

THEMIS ENVIRONMENTAL TEST MATRIX

HARDWARE			MECHANICAL												ELECTRICAL					THERMAL						CONTAMINATION				OTHER					
COMPONENT (ITEM)	QUANTITY	SUPPLIER	ALIGNMENT	MODAL SURVEY	STATIC LOAD	RANDOM VIBRATION	SINE VIBRATION	ACOUSTIC	PROOF TEST	CLAMP BAND SHOCK	VENTING/PRESSURE PROFILE	MASS PROPERTIES	MECH FUNCTION	LIFE TEST	INTERFACE VERIFICATION	CONDUCTED EMISSIONS	CONDUCTED SUSCEPTIBILITY	RADIATED EMISSIONS	RADIATED SUSCEPTIBILITY	THERMAL VACUUM (# CYCLES)	THERMAL BALANCE	THERMAL AIR (# CYCLES)	THERMAL LIMITS (OPERATING, DEPLOY)	THERMAL PREDICTS	THERMAL TEST LIMITS (QUAL) LIMITS +/-10C VAC; +/-15C AIR	THERMAL TEST LIMITS (ACC) PREDICTS +/-10C VAC; +/-15C AIR	ESC AND GROUNDING	DC MAGNETICS	AC MAGNETICS	BAKEOUT	RADIATION	OPERATING HOURS	FAILURE FREE HOURS	WORST-CASE ANALYSIS	
Instrument Payload	6	UCB										A7	M1			T9	T10	T10	T10	T10	6			-30 to +45		-40 to +55	-40 to +55			M3	T14		1000	100	
FGM Sensor	1	TUBS	T			T4	T5					A7	M1			T9					2			-90 to +70	-79 to +35	-100 to +80	-100 to +50	T11	M2			A	100		A
FGM Boom	1	UCB	T			T4	T5					A7	M1	T7		T9					2			-40 to +45	-15 to +39	-50 to +55	-25 to +50	T11	M2						
SCM Sensor	1	CETP	T	T1	A2	T4	T5					A7	M1			T9						3		-85 to +65	-53 to +28	-100 to +80	-70 to +45	T11	M2		T				
SCM Pre-Amp	1	CETP		T1	A2	T4	T5					A7	M1			T9						3		-30 to +45	-31 to +37	-45 to +60	-45 to +55	T11	M2		T				
SCM Boom	1	UCB	T	T1	A2	T4	T5					A7	M1	T7		T9					2			-40 to +45	+4 to +43	-50 to +55	-25 to +55	T11	M2			A	100		A
ESA	1	UCB		T1	T3	T4	T5			T6		A7	M1	T7		T9					2			-30 to +45	-31 to +36	-40 to +50	-40 to +50	T11	M2						
SST Sensor	2	UCB		T1	A2	T4	T5					A7	M1	T7		T9					2			-65 to +40	-52 to +13	-75 to +50	-65 to +30	T11	M2			A	100		A
EFI Pre-amp	1	UCB		T1	A2	T4	T5					A7	M1			T9						2		-75 to +80	-120 to +57	-130 to +70	-130 to +70	T11	M2		T	A	100		A
EFI SPB	1	UCB		T1	A2	T4	T5					A7	M1	T7	T8	T9					2			-20 to +45	-6 to +28	-30 to +55	-20 to +40	T11	M2						
EFI AXB	1	UCB		T1	A2	T4	T5					A7	M1	T7		T9					2			-20 to +50	-4 to +41	-45 to +60	-30 to +60	T11	M2						
IDPU Box	1	UCB		T1	A2	T4	T5					A7	M1			T9					2			-30 to +45	-31 to +37	-40 to +55	-40 to +55	T11	M2			T12	100		A
Instrument Harness	6	UCB											M1															T11	M2		T13				
Instrument Blankets		UCB										A7																T11	M2		T13				
Probe Subsystems		SAI		T	T	T	T	A	T	T	A	M				T	T	T	T	T	8							T	M		T	A	1000	100	A
Probe #1	1	SAI	T	T	T	T	T			T		M				T	self	self	T	T	8	T						T	M		T		1000	100	
Probe #2-5	4	SAI	T	T	A	T	T			T		M				T	self	self	simil	simil	4	T						T	M		T		1000	100	
Probe Carrier	1	SAI		T	T	T	T	A			A	M																							
Probe Carrier Assembly	1	SAI										M																							

notes:

- T1 0.25g sweep from 5 Hz to 2000 Hz
- A2 Analysis to show margin on Yield at 2.0 x limit load; and Ultimate at 2.6 x limit load
- T3 Test conducted at 1.25 x limit load
- T4 ETU tested to Qual; F1 tested to Protoflight; F2-F6 tested to Acceptance. Levels from coupled loads analysis
- T5 ETU tested to Qual; F1 tested to Protoflight; F2-F6 tested to Acceptance (sine profile in thm-sys-005)
- T6 ETU tested with SC shock test
- A7 Analysis to show margin at 2 x maximum pressure differential (launch ascent profile in thm-sys-005)
- M1 Mass, CG and MOIs measured
- T7 At least 10 x number of actuations during the mission life, unless mechanism is on Limited Life Items List
- T8 SPB Motor to go through Life Test - operation after 6 months (TBR)
- T9 Safe-to-Mate and compliance to ICD prior to Integration
- T10 Per MIL-STD-461C (levels in thm-sys-005)
- T11 Grounding and ESC compliance checked for each component prior to integration
- M2 DC Magnetism measured prior to Instrument Payload integration
- M3 AC Magnetism measured in mag facility at Probe Level
- T12 Total Dose and SEE Testing at part level if necessary
- T13 60C for 48 hours prior to TV w/ integrated payload
- T14 Contamination Verification w/ TQCM during Instrument Payload Thermal Vac