ORIGINALE ARCHIVIO

CARLO GAVAZZI SPACE SpA

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1	Mar. 2008		First issue

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1. SCOPE

The scope of this document is to define all materials to be used in the AMS 02 Program.
This document is based on the AMS 02 architecture defined for the Critical Design Review.

The document corresponds to contract deliverable DEL 026.

2. APPLICABLE & REFERENCE DOCUMENTS

2.1 APPLICABLE DOCUMENTS

AD	DOC. N.	ISSUE	TITLE
1	AMSCD-PL-CGS-001	1	Product Assurance Plan

2.2 REFERENCE DOCUMENTS

RD	DOC. N.	ISSUE	TITLE
1	JSC 63164	-	Quality Management Plan for the AMS02 Experiment
2	ECSS-Q-70	B	Materials, mechanical parts and processes

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3. RESPONSIBILITY

CGS shall be responsible where applicable for the selection, procurement and acceptance of material, cable and mechanical parts which are in accordance with contractual specification.

4. METHODOLOGY FOR THE COMPILATION OF THE DML

The materials list consists of 12 columns which shall be completed as indicated below in according to [RD 1] document. Furthermore, similar materials shall be grouped as specified in table:

GROUP	MATERIALS
1	Aluminium and aluminium alloys
2	Copper and copper alloys
3	Nickel and nickel alloys
4	Titanium and 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 and inks
13	Lubricants
14	Potting compounds, sealants, foams
15	Reinforced plastics
16	Rubbers and elastomers
17	Thermoplastics (non adhesive tapes, foils)
18	Thermoset plastics
19	Wires and cables (for materials aspects only)
20	Miscellaneous nonmetallic materials (ceramics)

Column 1:Group number/Item number
Identified number relevant to each group and sequential item number in each group of the list (one only per material type).

Column 2:Commercial identification
Trade name and number (to be completed in full).
Correct and standard designation. If no trade name exists, then the manufacturer's name plus number are entered.

Column 3:Chemical nature and type of product e.g.: "epoxy adhesive".

Column 4:Procurement information
Manufacturer/supplier: this identifies the abbreviated name of the manufacturer and name of the supplier if different.
Specification: reference of the procurement specification whit issue and revision.

Column 5:Summary of processing parameters
Indicate as relevant: specification number, mixture proportions, cure temperature, special cleaning agent, surface treatment, temperature, etc..

Column 6:Use and location
Indicate in what subsystems, box or item the material is used and whether it acts as structural element, thermal control, electrical insulation etc. as relevant.

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Column 7:Environmental code

R:Radiation/UV/ATOX(1)		A:Ambiance	T:Temperature
G=Geostationnary 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 4=301 to 400 K etc.

(1) For materials inside the spacecraft, choose a letter from the left-hand column. For materials on the surface of the spacecraft, combine this letter with "L" or "S".

Column 8:Size code

AREA VOLUME MASS	A (cm2) V (cm3) W (g)	0=0 to 1 1=1 to 10 2=10 to 100 3=100 to 1000 4=1000 to 10000 etc.

Choose an alphanumeric combination from the above mentioned table.

Column 9

All the codes of column 9 shall be relevant for the project concerned, which implies that they refer to validated data applicable to this project, as detailed in the following table and the individual properties description below:

CORR

Corrosion Resistence of metallic materials are rated per MSFC-SPEC-250, Class II requirements (as showed into NASA/MSFC MAPTIS databases) as follows:
A: meet the requirements, and do not require a coating
B: meet the requirements, if coated
X: materials fails requirements
U: property unknown/untested

SCC

Stress Corrosion Cracking Susceptibility of metallic materials are rated per ESA PSS-01-736 or MSFC-SPEC-522 (as showed into NASA/MSFC MAPTIS databases) as follows:
A: having high resistance to stress corrosion cracking (listed in table I)
B: having moderate resistance to stress corrosion cracking (listed in table II)
C: having low resistance to stress corrosion cracking (listed in table III)
N: property not applicable within defined application constraints
U: property unknown/untested

FLAM

Flammability of non-metallic materials tested per ESA PSS-01-721 tests are rated as follows:
P: passed the test
F: failed the test
U: property unknown/untested

Flammability of non-metallic materials tested per NASA-STD-6001 tests are rated (as showed into NASA/MSFC MAPTIS databases)as follows:
A: material that has a burn length of 6 in. (15 cm) or less
B: material that has a burn length of more than 6 in. (15 cm) but less than 12 in. (30 cm)
C: material that burn totally with small or no burn dripping
X: material ignites K10 paper with small, moderate or large drip burning
S: special test conducted on material
I: less than 3 standard samples with less than 12 in. (30 cm) burn
U: unacceptable data

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Note: for flammability wire and cable ratings per NASA-STD-6001 tests (as showed into NASA/MSFC MAPTIS databases) see as follows:
A: wire that has no ignition (no visible flame) with current overloads up to or exceeding fusion current of conductor and self-extinguishes in less than 3 in. (7 cm) per test 1
B: wire that has ignition (visible flame) burns less than 10 seconds, damage to all other wire (excluding current carrying wire) is less than 3 in. (7 cm) total per test 4, and self-extinguishes in 6 in. (15 cm) or less when tested in test 1
C: wire that fails criteria for above ratings
X: wire that burns completely in test 1 and/or test 4/or has moderate or large burn dripping
I: wire with insufficient data
S: special test conducted on material
U: unacceptable data

OFFG

Offgassing and toxicity of materials tested per ESA PSS-01-729 tests are rated (as showed into NASA/MSFC MAPTIS databases) as follows:
P: passed the test
F: failed the test
U: property unknown/untested

Offgassing and toxicity of materials tested per NASA-STD-6001 tests are rated (as showed into NASA/MSFC MAPTIS databases) as follows:
K: maximum limit weight >= 100 pounds (45400 grams)
H: maximum limit weight >= 50 pounds (22700 grams) < 100 pounds (45400 grams)
A: maximum limit weight >= 10 pounds (4540 grams) < 50 pounds (22700 grams)
V: maximum limit weight >= 5 pounds (2270 grams) < 10 pounds (4540 grams)
X: maximum limit weight < 5 pounds (2270 grams)
B: data inconclusive, a special cure is requested
I: material with insufficient data

OUTG

Outgassing or thermal vacuum stability of materials tested per ESA PSS-01-702 tests are rated as follows:
P: passed the test (TML <= 1.0 %, VCM <= 0.1 %)
F: failed the test
U: property unknown/untested

Outgassing or thermal vacuum stability of materials tested per JSC SP-R-0022A tests are rated (as showed into NASA/MSFC MAPTIS databases) as follows:
A: passed the test (TML <= 1.0, VCM <= 0.1)
B: data inconclusive, material should be tested prior to use
C: material with TML less than 3 and VCM less than 1
X: material with TML more than 3 and/or VCM more than 1
I: material with insufficient data
S: special test conducted on material
U: unacceptable data

Column 10:Justification for approval
The scope of this column is to enter any additional information that may be necessary in order to achieve customer's approval. This information is reference of the Request For Approval, reference of justificatory file for materials approved for other space or aeronautical programmes meeting the specific needs of the programme, reference of the evaluation report or waivers, reference NASA/MSFC MAPTIS databases codes, etc..

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Column 11:Approval status of the Prime (Prime App.)
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.
W=Approved with a waiver. These materials do not meet the requirements but are used for functional reasons. The use of such materials shall be reduced to a minimum. The waiver number shall be entered in column 10.
P=Pending a decision. Materials for which an evaluation report or a waiver is awaiting the Contractor's provisional or definitive approval.
O=Open.New materials or materials for which investigations and qualification are in progress.
D=Deleted. This classification is used for a material which is no longer used.

Column 12:Customer approval and comments (Customer App.)
This column will be completed by Customer in accordance with the standard comments listed in [RD 1] document annex E.

5. DECLARED MATERIALS LIST

In the following pages (ANNEX A) are listed the materials envisaged during the manufacturing phase.

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Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
Group 01: ALUMINIUM AND ALUMINIUM ALLOYS																	
01/01	Aluminium alloy	AL 7075-T7351 Plate	Specification AMS-QQ-A-250/12	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts: links 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 43, 46; rod tracker radiator bracket 1, 2, 3, 4, 5, 6, 7; end fitting-LH; end fitting-RH; lower rod-1 (bracket tube to USS); lower rod-1 (flange crate to tube); lower rod-2 (bracket tube to USS); lower rod-2 (flange crate to tube); lower rod (bracket rad to tube); MID bracket 1; MID bracket 2	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 50669		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/02	Aluminium alloy	AL 6061-T6 Plate	Specification AMS-QQ-A-250/11	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts	L	V	3 4	A4, V4, W4	B	A				NASA/MSFC MAPTIS: 50645		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/03	Aluminium alloy	AL 3.4364-T7351 Plate	DIN29546, LN9073, DAN26, DAN422, EN10204/3.1B	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or anodic clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 50669		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/04	Aluminium alloy	AL 7075-T7352 Plate	Specification AMS-QQ-A-367H/2	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or anodic clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts: top brackets	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 52929		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/05	Aluminium alloy	AL 6061-T6511 Round rod	Specification ASTM B221	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts: lower rod brackets	L	V	3 4	A4, V4, W4	B	A				NASA/MSFC MAPTIS: 50648		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/06	Laminated shims Aluminium alloy 1100, thickness 0,1 mm	AL 1100 laminated shims	Specification MIL-S-22499	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts: shimming	L	V	3 4	A1, V1, W1	B	A				NASA/MSFC MAPTIS: 10252		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/07	Aluminium alloy	AL 7075-T7351 Bar rolled	Specification AMS-QQ-A-225/9	Anodization coating on aluminum alloy MIL-A-8625 class 1 type I (not sealed)	Mechanical parts: handle insert, insert type A, B, C, D, E, F, G, H, L, M, N, P, Q.	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 10047		
01/08	Aluminium alloy	AL 6061-T651 Bar	Specification AMS-QQ-A-225/8	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts: tubes	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 51299		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
01/09	Aluminium alloy	AL 6063-T5 Bar	IBERESPACIO, Similar to specification AMS-QQ-A-200/9	Anodization coating on aluminum alloy MIL-A-8625 class 1 type I (not sealed) and EPOXY Primer coating EC 3924B	Mechanical parts: Ram (heat pipe shape 1÷16), Traker (heat pipe shape 1÷7), Wake radiator (heat pipe shape 1÷22)	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 52131		
01/10	Aluminium alloy	AL 6063-0 Pipe	IBERESPACIO, Similar to specification ASTM B345	Anodization coating on aluminum alloy MIL-A-8625 class 1 type I (not sealed)	Mechanical parts: Ram (heat pipe shape 1÷16), Traker (heat pipe shape 1÷7), Wake radiator (heat pipe shape 1÷22)	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 52136		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/11	Aluminium alloy	AL 7075-T73 Sheet	Specification AMS-QQ-A-250/12	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type II	Mechanical parts: Main Rad Ram to Tracket bracket, Main Rad Wake to Tracket bracket	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 50239		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
01/12	Aluminium alloy	AL 2024-T81 Sheet	Specification AMS-QQ-A-250/4	Chemical conversion coating on aluminium alloy MIL-C-5541class 3 and/or clear anodization coating on aluminum alloy MIL-A-8625 class 1 type I (not sealed) and/or EPOXY Primer coating EC 3924B	Mechanical parts: Ram radiator-inner skin LH, Ram radiator-inner skin RH, Ram radiator-outer skin LH, Ram radiator-outer skin RH, Tracker radiator-inner skin, Tracker radiator-outer skin, Wake radiator-inner skin LH, Wake radiator-inner skin RH, Wake radiator-outer skin LH, Wake radiator-outer skin RH	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 10750		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
01/13	Aluminium alloy	AL 2024-T81 Sheet	AIDC Specification AMS-QQ-A-250/4	Clear anodization coating on aluminum alloy MIL-A-8625 class 1 type I (not sealed) and/or EPOXY Primer coating EC 3924B	Mechanical parts: Ram radiator-inner skin strap 1, 2, 3, Ram radiator-outer skin strap 1, 2, 3, Wake radiator inner skin strap, Wake radiator outer skin strap	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 10750		
01/14	Aluminium alloy	AL 7075-T7351 Plate	Specification AMS-QQ-A-250/12	Clear anodization coating on aluminum alloy MIL-A-8625 class 1 type I (not sealed)	Mechanical parts: tracker handle insert	L	V	3 4	A5, V5, W5	B	A				NASA/MSFC MAPTIS: 50669		
Group 02: COPPER AND COPPER ALLOYS																	

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
02/01	Oxygen-Free Copper alloy C10100	Cu 99,99% min./plate	ASTM F68	Nickel plating QQ-N-290A	Mechanical parts	L	V	3 4	A3, V2, W2	A	A				NASA/MSFC MAPTIS: 54328		
Group 03: NICKEL AND NICKEL ALLOYS																	
03/01	NONE																
Group 04: TITANUM AND TITANUM ALLOYS																	
04/01	NONE																

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
Group 05: STEELS																	
05/01	NONE																
Group 06: STAINLESS STEELS																	
06/01	Stainless steels A 286	A 286 Plate, Bar	Specification AMS 5525 (plate), AMS 5731 (bar)	Surface passivation treatment according to QQ-P-35	Mechanical parts	L	V	3 4	A3, V2, W3	A	A				NASA/MSFC MAPTIS: 10267		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
06/02	Stainless steels AISI 301	AISI 301 Sheet	Specification AMS 5517	Surface passivation treatment according to QQ-P-35	Mechanical parts	L	V	3 4	A3, V2, W3	A	A				NASA/MSFC MAPTIS: 50515		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Fiam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
06/03	Stainless steels AISI 304	AISI 304 Plate, Bar	Specification AMS 5639	Surface passivation treatment according to QQ-P-35	Mechanical parts	L	V	3 4	A3, V2, W3	A	A				NASA/MSFC MAPTIS: 10351		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
06/04	Stainless steels AISI 316	AISI 316 Bar	Specification AMS 5524	Surface passivation treatment according to QQ-P-35	Mechanical parts	L	V	3 4	A3, V2, W3	A	A				NASA/MSFC MAPTIS: 10370		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
06/05	Stainless steels AISI 316L	AISI 316L Sheet	Specification AMS 5507	Surface passivation treatment according to QQ-P-35	Mechanical parts	L	V	3 4	A3, V2, W3	A	A				NASA/MSFC MAPTIS: 10096		
Group 07: FILLER METALS: WELDING, BRAZING, SOLDERING																	
07/01	NONE																
Group 08: MISCELLANEOUS METALLIC MATERIALS																	
08/01	NONE																

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
Group 09: OPTICAL MATERIALS																	
09/01	NONE																
Group 10: ADHESIVES, COATING, VARNISHES																	
10/01	Adhesive Eccobond 285/11 Epoxy	See column 2	National Starch&Chemical (div. Emerson &Cuming) N.V. Belgium / Technical Bullettin of Manufacturer	Mixing rations(by weight):4,5% of cat.11 Cured 8 h-82°C 50% R. H.	Adhes of non-structural parts	L	V	3 4	A0, V0, W1			A	K	A	NASA/MSFC MAPTIS: 05475		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
10/02	Adhesive Scotch-weld EC-2216 B/A and structural adhesive primer EC 3924B	Epoxy adhesive with amine catalyst	3M France/ Technical Bullettin of Manufacturer, MIL-A-46864	Mixing rations(by weight):7parts of A/5 parts of B Cured 2 h 70°C 50% R. H.	Sealant for radiators RAM, Tracker, Wake	L	V	3 4	A3, V2, W3			A	K	A	NASA/MSFC MAPTIS: 05066		
10/03	Adhesive REDUX 312	Epoxy one part	Hexcel Composites		Adhesive for glued the inserts, inner/outer skins on radiators RAM, Tracker, Wake	L	V	3 4	A3, V2, W4					A	NASA/MSFC MAPTIS: 02848		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
10/04	Adhesive HYSOL EA 934NA	EPOXY WITH POLYAMIDE CATALYST WITH ALUMINUM POWDER AND SILICA FILLER	LOCTITE		Adhesive for glued the inserts on radiators RAM, Tracker, Wake	L	V	3 4	A3, V2, W5			A	K	A	NASA/MSFC MAPTIS: 00007		
10/05	Masterbond EP21TDC-2LO	Two componentEPOXY Resin compound	MASTER BOND Inc.		Adhesive for gluing internal condenser tubes to Zenith Radiator skin	L	V	3 4	A2, V2, W2						Master Bond EP21TDC-2LO meets NASA low outgassing specifications Similar material in MAPTIS 02007		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
10/06	Adhesive RS-36	Modified epoxy resin for structural composite applications	YLA Inc.		Adhesive for spacers between Zenith radiator and TRD	L	V	3 4	A2, V2, W2					A	YLA Inc. datasheet, Outgassing (ASTM E 595) TML: 0,63%, CVCM: 0,00%		
Group 11: ADHESIVE TAPES																	

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
11/01	Silvered Teflon adhesive tape	Teflon tape with vacuum deposited silver and inconel and acrylic PSA	Sheldahl Technical Materials	According to supplier data sheet	outer side of HV BRICKS	L	V	3 4	A5, V5, W3						NASA/MSFC		
Group 12: PAINTS AND INKS																	

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
12/01	Thermal control paint MAP SG 121 FD	White silicone-zinc oxide paint	CNES/MAP data sheet RS127	Curing at room temperature 4 weeks	E CRATE	L	V	3 4	A5, V2, W1						ECSS-Q-70-71A rev.1 C.12.9		
Group 13: LUBRICANTS																	
13/01	NONE																

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
Group 14: POTTING COMPOUNDS, SEALANTS, FOAMS																	
14/01	NONE																
Group 15: REINFORCED PLASTICS																	
15/01	ROHACELL 51WF	Closed-cell rigid foam plastic based on polymethacrylimide	DEGUSSA, AIDC		Mechanical parts: Ram radiator core LH, RH, Tracker radiator core, Wake radiator core LH, RH	L	V	3 4	A5, V5, W4				A	A	NASA/MSFC MAPTIS: 88643		
Group 16: RUBBERS AND ELASTOMERS																	

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
16/01	Rubber silicon sheet Cho-therm 1671	See column 2	Chomerics MA-USA / Technical Bullettin of Manufacturer		Thermal interface for mechanical parts	L	V	3 4	A1, V1, W2			A	K	A	NASA/MSFC MAPTIS: 64178		
Group 17: THERMOPLASTICS																	

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFG	OUTG	Justification for approval	Prime App.	Customer App.
17/01	KETRON PEEK 1000	Polyether ether ketone (PEEK) unfilled	Specification: MIL-P-46183 type 1		WAKE Radiator Spacers	L	V	3 4	A3, V2, W2			A	K	A	NASA/MSFC MAPTIS: 07005		
17/02	PEEK with 30% glass fiber	Polyether ether ketone with glass fiber reinforcement 30%	Specification: MIL-P-46183 type 2 class 3		Mechanical parts	L	V	3 4	A3, V2, W2			A	K	A	NASA/MSFC MAPTIS: 02166		

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Coor	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
Group 18: THERMOSET PLASTICS																	
Group 19: WIRES AND CABLES																	
Group 20: MISCELLANEOUS NONMETALLIC MATERIALS																	

Declared Materials List

1	2	3	4	5	6	7			8	9					10	11	12
Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code R	A	T	Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
20/01	ECCOSPHERE IG 101	Glass microspheres. Hollow, thin-walled microspheres composed of borosilicate glass.	TRELLEBORG EMERSON & CUMING		Mixture of 60% ECCOSPHERE IG 101, 40% EC-2216 B/A for sealant of radiators RAM, Tracker, Wake and heat pipes assy	L	V	3 4	A2, V2, W2			A	K	A	Similar to NASA/MSFC MAPTIS: 02397		
20/02	MLI	Multi Layer Insulation Thermal Blankets	AUSTRIAN AEROSPACE		Thermal Control Surface	L	V	3 4							See EUTM-PRC-0001-AAE for Flammability and outgassing data		

Declared Materials List

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Group No / Item No:	Commercial identification	* Chemical nature and * type of product	* Procurement Information * Manufacturer / Supplier * Specification Issue/Rev	Summary of processing parameters	Use and location	Environm. code			Size code	Corr	SCC	Flam	OFFG	OUTG	Justification for approval	Prime App.	Customer App.
						R	A	T									
20/03	Ammonia	Working fluid in the Radiators Heat Pipes	IberEspacio		Radiator TCS										See CG020-ADP-002 / 003		
20/04	Propylene	Working fluid in the CRYO TCS Loop Heat Pipes	IberEspacio		CRYO TCS										To be provided by IberEspacio		