

REVISIONS

REV	DESCRIPTION	DATE	APPROVAL
D	REVISED PER ECO-A6078	94-06-01	SJK, JM, BR
E	REVISED PER ECO-A11535	97-09-29	JED
F	REVISED PER ECO-01-0339-2	00-11-15	JED
G	REVISED PER ECO-05-0580-1	05-08-05	JEK
H	REVISED PER ECO-20100167-1	10-04-21	CEH
J	REVISED PER ECO-20110356-1	11-06-29	BLD
K	REVISED PER QA-17-001	18-11-30	CEH
L	REVISED PER QA-21-005	22-03-23	BLD

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STELLANT SYSTEMS PROPRIETARY
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DRAWN	CEH	DATE	94-06-01
APPD	TAC	DATE	94-06-07
APPD	JRL	DATE	94-06-10
APPD		DATE	



**INTERPRET DRAWING
 PER
 DOD-STD-100**

QUALIFIED PRODUCT LISTS COOLANT, LUBRICANTS AND SOLVENTS

SIZE	A	CAGE CODE	89146	DWG NO	PI-4042	REV	L
SCALE				SHEET		1 OF 6	

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**APPROVED COOLANTS, LUBRICANTS,
AND SOLVENTS FOR PARTS FABRICATION**

1.0 SCOPE:

1.1 This specification lists (Table A) the specific coolants, lubricants, and solvents that have been approved for use in vacuum tube sub-component or parts fabrication. The use of coolants, lubricants, and solvents other than those that appear on this list could result in surface contamination, which will impact the quality of construction and performance of our products.

Note: Only those materials approved by Stellant Systems (Williamsport, PA) shall be permitted in the fabrication of vacuum tube sub-components or parts. The use of any unauthorized materials shall be considered as grounds for termination of supplier contract.

2.0 APPLICABLE DOCUMENTS:

- 2.1 PS-4036 - Preparation of Diversey Wyandotte Maxamp.
- 2.2 PS-4020 - Make-up of Hydrochloric Acid Dip Solution 50% by Volume.
- 2.3 PC-4013 - Degreasing of Metal Parts and Assemblies.
- 2.4 PC-4501 - Detection of Organic Contaminants - Water Break Test.
- 2.5 ASTM D-4294 by X-Ray Fluorescence analysis.
- 2.6 ASTM D-4327 by Ion Chromotography analysis.
- 2.7 ASTM D-1091 by gravimetric analysis.
- 2.8 ASTM D-5185 by Inductively Coupled Plasma analysis.
- 2.9 ASTM D-5443 by Multi-Dimensional Gas Chromatography.
- 2.10 LQA 1800-0158 Certificate of Conformance.
- 2.11 LQA 1800-0159 Letter of Authorization for Use.

3.0 MATERIALS:

3.1 Approved materials are listed in Table A.

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4.0 SAFETY:

Note: As this specification applies to both outside suppliers and Facility operations, in-house safety and handling requirements are specified here. Stellant expects that outside suppliers will address appropriate safety and health practices for safe handling of hazardous materials.

- 4.1 Read and understand all Material Safety Data Sheet safety and handling instructions as provided by the manufacturer.
- 4.2 Observe all recommended safety precautions and wear appropriate personal protection equipment (PPE).

5.0 PROCEDURE:

- 5.1 This specification applies to the fabrication of all sub-components or parts. Suppliers shall use only coolants, lubricants, and solvents specified on the approved list. No substitutions for approved coolants, lubricants, and solvents are permitted without approval per section 6.0 **prior** to use.

NOTE: Individual suppliers may have authorization for use of specific coolants, lubricants or solvents through LQA 1800-0159 (Letter of Authorization For Use - See section 6.1) not listed in Table A.

- 5.2 All dilutions and blending is to be performed in accordance with the coolant/lubricant manufacturer's instructions.

- 5.2.1 The use of additives such as anti-bacterial agents and anti-foam agents must be demonstrated to satisfy the quality requirements as defined in section 6.0.

6.0 QUALITY CONTROL - APPROVAL FOR NEW COOLANTS, LUBRICANTS, SOLVENTS:

- 6.1 The supplier must obtain and submit (to Stellant) a certification of chemical analysis from the manufacturer OR a completed certificate of conformance (LQA 1800-0158) for all proposed coolants, lubricants, and solvents. This certification is to establish that the requirements listed in section 6.4 of this specification are satisfied. Proposed additions to the approved list shall be considered for evaluation via engineering tests and if deemed acceptable, incorporated into this specification.

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NOTE: If proposed coolants, lubricants or solvents do not meet the criteria specified in section 6.4 in its entirety, then the product may be considered for individual authorized use. Upon analysis and approval by qualified company staff, the supplier may acquire consent to use particular coolants, lubricants or solvents for parts fabrication. This approval shall be provided to the individual supplier in writing through a Letter of Authorization For Use (LQA 1800-0159) by company quality control. This letter shall be kept on file by quality control.

- 6.2 Candidates for future use will be chemically and empirically tested for compliance with sections 6.3 and 6.4 by qualified Company technical staff. Surface contamination may be determined by Stellant Spectroscopy for Chemical Analysis (ESCA) of residues after processing per section 6.3. Stellant reserves the right to test any coolant, lubricant or solvent for compliance with section 6.4.
- 6.3 Any residues must be demonstrated to be removable in normal cleaning operations to which parts will be subject before assembly. Normal cleaning operations steps shall be defined as:
- PC-4013 - Degrease with Vertrel degreasing solvent
 - PS-4036 - Immersion clean with sodium hydroxide caustic solution
 - Deionized water cascade rinses
 - PS-4020 - Immersion clean with 50% hydrochloric acid solution
 - Deionized water cascade rinses
 - Acetone rinse
 - Dry in hot air oven @ 80°C
- Test pieces will be subject to a water break test per PC-4501 following normal cleaning operations to determine the presence or absence of hydrophobic surface contaminants. Examples of hydrophobic contaminants are oils, greases, and water-insoluble organic compounds.
- 6.4 Acceptable materials must meet the following basic requirements:
- 6.4.1 Active or "free" sulfur concentration shall be less than 150ppm. Recommended method is ASTM D-4294 by X-Ray Fluorescence or ASTM D-4327 by Ion Chromatography analysis.
 - 6.4.2 Phosphorus concentration shall be less than 2% (wt.). Recommended method is ASTM D-1091 by gravimetric analysis.
 - 6.4.3 Total chlorine concentration shall be less than 50ppm. Recommended method is Ion Chromatography analysis.

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6.4.4 Silicon concentration shall be less than 10ppm, lead concentration shall be less than 10ppm, and zinc concentration shall be less than 100ppm. Recommended method is ASTM D-5185 by Inductively Coupled Plasma analysis.

6.4.5 Paraffin concentration shall be less than 500ppm. Recommended method is ASTM D-5443 by Multi-Dimensional Gas Chromatography.

6.5 Scotch Brite or any other chemical treatment is **not** permitted unless otherwise specified.

Table A

Material	Manufacturer	Address
ACA-1410 (Synthetic)	Associated Chemical Abrasives	
Alum-Tap	Winfield Brooks	Woburn, MA
Anchor Lube G-771	Anchor Chemical Co.	Cleveland, Ohio
Aquasol #280	O.F. Zurn Co.	Philadelphia, PA
Axarel 2200	Petroferm Inc	Fernandina Beach, FL
Blasocut 4000 Strong	Blaser Swissslube	Goshen, NY
Blasocut BC40SW	Blaser Swissslube	Goshen, NY
Buttercut	Beltraction Co.	Chicago, IL
Chemtrol 400	Precision Finishing Inc	Sellersville, PA
Chlorothene 'R' SM Solvent	Dow Chemical Co.	Niagara Falls, NY
Cleaning Solvent	Safety Kleen	Plano, TX
Clearedge 6584	Castrol	Naperville, IL
Clearedge 6519	Castrol	Naperville, IL
Cool Tool	Monroe Chemical Co.	Hilton, NY
Corvus 519	Texaco Oil Co.	New York, NY
Cutmax Base #2	Houghton, E.F.& Co.	Philadelphia, PA
Dawn Dish Detergent	Proctor & Gamble	Cincinnati, OH
Ecocut AB	Fuchs Lubricants Co.	Harvey, IL
Hamicut 8924HD	Harry Miller Corp.	Philadelphia, PA
Hamicut 9124HD	Harry Miller Corp.	Philadelphia, PA
Hangsterfers #521	Hangsterfer Labs	Mantua, NJ
Hangsterfers Aldraw J-50	Hangsterfer Labs	Mantua, NJ
Hangsterfers S-500	Hangsterfer Labs	Mantua, NJ
Hangsterfers S-1001	Hangsterfer Labs	Mantua, NJ
HFE-72DE 3M Novec Engineering Machining Fluid	3M	St. Paul, MN
HFE-7100 3M Novec Engineering Machining Fluid	3M	St. Paul, MN
Houghto J-505	Houghton, E.F.& Co.	Mantua, NJ
Houghto Grind 50	Houghton, E.F.& Co.	Mantua, NJ
Ilocut 5721	Castrol Industrial North America	Naperville, IL

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Material	Manufacturer	Address
International Compound #124-C, Antirust	International Chemical Company	Philadelphia, PA
International Compound #922-NDL	International Chemical Company	Philadelphia, PA
International Machine Cleaner #550-LF	International Chemical Company	Philadelphia, PA
Joy Dish Detergent	Proctor & Gamble	Cincinnati, OH
Keycut Soluble	Keystone Lubricants	Linden, NJ
Lubriplate 930-AA	Fiske Bros. Refining Co.	Newark, NJ
Magnus Magnafilm #31	Magnus Chemical Co.	Garwood, NJ
Man-825-5 Honing Oil	Sunnen	St. Louis, MO
Missile Lube 1XL	Hangsterfer Labs	Mantua, NJ
PPG Magnudraw 50LF	PPG Pretreatment Specialty Products	Pittsburgh, PA
Prime-Cut	Monroe Chemical Co.	Hilton, NY
Rustlick WS-500A	ITW Fluid Products	Glenview, IL
Safe Tap Ultima	ITW Fluid Products	Glenview, IL
Renobase 44LVC	Fuchs Lubricant Co.	
Semi Kool Gel	G-C Lubricants Co.	San Carlos, CA
Shamrock "G"	Anderson Oil & Chemical Co.	Portland, CT
Sharpcool Grinding Fluid	ITW Fluid Products Group	Glenview, IL
Simple Green	Sunshine Makers Inc	Plymouth Meeting, PA
Slovac 1535	Socony Mobile	Harrisburg, PA
Solvating Agent 70	Petroferm Inc	Fernandina, FL
Specialty Metalworking Fluid MW-2001	3M	St. Paul, MN
Specialty Metalworking Fluid MW-2410	3M	St. Paul, MN
Stabelene Perc (M-3-425)	Marisol Inc.	Bound Brook, NJ
Syntilo 9904B	Castrol	Naperville, IL
Syntilo 9913	Castrol	Naperville, IL
Tap Free	Winfield-Brooks Co.	Woburn, MA
Techtride NPB DG	Parts Cleaning Technologies	Charlotte, NC
Vantrol 5487X	Van Straaton Chemical Co.	Philadelphia, PA
Zep Formula 50	Zep Manufacturing Co.	Atlanta, GA
WD-40	WD-40 Company	San Diego, CA
Mineral Oil		
Castor Oil		
Acetone		
Amyl Acetate		
Ethyl Alcohol		
Isopropyl Alcohol		
Kerosene		
Lacquer Thinner		
Methyl Alcohol		
Mineral Spirits		

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