



SPIRE & PACS
Sorption Coolers
Declared Material List

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(D.M.L.)

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QA Check	P. Dupont – PAManager	April 25th, 2001	
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List of Acronyms

AD / RD	Applicable / Reference Document		
ADP (EIDP)	Acceptance (End Item) Data Package		
AIT / (M)AIV	(Manufacturing,) Assembly, Integration & Test / Verification		
CADM	Configuration and Data Management		
CDR (DDR)	Critical (Detailed) Design Review	Revue de conception détaillée	RCD
CEA	Commissariat à l' Energie Atomique		
CIDL / ABCL	(As Built) Configuration Items Data List		
CN	Change Notice	Demande de Modification	DM
CQM	Cryogenic Qualification Model		
DML / DPL	Declared Material / Process List		
DRB	Delivery Review Board	Revue de Qualification	RQ
EM / (P)FM / FS	Engineering / (Proto)Flight / Spare Model		
ETF	Environmental Test Facility		
EV	Evaporator		
FIRST	Far Infrared and Submillimetre Telescope		
FMECA	Failure Mode Effects and Criticity Analysis		AMDEC
(M)GSE	(Mechanical) Ground Support Equipment		
H/W	Hardware		
HIFI	Heterodyne Instrument for First		
HSE	Heat Switch (on evaporator)		
HSP	Heat Switch (on sorption pump)		
ICD	Interface Control Document	Dossier de Contrôle des Interfaces	DCI
KIP / MIP	Key / Mandatory Inspection Point		
MRB	Material Review Board		
N/A	Not Applicable		
NCR	Non Conformance Report	Fiche d'Anomalie	FA
PACS	Photoconductor. Array Camera and Spectrometer		
PDR	Preliminary Design Review	Revue de Définition Préliminaire	RDP
PTR	Post Test Review	Comité de Revue et d'essai	CRE
PFM	ProtoFlight Model		
QA / PA	Quality / Product Assurance	Assurance Qualité / Produit	AQ / AP



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RFA	Request For Approval		
SAP	Service d'Astrophysique		
SBT	Service des Basses Températures		
SCO	Sorption Cooler (full unit)		
S/C	SpaceCraft		
SP	Sorption pump		
SPIRE	Spectral & Photometric Imaging Receiver		
TRR	Test Readiness Review	Bilan Technique	BT



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1. SCOPE OF THE DOCUMENT

This document lists all the materials (machined items, end items) to be used on the SBT Sorption Coolers Project.



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2. DOCUMENTS

2.1 Applicable documents

All Applicable Documents are listed in the AD chapter of the CIDL (HSO-SBT-LI-010).

2.2 Reference documents

	<i>Title</i>	<i>Reference</i>	<i>Iss</i>	<i>Rev</i>	<i>Date</i>
RD01	Data for Selection of Space Materials	ESA PSS-01-701	1	3	January 94
RD02	Materials, Mechanical Parts & Processes	ECSS-Q-70A			19/04/96
RD03	Guide pour les Projets Scientifiques				



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3. DECLARED MATERIAL LIST

The SCO Declared Material List, which consists of several arrays of 10 columns that shall be completed as indicated in doc. Ref. [RD02] & [RD03], is presented herebelow.

Furthermore, similar materials shall be grouped together, according to the following group definition:

<i>Group Type</i>	<i>Used</i>	<i>Item Id.</i>
1. Aluminum & Aluminum alloys,	✓	2017-A
2. Copper & Copper alloys,	✓	CuC1, CuA1
3. Nickel & Nickel alloys,	N/A	
4. Titanium & Titanium alloys,	✓	TA6V-ELI
5. Steels,	N/A	
6. Stainless Steels,	✓	SS A2
7. Filler metals & solders,	✓	Tin, Silver
8. Miscellaneous metallic materials,	N/A	
9. Optical materials,	N/A	
10. Adhesives, coatings & varnishes,	✓	STYCAST 2850/FT9, Loctite 270
11. Adhesive Tapes,	N/A	
12. Paints, primer & inks,	N/A	
13. Lubricants,	N/A	
14. Potting Compounds,	N/A	
15. Reinforced Plastics,	N/A	
16. Rubbers & Elastomers,	N/A	
17. Thermoplastics,	N/A	
18. Thermosets Plastics,	N/A	
19. Wires & Cables,	✓	Manganin Wires
20. Miscellaneous nonmetallic materials.	✓	Kevlar, Procelit P160, Vegetal Charcoal, He3



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Group 1 – Aluminum & Aluminum Alloys

Group 1 – Aluminum & Aluminum Alloys																	
1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	Environment Code			Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1- Manuf / Supplier 2- Specification			R	A	T		Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
1-1	2017-A	Aluminum alloy	1- Manuf / Supplier 2- Specification	Machined	Guiding tubes												
1-2	6061	Aluminum alloy	1- Manuf / Supplier 2- Specification		Evaporator cover & Pump cover												



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Group 2 – Copper & Copper alloys

1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	Environment Code			Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1 - Manuf / Supplier 2 - Specification			R	A	T		Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
2-1	CuC1	High purity electrolytic copper Cu: 99.99%	1 - Manuf / Supplier 2 - Specification	Gold plated	Strap & Strap ends 1/2 female & 1/2 male evaporator cups Shunt Charcoal casing Evaporator & Pump Cold Tips Switch Heads & Bases										ESA PSS-01-701		
2-2	CuA1	Copper alloy															



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Group 4 – Titanium & Titanium alloys																	
1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	Environment Code			Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1 - Manuf / Supplier 2 - Specification			R	A	T		Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
4-1	Ti-6Al-4V ELI, Diam. 200 mm	Al: 6.09 % V: 3.82 % C: 80 ppm Fe: 1402 ppm N: 20 ppm O2: 1095 ppm H2: 60 ppm	1 - FORTECH/TIMET 2 - ELI 200 (30/09/98) ABM 8-4062/2 DQG 06-01 F/A0		Structural parts Miscellaneous components Pump-tubing- Evaporator parts Heat Switches parts										ESA PSS-01-701	A	Coulée 293147C Lot T03290
4-2	Ti-6Al-4V ELI, diam. 10 & 20 mm	Al: 5.9 % V: 3.8 % C: 0.029% Fe: 0.18 % H: 0.0016% N: 0.010 % O: 0.12% Y: <0.005%	1 - TIMET UK 2 - ASTM F 136 Iss 98 ISO 5832-3 (ELI) Iss 3		Structural parts + EB Welding samples										ESA PSS-01-701	A	Coulée CU67913 Lot SC1513 (10 mm) Lot SC1421 (20 mm)
4-3	Ti-6Al-4V ELI, Diam. 65 mm	Al: 6.0 % V: 3.95 % C: 0.008% Fe: 0.135 % N: 0.005 % O: 0.110%	1 - TIMET UK 2 - MAG 426, Iss 0		EB Welding samples										ESA PSS-01-701	A	Coulée AV6549 Lot 9749.31



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Group 6 – Stainless Steels																	
1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	R	A	T	Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1 - Manuf / Supplier 2 - Specification							Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
6-1	Stainless Steel (AISI 304L)				Screws, nuts, washers, spring Minipump & Minipump tube & cap Grid Mesh Anti rotating Tool												



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Group 7 – Filler Metals & Solders

1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	R	A	T	Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1 - Manuf / Supplier 2 - Specification							Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
7-1	Tin																
7-2	Silver																



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Group 10 – Adhesives, Coatings & Varnishes

1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	R	A	T	Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1 - Manuf / Supplier 2 - Specification							Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
10-1	Stycast 2850/FT9	Epoxy resin			Gluing of charcoal onto/into housing Gluing of heaters & thermometers										ESA-PSS-01-701		
10-2	Loctite 270																



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Group 19 – Wires & Cables

Group 19 – Wires & Cables																	
1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	R	A	T	Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1 - Manuf / Supplier 2 - Specification							Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
19-1	Manganin Wires	Cu: 84% Mn: 12% Ni: 4% Varnish insulator			Heaters & thermometers wires												



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Group 20 – Miscellaneous Nonmetallic Materials																	
1	2	3	4	5	6	7			8	9					10		
Item #	Commercial Id.	Chemical Nature	Procurement Information	Summary of Processing Parameters	Use & Location	Environment Code			Size Code	9.1					9.2	9.3	Comment
		1- Chemical Products 2- Type of Product	1- Manuf / Supplier 2- Specification			R	A	T		Outg	Flam	Offg	SCC	Corr	Justification for Approval	Approval Status	
20-1	Kevlar cord		1- DuPONT/COUSIN 2-		Suspension wires												
20-2	Procelit P160	Al2O3: 91% SiO2: 9% impurities <0.1%	3- KAPYROK 4-	Bakeout before use	Evaporator Retention of liquid He by capillary attraction												
20-3	Vegetal Charcoal	C	1- PROLABO 2-	Bakeout before use	Pump Adsorption of gaseous He												
20-4	³ He	3He: 99.9965% 4He: 0.0035% N2, CO2, H2 < 1Vpm	1- EURISO-TOP 2-		Filling of Cooler												