CHAPTER 10 QUARTZ FIBER COMPOSITES

This section is reserved for future use.

10.1 INTRODUCTION

10.2 QUARTZ - EPOXY COMPOSITES

10.3 QUARTZ - POLYESTER COMPOSITES

10.4 QUARTZ - BISMALEIMIDE COMPOSITES

10.4.1 Astroquartz II/F650 8-harness satin weave fabric

Material Description:

Material: Astroquartz II/F650

Form: 8 harness satin weave fabric, fiber areal weight of 285 g/m^2, typical cured resin content of 37%, typical cured ply thickness of 0.010 inches.

Processing: Autoclave cure; 375°F, 85 psi for 4 hours. Postcure at 475°F for 4 hours

General Supplier Information:

Fiber: Astroquartz II fiber is a continuous, high strength, low modulus ceramic fiber made of pure fused silica. Typical tensile modulus is 10 x 10^6 psi. Typical tensile strength is 500,000 psi.

Matrix: F650 is a 350°F curing bismaleimide resin. It will retain light tack for several weeks at 70°F.

Maximum Short Term Service Temperature: 500°F (dry), 350°F (wet)

Typical applications: Primary and secondary structural applications, fire containment structures, radomes or any application where high strength and/or electrical properties are required.

10.4.1 Astroquartz II/F650 8-harness satin weave*

Q/BMI 285-8HSI Astroquartz II/F650 Summary

MATERIAL:	Astroquartz II/F650 8-harness satin weave fabric			
FORM:	Hexcel AQII581/F650 8-harness satin weave prepreg			
FIBER:	J.P. Stevens Astroquartz II		MATRIX:	Hexcel F650
T_g(dry):	600°F	T_g(wet):	T_g METHOD:	
PROCESSING:	Autoclave cure: 375°F, 4 hours, 85 psig; Postcure: 475°F, 4 hours			

* DATA WERE SUBMITTED BEFORE THE ESTABLISHMENT OF DATA DOCUMENTATION REQUIREMENTS (JUNE 1989). ALL DOCUMENTATION PRESENTLY REQUIRED WERE NOT SUPPLIED FOR THIS MATERIAL.

Date of fiber manufacture	Date of testing	
Date of resin manufacture	Date of data submittal	4/89
Date of prepreg manufacture	Date of analysis	1/93
Date of composite manufacture		

LAMINA PROPERTY SUMMARY

	75°F/A		450°F/A					
Tension, 1-axis								
Tension, 2-axis								
Tension, 3-axis								
Compression, 1-axis								
Compression, 2-axis								
Compression, 3-axis								
Shear, 12-plane								
Shear, 23-plane								
Shear, 31-plane								
SB strength, 31-plane	S - - -		S - - -					

Classes of data in Strength/Modulus/Poisson's Ratio/Strain-to-Failure order: A = A75, a = A55, B = B30, b = B18, M = Mean, I = Interim, S = Screening, - = no data (See Table 1.4.2(c))

* DATA WERE SUBMITTED BEFORE THE ESTABLISHMENT OF DATA DOCUMENTATION REQUIREMENTS (JUNE 1989). ALL DOCUMENTATION PRESENTLY REQUIRED WERE NOT SUPPLIED FOR THIS MATERIAL.

		Nominal	As Submitted	Test Method
Fiber Density	(g/cm^3)	2.17		
Resin Density	(g/cm^3)	1.27		
Composite Density	(g/cm^3)	1.78	1.73	
Fiber Areal Weight	(g/m^2)	285		
Fiber Volume	(%)	57	51	
Ply Thickness	(in)	0.0100	0.010	

LAMINATE PROPERTY SUMMARY

Classes of data in Strength/Modulus/Poisson's Ratio/Strain-to-Failure order: A = A75, a = A55, B = B30, b = B18, M = Mean, I = Interim, S = Screening, - = no data (See Table 1.4.2(c))

* DATA WERE SUBMITTED BEFORE THE ESTABLISHMENT OF DATA DOCUMENTATION REQUIREMENTS (JUNE 1989). ALL DOCUMENTATION PRESENTLY REQUIRED WERE NOT SUPPLIED FOR THIS MATERIAL.

Table 10.4.1(a)
Q/BMI 285-8HS
Astroquartz II/F650
SBS, 31-plane
$[0_f]12$
75/A, 450/A
Screening

MATERIAL: Astroquartz II/F650 8-harness satin weave fabric

RESIN CONTENT: 37 wt% COMP: DENSITY: 1.73 g/cm^3
FIBER VOLUME: 51 % VOID CONTENT:
PLY THICKNESS: 0.010 in.

TEST METHOD: MODULUS CALCULATION:
ASTM D 2344

NORMALIZED BY: Not normalized

Temperature (°F)		75	450				
Moisture Content (%)		ambient	ambient				
Equilibrium at T, RH							
Source Code		21	21				
	Mean	6.41	6.56				
	Minimum	6.31	6.43				
	Maximum	6.50	6.72				
	C.V.(%)	1.06	1.69				
	B-value	(1)	(1)				
F_{31}^{sbs}	Distribution	Normal	Normal				
(ksi)	C_1	6.41	6.56				
	C_2	0.068	0.111				
	No. Specimens	5	5				
	No. Batches	1	1				
	Data Class	Screening	Screening				

(1) Short beam strength test data are approved for Screening Data Class only.

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10.5 QUARTZ - POLYIMIDE COMPOSITES

10.6 QUARTZ - PHENOLIC COMPOSITES

10.7 QUARTZ - SILICONE COMPOSITES

10.8 QUARTZ - POLYBENZIMIDAZOLE COMPOSITES

10.9 QUARTZ - PEEK COMPOSITE