RMS040

ROHR INDUSTRIES, INC.

2.0 INLET COWL

2.4 MATERIAL ALLOWABLES

NOTE: MATERIAL TEMPERATURE AND EXPOSURE REDUCTION FACTORS OBTAINED FROM REFERENCES 36 AND 37

GRAPHITE TAPE (RMS 040)

NOTE:NASTRAN Sign Convention Utilized

DATA BANK LISTING

RMS 040
GRAPHITE TAPE (Wet)
Temp= 70. Degrees

El	19.60E+06 psi
Et	13.73E+05 psi
G	18.21E+05 psi
Nu12	.3100
Nu21	.0217
t	.0055 in
Ftl	137615 psi
Ftt	1736 psi
Fcl	98136 psi
Fct	17926 psi
Fs	5960 psi

RMS 040
GRAPHITE TAPE (Wet)
Temp= 160. Degrees

El	18.95E+06 psi
Et	12.44E+05 psi
G	13.03E+05 psi
Nu12	.3100
Nu21	.0204
t	.0055 in
Ftl	111123 psi
Ftt	1103 psi
Fcl	70449 psi
Fct	12869 psi
Fs	4376 psi

RMS 040
GRAPHITE TAPE (Wet)
Temp= 210. Degrees

El	18.58E+06 psi
Et	11.61E+05 psi
G	10.21E+05 psi
Nu12	.3100
Nu21	.0194
t	.0055 in
Ftl	96202 psi
Ftt	820 psi
Fcl	55770 psi
Fct	10209 psi
Fs	3492 psi

RMS 040
GRAPHITE TAPE (Wet)
Temp= 250. Degrees

El	18.27E+06 psi
Et	10.56E+05 psi
G	81.40E+04 psi
Nu12	.3100
Nu21	.0179
t	.0055 in
Ftl	83618 psi
Ftt	812 psi
Fcl	46277 psi
Fct	8562 psi
Fs	2772 psi

RMS 040
GRAPHITE TAPE (Wet)
Temp= 270. Degrees

El	18.11E+06 psi
Et	10.03E+05 psi
G	71.04E+04 psi
Nu12	.3100
Nu21	.0172
t	.0055 in
Ftl	77326 psi
Ftt	807 psi
Fcl	41531 psi
Fct	7738 psi
Fs	2412 psi

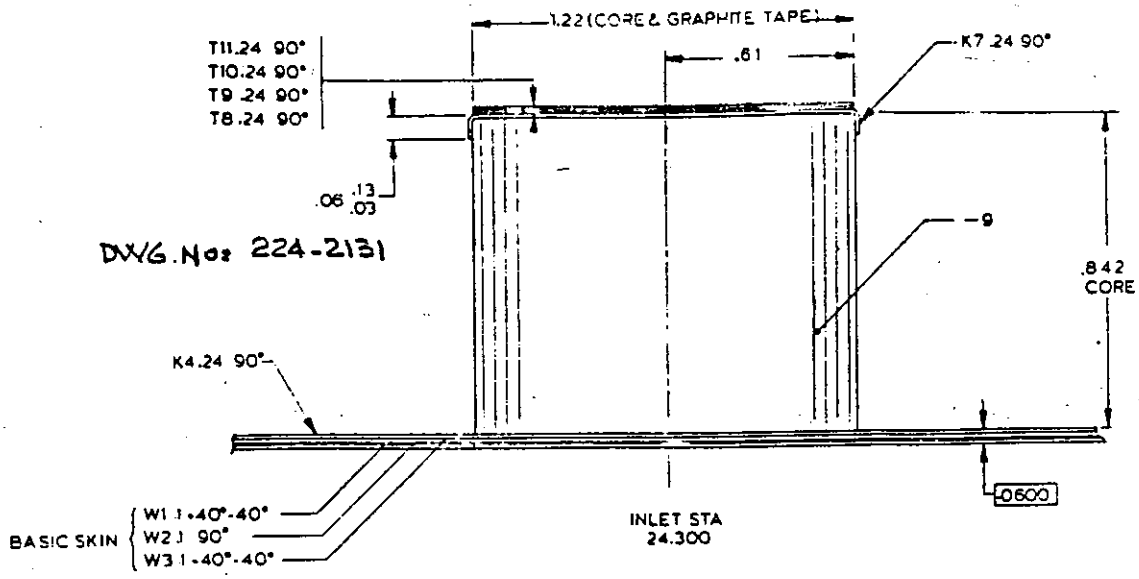
RMS 040
GRAPHITE TAPE (Wet)
Temp= 300. Degrees

El	17.87E+06 psi
Et	92.46E+04 psi
G	55.50E+04 psi
Nu12	.3100
Nu21	.0160
t	.0055 in
Ftl	67888 psi
Ftt	801 psi
Fcl	34411 psi
Fct	6503 psi
Fs	1872 psi

2.0 INLET COWL

2.5 NASTRAN MODEL DESCRIPTION

2.5.1 180 Degree Symmetric



DWG. No: 224-2131

C-C [24]

TYP AT INLET STA 31.400 & 38.500
EXC FOR CORE DASH NO DOUBLER
DASH NOS & TAPE DASH NOS
NO SCALE

PBAR (131)

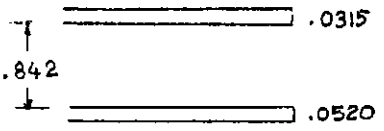
T === (.0055) x 4 = 0.0220 inches

K === (.0095) x 1 = 0.0095 inches

F === = 0.0145 inches

G === = 0.0050 inches

Basic Skin = 0.0425 inches



$$\bar{y} = \frac{(.052)(.026)+(.0315)(.0098)}{(.052+.0315)}$$

$\bar{y} = .3594''$

A = 1.32 sq.in Iz = 0.022 in**4

Iy = 1E-6 in**4 J = 1E-6 in**4

m = 4E-3

Cy = 0.66 Dy = 0.49

REFERENCES

35. Bell Structural Design Manual, Section 9.6

36. Meyn, W. A., "Test Report for the Determination of Graphite Fabric Epoxy and Graphite Tape-Epoxy Lamina Strength Allowables", RHR 80-058, December 1981.

37. Design Allowables for T300/5208 Graphite/Epoxy Composite Materials, lockheed-Calif., LR29607, Sept., 1980.

38. Rohr Report No. RHR 85-004, " TBC747-767/CF6-80C2 Nacelle System Composite Fan Cowl Subelement Test Report", September 1985.

ROHR

MECHANICAL PROPERTY DESIGN ALLOWABLES

☐ PRELIMINARY/LITERATURE
☐ QUALIFICATION/ACCEPTANCE
☒ CERTIFIED

DATE 10-25-93 REV. D

REF : RHR 88-107

TABLE 7.3.1

GRAPHITE/EPOXY TAPE

"B-BASIS" ALLOWABLES

PROPERTY	TEST TEMPERATURE (-67W)	(RTD)	(RTW)	(250W)	(350W)
TAPE				*	
Ftu - Long. (ksi)	201.30	204.90	209.90	209.10	211.10
Ftu - Trans (ksi)	3.67	3.98	3.40	1.31	0.50
Tensile Strain - Long. (%)	0.91	0.95	1.00	1.14	1.04
Tensile Strain - Trans. (%)	0.23	0.29	0.27	0.17	0.34
Et - Long. (Mean) (msi)	21.87	20.95	20.40	19.72	19.57
Et - Trans. (Mean) (msi)	1.58	1.37	1.25	0.82	0.17
ut - Poison's Ratio - Long. (Mean)		0.315			
ut - Poison's Ratio - Trans. (Mean)		0.020			
Fcu - Long. (ksi)	220.00	129.30	139.40	89.90	11.50
Compressive Strain - Long. - Ult. (%)	1.28	0.93	0.83	0.38	0.06
Ec - Long. (Mean) (msi)	18.97	18.48	18.92	19.03	15.19
uc - Poison's Ratio - Long. (Mean)		0.351			
Fs - Matrix (ksi)	9.33	8.90	8.16	3.73	1.33
Fs - Ultimate (ksi)	19.49	16.16	13.08	7.97	3.61
Shear Strain - Matrix (%)	0.65	0.94	0.88	0.73	0.70
Shear Strain - Ultimate (%)	1.28	1.63	1.24	1.34	2.07
G (msi)	1.25	0.92	0.83	0.55	0.16
Fils (ksi)	11.70	8.10	9.10	5.10	2.00

Note: All tests based on Hercules AS-4/3501-5A tape.

Legend:

RTD - Room temperature dry - No exposure
xxW - Tested at temperature xx following humidity exposure of 95-100% RH at 158 degrees F for 750 hours.