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### Change Record

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### Stamps

Stamps	Name and Function	Date	Visa
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**ORIGINAL**

## 1. PURPOSE

This document define the applicable materials for wiring HERSCHEL SPIRE Harness .

## 2. APPLICABLE / REFERENCE DOCUMENTS

### Applicable Documents :

AD (1)	The technical reporting and approval procedure for materials, mechanical parts and processes	ESA PSS-01-700
AD (2)	Declared wiring Process List	06H026/LIT/JCU/1147/06

### Reference Documents :

RD (1)	The determination of off-gassing products from materials and assembled articles to be used in a manned space vehicle crew compartment	ECSS-Q-70-29-A
RD (2)	Thermal vacuum outgassing test for the screening of space materials	ECSS-Q-70-02-A
RD (3)	Flammability testing for the screening of space materials	ECSS-Q-70-21-A
RD (4)	Material selection for controlling stress-corrosion cracking	ESCC-Q-70-36-A
RD (5)	The manual soldering of high-reliability electrical connections	ECSS-Q-70-08A
RD (6)	Data for selection of space materials	ECSS-Q-70-71A rev1
RD (7)	DML Câblage harnais PSU SPIRE HERSCHEL	DML-635/03/CAM/ST

### 3. MATERIAL CLASSIFICATION

1. Aluminium & aluminium alloys,
2. Copper & copper alloys,
3. Nickel & nickel alloys,
4. Titanium & titanium alloys,
5. Steels,
6. Stainless steels,
7. Filler metals : welding, brazing, soldering,
8. Miscellaneous metallic materials,
9. Optical materials,
10. Adhesives, coatings, varnishes,
11. Adhesive tapes,
12. Paints, primer and inks,
13. Lubricants,
14. Potting compounds, sealants, foams,
15. Reinforced plastics,
16. Rubbers & elastomers,
17. Thermoplastics (non adhesive tapes, foils (MLI), ...),
18. Thermoset plastics,
19. Wires and cables (for materials aspects only),
20. Miscellaneous non metallic materials (ceramics, ...).

### 4. DML (Declared Material List)

The materials list consist of 10 columns which shall be completed as indicated below. Furthermore, similar materials shall be grouped together as specified above. If a particular item does not apply, write N.A. (Not Applicable).

Column 1 :

Identification number in each group.

Column 2 :

Trade name and number. For example "ARALDITE AY 105".

Column 3 :

Chemical nature and type of product.

Column 4 :

Procurement information.

Column 5 :

Processing parameters (summary).

**Column 6 :**

Indicate in what subsystems, box or item the materials in used and whether it acts as structural element, thermal control, electrical insulation etc. as relevant.

**Column 7 :**

Radiation/UV/ATOX (1)		Ambience (A)	Temperature (T)
G = Geostationary L = Low orbit B = Radiation belts I = Interplanetary	S = outside shadow L = outside light	V = Vacuum H = Hermetic M = Manned E = Elevated pressure	1 = 0 to 100 K 2 = 101 to 200 K 3 = 201 to 300 K " " etc.

**Column 8 :**

AREA	A (cm <sup>2</sup> )	0 = 0 < 1
VOLUME	V (cm <sup>3</sup> )	1 = 1 < 10
MASS	W (g)	2 = 10 < 100
		3 = 100 < 1000
		etc.

**Column 9 : Corrosion :**

- A – The material does not require a surface treatment or coating for its intended application, otherwise it shall be rated B.
- B – Details of the surface treatment to be given in column 5.

**Column 10 : Stress Corrosion Cracking (SCC) :**

- A – The material is known to have a high resistance to SCC. Table 1 document AD 3
- B – Table 2 and 3 document AD 3
- U – Materials and / or weldments for which SCC characteristics are unknown.

**Column 11 : Flammability (Flamm.) (For manned space crafts) :**

- P – The material passed the requirements of document RD 3
- F – The material failed the test of document RD 3 in the applicable atmosphere. Waiver reference in column untitled "justification for approval".
- U – Materials of with characteristics are unknown.

Column 12 : Offgassing (For manned space crafts)

P – The material passed the requirements of document RD 1

F – The material failed. Waiver reference in column untitled "justification for approval".

U – Materials of with offgassing characteristics are unknown.

Column 13 : Outgassing (OUT) :

P – The material passed the outgassing test detailed in RD 2

F – The material failed. Waiver reference in column untitled "justification for approval".

U – Materials of which outgassing characteristics are unknown.

Column 14 :

The purpose of this column is to enter any additional information that may be necessary in order to achieve customer approval. For example: reference of waivers, request, evaluation report, etc...

Column 15 :

A : Approved. All materials classified A may be used without restriction.

Y : Approved with restriction. These materials require the preparation of QC test specimens or a treatment before use : potting, coating, test specimens, ...

W : Approved with a waiver. These materials do not meet the requirements but are used for functional reasons. The waiver number shall be entered in this column.

P : Pending a decision for a waiver or an evaluation report.

O : Open. New materials or materials for with investigations and qualification are in progress.

D : Deleted. This classification is used for a material which is no longer used.

Item	Commercial identification	1 Chemical nature 2 Type of product	1 Manufacturer 2 Supplier 3 N° of supplier spécif.	Summary of processing parameters	1 Use 2 Localisation	Environment Code		Size code	C o r r	S C C	F i a m	O U T	O F F	J u s t i f i c a t i o n f o r a p p r o v a l	P r i m e a p p .	E S A a p p .	Observations
						R a d	A m b										

Rad : Radiation ; Amb : Ambient conditions ; Tem : Temperature ; Corr : Corrosion ; SCC : Stress Corrosion Cracking ; Flam : flammability ; OFFG : Outgassing ; OUTG : Outgassing

## 2. COPPER & COPPER ALLOYS

2/1	Gaine EMC de sur blindage	Cuivre argenté	CGP Etude CGP 11 134 AS3A 01 525629 R éd 03	Revêtement argent 1,5µ mini DPL G07/7	EMC surblindage de torons	L	V	3	W3	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			
2/1	EMC shielding braid	Silver plated copper	CGP Etude CGP 11 134 AS3A 01 525629 R Iss 03	Silver plated minimum thickness 1,5µ DPL G07/7	EMC shielding	L	V	3	W3	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			

## 6. STAINLESS STEELS

6/1	Capot EMC pour connecteur Sub-D	Cheminée Z10CNT1811 Corps Z6CNT1810	Camerin Produit catalogue CA****	Etamage électrolytique de 20 à 25 µ (Sn/Pb 60/40) sur cheminée et/ou pastille DPL G07/7 DPL G09/1	Protection EMC pour connecteurs Sub-D	L	V	3	W3	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			
6/1	EMC backshell for Sub-D connectors	Chimney Z10CNT1811 Body Z6CNT1810	Camerin Catalogue product CA****	Chimney and/or pastille electrolytic tinned. (Sn/Pb 60/40) Thickness 20 to 25µ DPL G07/7 DPL G09/1	EMC backshells for Sub-D connectors	L	V	3	W3	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			

Item	Commercial identification	1 Chemical nature 2 Type of product	1 Manufacturer 2 Supplier 3 N° of supplier spécif.	Summary of processing parameters	1 Use 2 Localisation	Environment Code			S C C	O F U	T G	Justification for approval	Prime app.	ESA app.	Observations
						R	A	M							

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## 7. FILLER METALS

7/1	Fil de brasure	Sn62/Ag2/Pb36 avec flux K.1.1.1(3,5%)	Bleiwerk/Goslar	DPL G07/7	Réalisation de liaisons électriques par brasure à l'étain	L	V	3	W1	N / A	N / A	N / A	N / A	Batt E2P,E3000 THEOS		
7/1	Solder-lead	Sn62/Ag2/Pb36 with flux type K.1.1.1(3,5%)	Bleiwerk/Goslar	DPL G07/7	Soldering of electrical connections	L	V	3	W1	N / A	N / A	N / A	N / A	Batt E2P,E3000 THEOS		

## 11. ADHESIVE TAPES

11/1	Étiquettes d'identification connecteur	Kapton polyimide avec adhésif acrylique	Brady LCEP XB426	Impression thermique DPL G15-1	Identification connecteur	L	V	3	W1	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL		Test ITS 97-2 TML: 1.07 % RML: 0,22 % CVC/M: 0,02 %
11/1	Connector identification labels	Kapton polyimide with acrylic adhesive	Brady LCEP XB426	Thermal printing DPL G15-1	Identification of connectors	L	V	3	W1	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL		Test ITS 97-2 TML: 1.07 % RML: 0,22 % CVC/M: 0,02 %
11/2	Ruban adhésif	Kapton avec adhésif acrylique	3M BEZY Réf. 1205	Isolation DPL G16/2	Isolation / Protection maintien	L	V	3	W2	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL		ESA-RD:01 rev04 TML: 0,73 % RML: 0,25 % CVC/M: 0,10 %
11/2	Adhesive tape	polyimide with acrylic adhesive	3M BEZY Réf.1205	Insulation DPL G16/2	Insulation / Protection maintien	L	V	3	W2	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL		ESA-RD:01 rev04 TML: 0,73 % RML: 0,25 % CVC/M: 0,10 %

Item	Commercial identification	1 Chemical nature 2 Type of product	1 Manufacturer 2 Supplier 3 N° of supplier spécif.	Summary of processing parameters	1 Use 2 Localisation	Environment Code		Size code	C O U S F O C I F C C G r r			Justification for approval	Prime app.	ESA app.	Observations
						R a d	A m b		T e m						

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## 12. PAINTS, PRIMER AND INKS

12/1	Solvant	Alcool ISO	Shell Chimie Gaches Chimie IPA	DPL G05/1	Nettoyage	L	V	3	W0	N / A N / A N / A	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			
12/1	Solvent	ISO Alcohol	Shell Chimie Gaches Chimie IPA	DPL G05/1	Cleaning	L	V	3	W0	N / A N / A N / A	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			
12/2	Encre	---	IBM SACI 135 6000	DPL G15/2	Marquage d'étiquettes de repère connecteur	L	V	3	W0	N / A N / A N / A	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			
12/2	Ink	---	IBM SACI 135 6000	DPL G15/2	Marking of connector identification labels	L	V	3	W0	N / A N / A N / A	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			



Item	Commercial identification	1 Chemical nature 2 Type of product	1 Manufacturer 2 Supplier 3 N° of supplier spécif.	Summary of processing parameters	1 Use 2 Localisation		Environment Code		Size code	C O S C O F I F O U T G C o r r a m b	Justification for approval	Prime app.	ESA app.	Observations
					R a d	A m b	R a d	A m b						

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### 17 THERMOPLASTICS

17/1	Grane thermo-rétractable	Polyvinylidene Fluoride Kynar	3M BEZY MAT 005 PQ PTH 004	DPL G07/2	Protection et isolement électrique	L	V	3	W1	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			Test Intespace L36454 TML: 0,20 % RML: 0,17 % CYCM: 0,031 %
17/1	Heat shrink sleeve	Polyvinylidene Fluoride Kynar	3M BEZY MAT 005 PQ PTH 004	DPL G07/2	Electrical insulation	L	V	3	W1	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			Test Intespace L36454 TML: 0,20 % RML: 0,17 % CYCM: 0,031 %
17/2	Tie wrapp	EFTE Fluoropolymère TEFZEL	Panduit CLI PLT**-*76 NT.21300.4429.M T	DPL G07/8	Fixation d'étiquettes d'identification harnais Fixation de torons / structure	L	V	3	W2	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			Test Intespace M00835.01 TML: 0,107 % CYCM: 0,006 %
17/2	Tie wrapp	EFTE Fluoropolymère TEFZEL	Panduit CLI PLT**-*76 NT.21300.4429.M T	DPL G07/8	Fixation of harness on structure identification labels Bundle maintain	L	V	3	W2	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			Test Intespace M00835.01 TML: 0,107 % CYCM: 0,006 %
17/3	Ruban Téflon	PTFE	Angst & Pfister R128-3	Protection DPL G16/2	Protection toron / serre câble	L	V	3	W1	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			Test ESA PSS 01-702 TML: 0,05 % RML: 0,02 % CYCM: 0,00%
17/3	Téflon tape	PTFE	Angst & Pfister R128-3	Protection DPL G16/2	Loom protection / Connector accessories	L	V	3	W1	N / A N / A N / A	N / A N / A N / A	PSU SPIRE HERSCHEL			Test ESA PSS 01-702 TML: 0,05 % RML: 0,02 % CYCM: 0,00%

Item	Commercial identification	1 Chemical nature 2 Type of product	1 Manufacturer 2 Supplier 3 N° of supplier spécif.	Summary of processing parameters	1 Use 2 Localisation		Environment Code		Size code	C S F O U O C C F a F T T G r r m G						Justification for approval	Prime app.	ESA app.	Observations
					R a d	A m b	R a d	A m b		T e m									

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### 19 WIRES AND CABLES

19/1	Fils/Câbles	Cuivre argenté Isolant Kapton/Teflon	Fileca SCC 3901/001 et 002	DPL G07/1/3/4	Câblage Harnais	L	V	3	W4	N / A	N / A	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			DML spot 4 106/072/88 TML: 0,19 % CVC/M: 0,005 %
19/1	Wires/Cable	Silver plated copper Teflon/Kapton Insulation	Fileca SCC 3901/001 et 002	DPL G07/1/3/4	Harness wiring	L	V	3	W4	N / A	N / A	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			DML spot 4 106/072/88 TML: 0,19 % CVC/M: 0,005 %

### 20 MISCELLANEOUS NON METALLIC MATERIALS

20/1	Étiquettes de marquage	H-TMS Haute température Fluorocar- bonne irradié	Tyco-Raychem RK6065/7 Produit catalogue	DPL G07/8 DPL G15/02	Identification harnais	G	V	3	W2	N / A	N / A	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			Test Intespace LM107201 TML: 0,397 % RML: 0,319 % CVC/M: 0,090 % Lithium-ion/NI-H2
20/1	Harness labels	H-TMS High temperature Irradiated fluorocar- bonne	Tyco Raychem RK6065/7 Catalogue product	DPL G07/8 DPL G15/02	Harness identification	G	V	3	W2	N / A	N / A	N / A	N / A	N / A	N / A	PSU SPIRE HERSCHEL			Test Intespace LM107201 TML: 0,397 % RML: 0,319 % CVC/M: 0,090 % Lithium-ion/NI-H2

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