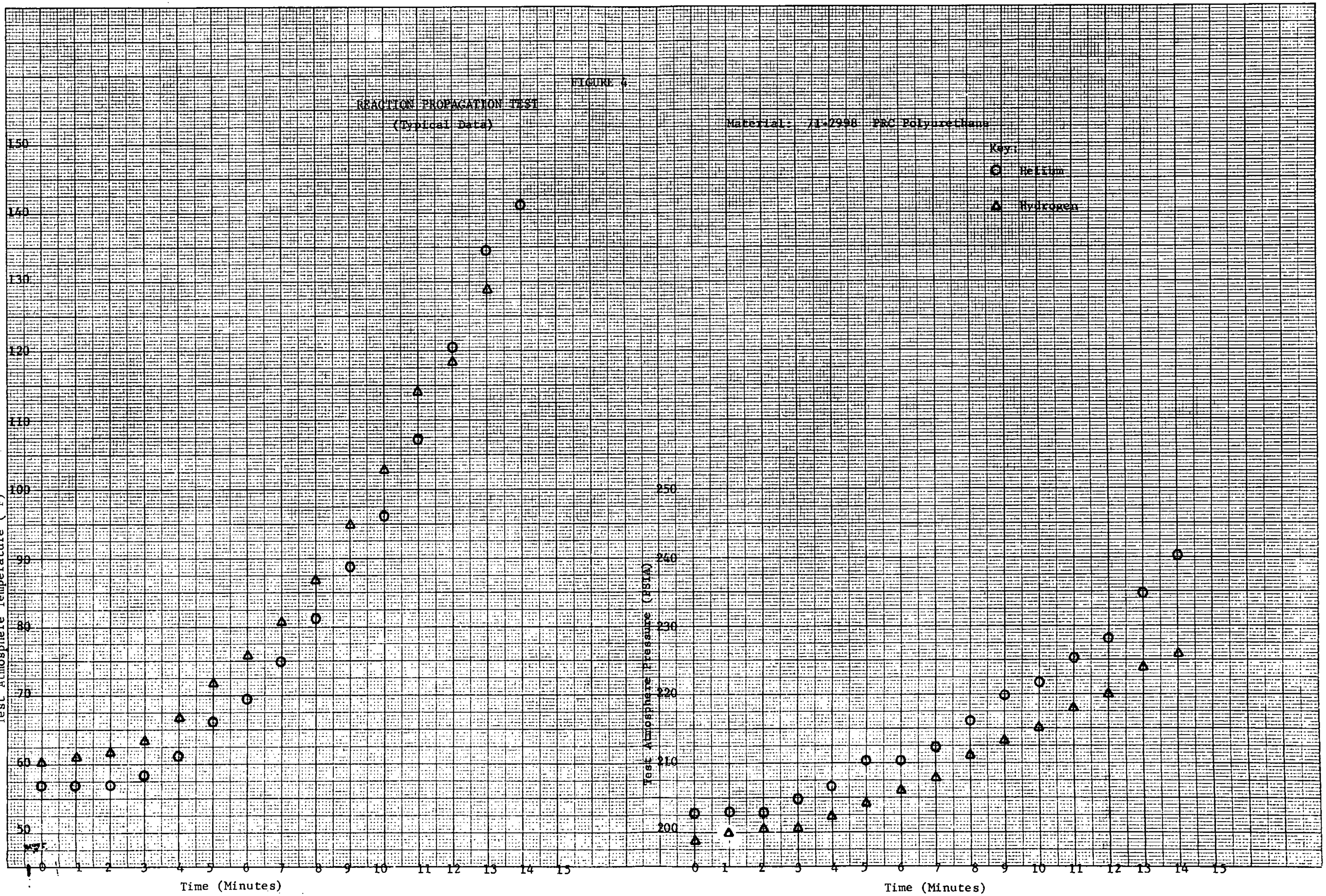


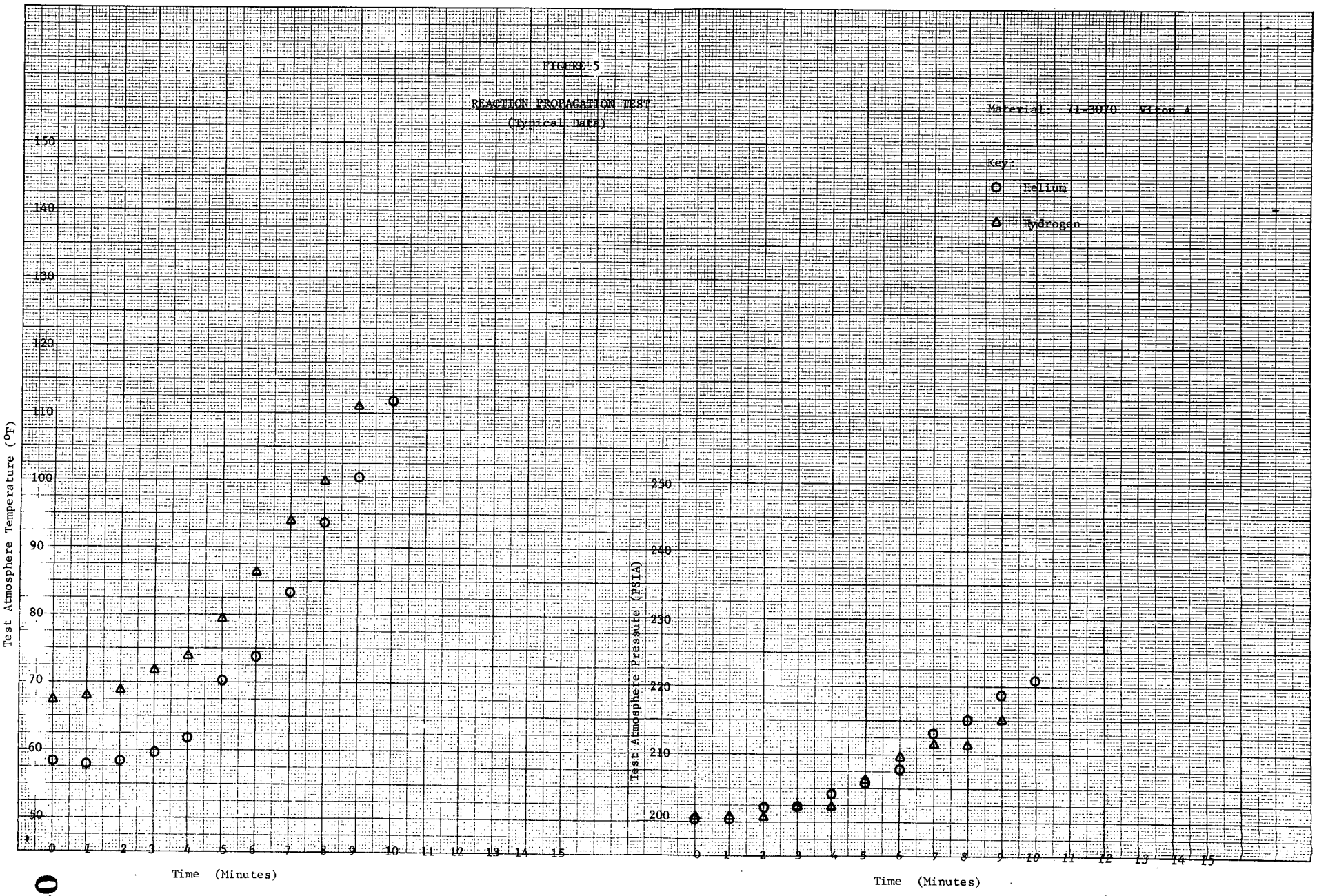
FIGURE 4
REACTION PROPAGATION TEST
(Typical Data)
Material: 71-2998 PRC Polyurethane
Key:
Helium
Hydrogen
Test Atmosphere Temperature (°F)
150
140
130
120
110
100
90
80
70
60
50
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Time (Minutes)
Test Atmosphere Pressure (PSIA)
250
240
230
220
210
200
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Time (Minutes)

010

FIGURE 5

REACTION PROPAGATION TEST
(Typical Data)

Material: Ti-3070 Viton A

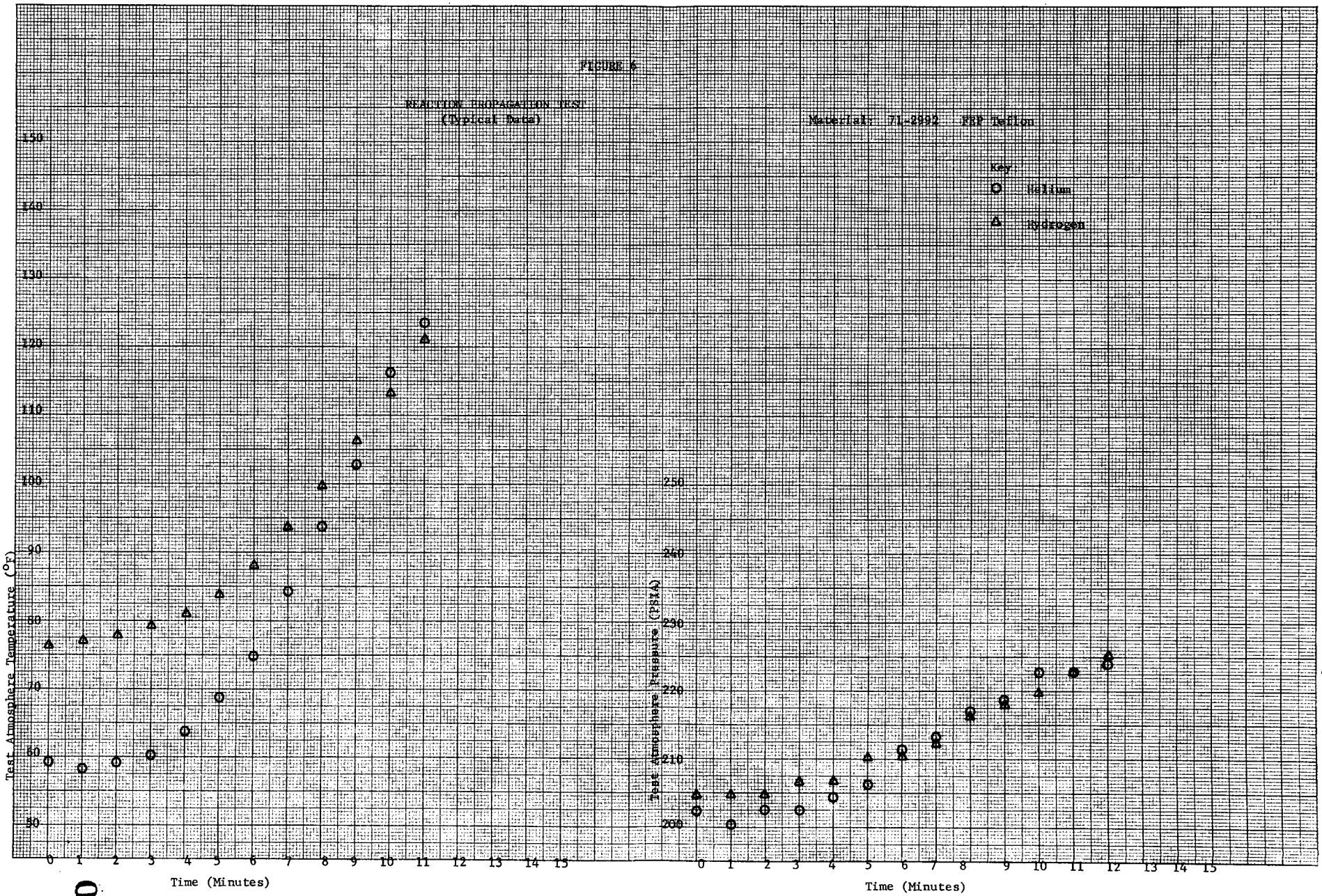


011

FIGURE 6

REACTION PROPAGATION TEST
(Typical Data)

Material: TL-2992 FEP Teflon



012

FIGURE 7

REACTION PROPAGATION TEST
(Typical Data)

Material: 71-3071 TFE Teflon

Key:
- Helium
- Hydrogen

Test Atmosphere Temperature (^{o}F)

Time (Minutes)

Test Atmosphere Pressure (PSIA)

Time (Minutes)

KEUFFEL & ESSER CO.

FIGURE 8

REACTION PROPAGATION TEST
(Typical Data)

Material: 71-5072 TFE Teflon - 15% glass-filled

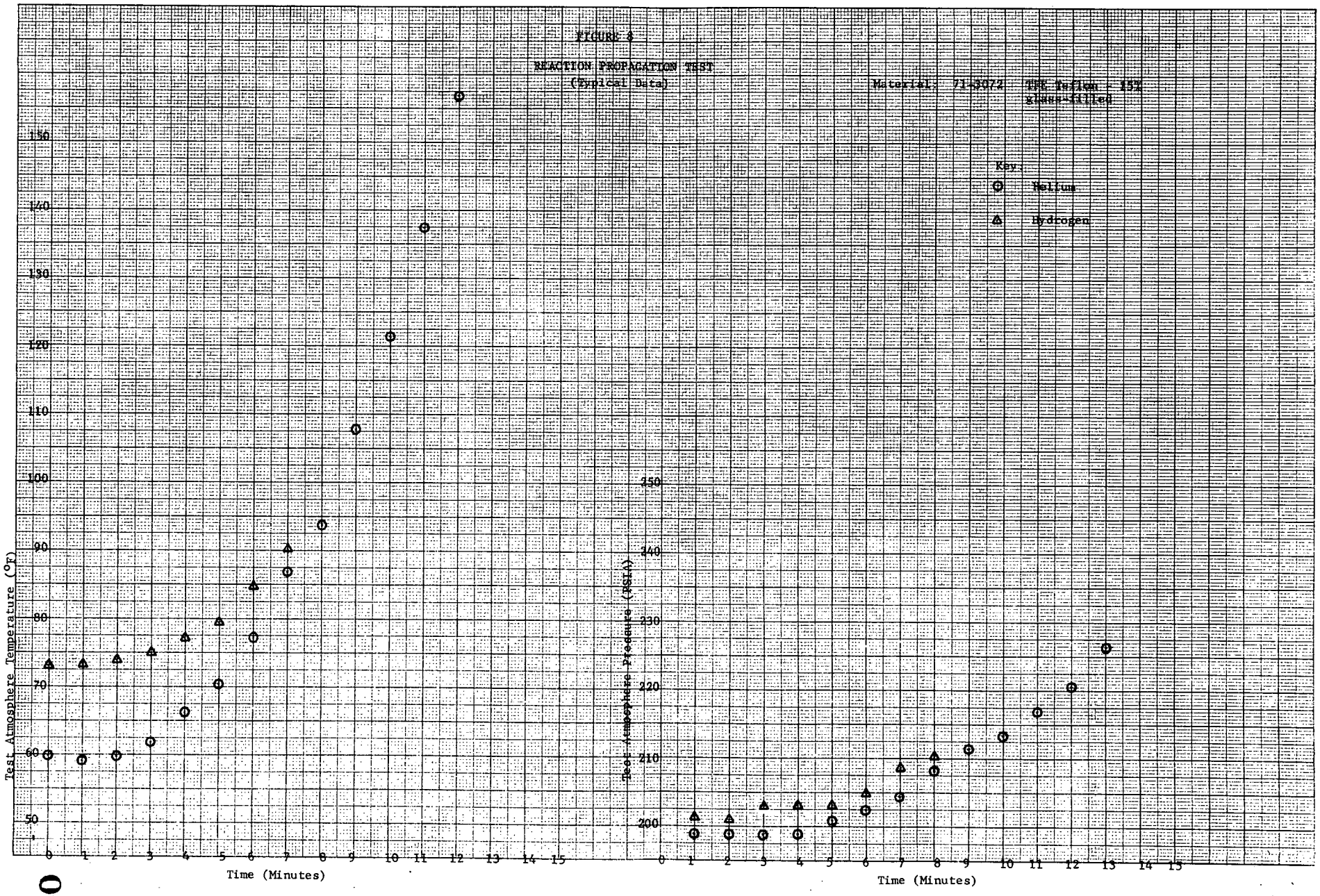
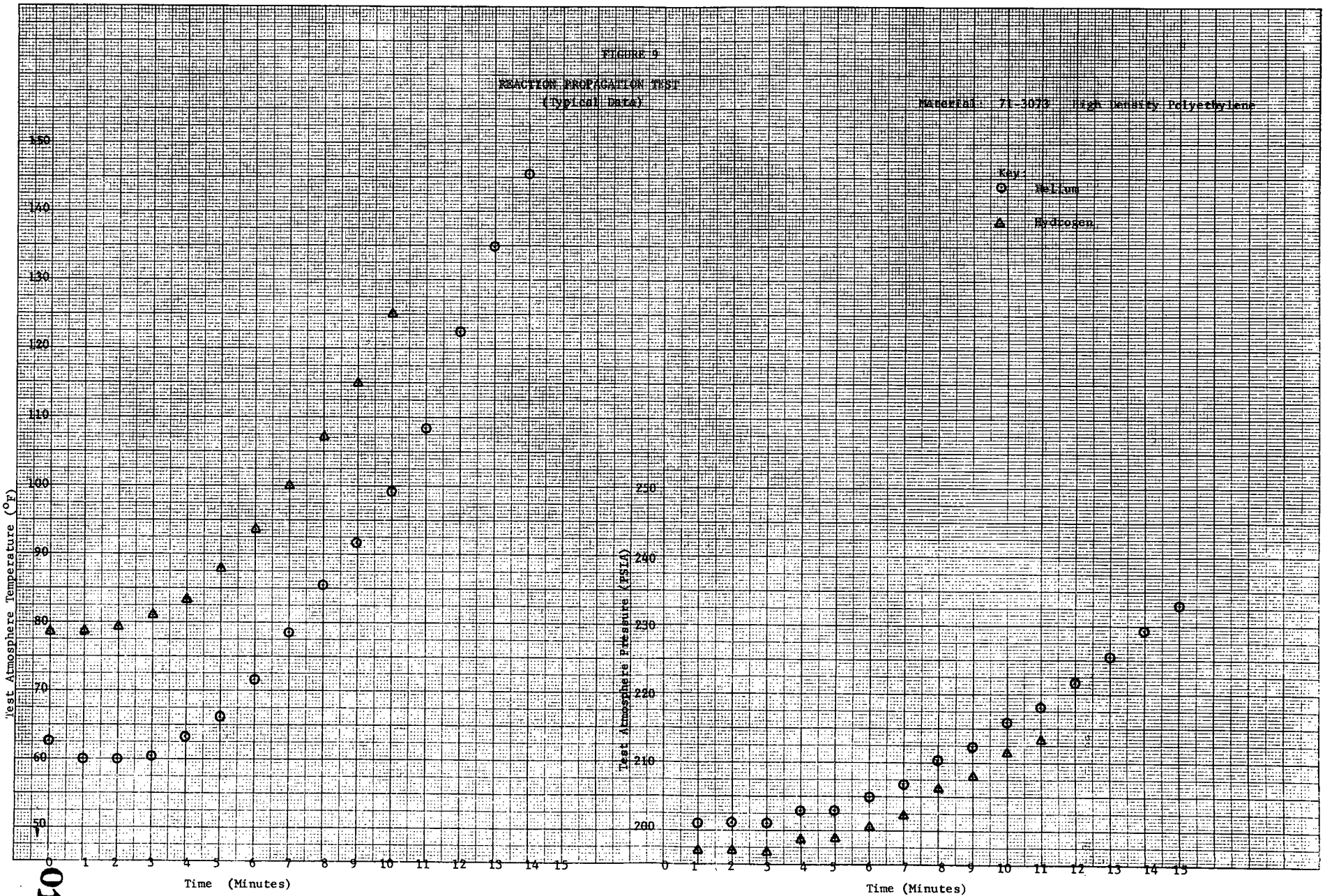


FIGURE 9

REACTION PROPAGATION TEST
(Typical Data)

Material: 71-3070 High Density Polyethylene



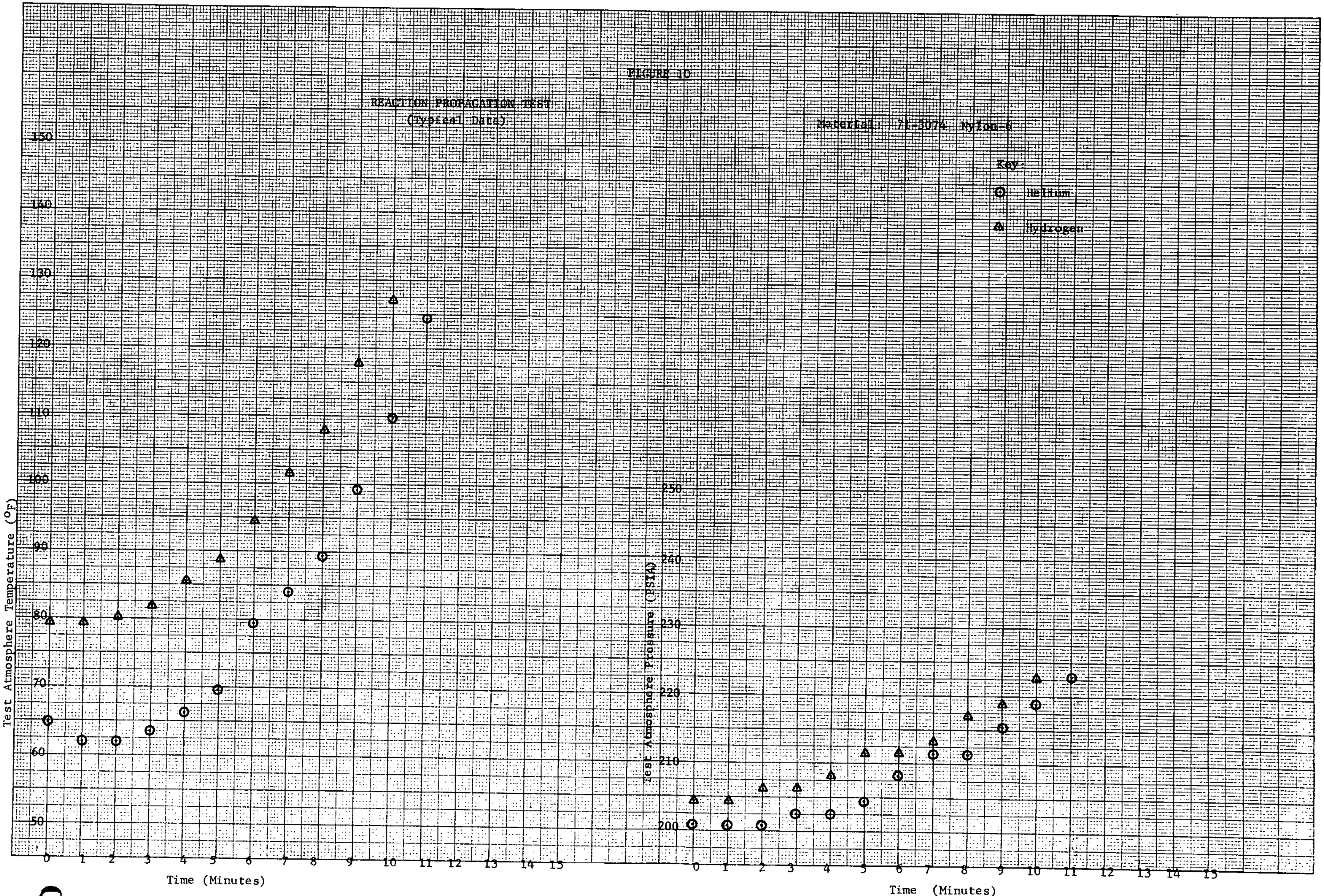
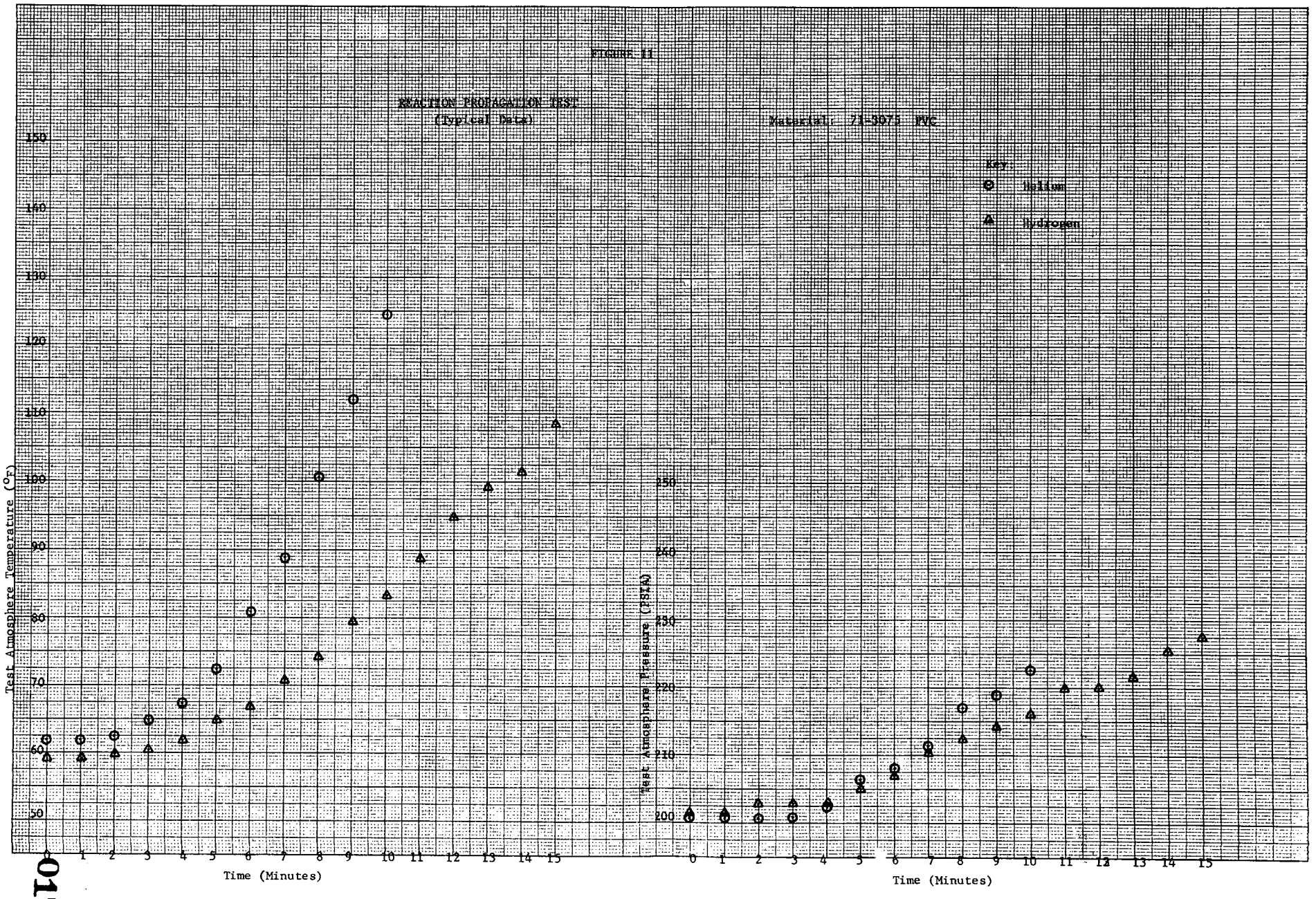


FIGURE 10
REACTION PROPAGATION TEST
(Typical Data)
Material: 71-3074 Nylon-6
Key:
Helium
Hydrogen
Test Atmosphere Temperature (°F)
150
140
130
120
110
100
90
80
70
60
50
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Time (Minutes)
Test Atmosphere Pressure (PSIA)
250
240
230
220
210
200
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Time (Minutes)

FIGURE 11

REACTION PROPAGATION TEST
(Typical Data)

Material: 71-3075 PVC



017

FIGURE 12

REACTION PROPAGATION TEST
(Typical Data)

Material, 71-9198 Cellulose Acetate Butyrate

Key
- Helium
- Hydrogen

Test Atmosphere Temperature (°F)

Time (Minutes)

Test Atmosphere Pressure (PSIA)

Time (Minutes)

HYDROGEN

HYDROGEN

Figure 13

HELIUM

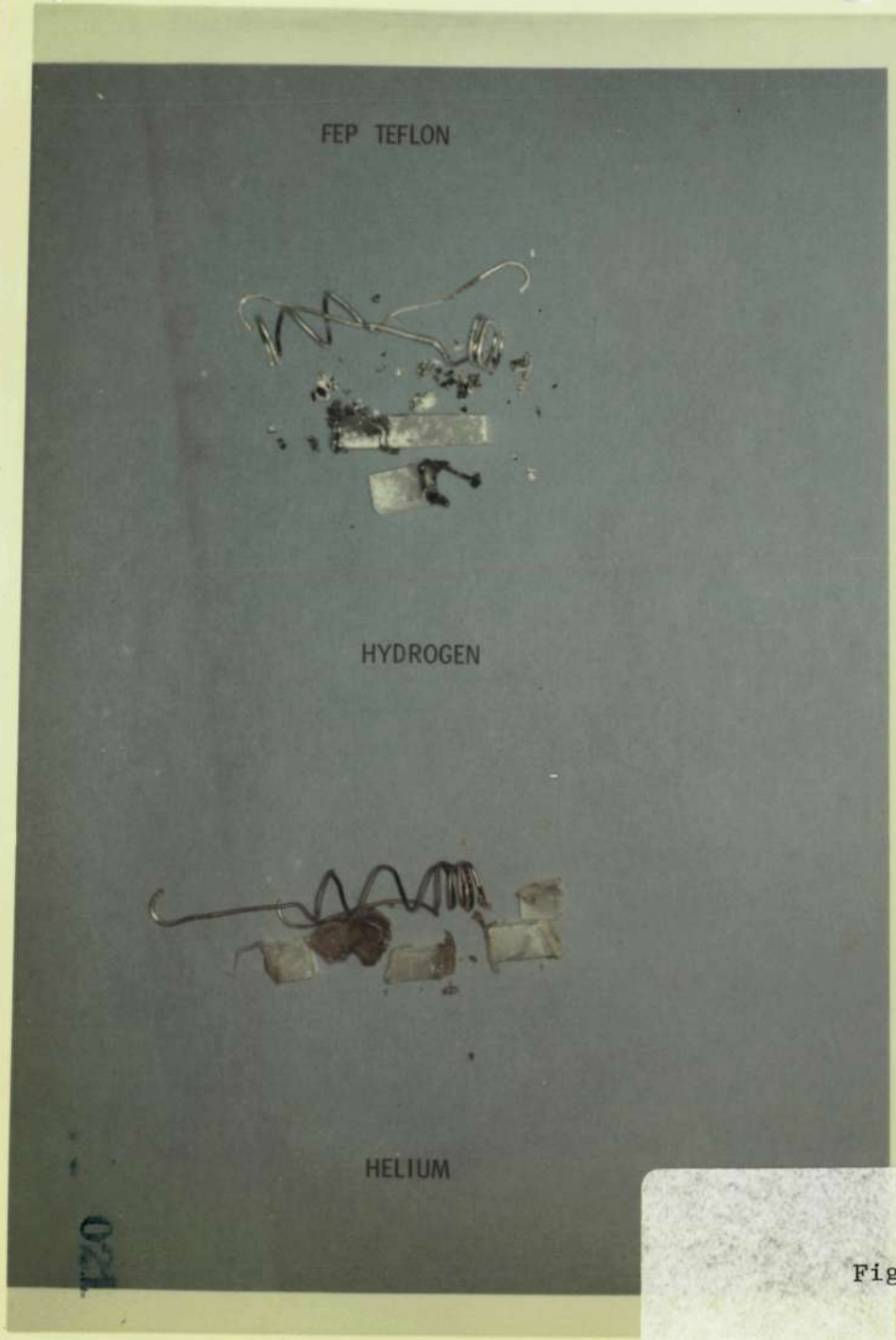
HELIUM

TFE Teflon 15% Glass-Filled

Helium

Hydrogen

Figure 14



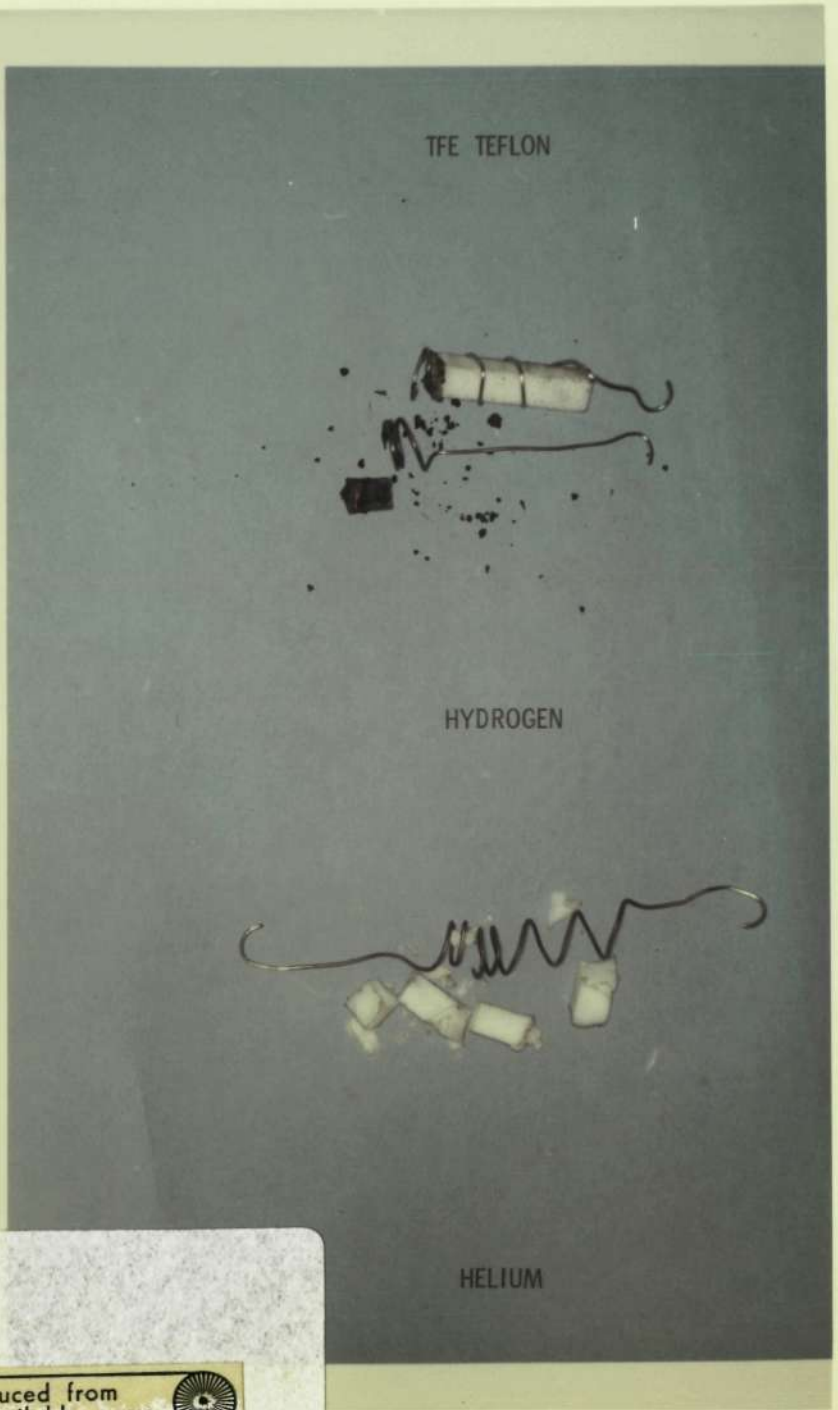


Figure 15

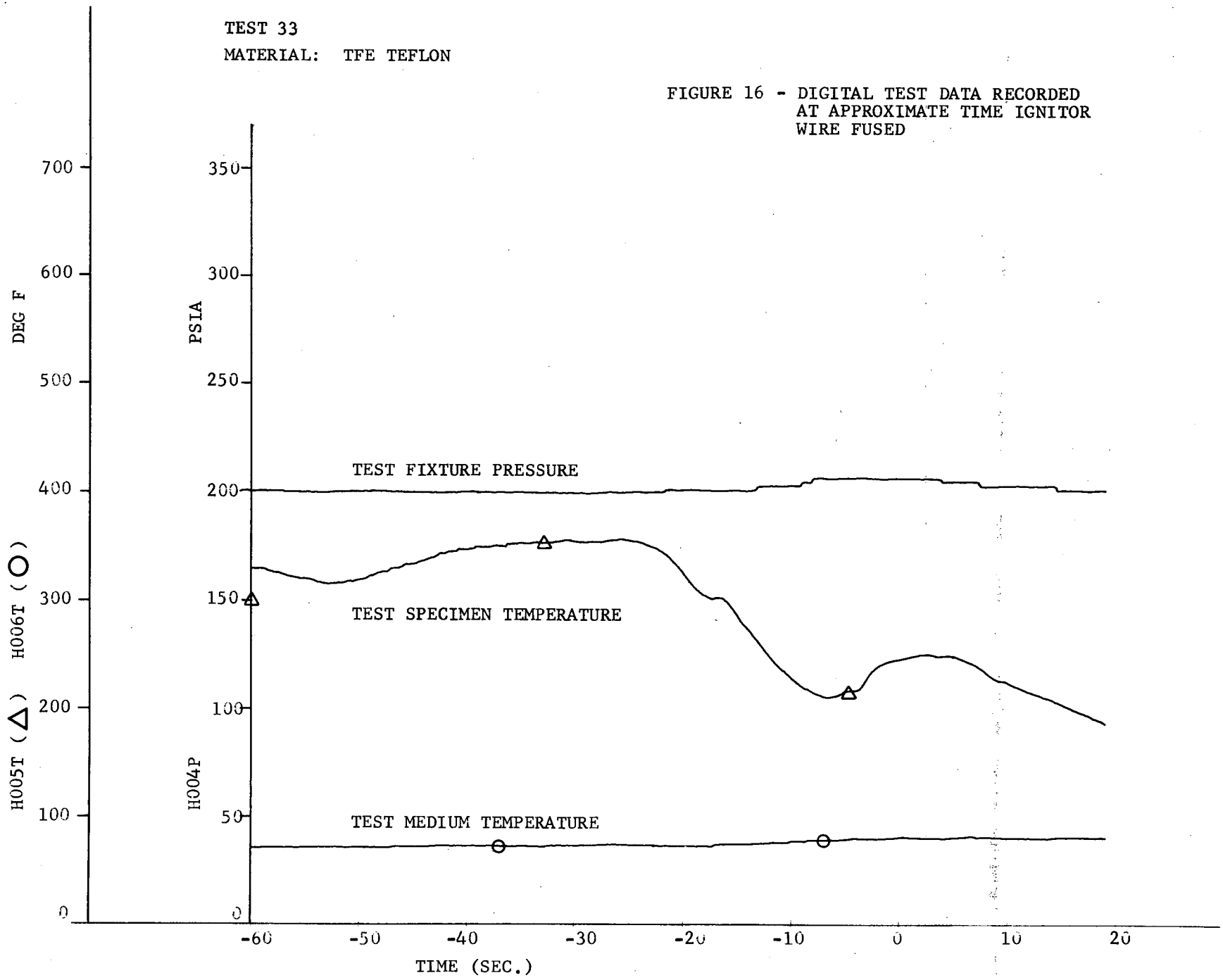


FIGURE 16 - DIGITAL TEST DATA RECORDED AT APPROXIMATE TIME IGNITOR WIRE FUSED

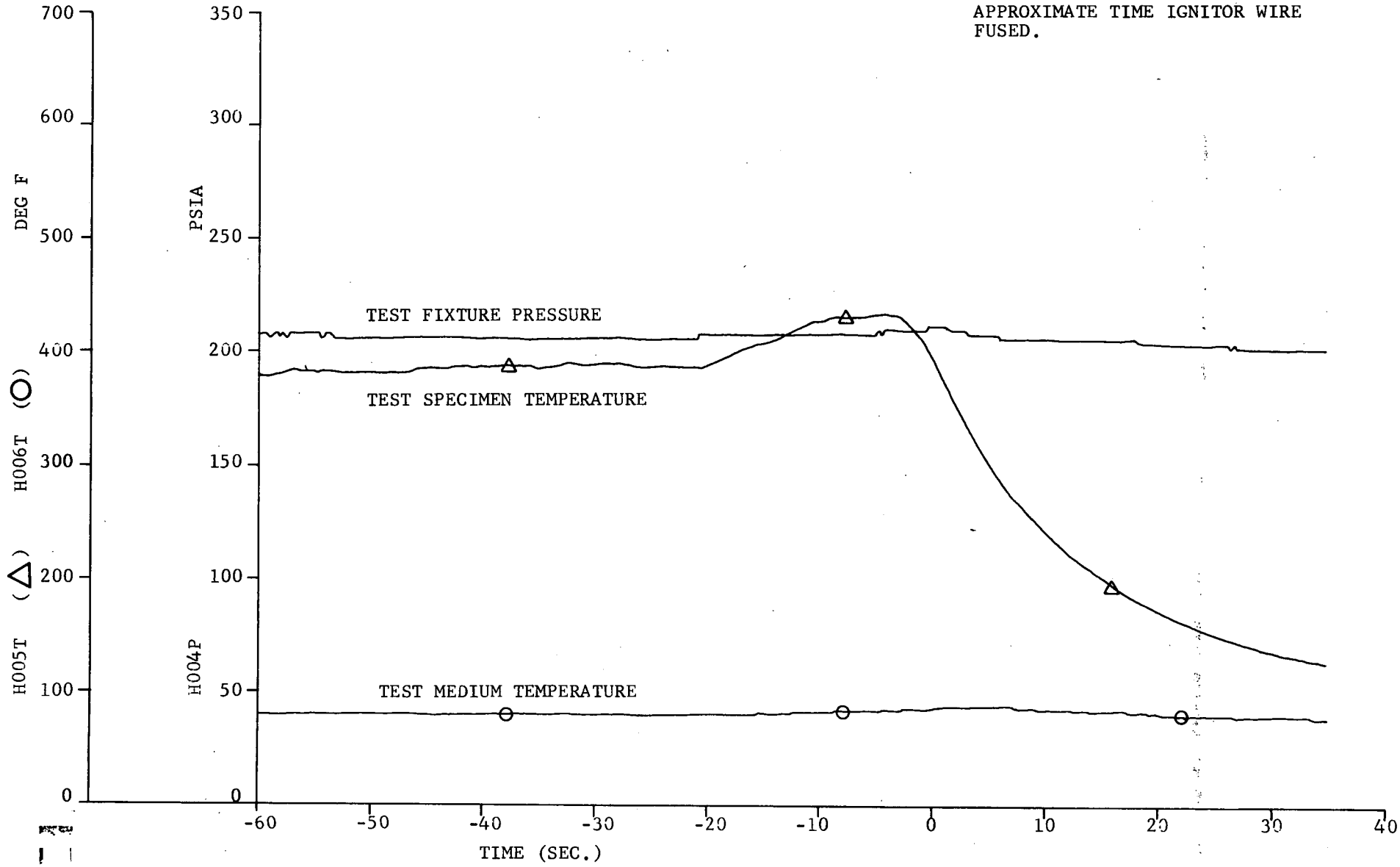
RD

220

TEST 35

MATERIAL: 15% GLASS FILLED TFE TEFLON

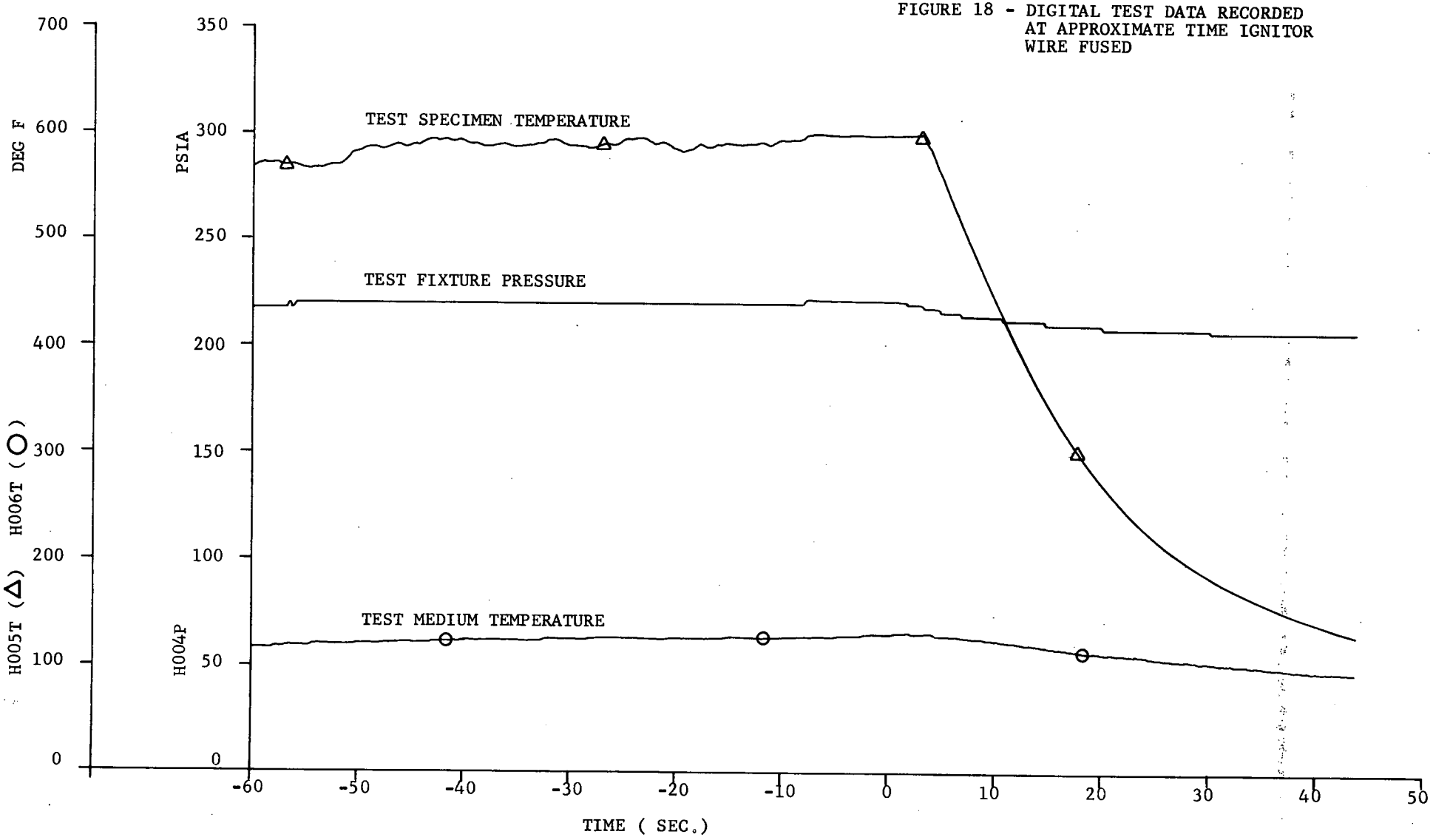
FIGURE 17 - DIGITAL TEST DATA RECORDED AT APPROXIMATE TIME IGNITOR WIRE FUSED.



TEST 45

MATERIAL: RTV-90 SILICONE RUBBER

FIGURE 18 - DIGITAL TEST DATA RECORDED AT APPROXIMATE TIME IGNITOR WIRE FUSED



TEST 38

MATERIAL: FEP TEFLON

FIGURE 19 - DIGITAL DATA RECORDED AT APPROXIMATE TIME IGNITOR WIRE FUSED

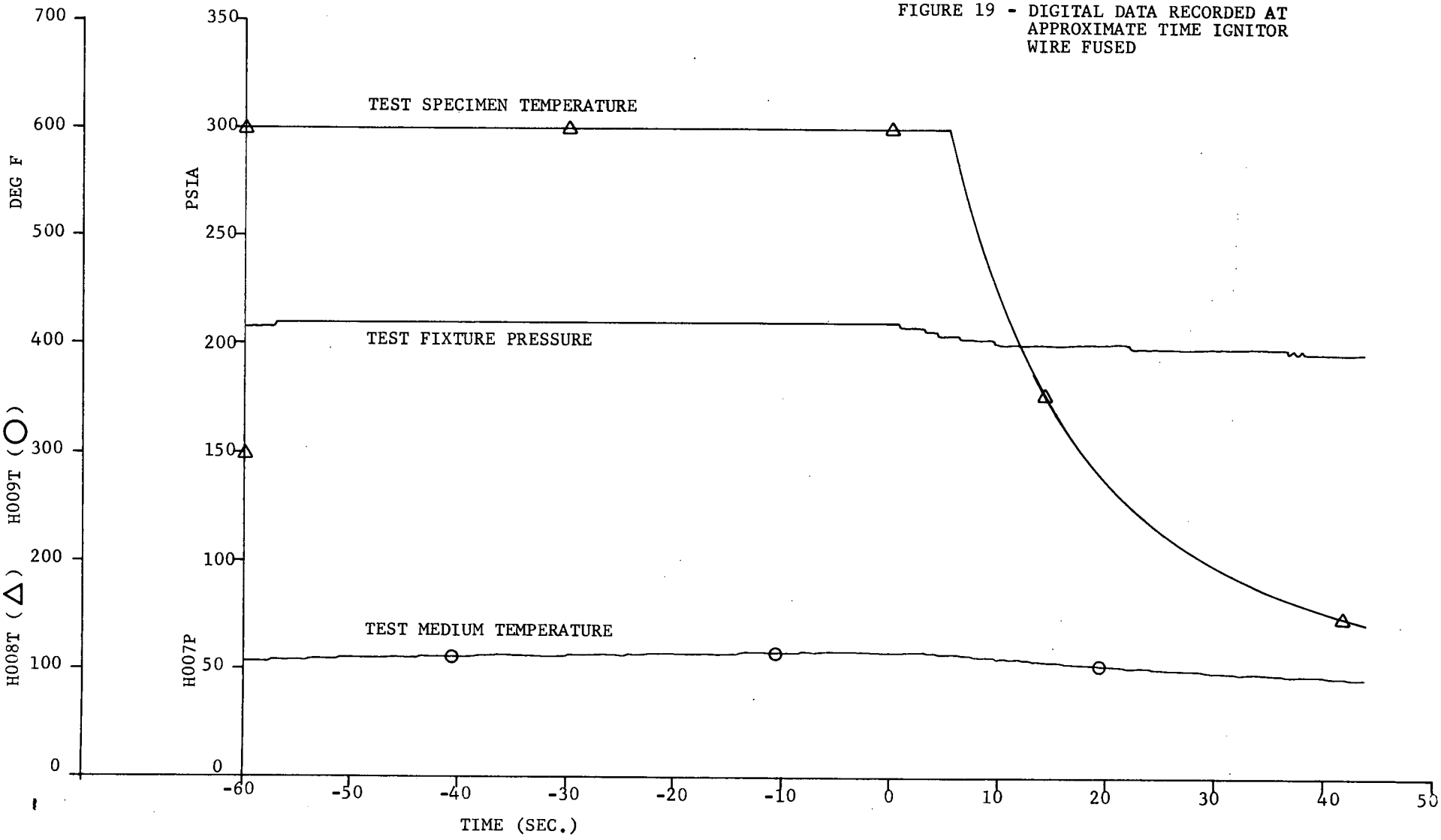


Table I : Summary of Reaction Propagation Test Data

Material I.D. No.	Material	End of Test Data: GHe Test No.	GHe Temp Rise Rate (°F/min)	GHe Press Rise Rate (psia/min)	End of Test Data: GH_2 Test No.	GH_2 Temp Rise Rate (°F/min)	GH_2 Press Rise Rate (psia/min)	Final Amperage/Voltage GHe	Final Amperage/Voltage GH_2	Time to End of Test (approx. min:sec) GHe	Time to End of Test (approx. min:sec) GH_2	Remarks (key below)
71-2977*	RTV-90 Silicone Rubber	1	13.3	3.7	45	5.3	3.7	22/18.5	24/19.0	10:50	11:50	Z
		2	10.5	5.6	25	11.9	1.9	22/17.25	22/19.0	10:40	10:15	Z
					26	11.7	3.7		24/19.1		11:10	Z
71-3393**	RTV-90 Silicone Rubber				44	9.4	1.9		24/18.5		11:55	Z
					47	13.2	3.7		22/18.4		10:20	Z
71-2978	PRC Polyurethane	3	11.6	5.6	31	12.3	2.0	26/20	30/20.5	12:15	14:05	X
		4	16.7	5.6	40	9.6	0.9	30/20	24/17.1	15:05	11:05	X
71-3070	Viton A	5	11.3	1.9	28	5.4	1.8	22/15	20/14.5	10:45	9:35	
		6	11.2	1.9	39	11.3	3.7	22/16.5	20/14.2	12:10	9:50	
71-2992	FEP Teflon	7	16.8	3.6	38	7.3	2.1	26/20.25***	26/17.0***	12:10	12:05	Y, Z
		8	14.2	5.6	36	8.1	5.6	26/20.1	24/18.5	12:10	11:05	Z
		17	7.9	5.5				24/21.7		11:30		Y
71-3071	TFE Teflon	9	16.0	7.4	27	4.0	2.0	24/19.5	12/9.5	12:00	5:15	Z
		10	10.6	1.9	33	3.6	1.9	24/18.5	12/9.8	11:10	5:05	Z
		18	15.4	3.7				24/20.0		11:05		
71-3072	15% Glass-filled TFE Teflon	11	19.4	5.6	35	0.7	5.2	26/19.5	16/13.0	12:05	7:20	Z
		12	15.5	5.6	32	5.4	1.8	26/20.5	16/12.0	12:10	7:30	Z
					48	9.6	3.8		22/17.0		11:20	Z
71-3073	High Density Polyethylene	13	9.0	3.7	41	10.2	1.9	20/16.25	22/18.5	9:10	10:10	X
		14	10.8	3.8	43	11.0	1.9	30/21.25	24/19.0	14:05	11:10	X
		19	6.5	5.6				26/19.5		12:15		X

* RTV-90 samples cast at WSTF contained gas bubbles.
** RTV-90 samples purchased cast in sheet form free from bubbles.
*** Last recorded voltage, wire fused when amperage was raised to level listed.

X = Sample found on burst disk at end of tests.
Y = Sample found on burst disk at end of GHe test
Z = Reacted in H_2.

020

Table I (continued)

Material I.D. No.	Material	End of Test Data: GHe Test No.	GHe Temp Rise Rate (°F/min)	GHe Press Rise Rate (psia/min)	End of Test Data: GH_2 Test No.	GH_2 Temp Rise Rate (°F/min)	GH_2 Press Rise Rate (psia/min)	Final Amperage/Voltage GHe	Final Amperage/Voltage GH_2	Time to End of Test (approx.) (min:sec) GHe	Time to End of Test (approx.) (min:sec) GH_2	Remarks (key below)
71-3074	Nylon 6	24	15.8	3.8	37	10.2	3.7	32/22.5***	22/19.0	14:05	10:05	X
		23	14.7	3.7	46	10.5	3.7	24/18.25***	26/20.5	11:00	12:05	X
		20	14.0	1.8				26/20.0		12:07		
71-3075	Polyvinyl-chloride		10.5	3.3	34	8.0	3.0	32/18.1***	26/18.2***	15:05	12:10	
		15	12.5	3.7	29	6.7	1.8	22/17.5	32/18.1	10:15	15:05	
		16	12.5	5.0				28/18.0		13:10		
71-3198	Cellulose Acetate Butyrate	21	11.9	3.7	42	10.8	3.7	22/18.25	34/21.5	10:10	16:05	X
		22	10.6	4.0	30	7.3	1.8	24/17.75	28/18.2	11:10	13:35	X
	20 AGW Nichrome Wire	52	10.3	3.7	50	6.7	1.9	22/17.1	24/17.0	10:10	11:10	
		51	8.9	3.7	49	10.7	3.8	24/18.0	28/21.8	11:35	13:10	

*** Last recorded voltage, wire fused when amperage was raised to level listed.

X = Sample found on burst disk at end of tests.

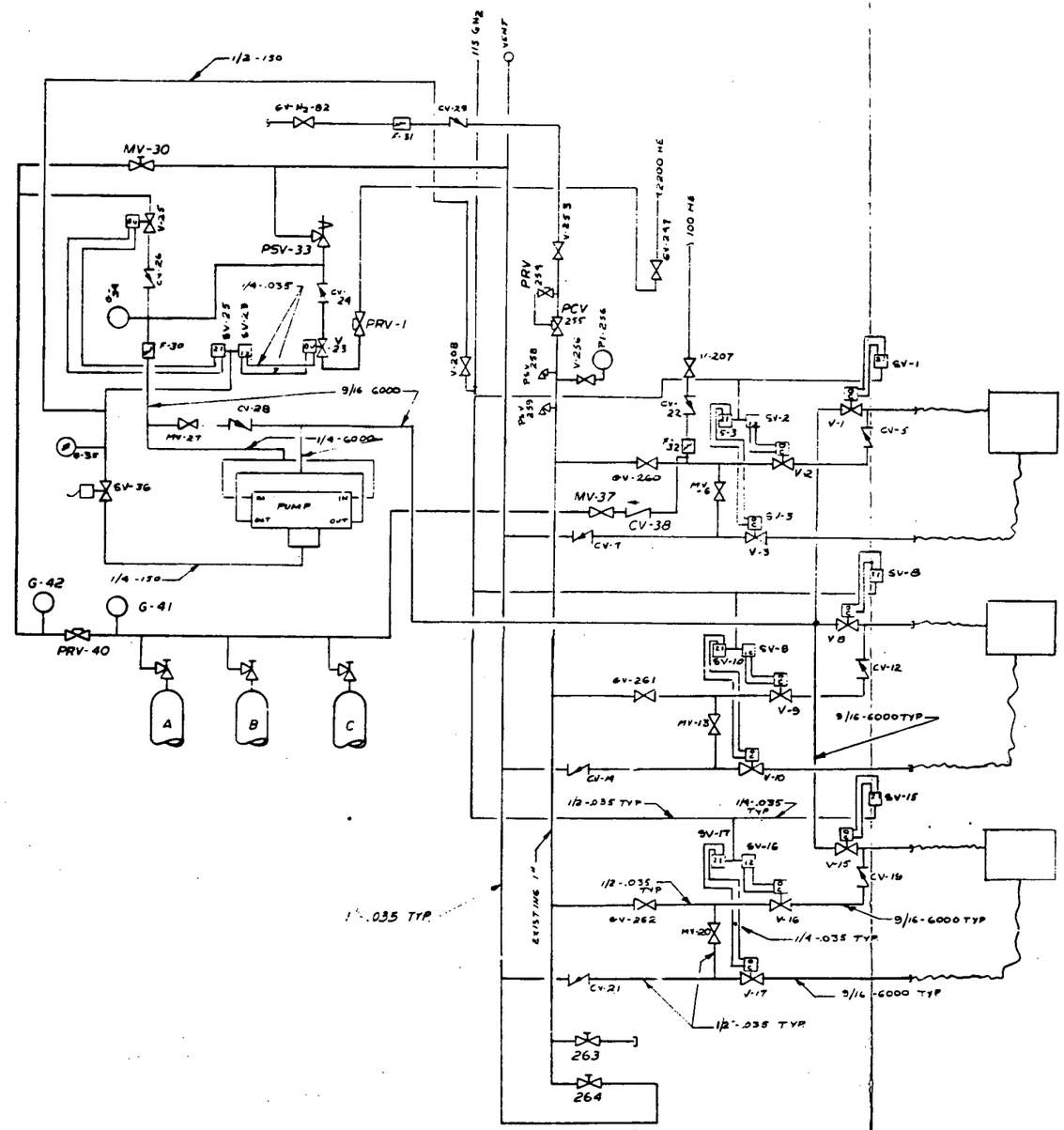
APPENDIX A

TEST PROCEDURE

FOLDOUT FRAME 1

FOLDOUT FRAME 2

SYMBOL	LETTER ZONE	DESCRIPTION	DATE	APPROVED
A		ADDED SHTS 4, 5 & 6.		
		D.C.C.		
B		ADDED PNEUMATIC SOLENOID VALVES AND LINES; REVISED VALVE CALL OUT FROM SV-X TO V-X & SV-X; ADDED INTENSIFIER; REVISED & REDREW SHEETS 1, 2 & 3.		
		D.C.C.		
C		ADDED VALVES PRV-1, PRV-40, MV-30, MV-37, & CV-38; ADDED GAGES G-41 & G-42 AND "K" BOTTLES A, B & C.		



MATERIALS TEST FACILITY

FLOW DIAGRAM

FOR BILL OF MATERIAL SEE TPS #3-HYD-016 M1

REQ'D PER ASS'Y	ITEM NO	PART NO.	DESCRIPTION	MATERIAL	SPECIFICATION	ENT. NO.

DIMENSIONAL TOLERANCE UNLESS NOTED OTHERWISE
0 ? ANGLES ±
00 ± FRACTIONS ±
000 ±
DIMENSIONS ARE IN INCHES
SURFACE FINISH IN MICRO INCHES RMS UNLESS OTHERWISE NOTED
UNLESS NOTED OTHERWISE REMOVE ALL SHARP EDGES AND BURRS

NEXT ASSY / RELATED DWGS

DRAWN C. PADILLA 12/8/71
ENGINEER
DESIGNED BY
CHECKED BY
APPROVED 10-25-71
APPROVED 11/9/71
RELEASED C. SADLER 10-26-71
RELEASE K. BLAIR 10-25-71

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
WHITE SANDS TEST FACILITY, NEW MEXICO

NON-METALLIC MATERIALS HYDROGEN TESTS

SCALE
SHEET 1 OF 6
CODE IDENT NO. D
SIZE 351-10642
REV. C

E/I 350-10643

Test Facility Start-Up and Shut-Down Procedure

TPS No. 3-HYD-044(R)
TPS Short Title: Daily Set Up and Shut Down
Reason for Work: To support 3-HYD testing

Item No.	Description
	DAILY SET-UP
	NOTE: Place TS 302 in Amber condition.
1.	Open or verify open GV-260, GV-261, and GV-262.
2.	Open or verify open V-208 and verify 115 ± 5 psig on G35.
3.	Open or verify open MV-27 ½ turn.
4.	Open GV-247.
5.	Close or verify closed MV-6, MV-13, and MV-20.
6.	Power up C14-062 console. Bay 1 and Bay 2.
7.	Verify arm key off.
8.	Verify following valve positions:

Bay 1 _____ Valve 455 and Main 455 ON

Bay 2 _____

SV-1	Closed
SV-2	Open
SV-3	Open
SV-8	Closed
SV-9	Open
SV-10	Open
SV-15	Closed
SV-16	Open
SV-17	Open
SV-23	Closed
SV-25	Closed
SV-36	Closed

Spark generator off.

9.	Close SV-2, SV-9, and SV-16.
10.	Ensure PRV-254 fully decreases.
11.	Slowly open V-256, V-253, and adjust PRV-254 as required to obtain 30 ± 5 psig as indicated on PI-256.
12.	Open SV-2, SV-9, and SV-16.

Item No.	Description
13.	Purge for approximately three minutes then close SV-2, SV-9, and SV-16.
14.	When H002, 4P, and 7P indicate ambient, close SV-3, SV-10, and SV-17.
15.	Close V-253.
16.	Open MV-20, vent system to ambient as read on PI-256, then close MV-20.
17.	Slowly open V-207 and verify 25 $\pm$ 5 psig on PI-256.
17a.	Open MV-37, MV-39, and adjust PR-40 to obtain purge. Purge for five minutes, then close MV-39, PR-40, and MV-37.
17b.	Open MV-264 DAILY SHUT-DOWN.
18.	Close V-207.
	NOTE: Perform Steps 19 through 22 for hydrogen testing.
19.	Open V-253 and verify 30 $\pm$ 5 psig on PI-256.
19a.	Open MV-39 and adjust PR-40 to obtain purge then open MV-37. Purge for five minutes, then close MV-39, PR-40, and MV-37.
20.	Open or verify open SV-2, SV-3, SV-9, SV-10, SV-16, and SV-17.
21.	Purge for approximately five minutes, then close V-253.
22.	Close or verify closed H_2 source valves.
23.	Close GV-247 and GV-264.
24.	Verify or position the following valves:

SV-1	Closed
SV-2	Open
SV-3	Open
SV-8	Closed
SV-9	Open
SV-10	Open
SV-15	Closed
SV-16	Open
SV-17	Open
SV-23	Closed
SV-25	Closed
SV-36	Closed

Spark generator OFF.

Item No.	Description
25.	Place TS-302 in green condition.
26.	Turn off Main and valve 455 on Bay 1.
27.	Power down C14-602, Bay 1 and Bay 2.
28.	Change hydrogen K-bottles as required to support testing.

Reaction Propagation Test Procedure

TPS No.: 3-HYD-045(R)
TPS Short Title: Perform Reaction Propagation Tests - Test E

Reason for Work: To determine compatibility of Materials

Item No.	Description
	NOTE: Extreme caution shall be exercised when performing the following steps. Hydrogen gas may be present in system or hydrogen leaks may occur during testing.
	NOTE: All personnel shall obtain test conductor's permission before changing any valve position status.
	NOTE: This is an open ended TPS and will remain open until cancelled.
1.	Verify DAS is ready.
2.	Verify with QA there are no constraints to testing.
3.	Verify TPS-3-HYD-044(R) (Daily Set Up) is complete.
	NOTE: All of the following steps are applicable for Test Stand 2 and/or Test Stand 3, whichever is applicable.
4.	Remove union between stand pressure and vent flex hoses.
5.	Mount bomb to be tested in the test stand.
6.	Install pressure flex hose to SP port valve on bomb.
7.	Install vent flex hose to DR port valve on bomb.
8.	Torque fittings per WS-10.
9.	Verify 1 OHM or less resistance across studs on bomb.
10.	Verify bunker 2 bomb power supply is off.
11.	Connect electrical power contacts on bomb. Connect thermocouple leaks to bomb, and verify operational H-005T, H006T, H-008T, H-009T as applicable.

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033

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Item No.	Description
	NOTE: Remove terminal covers from leads.
12.	Slowly open GV-247.
13.	Open bomb SP and DR port valves.
13a.	Verify TV picture acceptable to Test Conductor.
14.	Open SV-23 and verify 290 ± 5 psig on G-34. Adjust PR-1 as required.
15.	Open SV-8 and/or SV-15 (as applicable) and pressurize bombs to 300 ± 5 psia as indicated on H-004P and/or H-007P, then close SV-8 and/or SV-15.
	NOTE: SV-8 and/or SV-15 shall be cycled as required to stabilize bomb pressure for leak check before performing following steps:
16.	Perform leak check of bombs as follows:
	a. Read H-004P _____ and/or H-007P _____
	b. Wait five minutes.
	c. Read H-004P _____ and/or H-007P _____
	NOTE: Leak rate shall not exceed 4.0 psia per five minute period. If leak rate exceeds specification, perform following steps for repair. If leak rate is within tolerance allowed, proceed to Step 23 for test continuation.
17.	Determine location of leak.
18.	Verify closed SV-8 and/or SV-15 (as applicable).
19.	Open SV-10 and/or SV-17, vent system to minimum as read on H-004P or H-007P, then close SV-10 and/or SV-17.
20.	Repair leak. Retorque fittings per WS-10 or tighten studs as required to repair leaks.
21.	Repeat Step 15 to pressurize bomb.
22.	Repeat Step 16 for leak check.
23.	Verify closed SV-8 and/or SV-15 (as applicable) and PR-1.
23a.	Open SV-15 and SV-17, then close SV-15 and SV-17.

Item No.	Description
23b.	Adjust PR-1 to indicate 190 ± 5 psig on G-34.
23c.	Close SV-23.
24.	Open Building 328 for hydrogen testing.
	NOTE: Test conductor option for all other testing. Disconnect power cable and connect ground cables.
25.	If hydrogen gas is to be test media, slowly open H_2 K-bottle outlet valve, and adjust regulator PR-40 for 210 ± 5 psig as indicated on G-42.
26.	Place Test Stand 302 in an Amber condition, and make appropriate announcement.
	NOTE: All personnel clear Test Stand 302 area for testing.
26a.	Place Building 328 Area in a Red condition as specified on attached safety sheet.
27.	Open SV-10 and/or SV-17 (as applicable).
28.	Open SV-9 and/or SV-16, purge for five minutes, then close SV-10 and/or SV-17.
29.	Close SV-9 and/or SV-16 (as applicable).
	NOTE: The following sections (Test Stand 2 and Test Stand 3) will be performed at the Test Conductor's discretion.

TEST STAND 2

	NOTE: Perform R-Cals on oscillograph and magnetic tape if required and annotate sample material, test media, stand number, and date.
30.	Open or verify open SV-23 or SV-25, whichever is applicable.
	NOTE: Turn on arm key for SV-25 valve cycle.
31.	Open SV-8 and SV-10 purge for five minutes, then close SV-10.
32.	When H-004P indicates 200 ± 5 psia, Close SV-8. Cycle SV-8 and SV-10 as required to obtain pressure.

Item No.	Description

33. Close SV-23 or SV-25 and arm key off.

34. Verify Bunker 2 ready.

35. Verify DAS ready, and start oscillograph recording. (Start magnetic tape recording if required, at Test Conductor's direction).

36. Perform test as follows:

a. Verify Bunker 2 power supply for Stand 2 is as follows:

1. Amperage control to minimum.
2. Voltage control to minimum.
3. Power switch on.
4. Slowly increase voltage control to maximum.

b. At T + 0 and at one minute intervals thereafter, as designated by the Test Conductor, increase amperage control 2 amps and record voltage and amperage readings. DAS, read and record H-004P, H-005T, and H-006T. DAS will annotate oscillographs with time.

NOTE: When bunker 2 power supply indicates amperage drops to zero readings, the ignitor wire is fused. Record time on log sheet. Monitor both temperature and pressure until a decrease is noted.

NOTE: Record all test data on attached Test Stand 2 log sheet.

c. Shut-down as follows:

1. At Test Conductor option, perform post R-cals and annotated on oscillograph (and magnetic tape if required).
2. Turn off bunker 2 power supply to Stand 2.

Item No.	Description

d. Purge test fixture as follows:

1. Open SV-23.
2. Open SV-10 and SV-8, purge for approximately one minute, then close SV-23 and SV-8.
3. Open SV-9, purge for approximately 1 minute, then close SV-9 and SV-10.

Test Stand 3

NOTE: Perform R-cals on oscillograph (and magnetic tape if required), and annotate sample material, test media, Stand Number, and date.

37. Open or verify open SV-23 or SV-25, whichever is applicable.

NOTE: Turn on arm key for SV-25 valve cycle.

38. Open SV-15 and SV-17, purge for 3 minutes, then close SV-17.

39. When H-007P indicates 200 $\pm$ 5 psia, close SV-15. Cycle SV-15 and SV-17 as required to obtain pressure.

40. Close SV-23 or SV-25 and arm key off.

41. Verify bunker 2 ready.

42. Verify DAS ready, and start oscillograph recording. (Start magnetic tape recording, if required, at Test Conductor's direction).

43. Perform test as follows:

a. Verify Bunker 2 power supply for Stand 3 is as follows:

1. Amperage control to minimum.
2. Voltage control to minimum.
3. Power switch on.
4. Slowly increase voltage control to maximum.

Item No.	Description

b. At T + 0 and at one minute intervals thereafter, as designated by the Test Conductor, increase amperage control 2 amps and record voltage and amperage readings. DAS, read and record H-007P, H-008T, and H-009T. DAS will annotate oscillograph with time.

NOTE: When Bunker 2 power supply indicates amperage drops to zero readings, the ignitor wire is fused. Record time on log sheet. Monitor both temperature and pressure until a decrease is noted.

NOTE: Record all test data on attached Test Stand 3 log sheet.

c. Shut-down as follows:

1. At test conductors option, perform post R-cals and annotate on oscillograph (and magnetic tape if required).

2. Turn off bunker power supply to Stand 3.

d. Purge test fixture as follows:

1. Open SV-23
2. Open SV-17 and SV-15, purge for approximately one minute, then close SV-23 and SV-15.
3. Open SV-16, purge for approximately one minute, then close SV-16 and SV-17.

FINAL PURGE

NOTE: To be performed only after all testing is completed and when hydrogen gas is used as test media.

44. Open SV-23.

45. Open SV-3, SV-10, and SV-17.

46. Open SV-8, SV-15, and SV-1, purge for approximately five minutes, then close SV-1, SV-8, and SV-15.

47. Close SV-23.

Item No.	Description
48.	Open SV-2, SV-9, and SV-16, purge for five minutes, then close SV-2, SV-9, and SV-16.
49.	Close SV-3, SV-10, and SV-17 when H-002P, H-004P, and H-007P indicate minimum.

FINAL SHUT-DOWN

50.	Place TS 302 in Amber and make appropriate announcements.
51.	Close H_2 K-bottle valve is applicable.
52.	Close bomb SP and DR valves.
53.	Carefully disconnect stand pressure and vent flex hoses from bomb valves.
54.	Connect pressure and vent flex hoses with a union.
	NOTE: Use extreme caution on following step.
55.	Slowly open DR port valve, and vent bomb to ambient, then close DR port valve.
56.	Close Building 328.
57.	Disconnect electrical power contacts on bomb.
58.	Disconnect thermocouple cables on bomb and remove thermocouple from bomb.
59.	Break bomb flange nuts, and separate upper flange from lower flange.
60.	Remove sample from bomb upper half, and place in a plastic bag. Annotate bag with sample number and date.
61.	Assemble bomb upper half and lower half and return bomb and thermocouple to laboratory for cleaning.

APPENDIX B

TEST DATA

REACTION PROPAGATION TEST

Test # 1
Test Stand 2 Date 12/14/71
WSTF ID # 71-2997-A
Material Name RTV-Silicone Rubber Leak Check H-004P To 297.4 T+5 297.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5
Atmosphere Test Helium Pressure 200 ± 5

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.061 grams

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. °F H 005T	Test Specimen Temp. °F H 006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.4	56.9	56.1		
T+1	4	3.00	202.3	63.9	56.9		
T+2	6	4.75	202.3	80.0	57.6		
T+3	8	6.25	204.1	102.8	60.3		
T+4	10	7.80	204.1	130.9	63.8		
T+5	12	9.90	206.0	169.6	67.4		
T+6	14	11.50	211.3	247.5	79.2		
T+7	16	13.80	213.2	288.0	86.1		
T+8	18	15.00	218.7	335.0	101.5		
T+9	20	16.50	222.4	380.4	113.1		
T+10	22	18.50	226.1	421.9	126.4		
T+10:50	fused		216.8	185.5	101.5		
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
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T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2977
Material Name RTV Silicone Rubber
Specimen Number A
Specimen Weight 5.061 Gms
Date Prepared 10-27-71
Prepared By A.E. Chavez

STAND-2 #1 12/14/71

DATE ASSEMBLE 13-10-71

041

Test # 7
Test Stand 2
WSTF ID # 71-2797-A
Material Name RTV Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H. E. Wilson

04

H. E. Wilson 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 2
Test Stand 3
WSTF ID # 71-2977-B
Material Name RTV Silicone Rubber

Date 12/14/71

Leak Check H-007P To 300.24 T+5 300.24

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.022 grams

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	202.9	59.7	55.5		
T+1	4	3.0	202.9	64.6	56.2		
T+2	6	4.5	202.9	78.5	57.6		
T+3	8	6.0	204.8	104.7	59.0		
T+4	10	7.5	206.6	131.6	61.0		
T+5	12	9.0	206.6	153.3	65.3		
T+6	14	10.5	210.3	153.3	71.6		
T+7	16	12.25	212.2	216.3	81.8		
T+8	18	13.9	217.9	248.3	92.2		
T+9	20	15.5	219.8	282.4	105.7		
T+10	22	17.25	225.4	305.1	116.2		
T+10:40	fused		225.4	298.0	115.5		
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
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T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2977
Material Name RTV Silicone Rubber
Specimen Number B
Specimen Weight 5.022 gms
Date Prepared 10-27-71
Prepared By A E Chavez

Date Assemble 12-10-71
STAND 3 #1 12-14-71

Test # 2
Test Stand 3
WSTF ID # 71-2977-B
Material Name RTV Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes ____ No X

COMMENTS:

JD Smith
BY G.E. Gibson

G.E. Gibson 12/13/71 JD Smith 12/13/71

REACTION PROPAGATION TEST

Test # 3
Test Stand 2
WSTF ID # 71-2978-1
Material Name PRC Polyurethane

Date 12-16-71
Leak Check H-004P To 306.7 T+5 304.9

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5
Atmosphere Test Helium Pressure 200 ± 5

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.762

Time Min.	Amperage	Voltage	Pressure H-004P PSIA	Test Vessel Temp. H-005T °F	Test Specimen Temp. H-006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.3	60.3	59.7		
T+1	4	2.75	200.3	63.2	59.7		
T+2	6	4.50	200.3	66.0	60.3		
T+3	8	6.0	202.2	72.3	63.2		
T+4	10	7.5	202.2	178.7	66.7		
T+5	12	9.5	205.9	184.3	72.3		
T+6	14	11.25	205.9	246.1	77.2		
T+7	16	13.50	207.8	297.3	85.4		
T+8	18	15.0	211.3	401.5	94.3		
T+9	20	16.50	213.2	467.8	103.6		
T+10	22	18.25	216.9	561.2	119.1		
T+11	24	18.5	220.6	> 598.7	131.6		
T+12	26	20.0	226.2	> 598.7	143.2		
T+12:15	fused						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
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T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2978
Material Name PRC Polyurethane
Specimen Number A
Specimen Weight 3.762 gms
Date Prepared 10-27-71
Prepared By A Echavarry

DATE ASSEMBLE - 12-13-71

045

Test # 3
Test Stand 2
WSTF ID # 71-2978-A
Material Name PRC Polyurethane

Post Test Observations:

Discoloration - From NONE To
Propagation of Reaction - Yes No X

COMMENTS: Samples found on burst disc at completion of test.

BY G. G. Wilson

12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 4
Test Stand 3
WSTF ID # 71-2978-B
Material Name PRC Polyurethane

Date 12-16-71

Leak Check H-007P To 305.8 T+5 305.9

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5
Atmosphere Test Helium Pressure 200 ± 5

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.404

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. °F H 009T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	202.9	63.2	56.9		
T+1	4	3.0	202.9	79.2	56.9		
T+2	6	4.50	202.9	118.4	56.9		
T+3	8	6.0	204.7	178.0	58.3		
T+4	10	7.50	206.6	263.6	61.0		
T+5	12	9.25	210.3	292.3	66.0		
T+6	14	10.75	210.3	372.9	69.1		
T+7	16	12.50	212.2	432.2	74.9		
T+8	18	14.25	216.0	526.8	81.1		
T+9	20	15.75	219.7	>598.7	88.6		
T+10	22	17.25	221.6	>598.7	96.1		
T+11	24	19.0	225.3	>598.7	107.1		
T+12	26	20.75	229.1	>598.7	120.5		
T+13	28	22.50	234.7	>598.7	134.4		
T+14	30	20.0	240.3	>598.7	151.1		
T+15:05	Fuse 8						
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
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T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2978
Material Name PRC Polyurethane
Specimen Number B
Specimen Weight 3.404 grams
Date Prepared 10-27-71
Prepared By W E Beaver

DATE Assemble - 12-13-71

047

Test # 4
Test Stand 3
WSTF ID # 71-2976-B
Material Name PRC Polyurethane

Post Test Observations:

Discoloration - From NONE To
Propagation of Reaction - Yes No X

COMMENTS: Sample found on burst disc at completion of test

BY H. E. Wilson

H. E. Wilson 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 5
Test Stand 2
WSTF ID # 71-3070-A
Material Name Viton A

Date 12/16/71
Leak Check H-004P To 304.8 T+5 304.8

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5
Atmosphere Test Helium Pressure 200 ± 5

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.405

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. °F H 005T	Test Specimen Temp. °F H 006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.4	59.07	58.3		
T+1	4	2.75	200.4	70.1	57.6		
T+2	6	4.25	202.2	106.4	58.3		
T+3	8	5.50	202.2	163.9	59.7		
T+4	10	7.25	204.1	231.8	61.7		
T+5	12	8.50	205.9	394.1	70.1		
T+6	14	10.0	207.8	416.7	73.7		
T+7	16	11.5	213.2	486.5	83.2		
T+8	18	12.75	215.0	542.8	93.6		
T+9	20	14.0	218.7	564.0	100.4		
T+10	22	15.0	220.6	>598.7	111.7		
T+10.45	Fused.						
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
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T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3070
Material Name VITON A
Specimen Number A
Specimen Weight 4.405
Date Prepared 11/23/71
Prepared By J. Wheeler

Date Assembled 12-14-71
HYD-018-R
023

049

Test # 5
Test Stand 2
WSTF ID # 71-3070-A
Material Name Viton A

Post Test Observations:

Discoloration - From None To
Propagation of Reaction - Yes No X

COMMENTS:

BY H. E. Wilson

H. E. Wilson 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 6
Test Stand 3
WSTF ID # 71-3070-B
Material Name Viton A

Date 12/16/71

Leak Check H-007P To 305.85 T+5 305.85

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5
Atmosphere Test Helium Pressure 200 ± 5

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.330

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. °F H 007T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	206.6	63.2	57.6		
T+1	4	3.0	206.6	73.3	56.9		
T+2	6	4.25	206.6	96.8	56.9		
T+3	8	5.75	206.6	128.7	58.3		
T+4	10	7.0	210.3	173.1	60.3		
T+5	12	8.5	210.3	240.2	66.0		
T+6	14	9.75	214.0	316.9	74.9		
T+7	16	11.0	215.9	373.3	82.5		
T+8	18	12.25	219.7	399.4	86.8		
T+9	20	13.50	221.5	463.4	92.9		
T+10	22	14.75	225.3	486.5	101.4		
T+11	24	15.50	227.2	537.8	113.1		
T+12:10	26	16.5	229.1	557.0	124.3		
T+12:10	Fuse						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3070
Material Name VITON A
Specimen Number B
Specimen Weight 4.330
Date Prepared 11/23/71
Prepared By J. White

Date Assembled 12-14-71

051

Test # 6
Test Stand 3
WSTF ID # 71-3070-B
Material Name Viton A

Post Test Observations:

Discoloration - From None To
Propagation of Reaction - Yes No X

COMMENTS:

BY J D Smith H E Wilson

H. E. Wilson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 7
Test Stand 2
WSTF ID # 71-2992-A
Material Name FEP Teflon

Date 12/29/71
Leak Check H-004P To 301.6 T+5 299.6

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.870

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. °F H 005T	Test Specimen Temp. °F H 006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	202.4	54.0	54.0		
T+1	4	3.10	200.5	66.0	58.3		
T+2	6	4.5	202.4	86.1	54.0		
T+3	8	6.25	202.4	116.2	60.3		
T+4	10	8.10	204.2	149.6	63.9		
T+5	12	9.75	206.1	202.2	68.7		
T+6	14	11.50	211.3	337.1	74.9		
T+7	16	13.25	213.2	307.9	89.3		
T+8	18	15.00	216.9	369.3	93.6		
9	20	16.75	218.7	490.2	102.8		
T+10	22	18.25	222.6	488.0	116.2		
T+11	24	20.25	226.2	543.5	133.0		
T+12	26		231.7	598.7			
T+12.07	fused						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
35							
R-Cals							

Material Identification 71-2992
Material Name FEP-Teflon
Specimen Number A
Specimen Weight 4.870 gms
Date Prepared 10-27-71
Prepared By [signature]

DATE Assemble - 12-13-71

053

1208-B

Test # 7
Test Stand 2
WSTF ID # 71-2992-A
Material Name FEP Teflon

Post Test Observations:

Discoloration - From white To gray
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H. E. Wilson

Approved 12/13/71

REACTION PROPAGATION TEST

Test # 8
Test Stand 3
WSTF ID # 71-2992-B
Material Name FEP Teflon

Date 12/27/71
Leak Check H-007P To 296.5 T+5 294.6

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.865

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	201.0	62.5	57.6		
T+1	4	3.0	199.1	72.3	56.9		
T+2	6	4.5	201.0	92.6	56.9		
T+3	8	6.0	201.0	143.2	58.3		
T+4	10	7.25	202.7	182.2	61.7		
T+5	12	9.0	202.7	230.4	65.3		
T+6	14	10.50	206.6	418.1	68.0		
T+7	16	12.0	210.3	409.2	74.9		
T+8	18	13.50	210.3	457.7	83.2		
T+9	20	15.25	214.1	560.5	89.3		
T+10	22	16.75	216.0	>598.7	98.3		
T+11	24	18.25	219.7	>598.7	107.9		
T+12	26	20.10	225.3	>598.7	172.1		
T+12+12	FUSED						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2992
Material Name FEP - Teflon
Specimen Number B
Specimen Weight 4.865 gms.
Date Prepared 10-27-71
Prepared By C.E. Calvary

055

DATE Assemble-12-13-71

808-2

Test # 8
Test Stand 3
WSTF ID # 71-2992-B
Material Name FEP-Teflon

Post Test Observations:

Discoloration - From white To gray
Propagation of Reaction - Yes ______ No X

COMMENTS:

BY G.E. Wilson

G.E. Wilson 12/13/71 [illegible] 12/13/71

REACTION PROPAGATION TEST

Test # 9
Test Stand 2
WSTF ID # 71-3071-A
Material Name TFE Teflon

Date 12/30/71

Leak Check H-004P To 301.4 T+5 299.6

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 2.00 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.699

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. °F H 005T	Test Specimen Temp. °F H 006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	202.4	62.5°	66.8		
T+1	4	2.75	196.9	68.7°	58.8		
T+2	6	4.25	202.4	87.9°	59.8		
T+3	8	6.0	202.4	119.1°	61.8		
T+4	10	7.50	204.3	151.9°	64.5		
T+5	12	9.25	206.1	182.9°	69.5		
T+6	14	11.0	208.0	223.1°	75.7		
T+7	16	13.0	209.9	330.9°	83.3		
T+8	18	14.5	211.9	433.6°	92.9		
T+9	20	16.0	218.8	424.2°	102.9		
T+10	22	17.8	218.8	866.3°	116.3		
T+11	24	19.50	226.2	522.9°?	132.3		
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals				C2			

Material Identification 71-3071 E
Material Name TFE TEFLON
Specimen Number A
Specimen Weight 4.699
Date Prepared 11/23/71
Prepared By J Whelan

Date Assembled 12-16-71

05

Test # 9
Test Stand 2
WSTF ID # 71-3071-A
Material Name TFE-Teflon

Post Test Observations:

Discoloration - From WHITE To GRAY
Propagation of Roaction - Yes ____ No X

COMMENTS:

BY Gibson

April 1971 9212 12/13/71

REACTION PROPAGATION TEST

Test # 10
Test Stand 3
WSTF ID # 71-3071-B
Material Name TFE Teflon

Date 12/30/71

Leak Check H-007P To 300.2 T+5 296.5

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.581

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. °F H_008T	Test Specimen Temp. °F H_007T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.75	199.2	65.4	59.1		
T+1	4	3.0	190.2	70.2	52.6		
T+2	6	4.5	201.0	87.9	56.9		
T+3	8	6.0	201.0	115.6	55.4		
T+4	10	7.5	202.9	151.8	60.3		
T+5	12	9.25	202.9	190.6	63.9		
T+6	14	10.8	204.8	252.6	69.5		
T+7	16	12.25	210.4	389.0	77.8		
T+8	18	14.0	210.4	389.6	81.1		
T+9	20	15.25	216.0	334.3	90.1		
T+10	22	17.0	217.9	390.3	97.6		
T+11	24	18.50	219.8	457.7	109.2		
T+12+07	Fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
35							
R-Cals							

Material Identification 71-3071 B
Material Name TFE TEFLON
Specimen Number B
Specimen Weight 4.581
Date Prepared 11/23/71
Prepared By J Whelan

Date Assembled 12-16-71

059

Heavily

Test # 10
Test Stand 3
WSTF ID # 71-3071-B
Material Name TFE-Teflon

Post Test Observations:

Discoloration - From WHITE To GRAY
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H.P. Gibson

H.P. Gibson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 11
Test Stand 2
WSTF ID # 71-3072-A
Material Name TFE teflon-15% fiberglass

Date 12/30/71
Leak Check H-00_P To 299.6 T+5 297.7

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.847

Time Min.	Amperage	Voltage	Pressure H_004P PSIA	Test Vessel Temp. H_005T °F	Test Specimen Temp. H_006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	198.7	61.1	59.8		
T+1	4	2.75	198.7	71.6	59.1		
T+2	6	4.75	198.7	104.3	59.8		
T+3	8	5.75	198.7	159.0	61.8		
T+4	10	7.50	200.6	225.9	66.1		
T+5	12	9.0	202.4	307.2	70.2		
T+6	14	10.75	204.3	374.6	72.1		
T+7	16	12.50	208.0	514.5	86.8		
T+8	18	14.00	211.4	>598.7	93.7		
T+9	20	15.75	213.2	>598.7	107.9		
T+10	22	17.25	216.9	>598.7	121.3		
T+11	24	19.0	220.6	>598.7	132.9		
T+12	26	19.75	226.2	>598.7	156.8		
T+12:05	FUSED						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3072 (E)
Material Name TFE TEFLON - 15% GLASS
Specimen Number A
Specimen Weight 5.847
Date Prepared 11/23/71
Prepared by J. Whelan

Date Assembled - 12-17-71

Test # 11
Test Stand 2
WSTF ID # 71-3072-A
Material Name TFE Teflon 15% fiberglass

Post Test Observations:

Discoloration - From RED To BROWN
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H E Wilson

H.E. Wilson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 12
Test Stand 3
WSTF ID # 71-3072-B
Material Name TFE-Teflon 15% fiberglass
Date 12/30/71
Leak Check H-00 P To 300.2 T+5 300.2

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.767

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. °F H 007T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	199.2	63.9	59.1		
T+1	4	3.0	197.3	71.6	56.9		
T+2	6	4.50	199.2	99.0	56.9		
T+3	8	6.0	199.2	137.4	58.4		
T+4	10	7.50	201.0	182.9	60.3		
T+5	12	9.25	202.9	229.7	63.2		
T+6	14	10.75	204.8	272.3	68.0		
T+7	16	12.25	206.7	386.0	76.4		
T+8	18	14.0	210.4	409.2	84.0		
T+9	20	15.5	214.0	473.7	90.8		
T+10	22	17.0	216.0	525.4	100.4		
T+11	24	18.75	219.8	> 578.7	110.3		
T+12	26	20.50	225.4	> 578.7	125.8		
T+12:07	FUSED						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3072 (E)
Material Name TFE TEFLON - 15% GLASS
Specimen Number B
Specimen Weight 5.767
Date Prepared 11/23/71
Prepared by J Whelan

Date Assembled 12-17-71

063

Test # 12
Test Stand 3
WSTF ID # 71-3072-B
Material Name TFE Teflon-B% fiberglass

Post Test Observations:

Discoloration - From RED To BROWN
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY G.P. Wilson

G.P. Wilson 12/13/71 12/13/71

TPS No. 3-HYD-045(R)

REACTION PROPAGATION TEST

Test # 13
Test Stand 2
WSTF ID # 71-3073-A
Material Name Polyethylene

Date 1/3/72
Leak Check H-004P To 301.4 T+5 299.6

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.114

Time Min.	Amperage	Voltage	Pressure H 00 P PSIA	Test Vessel Temp. H 00 T °F	Test Specimen Temp. H 00 T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.5	62.5	62.5		
T+1	4	3.0	200.5	70.1	60.3		
T+2	6	4.5	200.5	92.2	60.3		
T+3	8	6.0	202.4	125.0	61.7		
T+4	10	7.5	202.4	151.8	64.6		
T+5	12	9.25	202.4	262.1	68.0		
T+6	14	11.10	207.9	295.9	74.2		
T+7	16	13.0	211.3	299.4	82.5		
T+8	18	14.50	213.2	353.9	90.0		
T+9	20	16.25	216.9	399.4	99.0		
T+9:12	FUSED						
T+11							
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
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T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3073 (E)
Material Name POLYETHYLENE
Specimen Number A
Specimen Weight 2.114
Date Prepared 11/23/71
Prepared by J Whelan

Date Assembled - 12-17-71

065

Test Stand 2
WSTF ID # 71-3073-A
Material Name POLYETHYLENE

Post Test Observations:

Discoloration - From None To
Propagation of Reaction - Yes No X

COMMENTS:

BY G E Wilson

G.E. Wilson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 14
Test Stand 3
WSTF ID # 71-3073-B
Material Name Polyethylene

Date 1/3/72
Leak Check H-00_P To 300.2 T+5 296.5

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2,126

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. H_008T °F	Test Specimen Temp. H_009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	201.0	67.3	62.5		
T+1	4	3.0	201.0	73.0	59.8		
T+2	6	4.25	201.0	94.4	59.8		
T+3	8	5.75	202.9	111.7	60.3		
T+4	10	7.25	202.9	133.0	63.2		
T+5	12	9.0	204.8	189.8	66.1		
T+6	14	10.25	206.7	312.8	71.6		
T+7	16	12.0	210.4	281.7	78.5		
T+8	18	13.25	212.3	332.1	85.4		
T+9	20	14.75	216.0	400.8	91.5		
T+10	22	16.25	217.9	461.3	99.0		
T+11	24	18.0	221.6	527.3	108.2		
T+12	26	18.75	225.4	7598.7	122.2		
T+13	28	19.25	229.1	7598.7	134.6		
T+14	30	21.25	232.9	7598.7	145.4		
T+14:05	fused						
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3073 (E)
Material Name POLYETHYLENE
Specimen Number B
Specimen Weight 2.126
Date Prepared 11/23/71
Prepared by J Whelan

067

G. E. Vilson 12/14/71   [illegible] 12/13/71

Test # 14
Test Stand 3
WSTF ID # 71-3073-B
Material Name Polyethylene

Post Test Observations:

Discoloration - From None To
Propagation of Reaction - Yes No X

COMMENTS: nichrome wire burned into 3 pieces.

BY G P Wilson

G.P. Wilson 12/13/71 RC G P Wilson 12/13/71

REACTION PROPAGATION TEST

Test # 15
Test Stand 2
STF ID # 71-3075-A
Material Name PVC

Date 1/10/72

Leak Check H-00_P To 304.9 T+5 301.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (200.5)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.043

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.6	61.1	61.8		
T+1	4	2.75	200.6	73.0	61.6		
T+2	6	4.50	200.6	109.6	62.5		
T+3	8	6.00	200.6	169.6	64.6		
T+4	10	7.90	202.4	243.8	67.3		
T+5	12	9.75	206.1	275.4	72.3		
T+6	14	11.00	208.0	365.4	80.7		
T+7	16	13.25	211.4	422.4	88.6		
T+8	18	14.50	216.9	435.1	100.5		
T+9	20	16.25	218.8	452.7	111.8		
T+10	22	17.50	222.5	489.5	121.3		
T+10.13	Fused						
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
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T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3075 E
Material Name PVC
Specimen Number 1
Specimen Weight 3.043
Date Prepared 11/23/71
Prepared By J W Nelson

069

Test # 15
Test Stand 2
WSTF ID # 71-3075-A
Material Name PVC

Post Test Observations:

Discoloration - From Black To Black
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H.E. Wilson

H.E. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 16
Test Stand 3
WSTF ID # 71-3075-B
Material Name PVC

Date 1/10/72

Leak Check H-00_P To 303.9 T+5 303.9

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (202.9)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.092

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. °F H_008T	Test Specimen Temp. °F H_009T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	4.75	202.9	64.0	61.0		
T+1	4	3.00	202.9	85.4	60.3		
T+2	6	4.50	202.9	117.7	60.3		
T+3	8	6.0	202.9	166.0	61.7		
T+4	10	8.0	204.7	229.0	63.9		
T+5	12	9.5	206.6	335.7	68.0		
T+6	14	11.0	210.3	348.8	73.7		
T+7	16	12.25	214.2	356.8	79.9		
T+8	18	13.90	216.0	417.5	86.8		
T+9	20	15.0	219.7	500.9	96.8		
T+10	22	15.50	225.3	543.5	105.0		
T+11	24	17.00	225.3	527.2	113.9		
T+12	26	17.50	229.1	560.5	126.9		
T+13	28	18.00	234.7	494.4	131.6		
T+13:11	FUSED						
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3075 E
Material Name PVC
Specimen Number B
Specimen Weight 3.092
Date Prepared 11/23/71
Prepared By J Wilson

071

G. L. Wilson 12/14/71

2.0.22 12/13/71

Test # 16
Test Stand 3
WSTF ID # 71-3075--B
Material Name PVC

Post Test Observations:

Discoloration - From Black To Black
Propagation of Reaction - Yes _____ No X

COMMENTS:

BY G. E. Wilson

G. E. Wilson 12/13/71 J. D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 17
Test Stand 2
WSTF ID # 71-2992-C
Material Name FEP Teflon

Date 1/13/72

Leak Check H-004P To 262.9 T+5 262.9
Ref. DR 3-HYD-021

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA
(196.8)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.038

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. °F H 005T	Test Specimen Temp. °F H 006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	196.8	69.4	72.3		
T+1	4	3.0	196.8	82.5	71.6		
T+2	6	4.75	196.8	128.7	71.6		
T+3	8	6.25	196.8	198.5	73.0		
T+4	10	8.25	198.7	252.6	77.0		
T+5	12	10.25	200.5	369.0	81.8		
T+6	14	12.0	203.4	482.2	88.1		
T+7	16	13.9	206.6	554.1	99.0		
T+8	18	16.0	207.9	> 598.7	106.7		
T+9	20	17.75	211.3	> 598.7	117.7		
T+10	22	19.75	213.2	> 598.7	132.3		
T+11	24	21.75	218.7	> 598.7	151.8		
T+12:28	24	21.75	218.7	> 598.7	159.7		
T+13	Fuse						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2992
Material Name FEP-Teflon
Specimen Number C
Specimen Weight 5.038 gms
Date Prepared 10-27-71
Prepared By A E Echavarry

1167-C

073

Test # 17
Test Stand 2
WSTF ID # 71-2992-C
Material Name FEP Teflon

Post Test Observations:

Discoloration - From White To Blackish White
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY G E Wilson

R.P. Neil 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 18'
Test Stand 3
WSTF ID # 71-3071-E
Material Name TFE Teflon

Date 1/13/72

Leak Check H-007P To 266.5 T+5 266.5
Ref. DR 3HYD-021

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (195.4)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.710

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. °F H_008T	Test Specimen Temp. H_009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.75	195.4	69.4	66.8		
T+1	4	3.20	197.2	86.1	66.0		
T+2	6	4.90	197.2	128.0	66.0		
T+3	8	6.50	197.2	196.7	67.3		
T+4	10	8.0	199.1	275.1	70.1		
T+5	12	10.0	201.0	364	73.7		
T+6	14	11.50	202.9	401.5	79.2		
T+7	16	13.00	206.6	> 598.7	86.1		
T+8	18	14.90	210.3	> 598.7	93.6		
T+9	20	16.30	212.2	> 598.7	105.7		
T+10	22	18.00	216.0	> 598.7	115.5		
T+11	24	20.00	214.7	> 598.7	130.9		
T+11:05	Fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3071 E
Material Name TFE TEFLON
Specimen Number C
Specimen Weight 4.710
Date Prepared 11/23/71
Prepared By J Wilson

075

J. E. Wilson 12/14/71

D.D. Lee 12/13/71

Test # 15
Test Stand 3
WSTF ID # 71-3021-C
Material Name TFE Teflon

Post Test Observations:

Discoloration - From White To Blackish White
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY J.E. Wilson

J.E. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 19
Test Stand 2
WSTF ID # 71-3073-C
Material Name Polyethylene

Date 1/13/72

Leak Check H-004P To 301.4 T+5 300.0

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (202.4)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.119

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	202.4	66.1	68.7		
T+1	4	3.0	202.4	75.7	68.7		
T+2	6	5.0	202.4	95.4	69.5		
T+3	8	6.50	204.3	93.7	72.3		
T+4	10	8.25	204.3	142.5	74.9		
T+5	12	10.50	208.0	113.2	80.0		
T+6	14	12.0	211.4	132.3	90.1		
T+7	16	14.0	213.2	133.8	96.9		
T+8	18	16.0	215.1	147.5	102.9		
T+9	20	17.80	218.8	149.0	114.8		
T+10	22	19.75	222.5	154.7	128.0		
T+11	24	19.50	228.1	165.3	143.9		
T+12	26	19.50	228.1	176.8	156.4		
T+12:13	fused		228.1	175.5	153.3		
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3073 (E)
Material Name POLYETHYLENE
Specimen Number C
Specimen Weight 2.119
Date Prepared 1/23/72
Prepared by J White

077

Test # 11
Test Stand 2
WSTF ID # 71-3073-C
Material Name Polyethylene

Post Test Observations:

Discoloration - From White To White
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY J.E. Wilson

J.E. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 20
Test Stand 3
TSTF ID # 71-3074-C
Material Name Nylon

Date 1/13/72
Leak Check H-007P To 303.9 T+5 302.1

Test Conditions:
Atmosphere Purge Helium Pressure 30 ±5 PSIG
Atmosphere Test Helium Pressure 200 ±5 PSIA (202.9)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.546

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. H_008T °F	Test Specimen Temp. H_007T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	202.9	70.2	68.0		
T+1	4	3.0	202.9	73.8	66.1		
T+2	6	4.50	202.9	91.5	64.7		
T+3	8	6.0	202.9	115.6	66.1		
T+4	10	7.2	202.9	119.1	68.0		
T+5	12	9.0	204.8	143.9	71.6		
T+6	14	10.75	210.4	151.8	77.1		
T+7	16	12.1	210.4	171.7	83.3		
T+8	18	14.0	212.3	188.5	88.6		
T+9	20	15.25	216.0	195.5	96.2		
T+10	22	16.75	219.8	178.0	105.0		
T+11	24	18.50	225.4	168.6	114.8		
T+12	26	20.0	227.2	169.2	128.8		
T+12:07	fused						
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3074
Material Name Nylon
Specimen Number C
Specimen Weight 2.546
Date Prepared 11/23/71
Prepared by J. Whelan

079

H. E. Wilson 12/14/71 — J.D.L. 12/13/71

Test Stand 3
WSTF ID # 71-3074-C
Material Name Nylon

Post Test Observations:

Discoloration - From Pale Yellow To Pale Yellow
Propagation of Reaction - Yes _____ No X

COMMENTS:

BY G.E. Wilson

G.E. Wilson 12/13/71 RD 12/13/71

REACTION PROPAGATION TEST

Test # 21
Test Stand 2
WSTF ID # 71-3198-A
Material Name Cellulose Acetate Butyrate

Date 1/13/72
Leak Check H-004P To 301.4 T+5 300.0

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (200.5)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 1.292

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.5	68.7	69.5		
T+1	4	2.90	200.5	79.2	68.0		
T+2	6	4.80	200.0	108.1	68.0		
T+3	8	6.20	202.4	153.9	70.2		
T+4	10	7.90	204.2	210.1	74.2		
T+5	12	9.80	204.2	259.1	79.2		
T+6	14	11.25	206.1	359.3	84.0		
T+7	16	13.10	207.9	446.7	90.8		
T+8	18	15.0	211.3	535.8	99.0		
T+9	20	16.8	215.0	552.1	109.6		
T+10	22	18.25	218.7	>587.9	121.5		
T+10:08	Fused						
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3198 [illegible]
MaterialName Cellulose Acetate Butyrate
Specimen Number A
Specimen Weight 1.292
Date Prepared 1-10-72
Prepared By [illegible signature]

081

Test # 21
Test Stand 2
WSTF ID # 71-3198-A
Material Name Cellulose Acetate Butyrate

Post Test Observations:

Discoloration - From Clear To Clear yellowish
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H. E. Wilson

H. E. Wilson 12/13/71 J. D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 22
Test Stand 3
WSTF ID # 71-3198-B
Date 1/13/72
Material Name Cellulose Acetate Butyrate
Leak Check H-007P To 302.1 T+5 302.1

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (202.9)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 1.294

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 007T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	202.9	71.6	69.4		
T+1	4	3.00	201.0	85.4	68.0		
T+2	6	4.25	202.9	133.0	65.7		
T+3	8	5.80	202.9	197.9	69.4		
T+4	10	7.20	202.9	286.6	71.6		
T+5	12	8.90	204.7	391.9	75.6		
T+6	14	10.60	206.6	503.7	78.5		
T+7	16	11.90	210.3	>598.7	82.5		
T+8	18	13.50	210.3	>598.7	87.9		
T+9	20	14.50	212.0	>598.7	96.1		
T+10	22	16.0	216.0	>598.7	104.2		
T+11	24	17.75	217.8	>598.7	114.8		
T+12 :08	fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
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T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3198 (I, A, E)
Material Name Cellulose Acetate Butyrate
Specimen Number B
Specimen Weight 1.294
Date Prepared 1-10-72
Prepared By [illegible signature]

08

[illegible signature] 12/1/71 [illegible] 12/13/71

Test # 22
Test Stand 3
WSTF ID # 71-3198-SB
Material Name Cellulose Acetate Butyrate

Post Test Observations:

Discoloration - From Clear To Clear yellowish
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY G E Wilson

[illegible] 12/13/71 [illegible] 12/13/71

REACTION PROPAGATION TEST

Test # HEN 23
Test Stand 2
ASTF ID # 71-3074-A
Material Name Nylon

Date 1/10/72

Leak Check H-00_P To 299.6 T+5 299.6

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (202.4)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.646

Time Min.	Amperage	Voltage	Pressure H_004P PSIA	Test Vessel Temp. °F H_005T	Test Specimen Temp. °F H_006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.6	63.9	64.9		
T+1	4	2.90	~~299.6~~ 200.6	70.9	61.8		
T+2	6	4.50	200.6	90.8	61.8		
T+3	8	6.00	202.4	122.2	63.2		
T+4	10	7.80	202.4	136.7	66.1		
T+5	12	9.50	204.3	164.0	69.5		
T+6	14	11.25	208.0	192.3	79.2		
T+7	16	12.75	211.4	187.0	83.9		
T+8	18	14.75	211.4	250.7	89.4		
T+9	20	16.25	215.1	292.3	99.0		
T+10	22	18.25	218.8	364.9	109.6		
T+11	24		222.5	458.4	124.3		
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3074
Material Name NYLON
Specimen Number A
Specimen Weight 2.646
Date Prepared 11/23/71
Prepared by J. Whelan

085

Test # LT 23 GEW
Test Stand 2
WSTF ID # 71-3074-A
Material Name Nylon

Post Test Observations:

Discoloration - From Whitish Yellow To Reddish Yellow
Propagation of Reaction - Yes _____ No X

COMMENTS:

BY W. E. Wilson

April 1971 9-12 12/13/71

REACTION PROPAGATION TEST

Test # ~~18~~ 24
Test Stand 3
WSTF ID # 71-3074-B
Material Name Nylon

Date 1/10/72

Leak Check H-00_P To 300.2 T+5 300.2

Test Conditions:

Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA (201.0)

Test Sample Description:

Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.620

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.50	201.0	63.9	59.1		
T+1	4	3.25	202.9	66.8	57.6		
T+2	6	4.80	202.9	74.9	57.4		
T+3	8	6.25	202.9	84.7	59.8		
T+4	10	8.0	204.8	86.1	62.5		
T+5	12	9.8	206.7	88.6	66.8		
T+6	14	11.25	210.4	99.0	74.2		
T+7	16	12.75	212.3	117.7	79.2		
T+8	18	14.25	214.1	122.9	84.7		
T+9	20	16.25	216.0	136.7	94.4		
T+10	22	19.50	219.8	146.1	104.3		
T+11	26	21.25	225.4	160.8	121.5		
T+12	28	22.25	230.9	221.0	136.0		
T+13	30	22.50	234.7	244.3	151.8		
T+14	32		240.3	284.1			
T+14:03	fused						
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3074
Material Name NYLON
Specimen Number B
Specimen Weight 2.620
Date Prepared 11/23/71
Prepared by: J. Whelan

087

G. L. Vilson 12/13/71 — G. D. Lu 12/13/71

Test # 48 24 4pm
Test Stand 3
WSTF ID # 71-3074-B
Material Name Nylon

Post Test Observations:

Discoloration - From White/Tish Yellow To White/Tish Yellow
Propagation of Reaction - Yes _____ No X

COMMENTS:

BY H.C. Wilson

H.C. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 25
Test Stand 2
WSTF ID # 71-2977-C
Material Name RTV Silicone Rubber

Date 1/27/72

Leak Check H-00_P To 297.7 T+5 295.9

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.712

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. °F H_005T	Test Specimen Temp. H_006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	200.6	58.4	59.1		
T+1	4	2.75	200.6	61.8	58.4		
T+2	6	4.75	202.4	71.6	59.1		
T+3	8	6.00	202.4	94.7	60.3		
T+4	10	8.00	204.3	113.9	63.2		
T+5	12	10.00	209.0	133.8	68.0		
T+6	14	12.00	209.8	173.0	74.9		
T+7	16	13.75	211.4	157.5	85.4		
T+8	18	15.50	213.2	231.4	94.7		
T+9	20	17.00	216.9	270.1	103.6		
T+10	22	19.00	218.8	298.1	115.5		
T+10.13	fused		218.8	292.4	119.8		
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2977
Material Name RTV Silicone Rubber
Specimen Number C
Specimen Weight 4.712 gms
Date Prepared 10-27-71
Prepared By [illegible]

089

Test # 25
Test Stand 2
WSTF ID # 71-2797-C
Material Name RTV Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY H E Gibson

H.E. Gibson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 26
Test Stand 3
WSTF ID # 71-2977-D
Material Name RTV Silicone Rubber

Date 1/27/72
Leak Check H-00_P To 298.3 T+5 296.5

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.1508

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 009T °F	Magnetic Tape	
						Start	Stop
R-Cals							
T+0	2	1.50	201.0	59.8	56.9		
T+1	4	3.00	201.0	62.5	56.9		
T+2	6	4.50	201.0	69.5	56.9		
T+3	8	6.00	202.9	84.7	59.1		
T+4	10	7.80	202.9	102.2	61.1		
T+5	12	9.25	204.8	122.9	63.9		
T+6	14	10.75	206.7	147.6	69.5		
T+7	16	12.00	210.4	172.3	75.7		
T+8	18	14.10	210.4	202.3	80.7		
T+9	20	15.75	214.1	181.8	91.5		
T+10	22	17.25	217.9	246.1	100.5		
T+11	24	19.00	221.6	274.5	107.9		
T+11:50	fused		225.4	291.7	113.2		
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2977
Material Name RTV Silicone Rubber
Specimen Number D
Specimen Weight 4.508 gms
Date Prepared 10-27-71
Prepared By R. E. Alvarez

091

Test # 26
Test Stand 3
WSTF ID # 71-2977-9
Material Name RTV Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY [signature]

RE

[signature] 12/13/71

REACTION PROPAGATION TEST

Test # 27
Test Stand 2
WSTF ID # 71-3071-E
Material Name TFE Teflon

Date 1/27/72
Leak Check H-004P To 297.7 T+5 297.7

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (2005)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.251

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 006T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	198.7	58.4	56.2		
T+1	4	2.80	198.7	74.9	56.2		
T+2	6	4.25	200.6	115.6	56.9		
T+3	8	6.00	200.6	191.8	59.0		
T+4	10	7.80	202.4	273.2	61.8		
T+5	12	9.50	204.3	348.8	65.4		
5:13	fused						
T+7							
T+8							
T+9							
T+10							
T+11							
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3071 (Test E)
Material Name TFE TEFLON
Specimen Number E
Specimen Weight 4.251 grams
Date Prepared 1-17-72
Prepared By R E Schwartz

Test # 27
Test Stand 2
WSTF ID # 71-3021-E
Material Name TFE Teflon

Post Test Observations:

Discoloration - From White To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY G E Wilson

G.E. Wilson 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 28
Test Stand 2
WSTF ID # 71-3070-C
Material Name Viton A

Date 2/14/72

Leak Check H-004P To 277.7 T+5 277.7

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA ~~(202.4)~~ (202.4)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.323

Time Min.	Amperage	Voltage	Pressure H_004P PSIA	Test Vessel Temp. °F H_005T	Test Specimen Temp. °F H_006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.0	202.4	59.8	60.3		
T+1	4	2.8	202.4	73.8	59.8		
T+2	6	4.1	202.4	117.7	61.1		
T+3	8	5.5	204.3	166.7	62.5		
T+4	10	7.5	204.3	232.7	64.7		
T+5	12	9.0	207.9	341.2	71.6		
T+6	14	10.5	209.8	360.0	73.8		
T+7	16	12.0	213.2	392.7	87.9		
T+8	18	13.0	215.1	443.7	91.5		
T+9	20	14.5	216.9	494.4	96.9		
T+9:35	fused						
T+11							
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3070
Material Name VITON A
Specimen Number C
Specimen Weight 4.323
Date Prepared 11/23/71
Prepared By J Wilson

095

Test # 28
Test Stand 2
WSTF ID # 71-3070-C
Material Name Viton A

Post Test Observations:

Discoloration - From Black To Black
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H E Wilson

H.E. Wilson 12/13/71 F.D. Lee 12/13/71

REACTION PROPAGATION TEST

Test # 28
Test Stand 3
WSTF ID # 71-3075-D
Material Name PVC

Date 2/14/72

Leak Check H-007P To 298.3 T+5 298.3

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (201.0)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.005

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. H 007T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.4	201.0	61.8	59.0		
T+1	4	3.0	201.0	73.8	59.0		
T+2	6	4.5	202.9	99.0	59.8		
T+3	8	6.0	202.9	127.9	60.3		
T+4	10	7.5	202.9	179.3	61.8		
T+5	12	9.0	204.8	263.5	64.7		
T+6	14	10.5	206.7	297.4	66.8		
T+7	16	12.2	210.4	471.5	70.9		
T+8	18	13.8	212.3	421.7	74.2		
T+9	20	15.0	214.1	453.3	79.2		
T+10	22	15.9	216.0	478.6	83.3		
T+11	24	16.9	219.9	527.3	88.6		
T+12	26	18.0	219.8	562.6	94.7		
T+13	28	18.1	221.6	566.2	99.0		
T+14	30	18.1	225.4	474.9	101.5		
T+15	32	—	227				
T+15.05	fused						
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3075 E
Material Name PVC
Specimen Number D
Specimen Weight 3.005
Date Prepared 11/23/71
Prepared by: J Whelan

097

Test # 29
Test Stand 3
WSTF ID # 71-3075-D
Material Name PVC

Post Test Observations:

Discoloration - From Black To Black
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY Gerald E. Wilson

G.E. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 30
Test Stand 2
JSTF ID # 71-3198-C
Material Name Cellulose Acetate Butyrate

Date 2/14/72
Leak Check H-004P To 303.0 T+5 301.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (200.5)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 1.218

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.2	198.7	62.5	63.2		
T+1	4	3.0	198.7	71.6	61.7		
T+2	6	4.3	198.7	92.2	62.5		
T+3	8	6.0	198.7	115.5	64.6		
T+4	10	7.5	200.5	167.8	66.8		
T+5	12	9.2	202.4	171.7	76.3		
T+6	14	11.0	204.2	249.2	76.3		
T+7	16	13.0	206.1	264.7	81.8		
T+8	18	14.0	211.3	264.3	90.0		
T+9	20	14.8	211.3	273.2	97.5		
T+10	22	16.1	215.0	281.5	105.0		
T+11	24	17.5	218.7	285.3	114.8		
T+12	26	17.9	222.5	294.4	125.7		
T+13	28	18.2	224				
T+13:35	fused						
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							099
T+34							
T+35							
R-Cals							

Material Identification 71-3198 (Test E)
Material Name Cellulose Acetate Butyrate
Specimen Number C
Specimen Weight 1.218
Date Prepared 1-10-72
Prepared By A E Chavez

Test # 30
Test Stand 2
WSTF ID # 71-3178-C
Material Name Cellulose Acetate Butyrate

Post Test Observations:

Discoloration - From Clear To Clear Yellowish
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY G.E. Wilson

H.C. [illegible] 12/13/71 [illegible] 12/13/71

REACTION PROPAGATION TEST

Test # 31
Test Stand 2
WSTF ID # 71-2978-C
Material Name PRC Polyurethane

Date 2/22/72

Leak Check H-004P To 299.6 T+5 299.6

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.603

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. °F H 005T	Test Specimen Temp. °F H 006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals	2	1.0	198.7	61.7	60.3		
T+0	4	2.5	200	90.7	61.0		
T+1	6	4.3	200.5	142.5	61.7		
T+2	8	6.0	200.5	221.2	63.2		
T+3	10	7.5	202.4	328.0	66.0		
T+4	12	9.0	204.2	388.8	71.6		
T+5	14	11.0	206.1	548.7	75.6		
T+6	16	12.8	207.9	>598	80.0		
T+7	18	15.0	211.3	>598	86.8		
T+8	20	16.2	213.2	>598	94.7		
T+9	22	18.0	215	>598	102.8		
T+10	24	16.0	218	>598	113.9		
T+11	26	17.5	220	>598	118.4		
T+12	28	19.0	224	>598	128.7		
T+13	30	20.5	226	>598	141.0		
T+14:05	fused						
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2978
Material Name PRC Polyurethane
Specimen Number C
Specimen Weight 3.603 gms
Date Prepared 10-27-71
Prepared By [illegible]

Test # 31
Test Stand 2
WSTF ID # 71-2978-C
Material Name PBC Polyurethane

Post Test Observations: Clear
Discoloration - From Amber Yellow To Same
Propagation of Reaction - Yes _____ No X

COMMENTS:

BY H.E. Wilson

H.E. Wilson 12/13/71 2nd 12/13/71

REACTION PROPAGATION TEST

Test # 32
Test Stand 3
WSTF ID # 71-3072-C
Date 2/14/72
Material Name TFE Teflon 15% Glass Leak Check H-007P To 303.9 T+5 303.9

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.582

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. H 002T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	201.0	77.0	73.0		
T+1	4	3.0	201.0	95.4	73.0		
T+2	6	4.3	202.9	142.5	73.7		
T+3	8	5.9	202.9	195.5	74.9		
T+4	10	7.5	202.9	263.6	77.0		
T+5	12	9.0	204.7	354.2	79.2		
T+6	14	10.5	208.5	387.4	84.6		
T+7	16	12.0	210.3	481.5	91.0		
T+7:30	fused						
T+9							
T+10							
T+11							
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3072 (E)
Material Name TFE TEFLON - 15% GLASS
Specimen Number C
Specimen Weight 5.582
Date Prepared 1/23/71
Prepared By J Whelan

10.

Test # 32
Test Stand 3
WSTF ID # 71-3072-C
Material Name Teflon TFE 15% Glass

Post Test Observations:

Discoloration - From White To Black

Propagation of Reaction - Yes X No

COMMENTS:

BY G E Wilson

[illegible] 12/13/71 [illegible] 12/13/71

REACTION PROPAGATION TEST

Test # 33
Test Stand 2
WSTF ID # 71-3071-D
Material Name TFE Teflon

Date 3/6/72

Leak Check H-004P To 303.0 T+5 303.0

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA
200.5

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.560

Time Min.	Amperage	Voltage	Pressure H_004P PSIA	Test Vessel Temp. °F H_005T	Test Specimen Temp. H_006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.2	198.7	71.6	71.6		
T+1	4	3.0	200.5	91.5	72.3		
T+2	6	4.5	200.5	141.0	73.0		
T+3	8	6.0	202.2	212.0	74.9		
T+4	10	8.0	202.2	298.7	77.8	140120	T+4:05
T+5	12	9.8	204.2	356.8	81.8		
T+5:20	fused					140243	fused
T+7							140333
T+8							
T+9							
T+10							
T+11							
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3071 E
Material Name TFE TEFLON
Specimen Number D
Specimen Weight 4.560
Date Prepared 11/23/71
Prepared By J Whelan

Test # 33
Test Stand 2
WSTF ID # 71-3021-D
Material Name TFE Teflon

Post Test Observations:

Discoloration - From White To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY JE Wilson

REACTION PROPAGATION TEST

Test # 34
Test Stand 3
WSTF ID # 71-3075-C
Material Name PVC

Date 3/6/72

Leak Check H-007P To 302.1 T+5 302.1

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4 x 2"
Sample Weight grams 3.063

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. °F H_008T	Test Specimen Temp. °F H_007T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	199	83.2	74.5		
T+1	4	3.0	199	99.7	76.3		
T+2	6	4.2	199	138.8	76.3		
T+3	8	6.0	199	186.8	77.0		
T+4	10	7.2	201	183.6	79.9		
T+5	12	9.0	202	285.9	81.8		
T+6	14	10.2	204	370	86.8		
T+7	16	12.0	206	431.3	92.2		
T+8	18	13.5	210	514.4	99.0	142605	
T+9:10	20	15.0	212	> 598.7	105.0		
T+10	22	16.0	214	> 598.7	110.3		
T+11	24	17.0	216	> 598.7	119.1		
T+12	26	18.2	219	> 598.7	127.1		
T+12:10	fused					143006	fused 143056
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3075 E
Material Name PVC
Specimen Number C
Specimen Weight 3.063
Date Prepared 11/23/71
Prepared by J. W. Nelson

Test # 34
Test Stand 3
WSTF ID # 71-3075-C
Material Name PVC

Post Test Observations:

Discoloration - From Black To Black
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY JE Wilson

REACTION PROPAGATION TEST

Test # 35
Test Stand 2
TF ID # 71-3072-D
Material Name TFE Teflon -15% Glass

Date 3/7/72
Leak Check H-004P To 299.6 T+5 299.6

Test Conditions:
Atmosphere Purge He Pressure 30 ± 5 PSIG
Atmosphere Test H_2 Pressure 200 ± 5 PSIA (202.4)

Test Sample Description:
Sample Size L x W x H in. ¼" x ¼" x 2"
Sample Weight grams 5.656

Time Min.	Amperage	Voltage	Pressure H-004P PSIA	Test Vessel Temp. H-005T °F	Test Specimen Temp. H-006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.1	202.4	70.1	68.7		
T+1	4	3.1	202.4	87.9	68.0		
T+2	6	4.5	202.4	146.1	68.7		
T+3	8	6.0	202.4	207.8	70.1		
T+4	10	8.0	204.2	283.2	72.3		
T+5	12	9.8	206.1	336.4	76.3	093544	
T+6	14	11.2	211.3	370.7	88.6		
T+7	16	13.0	211.3	490.3	87.9		
T+8	fixed					093802	fixed
T+9							093840
T+10							
T+11							
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3072 (E)
Material Name TFE TEFLON - 15% GLASS
Specimen Number D
Specimen Weight 5.656
Date Prepared 11/23/71
Prepared By J Whelan

Test # 35
Test Stand 2
WSTF ID # 71-3072-b
Material Name TFE Teflon - 15% Glass

Post Test Observations:

Discoloration - From white To black
Propagation of Reaction - Yes X No

COMMENTS:

BY H.P. Wilson

H.P. Wilson 12/13/71 F.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 36
Test Stand 3
MTF ID # 71-2992-D
Material Name FEP Teflon

Date 3/7/72
Leak Check H-007P To 300.2 T+5 300.2

Test Conditions:
Atmosphere Purge He Pressure 30 ± 5 Psig
Atmosphere Test H_2 Pressure ± 5 psia (204.7)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 5.316

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.2	204.7	80.6	76.3		
T+1	4	2.9	204.7	96.1	77.0		
T+2	6	4.1	204.7	130.9	77.8		
T+3	8	5.9	206.6	183.6	79.2		
T+4	10	7.1	206.6	242.7	81.1		
T+5	12	8.9	210.3	309.3	83.9		
T+6	14	10.2	210.3	408.4	87.9		
T+7	16	12.0	212.2	463.5	93.6		
T+8	18	13.5	216.0	571.8	99.7		
T+9	20	15.1	217.8	> 598.7	106.4		
T+10	22	17.0	219.7	> 598.7	113.1		
T+11	24	18.5	225.3	> 598.7	121.2		
T+12 :05	fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2992
Material Name FEP-Teflon
Specimen Number D
Specimen Weight 5.316 gms
Date Prepared 10-27-71
Prepared By C.E. Chavez

G.P. Vibo 12/14/71 — G.D. [signature] 12/13/71

Test # 26
Test Stand 3
WSTF ID # 71-2992-D
Material Name FEP Tiflon

Post Test Observations:

Discoloration - From White To Black + Flaky White
Propagation of Reaction - Yes X No

COMMENTS:

BY H E Wilson

H.E. Wilson 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 37
Test Stand 2
STF ID # 71-3074-D
Material Name Nylon

Date 3/7/72

Leak Check H-004P To 301.7 T+5 301.7

Test Conditions:
Atmosphere Purge He Pressure 30 ± 5 PSIG
Atmosphere Test H2 Pressure 200 ± 5 PSIA
204.2

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.559

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.8	204.3	80.0	79.2		
T+1	4	3.4	204.3	~~80.0~~ 90.8	79.2		
T+2	6	5.0	206.1	120.6	80.0		
T+3	8	6.5	206.1	160.9	81.8		
T+4	10	8.2	208.0	192.0	85.7		
T+5	12	10.2	211.4	267.3	88.6		
T+6	14	12.0	211.4	313.6	94.4		
T+7	16	14.0	213.2	375.7	101.5		
T+8	18	16.0	216.9	514.4	107.9		
T+9	20	17.5	218.8	>598.7	117.7		
T+10	22	19.0	222.5	>598.7	127.9		
T+10'05	fused						
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3074
Material Name NYLON
Specimen Number D
Specimen Weight 2.559
Date Prepared 4/23/71
Prepared by J. W. Tillar

J. E. Wilson 12/14/71

2.0.12 12/13/71

Test # 37
Test Stand 2
WSTF ID # 71-3077-D
Material Name Nylon

Post Test Observations:

Discoloration - From White Yellow To Yellow
Propagation of Reaction - Yes ✓ No X

COMMENTS:

BY J. D. Wilson

REACTION PROPAGATION TEST

Test # 38
Test Stand 3
STF ID # 71-2992-E
Material Name FEP Teflon

Date 3/7/72

Leak Check H-007P To 300.2 T+5 300.2

Test Conditions:
Atmosphere Purge He Pressure 30 ± 5 PSIG
Atmosphere Test H_2 Pressure 200 ± 5 PSIA
~~200~~ 204.7

Test Sample Description:
Sample Size L x W x H in. 1/4" x ~~3~~ 1/4" x 2"
Sample Weight grams 5.146

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 007T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	202.9	87.9	82.5		
T+1	4	3.0	202.9	99.0	81.1		
T+2	6	4.2	202.9	140.3	81.8		
T+3	8	5.9	202.9	192.4	82.5		
T+4	10	7.2	202.9	235.5	84.7		
T+5	12	9.0	202.9	280.2	87.6		
T+6	14	10.5	202.9	359.6	91.5		
T+7	16	12.0	204.8	452.6	96.1		
T+8	18	13.5	206.7	498.0	102.9		
T+9	20	15.5	210.4	>598.7	108.9	112348	
T+10	22	15.5	210.4	>598.7	115.6		
T+11	24	17.0*	210.4	>598.7	120.6		
T+12	26	—	212.5	>598.7	127.9		
T+13 sec	fused					112640	
T+14							112730
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-2992 (1 of 5)
Material Name FEP TEFLON
Specimen Number E
Specimen Weight 5.146 grams
Date Prepared 1-17-72
Prepared By [signature]

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Rec'd

Test # 38
Test Stand 3
WSTF ID # 71-2992-E
Material Name FEP Teflon

Page 88 of
TPS No. 3-HYD-045(R)

Post Test Observations:

Discoloration - From White To Black + Flaky White
Propagation of Reaction - Yes X No

COMMENTS:

BY H E Wilson

C3

REACTION PROPAGATION TEST

Test # 39
Test Stand 2
STF ID # 71-3070-D
Material Name Viton A

Date 3/8/72

Leak Check H-004P To 30.4 T+5 30.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (200.6)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.004

Time Min.	Amperage	Voltage	Pressure H_004P PSIA	Test Vessel Temp. °F H_005T	Test Specimen Temp. °F H_006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.2	200.6	68.0	67.3		
T+1	4	3.0	200.6	86.1	68.0		
T+2	6	4.2	200.6	131.6	68.7		
T+3	8	5.5	202.4	188.7	71.6		
T+4	10	7.5	202.4	247.4	73.8		
T+5	12	8.9	206.1	313.8	79.2		
T+6	14	10.2	211.4	382.1	86.1	105939	
T+7	16	11.5	211.4	416.7	93.7		
8	18	13.0	211.4	494.4	99.7		
9	20	14.2	215.1	568.9	111.0		
T+9.50	fused					110325	
T+11							110430
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
33							
34							
T+35							
R-Cals							

Material Identification 71-3070
Material Name VITON A
Specimen Number D
Specimen Weight 4.004
Date Prepared 11/23/71
Prepared By J. W. Nelan

Bomb SD-17
Stand #2

Test Stand 2
WSTF ID # 71-3070-D
Material Name Viton A

Post Test Observations:

Discoloration - From Black To Black
Propagation of Reaction - Yes X No

COMMENTS: Very Brittle in Heated Zone.

BY G E Wilson

G.E. Wilson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 40
Test Stand 3
STF ID # 71-2978-P
Material Name PRC Polyurethane

Date 3/8/72
Leak Check H-007P To 302.1 T+5 302.1

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.509

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	202.9	87.9	81.8		
T+1	4	3.0	202.9	101.2	81.1		
T+2	6	4.5	202.9	129.5	81.8		
T+3	8	6.0	201.8	158.99	83.3		
T+4	10	7.5	206.7	187.3	86.8		
T+5	12	9.0	206.7	193.6	90.8		
T+6	14	10.5	210.9	216.9	94.7		
T+7	16	12.2	210.7	268.7	99.7		
8	18	14.0	212.3	307.3	105.0		
9	20	15.9	214.1	349.9	105.8		
T+10	22	17.1	217.9	373.7	121.3		
T+11	24		218.8	551.4	130.9		
T+11.05	Fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
32							
33							
+34							
T+35							
R-Cals							

Material Identification 71-2978
Material Name PRC Polyurethane
Specimen Number P
Specimen Weight 3.509
Date Prepared 10-27-71
Prepared By [illegible]

Bomb S/N - 14
Stand # 3

Test # 40
Test Stand 3
WSTF ID # 71-2978-D
Material Name PBC Polyurethane

Post Test Observations:

Discoloration - From Clear Amber Yellow To Same
Propagation of Reaction - Yes ______ No X

COMMENTS:

BY G.E. Wilson

REACTION PROPAGATION TEST

Test # 41
Test Stand 2
TF ID # 71-3073-D
Material Name ~~Polyurethane~~ Polyethylene

Date 3/8/72
Leak Check H-004P To 297.7 T+5 297.7

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (198.7)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.126

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.2	196.8	79.2	78.5		
T+1	4	3.0	196.8	96.1	78.5		
T+2	6	4.8	196.8	142.5	79.2		
T+3	8	6.0	198.7	219.3	81.1		
T+4	10	8.0	198.7	299.1	83.2		
T+5	12	9.5	200.5	440.2	87.9		
T+6	14	11.2	202.4	522.9	93.6		
T+7	16	13.3	206.1	>598.7	99.7		
T+8	18	15.0	207.9	>598.7	107.2		
T+9	20	16.9	211.3	>598.7	117.8		
T+10	22	18.5	213.2	>598.7	125.0		
T+10:10	fused						
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3073 (E)
Material Name POLYETHYLENE
Specimen Number D
Specimen Weight 2.126
Date Prepared 11/23/71
Prepared by J Wheeler

STAND #2
S/N 23

Test # 41
Test Stand 2
WSTF ID # 71-3073-D
Material Name Polyurethane

Post Test Observations:

Discoloration - From White To White
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY H.P. Wilson

H.P. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 42
Test Stand 3
TF ID # 71-3198-D
Material Name Cellulose Acetate Butyrate
Date 3/8/72
Leak Check H-007P To 300.2 T+5 300.2

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 1.307

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	204.8	79.9	74.9		
T+1	4	3.0	204.8	93.6	74.9		
T+2	6	4.3	206.1	111.0	75.6		
T+3	8	6.0	206.1	137.4	77.0		
T+4	10	7.3	208.5	189.2	79.2		
T+5	12	9.1	210.4	188.4	81.8		
T+6	14	10.4	210.4	242.7	85.4		
T+7	16	12.0	212.3	281.5	88.6		
T+8	18	13.8	216.0	337.8	93.6		
T+9	20	15.5	217.9	363.9	99.0		
T+10	22	17.2-15.5	219.8	401.8	106.4	133824	
T+11	24	170°	221.6	356	110.0		
T+12	26	18.5-17.5	225.4	376.3	119.1		
T+13	28	18.8	227.2	393.5	125.0		
T+14	30	18.8	230.99	368.3	134.4		
T+15	32	20.0	232.9	391.3	141.0		
T+16	34	21.5	236.6	434.4	151.8		
T+17	Fused					134423	
T+18							134524
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3198 (Lot F)
Material Name Cellulose Acetate Butyrate
Specimen Number D
Specimen Weight 1.307
Date Prepared 1-10-72
Prepared By [signature]

STAND #3
S/N 47

Test # 42
Test Stand 3
WSTF ID # 71-3198-D
Material Name Cellulose Acetate Butyrate

Post Test Observations:

Discoloration - From Clear To Clear Yellowish
Propagation of Reaction - Yes ______ No X

COMMENTS:

BY G.E. Wilson

[illegible]

REACTION PROPAGATION TEST

Test # 43
Test Stand 2
WSTF ID # 71-3073-E
Material Name Polyethylene

Date 3/15/72
Leak Check H-004P To 303.0 T+5 304.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (2001.5)

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 1.850

Time Min.	Amperage	Voltage	Pressure H-004P PSIA	Test Vessel Temp. °F H-005T	Test Specimen Temp. °F H-006T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.75	200.6	66.3	66.8		
T+1	4	3.0	200.6	72.3	66.8		
T+2	6	5.0	200.6	81.8	68.0		
T+3	8	6.5	202.4	93.7	70.2		
T+4	10	8.0	202.4	101.5	73.0		
T+5	12	10.0	204.3	123.5	77.8		
T+6	14	11.6	206.1	134.5	84.0		
T+7	16	13.2	209.8	139.6	93.7	101921	
T+8	18	15.0	211.4	173.0	99.7		
T+9	20	15.5	213.2	244.6	106.5		
T+10	22	17.2	216.9	319.8	114.8		
T+11	24	19.0	218.8	415.8	125.8		
T+11.7	fused					102322	
T+13							102406
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3073 (Test E)
Material Name POLYETHYLENE
Specimen Number E
Specimen Weight 1.850 grams
Date Prepared 1-17-72
Prepared By [illegible]

5/N 14
5 STAND #2

125

Test # 93
Test Stand 2
WSTF ID # 71-3073-E
Material Name Polyethylene

Post Test Observations:

Discoloration - From White To White
Propagation of Roaction - Yes ____ No X

COMMENTS:

BY H E Wilson

REACTION PROPAGATION TEST

Test # 44
Test Stand 3
WSTF ID # 72-3393-A
Material Name Silicone Rubber

Date 3/15/72
Leak Check H-007P To 305.8 T+5 302.1

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA
197.2

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 3.622

Time Min.	Amperage	Voltage	Pressure H_007P PSIA	Test Vessel Temp. H_008T °F	Test Specimen Temp. H_009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	197.3	84.7	78.5		
T+1	4	3.0	195.4	94.7	79.2		
T+2	6	4.5	193.6	119.1	80.0		
T+3	8	5.75	193.6	160.4	81.1		
T+4	10	7.20	191.7	210.2	83.4		
T+5	12	8.9	191.7	266.8	86.8		
T+6	14	10.5	191.7	307.3	90.1		
T+7	16	12.0	193.6	366.0	99.0		
T+8	18	13.8	193.6	410.6	105.0		
T+9	20	15.2	193.6	467.9	111.0		
T+10	22	17.0	195.4	503.7	119.9		
T+11	24	18.5	197.3	541.5	128.8		
T+11:54	fused		197.3	578.2	138.2		
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

MATERIAL IDENTIFICATION 72-3393
MATERIAL NAME Silicone Rubber
SPECIMEN NUMBER A
SPECIMEN WEIGHT 3.622 GRAMS
DATE PREPARED 3-13-72
PREPARED BY A E Chavez
STAND #3
S/N - 10

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Test # 94
Test Stand 3
WSTF ID # 72-3393-A
Material Name Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY H E Wilson

REACTION PROPAGATION TEST

Test # 45
Test Stand 2
WSTF ID # 71-2977-E
Material Name Silicone Rubber

Date 3/15/72

Leak Check H-004P To 301.4 T+5 301.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA · 204.2

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.973

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape	
						Start	Stop
R-Cals							
T+0	2	1.0	202.4	67.3	67.3		
T+1	4	2.7	202.4	76.3	67.3		
T+2	6	4.1	204.2	105.0	68.0		
T+3	8	5.8	204.2	147.5	70.1		
T+4	10	7.2	206.1	212.6	73.0		
T+5	12	9.0	207.9	242.7	76.3		
T+6	14	10.5	211.3	291.6	83.2		
T+7	16	12.25	213.2	405.8	95.4		
T+8	18	14.0	215.0	500.6	102.1	131519	
T+9	20	15.5	218.7	508.0	111.7		
T+10	22	17.25	220.6	543.5	122.8		
T+11	24	19.10	224.3	573.7	134.5		
T+12 :10	fused					131823	
T+13							131913
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

MATERIAL IDENTIFICATION 71-2977
MATERIAL NAME RTV Silicone Rubber
SPECIMEN NUMBER E
SPECIMEN WEIGHT 2.973 GRAMS
DATE PREPARED Mar 2, 1972
PREPARED BY A E Chavez

STAND #2
S/N 6

H. L. Wilson 12/14/71

2.0 [illegible] 12/13/71

Test # 93
Test Stand 2
WSTF ID # 71-2977-E
Material Name Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY G E Wilson

G.E. Wilson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 46
Test Stand 3
NSTF ID # 71-3074-E
Material Name Nylon

Date 3/15/72

Leak Check H-007P To 303.9 T+5 302.1

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 2.383

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 007T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.6	202.9	76.3	71.6		
T+1	4	3.0	202.9	87.9	71.6		
T+2	6	4.5	202.9	113.9	71.6		
T+3	8	6.0	206.6	145.3	73.5		
T+4	10	7.5	208.5	182.4	74.9		
T+5	12	9.0	210.3	187.4	78.5		
T+6	14	10.6	210.3	199.8	81.8		
T+7	16	12.1	212.2	244.5	87.5		
T+8	18	14.0	216.0	309.2	94.3	123834	
T+9	20	15.5	217.8	367.5	99.7		
T+10	22	17.0	219.7	406.7	105.7		
T+11	24	18.8	221.6	474.3	113.1		
T+12	26	20.5	225.3	557.6	123.6		
T+12.5	Fused					134233	
T+14							134306
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

Material Identification 71-3074 (Unit E)
Material Name NYLON
Specimen Number E
Specimen Weight 2.383 grams
Date Prepared 1-17-72
Prepared By [illegible]

STAND #3
S/N 3

Test # 76
Test Stand 3
WSTF ID # 71-3074-E
Material Name Nylon

Post Test Observations:

Discoloration - From White To Yellowish White
Propagation of Reaction - Yes ____ No X

COMMENTS:

BY G.E. Wilson

G.E. Wilson 12/13/71 12/13/71

REACTION PROPAGATION TEST

Test # 47
Test Stand 2
WSTF ID # 72-3393-B
Material Name Silicone Rubber

Date 3/15/72
Leak Check H-004P To 301.4 T+5 301.4

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA
202.4

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4 x 2"
Sample Weight grams 3.675

Time Min.	Amperage	Voltage	Pressure H 004P PSIA	Test Vessel Temp. H 005T °F	Test Specimen Temp. H 006T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.25	198.7	73.7	73.7		
T+1	4	2.90	198.7	88.6	73.7		
T+2	6	4.50	200.5	126.4	74.2		
T+3	8	6.0	200.5	191.7	76.3		
T+4	10	7.8	202.4	268.0	78.5		
T+5	12	9.8	214.2	255.1	82.5		
T+6	14	11.8	206.1	446.7	90.0		
T+7	16	13.1	209.8	535.0	101.1		
T+8	18	14.8	211.3	> 598.7	105.7		
T+9	20	16.8	213.2	> 598.7	115.5	143718	
T+10	22	18.4	216.9	> 598.7	128.7		
T+10:16	fused		218.7	> 598.7	133.0	143830	
T+12							143930
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

MATERIAL IDENTIFICATION 72-3393
MATERIAL NAME Silicone Rubber
SPECIMEN NUMBER B
SPECIMEN WEIGHT 3.675 GRAMS
DATE PREPARED 3-13-72
PREPARED BY A.E. Chavez

S/N 23
STAND #2

133

H.L. Wilson 12/13/71 J.D. [illegible] 12/13/71

Test # 47
Test Stand 2
WSTF ID # 72-3393-B
Material Name Silicone Rubber

Post Test Observations:

Discoloration - From Red To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY H.P. Wilson

H.P. Wilson 12/13/71 J.D. Smith 12/13/71

REACTION PROPAGATION TEST

Test # 48
Test Stand 3
WSTF ID # 71-3072-E
Material Name TFE Teflon-15% Glass

Date 3/15/72
Leak Check H-007P To 302.1 T+5 300.2

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA 202.9

Test Sample Description:
Sample Size L x W x H in. 1/4" x 1/4" x 2"
Sample Weight grams 4.712

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 009T °F	Magnetic Tape	
						Start	Stop
R-Cals							
T+0	2	1.8	202.9	74.9	68.0		
T+1	4	3.0	202.9	92.9	68.7		
T+2	6	4.25	202.9	138.8	68.7		
T+3	8	5.80	202.9	194.2	70.1		
T+4	10	7.50	204.7	280.8	72.3	144951	
T+5	12	9.0	204.7	364.7	74.9		
T+6	14	10.5	208.5	361.4	79.2		
T+7	16	12.0	210.3	510.9	86.8		
T+8	18	14.0	212.2	> 598.7	94.7		
T+9	20	15.3	216.0	> 598.7	104.3		
T+10	22	17.0	217.	> 598.7	113.1		
T+10.18	fused					145602	
T+12							145636
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

MATERIAL IDENTIFICATION 71-3072
MATERIAL NAME TFE Teflon - 15% Glass
SPECIMEN NUMBER E
SPECIMEN WEIGHT 4.712 GRAMS
DATE PREPARED Mar 2, 1972
PREPARED BY A E Chavez

S/N 5
STAND #3

H. S. Wilson 12/1/71

135

Test # 48
Test Stand 3
WSTF ID # 71-3072-E
Material Name TFE Teflon - 15% glass

Post Test Observations:

Discoloration - From Reddish Brown To Black
Propagation of Reaction - Yes X No

COMMENTS:

BY G E Wilson

G.E. Wilson 12/13/71 J D Smith 12/13/71

REACTION PROPAGATION TEST

Test # 49
Test Stand 3
WSTF ID # N/A
Material Name Nichrome Wire

Date 3/27/72

Leak Check H-007P To 300.2 T+5 300.2

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (201.0)

Test Sample Description:
Sample Size L x W x H in. N/A x x
Sample Weight grams N/A

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	199.1	77.8	73.0		
T+1	4	3.0	197.2	97.5	73.7		
T+2	6	4.5	197.2	161.6	74.9		
T+3	8	5.8	197.2	175.5	76.3		
T+4	10	7.2	197.2	225.4	79.2		
T+5	12	8.5	197.2	288.5	81.8		
T+6	14	10.2	197.2	345.9	85.4		
T+7	16	11.9	197.2	433.6	90.0		
T+8	18	13.8	199.1	529.3	94.7		
T+9	20	15.0	201.0	> 598.7	101.1		
T+10	22	16.8	201.0	> 598.7	107.9		
T+11	24	18.3	202.9	> 598.7	115.5		
T+12	26	20.0	204.7	> 598.7	125.7		
T+13	28	21.8	208.5	> 598.7	136.0		
T+1308	fused						
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

W. S. Wilson 12/1/71 [illegible]

REACTION PROPAGATION TEST

Test # 50
Test Stand 3
WSTF ID # N/A
Material Name NICHROME WIRE

Date 3/27/72
Leak Check H-007P To 300.2 T+5 300.2

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Hydrogen Pressure 200 ± 5 PSIA (202.9)

Test Sample Description:
Sample Size L x W x H in. N/A x x
Sample Weight grams N/A

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 009T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	201.0	75.6	71.6		
T+1	4	3.0	201.0	94.3	71.6		
T+2	6	4.2	202.9	141.8	72.3		
T+3	8	6.0	202.9	194.2	73.7		
T+4	10	7.0	202.9	276.4	75.6		
T+5	12	8.5	204.7	371.9	77.8		
T+6	14	10.2	206.6	439.4	81.1		
T+7	16	11.5	208.5	534.2	84.6		
T+8	18	13.5	210.3	>597.1	88.6		
T+9	20	14.0	212.2	>597.1	94.3		
T+10	22	15.5	214.1	>597.1	99.7		
T+11	24	17.0	216.0	>597.1	106.4		
T+12:10	fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

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REACTION PROPAGATION TEST

Test # 51
Test Stand 3
WSTF ID # N/A
Material Name NICHROME WIRE

Date 3/27/72
Leak Check H-007P To 305.8 T+5 305.8

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA
2010

Test Sample Description:
Sample Size L x W x H in. N/A x x
Sample Weight grams N/A

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. H 008T °F	Test Specimen Temp. H 007T °F	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.5	199.1	71.6	67.3		
T+1	4	3.0	199.1	89.3	67.3		
T+2	6	4.3	199.1	122.8	68.0		
T+3	8	5.9	201.0	175.5	69.4		
T+4	10	7.1	201.0	236.7	71.6		
T+5	12	8.8	202.9	306.5	74.2		
T+6	14	10.1	204.7	391.2	78.5		
T+7	16	11.7	206.6	483.7	82.5		
T+8	18	13.5	210.3	577.4	87.9		
T+9	20	15.0	210.3	> 598.7	94.7		
T+10	22	16.4	214.1	> 598.7	102.8		
T+11	24	18.0	217.8	> 598.7	111.7		
T+11:35	fused						
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							

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REACTION PROPAGATION TEST

Test # 52
Test Stand 3
WSTF ID # N/A
Material Name NICHROME WIRE
Date 3/27/72
Leak Check H-007P To 112 T+5

Test Conditions:
Atmosphere Purge Helium Pressure 30 ± 5 PSIG
Atmosphere Test Helium Pressure 200 ± 5 PSIA

Test Sample Description:
Sample Size L x W x H in. N/A x x
Sample Weight grams N/A

Time Min.	Amperage	Voltage	Pressure H 007P PSIA	Test Vessel Temp. °F H 008T	Test Specimen Temp. °F H 009T	Magnetic Tape Start	Magnetic Tape Stop
R-Cals							
T+0	2	1.7	201.0	74.2	69.4		
T+1	4	3.1	202.9	96.8	68.3		
T+2	6	4.8	202.9	136.0	68.7		
T+3	8	6.0	202.9	199.8	71.6		
T+4	10	7.5	204.7	271.3	74.2		
T+5	12	9.0	206.6	355.3	77.8		
T+6	14	10.9	208.5	438.0	81.8		
T+7	16	12.2	210.3	548.4	87.9		
T+8	18	14.0	212.2	> 597.1	94.3		
T+9	20	15.5	214.1	> 597.1	102.1		
T+10	22	17.1	217.8	> 597.1	112.4		
T+10:10	fused						
T+12							
T+13							
T+14							
T+15							
T+16							
T+17							
T+18							
T+19							
T+20							
T+21							
T+22							
T+23							
T+24							
T+25							
T+26							
T+27							
T+28							
T+29							
T+30							
T+31							
T+32							
T+33							
T+34							
T+35							
R-Cals							