

<b>DECLARED MATERIALS LIST</b>				<b>ORIGINATOR:</b>				<b>UK ATC</b>							
<b>SPACECRAFT / PROJECT</b>				<b>Herschel</b>				<b>Doc. Number:</b>				<b>SPIRE-ATC-PRJ-710</b>			
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<b>SYSTEM / EXPERIMENT</b>				<b>SPIRE</b>				<b>Issue/Rev: (last CTD #0325)</b>				<b>1.5</b>			
<b>SUB-SYSTEM:</b>				<b>BSM</b>				<b>Date:</b>				<b>15-Jun-04</b>			

BSM MatL ID	Part ID	Name & Type of Product, Form & Condition	Spec	Size Code	Processing Parameters	Corr	SCC	Flamm	Off-gas	Out-gas	OK to bake at 80°C ?	Thermal & Vacuum stable?	OK at 4°K?	Manufacturer	Remarks, Approval Reference	Project approval	ESA approval
1.	Structure, Jiggle frame, Interface shoe, baffle	Aluminium SQUARE BAR	6082	To suit manuf	T6 BS L111 T6 Bar /BSL113 T6 Sheet / BS L114 T6 Tube / BSL 115 T6 Sheet	B	A	N/A	N/A	N/A	Y	Y	Y	ALCOA Extrusions	RAL DML list 1.01  composition Si 0.7-1.3, Fe 0.5, Cu 0.1, Mn 0.4-1, Mg 0.5-1.2, Cr 0.25, Ni 0.1, Zn 0.2, Ti 0.2		
2.	Baffle	Aluminium Sheet, welded.	6082	N/A	T6	B	A	N/A	N/A	N/A	Y	Y	Y	N/A	NOT USED : Baffle now machined as per material ID 1		
3.	Mirror	Aluminium, Bar	6061	To suit manuf	-T651	B	A	N/A	N/A	N/A	Y	Y	Y	British Al. Extrusions	Intermediate cycling per ATC Spec to provide stability.  MSFC-HDBK-527F p88  ASTMB211 or ISO/UK equivalent		
4.	Fasteners	stainless steel, austenitic	A2-70 to DIN 267	N/A	clean	A	A	A	N/A	N/A	Y	Y	Y	Reliance	Exact material within A2-70 per varies : ATC batch is traceable as AISI type 321		

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															MAPTIS code: (10351, 10334, 10098) CRES 321)		
5.	Locking inserts	stainless steel,	A2-70 to DIN 267	N/A	clean	A	A	A (GOX 500psi)	N/A	N/A	Y	Y	Y	Reliance	Exact material within A2-70 per varies : will be AISI type 304, 305 or 321. MAPTIS code: (10351, 10334, 10098) CRES 304, 321)		
6.	<b>Deleted</b>	INCONEL	718	To suit manuf	TBD	A	A	A	N/A	N/A	Y	Y	Y	SPECIAL METALS CORP / INCO ALLOYS INTL	Inconel not baselined - see material 4, 28, 29 for replacement. MAPTIS 55750, 10406 REFERS		
7.	Flex pivot sleeves	Aluminum plate, cold rolled. bar	6082	To suit manuf	T6 BS L111 T6 Bar /BSL113 T6 Sheet / BS L114 T6 Tube / BSL 115 T6 Sheet	B	A	N/A	U	N/A	Y	Y	Y	ALCOA or British Al. Extrusions	Baseline is Al 6082. As an option, may use matched grade material to flex pivots.		
8.	Sensor targets	Soft iron	R Fe 120 TO DIN	To suit manuf	ANNEAL	B?	B?	N/A	N/A	N/A	Y	Y	Y	VACUUM SCHMELZ E GmbH	USED ON ISOPHOT CHOPPER		

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			17405												Corrosion protection GOLD PLATING,		
9.	Sensor mount, motor housing	Glass fibre epoxy	G10/40	Sheet, 1/4" thick	Machined	N/A	N/A	A	A	A	Y	Y	Y	TUFNOL	MAPTIS 02776 TML 0.51, CVCm 0.015 Note: A cryogenic grade material consisting of 7628 fabric woven with continuous e-glass fiber in an amine-cure		
10. a	Potting compound/ Adhesive	Eccobond	285	N/A	with Catalyst 11	N/A	N/A	A	A TML <0.3	A cvcm <0.03	Y	Y	Y	Emerson & Cuming	MAPTIS 05475 NB - LIMITED LIFE MATERIAL		
10. b	Potting compound	Stycast	2850FT	N/A	with Catalyst 9	N/A	N/A	A	A TML <0.5	A cvcm <0.02	Y	Y	Y	Via TekData	Used in BSM cryoharness, supplied via RAL		
11.	Adhesive, cable run	Eccobond	285	N/A	with catalyst 11	N/A	N/A	A	A TML <0.3	A cvcm <0.03	Y	Y	Y	Emerson & Cuming	MAPTIS 05475 NB - LIMITED LIFE MATERIAL		
12.	<b>Deleted</b>	Mu-metal, sheet 0.125mm thick	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A	Y	N/A	Goodfellow	<b>Deleted</b> from Baseline design - MAPTIS code 10118 MSFC-HDBK-		

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															527F p181 (spec AMS 7701) Corrosion rating 'B'		
13.	Harness - wire core	Copper Alloy wire	ESA/SCC No.3901/013	21, 46	See spec	N/A	N/A	See Spec			Y	Y	Y	TekData	Supply via RAL, dpec SPIRE-RAL DOC-001362		
14.	Harness - insulation	PTFE insulated wire	ESA/SCC No.3901/013	21, 46	See spec	N/A	N/A				Y	Y	Y				
15. a	Harness P-Clips, Motor shims	Brass shim,	CZ108 to BS2870, BSEN 1652:1998 CW508L	Sheet,	rotary sheared.	A	A	N/A	N/A	N/A	Y	Y	Y	RS Components	MAPTIS 10234		
15.b	Jiggle frame Ballast mass,	Bar stock	CZ108 to BS2870, BSEN 1652:1998 CW508L	Bar	Annealed state	B	B	N/A	N/A	N/A	Y	Y	Y	TBC (via distributor)	MAPTIS 10321		
16.	Solder	60 Tin Solder	ECSS-Q-70-08A	N/A	N/A	A	A	N/A	U	N/A	Y	Y	Y	Multicore	ESA Space rated soldering certification available. Multicore Alloy SN60 TIN/LEAD 22 SWG		
17.	Motor Core	NiFe Soft magnetics Laminated sheets	<del>ULTRA PERM 250</del> or CryoPerm 10	Sheet	Annealed	A	U	N/A	N/A	TBD	Y	Y	Y	Zeiss	All details with Zeiss/ PACS programme.  DML V1.2:		

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															CryoPerm10 confirmed as selected.  MAPTIS 10118 refers to similar material		
18.	Motor Winding	Aluminium, high purity	5N	N/A	Per Zeiss/PACS processes						Y	Y	Y	California Fine Wires	All details with Zeiss/ PACS programme.		
19.	Motor insulation	Polyimide (sic) : Polyimide insulation	Per Zeiss/PACS processes	N/A	Per Zeiss/PACS processes						Y	Y	Y	Zeiss (may be Dupont Kapton ?)	Grade and application technique not known (see Zeiss, PACS QA documents).		
20.	Motor winding frames	Vespel	SP-1	N/A	Per Zeiss/PACS processes						Y	Y	Y	Zeiss, DuPont	Weight loss <10e-10 gm/cm²/s in - vacuum <500°F		
21.	Motor Permanent Magnet	NdFeB Permanent magnets	Grade 42	10mm dia	Ni Coated all faces						80°C MAX	Y	Y	Magnet Sales UK	Ni plate for corrosion resistance, 15 microns thick all sides. Handle with care - powerful magnet.		
22.	<b>deleted</b>	QMW Black	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not used		
23.	<b>deleted</b>	Anodize	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Alochrom added to DPL, deleted from DML		

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24.	<b>Deleted</b>	Copper	OHFC	N/A	Sheet BS 2875 C 103	A	U	N/A	N/A	TBC	Y	Y	Y	TBC	Not used		
25.	Surface plating	Copper flashing, Nickel Plate,	See DPL	N/A	See DPL	A	U	TBC	N/A	N/A	Y	Y	Y	MB Aerospace	SEE DECLARED PROCESS LISTS. MAPTIS 50141, 10311, 10328		
26.	Motor Thermal shields	Copper	manufact procedure EP/003-C Iss2	N/A	Electroformed	A	U	N/A	N/A	TBD	Y	Y	Y	Waveform Electro-forming	MAPTIS 10311.		
27.	<b>Deleted</b>	Niobium plate	N/A	N/A	plating	A	U	N/A	N/A	N/A	N/A	Y	Y	N/A	not baseline Potential use as superconducting magnetic shield, only if required by subsequent test . MAPTIS 50701 (wire)		
28.	Flex Pivots Jiggle (baseline)	Martensitic Stainless Steel	AISI 420 & 429	To suit manufacture	TBC	B	U	A (GOX 750psi)	N/A	N/A	Y	Y	Y	Lucas TRW	Included in Flex pivots (standard Lucas parts) - see Declared Component List. MAPTIS code 30136 (CRES 420)		
29.	Flex Pivots Chop (baseline)	Beryllium Copper	Uns 17200	Variou s bar, sheet	Induction brazed, heat treated 600°F	A	U	N/A	N/A	N/A	Y	Y	Y	C-FLEX	Included in flex pivots (special C-Flex parts). MAPTIS 10271		

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30.	Plating, misc	Gold	See DPL	N/A	SEE DPL	A	A	N/A	N/A	N/A	Y	Y	Y	MB Aerosace. UK	MAPTIS 10328. SEE DPL FOR PLATING SPEC		
31.	Washer, Thermal compensation	INVAR 36, BAR (UNS K93601)	ASTM B753 Alloy T36	1/2" bar	Obtain in annealed state.	B	A	N/A	N/A	N/A	Y	Y	Y	Carpenter Techn. Corp. or Equiv	MAPTIS 10314. Gold plate for corrosion resistance		
32.	<b>Deleted</b>	Apiezon Grease	Grade N	25g tube	N/A	N/A	N/A	N/A	Vapour pressure <10 <sup>-9</sup> mbar a	N/A	N/A	Y	Y	Oxford Instruments or equiv.	Not Used		
33.	Motor lamination end terminations	Titanium	Per Zeiss/PACS processes		Per Zeiss/PACS processes	A	A				Y	Y	Y	Zeiss	All details with Zeiss/ PACS programme.		
34.	Lacing Tape	Dacron (unwaxed)		N/A	Clean before use	A	N/A	U	CVCM 0.02%	TML 0.35%	Y	Y	Y	Gudebrod Inc. 22DPTH NATURAL GUDE-SPACE PT	RAL DML ITEM 20.44 ESA-RD: 01 REV. 1		
35.	Staking compound	Scotch-Weld	2216 B/A	N/A	Mix two parts	N/A	N/A	U	U	P	Y	Y	Y	3M Bracknell UK	Previous use PSS-01-701S-2		