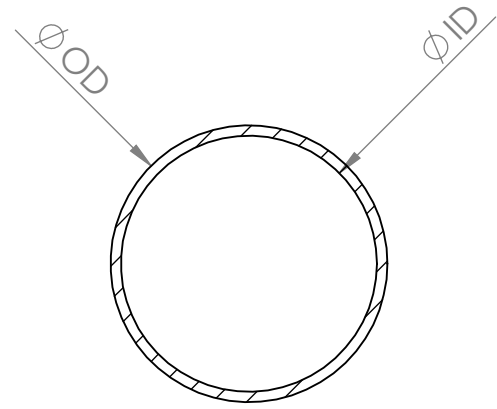
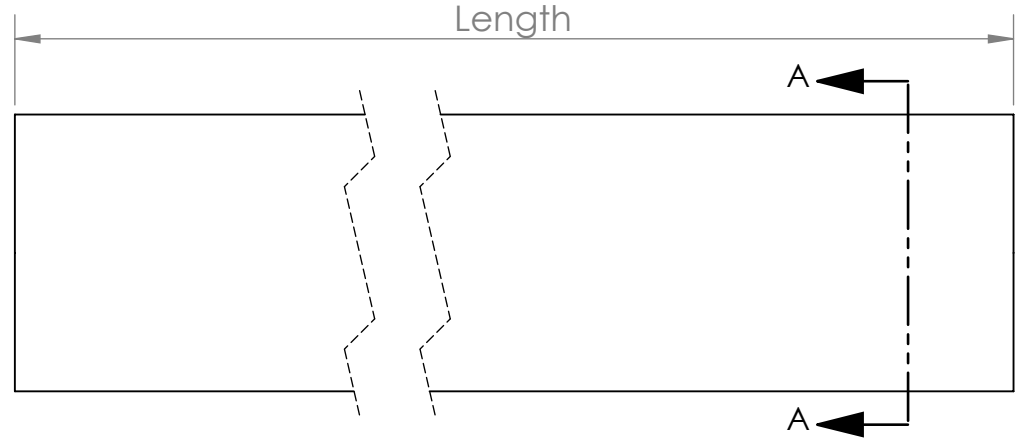


Part Number	ID	OD	Max. Length [Stock / Custom]	Surface Finish
45687	0.312	0.500	72 / 74	Plain Weave
45688	0.500	0.683	72 / 108	Plain Weave
45679	0.750	0.933	80 / 108	Plain Weave
45693	1.000	1.163	72 / 104	Unidirectional
45690	1.000	1.180	72 / 104	Plain Weave
45696	1.500	1.680	72 / 96	Plain Weave
45694	2.000	2.163	72 / 104	Unidirectional
45691	2.000	2.180	72 / 104	Plain Weave
45695	3.000	3.163	72 / 80	Unidirectional
45692	3.000	3.180	72 / 80	Plain Weave
45680	4.000	4.180	72 / 104	Plain Weave

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
NC	Initial Release	03/15/2017	ASC



SECTION A-A



THERMAL PROPERTIES:

- Linear Coefficients in Normal Operation Range (0C ~ 40C)
 - Linear Expansion (CTE): $\lt; \pm 0.5 \text{ Microns per Meter per Degree C}$
 - Bending: $\lt; \pm 2.0 \text{ Arc Seconds per Meter per Degree C}$
 - Twisting: $\lt; \pm 1.0 \text{ Arc Seconds per Meter per Degree C}$
- Hysteresis Bound in Environmental Temp. Range (-30C ~ 70C)
 - Linear: $\lt; \pm 0.5 \text{ Microns per Meter}$
 - Bending: $\lt; \pm 0.5 \text{ Arc Seconds per Meter}$
 - Twisting: $\lt; \pm 0.25 \text{ Arc Seconds per Meter}$

MATERIAL:

- Unidirectional Carbon: High Modulus Carbon Fiber
 - Minimum Tow Tensile Strength: 4136 MPa
 - Tow Tensile Modulus: 392 ± 10 GPa
 - Cured Ply Thickness: 0.0034 inches
- Plain Woven Carbon Cloth: Standard Modulus Carbon
 - Minimum Tow Tensile Strength: 4136 MPa
 - Tow Tensile Modulus: 230 ± 10 GPa
 - Cured Ply Thickness: 0.010 inches
- Resin: Epoxy
 - Toughened
 - T_g > 250F
 - Elevated Cure (>250F)
 - Meets NASA MSFC-SPEC-1443
 - 0.22% TML
 - 0.00% CVCM
 - 0.10% WVR

CONSTRUCTION:

- Layup provided upon request with approved NDA

Rock West COMPOSITES

PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ROCK WEST COMPOSITES. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ROCK WEST COMPOSITES IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES.
 TOLERANCES ARE CONTROLLED BY DOCUMENT:
 RW-PS-071 - STOCK TUBE TOLERANCE SHEET

MATERIAL: Composite
 FINISH: Sanded/Ground
 DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	ASC	3/3/2017
CHECKED	BDS	3/15/2017
ENG APPR.	ASC	3/15/2017
MFG APPR.	N/A	
Q.A.	N/A	

COMMENTS:
 Plain weave finish tubes have a slightly positive CTE. Unidirectional finish tubes have a slightly negative CTE.

TITLE:		
ZTE Tubing		
SHEET:	DWG. #	REV
Sheet1	0389	NC
SCALE: 2:3	WEIGHT: N/A	SHEET 1 OF 1