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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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PACKAGING & PRESERVATION OF CLEANED COMPONENTS

SIZE B | DWG. NO. 54000–GP11 | REV. 1

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CADD CONTROLLED DRAWING
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1.0 SCOPE

THIS SPECIFICATION COVERS THE REQUIREMENTS FOR PACKAGING AND PRESERVATION OF COMPONENTS, PIECE PARTS AND SOFTGOODS THAT HAVE BEEN CLEANED TO A SPECIFIED CLEAN LEVEL.

2.0 DEFINITIONS

2.1 ACLAR – TRANSPARENT, COLORLESS, CONTAMINATE–FREE POLYCHLOROTRIFLUOROETHYLENE (ACLAR 22A) FILM WITH A NOMINAL .0015 TO .0030 INCH THICKNESS.

2.2 COMPONENT – AN ARTICLE WHICH IS NORMALLY A COMBINATION OF PARTS, SUB–ASSEMBLIES, OR ASSEMBLIES AND IS A SELF–CONTAINED ELEMENT WITHIN A COMPLETE OPERATING UNIT.

2.3 FEP TEFLON – TRANSPARENT, VIRGIN FLUORINATED ETHYLENE PROPYLENE FILM WITH NO COLORING OR ADDITIVES OF ANY DESCRIPTION, AND A NOMINAL 2 MIL (.002") THICKNESS.

2.4 ITEM – THE WORD ITEM(S) IS USED HEREIN, FOR BREVITY, TO INDICATE COMPONENTS, PARTS, EQUIPMENT OR ANY COMBINATION OF THESE TERMS.

2.5 MARKING – THE APPLICATION OR USE OF MARKS, SYMBOLS, AND ADDRESSES FOR PURPOSES OF GUIDING OR DIRECTING THE SAFE HANDLING AND SHIPPING OF PACKAGED ITEMS.

2.6 NYLON, ANTI–STATIC – TRANSPARENT POLYAMIDE (NYLON 6 OR EQUAL) FILM WITH A NOMINAL 2 MIL (.002") THICKNESS, CONTAINING AN ORGANIC, ANTI–STATIC AGENT THROUGHOUT THE FILM.

2.7 PACKAGING – APPLICATION OR USE OF ADEQUATE PROTECTIVE MEASURES TO PREVENT DAMAGE FROM PHYSICAL HAZARDS OR CONDITIONS INCLUDING, AS APPLICABLE, WRAPPING FOR PROTECTION FROM PHYSICAL DANGER, CUSHIONING, INTERIOR CONTAINERS, AND COMPLETE IDENTIFICATION MARKING, UP TO BUT NOT INCLUDING THE EXTERIOR SHIPPING CONTAINER EXCEPT WHEN A UNIT CONTAINER IS ALSO THE SHIPPING CONTAINER.

2.7.1 PRIMARY (OR INTIMATE) PACKAGING – MATERIAL USED TO COVER AND PROTECT PRECISION CLEANED ITEMS.

2.7.2 SECONDARY (OR ENVIRONMENTAL) PACKAGING – MATERIAL USED TO PROVIDE PROTECTION TO THE PRIMARY PACKAGING AND AS AN ADDITIONAL BARRIER TO PROTECT THE PRECISION CLEANED ITEM.

2.8 PACKING – THE FINAL PLACEMENT OF ITEMS OR PACKAGES IN EXTERIOR SHIPPING CONTAINERS OR OTHER MEDIA INCLUDING THE NECESSARY BLOCKING, BRACING OR CUSHIONING, WEATHERPROOFING, AND EXTERIOR STRAPPING.

2.9 PART – THE LEAST SUBDIVISION OF A COMPONENT: A PIECE THAT FUNCTIONS IN INTERACTION WITH OTHER ELEMENTS OF A COMPONENT, BUT IS ITSELF NOT ORDINARILY SUBJECT TO DISASSEMBLY.

2.10 POLYETHYLENE, ANTI–STATIC – PINK, PLASTIC FILM WITH A NOMINAL 6 MIL (.006") THICKNESS, CONTAINING AN ORGANIC, ANTI–STATIC AGENT THROUGHOUT THE FILM.

2.11 PRECISION CLEAN – FOR THE PURPOSES OF THIS PROCEDURE, A HIGH DEGREE OF CLEANLINESS WHICH HAS BEEN VERIFIED TO MEET THE REQUIREMENTS OF A SPECIFIED CLEAN LEVEL (e.g., SSC STANDARD 79–001 LEVEL 1XX, KSC–123 LEVEL VC–UV).

2.12 PRESERVATION – APPLICATION OR USE OF ADEQUATE PROTECTIVE MEASURES TO PREVENT DETERIORATION FROM ENVIRONMENTAL HAZARDS OR CONDITIONS INCLUDING, AS APPLICABLE, THE USE OF APPROPRIATE CLEANING AND DRYING METHODS, PRESERVATIVES, AND WRAPPING FOR PROTECTION FROM CHEMICAL DANGER.

2.13 SHIPPING AND HANDLING – THE ACT OF TRANSPORTING AND HANDLING PACKAGED AND PACKED ITEMS FROM ONE PLACE TO ANOTHER.

2.14 SIGNIFICANT SURFACES – ANY SURFACE OF AN ITEM THAT CONTACTS THE SERVICE MEDIA AND/OR IS SUBJECT TO CLEAN LEVEL VERIFICATION. SIGNIFICANT SURFACES ARE SUBJECT TO THE PACKAGING AND PRESERVATION REQUIREMENTS OF THIS SPECIFICATION.

2.15 TAPE – A WATERPROOF, PRESSURE–SENSITIVE, ADHESIVE STRIP WITH BACKING MATERIAL MADE OF PLASTIC FILM WHICH MAY BE EITHER COLORED OR TRANSPARENT AND IS USED FOR PACKAGING AND SEALING. (TAPE WITH WOVEN FABRIC CLOTH BACKING MATERIAL MAY BE USED TO SECURE LEVEL 3 COMPONENT PACKAGING, AND SECONDARY PACKAGING ONLY.)

3.0 PACKAGING AND PRESERVATION

NOTE

SELECTION OF THE PRIMARY PACKAGING FILM IS BASED ON THE INTENDED SERVICE MEDIA OF THE ITEM. REFERENCE TABLE 1 FOR MATERIAL GUIDE WHEN SELECTING/VERIFYING PACKAGING MATERIAL.

TABLE 1
REQUIRED PACKAGING FOR SPECIFIC MEDIA/CLEANLINESS LEVEL

MEDIA/CLEANLINESS LEVEL	PACKAGING REQUIREMENT
ALL PRECISION CLEANED ITEMS FOR LO/GO SERVICE MEDIA.	• PRIMARY SEAL (OR BAG) OF ACLAR/FEP TEFLON FILM • SECONDARY SEAL (OR BAG) OF POLYETHYLENE FILM
ALL PRECISION CLEANED ITEMS FOR WHICH NO SERVICE MEDIA IS SPECIFIED.	
ALL PRECISION CLEANED ITEMS FOR SERVICE MEDIA OTHER THAN LO/GO [EXCEPT LEVEL 3 COMPONENTS (VISUALLY CLEAN)].	• PRIMARY SEAL (OR BAG) OF NYLON FILM • SECONDARY SEAL (OR BAG) OF POLYETHYLENE FILM
LEVEL 3 (VISUALLY CLEAN) ITEMS.	• PRIMARY SEAL (OR BAG) OF POLYETHYLENE FILM • SECONDARY SEAL NOT REQUIRED

3.1 GENERAL NOTES

3.1.1 THE OXYGEN COMPATIBLE PRIMARY SEALING MATERIAL SPECIFIED IN THIS PROCEDURE IS ACLAR OR FEP TEFLON FILM, AND IS TO BE USED ON ALL LO/GO ITEMS. ACLAR OR FEP TEFLON MAY ALSO BE USED AS THE PRIMARY SEALING MATERIAL FOR ALL OTHER APPLICATIONS, HOWEVER DUE TO COST CONSIDERATIONS AND THE TENDENCY FOR THE FILM TO SLOUGH, THEY SHOULD ONLY BE USED WHEN ABSOLUTELY NECESSARY.

3.1.2 ACLAR OR FEP TEFLON FILM SHALL BE USED AS THE PRIMARY SEALING MATERIAL ON PRECISION CLEANED ITEMS FOR WHICH NO SERVICE MEDIA IS SPECIFIED.

3.1.3 ANTI–STATIC NYLON SHALL BE THE PREFERRED PRIMARY PACKAGING MATERIAL ON ALL OTHER (NON–LO/GO) PRECISION CLEANED ITEMS, WITH THE EXCEPTION OF LEVEL 3 (VISUALLY CLEAN) ITEMS.

3.1.4 METAL CAPS, PLUGS, HUBS, ETC, (STAINLESS STEEL FOR STAINLESS COMPONENTS AND CARBON STEEL FOR CARBON COMPONENTS), MAY BE USED IN LIEU OF ACLAR/FEP TEFLON OR NYLON FILMS TO PROTECT SIGNIFICANT SURFACES OF PRECISION CLEANED ITEMS. WHEN USING METAL CLOSURES AS PRIMARY PACKAGING, NO SECONDARY PACKAGING MATERIAL IS REQUIRED.

3.1.5 ALL PRIMARY PACKAGING MATERIALS WILL BE CERTIFIED AS CLEAN AS, OR CLEANER THAN, THE ITEM IT IS TO PROTECT.

3.1.6 THE SECONDARY (OR ENVIRONMENTAL) PACKAGING SPECIFIED IN THIS PROCEDURE IS ANTI–STATIC POLYETHYLENE. THIS SECONDARY MATERIAL PROVIDES PHYSICAL PROTECTION ONLY. ALTHOUGH IT DOES NOT REQUIRE THE CLEANLINESS CERTIFICATION OF THE PRIMARY PACKAGING MATERIAL, THE POLYETHYLENE MATERIAL SHALL BE VISUALLY CLEAN.

3.1.7 DUE TO THE HIGH WATER VAPOR TRANSMISSION RATE (W.V.T.R.) OF NYLON FILMS, NYLON IS TO BE USED AS A PRIMARY COVER ONLY, AND THIS IS PERMITTED ONLY WHEN IT IS USED IN CONJUNCTION WITH A SECONDARY COVER OF POLYETHYLENE PACKAGING MATERIAL.

3.1.8 ADEQUATE OVER–PACKAGING OF ITEMS SHALL BE PROVIDED AS REQUIRED, IN ADDITION TO THE PACKAGING HEREINAFTER SPECIFIED, TO PROTECT THE ITEMS DURING HANDLING, SHIPPING AND STORAGE.

3.1.9 PACKAGING OF SOFT GOODS SHALL NOT CONSTRAIN THE PART OR IN ANY WAY IMPEDE THE PART'S ORIGINAL CONFIGURATION. THE PACKAGING SHALL BE SUFFICIENTLY OVERSIZED TO ALLOW FOR FREE MOVEMENT WITHIN THE PRIMARY SEALING MATERIAL.

3.1.10 AN ITEM FOR WHICH NYLON IS USED AS THE PRIMARY COVER SHALL HAVE ITS CLEANING CERTIFICATION CARD STAMPED "NOT PACKAGED FOR OXYGEN SERVICE".

3.2 FILTER ELEMENTS

3.2.1 DUE TO THE FRAGILE CONSTRUCTION AND HIGH COST OF STAINLESS STEEL FILTER ELEMENTS, SPECIAL CARE MUST BE APPLIED IN PACKAGING AND TRANSPORT. THE FOLLOWING NOTICES MUST BE APPLIED BETWEEN THE PRIMARY AND SECONDARY PACKAGING: "THIS END UP", "FRAGILE", "HANDLE WITH CARE".

3.2.2 FILTER ELEMENTS RECEIVED IN WOODEN CONTAINERS SHALL BE DOUBLE BAGGED PER STEP 3.2.1 AND RETURNED IN THE SAME WOODEN CONTAINERS. SMALL FILTER ELEMENTS SHALL BE DOUBLE BAGGED PER STEP 3.2.1 AND PLACED IN PASTEBOARD BOXES OR OTHER SUITABLE RIGID CONTAINERS, WITH ADEQUATE PADDING TO PREVENT FILTER DAMAGE. THE EXTERIOR OF THE CONTAINER SHALL BE LABELED "THIS END UP", "FRAGILE", "HANDLE WITH CARE".

3.2.3 THE CLEANING CERTIFICATION CARD SHALL BE SEALED IN A POLYETHYLENE BAG, AND ATTACHED TO THE OUTSIDE CONTAINER.

3.3 LO/GO COMPONENTS, PIECE PARTS, AND SOFTGOODS

3.3.1 COMPONENTS

3.3.1.1 COMPONENTS SHALL HAVE ALL PORTS AND OTHER SIGNIFICANT SURFACES PROTECTED BY COVERING WITH ONE LAYER OF CLEAN ACLAR OR FEP TEFLON FILM. SECURE AND REINFORCE THE ACLAR OR FEP TEFLON FILM WITH TAPE.

3.3.1.2A FOR SMALL COMPONENTS WHOSE SIZE WILL PERMIT PLACING THE ENTIRE COMPONENT IN A POLYETHYLENE BAG, COVER THE ACLAR, OR FEP TEFLON FILM BY PLACING THE ENTIRE COMPONENT IN A POLYETHYLENE BAG. THE CLEANING CERTIFICATION CARD SHALL BE PLACED IN THE POLYETHYLENE BAG WITH THE COMPONENT PRIOR TO SEALING.

3.3.1.2B FOR COMPONENTS WHOSE SIZE WILL NOT PERMIT PLACING THE ENTIRE COMPONENT IN A POLYETHYLENE BAG, COVER THE ACLAR, OR FEP TEFLON FILM WITH ONE LAYER OF POLYETHYLENE AND SECURE WITH TAPE. THE CLEANING CERTIFICATION CARD SHALL BE SEALED IN A POLYETHYLENE ENVELOPE AND ATTACHED TO THE COMPONENT.

3.3.1.3 OPENINGS (1–1/2" AND LARGER) SHALL HAVE AN ADDED COVER OF METAL OR HARDBOARD OVER THE SECONDARY PACKAGING TO PREVENT DAMAGE. SECURE HARD COVER WITH TAPE.

3.3.2 SMALL PARTS AND SOFTGOODS

NOTE

SMALL PARTS AND SOFTGOODS FOR WHICH NO SERVICE MEDIA IS SPECIFIED SHALL BE PACKAGED PER STEP 3.3.2.1.

3.3.2.1 SMALL PARTS AND SOFTGOODS SHALL BE SEALED IN ONE ACLAR OR FEP TEFLON BAG AND PLACED INTO ONE POLYETHYLENE BAG. THE CLEANING CERTIFICATION CARD SHALL BE PLACED BETWEEN THE PRIMARY AND SECONDARY BAG PRIOR TO SEALING. PURGING OR EVACUATION OF OVER–PACKAGING SHALL NOT BE REQUIRED.

3.3.3 VESSEL OR TANK PORTS

3.3.3.1 VESSEL OR TANK PORTS SHALL BE SEALED BY APPLYING ONE LAYER OF CLEAN ACLAR OR FEP TEFLON FILM OVER THE PORTS AND SECURING WITH TAPE. THE ACLAR OR FEP TEFLON SHALL BE TAPED ON THE OUTSIDE AREA OF THE PORT, ABOVE (OR BEHIND) THE THREADED AREA. COVER THE ACLAR OR FEP TEFLON WITH POLYETHYLENE, AND SECURE WITH TAPE.

3.3.3.2 SEAL THE CLEANING CERTIFICATION CARD INSIDE A POLYETHYLENE ENVELOPE AND ATTACH IT TO THE VESSEL OR TANK.

3.4 ALL PRECISION CLEANED COMPONENTS, PIECE PART AND SOFTGOODS, EXCEPT LEVEL 3 AND LO/GO ITEMS

3.4.1 COMPONENTS

3.4.1.1 COMPONENTS SHALL HAVE ALL PORTS AND OTHER SIGNIFICANT SURFACES PROTECTED BY COVERING WITH ONE LAYER OF CLEAN NYLON FILM. SECURE AND REINFORCE THE NYLON FILM WITH TAPE.

3.4.1.2A FOR SMALL COMPONENTS WHOSE SIZE WILL PERMIT PLACING THE ENTIRE COMPONENT IN A POLYETHYLENE BAG, COVER THE NYLON FILM BY PLACING THE ENTIRE COMPONENT IN A POLYETHYLENE BAG. THE CLEANING CERTIFICATION CARD SHALL BE STAMPED "NOT PACKAGED FOR OXYGEN SERVICE" AND PLACED IN THE POLYETHYLENE BAG WITH THE COMPONENT PRIOR TO SEALING.

3.4.1.2B FOR COMPONENTS WHOSE SIZE WILL NOT PERMIT PLACING THE ENTIRE COMPONENT IN A POLYETHYLENE BAG, COVER THE NYLON FILM WITH ONE LAYER OF POLYETHYLENE AND SECURE WITH TAPE. THE CLEANING CERTIFICATION CARD SHALL BE STAMPED "NOT PACKAGED FOR OXYGEN SERVICE", SEALED IN A POLYETHYLENE ENVELOPE AND ATTACHED TO THE COMPONENT.

3.4.1.3 OPENINGS (1–1/2" OR LARGER) SHALL HAVE AN ADDED COVER OF METAL OR HARDBOARD OVER THE SECONDARY PACKAGING TO PREVENT DAMAGE. SECURE HARD COVER WITH TAPE.

3.4.2 SMALL PARTS AND SOFTGOODS

NOTE

SMALL PARTS AND SOFTGOODS FOR WHICH NO SERVICE MEDIA IS SPECIFIED SHALL BE PACKAGED PER STEP 3.3.2.1

3.4.2.1 SMALL PARTS AND SOFTGOODS SHALL BE SEALED IN ONE NYLON BAG AND PLACED INTO ONE POLYETHYLENE BAG. THE CLEANING CERTIFICATION CARD SHALL BE STAMPED "NOT PACKAGED FOR OXYGEN SERVICE" AND PLACED BETWEEN THE PRIMARY AND SECONDARY BAG PRIOR TO SEALING. PURGING OR EVACUATION OF OVER–PACKAGING SHALL NOT BE REQUIRED.

3.4.3 VESSEL OR TANK PORTS

3.4.3.1 VESSEL OR TANK PORTS SHALL BE SEALED BY APPLYING ONE LAYER OF CLEAN NYLON FILM OVER THE PORTS AND SECURING WITH TAPE. THE NYLON SHALL BE TAPED ON THE OUTSIDE AREA OF THE PORT, ABOVE (OR BEHIND) THE THREADED AREA. COVER THE NYLON WITH POLYETHYLENE, AND SECURE WITH TAPE.

3.4.3.2 STAMP THE CLEANING CERTIFICATION CARD "NOT PACKAGED FOR OXYGEN SERVICE", SEAL IT INSIDE A POLYETHYLENE ENVELOPE AND ATTACH IT TO THE VESSEL OR TANK.

3.5 LEVEL 3 (VISUALLY CLEAN) COMPONENTS, PIECE PARTS AND SOFTGOODS

3.5.1 FOR ITEMS WHOSE SIZE WILL NOT PERMIT PLACING THE ENTIRE ITEM IN A POLYETHYLENE BAG, COVER ALL PORTS AND OTHER SIGNIFICANT SURFACES WITH ONE LAYER OF POLYETHYLENE FILM AND SECURE WITH TAPE. THE CLEANING CERTIFICATION CARD SHALL BE SEALED IN A POLYETHYLENE ENVELOPE AND ATTACHED TO THE ITEM.

3.5.2 FOR ITEMS WHOSE SIZE WILL PERMIT PLACING THE ENTIRE ITEM IN A POLYETHYLENE BAG, PLACE THE ENTIRE LEVEL 3 ITEM IN A POLYETHYLENE BAG. THE CLEANING CERTIFICATION CARD SHALL BE SEALED INSIDE THE POLYETHYLENE BAG WITH THE COMPONENT.

3.6 SPARE CARBON STEEL COMPONENTS

3.6.1 CLEANED SMALL CARBON STEEL COMPONENTS (LESS THAN 1–1/2") THAT ARE TO BE WAREHOUSED FOR INDEFINITE PERIODS OF TIME SHALL HAVE, IN ADDITION TO THE PROPER PACKAGING, A SUITABLE BAGGED DESICCANT AND A HUMIDITY CARD INDICATOR (STOCK NO. 6685–00–752–8240G OR EQUIVALENT) PLACED INSIDE THE OUTER POLYETHYLENE FILM COVER OR BAG PRIOR TO SEALING.

3.6.2 CLEANED CARBON STEEL COMPONENTS (1–1/2" OR LARGER) REQUIRE AN INERT GAS BLANKET FOR INDEFINITE WAREHOUSE STORAGE. USE THE FOLLOWING METHOD FOR PACKAGING.

3.6.2.1 INSTALL A CERTIFIED CLEAN HUB AND SEAL RING, OR FLANGE WITH GASKET (AS REQUIRED) WITH A SCHRAEDER VALVE ON ONE PORT OF THE COMPONENT.

3.6.2.2 INSTALL A CERTIFIED CLEAN HUB AND SEAL RING, OR FLANGE AND GASKET (AS REQUIRED) TAPPED FOR A 0–60 (MAXIMUM) PSIG PRESSURE GAUGE ON THE OPPOSITE PORT OF THE COMPONENT.

3.6.2.3 PURGE THROUGH THE SCHRAEDER VALVE WITH GN APPROXIMATELY THREE MINUTES TO EVACUATE ALL AIR. REDUCE GN PURGE TO THE MINIMUM PRESSURE REQUIRED TO MAINTAIN POSITIVE PRESSURE ON THE COMPONENT.

3.6.2.4 WHILE STILL MAINTAINING POSITIVE PURGE PRESSURE, INSTALL THE PRESSURE GAUGE. INCREASE GN PRESSURE IN COMPONENT TO 20 ±5 PSIG. RECORD STABILIZED PRESSURE READING IN "REMARKS" SECTION OF THE CLEANING CERTIFICATION CARD.

3.6.2.5 VERIFY NO PRESSURE LOSS AFTER A MINIMUM 12 HOUR WAITING PERIOD TO INSURE PRESERVATION OF THE COMPONENT.

3.6.2.6 THE CLEANING CERTIFICATION CARD SHALL BE SEALED IN A POLYETHYLENE ENVELOPE AND ATTACHED TO THE COMPONENT.