

<b>DECLARED MATERIALS LIST</b>		<b>ORIGINATOR:</b>										<b>UK ATC</b>			
<b>SPACECRAFT / PROJECT</b>		Herschel		<b>Doc. Number:</b>										<b>SPIRE-ATC-PRJ-710</b>	
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<b>SYSTEM / EXPERIMENT</b>		SPIRE		<b>Issue/Rev: (last CTD #01-66)</b>										<b>1.42</b>	
<b>SUB-SYSTEM:</b>		BSM		<b>Date:</b>										<b>4021.Oct.02</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
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  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)

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6.	Deleted	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 17405	To suit manuf	ANNEAL	B?	B?	N/A	N/A	N/A	Y	Y	Y	VACUUMS CHMELZE GmbH	USED ON ISOPHOT CHOPPER  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	Stycast	2850FT	N/A	with Catalyst 11	N/A	N/A	A	A TML <0.5	A cvcm <0.02	Y	Y	Y	Emerson & Cuming	Various grades in MAPTIS, MSFC-HDBK. <b>Select correct one</b> , EG 06451 NB - LIMITED LIFE MATERIAL

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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.	Deleted	Mu-metal, sheet 0.125mm thick	N/A	N/A	N/A	A	A	N/A	N/A	N/A	TBC	Y	TBC	Goodfellow	<b>Deleted</b> from Baseline design - MAPTIS code 10118 MSFC-HDBK-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	66 Tin Solder, 96 tin solder (eutectic)	ECSS-Q-70-08A	N/A	N/A	TBC	TBC	TBC	TBC	TBC	Y	Y	Y	TBD	ESA Space rated soldering certification available. Option will be RAL solder (RAL DML 7.03) Multicore Alloy SN63 TIN/LEAD 22 SWG

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17.	Motor Core	NiFe Soft magnetics Laminated sheets	ULTRA PERM 250 or CryoPerm 10	Sheet	Annealed	A	U	N/A	N/A	TBD	Y	Y	Y	Zeiss	<u>TBD by Zeiss/MPIA for PACS</u> <u>All details with Zeiss/PACS programme.</u>  <u>DML V1.2: CryoPerm10 confirmed as selected.</u>  <u>-MAPTIS 10118 refers to similar material</u>
18.	Motor Winding	Aluminium, high purity	5N	TBD	TBD	TBC	TBC	TBC	TBC	TBD	Y	Y	Y	California Fine Wires	<u>All details with Zeiss/PACS programme. Zeiss, PACS approved</u>
19.	Motor insulation	<del>Varnish</del> Polyimide (sic) : Polyimide insulation	Per Zeiss/PACS processes TBD	N/A	TBD Per Zeiss/PACS processes	TBC	TBC	TBC	TBC	TBD	Y	Y	Y	TBD Zeiss (may be Dupont Kapton ?)	<u>Grade and a Zeiss, PACS approved application technique not known (see Zeiss, PACS QA documents).</u>
20.	Motor winding frames	Vespel	SP-1	TBD	TBD	TBC	TBC	TBC	TBC	TBD	Y	Y	Y	Zeiss, DuPont	Weight loss <10e-10 gm/cm <sup>2</sup> /s in -vacuum <500°F
21.	Motor Permanent Magnet	NdFeB Permanent magnets	Grade 42	10mm dia	Ni Coated all faces					TBD	80°C MAX	Y	Y	Magnet Sales UK	Ni plate for corrosion resistance, 15 microns thick all sides. Handle with care - powerful magnet.
22.	deleted	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.	deleted	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.	Thermal end stops	Copper	OHFC	N/A	Sheet BS 2875 C 103	A	U	N/A	N/A	TBC	Y	Y	Y	TBC	TBC if required. MAPTIS 50836. RAL MATERIAL 2.06
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	TBD	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	TBC	Y	Y	TBD	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	TBD	TBD	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	Various 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
30.	Plating, misc	Gold	See DPL	N/A	SEE DPL	A	A	N/A	N/A	N/A	Y	Y	Y	MB Aerospace. 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

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32.	Grease	Apiezon Grease	Grade N	25g tube	N/A	N/A	N/A	TBC	Vapour pressure <10 <sup>-9</sup> mbar a		TBC	TBC	Y	Oxford Instruments or equiv.	Melt point 43°C, quantity small (screw threads on Cernox thermistor) and no running expected.
<del>32.33.</del>	<del>Motor lamination end terminations</del>	<del>Titanium</del>	<del>TBC</del>	<del>TBC</del>	<del>TBC</del>	<del>A</del>	<del>A</del>	<del>TBC</del>			<del>Y</del>	<del>Y</del>	<del>Y</del>	<del>Zeiss</del>	<del>All details with Zeiss/ PACS programme.</del>
<del>32.34.</del>	<del>Lacing Tape</del>	<del>Dacron (unwaxed)</del>	<del>TBC</del>	<del>TBC</del>	<del>Clean before use</del>	<del>A</del>	<del>N/A</del>	<del>U</del>	<del>CVCN 0.02%</del>	<del>TML 0.35%</del>	<del>Y</del>	<del>Y</del>	<del>Y</del>	<del>Gudebrod Inc. 22DPTH NATURAL GUDE-SPACE PT Or equiv.</del>	<del>RAL DML ITEM 20.24 ESA-RD: 01 REV. 1</del>