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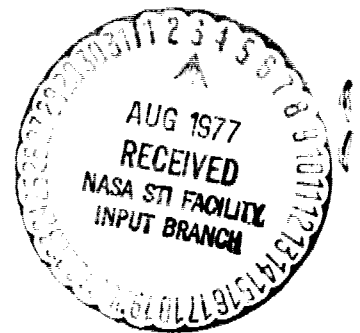
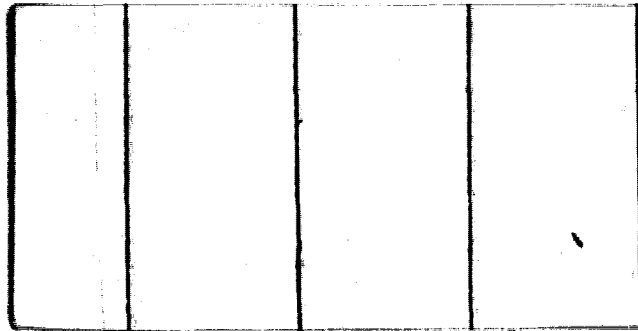
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CR 151457

(NASA-CR-151457) REUSABLE SURFACE
INSULATION (RSI) MATERIAL SAMPLES Final
Report (Lockheed Missiles and Space Co.)
27 p HC A03/MF A01 CSCI 11D

N77-27191

G3/24 Unclass
39162



LOCKHEED

MISSILES & SPACE COMPANY, INC. • SUNNYVALE, CALIFORNIA

A SUBSIDIARY OF LOCKHEED AIRCRAFT CORPORATION

FINAL REPORT
FOR
REUSABLE SURFACE INSULATION (RSI)
MATERIAL SAMPLES

CONTRACT NAS9-14771
27 June 1977

PREPARED BY

R. P. Banas 7/27/77

R. P. Banas
Project Leader

APPROVED BY:

K. J. Forsberg
K. J. Forsberg, Program Manager
SSD Thermal Protection Systems

Data sheets for all tiles shipped are summarized in the Appendix in chronological order by shipping date.

Also included as part of the contract was a trip by Ron Banas to NASA/KSC and NASA/JSC to review the testing status of tiles supplied on this contract and to discuss any items pertinent to the processing of both HRSI and LRSI tiles or specimens. This trip was taken in early May 1977 and provided Don Tillian with an excellent opportunity to review all aspects of LMSC materials processing for LI-900 and Class 1 and Class 2 tiles.

There were no new technology items reported under this contract since all the technology required to produce the tiles was developed either under the prime contract with Rockwell (M3J3XMA-483011D) or the Development Contracts (NAS9-12137, 9-12083) with NASA/JSC that preceded both the prime contract with Rockwell and the subject contract.

SUMMARY

A total of 110 tiles, 64 HRSI (Class 2) and 46 LRSI (Class 1) were supplied to NASA/JSC from August 1976 through April 1977. The tiles were all representative of those being produced for Rockwell for use on Orbiter 102 with the following exceptions;

1. All tiles were flat & square.
2. They were machined on a rotary profiler and had no witness line.
3. Six Class 2 specimens were machined as flat-faced cylinders for use in NASA/JSC arc plasma facility.
4. The initial 21 LRSI tiles shipped on 13 August 1976 were coated with the 0036 B coating and were used by NASA/JSC to evaluate the effectiveness of the 0011 secondary waterproofing system.

Data sheets summarizing the requested dimensional and material property data for all 110 tiles delivered are included in the Appendix.

TABLE I
SUMMARY OF TILES DELIVERED UNDER NAS9-14771

DATE SHIPPED	LMSC SHIPPER NO.	LRSI (CL.1)	HRSI (CL.2)
4/28/77	589409	2	12
4/5/77	594507	8	9
3/31/77	594502	0	3
3/16/77	587987	3	9
3/7/77	587994	12	0
10/19/76	587974*	0	10
10/20/76	587975	0	21
8/13/76	589404	11	0
8/10/76	589402	10	0
TOTALS		46	64

* These tiles were shipped to R. C. Ketterer Jr., NASA/KSC, Cape Kennedy, Florida. All other tiles were shipped to Don Tillian.

APPENDIX

PERTINENT DATA FOR ALL TILES SHIPPED
UNDER NAS9-14771

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
RCG
0011

- Tile/Test Specimen Properties

Part No. 60602C

Identification No.	-5151	-5152	-5153	-5154	-5157	-5158
Dimensions*(in.):						
Length.	6.002	6.003	6.000	6.004	6.000	5.997
Width	6.004	6.004	5.999	6.004	6.004	6.002
Thickness	2.005	2.011	2.008	2.003	2.004	2.003
Density (pcf)	9.24	8.74	8.95	9.39	8.88	8.98
Coating Wt.** (psf)	0.127	0.129	0.129	0.129	.127	.127
Final Tile Wt (lb)	0.454	0.434	0.443	0.461	0.439	0.443
Process Lot No.	A	A	A	A	A	A

A - Indicates blend of J-M Richmond III Fiber Lots 298, 299, 300 and 302 (PTX Lot 28)

* - Average Tile Dimensions

** - Avg. Coating Weight for 12 tiles is 0.129 psf with standard deviation of 0.004 psf. These tiles were sprayed by robot No. 3 on the same day using the same tape. The coating weights are based on an uncoated distance of 0.25-in. from bottom of the tile. Coated area used was 0.542 ft².

• Miscellaneous Data:

- Ship Date(s): LMSC Shipper No. 589409 dated 4/28/77
- Deliver to: D. J. Tillian

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
RCG
0011

- Tile/Test Specimen Properties

Part No. 606020

Identification No.	-5159	-5160	-5161	-5162	-5163	-5164
Dimensions* (in.):						
Length.	6.003	6.001	6.003	6.004	6.004	6.007
Width	6.002	6.004	6.006	6.004	6.008	6.006
Thickness	2.010	1.988	2.002	2.002	2.008	1.999
Density (pcf)	8.76	9.07	9.12	8.66	8.71	9.17
Coating Wt. (psf)	0.126	0.124	0.127	0.131	0.133	0.135
Final Tile Wt (lb)	0.433	0.445	0.449	0.432	0.435	0.455
Process Lot No.	A	A	A	A	A	A

for Notes see p. A-1

- Miscellaneous Data:

- Ship Date(s): LMSC Shipper No. 589409 dated 4/28/77
- Deliver to: D. J. Tillian

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036C
0011

- Tile/Test Specimen Properties

L808010						
Identification No.	L808010 -500001	L808002 -1013		-500014	-500015	-500016
Dimensions (in.):						
Length	~ 8.0	8.013		8.015	8.016	8.015
Width	~ 8.0	8.010		8.022	8.019	8.019
Thickness	~ 1.0	~ 0.2		1.015	1.016	1.016
Density (pcf)	~ 8.6	8.18		~ 8.5	~ 8.4	~ 8.5
Coating Wt. (psf)	0.110	0.097		0.117	0.117	~ 0.12
Final Tile Wt (lb)	~ 0.38	0.346		0.379	0.386	0.365
Process Lot No.	B	D		B	C	D

LMSC Shipper No. 589409
(4/28/77)

LMSC Shipper No. 587987
(3/16/77)

- B - Indicates J.M. Waterville I Lots 2445, 2446 & 2447 (PTX 8269)
- C - Indicates J.M. Richmond III Lots 536, 537 & 538 (PTX 8287)
- D - Indicates J.M. Waterville I Lots 2398, 2399 & 2400 (PTX 8244)

- Miscellaneous Data: Last Shipment on NAS9-14771
- Ship Date(s):
- Deliver to: D. J. Tillian

CONTRACT NAS - 14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
RCG
0011

- Tile/Test Specimen Properties Part No. DJT-001

Identification No.	-1001	-1002	-1003	-1004	-1005	-1006
Dimensions (in.):						
Diameter (Top)	3.829	3.821	3.815	3.808	3.815	3.816
Diameter (Bottom)	3.839	3.834	3.820	3.828	3.820	3.820
Thickness*	1.985	1.984	1.988	1.983	1.981	1.980
Density (pcf)	9.47	8.33	8.78	8.94	8.32	9.01
Coating Wt. (psf)	0.138	0.143	0.139	0.116	0.107	0.138
Final Tile Wt (lb)	0.156	0.142	0.146	0.144	0.133	0.149
Process Lot No.	A	A	A	A	A	A
Coating Thickness ⁽¹⁾ on Top (in)	0.013	0.013	0.013	0.010	0.010	0.013

* Average of 5 PTS.

"A" indicates a blend of J-M Waterville I fiber lots 2192, 2211, 2212 and 2213 (PTX 8148)

(1) indicates average values on top as determined from the Betascope Model DZ-800

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- Miscellaneous Data:
- Ship Date(s):
- Deliver to: D. J. Tillian, LMSC Shipping Notice 594507 4/5/77

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036C
0011

- Tile/Test Specimen Properties Part No. L808010

Identification No.	-500002	-500003	-500004	-500005	-500009	-500010
Dimensions* (in.):						
Length	8.020	8.015	8.022	8.011	8.015	8.010
Width	8.014	8.020	8.016	8.026	8.020	8.019
Thickness	0.998	0.998	1.001	0.996	0.995	0.998
Density (pcf)	8.59	8.65	8.59	8.46	9.00	8.70
Coating Wt. ⁽¹⁾ (psf)	0.110	0.106	0.106	0.106	0.108	0.106
Final Tile Wt (lb)	0.369	0.369	0.367	0.362	0.383	0.371
Process Lot No.**	A	A	A	A	A	A

* Average Tile Dimensions

** Waterville I Fibers

"A" Represent a blend of J-M lots 2445, 2446 & 2447 (PTX Lot 8269)

(1) Indicates tiles were robot sprayed

- Miscellaneous Data:

• Ship Date(s):

• Deliver to: D. J. Tillian, LMSC Shipping Notice No. 594507 4/5/77

CONTRACT NAS 9-477
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036C
0011

- Tile/Test Specimen Properties Part No. L 808002

Identification No.	-500001	-500011				
Dimensions (in.):						
Length.	~ 8.	~ 8.				
Width	~ 8.	~ 8.				
Thickness	0.21	0.21				
Density (pcf)	~ 8.84	~ 8.89				
Coating Wt. (psf)	0.115	0.105				
Final Tile Wt (lb)	0.121	0.122				
Process Lot No.*	A	B				

LMSC Shipping Notice
No. 594507

* Waterville I Fibers

"A" Indicates a blend of J-M lots 2133, 2134, 2135 & 2136 (PTX 5111)

"B" Indicates a blend of J-M lots 2132, 2133 & 2134 (PTX 5110)

- Miscellaneous Data:
- Ship Date(s):
- Deliver to: D. J. Tillian

CONTRACT NAS 9-14771
FILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
RCG
0011

• Tile/Test Specimen Properties

Part No. L606020

Identification No.	-8385	-8386	-8393	-8391	-8392	-8394
Dimensions (in.):						
Length	5.999	5.993	6.009	6.000	6.005	6.008
Width	5.999	5.992	6.010	6.006	6.005	6.006
Thickness	1.997	1.998	2.009	2.010	2.001	2.006
Density (pcf)	8.18	8.66	8.95	3.54	8.45	8.52
Coating Wt. (psf)	0.124	0.122	0.144	0.120	0.131	0.149
Final Tile Wt (lb)	0.408	0.427	0.451	0.421	0.423	0.436
Process Lot No.	A	A	D	B	C	C

LMSC Shipping Notice
No. 594507 4/5/77

LMSC Shipping Notice
No. 594502 3/31/77

"A" represents a blend of J-M fiber lots 307, 2308, 2309 & 2310 (PTX 8189)
 "B" " " " " " " " 2192, 2211, 2212 & 2213 (PTX 8148)
 "C" " " " " " " " 2289, 2290 and 2291 (PTX 8179)
 "D" " " " " " " " 2077, 2079 and 2080 (PTX 5103)

} Waterville I

- Miscellaneous Data:
- Ship Date(s):
- Deliver to: D. J. Tillian,

CONTRACT NAS 9-14771
FILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
R. C. G.
0011

• Tile/Test Specimen Properties

Part No. L606020

Identification No.	-8377	-8378	-8381	-8382	-8383	-8384
Dimensions* (in.):						
Length	6.000	6.004	6.009	5.999	6.001	5.995
Width	6.001	6.008	6.009	6.006	6.001	6.000
Thickness	2.007	2.008	2.003	2.007	1.997	1.995
Density (pcf)	8.02	9.14	9.31	9.33	8.35	8.83
Coating Wt. (psf)	0.126	0.129	0.126	0.133	0.126	0.120
Final Tile Wt (lb)	0.402	0.451	0.456	0.461	0.416	0.433
Process Lot No.**	2310 & 2311	2310 & 2311	A	A	A	A

* Average Tile Dimensions

** Waterville I Fibers

"A" represents a blend of J.M. lots 2307, 2308, 2309 and 2310 (PTX Lot 8189)

"B" represents a blend of J.M. lots 2278, 2280 and 2281 (PTX Lot 8167)

• Miscellaneous Data:

• Ship Date(s):

• Deliver to: D. J. Tillian, LMSC Shipping Notice 587987, 3/16/77

CONTRACT NAS 3-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
RCG
0011

- Tile/Test Specimen Properties Part No. L606020

Identification No.	-8387	-8388	-500002			
Dimensions* (in.):						
Length	6.000	5.998	5.997			
Width	6.003	5.999	5.997			
Thickness	2.006	2.002	2.003			
Density (pcf)	9.29	8.88	8.96			
Coating Wt. (psf)	0.124	0.118	0.126			
Final Tile Wt (lb)	0.454	0.434	0.442			
Process Lot No.**	B	B	B			

* Average Tile Dimensions

** All Waterville I Fiber Lots

"B" represents a blend of J.M. lots 2278, 2280 & 2281 (PTX Lot 8167)

- Miscellaneous Data:
- Ship Date(s):
- Deliver to: D. J. Tillian, LMSC shipping notice No. 587987 3/16/77

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036C
0011

• Tile/Test Specimen Properties

Identification No. (1)	-500002	-500003	-500004	-500005	-500006	-500007
Dimensions (in.):						
Length	8.0	8.0	8.0	8.0	8.0	8.0
Width	8.0	8.0	8.0	8.0	8.0	8.0
Thickness (2)	0.210	0.211	0.211	0.212	0.211	0.212
Density (pcf)	~ 8.8	~ 8.8	~ 8.8	~ 8.7	~ 8.7	~ 8.7
Coating Wt. (psf)	0.110	0.120	0.115	0.117	0.120	0.133
Final Tile Wt (lb)	0.120	0.128	0.126	0.121	0.124	0.132
Process Lot No. *	2133,2134 2135,2136	2133,2134 2135,2136	2115,2130 2132	2115,2130 2132	2115,2130 2132	2115,2130 2132

(1) All tiles are Part No. L808002

(2) at diagonal center of tile

* Johns-Manville Fiber Lot Numbers - Waterville I

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- Miscellaneous Data: All Tiles Manually Sprayed
- Ship Date(s): 7 March 1977 National Airlines Bill of Lading No. 010-SFO-3515-0522
- Deliver to: NASA/JSC C/O D. J. Tillian
LMSC Shipper No. 587994

27 June 1977

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036C
0011

• Tile/Test Specimen Properties

Identification No. ⁽¹⁾	-500008	-500010	-500012	-500013	-500014	-500015
Dimensions (in.):						
Length	8.0	8.0	8.0	8.0	8.0	8.0
Width	8.0	8.0	8.0	8.0	8.0	8.0
Thickness (2)	0.210	0.209	0.210	0.213	0.209	0.212
Density (pcf)	8.7	~ 8.9	~ 8.9	9.0	~ 9.0	~ 9.0
Coating Wt. (psf)	0.130	0.120	0.116	0.120	0.101	0.110
Final Tile Wt (lb)	0.132	0.129	0.131	0.124	0.116	0.124
Process Lot No.	2132, 2133 2132	2132, 2133 2134	2132, 2133 2134	2132, 2133 2134	2132, 2133 2134	2132, 2133 2134

- (1) All Tiles are Part No. L808002
(2) at diagonal center of tile

* Johns-Manville Fiber Lot Numbers - Waterville I

- Miscellaneous Data: All tiles manually sprayed
- Ship Date(s): 7 March 1977 National Airlines Bill of Loading No. 010-SFO-3515-0522
- Deliver to: NASA/JSC C/O D. J. Tillian
LMSC Shipper No. 587994

CONTRACT NAS9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
CLASS 2 (RCG)
0011 Vapor Deposited

- Tile/Test Specimen Properties; Part No. L606010

Identification No.	-8001	-8002	-8003	-8004	-8005	-8006
Dimensions (in.):						
Length...	5.994	5.997	6.003	6.006	6.003	5.996
Width	5.993	5.995	6.002	6.013	5.998	5.998
Thickness	1.003	1.003	1.003	1.002	1.003	1.002
Density (pcf)	8.86	8.71	8.69	8.76	8.59	8.97
Coating Wt. (psf)	0.101	0.125	0.136	0.144	0.115	0.101
Final Tile Wt (lb)	-	-	-	-	-	-
Process Lot No.	A	A	A	A	A	A

A - indicates of blend of J-M Richmond III fiber lots 301, 302 and 303

- Miscellaneous Data:
- Ship Date(s): 19 October 1976, LMSC Shipping Notice 587974
- Deliver to: R. C. Ketterer Jr., NASA/KSC Kennedy Space Center, Florida

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
CLASS 2 (RCG)
0011 Vapor Deposited

- Tile/Test Specimen Properties ; Part No. L606010

Identification No.	-8007	-8008	-8009	-8010		
Dimensions (in.):						
Length...	5.989	5.996	5.994	5.996		
Width	5.992	5.996	5.997	5.998		
Thickness	1.003	1.000	1.003	1.003		
Density (pcf)	8.45	8.54	8.90	8.50		
Coating Wt. (psf)	0.107	0.109	0.112	0.101		
Final Tile Wt (lb)	-	-	-	-	-	-
Process Lot No.	A	A	A	A		

A - indicates a blend of J-M Richmond III fiber lots 301, 302, and 303.

- Miscellaneous Data:
- Ship Date(s): 19 October 1976, LMSC Shipping Notice 587974
- Deliver to: R. C. Ketterer Jr., NASA/KSC Kennedy Space Center, Florida

CONTRACT NAS9-14771
FILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
CLASS 2 (RCG)
0011 Vapor Deposited

• Tile/Test Specimen Properties ;

Part Number L606020

Identification No.	-5159	-5195	-5197	-5198	-5202	-5292
Dimensions (in.):						
Length	6.009	5.997	6.002	6.000	6.004	6.012
Width	6.005	5.999	6.001	6.002	6.006	6.006
Thickness	2.009	2.012	2.006	2.005	2.002	2.006
Density (pcf)	8.62	8.71	8.64	8.93	8.83	9.07
Coating Wt. (psf)	0.132	0.120	0.114	0.135	0.124	0.135
Final Tile Wt (lb)	0.433	0.431	4.26	0.454	0.437	0.453
Process Lot No.	B	B	B	B	A	A

- A - indicates a blend of J-M Richmond III fiber lots 301, 302 and 303
 B - indicates a blend of J-M Richmond III fiber lots 296, 299, 300 and 301
 C - indicates a blend of J-M Richmond III fiber lots 284, 285 and 286

• Miscellaneous Data:

- Ship Date(s): 20 October 1976 LMSC Shipper No. 587975
- Deliver to: D. Tillian; NASA/JSC

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
CLASS 2 (RCG)
0011 Vapor Deposited

- Tile/Test Specimen Properties: Part No. L606020

Identification No.	-5125	-5161	-5201	-5238	-5246	-5300
Dimensions (in.):						
Length	5.997	6.002	6.001	6.006	6.004	6.002
Width	6.005	6.004	6.001	6.003	6.003	6.004
Thickness	1.998	2.011	2.002	2.004	2.002	2.006
Density (pcf)	9.17	8.90	8.81	8.88	8.90	8.90
Coating Wt. (psf)	0.139	0.127	0.113	0.118	0.118	0.126
Final Tile Wt (lb)	0.459	0.442	0.429	0.436	0.440	0.443
Process Lot No.	C	B	A	A	A	A

for Notes see p. A-14

- Miscellaneous Data:
- Ship Date(s): LMSC Shipper No. 587975
- Deliver to:

A-15

CONTRACT NAS9-14771
FILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
CLASS 2 (RCG)
OC11 Vapor Deposited

- Tile/Test Specimen Properties; Part No. L606020

Identification No.	-5098	-5155	-5158	-5192	-5196	-5282
Dimensions (in.):						
Length...	6.005	6.003	5.997	6.000	6.005	5.993
Width	6.005	6.001	6.002	6.002	6.008	6.003
Thickness	2.002	2.006	2.006	2.006	2.004	2.005
Density (pcf)	8.86	8.76	9.02	9.00	9.00	8.81
Coating Wt. (psf)	0.146	0.126	0.120	0.113	0.135	0.118
Final Tile Wt (lb)	0.449	0.435	0.443	0.440	0.450	.433
Process Lot No.	C	B	B	B	B	B

for Notes see p. A-14

- Miscellaneous Data:
- Ship Date(s): LMSC Shipper No. 587975
- Deliver to:

A-16

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
CLASS 2 (RCG)
0011 Vapor Deposited

- Tile/Test Specimen Properties; Part No. L606020

Identification No.	-5037	-5080	-5157			
Dimensions (in.):						
Length...	6.005	6.001	6.000			
Width	6.003	6.006	6.024			
Thickness	1.998	2.004	2.007			
Density (pcf)	8.33	8.50	8.78			
Coating Wt. (psf)	0.112	0.146	0.111			
Final Tile Wt (lb)	0.412	0.434	0.427			
Process Lot No.	C	C	B			

for Notes see p. A-14

- Miscellaneous Data:
- Ship Date(s): LMSC Shipper No. 587975
- Deliver to:

CONTRACT NAS 9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036B
0011 VAPOR DEPOSITED

- Tile/Test Specimen Properties ; Part No. VT 70-090110-009

Identification No.	-8021	-8022	-8024	-8025	-8026	-8030
Dimensions (in.):						
Length	8.007	8.011	8.005	8.015	8.008	8.004
Width	8.012	8.008	8.004	8.015	8.005	8.007
Thickness	0.508	0.507	0.506	0.506	0.505	0.505
Density (pcf)	9.29	8.01	8.01	9.17	8.91	8.95
Coating Wt. (psf)	0.117	0.115	0.117	0.123	0.115	0.115
Final Tile Wt (lb)	0.408	0.387	0.387	0.410	0.392	0.394
Process Lot No.	A	A	A	B	B	B

A indicates a blend of J-M lots 319, 320 & 321

B indicates a blend of J-M lots 317, 318, & 319

- Miscellaneous Data:
- Ship Date(s): 13 Aug 1976, LMSC Shipper No. 589404
- Deliver to: D. J. Tillian, NASA/JSC ES 32

27 June 1977

CONTRACT NAS9-14771
TILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036B
0011 VAPOR DEPOSITED

- Tile/Test Specimen Properties; Part No. VT70-090110-009

Identification No.	-8033	-8034	-8035	-8036	-8038	
Dimensions (in.):						
Length	8.008	8.008	8.008	8.003	8.008	
Width	8.007	8.004	8.005	8.004	8.009	
Thickness	0.507	0.497	0.506	0.505	0.505	
Density (pcf)	9.25	8.78	8.75	8.82	9.02	
Coating Wt. (psf)	0.115	0.117	0.113	0.120	0.115	
Final Tile Wt (lb)	0.406	0.388	0.385	0.392	0.397	
Process Lot No.	B	B	B	B	B	

A indicates a blend of J-M lots 319, 320 & 321

B indicates a blend of J-M lots 317, 318, & 319

• Miscellaneous Data:

- Ship Date(s): 13 Aug. 1976, LMSC Shipper No. 589404
- Deliver to: D. J. Tillian NASA/JSC ES32

CONTRACT NAS 9-14771
FILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036B
0011 VAPOR DEPOSITED

- Tile/Test Specimen Properties; Part No. VT 70-090110-013

Identification No.	-8042	-8043	-8045	-8047	-8048	-8049
Dimensions (in.):						
Length	8.004	8.008	8.006	8.007	8.010	8.005
Width	8.005	8.008	8.006	8.006	8.010	8.006
Thickness	~1.0	~1.0	~1.0	0.998	0.997	~1.0
Density (pcf)	8.92	8.80	9.24	8.67	8.69	9.24
Coating Wt. (psf)	0.125	0.127	0.122	0.107	0.112	0.127
Final Tile Wt (lb)	0.504	0.500	0.518	0.481	0.485	0.521
Process Lot No.	B	B	B	B	B	A

A indicates a blend of J-M lots 319, 320 & 321

B indicates a blend of J-M lots 317, 318 & 319

• Miscellaneous Data:

- Ship Date(s): 10 Aug. 1976; LMSC Shipper No. 569402
- Deliver to: D. J. Tillian, NASA/JSC ES32

CONTRACT NAS 9-14771
FILE/TEST SPECIMEN DATA SHEET

- Lot Identification
- Basic Material
- Surface Coating
- Hydrophobic Treatment

Call Requirement No.
LI-900
0036B
0011 VAPOR DEPOSITED

- Tile/Test Specimen Properties: Part No. VT 70-090110-013

Identification No.	-8052	-8056	-8057	-8059		
Dimensions (in.):						
Length	8.005	8.005	8.005	8.005		
Width	8.006	8.005	8.006	8.005		
Thickness	~1.0	~1.0	~1.0	~1.0		
Density (pcf)	8.65	8.52	9.16	8.73		
Coating Wt. (psf)	0.120	0.120	0.118	0.118		
Final Tile Wt (lb)	0.488	0.482	0.512	0.491		
Process Lot No.	A	A	A	A		

A indicates a blend of J-M lots 319, 320 & 321

B indicates a blend of J-M lots 317, 318 & 319

• Miscellaneous Data:

- Ship Date(s): 10 Aug. 1976; IMSC Shipper No. 589402
- Deliver to: D. J. Tillian, NASA/JSC ES 32