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FUEL ASSESSMENT PROGRAM

PHASE 1-1C

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FUEL ASSESSMENT PROGRAM

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Reactor Engineering Staff
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Approved By:

E. A. DeZubay

E. A. DeZubay Manager
Thermo-Flow Laboratory

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LIST OF CONTRIBUTORS

ACKNOWLEDGMENT IS GIVEN TO THE
FOLLOWING WHO PARTICIPATED IN THE
PREPARATION OF THIS REPORT

C. Anderson

W. Green

M. B. Blinn

J. C. Guzek

J. H. Bzura

W. J. Havener

E. A. DeZubay

R. A. Leasure

R. N. Eichbauer

F. A. Sipe

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1. INTRODUCTION

The major objective of Phase 1-1C of the Fuel Assessment Program was to investigate the relative corrosion behavior of elements, with high and low leak rates, in the electrical test. Fuel elements from Y-12 were chosen with low leak rates prior to coating. Similar elements chosen from WAFF had high leak rates prior to coating. Thus, large differences in matrix leak rates were available for evaluation. Two groups of 34 elements were selected and divided into two lots. One lot from each source was coated, respectively, at Y-12 and WAFF. This type of division was made to determine effects of matrix leak rate as well as coating from two coating sources. The test plan was to evaluate the effect of large differences in the permeability of the elements with identical coatings. Four combinations existed: Y-12 elements coated at Y-12, Y-12 elements coated at WAFF, WAFF elements coated at WAFF, and WAFF elements coated at Y-12. A similar grouping, with molybdenum overcoating, were also evaluated to determine the effect of the additional coating on the original group of four; that is, two sources and two coatings. The details of the test plan and the requirements for measurements on each of these elements, are shown in Appendix A, Test Specification. The test plan described in the Test Specification was followed in general, but minor deviations were made during the course of the experiments to obtain more useful information.

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II. DESCRIPTION OF TEST IN PHASE 1-1C

A. EQUIPMENT

The corrosion tests were performed in the single element furnace at the WANL Thermo-Flow Laboratory. An element was mounted in the center of a horizontal water-cooled pressure vessel, fitted with graphite chucking fixtures, and resistance heated to the test temperature by direct current. Element surface temperatures were measured with a disappearing filament brightness pyrometer. A flow of 500 scfm of hydrogen was directed through the 19 coolant channels of the element, and the pressure at the exit of the element was held constant by a back-pressure controller. A helium atmosphere was maintained around the outside of the fuel element and held constant at the required pressure by means of a separate back-pressure controller. Helium flow was held constant by an upstream flow controller. The hot hydrogen gas exiting from the fuel element was cooled by a water-cooled heat exchanger, filtered and discharged into the atmosphere.

B. REDUCED PRESSURE TEST DEVELOPMENT

For the standard corrosion test, the helium atmosphere was maintained 0.5 psi higher than the hydrogen inlet pressure to prevent hydrogen leaking from the inlet chuck of the element into the atmosphere and corroding the external surfaces of the element. To reduce the helium atmosphere pressure, the element was sealed at its inlet and the hydrogen gas was channeled directly to the element. An inlet end seal was designed which consisted of a silastic rubber washer that conformed to the external dimensions of the element. The seal was compressed

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against the element flats by being placed between two boron nitride holders. The boron nitride holders were sealed against the walls of an aluminum chuck with O-rings. Hydrogen gas was introduced into the chuck by means of a flexible hose that connected directly to the hydrogen supply. With the hydrogen inlet effectively isolated with this sealing arrangement, the hydrogen pressure and flow were independent of the helium atmosphere pressure, and the helium flow and pressure could be maintained at any desired level. This arrangement permits setting differential pressures between the element bores and element exterior at specific axial locations along the element.

Fuel elements were tested at two pressure levels with the hydrogen outlet pressure of the fuel element maintained during the test at 560 psig and the normal hydrogen inlet pressure of approximately 660 psig. The pressure distribution in the bore is shown in Figure 2-1 for normal hydrogen inlet and outlet pressure. The furnace atmosphere helium pressure was either 660.5 or 590 psig. The pressure level is shown in Figure 2-1 in two ways: (1) the helium pressure external to the fuel element is as previously listed and (2) the ΔP at a station located 20 inches from the inlet end was either - 25 psi or 45 psi.

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NOMINAL PRESSURE RELATIONS FOR HYDROGEN CORROSION TESTS

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III. TEST RESULTS

A. PHASE 1-1C PRE-CORROSION TEST PERMEABILITY MEASUREMENTS

Pre-corrosion test permeability data consisted of leak-rate measurements made on fuel elements using three different techniques. These were the following:

1. Incremental data obtained at 17 points along the length of an element at 3 inch intervals, each measurement covering a 3.75 inch segment of the element.

2. Whole body measurements, i.e. 50 inches.

3. Whole channel-to-channel measurements.

Techniques 1 and 2 have been previously described in WANL-TME-1499. The channel-to-channel leak-rate data is obtained by pressurizing each individual channel for the full length of the element and measuring the flow rate required to maintain a 10 psig pressure level. All permeability measurements are reported in terms of an equivalent helium leak-rate.

Leak-rate data were obtained at three stages during the manufacturing of the Phase 1-1C corrosion test elements. Specifically, fuel element porosity was measured in the as leached (prior to NbC coating) condition, after NbC coating, and again after molybdenum overcoating. Incremental and whole body measurements are reported for all of the cited manufacturing stages, whereas, the data on whole channel-to-channel permeability is for the as-leached condition and for Y-12 elements only.

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Figure 3-1 shows a comparison of average incremental porosity for WAFF and Y-12 elements (34 WAFF and 34 Y-12) measured in the as-leached stage of element manufacture. The average incremental (3.75 inch segment) leak rate in the as-leached condition for the WAFF elements was 41.3 cc/min and the corresponding average values for the Y-12 elements were 1.8 cc/min, well below the accuracy limit of the incremental measuring device, less than 7 cc/min. Figures 3-2 and 3-3 show similar incremental data taken after NbC coating and molybdenum overcoating respectively, in which, a reduction in permeability was measured after each subsequent coating operation. The average incremental value for the WAFF elements after NbC coating (34 elements) and molybdenum overcoating (16 elements) was 21.5 cc/min and 14.2 cc/min respectively. A similar trend is noted with the Y-12 elements, i.e., 1.8 cc/min as-leached porosity is reduced to 0.7 cc/min after NbC coating. Such low values are inconclusive from an absolute measurement point of view, but nevertheless are indicative of more elements having values near zero after NbC coating in the Y-12 NbC comparison. There is an exception indicated in the data on Y-12 elements after molybdenum coating, i.e., 2.2 cc/min helium which shows an apparent increase in leak-rate after molybdenum coating. This apparent increase in leakage is attributed to differences between WAFF and Y-12 coatings, which are discussed in the next paragraph.

Figure 3-4 compares incremental permeability after WAFF and Y-12 NbC coating on WAFF matrix elements. The WAFF coated elements had an average value of 22.2 cc/min

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- X WAFF Matrix Average for 34 Elements
(Incremental Average = 41.3 cc/min)
- Y-12 Matrix Average for 34 Elements
(Incremental Average = 1.8 cc/min)
- * 3.75 Inch Increments

FIGURE 3-1

INCREMENTAL PERMEABILITY, ELEMENT IN AS LEACHED CONDITION

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- ⊗ WAFF Matrix Average for 34 Elements
(Incremental Average = 21.5 cc/min)
- ⊙ Y-12 Matrix Average for 34 Elements
(Incremental Average = 0.7 cc/min)
- * 3.75 Inch Increments

FIGURE 3-2

INCREMENTAL PERMEABILITY, ELEMENTS IN NbC COATED CONDITION

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- WAFF Matrix Average for 16 Elements
(Incremental Average = 14.2 cc/min)
- Y-12 Matrix Average for 16 Elements
(Incremental Average = 2.2 cc/min)
- * 3.75 Inch Increments

FIGURE 3-3

INCREMENTAL PERMEABILITY, ELEMENTS IN MOLY OVERCOATED CONDITION

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- ☒ WAFF NbC (L219) Average for 17 WAFF Elements
(Incremental Average = 22.2 cc/min)
- ⊗ Y-12 NbC (8998) Average for 17 WAFF Elements
(Incremental Average = 20.1 cc/min)
- * 3.75 Inch Increments

FIGURE 3-4

INCREMENTAL PERMEABILITY, ELEMENTS IN NbC COATED CONDITION

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and the Y-12 NbC coated elements were lower, i.e., 20.1 cc/min. Figure 3-5 similarly compares the permeability of WAFF and Y-12 molybdenum overcoatings on WAFF elements. The higher average value of 16.8 cc/min measured for the WAFF overcoating versus 11.6 cc/min. for Y-12 overcoating is due primarily to the level of porosity measured after NbC coating and the generally higher level of leakage exhibited by the WAFF elements. The same comparison of WAFF and Y-12 moly-coating on less permeable elements discloses that the WAFF moly overcoat tended to produce a lower level of permeability as shown in Figure 3-6. Whole-body leak-rate measurements which were also taken at the same three stages of fabrication of the phase 1-1C elements exhibit the same trends observed with the incremental data. The whole-body measurements are summarized in Table 3-1.

Whole channel-to-channel leak-rate data obtained for 34 Y-12 elements in the as-leached condition have been averaged for individual channels and the results are illustrated graphically in Figure 3-7. The number 10 channel consistently measured the lowest leak-rate. Conversely the highest channel leak-rates for these Y-12 as-leached elements occurred in the channels inboard of the edge channels.

The data on pre-corrosion test of fuel element permeability have been correlated with resulting corrosion that was measured after exposure to Phase 1-1C electrical test conditions. Figure 3-8 shows incremental corrosion rate data for non overcoated elements which occurred in the axial interval of 15 to 25

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⊗ WAFF Moly (AA011) Average for 8 WAFF Elements
(Incremental Average = 16.8 cc/min)

△ Y-12 Moly (1719) Average for 8 WAFF Elements
(Incremental Average = 11.6 cc/min)

* 3.75 Inch Increments

FIGURE 3-5

INCREMENTAL PERMEABILITY, ELEMENTS IN MOLY OVERCOATED CONDITION

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FIGURE 3-6
INCREMENTAL PERMEABILITY, ELEMENTS IN MOLY OVERCOATED CONDITION

TABLE 3-1

PHASE 1-1C WHOLE BODY PERMEABILITY MEASUREMENTS
EQUIVALENT HELIUM LEAK-RATE-CC/MIN

<u>Elements As-Leached</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>	<u>No. Elements</u>
WAFF Elements	600	280	325	32
Y-12 Elements	31	7	20	29
<u>Elements After NbC⁽¹⁾</u>				
WAFF Elements	30	0	8	10
Y-12 Elements	37	0	15	7
<u>Elements After Moly⁽¹⁾</u>				
WAFF Elements ⁽²⁾	35	3	8	7
Y-12 Elements	20	5	10	6

(1) All WAFF coated

(2) Includes 2 elements with Y-12 NbC coating which had measured leakages of 3 and 7 cc/min helium.

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CHANNEL IDENTIFICATION

FIGURE 3-7

WHOLE CHANNEL TO CHANNEL PRE CORROSION TEST PERMEABILITY OF
Y-12 ELEMENTS IN AS LEACHED CONDITION

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FIGURE 3-8

INCREMENTAL CORROSION RATE AT STATION 15-20 VERSUS INCREMENTAL LEAK
 RATE IN AS-LEACHED CONDITION AT STATION 20-cc/MIN. HELIUM

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inch stations (region of mid band corrosion) versus the as-leached leak-rates measured at station 20. Statistical treatment of these data using a multiple regression computer code produced a curve fit which shows a significant correlation of permeability with resulting mid band corrosion weight loss for non overcoated elements. The results indicate that elements which had high leakage rates during pre-test permeability measurements also exhibited higher mid band weight losses. Moreover, the correlation in Figure 3-8 shows that there is a marked increase in mid band corrosion weight loss for elements with higher leak-rates beyond 10-20 cc/min, measured in the as-leached condition. The equivalent value of 11.2 cc/min has been specified as the maximum allowable for NRX-A6 reactor candidate element.¹ Figure 3-9 shows the same corrosion rate data for non overcoated elements correlated with leak-rate data made after NbC coating. The resulting curve fit similarly reflects the trend of increasing corrosion with increasing permeability.

B. HYDROGEN CORROSION TESTS

1. Gross Results

The fuel element data from the hydrogen high temperature corrosion tests are presented in the Appendix along with two cross indexes. The Thermo-Flow Laboratory test number and the planned times are shown in Table 3-2 for the twelve combinations of fuel element matrix source, NbC coating, and molybdenum overcoating.

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FIGURE 3-9

INCREMENTAL CORROSION RATE AT STATION 15 TO 20 VERSUS INCREMENTAL LEAK
RATE AT STATION 20 FOR AS NbC COATED CONDITION

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TABLE 3-2

THERMO-FLOW TEST NUMBERS AND PLANNED TIMES FOR EACH SUBGROUP

MFG. MATRIX SOURCE	WAFF AC99-	WAFF AC99-	Y-12 UN99-	Y-12 UN99-
NbC Coating Ident.	WAFF L219	Y-12 8998	WAFF L219	Y-12 8998
Non-Overcoat	0019 TTF 0020 3/4 TTF 0048 TTF 0049 3/4 TTF 0074 25' 0077 24' 0079 24' 0122 25'	0052 TTF 0053 3/4 TTF 0054 3/4 TTF 0062 TTF 0063 3/4 TTF 0072 24'	0021 * TTF 0022 TTF 0050 TTF 0051 3/4 TTF 0073 * 24' 0075 32' 0076 30' 0121 25'	0055 TTF 0056 3/4 TTF 0057 37' 0058 * 37' 0059 TTF 0060 3/4 TTF 0061 15'+15'
He Over-Pressure		0064 15'+15'		0065 15'+15'
WAFF Overcoat Run No. AA011	0086 TTF 0087 3/4 TTF	0090 TTF 0091 3/4 TTF	0092 TTF 0093 3/4 TTF 0094 * TTF 0095 3/4 TTF	0088 TTF 0089 3/4 TTF
He. Over-pressure	0096 60' 0097 * 60'	0098 40'	0100 60'	0099 40'
Y-12 Overcoat Run No. 1719	0107 TTF 0108 3/4 TTF 0109 55'	0105 TTF 0106 3/4 TTF 0111 45' 0112 60' 0116 * 30'	0103 * TTF 0104 TTF 0110 60'	0101 TTF 0102 3/4 TTF 0113 60' 0114 45' 0115 60'

* Aborted or stopped tests

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The elements were subjected to the test conditions described in Fuel Element Assessment Test Specification 1-1C dated July 24, 1966 included in Appendix A. The test conditions were: hydrogen flow rate - 500 Scfm, power-785 KW, exit pressure - 560 psig with a helium atmosphere pressure of 590 psig. This helium atmosphere pressure results in a difference in pressure between the bores of the element and the surrounding atmosphere of 45 psi at a station 20 inches from the cold end.

The gross weight loss, total pinholes, failure location, planned test time and actual test time are summarized in Table 3-3. Figure 3-10 is a plot of gross weight loss versus time for the total group of non-overcoated elements, and Figure 3-11 is a similar plot for the molybdenum overcoated elements.

The data in Table 3-3 has been treated as follows. All of the elements, that actually broke, except those involved in aborted tests, are grouped as TTF (Time to Failure), and their times and weight losses were averaged. Those elements which were close to $3/4$ TTF but did not fail were grouped and their times and weight losses were averaged. For the non-molybdenum overcoated elements, a third group was formed, these elements running approximately $7/8$ TTF. Figure 3-12 is a plot of the average weight loss versus average time for similar tests with non-molybdenum overcoated elements, Figure 3-13 is a plot for Y-12 (1719) molybdenum overcoated elements and, Figure 3-14 is a plot for WAFF (AA011) molybdenum overcoated elements. Figure 3-15 is a plot of the averaged times versus averaged weight losses for the tests grouped in the TTF category. This plot shows three specific and separate zones for non-overcoated and molybdenum overcoated elements.

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TABLE 3-3A
TEST RESULTS - NO OVERCOAT

Type of Element	TFL Test#	T I M E		Failure Location	Pin Hole	Gross ΔW GMS	Ave. Time	Ave. ΔW GMS
		Planned (Min.)	Actual (Min.)					
WAFF Matrix AC WAFF NbC	0019	TTF	26.98	18.7	5	10.3	27.2	10.9
	0048	TTF	27.50	28.0	5	11.5		
	0122	25	25.0	---	13	8.1		
	0074	24	24.0	---	5	8.8		
	0077	24	24.0	---	10	9.0	24.2	8.2
	0079	24	24.0	---	5	6.9		
	0020	3/4 TTF	20.25	---	1	7.0	20.4	6.3
	0049	3/4 TTF	20.60	---	0	5.6		
WAFF Matrix AC Y-12 NbC 8998	0052	TTF	25.80	16.7	8	9.4	25.5	9.8
	0062	TTF	25.26	21.5	4	10.1		
	0072	24	24.0	--	3	7.3	24.0	7.3
	0053	3/4 TTF	19.30	---	0	5.1	19.1	5.1
	0054	3/4 TTF	19.30	---	0	5.4		
	0063	3/4 TTF	18.75	---	0	4.7		
	0064	15+15	15+15	--	0	8.1	He OVERPRES	
	Y-12 Matrix UN WAFF NbC L219	0022	TTF	34.3	36.0	12	17.2	28.8
0050		TTF	27.3	36&51	8	11.1		
0076		30	24.9	19.2	10	9.2		
0075		32	32.0	--	15	14.0	28.5	9.7
0121		25	25.0	--	5	5.5		
0051		3/4 TTF	20.5	---	0	4.9	20.5	4.9
0021		TTF	14.1	---	2	4.9	TEST ABORTED	
0073		24'	6.0	---	0	2.0	TEST ABORTED	
Y-12 Matrix UN Y-12 NbC 8998	0055	TTF	42.6	39.0	5	13.3	38.9	11.5
	0059	TTF	44.8	16&51	4	10.8		
	0060	3/4 TTF	27.3	25.5	10	10.3		
	0057	37	37.0	--	14	10.8	37.0	10.8
	0056	3/4 TTF	32.0	--	2	7.0	32.0	7.0
	0058	37		SHUT DOWN DUE TO ARCING				
	0061	15+15	15+15		0	10.7		
	0065	15+15	15+15		2	7.5	He OVERPRES	

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TABLE 3-3B
TEST RESULTS Y-12 OVERCOAT 1719

Type of Element	TFL Test#	T I M E		Failure Location	Pin Hole	Gross ΔW GMS	Ave. Time	Ave. ΔW GMS
		Planned (Min.)	Actual (Min.)					
WAFF Matrix AC	0107	TTF	55.0	13.0	7	20.7	55.0	20.7
WAFF NbC L219	0109	55'	55.0	--	2	16.9	48.0	15.8
	0108	3/4 TTF	41.0	--	3	14.8		
WAFF Matrix AC Y-12 NbC 8998	0105	TTF	45.8	13&15	4	18.3	36.8	17.9
	0112	60'	33.7	12&16	11	18.1		
	0111	45	30.8	13.5	15	17.3		
	0106	3/4 TTF	34.5	--	0	12.0	34.5	12.0
	0116	30	T E S T	A B O R T E D				
Y-12 Matrix UN WAFF NbC L219	0104	TTF	72.1	14.8	0	17.9	72.1	17.9
	0110	60	60.0	--	11	17.7	60.0	17.7
	0103	TTF	T E S T	A B O R T E D				
Y-12 Matrix UN Y-12 NbC L219	0101	TTF	71.6	14.0	3	22.3	46.4	18.0
	0113	60	34.9	15.0	0	15.3		
	0115	60	42.1	51.0	0	16.0		
	0102	3/4 TTF	36.8	9.4	5	18.5		
	0114	45'	45.0	--	0	16.4	45.0	16.4

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TABLE 3-3C
TEST RESULTS WAFF OVERCOAT AA011

Type of Element	TFL Test#	T I M E		Failure Location	Pin Hole	Gross ΔW GMS	Ave. Time	Ave. ΔW GMS
		Planned (Min.)	Actual (Min.)					
WAFF Matrix AC WAFF NbC L219	0086	TTF	85.2	49.0	28	69.6	85.2	69.6
	0087	3/4 TTF	60.0	--	36	46.1	60.0	46.1
	0096	60	49.4	49.0	0	20.3	H _e OVERPRES	
	0097	60	T E S T A B O R T E D				H _e OVERPRES	
WAFF Matrix AC Y-12 NbC 8998	0090	TTF	95.6	17.0	0	34.8	72.1	33.3
	0091	3/4 TTF	48.6	17.0	0	31.7		
	0098	40'	40.0	--	0	10.7	H _e OVERPRES	
Y-12 Matrix UN WAFF NbC 8998	0092	TTF	37.4	36.8	2	14.6	43.7	25.6
	0095	3/4 TTF	25.3	38&51	35	36.6		
	0094	TTF	68.5	T E S T S T O P P E D				
	0093	3/4 TTF	28.0	--	2	6.6	28.0	6.6
	0100	60'	60.0	--	0	11.5	H _e OVERPRES	
Y-12 Matrix UN Y-12 NbC 8998	0088	TTF	44.4	38.3	28	19.1	44.4	19.1
	0089	3/4 TTF	33.2	--	0	7.7	33.2	7.7
	0099	40'	40.0	--	0	9.0	H _e OVERPRES	

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FIGURE 3-10

GROSS WEIGHT LOSS VERSUS TIME FOR NON MOLY OVERCOATED ELEMENTS

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FIGURE 3-11

GROSS WEIGHT LOSS VERSUS TIME FOR MOLY OVERCOATED ELEMENTS

FIGURE 3-12

GROSS WEIGHT LOSS VERSUS TIME FOR NON MOLY COATED ELEMENTS

FIGURE 3-13
AVERAGE WEIGHT LOSS VERSUS TIME FOR ELEMENTS MOLY OVERCOATED AT Y-12

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FIGURE 3-14
 AVERAGE WEIGHT LOSS VERSUS TIME FOR ELEMENTS MOLY OVERCOATED AT WAFF

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FIGURE 3-15
AVERAGE WEIGHT LOSS VERSUS TIME FOR ELEMENTS WHICH EXPERIENCED FAILURES

C. CHARACTERIZATION AND DETAILED CORROSION BEHAVIOR OF PHASE 1-1C FUEL ELEMENTS

1. Introduction

Several methods were used to characterize the fuel elements produced for Phase 1-1C; these methods included leak rate, bore replication, electrical resistance profiles (before and after molybdenum overcoating), beta backscatter coating thickness measurements, and pore volume distribution (mercury porosimetry). The results are discussed below.

a. NbC Thickness Profiles

The thickness profiles of the two NbC coating batches involved in Phase 1-1C indicated that uniformity within a given batch was good. Figures 3-16 and 3-17 show typical beta backscatter thickness along with some values measured metallographically.

b. Bore Replication

Representative fuel elements from each coating batch were replicated after NbC coating to determine crack distributions. The results obtained from WAFF NbC batch L219 elements are plotted in Figure 3-18 for both matrix manufacturers. Figure 3-19 presents the results for Y-12 coating batch 8998W. The replication studies indicated that when WAFF and Y-12 matrices are coated in the same coating run, the WAFF matrix elements have a larger number of cracks per inch than those of Y-12. Previous studies ^{2,3} indicated that for either type of matrix with 1900°C vapor deposited NbC, a small number of cracks (less than 20 per inch at 200X) was not desirable, pinholing occurred during corrosion testing.

FIGURE 3-16

TYPICAL COATING THICKNESS PROFILE

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FIGURE 3-17

TYPICAL COATING THICKNESS PROFILE

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FIGURE 3-18

CRACK DENSITY PROFILE OF WAFF (219) NbC COATED ELEMENTS

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FIGURE 3-19

CRACK DENSITY PROFILE OF Y-12 (8998) NbC COATED ELEMENTS

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c. Electrical Resistance Profiles - Before Molybdenum Coating

Previous studies ³ indicated that fuel elements with coatings with a small number of cracks (8-15 per inch) had electrical resistance profiles with many large undulations; elements with a large number of cracks (25-30 per inch) gave electrical resistance profiles which were relatively smooth. Typical electrical resistance profiles for the four fuel element types (2 matrix, 2 NbC coating) before molybdenum coating are shown in Figure 3-20 together with the pre-test crack counts. Figure 3-20 demonstrates that a qualitative relationship exists between the type of electrical resistance profile and the crack density of the NbC coating for the Phase I-1C fuel elements.

d. Electrical Resistance Profiles - After Molybdenum Overcoating

It has been shown that when an NbC coated fuel element is overcoated with molybdenum, the electrical resistance of the element decreases. The change in incremental electrical resistance can be used to define the distribution of the molybdenum overcoat. The change in incremental electrical resistance for typical Phase I-1C elements molybdenum overcoated at WAFF (Run No. AA-11) and Y-12 (Run No. 1719) are shown in Figures 3-21 and 3-22, together with the location of visible corrosion of the tested elements. A decrease in the incremental electrical resistance of the fuel element after molybdenum overcoating is related to improved corrosion test performance, because a significant change in resistance indicates the deposition of adequate molybdenum for corrosion protection of the region from the cold end to station 20. Figures 3-23 and 3-24 show

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FIGURE 3-20

TYPICAL PRE-CORROSION TEST ELECTRICAL RESISTANCE PROFILES OF
PHASE I-1C FUEL ELEMENTS ALONG WITH CRACK COUNTS

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FIGURE 3-21

DECREASE IN INCREMENTAL ELECTRICAL RESISTANCE AFTER
WAFF OVERCOATING

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FIGURE 3-22
DECREASE IN INCREMENTAL ELECTRICAL RESISTANCE AFTER
Y-12 OVERCOATING

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photographs of typical fuel elements, one molybdenum overcoated at WAFF* and the other at Y-12**, which were sliced open after corrosion testing.

It appears that elements molybdenum overcoated at Y-12 had insufficient molybdenum deposited from the cold end to station 15-20 to afford good corrosion protection.

e. Mercury Porosimetry

The pore volumes of Phase I-1C elements were measured to characterize the differences between the high permeability of WAFF elements and the low permeability of Y-12 elements.

Specimens were cut 5, 25, and 45 inches from the cold end of two WAFF elements and one Y-12 element. One WAFF element and the Y-12 element were NbC coated at WAFF; the other WAFF element was coated at Y-12. The pore volumes were measured with an AMINCO mercury porosimeter up to the smallest pore size measureable (0.035μ). The values obtained were corrected to a sample weight of 10.0 grams and compensated for the weight of the NbC.

The pore volume distributions of the specimens cut 5 inches from the cold end are shown in Figure 3-25. The curves are similar in shape to those

* WAFF Overcoating Run AA011 had a molybdenum distribution from 0-50 inches of 5.0 g.

** Y-12 has informed WANL that an element sliced open after moly coating showed the presence of only a small quantity of molybdenum deposited over the 0-15 inch range. Apparently this small amount was insufficient to produce an electrical resistance change or to afford protection against hydrogen corrosion.

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FIGURE 3-23

AXDALLY SLICED WAFF MOLY OVERCOATED ELEMENT

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FIGURE 3-24
AXIALLY SLICED Y-12 MOLY OVERCOATED ELEMENT

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FIGURE 3-25
PORE VOLUME OF PHASE I-1C FUEL ELEMENTS

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obtained for the samples from the 25 and 45 inch positions. Examination of Figure 3-25 shows that the curves of the WAFF matrix elements are parallel to the curve for the Y-12 element at pore sizes below 0.25 microns (700 psi). The differences in the pore volumes of the WAFF coated WAFF and Y-12 matrices are given in Table 3-4; from this data, it is concluded that the WAFF matrix has a larger pore volume in the 0.35 to 1.8 micron pore diameter region and a volume similar to the Y-12 matrix for pores less than 0.35 microns diameter. The large increase in pore volume with a relatively small increase in pressure shows that 0.35 to 1.8 microns is the predominant pore size range for either matrix.

The pore volumes were not equal along the length of the elements as is seen by examination of Table 3-5. The samples from the 5 and 45 inch positions each have a smaller total pore volume than the samples from the 25 inch station, regardless of the origin of the matrix.

The dependence upon pore diameter of the as-leached incremental leak rates was investigated by plotting the leak rate as a function of the volume of pores included in various ranges of pore sizes. Some of the results are shown in Figure 3-26. The major conclusions from this study are:

- 1) Leak rate varies with total pore volume (pores of diameter 0.035 - 17.5 microns).
- 2) Leak rate is independent of the volume of pores in the size range 0.035 - 0.43 microns).

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TABLE 3-4
PORE VOLUME DISTRIBUTIONS OF WAFF
AND Y-12 MATRIX FUEL ELEMENTS

(Samples Taken From Station 5)

Pore Diameter (μ)	Cumulative Pore Volume ($v_v/10g$) ^(a)		
	V_{ww}	V_{yw}	ΔV
17.5	0.000	0.000	0.000
1.75	0.008	0.004	0.000
0.875	0.026	0.013	0.013
0.70	0.046	0.020	0.026
0.583	0.059	0.029	0.030
0.427	0.079	0.043	0.036
0.35	0.090	0.056	0.034
0.25	0.099	0.067	0.032
0.175	0.109	0.077	0.032
0.0875	0.123	0.091	0.032
0.0583	0.134	0.102	0.032
0.0427	0.145	0.112	0.033
0.035	0.156	0.122	0.034

(a) ww: WAFF matrix, WAFF NbC
yw: Y-12 matrix, WAFF NbC

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TABLE 3-5

PORE VOLUMES OF UNTESTED PHASE 1-1C FUEL ELEMENTS

		(Values Corrected for Weight of NbC) Total Pore Vol. (cc/10g) at Indicated Pore Diameter					
		5		Sample Location 25		45	
Source				Pore Diameter			
<u>Matrix</u>	<u>NbC</u>	<u>0.35</u>	<u>0.035</u>	<u>0.35</u>	<u>0.035</u>	<u>0.35</u>	<u>0.035</u>
WAFF	WAFF	0.090	0.156	0.126	0.202	0.108	0.173
WAFF	Y-12	0.103	0.169	0.127	0.185*	0.107	0.172
Y-12	WAFF	0.056	0.122	0.081	0.142	0.077	0.134

* Estimated

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FIGURE 3-26

DEPENDENCE OF LEAK RATE UPON PORE DIAMETER IN AS LEACHED CONDITION

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3) Leak rate depends most strongly upon the volume of pores in the size range 0.58 - 0.88 microns and slightly upon the pores on either side of this range (0.43 - 0.58 microns and 0.88 - 1.75 microns).

Thus, the leak rate is strongly dependent upon the volume of pores in the predominant pore size range, and it appears as if a reduction in the volume of these pores would result in a corresponding reduction in leak rate.

f. Incremental Weight Loss

One of the more useful methods for studying the corrosion performance of fuel elements is incremental weight loss. This method involves cutting the element into five inch lengths and calculating the weight loss which occurred in each section from considerations involving the pre-test weight. The incremental weight loss values obtained at the peak of mid-band corrosion permit the evaluation of this area with time. Since the mid-band regions is the area where the most severe corrosion usually occurs, the incremental weight loss values can be used for the comparison of elements with various combinations of matrix and NbC coating, with and without molybdenum overcoatings.

g. Mid-Band Performance

The peak mid-band weight losses of the non-molybdenum overcoated fuel elements is shown in Figure 3-27. In all instances where a break occurred the values obtained were carefully corrected for fragment losses; the corrections varied from 0.5 to 1.7 grams. The general conclusion reached from a study of

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FIGURE 3-27

PEAK MID BAND BEHAVIOR NON MOLYBDENUM OVERCOATED ELEMENTS

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the data is that the results can be separated according to matrix rather than NBC coating source, and the peak mid-band performance of the Y-12 matrix elements was superior to that of the WAFF, averaging weight losses at 25 minutes of approximately 0.4 grams/5 inches (0.2 - 0.6 grams/5 inches) versus 0.8 grams (0.4 - 1.2 grams/5 inches).

The peak mid-band weight losses of the molybdenum overcoated Phase 1-1C fuel elements is shown in Figure 3-28. For reference purposes the range of values obtained without molybdenum (Figure 3-27) are also shown. Figure 3-28 shows that the performance of the elements overcoated at Y-12 was considerably worse than those overcoated at WAFF, previously shown to be caused by insufficient molybdenum being deposited over the first 15-20 inches of the fuel elements in the Y-12 molybdenum coating run 1719.

The WAFF molybdenum overcoating run AA011 did produce the desired distribution and weight gain of molybdenum and these elements showed the usual mid-band performance of elements with molybdenum overcoats. The discussion of the effect of molybdenum overcoating will be derived from the WAFF molybdenum overcoat results as those from Y-12 are not typical of the hydrogen corrosion test performance of molybdenum overcoated elements.*

* It should be noted that all of the peak mid-band incremental weight loss values of molybdenum overcoated elements were reduced by the common value of 0.3 grams. Careful plotting of these results as a function of time using an expanded weight loss scale shows that the results do not go through zero (0.0) weight loss at zero (0.0) time, as do non-moly results, but have a weight loss intercept of 0.3 grams. This intercept value is interpreted as being a reflection of an error inherent in the method of incremental weight loss calculation (perhaps an improper assessment of moly blowdown losses) and accordingly all results were adjusted to produce a 0.0 gram intercept value.

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FIGURE 3-28

PEAK MID BAND BEHAVIOR Y-12 & WAFF MOLYBDENUM OVERCOATED ELEMENTS

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The major conclusions to be drawn from the results shown in Figure 3-28 are that in the electrical corrosion test (760 KW, 500 Scfm $\Delta P_{20}=45$) molybdenum overcoating extends fuel element lifetimes to 95 minutes, maximum, and peak mid-band performance is improved over that of elements without molybdenum overcoats.

h. Hot End Performance

The behavior of the hot ends (station 45-50) of fuel elements tend to be difficult to interpret because of the influence of such factors as surface corrosion, and arcing or overheating. There often is considerable spread in the weight loss data, which is as much a reflector of testing effects as of fuel element performance. An attempt to treat all of the hot end incremental weight loss data of elements lead to inconclusive results. However, when values believed to reflect only bore corrosion effects were studied several effects were observed. The data are plotted in Figure 3-29 for the moly overcoated elements and the range of values showing the hot end performance of the non-overcoated elements are also shown, according to NbC coating source. Figure 3-29 shows for hot end performance that:

- 1) Without molybdenum overcoating the weight losses can be separated according to NbC coating source and not according to matrix. The differences are not attributable to coating thickness differences but may be related to slight amounts of grain boundary attack which was observed to occur in coating batch L219.

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FIGURE 3-29
 HOT END BEHAVIOR OF WAFF & Y-12 MOLY OVERCOATED ELEMENTS

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2) With molybdenum overcoating the hot ends of both the WAFF and Y-12 NbC coated elements had the same corrosion rate as the Y-12 NbC coated elements without molybdenum (nominal 0.088 grams/minute). Metallographic studies indicated that molybdenum was deposited in some of the slightly enlarged grain boundaries of batch L219 fuel elements and it appears as if this deposition resulted in the improved performance of elements from this coating batch.

3) With molybdenum the weight loss was approximately linear with time.

i. Pinholing

The combinations of matrix and coating, with and without molybdenum overcoats, included in the Phase 1-1C program afford an opportunity to evaluate some of the factors influencing the pinholing of fuel elements.

Figures 3-30 and 3-31 show the distribution of pinholes of the elements without and with molybdenum overcoats, respectively. The results without molybdenum show, in the mid-band region, that WAFF matrix elements tended to pinhole to a greater degree than those of Y-12. It should be recalled that with elements of the same matrix, pinholing is inversely proportional to the number of coating cracks. This effect leads to the expectation that the elements with the smallest number of cracks in the mid-band regions (Y-12 matrix elements) should exhibit the greatest degree of mid-band pinholing. The fact that the elements with the greatest mid-band crack densities (WAFF matrix) were

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FIGURE 3-30

PINHOLE BEHAVIOR OF FUEL ELEMENTS WITHOUT MOLYBDENUM OVERCOATS

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FIGURE 3-31

PINHOLE BEHAVIOR OF I-1C MO COATED ELEMENTS

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those which pinholed most indicates that some factor other than crack density, such as permeability, predominates.

Beyond the mid-band region, for elements without molybdenum overcoats, the WAFF matrices showed practically no pinholes whereas those of Y-12 showed the greatest degree of pinholing of any of the non-overcoated elements. In this region (stations 31-49) the Y-12 elements showed considerably fewer coating cracks than those of WAFF, regardless of coating source. The pinholing observed is directly in keeping with previous pinhole-crack density observations, and it is concluded that pinholing in this region (stations 31-49) is related to crack density.

With molybdenum overcoats two effects upon pinholing were observed:

1) With either molybdenum coating run, the station 31-49 pinholing tendency of the Y-12 matrix elements decreased (maximum average values, 3.0 pinholes/3 inch increment without molybdenum, 1.6 pinholes/3 inch increment with molybdenum).

2) The elements molybdenum coated at Y-12 which had little or no molybdenum deposited up to station 15-20 showed an increased tendency to pinhole at the mid-band region. This effect was related to the increased mid band bore corrosion observed in these elements.

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j. Summary

- 1) Within the same NbC coating batch WAFF matrix elements had more cracks than the Y-12 matrix elements.
- 2) The decrease in incremental electrical resistance after molybdenum coating indicates the molybdenum distribution, and the presence of molybdenum is associated with an improvement in the mid-band corrosion behavior.
- 3) The total observable volume of pores was less for the Y-12 matrix than the WAFF. Pores having the greatest influence on as-leached incremental leak rate were 0.58 - 0.68 microns in diameter.
- 4) WAFF and Y-12 elements NbC coated in the same coating batch exhibited different mid-band performance characteristics; the Y-12 matrix elements showed lower mid-band weight losses than the WAFF.
- 5) With adequate molybdenum overcoats peak mid-band corrosion performance was better than without molybdenum.
- 6) Molybdenum overcoating resulted in little change in hot end performance. Hot end weight losses were linear with time.
- 7) Pinholing at the mid-band was greater in the WAFF matrix elements higher leak rate, greater crack density.

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8) Hot end pinholing was greater in the Y-12 matrix elements (lower leak rate, lower crack density).

9) Adequate molybdenum overcoating reduced the total number of pinholes of any particular matrix coating combination.

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4. CONCLUSIONS

Niobium carbide coating and molybdenum overcoating each contribute to reducing the element leak rates measured at ambient conditions.

Pre-corrosion test permeability correlated with mid band corrosion data; Phase I-1C non-molybdenum overcoated elements which had high leak rates also exhibited higher mid-band weight losses.

With molybdenum overcoating, the corrosion performance of both high and low leak rate elements was improved. Mid-band weight losses were lower and significantly longer test durations resulted. The limited data does not permit the determination of a correlation between mid-band weight loss and leak rate for the molybdenum overcoated elements. The limited data was due to differences in the molybdenum overcoating runs.

The hot end weight losses of Phase I-1C elements were linear with test time. The hot end behavior of WAFF and Y-12 matrix elements with and without molybdenum overcoating were not measurably different. Without molybdenum the elements coated at WAFF showed somewhat higher hot end weight losses than those coated at Y-12.

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APPENDIX A

FUEL ELEMENT ASSESSMENT TEST SPECIFICATION 1-1C

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FUEL ELEMENT ASSESSMENT

TEST SPECIFICATION

1 - 1C

APPROVED BY: W. R. Morris

Date: 7/24/66

INFORMATION CATEGORY

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B. R. Morris 6/12/69
Authorized Classifier Date

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TEST SPECIFICATION

Responsible Engineers:

C. L. Meuche - Y-12 Coordination
W. J. Havener - Test Performance
M. B. Blinn - Pre and Post Test
Sample Analysis

Phase 1 Facet 1C Date 7/24/66

Purpose of Experiment

To determine effects of bore/interstitial pressure difference on elements with the range of porosities as has been exhibited in NRX-A6 fuel element fabrication at WAFF and Y-12.

Objective of Experiment

Primary Objective

A. To determine in electrical corrosion tests the effect of bore/interstitial ΔP on corrosion phenomena.

Secondary Objectives

A. To distinguish between the differences in corrosion phenomena between Y-12 and WAFF produced elements.

B. To relate such phenomena to results observed in reactor tests.

C. To devise a screening test in electrical corrosion equipment for the purpose of evaluating production elements, with emphasis on ΔP tests effects and sample porosity effects.

D. To determine the effect of Mo overcoating on corrosion behavior in ΔP tests.

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Sample Selection Criteria

Samples will be selected from WAFF and Y-12 NRX-A6 production elements. The Y-12 samples will consist of elements that show minimum porosity, as measured on an incremental basis with helium at 10 psid pressure. The WAFF elements will consist of samples that show maximum porosity as measured above. These criteria will be applied to elements in the as-leached condition. Every attempt in selection will be made to minimize process and raw material variables in the production and selection of each of these two groups of samples. It is a necessary condition that all process and raw-material histories be available for such samples, including raw material identification, ingredient mix, and identification (by run number) of each process step, which run number will completely define the process parameters by reference.

Number of Samples

Sufficient samples of non-coated material will be chosen as above to complete one full coating batch in each of Y-12 and WAFF coating furnaces (nominally 34), and will be coated by the NRX-A6 specification coating process at each facility. Coating parameters will be recorded by reference to coating run number. Each coating run at each facility will include 50% Y-12 and 50% WAFF elements as selected above.

Data to be Made Available Prior to Test

A. Production and selection information as called for above, and a complete NRX-A6 inspection package for each element.

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B. Porosity data of each sample after coating, as called for above, and such data for one Y-12 and one WAFF element from each coating batch after stripping of coating (together with all selection data called for above).

C. Pore-size-distribution measurements will complement the permeability and porosity measurements called for above.

Test Conditions

All tests will be conducted with full length elements in the ΔP corrosion equipment at WANL under the following target conditions:

- A. He blanket pressure: 590 psia at the inlet
- B. Hydrogen flow rate: 500 scfm
- C. Hydrogen exit pressure: 560 psia
- D. Thermal conditions in accordance with "IMB" conditions
- E. Samples will be tested in accordance with the following outline:

- 68 Elements Fabricated (or obtained from uncoated stock) (GA Beads)
- 34 Y-12 Best Porosity (as consistent as possible)
- 17 Y-12 NbC Coat (NRX-A6 Spec).
- 7 No Mo Coat
 - 6 Tested at 590 psi He
 - 2 Tested to failure
 - 4 Tested to 75% failure
 - 1 Standard NRX-A6 QC Test
- 4 Y-12 Mo Coat
 - 4 Tested at 590 psi He
 - 2 Tested to failure
 - 2 Tested to 75% failure
- 2 WAFF Mo Coat
 - 2 Tested at 590 psi He
 - 1 Tested to failure
 - 1 Tested to 75% failure

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~~Atomic Energy~~

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~~RESTRICTED DATA~~

- 4 Rejects, aborts, spares
- 17 WAFF NbC Coat (NRX-A6 spec).
 - 7 No Mo Coat
 - 6 Tested at 590 psi He
 - 2 Tested to failure
 - 4 Tested to 75% failure
 - 1 Standard NRX-A6 QC Test
 - 4 WAFF Mo Coat
 - 4 Tested at 590 psi he.
 - 2 Test to failure
 - 2 Tested to 75% failure
 - 2 Y-12 Mo Coat
 - 2 Tested at 590 psi He.
 - 1 Tested to failure
 - 1 Tested to 75% failure
- 34 WAFF "Worst" Porosity (as consistent as possible)
 - 17 WAFF NbC Coat (NRX-A6 Spec.)
 - 7 No Mo Coat
 - 6 Tested at 590 psi he.
 - 2 Tested to Failure
 - 4 Tested to 75% failure
 - 1 Standard NRX-A6 QC Test
 - 4 WAFF Mo Coat
 - 4 Tested at 590 psi He.
 - 2 Tested to Failure
 - 2 Tested to 75% failure
 - 2 Y-12 Mo Coat
 - 1 Tested to failure
 - 1 Tested to 75% failure
 - 4 Rejects, aborts, spares
- 17 Y-12 NbC Coat (NRX-A6 Spec.)
 - 7 No Mo Coat
 - 6 Tested at 590 psi he.
 - 2 Tested to Failure
 - 4 Tested to 75% failure
 - 1 Standard NRX-A6 QC Test
 - 4 Y-12 Mo Coat
 - 4 Tested at 590 psi He.
 - 2 Tested to Failure
 - 2 Tested to 75% failure
 - 2 WAFF Mo Coat
 - 2 Tested at 590 psi He.
 - 1 Tested to failure
 - 1 Tested to 75% failure
 - 4 Rejects, aborts, spares

~~CONFIDENTIAL~~
~~RESTRICTED DATA~~
Atomic Energy Act of 1954

~~CONFIDENTIAL~~
~~RESTRICTED DATA~~

Astronuclear
Laboratory

Total Elements: 68 Fabricated; 52 tested; 16 spares, etc.

No-Mo elements will be given first priority in the test program.

Data Required During

Data will be recorded in accordance with PS 294613, Rev. 9, (Corrosion Test Spec.), including time of test. In addition, if at all possible, Beckman Flame Ionization Data will be taken during each test.

Post Test Data

1. Total and Incremental Weight Loss
2. Pinhole Count and Location
3. Electrical resistivity
4. Incremental Permeability
5. Any other pertinent visual or anomolous information, including appropriate metallography.

~~CONFIDENTIAL~~
~~RESTRICTED DATA~~

~~CONFIDENTIAL~~
~~RESTRICTED DATA~~
~~Atomic Energy, Rel. 1754~~

WANL-TME-1626

APPENDIX B
CORROSION TEST DATA

~~CONFIDENTIAL~~
~~RESTRICTED DATA~~
~~Atomic Energy, Rel. 1754~~

CORROSION TEST NUMBER - 2.0019

ELEMENT SERIAL NUMBER - 99-33811

TEST DATE - 10/06/66

TOTAL TEST TIME - 26.98

TOTAL WEIGHT LOSS - 10.3

FAILURE OCCURRED - 18.75

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 5

END BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - 3933 CURE RUN - 333A

NB WEIGHT GAIN - 66.3

MOLY WEIGHT GAIN - NONE

BAKE RUN - 404A GRAPHITIZING RUN - 793A

MOLY DISTRIBUTION

NONE

LEACH RUN - 454A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2670	3435	4215	4615	790	560.0	95.0	500.0	500.0	586.0	27.5
5 MIN TIME	2695	3455	4235	4640	785	560.0	95.0	500.0	500.0	586.0	27.5
FINAL	2670	3455	4285	4640	790	560.0	95.0	500.0	500.0	586.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1530	2011	2457	2869	3247	3590	3898	4173	4413	4618	4742	
MAX INTERNAL TEMPERATURE	1546	2089	2587	3040	3445	3809	4135	4425	4681	4902	5035	
BORE PRESSURE	654.0	649.8	643.8	636.5	628.0	618.5	608.1	596.8	584.8	572.1	562.7	
DELTA PRESSURE	68.0	63.8	57.8	50.5	42.0	32.5	22.1	10.8	-1.2	-13.9	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	33	38	34	30	35	38	36	49	35	14	0	342
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.042	2.235	0.619	0.511	0.610	0.157	1.434	4.386	0.306	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	1	1	0	0	0	0	0	2
FACE E	0	0	0	0	1	1	0	0	0	1	0	3

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	2	2	0	0	0	1	0	5
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	10	8	5	15	30	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	30	10	35	30	40	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	10	11	6	2	2	0	31
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	4	1	4	1	0	10
MAXIMUM DEPTH	0	0	0	0	0	0	30	30	35	50	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	26.0	38.0	42.0	40.0	46.0	47.0	50.0	50.0	50.0	50.0	49.0	48.0	47.0	44.0	42.0	38.0	113
POST COAT PERMEABILITY	16.0	19.0	21.0	22.0	22.0	24.0	23.0	21.0	22.0	24.0	21.0	21.0	19.0	15.0	12.0	13.0	22.0
POST TEST PERMEABILITY	19.0	24.0	28.0	33.5	72.8	BRK	BRK	82.0	13K	9.9	138	22.5	34.0	51.6	72.8	880	1.6K

CORROSION TEST NUMBER - 2.0020

ELEMENT SERIAL NUMBER - 99-33913

TEST DATE - 10/06/66

TOTAL TEST TIME - 20.25
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 7.0
TOTAL PINHOLES - 1

FAILURE OCCURRED - NO
END BEHAVIOR (BAR/EAR) - 100/ 90

NB COATING RUN - L219
NB WEIGHT GAIN - 67.2

MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONE

EXTRUSION BATCH - 3958 CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 795A
LEACH RUN - 453A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2625	3395	4190	4640	805	560.0	100.0	500.0	590.0	27.5	
5 MIN TIME	2645	3455	4245	4640	820	560.0	100.0	500.0	590.0	27.5	
FINAL	2695	3465	4315	4640	810	560.0	100.0	500.0	590.0	27.5	

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1393	1914	2393	2833	3231	3590	3908	4186	4423	4620	4734	
MAX INTERNAL TEMPERATURE	1410	1996	2529	3011	3439	3819	4155	4449	4703	4916	5040	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.0	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	52	49	33	17	13	14	13	8	42	19	0	260
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	1	1
FACE F	0	0	0	0	0	0	0	0	0	0	0	1	1
TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	1
TYPICAL CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	0	0	10	30	10	10	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	0	0	20	30	35	35	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0	0
CORROSION RINGS -													
CHANNELS 8 AND 12	0	0	0	0	0	0	5	1	6	5	0	17	0
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -													
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	7	1	0	1	0	9	0
MAXIMUM DEPTH	0	0	0	0	0	0	20	50	0	50	0	0	0
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	20.0	24.0	23.0	18.0	17.0	17.0	18.0	21.0	22.0	28.0	32.0	35.0	36.0	42.0	48.0	50.0	187
POST COAT PERMEABILITY	9.0	12.0	9.0	11.0	9.0	14.0	16.0	13.0	16.0	20.0	18.0	22.0	31.0	29.0	29.0	25.0	31
POST TEST PERMEABILITY	9.2	11.6	11.6	11.9	17.0	27.0	29.5	0.0	8.7	11.6	14.5	19.0	30.5	72.8	140.	1.7K	13K

CORROSION TEST NUMBER - 2.0021

ELEMENT SERIAL NUMBER - 99-75839

TEST DATE - 10/06/66

TOTAL TEST TIME - 14.08

TOTAL WEIGHT LOSS - 4.9

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLS - 2

LEAK BEHAVIOR (BAR/CAR) - 100/ 95

NB COATING RUN - L219
NB WEIGHT GAIN - NAMOLY COATING RUN - MCNE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONEEXTRUSION BATCH - Y11 CURE RUN - Y11
BAKE RUN - Y11 GRAPHITIZING RUN - Y11
LEACH RUN - Y10

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2670	3435	4190	4640	799	560.0	100.0	500.0	590.0	27.5	
5 MIN TIME	2790	3525	4285	4640	820	560.0	100.0	500.0	590.0	27.5	
FINAL	2790	3525	4330	4640	813	560.0	100.0	500.0	590.0	27.5	

- - - 5 INCH (NOT OVERLAPING) INCREMENTS - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1628	2109	2553	2960	3330	3663	3959	4218	4440	4625	4732	
MAX INTERNAL TEMPERATURE	1644	2191	2688	3138	3537	3891	4206	4481	4720	4921	5039	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	24	19	13	12	11	10	21	10	18	24	0	162
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.00	0.00	0.00	0.00	0.29	0.15	0.10	0.27	0.33	0.90	1.20	0.84
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	1	0	0	0	1
FACE C	0	0	0	0	0	0	0	1	0	0	0	1
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	FACE F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
TYPICAL CORROSION DEPTH																
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH																
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -																
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -																
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF																
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST COAT PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14K	13K	0.0	0.0	0.0	16.2	13K

CORROSION TEST NUMBER - 2.0022

ELEMENT SERIAL NUMBER - 99-75991

TEST DATE - / /

TOTAL TEST TIME - 34.3

TOTAL WEIGHT LOSS - 17.2

FAILURE OCCURRED - 36.0

EFFECTIVE HEATED LENGTH - 46.0

TOTAL PINHOLES - 12

END BEHAVIOR (BAR/CAR) - 100/ 95

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y12 CURE RUN - Y12

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y12 GRAPHITIZING RUN - Y12

MOLY DISTRIBUTION NONE

LEACH RUN - Y11

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2625	3405	4215	4640	815	560.0	99.0	500.0	590.0	27.5
5 MIN TIME	2683	3455	4285	4640	820	560.0	99.0	500.0	590.0	27.5
FINAL	2765	3513	4405	4615	812	560.0	99.0	500.0	590.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1430	1948	2425	2861	3257	3613	3928	4202	4436	4629	4740	
MAX INTERNAL TEMPERATURE	1446	2030	2560	3040	3464	3841	4175	4465	4716	4925	5046	
BORE PRESSURE	658.0	653.6	647.3	639.7	630.8	620.9	610.1	598.4	585.9	572.6	562.8	
DELTA PRESSURE	68.0	63.6	57.3	49.7	40.8	30.9	20.1	8.4	-4.1	-17.4	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	34	25	16	12	6	10	10	8	10	17	0	148
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.462	0.095	0.103	0.662	4.250	4.399	7.227	0.000	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	2	0	2
FACE B	0	0	0	0	0	0	3	0	0	1	0	4
FACE C	0	0	0	0	0	0	0	1	0	0	0	1
FACE D	0	0	0	0	0	0	0	2	0	0	0	2
FACE E	0	0	0	0	0	0	1	0	0	1	0	2

	FACE F	TOTAL
FACE F	0	0
TOTAL	0	0
TYPICAL CORROSION DEPTH		
- CHANNELS 8 AND 12	-	-
- CHANNELS 9 AND 11	-	-
- CHANNEL 10	-	-
MAXIMUM CORROSION DEPTH		
- CHANNELS 8 AND 12	-	-
- CHANNELS 9 AND 11	-	-
- CHANNEL 10	-	-
CORROSION RINGS -		
CHANNELS 8 AND 12	-	-
CHANNELS 9 AND 11	-	-
CHANNEL 10	-	-
DEFECT CORROSION -		
RING RELATED	-	-
NON RING RELATED	-	-
MAXIMUM DEPTH	-	-
INDICATION OF		
SURFACE CORROSION	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.6	1.4	1.6	2.3	2.5	2.3	3.3	3.3	3.2	3.3	3.5	4.1	4.7	4.7	4.7	3.5	2.9
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	13.0	0.0	8.0	11.0	22.0	26.0	15.0	17.0	0.0	0.0	0.0	0.0	29.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	12.5	34.5	16.2	0.0	0.0	0.0	0.0	BRK	38.0	37.0	81.5	2.0K	2.4K

CORROSION TEST NUMBER - 2.0048

ELEMENT SERIAL NUMBER - 99-33870

TEST DATE - 10/11/68

TOTAL TEST TIME - 27.5

TOTAL WEIGHT LOSS - 11.5

FAILURE OCCURRED - 28.0

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 5

END BEHAVIOR (BAR/CAR) - 100/ 97

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - 3552

CURE RUN - 333A

NB WEIGHT GAIN - 67.0

MOLY WEIGHT GAIN - NONE

BAKE RUN - 404A

GRAPHITIZING RUN - 794A

MOLY DISTRIBUTION - NONE

LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2480	3360	4050	4605	741	560.0	90.0	500.0	583.0	27.5	
5 MIN TIME	2505	3372	4050	4605	725	560.0	90.0	500.0	583.0	27.5	
FINAL	2505	3465	4050	4495	719	560.0	90.0	500.0	583.0	27.5	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1372	1846	2290	2704	3087	3441	3764	4057	4320	4553	4698	
MAX INTERNAL TEMPERATURE	1387	1919	2410	2861	3270	3643	3982	4290	4567	4815	4969	
BORE PRESSURE	649.1	645.1	639.4	632.4	624.4	615.4	605.5	594.9	583.5	571.4	562.6	
DELTA PRESSURE	66.1	62.1	56.4	49.4	41.4	32.4	22.5	11.9	0.5	-11.6	-20.4	
CRACK DISTRIBUTION -												
PRE TEST	39	25	27	25	20	63	50	81	60	31	0	421
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-

	0.000	0.000	0.000	0.147	0.415	2.745	0.838	1.041	1.794	4.085	0.428
INCREMENTAL WEIGHT LOSS											
PINHOLE DISTRIBUTION -											

	0	0	0	0	0	0	0	0	0	0	0	0
FACE A												
FACE B												
FACE C												
FACE D												
FACE E												

	0	0	0	0	0	0	0	0	0	1	0	1
FACE F												
TOTAL												

	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12												
- CHANNELS 9 AND 11												
- CHANNEL 10												
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12												
- CHANNELS 9 AND 11												
- CHANNEL 10												
CORROSION RINGS -												
CHANNELS 8 AND 12												
CHANNELS 9 AND 11												
CHANNEL 10												
DEFECT CORROSION -												
RING RELATED												
NON RING RELATED												
MAXIMUM DEPTH												
INDICATION OF SURFACE CORROSION												

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	13.0	18.0	19.0	18.0	19.0	21.0	24.0	26.0	34.0	46.0	48.0	50.0	56.0	72.0	74.0	60.0	275.
POST COAT PERMEABILITY	10.0	11.0	11.0	11.0	12.0	13.0	13.0	18.0	23.0	27.0	29.0	32.0	41.0	46.0	44.0	40.0	44.
POST TEST PERMEABILITY	8.6	11.0	11.6	11.9	17.5	55.0	100.	64.	BRK	BRK	72.8	72.8	100.	170.	225.	2.1K	1.9K

CORROSION TEST NUMBER - 2.0049

ELEMENT SERIAL NUMBER - 99-33929

TEST DATE - 10/11/65

TOTAL TEST TIME - 20.6

TOTAL WEIGHT LOSS - 5.6

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR(BAR/CAR) - 100/100

NB COATING RUN - L219
NB WEIGHT GAIN - 67.0

MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONE

EXTRUSION BATCH - 3959 CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 795A
LEACH RUN - 453A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2685	3395	4055	4735	770	560.0	92.0	500.0	584.0	29.9
5 MIN TIME	2695	3475	4105	4755	770	560.0	92.0	500.0	584.0	29.9
FINAL	2670	3550	4130	4690	788	560.0	92.0	500.0	584.0	29.9

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1798	2167	2523	2868	3201	3522	3831	4128	4413	4686	4870	
MAX INTERNAL TEMPERATURE	1814	2244	2650	3036	3395	3736	4063	4375	4676	4964	5158	
BORE PRESSURE	651.0	647.0	641.2	634.0	625.8	616.6	606.5	595.7	584.0	571.7	562.6	
DELTA PRESSURE	67.0	63.0	57.2	50.0	41.8	32.5	22.5	11.7	0.0	-12.3	-21.4	
CRACK DISTRIBUTION -												
PRE TEST	58	55	40	28	53	71	57	59	69	10	0	505
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-

INCREMENTAL WEIGHT LOSS 0.000 0.000 0.208 0.420 1.201 0.977 0.081 0.081 0.205 1.241 1.393

PINHOLE DISTRIBUTION -

FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	1	1	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	1	0	0	0	0	0	0	0	0
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	1	6	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	1	0	0	0	0	0	0	0	0
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	8	0	0	0	0	0	0	0	10
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	1	0	5	0	0	0	0	0	8
MAXIMUM DEPTH	0	0	0	0	10	0	15	10	0	0	0	0
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	19.0	31.0	38.0	38.0	41.0	44.0	48.0	50.0	50.0	49.0	46.0	42.0	38.0	33.0	32.0	32.0	460.
POST COAT PERMEABILITY	14.0	16.0	16.0	19.0	22.0	24.0	31.0	32.0	34.0	31.0	29.0	25.0	22.0	20.0	17.0	13.0	17.
POST TEST PERMEABILITY	14.0	24.5	28.0	30.5	36.5	68.0	140.	120.	1.4K	640.	19.8	27.5	23.0	38.5	58.0	480.	13K

CORROSION TEST NUMBER - 2.0050

ELEMENT SERIAL NUMBER - 99-78571

TEST DATE - 10/11/66

TOTAL TEST TIME - 27.3

TOTAL WEIGHT LOSS - 11.1

FAILURE OCCURRED - 36.51

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 8

END BEHAVIOR(BAR/CAR) - 100/ 90

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y19 CURE RUN - Y19

NB WEIGHT GAIN - 64.7

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y17 GRAPHITIZING RUN - Y19

MOLY DISTRIBUTION - NONE

LEACH RUN - Y17

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2658	3405	4095	4710	775	560.0	95.0	500.0	587.0	29.9	
5 MIN TIME	2720	3385	4115	4690	770	560.0	95.0	500.0	587.0	29.9	
FINAL	2670	3360	4115	4640	770	560.0	95.0	500.0	587.0	29.9	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1871	2209	2541	2864	3179	3487	3787	4079	4363	4640	4829	
MAX INTERNAL TEMPERATURE	1886	2286	2668	3031	3374	3702	4019	4326	4626	4918	5117	
BORE PRESSURE	654.0	649.8	643.8	636.5	628.0	618.5	608.1	596.8	584.8	572.1	562.7	
DELTA PRESSURE	67.0	62.8	56.8	49.5	41.0	31.5	21.1	9.8	-2.2	-14.9	-24.3	
CRACK DISTRIBUTION -												
PRE TEST	26	17	17	16	6	6	4	8	7	17	0	124
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.186	0.159	1.771	0.349	2.452	2.122	3.437	0.624	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	1	0	0	0	0	1
FACE B	0	0	0	0	0	0	1	1	0	0	0	2
FACE C	0	0	0	0	0	0	0	1	0	0	0	1
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	3

	0	0	0	0	0	0	0	0	1	0	0	0	1
FACE F	0	0	0	0	0	0	0	0	1	0	0	0	1
TOTAL	0	0	0	0	0	0	0	2	2	0	0	0	8
TYPICAL CORROSION DEPTH													
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH													
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -													
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -													
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF													
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.2	2.5	2.3	2.0	2.3	2.3	2.0	2.3	2.3	2.5	3.2	8.2	3.3	3.3	3.3	3.3	2.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	32.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0	13K	BRK	BRK	4.4K	30.5	81.5	100.

CORROSION TEST NUMBER - 2.0051

ELEMENT SERIAL NUMBER - 99-75993

TEST DATE - 10/11/66

TOTAL TEST TIME - 20.5

TOTAL WEIGHT LOSS - 4.9

FAILURE OCCURRED - 51.0

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR(BAR/CAR) - 100/ 99

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y12 CURE RUN - Y12

NB WEIGHT GAIN - 65.0

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y12 GRAPHITIZING RUN - Y12

MOLY DISTRIBUTION - NONE

LEACH RUN - Y11

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2670	3445	4070	4690	787	560.0	94.0	501.2	586.0	29.9	
5 MIN TIME	2680	3435	4115	4710	766	560.0	94.0	501.2	586.0	29.9	
FINAL	2680	3385	4105	4665	757	560.0	94.0	501.2	586.0	29.9	

- - - 5 INCH (NOT OVERLAPING) INCREMENTS - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1744	2127	2495	2848	3186	3509	3817	4111	4389	4653	4829	
MAX INTERNAL TEMPERATURE	1760	2204	2621	3014	3379	3722	4048	4357	4651	4930	5115	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	595.4	584.5	571.9	562.7	
DELTA PRESSURE	67.0	62.9	56.9	49.6	41.2	31.8	21.6	10.4	-1.5	-14.1	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	28	21	12	11	14	15	6	11	9	37	0	164
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.146	0.471	0.158	0.016	0.155	0.027	1.287	1.738	0.898	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	5	10	15	20	25	30	35	40	45	50	52	TOTAL
FACE F	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	1	5	4	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	1	5	10	15	40	0	0	0	
- CHANNEL 10	0	0	0	0	1	4	15	0	0	0	0	0	
MAXIMUM CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	10	15	20	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	10	15	15	15	40	0	0	0	
- CHANNEL 10	0	0	0	0	5	11	18	0	0	0	0	0	
CORROSION RINGS -													
CHANNELS 8 AND 12	0	0	0	0	11	4	4	0	0	0	0	17	
CHANNELS 9 AND 11	0	0	0	0	10	4	4	1	1	0	0	22	
CHANNEL 10	0	0	0	0	9	5	0	0	0	0	0	18	
DEFECT CORROSION -													
RING RELATED	0	0	0	0	0	0	0	0	1	0	0	1	
NON RING RELATED	0	0	0	0	0	8	18	4	6	2	0	38	
MAXIMUM DEPTH	0	0	0	0	0	20	30	55	40	0	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - -

	1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	1.4	2.3	3.3	3.2	2.0	2.3	2.5	2.3	2.5	2.0	2.3	2.3	2.3	2.0	1.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	195.0

CORROSION TEST NUMBER - 2.0052

ELEMENT SERIAL NUMBER - 99-31693

TEST DATE - 10/12/66

TOTAL TEST TIME - 25.8

TOTAL WEIGHT LOSS - 9.4

FAILURE OCCURRED - 16.75

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 8

LEAK BEHAVIOR (BAR/CAR) - 100/ 98

NB COATING RUN - 8958

MOLY COATING RUN - NONE

EXTRUSION BATCH - 3663 CURE RUN - 100A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NONE

BAKE RUN - 375A GRAPHITIZING RUN - 733A

MOLY DISTRIBUTION NONE

LEACH RUN - 462A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2285	3389	4050	4630	754	560.0	93.0	499.9	586.0	27.5	
5 MIN TIME	2740	3455	4130	4690	768	560.0	93.0	499.9	586.0	27.5	
FINAL	2710	3430	4155	4675	762	560.0	93.0	499.9	586.0	27.5	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1834	2203	2558	2898	3224	3536	3833	4116	4384	4638	4808	
MAX INTERNAL TEMPERATURE	1849	2280	2685	3065	3418	3750	4065	4363	4646	4916	5095	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	595.0	584.3	571.8	562.7	
DELTA PRESSURE	66.0	61.9	56.0	48.8	40.5	31.2	21.0	10.0	-1.7	-14.2	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	52	41	19	23	34	56	60	35	31	0	0	351
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	1.474	1.013	0.216	0.252	0.316	1.415	2.891	1.827	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	8	0	0	0	0	0	0	8
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	8	0	0	0	0	0	0	8
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	1	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	1	0	0	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	20	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	5	0	0	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	9	0	0	0	0	0	0	9
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	10	0	0	0	0	0	0	0	10
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	1	0	0	1	0	5	0	7
MAXIMUM DEPTH	0	0	0	0	20	0	0	20	0	25	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	36.0	51.0	53.0	56.0	59.0	59.0	59.0	59.0	59.0	56.0	56.0	56.0	56.0	54.0	50.0	44.0	82.0
POST COAT PERMEABILITY	11.0	16.2	19.5	22.3	24.6	25.0	26.5	27.7	27.3	29.0	36.5	37.0	37.0	35.0	32.0	28.8	
POST TEST PERMEABILITY	12.5	15.5	2.3	34.0	BRK	BRK	13K	13K	19.4	15.7	19.8	30.5	45.7	68.0	100.	430.	13K

CORROSION TEST NUMBER - 2.0053

ELEMENT SERIAL NUMBER - 99-55817

TEST DATE - 10/12/66

TOTAL TEST TIME - 19.3

TOTAL WEIGHT LOSS - 5.1

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - 8998

MOLY COATING RUN - NONE

EXTRUSION BATCH - 3935 CURE RUN - 333A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NONE

BAKE RUN - 404A GRAPHITIZING RUN - 793A

MOLY DISTRIBUTION - NONE

LEACH RUN - 454A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLUX RATE	FLUX RATE	PRESSURE	FLUX RATE	FLUX RATE
INITIAL	2645	3385	4050	4665	770	560.0	94.0	501.7	586.0	27.5		
5 MIN TIME	2655	3395	4105	4640	761	560.0	94.0	501.7	586.0	27.5		
FINAL	2730	3445	4145	4640	763	560.0	94.0	501.7	586.0	27.5		

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1672	2074	2457	2820	3164	3489	3794	4080	4347	4594	4756	
MAX INTERNAL TEMPERATURE	1687	2150	2582	2986	3357	3701	4024	4325	4607	4869	5040	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.6	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	67.0	62.9	56.9	49.6	41.2	31.8	21.6	10.4	-1.5	-14.1	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	56	13	8	14	27	54	59	57	28	0	373	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.218	0.261	0.013	0.064	0.254	1.013	2.577	0.697	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	5	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	15	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	6	0	0	0	0	0	0	6
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	18	13	2	10	0	0	0	0	43
MAXIMUM DEPTH	0	0	0	10	10	30	50	0	0	0	0	0
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	40.0	46.0	47.0	49.0	50.0	50.0	51.0	52.0	52.0	52.0	53.0	52.0	49.0	47.0	46.0	42.0	232.
POST COAT PERMEABILITY	8.6	12.0	14.4	17.5	19.0	19.0	19.5	22.0	24.6	28.0	32.0	33.0	30.0	27.7	28.0	25.0	
POST TEST PERMEABILITY	9.0	13.1	17.8	23.5	46.9	140.	195.	195.	6.7	11.0	17.0	24.0	31.5	46.9	61.0	81.5	100.

CORROSION TEST NUMBER - 2.C054

ELEMENT SERIAL NUMBER - 99-3-859

TEST DATE - 10/12/66

TOTAL TEST TIME - 19.3

TOTAL WEIGHT LOSS - 5.4

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

LEAK BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - 8598

MOLY COATING RUN - NONE

EXTRUSION BATCH - 355C

CURE RUN - 333A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NONE

BAKE RUN - 4J4A

GRAPHITIZING RUN - 794A

MOLY DISTRIBUTION - NONE

LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2645	3395	4050	4665	789	560.0	93.0	502.7	585.0	27.5
5 MIN TIME	2645	3395	4085	4625	766	560.0	93.0	502.7	585.0	27.5
FINAL	2730	3485	4300	4665	762	560.0	93.0	502.7	585.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1662	2066	2449	2813	3157	3481	3785	4069	4333	4577	4736	
MAX INTERNAL TEMPERATURE	1678	2143	2576	2980	3350	3694	4015	4315	4594	4854	5022	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	596.0	584.3	571.8	562.7	
DELTA PRESSURE	67.0	62.9	57.0	49.8	41.5	32.2	22.0	11.0	-0.7	-13.2	-22.3	
CRACK DISTRIBUTION -												
PRE TEST	45	14	11	16	31	31	27	48	26	23	0	272
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.058	0.457	0.538	0.074	0.138	0.276	0.658	1.629	1.574	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	3	1	1	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	5	5	1	20	0	0	0	0	
- CHANNEL 10	0	0	0	5	0	40	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	15	5	5	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	10	20	5	20	0	0	0	0	
- CHANNEL 10	0	0	0	20	0	40	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	21	3	3	0	0	0	0	27
CHANNELS 9 AND 11	0	0	0	3	10	5	1	0	0	0	0	19
CHANNEL 10	0	0	0	11	0	1	0	0	0	0	0	12
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	5	6	4	4	3	2	1	0	25
MAXIMUM DEPTH	0	0	0	10	60	20	10	15	15	20	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	16.0	24.0	25.0	26.0	28.0	30.0	33.0	37.0	41.0	44.0	47.0	49.0	54.0	55.0	54.0	46.0	360
POST COAT PERMEABILITY	12.0	14.0	14.4	15.0	15.9	16.5	17.5	21.0	23.0	25.0	26.0	27.7	29.0	28.5	28.0	20.5	
POST TEST PERMEABILITY	10.8	12.8	13.1	15.5	29.5	68.0	170.	530.	530.	580.	16.5	25.7	33.5	43.5	485.	100.	13K

CORROSION TEST NUMBER - 2.0055 ELEMENT SERIAL NUMBER - 99-75968 TEST DATE - 10/12/66
 TOTAL TEST TIME - 42.6 TOTAL WEIGHT LOSS - 13.3 FAILURE OCCURRED - 39.0
 EFFECTIVE HEATED LENGTH - 48.0 TOTAL PINHOLES - 5 END BEHAVIOR (BAR/CAR) - 100/ 98
 NB COATING RUN - 8998 MOLY COATING RUN - NONE EXTRUSION BATCH - Y12 CURE RUN - Y12
 NB WEIGHT GAIN - 65.7 MOLY WEIGHT GAIN - NONE BAKE RUN - Y3R GRAPHITIZING RUN - Y12
 MOLY DISTRIBUTION NONE LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
INITIAL	15.1	26.3	37.6	48.6	765	560.0	93.0	499.1	586.0	27.5
5 MIN TIME	2670	3360	4095	4690	765	560.0	93.0	499.1	586.0	27.5
FINAL	2730	3385	4145	4680	765	560.0	93.0	499.1	586.0	27.5

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1844	2197	2540	2872	3193	3504	3804	4093	4371	4638	4819	
MAX INTERNAL TEMPERATURE	1859	2273	2666	3038	3386	3716	4033	4337	4630	4913	5103	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	596.0	584.3	571.8	562.7	
DELTA PRESSURE	66.0	61.9	56.0	48.8	40.5	31.2	21.0	10.0	-1.7	-14.2	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	39	19	8	11	24	20	24	16	18	9	0	188
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	1.347	0.881	0.086	0.254	2.806	2.399	4.472	1.055	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	1	0	0	0	1
FACE B	0	0	0	0	1	0	0	0	0	0	0	1
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	1	0	0	0	1
FACE E	0	0	0	0	0	0	0	1	0	0	0	1

	0	0	0	0	0	0	0	1	0	0	0	1
FACE F	0	0	0	0	0	0	0	1	0	0	0	1
TOTAL	0	0	0	0	1	0	0	4	0	0	0	5
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	10	10	10	15	30	0	0	0	
- CHANNELS 9 AND 11	0	0	0	1	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	1	0	5	10	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	20	20	15	20	30	0	0	0	
- CHANNELS 9 AND 11	0	0	0	18	0	15	10	0	0	0	0	
- CHANNEL 10	0	0	0	5	0	15	10	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	18	26	17	7	1	0	0	0	69
CHANNELS 9 AND 11	0	0	0	15	0	0	0	0	0	0	0	15
CHANNEL 10	0	0	0	15	0	11	7	0	0	0	0	33
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	1	0	21	0	3	6	3	0	0	34
MAXIMUM DEPTH	0	0	30	0	40	0	60	50	25	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.2	1.6	2.0	2.9	3.3	3.2	2.9	3.3	3.2	3.3	2.9	2.5	2.9	2.9	2.0	1.6	1.5
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.2	1.2	1.5	1.5	1.2	1.2	1.2	0.5	0.5	0.5
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	8.6	640.	1.7K	0.0	0.0	0.0	0.0	BRK	BRK	100.	580.	170.	195.

CORROSION TEST NUMBER - 2.0056

ELEMENT SERIAL NUMBER - 99-76328

TEST DATE - 10/12/66

TOTAL TEST TIME - 32.0
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 7.0
TOTAL PINHOLES - 2

FAILURE OCCURRED - NO
END BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - 8998
NB WEIGHT GAIN - 68.1

MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONE

EXTRUSION BATCH - Y16 CURE RUN - Y16
BAKE RUN - Y3R GRAPHITIZING RUN - Y16
LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2710	3360	4050	4640	770	560.0	93.0	500.1	586.0	27.5
5 MIN TIME	2730	3360	4130	4640	765	560.0	93.0	500.1	586.0	27.5
FINAL	2835	3435	4215	4710	770	560.0	93.0	500.1	586.0	27.5

----- 5 INCH (NOT OVERLAPING) INCREMENTS -----

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1852	2201	2539	2866	3183	3488	3783	4067	4340	4603	4780	
MAX INTERNAL TEMPERATURE	1868	2278	2665	3033	3376	3702	4013	4313	4601	4879	5066	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	596.0	584.3	571.8	562.7	
DELTA PRESSURE	66.0	61.9	56.0	48.8	40.5	31.2	21.0	10.0	-1.7	-14.2	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	25	13	18	12	16	13	16	16	15	11	0	155
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
DATA NOT AVAILABLE FOR THIS PRINTING												
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.396	0.096	0.000	0.136	0.411	1.131	2.078	1.756	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	1	0	0	1
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	1	0	0	0	1

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	1	1	0	0	2
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	5	10	0	5	20	20	0	0	
- CHANNELS 9 AND 11	0	0	0	5	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	1	0	1	5	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	10	20	0	10	30	30	0	0	
- CHANNELS 9 AND 11	0	0	0	15	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	10	0	10	20	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	10	23	0	8	12	2	0	0	55
CHANNELS 9 AND 11	0	0	0	6	0	0	0	0	0	0	0	6
CHANNEL 10	0	0	0	10	0	3	3	0	0	0	0	16
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	2	0	6	10	7	0	25
MAXIMUM DEPTH	0	0	0	20	0	10	0	18	40	20	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	
DATA NOT AVAILABLE FOR THIS PRINTING												

----- 3 3/4 INCH (OVERLAPING) INCREMENTS -----

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.2	1.2	1.2	1.2	0.5	1.0	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	48.5	0.0	2.6K	0.0	0.0	0.0	0.0	6.5K	3.2K	0.0	195.	260.

CORROSION TEST NUMBER - 2.0057

ELEMENT SERIAL NUMBER - 99-76068

TEST DATE - 10/12/66

TOTAL TEST TIME - 37.0

TOTAL WEIGHT LOSS - 10.8

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 14

END BEHAVIOR(BAR/CAR) - 99/ 99

NB COATING RUN - 8998

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y13

CURE RUN - Y18

NB WEIGHT GAIN - 64.6

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y13

GRAPHITIZING RUN - Y18

MOLY DISTRIBUTION NONE

LEACH RUN - Y12

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2685	3445	4095	4665	805	560.0	93.0	499.4	592.0	27.5
5 MIN TIME	2670	3395	4115	4690	770	560.0	93.0	499.4	592.0	27.5
FINAL	2645	3323	4130	4665	760	560.0	93.0	499.4	592.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1739	2116	2480	2830	3166	3488	3796	4091	4372	4639	4817	
MAX INTERNAL TEMPERATURE	1754	2193	2607	2997	3360	3703	4028	4338	4635	4917	5105	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	596.0	584.3	571.8	562.7	
DELTA PRESSURE	60.0	55.9	50.0	42.8	34.5	25.2	15.0	4.0	-7.7	-20.2	-29.3	
CRACK DISTRIBUTION -												
PRE TEST	26	11	11	11	10	9	22	7	23	14	0	144
POST TEST	-	-	-	-	-	-	-	-	-	-	-	

INCREMENTAL WEIGHT LOSS 0.000 0.000 0.000 0.584 0.705 0.364 0.731 1.026 1.794 2.599 2.999

PINHOLE DISTRIBUTION -

FACE A	0	0	0	0	0	0	1	1	0	0	0	2
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	3	2	0	0	0	5

FACE F	0	0	0	0	1	0	2	4	0	0	0	7
TOTAL	0	0	0	0	1	0	6	7	0	0	0	14

TYPICAL CORROSION DEPTH

- CHANNELS 8 AND 12	0	0	0	10	20	10	15	20	0	0	0	
- CHANNELS 9 AND 11	0	0	0	10	5	1	1	0	0	0	0	
- CHANNEL 10	0	0	0	1	5	10	30	0	0	0	0	

MAXIMUM CORROSION DEPTH

- CHANNELS 8 AND 12	0	0	0	15	60	15	22	30	0	0	0	
- CHANNELS 9 AND 11	0	0	0	10	17	1	5	0	0	0	0	
- CHANNEL 10	0	0	0	5	10	15	40	0	0	0	0	

CORROSION RINGS -

CHANNELS 8 AND 12	0	0	0	5	25	19	14	10	1	0	0	72
CHANNELS 9 AND 11	0	0	0	4	10	1	2	0	0	0	0	17
CHANNEL 10	0	0	0	5	10	9	5	0	0	0	0	29

DEFECT CORROSION -

RING RELATED	0	0	0	0	0	0	1	4	0	0	0	5
NON RING RELATED	0	0	0	0	0	0	1	4	5	0	0	16
MAXIMUM DEPTH	0	0	0	0	0	10	200	170	40	0	0	

INDICATION OF

SURFACE CORROSION - - - DATA NOT AVAILABLE FOR THIS PRINTING - - -

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	0.5	0.5	0.5	4.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	340.	6.5K	0.0	0.0	0.0	13K	6.8K	7.0K	81.5	43.0	100.

CORROSION TEST NUMBER - 2.0059

ELEMENT SERIAL NUMBER - 99-76069

TEST DATE - 10/12/66

TOTAL TEST TIME - 44.8

TOTAL WEIGHT LOSS - 10.8

FAILURE OCCURRED - 16.51

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 4

END BEHAVIOR(BAR/CAR) - 100/ 90

NB COATING RUN - 8998

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y13

CURE RUN - Y13

NB WEIGHT GAIN - 69.3

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y13

GRAPHITIZING RUN - Y13

MOLY DISTRIBUTION NONE

LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2708	3385	4083	4665	795	560.0	93.0	500.4	585.0	29.2
5 MIN TIME	2708	3360	4115	4605	775	560.0	93.0	500.4	585.0	29.2
FINAL	2728	3360	4105	4595	777	560.0	93.0	500.4	585.0	29.2

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1789	2158	2512	2851	3175	3484	3778	4057	4321	4570	4735	
MAX INTERNAL TEMPERATURE	1804	2235	2640	3020	3371	3700	4011	4306	4585	4850	5024	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	596.0	584.3	571.8	562.7	
DELTA PRESSURE	67.0	62.9	57.0	49.8	41.5	32.2	22.0	11.0	-0.7	-13.2	-22.3	
CRACK DISTRIBUTION -												
PRE TEST	49	26	15	16	26	49	33	13	20	18	0	265
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.171	1.786	0.851	0.306	0.481	0.836	1.681	3.389	1.246	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	1	0	0	1
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	FACE F	0	0	0	0	2	1	0	0	0	0	0	0	3
TOTAL	0	0	0	0	2	1	0	0	1	0	0	0	4	
TYPICAL CORROSION DEPTH														
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH														
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -														
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -														
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF														
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	1.0	1.4	1.5	2.0	2.5	3.2	3.3	3.5	3.9	4.5	5.5	3.3	3.2	2.5	1.6	0.5
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST TEST PERMEABILITY	C.C	0.0	0.0	0.0	BRK	BRK	13K	1.2K	0.0	0.0	0.0	0.0	0.0	0.0	120.	300.	BRK

CORROSION TEST NUMBER - 2.0060

ELEMENT SERIAL NUMBER - 99-76327

TEST DATE - 10/12/66

TOTAL TEST TIME - 27.3

TOTAL WEIGHT LOSS - 10.3

FAILURE OCCURRED - 25.5

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 10

END BEHAVIOR (BAR/CAR) - 100/ 95

NB COATING RUN - 8998

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y16 CURE RUN - Y16

NB WEIGHT GAIN - 69.9

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y19B GRAPHITIZING RUN - Y16

MOLY DISTRIBUTION NONE

LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN		INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6		POWER	PRESSURE	PRESSURE	FLOW RATE		PRESSURE	FLOW RATE	
INITIAL	2730	3370	4070	4665		805	560.0	95.0	500.8		587.0	29.2	
5 MIN TIME	2765	3385	4115	4640		766	560.0	95.0	500.8		587.0	29.2	
FINAL	2815	3370	4130	4690		757	560.0	95.0	500.8		587.0	29.2	

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1937	2266	2586	2899	3203	3498	3786	4065	4336	4598	4777	
MAX INTERNAL TEMPERATURE	1952	2342	2713	3065	3396	3712	4017	4311	4597	4875	5063	
BORE PRESSURE	654.0	649.8	643.8	636.5	628.0	618.5	608.1	596.8	584.8	572.1	562.7	
DELTA PRESSURE	67.0	62.8	56.8	49.5	41.0	31.5	21.1	9.8	-2.2	-14.9	-24.3	
CRACK DISTRIBUTION -												
PRE TEST	28	7	10	4	5	6	11	14	15	12	0	112
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.041	0.722	0.728	1.814	0.644	0.946	2.015	2.747	0.637	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	3	0	0	0	0	3
FACE C	0	0	0	0	0	0	2	0	0	0	0	2
FACE D	0	0	0	0	0	0	0	0	1	0	0	1
FACE E	0	0	0	0	0	0	0	0	3	0	0	3

FACE F	0	0	0	0	0	1	0		0	0	0	1
TOTAL	0	0	0	0	0	6	0		4	0	0	10
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	10	10	5	10	20	0	0	0	
- CHANNELS 9 AND 11	0	0	0	10	0	0	5	0	0	0	0	
- CHANNEL 10	0	0	0	10	1	5	10	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	15	25	30	10	25	0	0	0	
- CHANNELS 9 AND 11	0	0	0	10	0	0	5	0	0	0	0	
- CHANNEL 10	0	0	0	20	5	5	20	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	16	23	13	18	11	0	0	0	81
CHANNELS 9 AND 11	0	0	0	6	0	0	1	0	0	0	0	7
CHANNEL 10	0	0	0	12	5	2	0	0	0	0	0	25
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	1	0	0	0	0	0	1
NON RING RELATED	0	0	1	14	4	9	3	7	7	0	0	45
MAXIMUM DEPTH	0	0	15	25	100	160	10	20	15	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	1.4K	BRK	BRK	13K	0.0	0.0	9.6	1.6K	195.	940.	170.

CORROSION TEST NUMBER - 2.0061 ELEMENT SERIAL NUMBER - 99-76230 TEST DATE - 10/13/66

TOTAL TEST TIME - 30.0 TOTAL WEIGHT LOSS - 10.7 FAILURE OCCURRED - 49.51
EFFECTIVE HEATED LENGTH - 48.0 TOTAL PINHOLES - 0 END BEHAVIOR(BAR/CAR) - 100/ 99

NB COATING RUN - 8996 MOLY COATING RUN - NONE EXTRUSION BATCH - Y15 CURE RUN - Y15
NB WEIGHT GAIN - 69.2 MOLY WEIGHT GAIN - NONE BAKE RUN - Y3R GRAPHITIZING RUN - Y15
MOLY DISTRIBUTION NONE LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
	15.1	26.3	37.6	48.6						
INITIAL	2625	3345	4050	4615	780	560.0	89.0	500.1	586.0	27.5
5 MIN TIME	2655	3345	4130	4640	782	560.0	89.0	500.1	586.0	27.5
FINAL	2775	3435	4130	4640	776	560.0	89.0	500.1	586.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1682	2074	2449	2807	3148	3473	3781	4071	4346	4603	4773	
MAX INTERNAL TEMPERATURE	1698	2152	2578	2977	3346	3691	4016	4323	4612	4885	5065	
BORE PRESSURE	648.1	644.1	638.5	631.6	623.7	614.8	605.0	594.5	583.2	571.3	562.6	
DELTA PRESSURE	62.1	58.1	52.5	45.6	37.7	28.8	19.0	8.5	-2.8	-14.7	-23.4	
CRACK DISTRIBUTION -												
PRE TEST	59	44	17	14	23	22	28	22	24	11	0	264
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.563	0.990	0.628	0.519	0.634	1.239	2.369	3.780	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	FACE F	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TYPICAL CORROSION DEPTH																			
- CHANNELS 8 AND 12	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	1	0	1	6	1	1	1	1	1	1	1	1	1	1	1
MAXIMUM CORROSION DEPTH																			
- CHANNELS 8 AND 12	0	0	0	0	5	5	1	1	5	0	0	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	1	0	1	17	1	5	0	0	0	0	0	0	0	0	0
CORROSION RINGS -																			
CHANNELS 8 AND 12	0	0	0	0	6	29	24	33	12	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	0	15	20	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	10	10	8	17	5	3	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -																			
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	1	2	1	5	6	0	0	0	0	0	0	0	0
MAXIMUM DEPTH	0	0	0	0	0	0	40	5	30	70	20	0	0	0	0	0	0	0	0
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.6	2.0	3.2	3.2	3.5	3.3	3.5	3.3	3.5	3.3	3.2	3.9	3.9	3.2	3.2	2.0	0.5
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	1.0	0.5	0.5	1.2	1.5	1.0	1.0	1.2	1.0	1.0	0.5	0.5
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	16.5	760.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	BRK

CORROSION TEST NUMBER - 2.0062

ELEMENT SERIAL NUMBER - 99-31725

TEST DATE - 10/13/65

TOTAL TEST TIME - 25.3
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 10.1
TOTAL PINHOLES - 4

FAILURE OCCURRED - 21.5
END BEHAVIOR (BAR/CAR) - 100/ 95

NB COATING RUN - 8998
NB WEIGHT GAIN - NA

MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION NONE

EXTRUSION BATCH - 3666 CURE RUN - 100A
BAKE RUN - 375A GRAPHITIZING RUN - 734A
LEACH RUN - 461A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
	15.1	26.3	37.6	48.6						
INITIAL	2670	3300	4050	4640	800	560.0	94.0	499.1	587.0	27.5
5 MIN TIME	2670	3335	4050	4560	788	560.0	94.0	499.1	587.0	27.5
FINAL	2695	3365	4050	4525	780	560.0	94.0	499.1	587.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1771	2134	2482	2816	3136	3441	3732	4009	4271	4519	4684	
MAX INTERNAL TEMPERATURE	1787	2213	2612	2988	3335	3661	3970	4262	4540	4804	4978	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	66.0	61.9	55.9	48.6	40.2	30.8	20.6	9.4	-2.5	-15.1	-24.3	
CRACK DISTRIBUTION -												
PRE TEST	36	23	15	22	29	53	48	54	83	45	0	408
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.988	1.809	0.607	0.634	0.547	1.242	2.984	1.292	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	1	0	0	0	0	0	0	1
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	1	1	0	0	0	0	0	0	2
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	1	0	0	0	0	0	0	1
FACE F	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	0	0	0	1	2	1	0	0	0	0	0	0	4
TYPICAL CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	1	0	0	0	12	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	1	1	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	3	1	0	16	0	0	0	0	0	
MAXIMUM CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	1	0	0	0	12	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	1	1	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	17	1	0	16	0	0	0	0	0	
CORROSION RINGS -													
CHANNELS 8 AND 12	0	0	0	3	0	0	0	1	0	0	0	0	4
CHANNELS 9 AND 11	0	0	0	9	2	0	0	0	0	0	0	0	11
CHANNEL 10	0	0	0	14	6	0	1	0	0	0	0	0	21
DEFECT CORROSION -													
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	5	0	0	0	0	5
MAXIMUM DEPTH	0	0	0	0	0	0	0	30	0	0	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	34.0	60.0	66.0	67.0	68.0	68.0	66.0	60.0	58.0	56.0	54.0	52.0	52.0	46.0	42.0	41.0	84.0
POST COAT PERMEABILITY	34.0	60.0	66.0	67.0	68.0	68.0	66.0	60.0	58.0	56.0	54.0	52.0	52.0	46.0	42.0	41.0	84.0
POST TEST PERMEABILITY	14.5	24.8	33.0	42.0	120.	760.	BRK	BRK	2.2K	14.5	15.7	25.3	35.0	51.6	72.8	100.	38.0

CONFIDENTIAL

FUEL ASSESSMENT PROGRAM PHASE 1-1C CORROSION TEST DATA

PRINTED- 6/ 8/67

CORROSION TEST NUMBER - 2.0063

ELEMENT SERIAL NUMBER - 99-339.8

TEST DATE - 10/13/68

TOTAL TEST TIME - 18.75
EFFECTIVE HEATED LENGTH - 48.0TOTAL WEIGHT LOSS - 4.7
TOTAL PINHOLES - 0FAILURE OCCURRED - NO
END BEHAVIOR (BAR/CAR) - 100/100NB COATING RUN - 8998
NB WEIGHT GAIN - NAMOLY COATING RUN - NCNE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONEEXTRUSION BATCH - 356C CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 796A
LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2680	3365	4050	4675	790	560.0	94.0	502.0	586.0	27.5
5 MIN TIME	2695	3360	4070	4685	779	560.0	94.0	502.0	586.0	27.5
FINAL	2765	3395	4130	4625	780	560.0	94.0	502.0	586.0	27.5

- - - 5 INCH (NOT OVERLAPING) INCREMENTS - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1892	2211	2526	2838	3146	3449	3750	4046	4339	4627	4827	
MAX INTERNAL TEMPERATURE	1907	2289	2655	3007	3342	3667	3984	4296	4604	4909	5118	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	67.0	62.9	56.9	49.6	41.2	31.8	21.6	10.4	-1.5	-14.1	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	48	16	17	23	39	63	52	51	67	17	0	393
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.295	0.280	0.158	0.275	0.158	1.010	1.002	1.523	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	1	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	1	1	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	1	0	0	10	0	0	0	0	0	0
MAXIMUM CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	1	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	1	3	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	1	0	0	10	0	0	0	0	0	0
CORROSION RINGS -													
CHANNELS 8 AND 12	0	0	0	0	12	0	0	0	0	0	0	12	12
CHANNELS 9 AND 11	0	0	0	8	18	0	0	0	0	0	0	26	26
CHANNEL 10	0	0	0	4	0	0	1	0	0	0	0	5	5
DEFECT CORROSION -													
RING RELATED	0	0	0	1	0	0	0	0	0	0	0	1	1
NON RING RELATED	0	0	0	1	2	2	2	4	1	0	0	12	12
MAXIMUM DEPTH	0	0	0	30	120	10	45	15	15	0	0		
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	20.0	31.0	41.0	44.0	43.0	46.0	47.0	50.0	50.0	48.0	47.0	45.0	42.0	42.0	42.0	36.0	36.0
POST COAT PERMEABILITY	5.0	5.4	10.0	13.5	15.0	16.5	19.0	22.3	25.0	25.5	25.0	21.8	19.5	20.5	19.5	16.5	16.5
POST TEST PERMEABILITY	0.0	11.0	14.5	17.8	43.0	53.0	140.	0.0	0.0	12.5	14.9	17.0	24.0	34.5	44.0	51.6	5.4K

CORROSION TEST NUMBER - 2.0064

ELEMENT SERIAL NUMBER - 99-33949

TEST DATE - 10/13/66

TOTAL TEST TIME - 30.0
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 8.1
TOTAL PINHOLES - 0

FAILURE OCCURRED - NO
END BEHAVIOR (BAR/CAR) - 100/100

NB COATING RUN - 8998
NB WEIGHT GAIN - NA

MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONE

EXTRUSION BATCH - 3962 CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 796A
LEACH RUN - 455A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
	15.1	26.3	37.6	48.6						
INITIAL	2720	3370	4050	4605	780	560.0	93.5	500.0	652.0	27.5
5 MIN TIME	2720	3435	4115	4640	780	560.0	93.5	500.0	652.0	27.5
FINAL	2720	3455	4145	4665	780	560.0	93.5	500.0	652.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1780	2165	2531	2880	3210	3523	3817	4094	4353	4594	4752	
MAX INTERNAL TEMPERATURE	1796	2243	2660	3049	3407	3740	4052	4345	4619	4876	5044	
BORE PRESSURE	652.5	648.4	642.5	635.2	626.9	617.5	607.3	596.2	584.4	571.9	562.7	
DELTA PRESSURE	0.5	-3.6	-9.5	-16.8	-25.1	-34.5	-44.7	-55.8	-67.6	-80.1	-89.3	
CRACK DISTRIBUTION -												
PRE TEST	49	16	15	14	43	30	48	40	48	33	0	336
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.057	0.773	0.916	0.445	0.643	0.537	1.225	2.485	1.021	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	1	1	1	1	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	10	0	1	1	0	0	0	0	
- CHANNEL 10	0	0	0	5	0	5	10	10	25	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	5	5	1	1	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	15	0	5	10	0	0	0	0	
- CHANNEL 10	0	0	0	15	0	10	25	20	25	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	6	10	11	14	0	0	0	0	41
CHANNELS 9 AND 11	0	0	0	5	0	23	50	0	0	0	0	78
CHANNEL 10	0	0	0	4	0	18	23	4	1	0	0	50
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	8	22	0	0	4	6	1	0	41
MAXIMUM DEPTH	0	0	0	15	65	0	0	15	110	10	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	26.0	39.0	40.0	46.0	47.0	47.0	50.0	48.0	47.0	46.0	46.0	43.0	40.0	37.0	31.0	30.0	610
POST COAT PERMEABILITY	4.7	5.4	8.6	11.0	14.0	15.5	15.9	16.0	16.2	17.5	19.0	19.5	20.2	18.4	18.4	15.9	
POST TEST PERMEABILITY	0.0	11.0	12.8	19.5	19.4	39.5	58.0	51.6	37.0	41.0	58.0	78.0	85.9	140.	225.	340.	480.

CORROSION TEST NUMBER - 2.0065

ELEMENT SERIAL NUMBER - 99-76415

TEST DATE - 10/13/66

TOTAL TEST TIME - 30.0

TOTAL WEIGHT LOSS - 7.5

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 2

END BEHAVIOR (BAR/CAR) - 100/ 97

NB COATING RUN - 8998

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y17 CURE RUN - Y17

NB WEIGHT GAIN - 67.5

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y3R GRAPHITIZING RUN - Y17

MOLY DISTRIBUTION NONE

LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2705	3360	4050	4665	790	560.1	91.5	500.1	655.0	27.5	27.5
5 MIN TIME	2750	3415	4155	4665	788	560.1	91.5	500.1	655.0	27.5	27.5
FINAL	2750	3405	4145	4615	779	560.1	91.5	500.1	655.0	27.5	27.5

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1838	2205	2558	2896	3220	3530	3825	4106	4373	4625	4794	
MAX INTERNAL TEMPERATURE	1853	2284	2688	3067	3419	3750	4063	4359	4642	4910	5088	
BORE PRESSURE	650.6	646.6	640.8	633.7	625.6	616.4	606.4	595.6	584.0	571.7	562.7	
DELTA PRESSURE	-4.4	-8.4	-14.2	-21.3	-29.4	-38.6	-48.6	-59.4	-71.0	-83.3	-92.3	
CRACK DISTRIBUTION -												
PRE TEST	54	26	23	18	58	29	57	27	41	15	0	328
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.000	0.078	0.240	0.163	0.301	0.165	0.732	1.966	3.857	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	1	0	0	1
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	1	0	0	0	1
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	1	1	0	0	2
TYPICAL CORROSION DEPTH -												
- CHANNELS 8 AND 12	0	0	0	0	1	1	2	1	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	1	1	4	1	0	0	0	
- CHANNEL 10	0	0	0	1	1	3	5	1	1	0	0	
MAXIMUM CORROSION DEPTH -												
- CHANNELS 8 AND 12	0	0	0	0	7	1	7	1	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	1	1	8	1	0	0	0	
- CHANNEL 10	0	0	0	10	1	7	7	26	1	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	28	40	83	30	0	0	0	181
CHANNELS 9 AND 11	0	0	0	1	8	42	98	1	0	0	0	110
CHANNEL 10	0	0	0	7	9	29	31	12	5	0	0	93
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	1	0	0	0	1	1	5	0	8
MAXIMUM DEPTH	0	0	0	20	0	0	0	45	55	60	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.6	2.5	2.3	2.5	3.2	3.5	2.9	2.5	2.5	2.3	2.5	1.6	2.0	1.2	1.0	0.5	3.0
POST COAT PERMEABILITY	1.6	2.5	2.3	2.5	3.2	3.5	2.9	2.5	2.5	2.3	2.5	1.6	2.0	1.2	1.0	0.5	3.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4K	4.7K	44.5	30.5	1.5K

CONFIDENTIAL

FUEL ASSESSMENT PROGRAM PHASE I-IC CORROSION TEST DATA

PRINTED- 6/ 8/67

CORROSION TEST NUMBER - 2.0072

ELEMENT SERIAL NUMBER - 99-33950

TEST DATE - 10/14/65

TOTAL TEST TIME - 24.0

TOTAL WEIGHT LOSS - 7.3

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 3

END BEHAVIOR(BAR/CAR) - 100/ 97

NB COATING RUN - 8998

MOLY COATING RUN - NONE

EXTRUSION BATCH - 3963

CURE RUN - 118A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NONE

BAKE RUN - 405A

GRAPHITIZING RUN - 796A

MOLY DISTRIBUTION - NONE

LEACH RUN - 455A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2695	3420	4020	4710	775	560.0	93.0	501.5	585.0	28.4	
5 MIN TIME	2705	3405	4115	4665	770	560.0	93.0	501.5	585.0	28.4	
FINAL	2730	3435	4130	4723	770	560.0	93.0	501.5	585.0	28.4	

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1793	2162	2518	2859	3187	3501	3801	4087	4359	4617	4780	
MAX INTERNAL TEMPERATURE	1809	2239	2645	3027	3381	3715	4033	4334	4622	4895	5077	
BORE PRESSURE	652.0	647.9	642.0	634.8	626.5	617.2	607.0	596.0	584.3	571.8	562.7	
DELTA PRESSURE	67.0	62.9	57.0	49.8	41.5	32.2	22.0	11.0	-0.7	-13.2	-22.3	
CRACK DISTRIBUTION -												
PRE TEST	41	17	6	12	16	12	14	36	38	35	0	227
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-

INCREMENTAL WEIGHT LOSS 0.000 0.000 0.172 0.588 0.265 0.130 0.648 0.980 1.739 2.280 0.494

PINHOLE DISTRIBUTION -

	0	0	0	0	0	0	0	0	0	0	0	0
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	2	1	0	0	0	0	0	3
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	2	1	0	0	0	0	0	3
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	1	1	0	10	27	0	0	0	
- CHANNELS 9 AND 11	0	0	0	1	1	0	10	0	0	0	0	
- CHANNEL 10	0	0	0	1	0	0	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	10	30	1	10	27	0	0	0	
- CHANNELS 9 AND 11	0	0	0	20	1	0	10	0	0	0	0	
- CHANNEL 10	0	0	0	1	0	0	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	7	14	4	3	2	0	0	0	30
CHANNELS 9 AND 11	0	0	0	8	9	0	2	0	0	0	0	19
CHANNEL 10	0	0	0	4	0	0	0	0	0	0	0	4
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	1	0	0	0	1
MAXIMUM DEPTH	0	0	0	0	0	0	0	35	0	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	13.0	16.0	19.0	20.0	20.0	21.0	24.0	27.0	31.0	38.0	41.0	46.0	50.0	60.0	67.0	54.0	236.
POST COAT PERMEABILITY	3.5	4.7	5.6	6.0	6.5	7.8	8.9	12.0	15.0	16.5	18.4	18.7	22.0	29.0	35.0	34.0	
POST TEST PERMEABILITY	6.7	0.0	8.4	9.1	25.3	120.	1.4K	22.7	9.6	11.9	15.7	22.0	42.0	72.8	195.	340.	300.

CONFIDENTIAL - RESTRICTED DATA

CORROSION TEST NUMBER - 2.0074

ELEMENT SERIAL NUMBER - 99-33935

TEST DATE - 10/14/66

TOTAL TEST TIME - 24.0

TOTAL WEIGHT LOSS - 8.8

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 5

LND BEHAVIOR (BAR/CAR) - 100/100

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - 3960

CURE RUN - 118A

NB WEIGHT GAIN - 66.5

MOLY WEIGHT GAIN - NONE

BAKE RUN - 405A

GRAPHITIZING RUN - 796A

MOLY DISTRIBUTION NONE

LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2670	3455	4070	4665	785	560.0	94.0	502.9	586.0	586.0	28.4
5 MIN TIME	2670	3435	4095	4640	775	560.0	94.0	502.9	586.0	586.0	28.4
FINAL	2645	3455	4115	4665	777	560.0	94.0	502.9	586.0	586.0	28.4

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1686	2093	2478	2842	3186	3508	3810	4091	4350	4589	4744	
MAX INTERNAL TEMPERATURE	1702	2170	2606	3011	3382	3724	4043	4340	4615	4869	5034	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	67.0	62.9	56.9	49.6	41.2	31.6	21.6	10.4	-1.5	-14.1	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	44	45	35	35	45	53	57	73	45	32	0	464
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	1	0	1
FACE B	0	0	0	0	0	0	0	0	0	4	0	4
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	5	0	5
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	1	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	5	0	0	0	0	5
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	8	6	4	0	0	18
MAXIMUM DEPTH	0	0	0	0	0	0	15	60	15	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	24.0	36.0	40.0	42.0	43.0	44.0	46.0	46.0	44.0	44.0	42.0	41.0	38.0	38.0	33.0	30.0	720.
POST COAT PERMEABILITY	14.0	15.0	18.0	20.0	20.0	24.0	27.0	29.0	28.0	20.0	23.0	22.0	22.0	20.0	17.0	13.0	22.
POST TEST PERMEABILITY	16.2	21.5	24.5	29.5	43.0	140.	640.	380.	0.0	1.2	15.5	24.5	33.0	45.7	61.0	4.2K	4.9K

CORROSION TEST NUMBER - 2.0075

ELEMENT SERIAL NUMBER - 99-76234

TEST DATE - 10/14/66

TOTAL TEST TIME - 32.

TOTAL WEIGHT LOSS - 14.0

FAILURE OCCURRED - 38.51

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 15

END BEHAVIOR (BAR/CAR) - 100/ 98

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y15

CURE RUN - Y15

NB WEIGHT GAIN - 64.7

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y3R

GRAPHITIZING RUN - Y15

MOLY DISTRIBUTION

NONE

LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2695	3435	4105	4640	768	560.0	91.0	91.0	499.8	584.0	28.4	28.4
5 MIN TIME	2695	3405	4145	4648	770	560.0	91.0	91.0	499.8	584.0	28.4	28.4
FINAL	2860	3405	4155	4615	765	560.0	91.0	91.0	499.8	584.0	28.4	28.4

----- 5 INCH (NOT OVERLAPING) INCREMENTS -----

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1711	2111	2492	2893	3285	3517	3819	4102	4365	4600	4768	
MAX INTERNAL TEMPERATURE	1726	2188	2619	3021	3389	3781	4051	4349	4628	4887	5056	
BORE PRESSURE	650.0	646.0	640.3	633.2	625.1	616.0	606.0	595.3	583.8	571.4	562.6	
DELTA PRESSURE	66.0	62.0	56.3	49.2	42.1	32.0	22.0	11.3	-0.2	-12.4	-21.4	
CRACK DISTRIBUTION -												
PRE TEST	28	14	13	9	8	4	4	7	12	20	0	119
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
	DATA NOT AVAILABLE FOR THIS PRINTING											
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	1	2	1	0	0	4
FACE C	0	0	0	0	0	0	2	2	0	0	0	4
FACE D	0	0	0	0	0	0	1	0	0	0	0	1
FACE E	0	0	0	0	0	0	1	2	1	0	0	4

FACE F	0	0	0	0	0	0	0	1	1	0	0	2
TOTAL	0	0	0	0	0	0	1	6	6	2	0	15
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	1	1	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	10	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	5	10	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	1	5	25	0	15	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	15	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	5	25	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	3	13	15	1	1	0	0	33
CHANNELS 9 AND 11	0	0	0	0	0	0	10	0	0	0	0	10
CHANNEL 10	0	0	0	0	0	3	7	0	0	0	0	10
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
ACN RING RELATED	0	0	0	0	1	4	2	13	0	0	0	20
MAXIMUM DEPTH	0	0	0	0	20	132	35	105	0	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-
	DATA NOT AVAILABLE FOR THIS PRINTING											

----- 3 3/4 INCH (OVERLAPPING) INCREMENTS -----

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.6	3.5	4.1	4.5	4.5	4.5	4.7	4.5	4.5	4.1	4.4	3.3	3.5	3.2	3.2	1.6	1.5
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	12.8	40.5	85.9	0.0	13K	13K	13K	BRK	BRK	20.0	30.5	43.0	BRK

CORROSION TEST NUMBER - 2.0076

ELEMENT SERIAL NUMBER - 99-76074

TEST DATE - 10/17/66

TOTAL TEST TIME - 25.0

TOTAL WEIGHT LOSS - 9.2

FAILURE OCCURRED - 19.25

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 15

LND BEHAVIOR(BAR/CAR) - 100/ 95

NB COATING RUN - L219

MOLY COATING RUN - NONE

EXTRUSION BATCH - Y13 CURE RUN - Y1B

NB WEIGHT GAIN - 63.9

MOLY WEIGHT GAIN - NONE

BAKE RUN - Y13 GRAPHITIZING RUN - Y1B

MOLY DISTRIBUTION NONE

LEACH RUN - Y11

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
	15.1	26.3	37.6	48.6						
INITIAL	2695	3360	4225	4775	760	560.0	102.0	500.0	592.0	28.3
5 MIN TIME	2670	3435	4070	4550	785	560.0	102.0	500.0	592.0	28.3
FINAL	2695	3365	4070	4580	780	560.0	102.0	500.0	592.0	28.3

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1642	2071	2472	2845	3191	3509	3800	4064	4299	4508	4637	
MAX INTERNAL TEMPERATURE	1658	2149	2601	3016	3389	3728	4037	4316	4567	4791	4931	
BORE PRESSURE	660.9	656.4	650.0	642.1	633.0	622.8	611.6	599.5	586.6	572.9	562.9	
DELTA PRESSURE	68.9	64.4	58.0	50.1	41.0	30.8	19.6	7.5	-5.4	-19.1	-29.1	
CRACK DISTRIBUTION -												
PRE TEST	14	36	41	57	62	15	11	43	9	18	0	306
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.443	1.482	0.807	0.948	0.388	0.525	1.029	2.407	1.166	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	2	0	0	0	0	0	2
FACE B	0	0	0	0	0	2	0	0	0	0	0	2
FACE C	0	0	0	0	0	0	0	0	0	0	1	1
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	1	0	0	2	2	0	1	6

FACE F	0	0	0	0	0	1	0	3	0	0	0	4
TOTAL	0	0	0	0	1	5	0	5	2	0	2	15
TYPICAL CORROSION DEPTH -												
- CHANNELS 8 AND 12	0	0	0	5	5	1	5	1	10	0	0	
- CHANNELS 9 AND 11	0	0	0	1	10	1	5	1	0	0	0	
- CHANNEL 10	0	0	0	1	5	5	5	5	0	0	0	
MAXIMUM CORROSION DEPTH -												
- CHANNELS 8 AND 12	0	0	0	20	20	20	20	10	10	0	0	
- CHANNELS 9 AND 11	0	0	0	5	33	10	10	5	0	0	0	
- CHANNEL 10	0	0	0	5	10	10	10	10	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	12	17	40	31	7	5	0	0	112
CHANNELS 9 AND 11	0	0	0	7	19	38	26	5	0	0	0	95
CHANNEL 10	0	0	0	6	19	21	12	3	0	0	0	61
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	1	0	0	0	1
NON RING RELATED	0	0	0	0	4	0	1	10	11	0	0	26
MAXIMUM DEPTH	0	0	0	0	10	0	55	100	32	5	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	0.5	0.5	0.5	1.0	1.2	1.6	2.0	2.0	2.9	3.3	4.1	4.7	4.5	3.3	3.3	1.2
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	0.0	BRK	BRK	0.0	13K	55.0	0.0	13K	13K	13K	12.8	340.	13K

CORROSION TEST NUMBER - 2.0077

ELEMENT SERIAL NUMBER - 99-33917

TEST DATE - 10/18/66

TOTAL TEST TIME - 24.

TOTAL WEIGHT LOSS - 9.0

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 10

END BEHAVIOR (BAR/CAR) - 100/ 98

NB COATING RUN - L219
NB WEIGHT GAIN - 66.5

MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONE

EXTRUSION BATCH - 3560 CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 796A
LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

TEMPERATURE AT STATION					POWER	EXIT HYDROGEN		DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
15.1	26.3	37.6	48.6	PRESSURE		TEMPERATURE					
INITIAL	2535	3290	3950	4550	785	560.0	94.0	500.0	586.0	27.5	
FINAL	2585	3290	3985	4570	785	560.0	94.0	500.0	586.0	27.5	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1614	1992	2354	2703	3037	3356	3662	3952	4229	4491	4666	
MAX INTERNAL TEMPERATURE	1630	2070	2484	2874	3235	3575	3898	4205	4497	4774	4959	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	67.0	62.9	56.9	49.6	41.2	31.8	21.6	10.4	-1.5	-14.1	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	43	65	47	40	38	68	75	77	67	62	0	582
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.00	0.00	0.09	1.18	0.33	1.66	0.36	0.02	0.54	2.40	2.42	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	1	0	0	0	0	0	0	1
FACE C	0	0	0	0	1	0	0	0	0	1	0	2
FACE D	0	0	0	0	0	1	0	0	0	1	0	2
FACE E	0	0	0	0	2	1	0	0	0	0	0	3

	0	0	0	0	0	2	0	0	0	0	0	2
FACE F	0	0	0	0	0	2	0	0	0	0	0	2
TOTAL	0	0	0	0	4	4	0	0	0	2	0	10
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	2	4	1	0	0	7
MAXIMUM DEPTH	0	0	0	0	0	0	10	20	20	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	35.0	42.0	46.0	48.0	48.0	52.0	57.0	54.0	51.0	48.0	46.0	46.0	46.0	44.0	39.0	516	
POST COAT PERMEABILITY	14.0	16.0	25.0	25.0	27.0	29.0	34.0	36.0	34.0	32.0	29.0	27.0	26.0	25.0	22.0	15.0	17.0
POST TEST PERMEABILITY	16.5	24.5	27.0	30.5	45.7	1.1K	4.7K	1.3K	1.4K	13K	18.5	30.0	41.0	81.0	85.9	94.0	13K

CORROSION TEST NUMBER - 2.0079

ELEMENT SERIAL NUMBER - 99-33948

TEST DATE - 01/86/6

TOTAL TEST TIME - 24.0
EFFECTIVE HEATED LENGTH - 48.0TOTAL WEIGHT LOSS - 6.9
TOTAL PINHOLE - 5FAILURE OCCURRED - NO
END BEHAVIOR (BAR/CAR) - 100/100NB COATING RUN - L219
NB WEIGHT GAIN - 67.8MOLY COATING RUN - NONE
MOLY WEIGHT GAIN - NONE
MOLY DISTRIBUTION - NONEEXTRUSION BATCH - 3562 CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 796A
LEACH RUN - 453A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2645	3360	4058	4723	800	560.0	99.0	500.4	580.0	28.3	
5 MIN TIME	2635	3395	4070	4640	790	560.0	99.0	500.4	580.0	28.3	
FINAL	2625	3360	4013	4595	770	560.0	99.0	500.4	580.0	28.3	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1673	2068	2445	2805	3147	3470	3776	4064	4334	4586	4752	
MAX INTERNAL TEMPERATURE	1688	2147	2576	2977	3346	3691	4014	4318	4604	4872	5047	
BORE PRESSURE	658.0	653.6	647.3	639.7	630.8	620.9	610.1	598.4	585.9	572.6	562.8	
DELTA PRESSURE	78.0	73.6	67.3	59.7	50.8	40.9	30.1	18.4	5.9	-7.4	-17.2	
CRACK DISTRIBUTION -												
PRE TEST	49	56	59	47	67	44	52	65	37	24	0	500
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-

INCREMENTAL WEIGHT LOSS 0.000 0.000 0.000 0.456 0.868 1.291 0.342 0.105 0.313 2.387 1.292

PINHOLE DISTRIBUTION -

	0	0	0	0	0	0	0	0	0	0	0	0
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	1	0	0	0	0	0	0	1
FACE C	0	0	0	0	1	2	0	0	0	0	0	3
FACE D	0	0	0	0	1	0	0	0	0	0	0	1
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	3	2	0	0	0	0	0	5
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	15	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	15	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	3	0	0	0	0	3
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	1	0	0	0	0	1
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	5	0	1	5	0	0	0	11
MAXIMUM DEPTH	0	0	0	0	10	0	20	30	0	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	22.0	34.0	40.0	44.0	46.0	47.0	46.0	47.0	47.0	45.0	42.0	41.0	41.0	36.0	33.0	28.0	145
POST COAT PERMEABILITY	14.0	17.0	20.0	22.0	24.0	25.0	27.0	29.0	29.0	29.0	27.0	27.0	26.0	23.0	21.0	13.0	13.0
POST TEST PERMEABILITY	15.2	24.0	29.0	32.0	36.0	100	22.5	580	48.5	15.7	15.5	20.0	31.0	48.5	64.4	1.2K	2.4K

CORROSION TEST NUMBER - 2.0086

ELEMENT SERIAL NUMBER - 99-33947

TEST DATE - 10/19/66

TOTAL TEST TIME - 85.2

TOTAL WEIGHT LOSS - 69.6

FAILURE OCCURRED - 49.0

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 28

END BEHAVIOR(BAR/CAR) - 100/ NA

NB COATING RUN - L219

MOLY COATING RUN - AA011

EXTRUSION BATCH - 3562 CURE RUN - 118A

NB WEIGHT GAIN - 67.5

MOLY WEIGHT GAIN - NA

BAKE RUN - 405A GRAPHITIZING RUN - 796A

MOLY DISTRIBUTION NA

LEACH RUN - 453A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2467	3372	4130	4665	805	560.0	98.0	499.5	588.0	26.7	
5 MIN TIME	2455	3385	4070	4570	795	560.0	98.0	499.5	588.0	26.7	
FINAL	2325	3170	4000	4537	800	560.0	98.0	499.5	588.0	26.7	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1178	1718	2216	2672	3086	3458	3788	4076	4322	4526	4644	
MAX INTERNAL TEMPERATURE	1194	1798	2347	2845	3287	3680	4028	4332	4593	4813	4941	
BORE PRESSURE	657.0	652.6	646.4	638.9	630.1	620.3	609.6	598.0	585.6	572.4	562.8	
DELTA PRESSURE	69.0	64.6	58.4	50.9	42.1	32.3	21.6	10.0	-2.4	-15.6	-25.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	0.	0.	.594	3.934	5.462	6.286	5.926	6.040	10.188	18.479	12.687	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	1	0	0	0	1	0	2
FACE B	0	0	0	0	0	0	2	0	0	1	0	3
FACE C	0	0	0	0	0	2	1	4	2	1	0	10
FACE D	0	0	0	0	0	1	0	2	1	0	0	4
FACE E	0	0	0	0	0	3	0	0	1	1	0	5

FACE F	0	0	0	0	1	2	0	0	1	0	0	4
TOTAL	0	0	0	0	1	9	3	6	5	4	0	28
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	5	0	15	0	0	0	
- CHANNEL 10	0	0	0	0	0	10	10	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	15	25	35	0	0	0	
- CHANNEL 10	0	0	0	0	0	15	20	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	18	71	22	0	0	0	111
CHANNEL 10	0	0	0	0	0	3	25	0	0	0	0	28
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	20	0	27	2	2	0	51
MAXIMUM DEPTH	0	0	0	0	0	10	0	35	90	60	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	18.0	30.0	36.0	39.0	40.0	42.0	42.0	43.0	42.0	40.0	40.0	40.0	34.0	31.0	27.0	28.0	111
POST COAT PERMEABILITY	12.0	15.0	15.0	17.0	18.0	20.0	20.0	23.0	31.0	23.0	25.0	22.0	21.0	20.0	15.0	11.0	16.0
POST MOLY PERMEABILITY	10.0	12.0	14.0	17.0	18.0	17.0	18.0	19.0	20.0	18.0	18.0	17.0	15.0	13.0	11.0	10.0	13.0
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0087

ELEMENT SERIAL NUMBER - 99-33952

TEST DATE - 10/19/66

TOTAL TEST TIME - 60.0

TOTAL WEIGHT LOSS - 46.1

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 36

END BEHAVIOR (BAR/CAR) - 100/ 75

NB COATING RUN - L219

MOLY COATING RUN - AB011

EXTRUSION BATCH - 3963

CURE RUN - 118A

NB WEIGHT GAIN - 67.3

MOLY WEIGHT GAIN - NA

BAKE RUN - 405A

GRAPHITIZING RUN - 796A

MOLY DISTRIBUTION NA

LEACH RUN - 455A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2480	3385	4020	4665	798	560.0	99.0	500.0	590.0	26.7
5 MIN TIME	2443	3360	4095	4640	795	560.0	99.0	500.0	590.0	26.7
FINAL	2360	3290	4035	4550	795	560.0	99.0	500.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1198	1720	2205	2654	3068	3445	3786	4091	4360	4592	4734	
MAX INTERNAL TEMPERATURE	1214	1799	2336	2827	3268	3666	4025	4346	4631	4880	5031	
BORE PRESSURE	658.0	653.6	647.3	639.7	630.8	620.9	610.1	598.4	585.9	572.6	562.8	
DELTA PRESSURE	68.0	63.6	57.3	49.7	40.8	30.9	20.1	8.4	-4.1	-17.4	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.714	3.488	5.056	5.590	4.695	5.135	8.224	9.645	3.523	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	1	0	0	0	1
FACE D	0	0	0	0	1	2	5	4	0	0	0	12
FACE E	0	0	0	3	0	5	6	3	0	0	0	17

	FACE F	0	0	0	0	4	2	0	0	0	0	0	0	6
TOTAL		0	0	0	3	5	9	11	8	0	0	0	0	36
TYPICAL CORROSION DEPTH														
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH														
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -														
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -														
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF														
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	14.0	32.0	28.0	29.0	32.0	33.0	33.0	33.0	25.0	30.0	30.0	29.0	29.0	27.0	24.0	22.0	114.
POST COAT PERMEABILITY	17.0	20.0	20.0	21.0	21.0	21.0	20.0	19.0	19.0	22.0	22.0	23.0	22.0	22.0	18.0	14.0	20.0
POST MGLY PERMEABILITY	10.0	11.0	12.0	13.0	14.0	16.0	14.0	14.0	15.0	17.0	16.0	16.0	14.0	13.0	11.0	10.0	13.0
POST TEST PERMEABILITY	17.8	23.5	26.2	61.0	94.0	3.4K	6.3K	13K	13K	13K	13K	13K	13K	13K	13K	13K	8K

CORROSION TEST NUMBER - 2.0088

ELEMENT SERIAL NUMBER - 99-78536

TEST DATE - 10/20/66

TOTAL TEST TIME - 44.4

TOTAL WEIGHT LOSS - 19.1

FAILURE OCCURRED - 38.25

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 28

END BEHAVIOR (BAR/CAR) - 100/ 95

NB COATING RUN - 8998

MOLY COATING RUN - AA011

EXTRUSION BATCH - Y19 CURE RUN - Y19

NB WEIGHT GAIN - 67.2

MOLY WEIGHT GAIN - NA

BAKE RUN - Y17 GRAPHITIZING RUN - Y19

MOLY DISTRIBUTION NA

LEACH RUN - Y17

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2480	3335	4050	4725	788	560.0	94.0	500.0	585.0	27.5	
5 MIN TIME	2480	3290	4070	4625	788	560.0	94.0	500.0	585.0	27.5	
FINAL	2490	3200	4070	4615	780	560.0	94.0	500.0	585.0	27.5	

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1375	1829	2257	2662	3042	3398	3730	4038	4321	4580	4746	
MAX INTERNAL TEMPERATURE	1391	1907	2387	2833	3241	3618	3968	4291	4590	4864	5041	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	68.0	63.9	57.9	50.6	42.2	32.8	22.6	11.4	-0.5	-13.1	-22.3	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	0.000	0.000	0.590	1.508	0.586	0.273	0.405	4.008	4.594	5.611	1.524	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	1	1	0	0	0	0	2
FACE B	0	0	0	0	0	0	0	2	1	0	0	3
FACE C	0	0	0	0	1	0	0	1	1	0	0	3
FACE D	0	0	0	0	1	0	0	3	1	0	0	5
FACE E	0	0	0	0	0	3	0	2	3	0	0	8
FACE F	0	0	0	0	0	4	1	1	1	0	0	7
TOTAL	0	0	0	0	2	8	2	3	7	0	0	28
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -												
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -												
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.2	1.6	1.6	1.5	2.0	2.0	2.0	2.9	2.5	2.5	3.2	3.3	3.5	3.5	4.1	4.7	28.0
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.2	1.6	1.4	2.0	2.0	2.0	2.3	2.5	3.2	
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
POST TEST PERMEABILITY	11.0	0.0	0.0	14.0	40.5	53.0	3.5K	13K	13K	13K	11.0	5.2K	BRK	13K	380.	13K	1.4K

CORROSION TEST NUMBER - 2.0089

ELEMENT SERIAL NUMBER - 99-70314

TEST DATE - 10/20/66

TOTAL TEST TIME - 33.25
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 7.7
TOTAL PINHOLES - 0

FAILURE OCCURRED - 51.0
END BEHAVIOR(BAR/CAR) - 100/ NA

NB COATING RUN - 8998
NB WEIGHT GAIN - 73.0

MOLY COATING RUN - AA011
MOLY WEIGHT GAIN - NA
MOLY DISTRIBUTION - NA

EXTRUSION BATCH - Y16 CURE RUN - Y16
BAKE RUN - Y2R GRAPHITIZING RUN - Y16
LEACH RUN - Y18

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2505	3315	4050	4700	800	560.0	94.0	500.0	586.0	27.5
5 MIN TIME	2445	3280	4080	4640	788	560.0	94.0	500.0	586.0	27.5
FINAL	2445	3255	4105	4625	785	560.0	94.0	500.0	586.0	27.5

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1298	1769	2214	2633	3026	3392	3732	4046	4334	4595	4762	
MAX INTERNAL TEMPERATURE	1313	1848	2344	2805	3225	3612	3970	4299	4603	4880	5057	
BORE PRESSURE	653.0	648.9	642.9	635.6	627.2	617.8	607.6	596.4	584.5	571.9	562.7	
DELTA PRESSURE	67.0	62.9	56.9	49.6	41.2	31.0	21.6	10.4	-1.5	-14.1	-23.3	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM DEPTH	0	0	0	0	0	0	0	0	0	0	0	0
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	3.3	3.2	2.9	3.2	2.9	2.0	2.9	2.0	1.4	1.6	1.5	1.6	1.2	1.4	2.0	1.5	2.9
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0090

ELEMENT SERIAL NUMBER - 99-33809

TEST DATE - 10/20/66

TOTAL TEST TIME - 95.7

TOTAL WEIGHT LOSS - 34.8

FAILURE OCCURRED - 17.51

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/ NA

NB COATING RUN - 8998

MOLY COATING RUN - AA011

EXTRUSION BATCH - 3933

CURE RUN - 333A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NA

BAKE RUN - 404A

GRAPHITIZING RUN - 793A

MOLY DISTRIBUTION NA

LEACH RUN - 454A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2440	3300	4070	4665	810	560.0	99.0	499.0	590.0	27.5
5 MIN TIME	2505	3290	4070	4615	791	560.0	99.0	499.0	590.0	27.5
FINAL	2490	3170	4050	4710	800	560.0	99.0	499.0	590.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1428	1868	2286	2681	3053	3402	3729	4032	4313	4571	4739	
MAX INTERNAL TEMPERATURE	1444	1947	2416	2853	3253	3623	3967	4287	4583	4857	5034	
BORE PRESSURE	658.0	653.6	647.3	639.7	630.8	620.9	610.1	598.4	585.9	572.6	562.8	
DELTA PRESSURE	68.0	63.6	57.3	49.7	40.8	30.9	20.1	8.4	-4.1	-17.4	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-

INCREMENTAL WEIGHT LOSS 0.000 0.000 1.491 4.746 0.566 2.957 1.310 2.058 4.764 8.937 7.970

PINHOLE DISTRIBUTION -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0

TYPICAL CORROSION DEPTH

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	10	1	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	10	0	0	0	0	0

MAXIMUM CORROSION DEPTH

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	30	30	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	20	0	0	0	0	0

CORROSION RINGS -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	0	43	11	0	0	0	54
CHANNEL 10	0	0	0	0	0	0	17	0	0	0	0	17

DEFECT CORROSION -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	9	2	4	47	43	0	2	0	107
MAXIMUM DEPTH	0	0	0	60	70	20	20	80	0	30	0	

INDICATION OF

SURFACE CORROSION - - - DATA NOT AVAILABLE FOR THIS PRINTING - - -

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST COAT PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST MOLY PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST PERMEABILITY	15.7	18.2	24.5	1.2K	13K	8K	3.2K	81.5	28.5	14.5	21.5	29.0	64.4	120.	1.1K	3.2K	13K

CORROSION TEST NUMBER - 2.0C91

ELEMENT SERIAL NUMBER - 99-30807

TEST DATE - 10/20/66

TOTAL TEST TIME - 48.6

TOTAL WEIGHT LOSS - 31.7

FAILURE OCCURRED - 17.0

EFFECTIVL HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR(BAR/CAR) - 100/ 65

NB COATING RUN - 8998

MOLY COATING RUN - AAC11

EXTRUSION BATCH - 3951 CURE RUN - 333A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NA

BAKE RUN - 404A GRAPHITIZING RUN - 794A

MOLY DISTRIBUTION NA

LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2695	3405	4165	4690	775	560.0	96.0	500.0	590.0	26.7
5 MIN TIME	2720	3420	4250	4755	775	560.0	96.0	500.0	590.0	26.7
FINAL	2740	3420	4265	4785	770	560.0	96.0	500.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1704	2112	2502	2874	3228	3563	3880	4179	4459	4721	4894	
MAX INTERNAL TEMPERATURE	1720	2190	2630	3043	3423	3779	4113	4428	4724	5001	5184	
BORE PRESSURE	655.0	650.7	644.7	637.3	628.7	619.1	608.6	597.2	585.1	572.2	562.8	
DELTA PRESSURE	65.0	60.7	54.7	47.3	38.7	29.1	18.6	7.2	-4.9	-17.8	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	FACE F	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TYPICAL CORROSION DEPTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	0	5	10	1	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	0	1	15	5	10	1	0	0	0	0	0	0	0	0	0
MAXIMUM CORROSION DEPTH	0	0	0	0	0	0	0	0	0	0	15	20	0	0	0	0	0	0	0
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	20	33	25	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	0	20	33	25	0	0	0	0	0	0	0
- CHANNEL 10	0	0	0	0	0	20	15	15	40	1	0	0	0	0	0	0	0	0	0
CORROSION RINGS -																			
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	7	17	0	0	0	0	0	0	0	24
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	19	37	25	0	0	0	0	0	0	0	81
CHANNEL 10	0	0	0	0	4	1	20	17	3	0	0	0	0	0	0	0	0	0	45
DEFECT CORROSION -																			
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	6	5	10	5	0	0	0	0	0	0	0	0	0	26
MAXIMUM DEPTH	0	0	0	0	0	40	25	10	10	0	0	0	0	0	0	0	0	0	0
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	31.0	47.0	50.0	54.0	51.0	52.0	54.0	52.0	52.0	51.0	49.0	46.0	44.0	40.0	30.0	28.0	360.
POST COAT PERMEABILITY	2.5	4.7	8.6	12.5	14.4	15.9	17.5	19.0	20.2	20.2	22.0	22.7	21.0	20.5	18.4	12.0	
POST MOLY PERMEABILITY	0.0	0.0	4.0	7.0	10.0	11.0	12.0	13.0	14.0	14.0	14.0	12.0	12.0	11.0	9.0	8.0	19.0
POST TEST PERMEABILITY	11.9	15.7	15.5	380.	6.6K	BRK	13K	13K	3.2K	1.4K	340.	100.	120.	380.	530.	13K	1.6K

CORROSION TEST NUMBER - 2.0C92

ELEMENT SERIAL NUMBER - 99-78555

TEST DATE - 10/20/66

TOTAL TEST TIME - 37.4

TOTAL WEIGHT LOSS - 14.6

FAILURE OCCURRED - 36.75

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 2

END BEHAVIOR(BAR/CAR) - 99/ 80

NB COATING RUN - L219

MOLY COATING RUN - AAC11

EXTRUSION BATCH - Y19 CURE RUN - Y19

NB WEIGHT GAIN - 66.4

MOLY WEIGHT GAIN - NA

BAKE RUN - Y17 GRAPHITIZING RUN - Y19

MOLY DISTRIBUTION - NA

LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2505	3385	4070	4665	810	560.0	96.0	500.0	590.0	590.0	26.7	
5 MIN TIME	2505	3346	4105	4640	805	560.0	96.0	500.0	590.0	590.0	26.7	
FINAL	2505	3315	4095	4615	795	560.0	96.0	500.0	590.0	590.0	26.7	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1349	1827	2277	2696	3087	3447	3779	4081	4353	4596	4749	
MAX INTERNAL TEMPERATURE	1365	1908	2409	2871	3290	3672	4021	4339	4628	4887	5050	
BORE PRESSURE	655.0	650.7	644.7	637.3	628.7	619.1	608.6	597.2	585.1	572.2	562.8	
DELTA PRESSURE	65.0	60.7	54.7	47.3	38.7	29.1	18.6	7.2	-4.9	-17.8	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-

INCREMENTAL WEIGHT LOSS 0.000 0.000 0.800 0.862 0.342 0.435 0.817 2.668 2.459 4.126 2.088

PINHOLE DISTRIBUTION -

	0	0	0	0	0	0	0	0	0	0	0	0
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	1	1	0	0	0	1
FACE E	0	0	0	0	0	0	1	0	0	0	0	1

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	2	0	0	0	0	2

TYPICAL CORROSION DEPTH

- CHANNELS 8 AND 12 - DATA NOT AVAILABLE FOR THIS PRINTING
- CHANNELS 9 AND 11 - DATA NOT AVAILABLE FOR THIS PRINTING
- CHANNEL 10 - DATA NOT AVAILABLE FOR THIS PRINTING

MAXIMUM CORROSION DEPTH

- CHANNELS 8 AND 12 - DATA NOT AVAILABLE FOR THIS PRINTING
- CHANNELS 9 AND 11 - DATA NOT AVAILABLE FOR THIS PRINTING
- CHANNEL 10 - DATA NOT AVAILABLE FOR THIS PRINTING

CORROSION RINGS -

- CHANNELS 8 AND 12 - DATA NOT AVAILABLE FOR THIS PRINTING
- CHANNELS 9 AND 11 - DATA NOT AVAILABLE FOR THIS PRINTING
- CHANNEL 10 - DATA NOT AVAILABLE FOR THIS PRINTING

DEFECT CORROSION -

- RING RELATED - DATA NOT AVAILABLE FOR THIS PRINTING
- NON RING RELATED - DATA NOT AVAILABLE FOR THIS PRINTING
- MAXIMUM DEPTH - DATA NOT AVAILABLE FOR THIS PRINTING

INDICATION OF SURFACE CORROSION - DATA NOT AVAILABLE FOR THIS PRINTING

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.2	1.2	1.5	2.0	2.9	2.9	2.0	1.6	1.6	1.6	3.2	2.5	2.9	3.2	2.0	1.5	1.5
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.0
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
POST TEST PERMEABILITY	12.5	9.6	6.7	14.0	12.2	11.0	0.0	8.6	0.0	0.0	12.5	BRK	BRK	37.0	34.0	34.0	26.0

CORROSION TEST NUMBER - 2.0093

ELEMENT SERIAL NUMBER - 99-78559

TEST DATE - 10/21/66

TOTAL TEST TIME - 28.

TOTAL WEIGHT LOSS - 6.6

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 2

END BEHAVIOR (BAR/CAR) - 100/ 99

NO COATING RUN - L219

MOLY COATING RUN - AAC11

EXTRUSION BATCH - Y19

CURE RUN - Y19

NO WEIGHT GAIN - 64.7

MOLY WEIGHT GAIN - NA

BAKE RUN - Y17

GRAPHITIZING RUN - Y19

MOLY DISTRIBUTION NA

LEACH RUN - Y16

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2585	3360	4050	4675	822	560.0	96.0	500.0	589.0	27.5	
5 MIN TIME	2465	3290	4050	4595	788	560.0	96.0	500.0	589.0	27.5	
FINAL	2455	3245	4080	4570	788	560.0	96.0	500.0	589.0	27.5	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1340	1804	2241	2652	3035	3392	3722	4024	4301	4550	4708	
MAX INTERNAL TEMPERATURE	1356	1883	2371	2823	3234	3611	3959	4278	4569	4834	5003	
BORE PRESSURE	655.0	650.7	644.7	637.3	628.7	619.1	608.6	597.2	585.1	572.2	562.8	
DELTA PRESSURE	66.0	61.7	55.7	48.3	39.7	30.1	19.6	8.2	-3.9	-16.8	-26.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	0.000	0.060	0.687	0.455	0.323	0.323	0.359	0.675	0.952	1.988	0.842	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	1	1	0	0	2

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	1	1	0	0	2
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	1	1	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	1	1	1	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	1	1	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	5	50	5	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	25	20	1	0	0	
- CHANNEL 10	0	0	0	0	0	0	10	15	1	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	21	32	59	0	0	112
CHANNELS 9 AND 11	0	0	0	0	0	0	21	39	13	0	0	73
CHANNEL 10	0	0	0	0	0	0	10	22	10	0	0	42
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	1	0	0	0	0	1
NON RING RELATED	0	0	0	0	0	0	1	1	5	7	0	14
MAXIMUM DEPTH	0	0	0	0	0	0	60	30	35	32	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	2.0	1.6	1.6	2.0	2.0	2.9	2.5	2.5	2.3	1.4	2.0	2.9	3.2	2.0	2.3	2.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0
POST TEST PERMEABILITY	9.0	8.4	8.4	9.4	15.7	22.5	21.5	0.0	0.0	0.0	0.0	13K	13K	5.1K	11.2	880.	4.1K

CORROSION TEST NUMBER - 2.0094

ELEMENT SERIAL NUMBER - 99-76466

TEST DATE - 10/21/66

TOTAL TEST TIME - 68.5

TOTAL WEIGHT LOSS - -0

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 7

END BEHAVIOR (BAR/CAR) - 100/ NA

NB COATING RUN - L219

MOLY COATING RUN - AA011

EXTRUSION BATCH - Y18 CURE RUN - Y18

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NA

BAKE RUN - Y16 GRAPHITIZING RUN - Y18

MOLY DISTRIBUTION NA

LEACH RUN - Y15

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE		
INITIAL	2440	3335	4050	4640	812	560.0	98.0	500.0	588.0	27.5		
5 MIN TIME	2430	3300	4050	4615	800	560.0	98.0	500.0	588.0	27.5		
FINAL	2405	3200	4080	4640	785	560.0	98.0	500.0	588.0	27.5		

- - - 5 INCH (NOT OVERLAPING) INCREMENTS - - -

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1263	1747	2202	2628	3024	3391	3729	4037	4316	4566	4723	
MAX INTERNAL TEMPERATURE	1279	1827	2334	2802	3226	3614	3970	4294	4589	4855	5022	
BORE PRESSURE	657.0	652.6	646.4	638.9	630.1	620.3	609.6	598.0	585.6	572.4	562.8	
DELTA PRESSURE	69.0	64.6	58.4	50.9	42.1	32.3	21.6	10.0	-2.4	-15.6	-25.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TYPICAL CORROSION DEPTH																	
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH																	
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -																	
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -																	
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF																	
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.5	1.5	1.5	1.2	1.5	2.0	1.6	1.6	1.6	1.6	1.6	2.9	3.2	1.0	1.4	1.0	4.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0095

ELEMENT SERIAL NUMBER - 99-76493

TEST DATE - 10/21/66

TOTAL TEST TIME - 25.3

TOTAL WEIGHT LOSS - 36.6

FAILURE OCCURRED - 38.5

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 35

END BEHAVIOR (BAR/CAR) - 100/ NA

NB COATING RUN - L219

MOLY COATING RUN - AAC11

EXTRUSION BATCH - Y18 CURE RUN - Y18

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NA

BAKE RUN - Y16 GRAPHITIZING RUN - Y18

MOLY DISTRIBUTION NA

LEACH RUN - Y15

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2525	3395	4080	4710	820	560.0	87.0	499.1	581.0	27.5
5 MIN TIME	2440	3280	4050	4615	775	560.0	87.0	499.1	581.0	27.5
FINAL	NA	3265	3950	4450	780	560.0	87.0	499.1	581.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1306	1774	2215	2630	3018	3381	3717	4027	4310	4567	4732	
MAX INTERNAL TEMPERATURE	1321	1851	2343	2798	3214	3597	3950	4276	4575	4847	5021	
BORE PRESSURE	646.1	642.2	636.7	630.0	622.2	613.5	604.0	593.7	582.7	571.0	562.5	
DELTA PRESSURE	65.1	61.2	55.7	49.0	41.2	32.5	23.0	12.7	1.7	-10.0	-18.5	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	2	3	0	0	0	5
FACE D	0	0	0	0	0	1	3	8	1	1	0	14
FACE E	0	0	0	0	0	0	4	6	3	0	0	13

FACE F	0	0	0	0	1	0	1	0	1	0	0	3
TOTAL	0	0	0	0	1	1	10	17	5	1	0	35
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	10	10	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	5	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	0	5	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	5	0	85	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	5	0	10	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	65	0	35	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	3	18	9	0	0	30
CHANNELS 9 AND 11	0	0	0	0	0	0	3	5	1	0	0	9
CHANNEL 10	0	0	0	0	0	0	3	5	0	1	0	9
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	2	2	0	0	0	0	4
MAXIMUM DEPTH	0	0	0	0	0	10	10	0	0	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	2.0	2.0	2.3	2.0	2.3	2.0	2.0	0.5	0.5	0.5	0.5	1.0	1.0	1.0	3.5	0.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
POST TEST PERMEABILITY	13K	12.8	12.8	22.5	29.0	48.5	260.	13K	2.1K	13K	13K	13K	BRK	BRK	13K	13K	BRK

CORROSION TEST NUMBER - 2.0096

ELEMENT SERIAL NUMBER - 99-33820

TEST DATE - 10/21/66

TOTAL TEST TIME - 49.4
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 20.3
TOTAL PINHOLES - 0

FAILURE OCCURRED - 49.0
END BEHAVIOR(BAR/CAR) - 100/ 70

NB COATING RUN - L219
NB WEIGHT GAIN - 67.5

MOLY COATING RUN - AA011
MOLY WEIGHT GAIN - NA
MOLY DISTRIBUTION NA

EXTRUSION BATCH - 3935 CURE RUN - 333A
BAKE RUN - 404A GRAPHITIZING RUN - 793A
LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
INITIAL	2492	3335	4070	4735	795	560.0	98.0	499.0	661.0	27.5
5 MIN TIME	2505	3335	4095	4650	795	560.0	98.0	499.0	661.0	27.5
FINAL	2587	3335	4177	4735	785	560.0	98.0	499.0	661.0	27.5

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1382	1845	2282	2693	3077	3435	3766	4072	4351	4603	4764	
MAX INTERNAL TEMPERATURE	1398	1925	2413	2866	3278	3656	4006	4327	4622	4890	5062	
BORE PRESSURE	657.0	652.6	646.4	638.9	630.1	620.3	609.6	598.0	585.6	572.4	562.8	
DELTA PRESSURE	-4.0	-8.4	-14.6	-22.1	-30.9	-41.7	-51.4	-63.0	-75.4	-88.6	-98.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	10	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	10	0	0	0	0
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	10	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	10	0	0	0	0
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	3	0	0	0	0	0	3
CHANNELS 9 AND 11	0	0	0	0	0	0	23	0	0	0	0	23
CHANNEL 10	0	0	0	0	0	0	24	0	0	0	0	24
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	7	2	1	0	10
MAXIMUM DEPTH	0	0	0	0	0	0	0	20	25	20	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	26.0	38.0	44.0	52.0	54.0	50.0	52.0	52.0	52.0	52.0	54.0	52.0	51.0	53.0	42.0	61.0	
POST COAT PERMEABILITY	18.0	22.0	24.0	30.0	29.0	30.0	35.0	36.0	35.0	35.0	36.0	36.0	34.0	31.0	27.0	22.0	27.0
POST MOLY PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0098

ELEMENT SERIAL NUMBER - 99-33945

TEST DATE - 10/22/66

TOTAL TEST TIME - 40.0

TOTAL WEIGHT LOSS - 10.7

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/ 85

NB COATING RUN - 8998

MOLY COATING RUN - A4011

EXTRUSION BATCH - 3962

CURE RUN - 118A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NA

BAKE RUN - 405A

GRAPHITIZING RUN - 796A

MOLY DISTRIBUTION NA

LEACH RUN - 453A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2305	3180	4050	4710	835	560.0	99.0	501.0	501.0	656.0	27.5
5 MIN TIME	2480	3245	4050	4565	825	560.0	99.0	501.0	501.0	656.0	27.5
FINAL	2455	3160	4070	4570	800	560.0	99.0	501.0	501.0	656.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1392	1835	2255	2651	3023	3372	3697	3997	4274	4528	4691	
MAX INTERNAL TEMPERATURE	1408	1918	2391	2831	3232	3602	3945	4262	4556	4826	4999	
BORE PRESSURE	658.0	653.6	647.3	639.7	630.8	620.9	610.1	598.4	585.9	572.6	562.8	
DELTA PRESSURE	2.0	-2.4	-8.7	-16.3	-25.2	-35.1	-45.9	-57.6	-70.1	-83.4	-93.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PIN HOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	3	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	5	1	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	1	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	5	10	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	15	40	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	10	10	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	16	21	0	0	0	37
CHANNELS 9 AND 11	0	0	0	0	0	0	31	60	0	0	0	91
CHANNEL 10	0	0	0	0	0	0	23	29	0	0	0	52
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	8	3	0	0	0	11
MAXIMUM DEPTH	0	0	0	0	0	0	30	10	0	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	24.0	36.0	44.0	46.0	49.0	50.0	47.0	46.0	42.0	42.0	41.0	40.0	38.0	35.0	29.0	43.0	670.
POST COAT PERMEABILITY	10.8	14.0	16.2	18.7	20.2	21.8	22.3	22.3	22.0	21.0	19.5	18.4	16.2	15.9	14.0	12.9	
POST MOLY PERMEABILITY	0.0	9.0	11.0	13.0	15.0	16.0	17.0	18.0	17.0	17.0	15.0	12.0	11.0	10.0	10.0	10.0	86.0
POST TEST PERMEABILITY	14.5	21.5	25.3	34.0	64.4	48.5	31.0	27.5	28.0	27.5	24.0	48.5	120.	170.	170.	225.	340.

CORROSION TEST NUMBER - 2.0099

ELEMENT SERIAL NUMBER - 99-76041

TEST DATE - 10/22/66

TOTAL TEST TIME - 40.0
EFFECTIVE HEATED LENGTH - 48.0TOTAL WEIGHT LOSS - 9.0
TOTAL PINHOLES - 0FAILURE OCCURRED - NO
END BEHAVIOR (BAR/CAR) - 100/ 99NB COATING RUN - 8998
NB WEIGHT GAIN - 66.8MOLY COATING RUN - AA011
MOLY WEIGHT GAIN - NA
MOLY DISTRIBUTION NAEXTRUSION BATCH - Y13 CURE RUN - Y13
BAKE RUN - Y13 GRAPHITIZING RUN - Y13
LEACH RUN - Y11

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2535	3360	4050	4665	820	560.0	96.0	501.9	663.0	27.5
5 MIN TIME	2505	3265	4050	4615	791	560.0	96.0	501.9	663.0	27.5
FINAL	2490	3255	4070	4605	795	560.0	96.0	501.9	663.0	27.5

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1479	1896	2294	2673	3035	3378	3703	4010	4299	4569	4747	
MAX INTERNAL TEMPERATURE	1495	1975	2424	2846	3235	3599	3942	4264	4569	4855	5043	
BORE PRESSURE	655.0	650.7	644.7	637.3	628.7	619.1	608.6	597.2	585.1	572.2	562.8	
DELTA PRESSURE	-8.0	-12.3	-18.3	-25.7	-34.3	-43.9	-54.4	-65.8	-77.9	-90.8	-100.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	15	5	1	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	1	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	1	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	40	35	10	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	20	1	0	0	0	
- CHANNEL 10	0	0	0	0	0	0	10	20	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	4	50	91	0	0	145
CHANNELS 9 AND 11	0	0	0	0	0	0	1	46	0	0	0	47
CHANNEL 10	0	0	0	0	0	0	3	46	0	0	0	49
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	3	1	0	1	0	5
MAXIMUM DEPTH	0	0	0	0	0	0	10	15	0	10	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	1.6	2.5	2.3	2.9	2.9	3.2	3.2	2.0	2.3	2.9	3.2	3.2	3.2	2.9	1.5	1.4	1.2
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	1.0	1.2	1.2	1.4	1.4	1.5	1.4	1.2	1.2	1.2	1.2	1.2	1.2
POST MOLY PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	11.0	13.8	8.6	0.0	8.0	0.0	0.0	480.	640.	262.	34.0	58.0	760.

CORROSION TEST NUMBER - 2.0100

ELEMENT SERIAL NUMBER - 99-76051

TEST DATE - 10/22/66

TOTAL TEST TIME - 60.0

TOTAL WEIGHT LOSS - 11.5

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - L219

MOLY COATING RUN - AAO11

EXTRUSION BATCH - Y13 CURE RUN - Y13

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - NA

BAKE RUN - Y13 GRAPHITIZING RUN - Y13

MOLY DISTRIBUTION NA

LEACH RUN - Y11

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	
INITIAL	2505	3315	4050	4640	608	560.0	96.0	501.9	660.0	27.5	
5 MIN TIME	2455	3215	4050	4550	788	560.0	96.0	501.9	660.0	27.5	
FINAL	2505	3245	4080	4605	790	560.0	96.0	501.9	660.0	27.5	

- - - 5 INCH (NOT OVERLAPING) INCREMENTS - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1345	1796	2223	2625	3002	3355	3682	3985	4264	4517	4680	
MAX INTERNAL TEMPERATURE	1361	1875	2353	2796	3201	3574	3920	4238	4532	4802	4974	
BORE PRESSURE	655.0	650.7	644.7	637.3	628.7	619.1	608.6	597.2	585.1	572.2	562.8	
DELTA PRESSURE	-5.0	-9.3	-15.3	-22.7	-31.3	-40.9	-51.4	-62.8	-74.9	-87.8	-97.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	5	5	5	1	1	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	10	5	1	0	0	0
- CHANNEL 10	0	0	0	0	0	0	10	1	0	0	0	0
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	15	25	25	20	1	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	30	30	25	0	0	0
- CHANNEL 10	0	0	0	0	0	0	25	5	0	0	0	0
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	6	10	21	16	12	0	65
CHANNELS 9 AND 11	0	0	0	0	0	0	27	13	4	0	0	44
CHANNEL 10	0	0	0	0	0	0	17	9	0	0	0	26
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	2	0	0	1	5	1	0	9
MAXIMUM DEPTH	0	0	0	0	40	0	0	20	50	55	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	1.2	1.4	1.4	1.5	1.6	1.6	1.5	1.4	1.2	1.4	1.0	1.2	1.0	0.5	0.5	0.5
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0
POST MOLY PERMEABILITY	0.0	0.0	0.0	21.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
POST TEST PERMEABILITY	0.0	0.0	0.0	0.0	7.6	7.6	0.0	0.0	0.0	0.0	1.2K	0.0	1.0K	340.	100.	2.0K	1.2K

CORROSION TEST NUMBER - 2.0101

ELEMENT SERIAL NUMBER - 99-7c065

TEST DATE - 10/21/66

TOTAL TEST TIME - 71.6

TOTAL WEIGHT LOSS - 22.3

FAILURE OCCURRED - 14.0

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 3

END BEHAVIOR (BAR/CAR) - 100/ 70

NB COATING RUN - 8998

MOLY COATING RUN - 1719

EXTRUSION BATCH - Y13

CURE RUN - Y13

NB WEIGHT GAIN - 71.4

MOLY WEIGHT GAIN - 5.2

BAKE RUN - Y13

GRAPHITIZING RUN - Y13

MOLY DISTRIBUTION NA

LEACH RUN - Y12

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2563	3250	4090	4653	762	560.0	97.0	500.0	590.0	26.7
5 MIN TIME	2635	3245	4130	4570	772	560.0	97.0	500.0	590.0	26.7
FINAL	2995	3245	4095	4595	766	560.0	97.0	500.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1663	2047	2415	2767	3103	3424	3729	4019	4293	4551	4722	
MAX INTERNAL TEMPERATURE	1678	2124	2542	2935	3298	3639	3962	4267	4556	4829	5010	
BORE PRESSURE	656.0	651.7	645.6	638.1	629.4	619.7	609.1	597.6	585.3	572.3	562.8	
DELTA PRESSURE	66.0	61.7	55.6	48.1	39.4	29.7	19.1	7.6	-4.7	-17.7	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	2	0	0	0	0	0	0	0	2

FACE F	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	0	0	0	3	0	0	0	0	0	0	0	3
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	10	0	0	0	0	1	0	0	0	
- CHANNELS 9 AND 11	0	0	1	5	0	0	1	1	0	0	0	
- CHANNEL 10	0	0	1	10	0	0	1	1	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	20	70	0	0	0	5	0	0	0	
- CHANNELS 9 AND 11	0	0	20	15	0	0	1	5	0	0	0	
- CHANNEL 10	0	0	30	40	0	0	5	15	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	12	1	0	0	0	10	0	0	0	23
CHANNELS 9 AND 11	0	0	25	4	0	0	8	10	0	0	0	47
CHANNEL 10	0	0	16	9	0	0	8	26	0	0	0	59
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	4	0	0	3	0	0	1	0	8
MAXIMUM DEPTH	0	0	0	40	0	0	20	0	0	20	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
POST COAT PERMEABILITY	34.0	42.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	0.5	1.0	0.5	0.5	0.5	
POST MOLY PERMEABILITY	20.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
POST TEST PERMEABILITY	35.0	0.0	9.4	38.5	BRK	5.6K	0.0	0.0	0.0	0.0	0.0	0.0	9.4	430.	700.	3.0K	6.0K

CORROSION TEST NUMBER - 2.C102

ELEMENT SERIAL NUMBER - 99-70315

TEST DATE - 10/22/66

TOTAL TEST TIME - 36.8
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 18.5
TOTAL PINHOLES - 5

FAILURE OCCURRED - 9.4
END BEHAVIOR(BAR/CAR) - 100/ 80

NB COATING RUN - 8998
NB WEIGHT GAIN - 69.8

MOLY COATING RUN - 1719
MOLY WEIGHT GAIN - 5.4
MOLY DISTRIBUTION NA

EXTRUSION BATCH - Y16 CURE RUN - Y16
BAKE RUN - Y208 GRAPHITIZING RUN - Y16
LEACH RUN - Y14

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
	15.1	26.3	37.6	48.6						
INITIAL	2562	3202	4095	4595	787	560.0	100.0	500.0	590.0	26.7
5 MIN TIME	2587	3245	4095	4640	775	560.0	100.0	500.0	590.0	26.7
FINAL	2625	3170	4045	4485	755	560.0	100.0	500.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1657	2024	2381	2728	3065	3393	3710	4017	4315	4602	4797	
MAX INTERNAL TEMPERATURE	1672	2102	2509	2897	3261	3609	3943	4266	4579	4882	5087	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	2	0	0	0	0	0	0	2
FACE B	0	0	0	0	1	0	0	0	0	0	0	1
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	1	0	0	0	0	0	0	0	0	0	1

FACE F	0	0	1	0	0	0	0	0	0	0	0	1
TOTAL	0	1	1	0	3	0	0	0	0	0	0	5
TYPICAL CORROSION DEPTH -												
- CHANNELS 8 AND 12	0	0	20	10	0	0	1	1	1	0	0	
- CHANNELS 9 AND 11	0	0	5	0	0	0	1	1	1	0	0	
- CHANNEL 10	0	0	5	5	0	0	1	5	5	0	0	
MAXIMUM CORROSION DEPTH -												
- CHANNELS 8 AND 12	0	0	30	20	0	0	1	10	10	0	0	
- CHANNELS 9 AND 11	0	0	20	0	0	0	1	1	10	0	0	
- CHANNEL 10	0	0	10	10	0	0	1	10	5	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	22	6	0	0	13	43	15	0	0	99
CHANNELS 9 AND 11	0	0	17	0	0	0	30	39	14	0	0	100
CHANNEL 10	0	0	7	5	0	0	17	20	9	0	0	58
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	0	1	4	0	5
MAXIMUM DEPTH	0	0	0	0	0	0	0	0	10	55	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
POST MOLY PERMEABILITY	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
POST TEST PERMEABILITY	0.0	0.0	BRK	BRK	13K	13K	3.5K	26.5	0.0	0.0	13.5	0.0	9.6	10.8	15.7	2.1K	940

CORROSION TEST NUMBER - 2.0103

ELEMENT SERIAL NUMBER - 99-76C+0

TEST DATE - 10/24/66

TOTAL TEST TIME - 8.67

TOTAL WEIGHT LOSS - 5.8

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 1

END BEHAVIOR (BAR/CAR) - 99/ 95

NB COATING RUN - L219

MOLY COATING RUN - 1719

EXTRUSION BATCH - Y13 CURE RUN - Y13

NB WEIGHT GAIN - 64.9

MOLY WEIGHT GAIN - NA

BAKE RUN - Y13 GRAPHITIZING RUN - Y13

MOLY DISTRIBUTION NA

LEACH RUN - Y11

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2625	3315	4095	4665	787	560.0	105.0	500.0	590.0	26.7		
5 MIN TIME	2635	3360	4070	4665	772	560.0	105.0	500.0	590.0	26.7		
FINAL	2635	3360	4070	4665	772	560.0	105.0	500.0	590.0	26.7		

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1727	2094	2450	2794	3126	3447	3755	4052	4337	4610	4794	
MAX INTERNAL TEMPERATURE	1742	2172	2578	2962	3321	3662	3988	4300	4600	4889	5083	
BORE PRESSURE	663.9	659.2	652.6	644.5	635.1	624.6	613.1	600.7	587.4	573.3	563.0	
DELTA PRESSURE	73.9	69.2	62.6	54.5	45.1	34.6	23.1	10.7	-2.6	-16.7	-27.0	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	1
TYPICAL CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	1	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	1	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	0	1	0	0	0	0
MAXIMUM CORROSION DEPTH													
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	1	0	0	0	0
- CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	1	0	0	0	0
- CHANNEL 10	0	0	0	0	0	0	0	0	5	0	0	0	0
CORROSION RINGS -													
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	5	0	0	0	5
CHANNELS 9 AND 11	0	0	0	0	0	0	0	0	29	0	0	0	29
CHANNEL 10	0	0	0	0	0	0	0	0	13	0	0	0	13
DEFECT CORROSION -													
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM DEPTH	0	0	0	0	0	0	0	0	0	0	0	0	0
INDICATION OF													
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	3.3	3.5	4.5	4.7	4.7	4.5	3.5	3.3	3.3	3.2	3.3	3.3	3.3	3.2	3.2	3.3	1.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	8.0	0.0	7.0	0.0	26.0
POST MOLY PERMEABILITY	4.0	4.6	4.7	4.7	4.5	4.4	4.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
POST TEST PERMEABILITY	8.4	9.9	11.6	12.8	12.2	9.1	0.0	0.0	0.0	0.0	8.0	0.0	8.6	8.4	11.3	380.	13K

CORROSION TEST NUMBER - 2.0104

ELEMENT SERIAL NUMBER - 99-76320

TEST DATE - 10/25/66

TOTAL TEST TIME - 72.1

TOTAL WEIGHT LOSS - 14.9

FAILURE OCCURRED - U4.75

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/ 90

NB COATING RUN - L219

MOLY COATING RUN - 1719

EXTRUSION BATCH - Y16 CURE RUN - Y16

NB WEIGHT GAIN - 66.2

MOLY WEIGHT GAIN - NA

BAKE RUN - Y2R GRAPHITIZING RUN - Y16

MOLY DISTRIBUTION NA

LEACH RUN - Y18

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2515	3215	3975	4570	797	560.0	100.0	499.5	590.0	590.0	26.7
5 MIN TIME	2575	3290	4000	4595	785	560.0	100.0	499.5	590.0	590.0	26.7
FINAL	2750	3170	4070	4595	757	560.0	100.0	499.5	590.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1681	2042	2392	2732	3060	3378	3685	3981	4266	4540	4726	
MAX INTERNAL TEMPERATURE	1697	2121	2522	2902	3258	3597	3921	4233	4534	4824	5019	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	5	10	1	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	5	10	1	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	5	1	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	10	25	20	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	15	20	15	0	0	
- CHANNEL 10	0	0	0	0	0	0	10	20	5	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	8	49	21	0	0	78
CHANNELS 9 AND 11	0	0	0	0	0	0	21	50	10	0	0	81
CHANNEL 10	0	0	0	0	0	0	14	23	8	0	0	45
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	2	0	1	15	0	0	0	18
MAXIMUM DEPTH	0	0	0	0	10	0	10	15	0	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	3.3	2.9	3.2	3.2	3.2	2.0	2.3	2.5	2.3	2.0	2.0	2.3	3.2	2.3	3.2	2.3	2.9
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POST MOLY PERMEABILITY	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
POST TEST PERMEABILITY	0.0	0.0	12.5	15.2	BRK	15.7	0.0	0.0	0.0	6.6	0.0	0.0	9.6	580.	480.	580.	940.

CORROSION TEST NUMBER - 2.0105

ELEMENT SERIAL NUMBER - 99-31675

TEST DATE - 10/25/66

TOTAL TEST TIME - 45.8

TOTAL WEIGHT LOSS - 18.3

FAILURE OCCURRED - 3 LOC.

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 4

END BEHAVIOR (BAR/CAR) - 100/ 85

NB COATING RUN - 8598

MOLY COATING RUN - 1719

EXTRUSION BATCH - 3663

CURE RUN - 312A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - 5.6

BAKE RUN - 367A

GRAPHITIZING RUN - 720A

MOLY DISTRIBUTION NA

LEACH RUN - 462A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	FLOW RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2585	3245	4050	4595	782	560.0	102.0	498.2	590.0	27.5		
5 MIN TIME	2630	3255	4050	4615	785	560.0	102.0	498.2	590.0	27.5		
FINAL	2875	3245	4050	4570	763	560.0	102.0	498.2	590.0	27.5		

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	C - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1795	2122	2445	2763	3076	3384	3688	3987	4281	4571	4771	
MAX INTERNAL TEMPERATURE	1811	2201	2574	2933	3274	3603	3924	4239	4549	4854	5064	
BORE PRESSURE	660.9	656.4	650.0	642.1	633.0	622.8	611.6	599.5	586.6	572.9	562.9	
DELTA PRESSURE	70.9	66.4	60.0	52.1	43.0	32.8	21.6	9.5	-3.4	-17.1	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	3	0	0	0	0	0	0	0	3
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	1	0	0	0	0	0	0	0	1
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	FACE F	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TYPICAL CORROSION DEPTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNELS 8 AND 12	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	10	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	5	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM CORROSION DEPTH																			
- CHANNELS 8 AND 12	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNELS 9 AND 11	0	0	20	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CHANNEL 10	0	0	10	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CORROSION RINGS -																			
CHANNELS 8 AND 12	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	25	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHANNEL 10	0	0	18	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEFECT CORROSION -																			
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM DEPTH	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	38.0	42.0	47.0	47.0	47.0	48.0	48.0	47.0	47.0	46.0	44.0	44.0	44.0	42.0	40.0	33.0	128.
POST COAT PERMEABILITY	5.9	11.0	15.3	18.4	20.5	22.3	26.0	27.3	28.0	28.5	28.8	31.0	30.0	28.8	28.0	26.0	
POST MOLY PERMEABILITY	6.7	8.0	8.3	11.0	12.3	14.0	15.9	16.6	16.6	15.5	15.2	15.2	13.7	11.7	10.8	10.5	
POST TEST PERMEABILITY	20.8	41.0	120.	BRK	BRK	BRK	26.5	6.7	12.2	55.0	35.5	38.0	43.0	58.0	85.9	100.	380.

CORROSION TEST NUMBER - 2.0106

ELEMENT SERIAL NUMBER - 99-33810

TEST DATE - 10/25/65

TOTAL TEST TIME - 34.5
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 12.0
TOTAL PINHOLES - 0

FAILURE OCCURRED - NO
END BEHAVIOR(BAR/CAR) - 100/ 98

MO COATING RUN - 8998
MO WEIGHT GAIN - NA

MOLY COATING RUN - 1719
MOLY WEIGHT GAIN - 5.3
MOLY DISTRIBUTION NA

EXTRUSION BATCH - 3933 CURE RUN - 333A
BAKE RUN - 404A GRAPHITIZING RUN - 793A
LEACH RUN - 454A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2645	3315	4070	4650	804	560.0	100.0	501.0	590.0	27.5
5 MIN TIME	2625	3275	4050	4615	773	560.0	100.0	501.0	590.0	27.5
FINAL	2740	3265	4080	4545	762	560.0	100.0	501.0	590.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1764	2105	2438	2765	3083	3395	3700	3997	4287	4569	4763	
MAX INTERNAL TEMPERATURE	1780	2182	2566	2933	3279	3611	3932	4245	4550	4849	5052	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PIN HOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	1	1	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	1	1	5	0	1	5	1	0	0	
- CHANNEL 10	0	0	1	1	0	0	1	10	1	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	1	1	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	5	5	5	0	5	20	10	0	0	
- CHANNEL 10	0	0	1	30	0	0	5	20	5	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	26	13	0	0	0	0	0	0	0	39
CHANNELS 9 AND 11	0	0	24	10	1	0	11	56	11	0	0	113
CHANNEL 10	0	0	10	4	0	0	14	27	7	0	0	62
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	6	2	0	0	8
MAXIMUM DEPTH	0	0	0	0	0	0	0	10	10	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	26.0	40.0	44.0	46.0	48.0	50.0	50.0	52.0	51.0	51.0	51.0	48.0	48.0	46.0	42.0	36.0	86.0
POST COAT PERMEABILITY	4.1	6.5	11.5	15.3	17.0	19.0	21.0	22.0	22.8	24.6	29.0	29.5	28.5	27.3	27.3	26.0	
POST MOLY PERMEABILITY	5.1	6.5	7.5	9.1	10.3	11.2	11.5	12.3	12.8	13.7	14.3	14.3	12.8	11.0	9.9	10.3	
POST TEST PERMEABILITY	13.8	25.7	40.5	72.8	170.	170.	100.	14.0	18.5	33.0	34.0	33.0	34.0	43.0	78.0	100.	940.

CORROSION TEST NUMBER - 2.0107

ELEMENT SERIAL NUMBER - 99-35866

TEST DATE - 10/25/66

TOTAL TEST TIME - 55.0

TOTAL WEIGHT LOSS - 20.7

FAILURE OCCURRED - 13.0

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 7

END BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - L219

MOLY COATING RUN - 1719

EXTRUSION BATCH - 3551 CURE RUN - 333A

NB WEIGHT GAIN - 66.5

MOLY WEIGHT GAIN - 5.8

BAKE RUN - 404A GRAPHITIZING RUN - 794A

MOLY DISTRIBUTION NA

LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2505	3335	4050	4650	758	560.0	100.0	100.0	500.0	590.0	27.5
5 MIN TIME	2680	3335	4095	4650	760	560.0	100.0	100.0	500.0	590.0	27.5
FINAL	2890	3360	4105	4650	758	560.0	100.0	100.0	500.0	590.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	C - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1811	2157	2494	2821	3141	3451	3753	4045	4330	4605	4792	
MAX INTERNAL TEMPERATURE	1827	2233	2619	2987	3333	3663	3962	4290	4589	4879	5076	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	1	0	0	0	0	0	1
FACE D	0	0	0	0	2	0	0	0	0	0	0	2
FACE E	0	0	0	1	3	0	0	0	0	0	0	4

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	1	5	1	0	0	0	0	0	7
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	1	10	5	0	0	
- CHANNEL 10	0	0	0	0	0	0	1	10	5	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	5	25	30	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	18	20	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	0	26	27	6	0	0	59
CHANNEL 10	0	0	0	0	0	0	13	20	6	0	0	39
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	3	0	0	0	1	0	8	0	0	12
MAXIMUM DEPTH	0	0	50	0	0	0	40	0	45	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	43.0	46.0	52.0	52.0	54.0	57.0	58.0	57.0	53.0	53.0	51.0	48.0	46.0	42.0	36.0	30.0	360.
POST COAT PERMEABILITY	20.0	26.0	26.0	31.0	22.0	26.0	30.0	32.0	33.0	35.0	35.0	34.0	31.0	27.0	19.0	13.0	25.0
POST MOLY PERMEABILITY	12.0	16.9	19.0	19.0	19.4	19.8	19.8	20.1	19.4	18.0	16.9	15.9	14.3	11.0	8.5	7.7	
POST TEST PERMEABILITY	195.	51.6	100.	BRK	BRK	13K	13K	760.	18.5	29.0	33.5	40.0	43.5	55.0	72.8	2.3K	13K

CORROSION TEST NUMBER - 2.C108

ELEMENT SERIAL NUMBER - 99-33946

TEST DATE - 10/25/66

TOTAL TEST TIME - 41.0

TOTAL WEIGHT LOSS - 14.8

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLE - 3

END BEHAVIOR (BAR/CAR) - 100/ 90

NB COATING RUN - L219

MOLY COATING RUN - 1719

EXTRUSION BATCH - 3562 CURE RUN - 118A

NB WEIGHT GAIN - 66.7

MOLY WEIGHT GAIN - 5.6

BAKE RUN - 405A GRAPHITIZING RUN - 796A

MOLY DISTRIBUTION NA

LEACH RUN - 453A

***** CORROSION TEST PARAMETERS *****

TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2505	3202	4095	4665	798	560.0	106.0	500.0	590.0	26.7
5 MIN TIME	2600	3315	4070	4640	792	560.0	106.0	500.0	590.0	26.7
FINAL	2625	3215	4045	4595	765	560.0	106.0	500.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1660	2039	2405	2757	3096	3422	3734	4033	4319	4592	4775	
MAX INTERNAL TEMPERATURE	1676	2118	2535	2929	3296	3642	3973	4288	4589	4878	5071	
BORE PRESSURE	664.9	660.2	653.5	645.3	635.8	625.2	613.6	601.1	587.7	573.5	563.0	
DELTA PRESSURE	74.9	70.2	63.5	55.3	45.8	35.2	23.6	11.1	-2.3	-16.5	-27.0	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	1	0	0	0	0	0	1
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	1	0	0	0	0	1	0	2
TOTAL	0	0	0	0	1	1	0	0	0	1	0	3
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	1	10	5	0	0	
- CHANNEL 10	0	0	0	0	0	0	1	5	1	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	5	10	5	0	0	
- CHANNEL 10	0	0	0	0	0	0	10	10	1	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	0	0	0	0	0	0
CHANNELS 9 AND 11	0	0	0	0	0	0	13	55	19	0	0	87
CHANNEL 10	0	0	0	0	0	0	25	32	4	0	0	61
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	0	1	6	0	7
MAXIMUM DEPTH	0	0	0	0	0	0	0	0	20	35	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	24.0	36.0	41.0	42.0	46.0	48.0	48.0	47.0	50.0	44.0	33.0	42.0	40.0	38.0	36.0	32.0	51.0
POST COAT PERMEABILITY	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	29.0	26.0	25.0	26.0	25.0	23.0	19.0	12.0	21.0
POST MOLY PERMEABILITY	8.5	11.5	12.5	13.1	14.0	14.3	15.2	15.9	16.2	14.9	12.0	12.8	13.7	12.0	10.5	8.3	
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

CORROSION TEST NUMBER - 2.0109

ELEMENT SERIAL NUMBER - 99-33953

TEST DATE - 10/25/66

TOTAL TEST TIME - 55.0
EFFECTIVE HEATED LENGTH - 48.0TOTAL WEIGHT LOSS - 16.9
TOTAL PINHOLE - 2FAILURE OCCURRED - NO
END BEHAVIOR (BAR/CAR) - 100/ 99NB COATING RUN - L219
NB WEIGHT GAIN - 66.5MOLY COATING RUN - 1719
MOLY WEIGHT GAIN - 5.7
MOLY DISTRIBUTION NAEXTRUSION BATCH - 3563 CURE RUN - 118A
BAKE RUN - 405A GRAPHITIZING RUN - 790A
LEACH RUN - 454A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2550	3245	4000	4615	796	560.0	105.0	500.0	590.0	26.7		
5 MIN TIME	2550	3215	3975	4582	790	560.0	105.0	500.0	590.0	26.7		
FINAL	2587	3045	3930	4525	768	560.0	105.0	500.0	590.0	26.7		

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1713	2044	2370	2692	3010	3323	3631	3935	4234	4529	4732	
MAX INTERNAL TEMPERATURE	1729	2123	2501	2864	3209	3543	3869	4189	4504	4814	5028	
BORE PRESSURE	663.9	659.2	652.6	644.5	635.1	624.6	613.1	600.7	587.4	573.3	563.0	
DELTA PRESSURE	73.9	69.2	62.6	54.5	45.1	34.6	23.1	10.7	-2.6	-16.7	-27.0	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	1	1
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

	0	0	0	0	1	0	0	0	0	0	0	1
FACE F	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	0	0	0	0	1	0	0	0	0	0	1	2
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	10	20	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	1	20	20	0	0	
- CHANNEL 10	0	0	0	0	0	0	5	10	10	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	5	20	30	0	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	15	50	35	0	0	
- CHANNEL 10	0	0	0	0	0	0	20	20	20	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	0	0	0	0	3	53	15	0	0	71
CHANNELS 9 AND 11	0	0	0	0	0	0	30	57	23	0	0	110
CHANNEL 10	0	0	0	0	0	0	17	33	10	0	0	60
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	1	0	0	1
NON RING RELATED	0	0	0	0	2	0	0	0	0	0	0	2
MAXIMUM DEPTH	0	0	0	0	40	0	0	0	50	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	24.0	34.0	38.0	38.0	42.0	42.0	42.0	40.0	39.0	38.0	37.0	36.0	32.0	28.0	25.0	31.0	236
POST COAT PERMEABILITY	16.0	19.0	21.0	22.0	22.0	24.0	23.0	21.0	22.0	24.0	21.0	21.0	19.0	15.0	12.0	13.0	22.0
POST MOLY PERMEABILITY	8.7	12.0	12.8	14.0	14.3	14.3	13.7	13.1	12.3	12.5	12.8	11.7	9.9	8.2	7.2	7.2	
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0110

ELEMENT SERIAL NUMBER - 99-78550

TEST DATE - 10/25/66

TOTAL TEST TIME - 60.0
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 17.7
TOTAL PINHOLES - 11

FAILURE OCCURRED - NO
INCL BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - L219
NB WEIGHT GAIN - 66.5

MOLY COATING RUN - 1719
MOLY WEIGHT GAIN - NA
MOLY DISTRIBUTION NA

EXTRUSION BATCH - Y15 CURE RUN - Y15
BAKE RUN - Y17 GRAPHITIZING RUN - Y15
LEACH RUN - Y17

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLUX RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2550	3305	4025	4595	779	560.0	98.0	500.0	590.0	26.7	
5 MIN TIME	2560	3290	3930	4550	768	560.0	98.0	500.0	590.0	26.7	
FINAL	2705	3180	4025	4605	755	560.0	98.0	500.0	590.0	26.7	

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1704	2053	2392	2721	3040	3349	3648	3938	4217	4487	4670	
MAX INTERNAL TEMPERATURE	1720	2130	2519	2888	3234	3563	3880	4184	4479	4764	4957	
BORE PRESSURE	657.0	652.6	646.4	638.9	630.1	620.3	609.6	598.0	585.6	572.4	562.8	
DELTA PRESSURE	67.0	62.6	56.4	48.5	40.1	30.3	19.6	8.0	-4.4	-17.6	-27.2	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	1	1	0	0	0	2
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	2	0	2	4
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	1	0	2	0	3

FACE F	0	0	0	0	0	0	0	1	0	0	1	2
TOTAL	0	0	0	0	0	0	1	3	2	2	3	11
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	0	0	0	0	1	15	10	10	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	1	20	10	0	0	
- CHANNEL 10	0	0	0	0	0	0	1	10	10	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	10	0	0	0	10	40	35	15	0	
- CHANNELS 9 AND 11	0	0	0	0	0	0	15	30	35	0	0	
- CHANNEL 10	0	0	0	0	0	0	20	25	50	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	1	0	0	0	21	35	21	8	0	86
CHANNELS 9 AND 11	0	0	0	0	0	0	25	48	19	0	0	92
CHANNEL 10	0	0	0	0	0	0	15	25	10	0	0	50
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	2	3	0	0	5
NON RING RELATED	0	0	4	0	0	0	0	0	1	0	0	5
MAXIMUM DEPTH	0	0	25	0	0	0	0	80	70	0	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	0.5	0.5	1.2	1.0	1.0	1.0	0.5	0.0
POST COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0
POST MOLY PERMEABILITY	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

CORROSION TEST NUMBER - 2.0111

ELEMENT SERIAL NUMBER - 99-33814

TEST DATE - 10/26/66

TOTAL TEST TIME - 30.8

TOTAL WEIGHT LOSS - 17.3

FAILURE OCCURRED - 13.5

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 15

END BEHAVIOR (BAR/CAR) - 100/ 99

NB COATING RUN - 8998

MOLY COATING RUN - 1719

EXTRUSION BATCH - 3935

CURE RUN - 333A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - 5.7

BAKE RUN - 404A

GRAPHITIZING RUN - 793A

MOLY DISTRIBUTION NA

LEACH RUN - 454A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
INITIAL	15.1	26.3	37.6	48.6	790	560.0	100.0	500.0	590.0	27.5
5 MIN TIME	2645	3225	4070	4680	766	560.0	100.0	500.0	590.0	27.5
FINAL	NA	NA	4115	4595	760	560.0	100.0	500.0	590.0	27.5

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1870	2183	2493	2799	3102	3402	3699	3992	4282	4569	4768	
MAX INTERNAL TEMPERATURE	1886	2260	2619	2966	3296	3616	3930	4238	4544	4846	5055	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	1	0	1	0	0	0	0	0	0	2
FACE B	0	0	1	0	0	0	0	0	0	0	0	1
FACE C	0	0	0	0	1	0	0	0	0	0	0	1
FACE D	0	0	1	1	4	0	0	0	0	0	0	6
FACE E	0	0	0	2	3	0	0	0	0	0	0	5

	FACE F	TOTAL	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
FACE F	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	3	3	9	0	0	0	0	0	0	0	0	15
TYPICAL CORROSION DEPTH														
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM CORROSION DEPTH														
- CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CORROSION RINGS -														
CHANNELS 8 AND 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNELS 9 AND 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHANNEL 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEFECT CORROSION -														
RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON RING RELATED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAXIMUM DEPTH	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	12.0	15.0	16.0	16.0	16.0	17.0	18.0	22.0	34.0	41.0	46.0	50.0	54.0	59.0	60.0	54.0	41.0
POST COAT PERMEABILITY	2.3	3.3	4.1	3.9	3.5	4.7	5.6	8.2	15.5	20.2	22.3	24.6	26.8	32.0	28.0	44.0	
POST MOLY PERMEABILITY	4.0	4.5	4.4	4.4	4.6	4.8	5.1	5.0	7.8	8.9	9.1	9.7	9.7	10.5	13.4	20.9	
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0112

ELEMENT SERIAL NUMBER - 99-33865

TEST DATE - 10/26/66

TOTAL TEST TIME - 33.7

TOTAL WEIGHT LOSS - 18.1

FAILURE OCCURRED - 11.75

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 11

END BEHAVIOR (BAR/CAR) - 100/ 90

NB COATING RUN - 8998

MOLY COATING RUN - 1719

EXTRUSION BATCH - 3951

CURE RUN - 333A

NB WEIGHT GAIN - NA

MOLY WEIGHT GAIN - 5.5

BAKE RUN - 404A

GRAPHITIZING RUN - 794A

MOLY DISTRIBUTION NA

LEACH RUN - 452A

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE	FLOW RATE
INITIAL	2600	3315	4050	4665	796	560.0	102.0	102.0	500.0	590.0	27.5	27.5
5 MIN TIME	2645	3305	4070	4605	788	560.0	102.0	102.0	500.0	590.0	27.5	27.5
FINAL	2825	3305	4050	4550	770	560.0	102.0	102.0	500.0	590.0	27.5	27.5

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1749	2107	2453	2788	3112	3425	3727	4017	4296	4563	4744	
MAX INTERNAL TEMPERATURE	1764	2185	2583	2960	3311	3645	3964	4270	4565	4848	5038	
BORE PRESSURE	660.9	656.4	650.0	642.1	633.0	622.8	611.6	599.5	586.6	572.9	562.9	
DELTA PRESSURE	70.9	66.4	60.0	52.1	43.0	32.8	21.6	9.5	-3.4	-17.1	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
PCST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	3	0	0	0	0	0	0	0	0	3
FACE B	0	0	1	1	0	0	0	0	0	0	0	2
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	2	2	0	0	0	0	0	0	0	4

FACE F	0	0	0	2	0	0	0	0	0	0	0	2
TOTAL	0	0	6	5	0	0	0	0	0	0	0	11
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	10	10	0	0	0	0	5	0	0	
- CHANNELS 9 AND 11	0	0	10	15	0	0	0	1	1	0	0	
- CHANNEL 10	0	0	10	5	0	0	0	1	1	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	50	25	0	0	0	0	5	0	0	
- CHANNELS 9 AND 11	0	0	25	40	0	0	0	15	10	0	0	
- CHANNEL 10	0	0	20	10	0	0	0	10	5	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	22	17	0	0	0	0	2	0	0	41
CHANNELS 9 AND 11	0	0	36	19	0	0	0	19	8	0	0	82
CHANNEL 10	0	0	15	7	0	0	0	18	9	0	0	49
DEFECT CORROSION -												
RING RELATED	0	0	0	1	0	0	0	0	0	0	0	1
NON RING RELATED	0	0	0	0	11	0	10	2	0	0	0	23
MAXIMUM DEPTH	0	0	0	30	20	0	25	20	0	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	28.0	38.0	40.0	40.0	41.0	42.0	41.0	40.0	38.0	42.0	40.0	36.0	33.0	30.0	26.0	22.0	270
POST COAT PERMEABILITY	8.9	12.5	14.4	15.5	16.2	17.5	18.4	19.0	19.5	19.5	19.0	19.0	17.5	17.0	16.2	12.0	
POST MOLY PERMEABILITY	5.9	8.0	9.1	9.3	9.7	10.5	10.5	10.8	11.0	11.0	10.8	10.3	9.9	9.5	8.2	6.5	
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

CORROSION TEST NUMBER - 2.0113

ELEMENT SERIAL NUMBER - 99-76330

TEST DATE - 10/26/66

TOTAL TEST TIME - 34.9

TOTAL WEIGHT LOSS - 15.3

FAILURE OCCURRED - 15.0

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/ 90

NB COATING RUN - 8998

MOLY COATING RUN - 1719

EXTRUSION BATCH - Y17 CURE RUN - Y17

NB WEIGHT GAIN - 70.1

MOLY WEIGHT GAIN - 5.1

BAKE RUN - Y18B GRAPHITIZING RUN - Y17

MOLY DISTRIBUTION NA

LEACH RUN - Y15

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM		HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE		
INITIAL	2610	3345	4050	4700	813	560.0	100.0	498.3	590.0		27.5	
5 MIN TIME	2610	3315	4070	4625	792	560.0	100.0	498.3	590.0		27.5	
FINAL	2775	3315	4050	4580	778	560.0	100.0	498.3	590.0		27.5	

- - - - 5 INCH (NOT OVERLAPPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1671	2050	2414	2765	3102	3425	3734	4029	4311	4579	4758	
MAX INTERNAL TEMPERATURE	1687	2129	2545	2937	3302	3645	3973	4284	4581	4865	5054	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	20	10	0	0	0	1	0	0	0	0
- CHANNELS 9 AND 11	0	0	15	5	0	0	0	1	5	0	0	0
- CHANNEL 10	0	0	10	10	0	0	0	1	5	0	0	0
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	30	15	0	0	0	5	0	0	0	0
- CHANNELS 9 AND 11	0	0	30	10	0	0	0	5	10	0	0	0
- CHANNEL 10	0	0	20	25	0	0	0	10	10	0	0	0
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	13	3	0	0	0	19	0	0	0	35
CHANNELS 9 AND 11	0	0	27	7	0	0	0	46	15	0	0	95
CHANNEL 10	0	0	13	4	0	0	0	25	10	0	0	52
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM DEPTH	0	0	0	0	0	0	0	0	0	0	0	0
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	-

- - - - 3 3/4 INCH (OVERLAPPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST MOLY PERMEABILITY	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 2.0114

ELEMENT SERIAL NUMBER - 99-70413

TEST DATE - 10/26/66

TOTAL TEST TIME - 45.0

TOTAL WEIGHT LOSS - 16.4

FAILURE OCCURRED - NO

EFFECTIVE HEATED LENGTH - 48.0

TOTAL PINHOLES - 0

END BEHAVIOR (BAR/CAR) - 100/100

NB COATING RUN - 8998

MOLY COATING RUN - 1719

EXTRUSION BATCH - Y17

CURE RUN - Y17

NB WEIGHT GAIN - 70.1

MOLY WEIGHT GAIN - 5.4

BAKE RUN - Y238

GRAPHITIZING RUN - Y17

MOLY DISTRIBUTION NA

LEACH RUN - Y18

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN	DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2625	3277	4035	NA	770	560.0	96.0	499.9	590.0	26.7
5 MIN TIME	2625	3245	4045	NA	769	560.0	96.0	499.9	590.0	26.7
FINAL	2835	3335	4190	NA	785	560.0	96.0	499.9	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1710	2083	2443	2789	3120	3437	3740	4029	4304	4564	4738	
MAX INTERNAL TEMPERATURE	1725	2160	2570	2956	3314	3652	3972	4276	4566	4842	5026	
BORE PRESSURE	655.0	650.7	644.7	637.3	628.7	619.1	608.6	597.2	585.1	572.2	562.8	
DELTA PRESSURE	65.0	60.7	54.7	47.3	38.7	29.1	18.6	7.2	-4.9	-17.8	-27.0	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0

FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	5	1	0	0	1	5	0	0	0	
- CHANNELS 9 AND 11	0	0	1	5	0	0	1	10	0	0	0	
- CHANNEL 10	0	0	1	0	0	0	1	10	0	0	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	10	10	0	0	5	20	10	0	0	
- CHANNELS 9 AND 11	0	0	10	10	0	0	5	15	10	0	0	
- CHANNEL 10	0	0	10	0	0	0	5	15	0	0	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	15	3	0	0	16	54	15	0	0	103
CHANNELS 9 AND 11	0	0	25	6	0	0	43	63	5	0	0	142
CHANNEL 10	0	0	13	0	0	0	17	25	0	0	0	55
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	2	0	0	0	0	0	0	3	0	5
MAXIMUM DEPTH	0	0	10	0	0	0	0	0	0	45	0	
INDICATION OF SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
POST MOLY PERMEABILITY	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

CORROSION TEST NUMBER - 2.0115

ELEMENT SERIAL NUMBER - 99-78551

TEST DATE - 10/26/66

TOTAL TEST TIME - 42.1
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 16.0
TOTAL PINHOLES - 0

FAILURE OCCURRED - 51.0
END BEHAVIOR(BAR/CAR) - 100/ NA

NB COATING RUN - 8998
NB WEIGHT GAIN - 68.4

MOLY COATING RUN - 1719
MOLY WEIGHT GAIN - 5.1
MOLY DISTRIBUTION NA

EXTRUSION BATCH - Y19 CURE RUN - Y19
BAKE RUN - Y17 GRAPHITIZING RUN - Y19
LEACH RUN - Y17

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION					EXIT HYDROGEN		DELTA	HYDROGEN	INLET HELIUM	HELIUM
	15.1	26.3	37.6	48.6	POWER	PRESSURE	PRESSURE	PRESSURE	FLOW RATE	PRESSURE	FLOW RATE
INITIAL	2625	3315	4070	4615	797	560.0	100.0	502.3	590.0	590.0	26.7
5 MIN TIME	2682	3215	4082	4640	790	560.0	100.0	502.3	590.0	590.0	26.7
FINAL	2765	3245	4045	4375	766	560.0	100.0	502.3	590.0	590.0	26.7

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - -

	0 - 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-52	TOTAL
5 MIN TIME -												
SURFACE TEMPERATURE	1936	2217	2501	2790	3082	3378	3678	3982	4290	4602	4823	
MAX INTERNAL TEMPERATURE	1952	2296	2632	2961	3281	3598	3916	4236	4560	4887	5118	
BORE PRESSURE	658.9	654.5	648.2	640.5	631.5	621.5	610.6	598.8	586.1	572.7	562.9	
DELTA PRESSURE	68.9	64.5	58.2	50.5	41.5	31.5	20.6	8.8	-3.9	-17.3	-27.1	
CRACK DISTRIBUTION -												
PRE TEST	-	-	-	-	-	-	-	-	-	-	-	
POST TEST	-	-	-	-	-	-	-	-	-	-	-	
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-	-	
PINHOLE DISTRIBUTION -												
FACE A	0	0	0	0	0	0	0	0	0	0	0	0
FACE B	0	0	0	0	0	0	0	0	0	0	0	0
FACE C	0	0	0	0	0	0	0	0	0	0	0	0
FACE D	0	0	0	0	0	0	0	0	0	0	0	0
FACE E	0	0	0	0	0	0	0	0	0	0	0	0
FACE F	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TYPICAL CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	10	10	1	0	5	10	20	1	0	
- CHANNELS 9 AND 11	0	0	1	10	1	0	1	5	20	0	0	
- CHANNEL 10	0	0	1	10	15	1	10	20	10	10	0	
MAXIMUM CORROSION DEPTH												
- CHANNELS 8 AND 12	0	0	10	30	1	0	10	35	30	1	0	
- CHANNELS 9 AND 11	0	0	10	30	1	0	10	40	45	0	0	
- CHANNEL 10	0	0	1	40	15	1	15	35	40	10	0	
CORROSION RINGS -												
CHANNELS 8 AND 12	0	0	2	10	1	0	13	46	20	1	0	93
CHANNELS 9 AND 11	0	0	25	8	1	0	17	46	12	0	0	109
CHANNEL 10	0	0	19	11	1	1	10	19	12	1	0	74
DEFECT CORROSION -												
RING RELATED	0	0	0	0	0	0	0	0	0	0	0	0
NON RING RELATED	0	0	0	0	0	4	0	0	0	0	0	4
MAXIMUM DEPTH	0	0	0	0	0	10	0	0	0	0	0	
INDICATION OF												
SURFACE CORROSION	-	-	-	-	-	-	-	-	-	-	-	

- - - - 3 3/4 INCH (OVERLAPING) INCREMENTS - - - -

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PRE COAT PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POST COAT PERMEABILITY	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
POST MOLY PERMEABILITY	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
POST TEST PERMEABILITY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CORROSION TEST NUMBER - 200116

ELEMENT SERIAL NUMBER - 99-33926

TEST DATE - 10/20/66

TOTAL TEST TIME - 1.0
EFFECTIVE HEATED LENGTH - 48.0

TOTAL WEIGHT LOSS - 3.6
TOTAL PINHOLES - 0

FAILURE OCCURRED - NO
END OF HAVILKIEAR/CAR - 100/NA

NO COATING RUN - 859E
NO WEIGHT GAIN - NA

MOLY COATING RUN - 1719
MOLY WEIGHT GAIN - NA
MOLY DISTRIBUTION - NA

EXTRUSION BATCH - 3455 CURE RUN - 118A
BAKE RUN - 403 GRAPHITIZING RUN - 793A
LEACH RUN - 45.4

***** CORROSION TEST PARAMETERS *****

	TEMPERATURE AT STATION				POWER	EXIT HYDROGEN PRESSURE	DELTA PRESSURE	HYDROGEN FLOW RATE	INLET HELIUM PRESSURE	HELIUM FLOW RATE
	15.1	26.3	37.0	46.6						
INITIAL	NA	NA	4050	4665	811	NA	NA	500.0	NA	27.5
5 MIN TIME	0	0	0	0	0	0	0	0	0	0
FINAL	0	0	0	0	0	0	0	0	0	0

- - - - 5 INCH (NOT OVERLAPING) INCREMENTS - - - - -

0 - 5 5-10 10-15 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-52 TOTAL

5 MIN TIME -	-	-	-	-	-	-	-	-	-	-
SURFACE TEMPERATURE	-	-	-	-	-	-	-	-	-	-
MAX INTERNAL TEMPERATURE	-	-	-	-	-	-	-	-	-	-
ORCL PRESSURE	-	-	-	-	-	-	-	-	-	-
DELTA PRESSURE	-	-	-	-	-	-	-	-	-	-
CRACK DISTRIBUTION -	-	-	-	-	-	-	-	-	-	-
PRE TEST	-	-	-	-	-	-	-	-	-	-
POST TEST	-	-	-	-	-	-	-	-	-	-
INCREMENTAL WEIGHT LOSS	-	-	-	-	-	-	-	-	-	-
PINHOLE DISTRIBUTION -	-	-	-	-	-	-	-	-	-	-
FACE A	-	-	-	-	-	-	-	-	-	-
FACE B	-	-	-	-	-	-	-	-	-	-

SHIELD O ROODME BUSINESS FORMS NO. 5

SHIELD O ROODME BUSINESS FORMS NO. 5

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Astronuclear
Laboratory

WANL-TME-1626

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