

Submitted for recognition as an American National Standard

**NATIONAL AEROSPACE AND DEFENSE CONTRACTORS
ACCREDITATION PROGRAM (NADCAP)**

**AUDIT AND INSPECTION CHECKLISTS FOR THE
SEALANT MANUFACTURERS ACCREDITATION PROGRAM**

1. Scope

- 1.1 This standard includes the forms to be used by a third party for auditing and on-going inspection for assessing the capability of sealant suppliers to furnish product to indicated standards.

2. References

2.1 Applicable Documents

2.1.1 SAE Publications

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AS7001 - National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Program Description

AS7002 - National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Rules for Implementation

AS7003 - National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Program Operation

2.1.2 Military Publications

Available from Naval Publications and Forms Center, Attn: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

2.1.3 Federal Standards

FED-STD-368 - Quality Control System Requirements

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2.1.4 Military Standards

MIL-STD-1535 - Supplier Quality Assurance Program Requirements

MIL-STD-45662 - Calibration Systems Requirements

2.1.5 Military Specifications

MIL-S-8802 - Sealing Compound, Temperature-Resistant, Integral Fuel Tanks and Fuel Cell Cavities, High Adhesion

MIL-Q-9858 - Quality Program Requirements

MIL-I-45208 - Inspection System Requirements

3. Requirements

3.1 The checklists have been divided as follows:

- Appendix A - Facility and Quality Assurance System Audit
- Appendix B - Quality Assurance System Continuous Audit Checklist
- Appendix C - Sealant Inspection Checklist
- Appendix D - Criteria for Evaluation of an Independent Test Laboratory for Sealants

3.1.1 These checklists are appended to this standard.

4. Glossary

AREA, RESTRICTED ACCESS - An area delineated by barrier or floor marking which is clearly posted against unauthorized removal of material. Authorization to remove material from a restricted access area can come from the Quality Control department only.

ACCELERATOR - An ingredient used in a sealant formulation to accelerate the rate of cure.

ACCEPTANCE TEST - One of a number of tests called out by a sealant specification to assure the conformance of a particular batch of product to the physical and chemical requirements for the material.

ADHESIVE STRENGTH - The strength of the bond between the sealant and the substrate. It is desired that the adhesive bond be stronger than the sealant itself. Thus, if an attempt were made to peel the sealant from the surface, the sealant would pull apart before the bond between substrate and sealant would fail.

APPLICATION TIME - The time available for sealant application following mixing or thawing premixed and frozen sealant. Acceptability limits established for "A" class, brushable sealants are expressed in the time required for the viscosity to increase to a specified level at standard conditions. The acceptability limits for "B" class, extrudable sealants are expressed in terms of the extrusion rate of a sealant at standard conditions.

4. (Continued):

ASSEMBLY TIME - (also called "work life" or "open time" or "squeeze-out life") - A term used in reference to faying surface sealants. It refers to the amount of time at standard conditions available after mixing or thawing in which work can be done before the overlapping surfaces must be closed, still permitting squeeze-out of the curing sealant.

BASE COMPOUND - The major component of a two-part curing type sealant containing the prepolymer.

BATCH - A mass of base compound or catalyst manufactured at one time. Its identity is maintained by an assigned batch number.

BLOCK FLOW - The distance freshly mixed, uncured sealant will sag while hanging from a vertical surface for approximately one-half hour at standard conditions.

CALIBRATION - The comparison of a standard with a higher ranking reference standard.

CATALYST - The component of a two-part curing type sealant which causes the prepolymer to polymerize.

COHESIVE STRENGTH - The strength of internal forces holding a sealant together.

CURE RATE - A measure of the rate of polymerization based upon the increasing hardness of the sealant with time. The time required to reach the specified hardness varies widely with the type of sealant and with the temperature and relative humidity. Testing is performed at standard conditions.

CURE TIME - A measure of the time required for the polymerization to advance to a given hardness at standard conditions.

DUROMETER - A mechanical device used to measure the hardness of a sealant. A Shore A or REX A reading is produced. Some coatings are measured on a Shore D scale, which encompasses a higher hardness range.

INSPECTION, FINAL - Quality control inspector certification performed after the last in-plant fabrication or assembly operation and prior to preparation for shipment.

INSPECTION, QUALITY CONTROL - A critical comparison of characteristics to standards required by the customer.

JET REFERENCE FLUID (JRF) - A combination of aliphatic and aromatic liquids, also containing mercaptans, used as a harsh environment to test the resistance of integral fuel tank sealants to jet fuels.

KIT - A container or containers in which a one-part or a two-part sealant is packaged. Two component kits consist of the base compound in one container and the catalyst in the other.

4. (Continued):

LOT (2-PART MATERIAL) - A quantity of material packaged from a batch of base compound and a batch of catalyst, given a specific identity, and offered for acceptance. This definition also pertains to one-part material except that it is produced from a single batch.

MEGOHMMETER - A device which measures the electrical resistance of a sealant (and other materials as well).

NONCONFORMING MATERIAL - Contract material which has physical, functional and/or dimensional variation or deviation from the applicable specification, or is incomplete.

NONVOLATILE MATTER (NVM) TEST - A test for the percentage of nonvolatile matter in a sealant. Generally, volatile solvents are used to produce the desired amount of flow in brushable and sprayable sealants in particular.

OPEN TIME - See "Assembly Time".

PEEL TEST - Sealant is cured on a selected substrate, then peeled from it using one of several types of testing machines (Scott, Instron, Tinius Olson). Two factors are of particular importance: the force required to peel it off and the site of the failure. If it is within the sealant, it is called "cohesive failure". If it fails at the bond line, it is called "adhesive failure". The former type of failure is preferred.

QUALITY ASSURANCE SYSTEM - The combination of policy, organization, personnel, procedures, inspection and test plans which assure that from receipt of materials to shipment of product, the quality of the product will not be compromised and the performance requirements will be met.

REWORK - The action taken to restore nonconforming materials to an acceptable configuration.

REX "A" HARDNESS - The hardness of a sealant as measured by a REX "A" hardness gauge. It is essentially the same value as Shore "A" hardness.

SEAL KIT - A copyrighted product. See description under "Two Component Plastic Injection Kit".

SEMKIT - A copyrighted product. See description under "Two Component Plastic Injection Kit".

SHORE "A" HARDNESS - The hardness of a sealant as measured by a Shore "A" hardness gauge. It is essentially the same value as Rex "A" hardness.

SOAK TEST - Sealants are soaked in fluids as specified in specifications to determine resistance to these materials. The conditions are somewhat harsher than are found in actual use.

4. (Continued):

SHEAR TEST - Two narrow strips of aluminum are overlapped at one end by approximately 1 inch and bonded in this area by sealant. After cure, the specimen is mounted in a testing machine and pulled in opposite directions, creating shear forces in the sealant. The force required for the sealant to fail in shear is a measure of its shear strength.

SQUEEZE-OUT TIME - A test performed on faying surface sealants at standard conditions. It is essentially the time from the start of mixing of a two-part kit (or the thawing of a frozen tube of sealant) to the tightening of two surfaces with sealant between them. That period of time which still allows the partially cured sealant to be squeezed out to a preselected thickness between the two surfaces is called the squeeze-out time.

STANDARD CONDITIONS - Standard conditions for preparation of sealant samples and testing are $77^{\circ}\text{F} \pm 2$ and $50\% \pm 5$ relative humidity.

STANDARD, CONTROL - A measuring or controlling device used to provide assurance that allowable process variation has not been exceeded.

STANDARD, REFERENCE - The most accurate company held device for assuring the accuracy of control and acceptance standards by periodic comparison.

STANDARD, TRANSFER - A standard device of reference-standard caliber to be used in calibrating control or acceptance standards which cannot readily be brought to the reference standard.

TACK FREE TIME - The time required at standard conditions for a curing sealant to lose its surface tackiness as determined by placing a small piece of polyethylene film on its surface and then peeling the film away. The sealant is tack free when no sealant is removed by the film.

TECH KIT - A copyrighted product. See "Two Component Plastic Injection Kit".

TEST REPORT - A report listing physical and chemical properties of a sealant. Test reports are generated for every batch of aerospace sealant manufactured. Generally, the tests are those acceptance tests called for by a given specification.

TRAVELER - A piece of documentation which travels with material in-process, identifying it, indicating the steps of processing necessary, the inspections required, the approvals as initialled by compounders and inspectors. Compounders indicate steps completed. Inspectors confirm quality standards have not been compromised.

4. (Continued):

TWO COMPONENT PLASTIC KIT - A two component plastic injection kit packages the base compound and catalyst of a two-part sealant in separate sections until the time of use. The base compound is contained in a 2-1/2 or 6 fluid ounces polyethylene cartridge, fitted with a plunger at one end and a hollow dasher rod (in which the catalyst is stored) at the other. An agitator is attached to the dasher rod inside the cartridge. The catalyst is mixed with the base compound by inserting a ramrod into the dasher rod, forcing the catalyst into the chamber with the base compound. The dasher rod is then pulled and pushed back and forth with periodic rotation to add to the efficiency of the agitation. When the sealant is mixed thoroughly, the dasher rod is unscrewed from the agitator and removed. A nozzle is screwed onto the cartridge and the unit inserted into a sealant gun for application of the sealant.

VISCOSITY - Viscosity is the property of a fluid relating to shearing stress and continued resistance to flow. The viscosity of sealants is measured at standard conditions by a device which has a spindle mounted on a gauge.

VISCOMETER - A device which measures viscosity.

WORK LIFE - (See "Assembly Time") - The term is sometimes incorrectly used interchangeably with application time. The term "work life" in MIL-S-8802, a U.S. Government sealant specification, refers to the assembly time or open time of faying surface sealants. Application time, on the other hand, is the time available for application after sealant mixing before the material is too thick to apply by a brush or by extrusion from a sealant gun.

PREPARED BY THE
PRI NADCAP COUNCIL

APPENDIX A
SUMMARY OF SEALANT SUPPLIER AUDIT
(Facility & Quality Assurance System)

SUPPLIER NAME:

ADDRESS:

NADCAP VISIT DATE

REASON FOR VISIT

PREVIOUS VISIT DATE

AUDIT, Original
AUDIT, Follow-up
AUDIT, Reaccredit

AUDIT RESULTS

CIRCLE ONE (or more)

AUDIT ELEMENTS

C D P
C D P
C D P
C D P
C D P
C D P
C D P
C D P

7220 SUPPLIER OPERATION INFORMATION
7230 QUALITY ASSURANCE SYSTEM
7240 PRODUCT SPECIFICATION & CHANGE CONTROL
7250 PROCUREMENT SYSTEM
7260 PRODUCTION SYSTEM
7270 HUMAN SYSTEM (Personnel Qualification)
7280 PERFORMANCE SYSTEM
7290 SUPPLIER SELF-AUDIT

Note: C = Compliance; D = Data from supplier attached; P = Problem - comments attached.

ACTIONS REQUIRED, IF ANY:

Projected completion date of corrective action: _____

Supplier acknowledgement: Name: _____ Title: _____
Phone: _____

NADCAP AUDITOR: _____ Other SAE Representatives: _____

Supplier representatives who accompanied auditor on inspection (if other than person acknowledging audit results): _____

AUDITOR COMMENTS: _____

(Attach brief report if necessary)

Audit Date: _____

Date of last Audit: _____

7210 SUPPLIER IDENTIFICATION

SUPPLIER NAME: _____

Division/Subsidiary of: _____

SUPPLIER ADDRESS: _____

Phone: _____

NATURE OF BUSINESS: _____

CURRENT EXPERIENCE AS A SUPPLIER OF AEROSPACE SEALANTS:

(List current Aerospace companies being supplied, the types of products being supplied, and the specifications to which the products are qualified.)

<u>COMPANY</u>	<u>PRODUCTS</u>	<u>SPECIFICATIONS</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

LIST COMMERCIAL COMPANIES AND GOVERNMENT AGENCIES WHICH HAVE AUDITED THIS FACILITY AND QUALITY ASSURANCE SYSTEM:

<u>COMPANY OR AGENCY</u>	<u>LAST AUDIT DATE</u>	<u>CURRENT STATUS</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

7220 INFORMATION

A. FACILITY

1. Buildings:

Type: _____ Floor Area (sq. ft.) _____

Current: _____ Expandable To: _____

2. Plant Capacity for Production, (gal/yr): _____

Current production level: _____

3. Research and Development:

Area (sq. ft.): _____

4. Production Equipment: Describe briefly; Attach list_____
_____5. Test Equipment: Describe briefly; Attach list_____
_____6. Inspection Equipment: Describe briefly; Attach list_____
_____7. Process Control & Quality Control Laboratories: Describe or attach statement._____
_____8. Calibration Capability or Provisions: Describe whether capability is in-house, outside service or combination thereof.

(Attach list of outside companies used and services performed)

9. Environmental Control: Is the facility adequately lighted, ventilated, temperature and humidity controlled (where necessary) for the type of manufacturing, testing or storage involved? Yes No

If no, explain: _____

10. Housekeeping: Does the supplier exhibit good housekeeping practices? Yes No

B. ORGANIZATION

Personnel: (Numbers of people in major functions)

Quality Control	_____
Production (Direct Labor only)	_____
Research and Development	_____
All Other	_____
Total	_____

1. Does the current organization chart show the relationship of the Quality Control Department to plant management? Yes No

2. Does the Quality Control Department have sufficient authority within the organization? Yes No
3. Is the Quality Control Department free from the line management control of the production department? Yes No
4. Current Quality Control Manager:
 Name: _____ Title: _____
 Reports to:
 Name: _____ Title: _____
5. Are both the managers listed above shown to be in line positions on the organization chart? Yes No
6. Have the personnel, using these facilities and equipment, demonstrated an ability to produce not only 1st article qualified products, but to retain that quality in mass production? Yes No

C. ADMINISTRATIVE & FINANCIAL

1. What are the supplier's annual sales of sealants for the last three years?

2. Has the company filed for bankruptcy in the past three years? Yes No
3. Are current financial responsibility statements available from banks, lending institutions or other business evaluation organizations? Yes No
4. Attach a copy or copies of reports of financial responsibility:
 Dunn and Bradstreet
 Security Analyst's Report
 Annual report
 Other
5. Are good credit references on sub-tier suppliers on file? Yes No
6. What is the form of ownership of this company?
 Sole proprietor _____ Public Corporation _____
 Partnership _____
 Closed Corporation _____
7. Is the company adequately insured? Yes No
8. Is the company currently in a position of profit ___ or loss ___?

9. Has the company been investigated or charged with poor business practices in the past three years? Yes No

7230 QUALITY ASSURANCE SYSTEM

(Note to Auditor: If a particular question produces an important observation which calls for more than a Yes/No answer, attach a sheet referring to the section number and question number, and provide the added information. It is important to explain all "No" answers.)

1. Is a written manual(s) of quality control policies and procedures available and maintained for use by all inspection personnel? Yes No
2. Does the supplier maintain an updated quality control manual available for review at any time? Yes No
3. Is the quality assurance system based upon a particular quality standard, such as:
- MIL-STD-1535 - Supplier Quality assurance Program Requirements _____
- MIL-Q-9858 - Quality Program Requirements _____
- MIL-I-45208 - Inspection System Requirements _____
- FED-STD-368 - Quality Control System Requirements _____
- AS7000 Series - National Aerospace and Defense Contractors Accreditation Program (NADCAP) _____
- OTHER _____
4. Is the manual of quality assurance procedures updated regularly to reflect the latest industry practices of commercial companies and government agencies? Yes No
5. Are the issued copies controlled regarding revisions and updating? Yes No
6. Does the quality control manual contain a statement of the responsibilities and delegated authority of the quality control organization? Yes No
7. Does the quality control manual include organization charts showing quality control access to plant management? Yes No
8. Are quality control written procedures available for all inspections and/or tests from the receipt of raw materials through each succeeding step of storage, issuance to manufacturing, in-process operation, end product conformance, packaging, shipping and periodic retest of bulk stock? Yes No
9. Are the written procedures adequately followed? Yes NO
10. Are sampling plans and procedures available for review? Yes No

11. Are sampling plans called out by:

Government procurement documents? _____
 Commercial company specifications? _____
 Other? _____

12. Does quality assurance participate in contract review to identify and evaluate quality requirements? Yes No

13. Does quality assurance review manufacturing plans prior to implementation to establish inspection checkpoints to ensure that important process characteristics are monitored, controlled and verified? Yes No

14. Indicate the general attitudes of supplier personnel:

Excellent ___ Average ___ Below Par ___ Poor ___

7240 PRODUCT SPECIFICATIONS & CHANGE CONTROL

1. Are the product requirements traceable from sales order to manufacturing travelers and quality control inspection directives? Yes No

2. Does the supplier have adequate written procedures, including identification of authorizing personnel, to accommodate contract and specification changes and their appropriate implementation? Yes No

3. Do both the sales and procurement change control procedures document the date of effectivity of the change(s) and implement the agreed upon change(s) in manufacturing and quality control documents (travelers, etc.)? Yes No

4. Does quality control verify that changes have been properly incorporated at the appropriate time? Yes No

5. Do the appropriate change control procedures provide for the timely removal of obsolete specifications and instructions from the manufacturing, inspection and test areas? Yes No

6. Are the agreed upon technical changes to the contract or specification (internal and customer) controlled and disbursed from a central point? Yes No

7250 PROCUREMENT OF RAW MATERIALS

1. Are procurement documents reviewed for the inclusion of quality requirements? Yes No

- | | | | |
|-----|--|-----|----|
| 2. | Are applicable specifications, requirements and acceptance criteria referenced or included on purchase orders to sub-tier sources? | Yes | No |
| 3. | Is the product quality of sub-tier sources of material evaluated prior to procurement? | Yes | No |
| 4. | Is the quality history of the sub-tier sources evaluated regarding variability for important product characteristics? | Yes | No |
| 5. | Are adequate written procedures in use for the quality control of purchased materials and services? | Yes | No |
| 6. | Are certified test reports and/or certificates of conformance required for all purchased material? | Yes | No |
| 7. | Are periodic tests conducted to verify the accuracy of sub-tier certificates and test reports? | Yes | No |
| 8. | Is a list of approved sources maintained and periodically reviewed? | Yes | No |
| 9. | Are records available to serve as a basis for evaluating sub-tier suppliers? | Yes | No |
| 10. | Does the supplier quality system provide for effective corrective action with a sub-tier supplier? | Yes | No |

7260 PRODUCTION SYSTEM

A. MATERIAL CONTROL

- | | | | |
|----|---|-----|----|
| 1. | Are the written procedures adequate for the control of storage and issuance of materials? | Yes | No |
| 2. | Are materials stored in a controlled area? | Yes | No |
| 3. | Are materials received at the stockroom area properly identified to show inspection acceptance? | Yes | No |
| 4. | Are the racks, bins, storage containers, etc. adequate for the types of materials stored? | Yes | No |
| 5. | Are materials properly protected to prevent deterioration? | Yes | No |
| 6. | Does quality control periodically inspect stock rooms? | Yes | No |
| 7. | Are records of stockroom inspections available? | Yes | No |
| 8. | Are "age controlled" items properly identified to show when the useful life is expended? | Yes | No |

- | | | | |
|-----|---|-----|----|
| 9. | Are the raw materials in storage periodically inspected and/or tested - especially age-controlled materials? | Yes | No |
| 10. | Is "first in, first out" stock rotation practiced? | Yes | No |
| 11. | Is the original identification regarding quality acceptance maintained throughout the storage period? | Yes | No |
| 12. | Are materials properly identified as to their contents by name, code or chemical/physical characteristics to preclude error during issuance? | Yes | No |
| 13. | Are materials traceable to their chemical/physical analyses, certifications of compliance, test documents or purchase orders? | Yes | No |
| 14. | Do records show to which batches of product make-up the raw materials were issued? | Yes | No |
| 15. | Does the shop traveler, showing batch make-up materials, identify the lots of raw materials used, providing traceability? | Yes | No |
| 16. | Is good housekeeping evident in the storage and batch make-up areas? | Yes | No |
| 17. | Are all hazardous materials completely identified and stored properly and are MSD's complete and available for personnel? | Yes | No |
| B. | IN-PROCESS CONTROL | | |
| 1. | Are the written procedures adequate for the in-process control of raw materials and product batches? | Yes | No |
| 2. | Is there a batch sheet, traveler, manufacturing instruction or combination thereof available with the batch to identify the materials used, the quantities used, the sequence and manner of manufacturing and the controls necessary for manufacture? | Yes | No |
| 3. | Is there a requirement for inspection sign-off at appropriate points during manufacture? | Yes | No |
| 4. | Are in-process materials properly handled and stored? | Yes | No |
| 5. | Does the traveler identify special conditions required for manufacture, such as environmental controls, workmanship standards, cleanliness, etc.? | Yes | No |
| 6. | Are the inspection criteria in the accompanying documents traceable to, and compatible with, customer-specified product acceptance requirements? | Yes | No |

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|-------------------------|--|-----|----|
| 7. | Do procedures assure removal of age-sensitive manufactured materials when useful life is expended? | Yes | No |
| 8. | Is there clear and proper identification of in-process acceptance/rejection status? | Yes | No |
| 9. | Are there adequate procedures for in-process corrective actions as and where required? | Yes | No |
| 10. | Are there restrictions on the extent to which a batch can be adjusted by an in-process control technician before R & D approval is required? | Yes | No |
| 11. | Are in-process corrective actions properly documented? | Yes | No |
| 12. | Are the types and quantities of inspection equipment used adequate for the types and volume of work performed? | Yes | No |
| 13. | Does the supporting batch documentation identify the personnel who manufactured and inspected the batch? | Yes | No |
| 14. | Is batch identity maintained throughout the manufacturing operation? | Yes | No |
| 15. | Are surplus raw materials, used in batch makeup, identified, inspected and promptly returned to stock? | Yes | No |
| 16. | Are nonconforming, contaminated or compromised materials identified and segregated? | Yes | No |
| C. PACKAGING & SHIPPING | | | |
| 1. | Are adequate controls and written procedures used to protect the product and conform to contractual requirements? | Yes | No |
| 2. | Are adequate facilities, equipment and environmental controls available to properly fill kits and protect the product? | Yes | No |
| 3. | Does the method and type of packaging meet customer requirements? | Yes | No |
| 4. | Are packing requirements made available to shipping personnel? | Yes | No |
| 5. | Are marking and labeling instructions in accordance with customer requirements and are they available to shipping personnel? | Yes | No |
| 6. | Is the supplier capable of packaging to: | | |
| | U.S. Government standards? | Yes | No |
| | Commercial standards? | Yes | No |

- | | | | |
|---------------|--|-----|----|
| 7. | Is there a procedure used to verify shipping requirements and documentation to be included with the shipment? | Yes | No |
| 8. | Are written shipping instructions provided to control the in-transit environment of temperature-sensitive products? | Yes | No |
| D. INSPECTION | | | |
| 1. | Are acceptance criteria on incoming shipments of raw materials given to receiving inspection and test personnel on or before receipt of material? | Yes | No |
| 2. | Are copies of applicable purchase orders for raw materials available to receiving inspection? | Yes | No |
| 3. | Are provisions made to preclude unauthorized use of raw materials pending acceptance by receiving inspection? | Yes | No |
| 4. | Do receiving inspection records indicate acceptance or rejection of incoming raw material? | Yes | No |
| 5. | Do the receiving inspection records record the reasons for rejections of raw material? | Yes | No |
| 6. | Do receiving inspection records include variables data as well as an indication of acceptance or rejection? | Yes | No |
| 7. | Are test reports or certificates of chemical analysis of raw materials maintained on file? | Yes | No |
| 8. | Is inspected raw material adequately identified as to acceptance or rejection? | Yes | No |
| 9. | Are age-controlled raw materials inspected for the date of manufacture and the expiration date? | Yes | No |
| 10. | Are raw materials that are subject to deterioration periodically reinspected in accordance with a written schedule? | Yes | No |
| 11. | Are shop travelers, operation sheets and/or inspection instructions used to indicate inspections performed during the total manufacturing, packaging and labeling process? | Yes | No |
| 12. | Are inspection records available for on-site examination by customer representatives? | Yes | No |
| 13. | Do procedures prescribe the method of indicating inspection status (stamps, tags, labels)? | Yes | No |

- | | |
|---|--------|
| 14. Are inspection personnel trained and periodically retrained? | Yes No |
| 15. Are inspection procedures adequate and followed? | Yes No |
| 16. Are inspection gages, measuring devices and test equipment inspected and recalibrated at specified regular intervals? | Yes No |
| 17. Are records retained in accordance with contractual requirements? | Yes No |

E. INSPECTION MEASURING & TEST EQUIPMENT

- | | |
|--|--------|
| 1. Does the supplier have adequate written procedures for the control and scheduled frequency of recalibration of measuring and test equipment? | Yes No |
| 2. Do calibration records demonstrate adherence to schedules, showing dates of calibration, dates for future calibrations, dates of rework and the identities of the calibrators? | Yes No |
| 3. Are decals and/or labels used to identify equipment and indicate current calibration status plus the date for next calibration? | Yes No |
| 4. Is the calibrator's identity shown on the decal or label? | Yes No |
| 5. Is there a marking system for small instruments (which can't be labeled) showing adherence to calibration schedules? | Yes No |
| 6. Are equipment and standards properly handled and protected? | Yes No |
| 7. To what specification is the calibration program controlled?
X _____ | |
| 8. Are working standards periodically calibrated using primary standards traceable to the National Institute of Standards and Technology? | Yes No |
| 9. Do the supplier's procedures require removal from service of any equipment not maintained or calibrated in accordance with established procedures and schedules? | Yes No |
| 10. When calibrated equipment is found to be nonconforming, do the procedures provide a feedback path to the users to alert them to reevaluate the acceptance status of items tested by the nonconforming equipment? | Yes No |

- | | | | |
|-----|---|-----|----|
| 11. | Do the procedures call for a periodic review of calibration history to determine the validity of the current calibration intervals? | Yes | No |
| 12. | Does the supplier maintain calibration facilities and standards? | Yes | No |
| 13. | Does the supplier utilize approved facilities for the calibration of standards? | Yes | No |
| 14. | Does the supplier utilize approved facilities for the calibration of mechanical and electrical test equipment? | Yes | No |
| 15. | Are environmental conditions controlled where necessary to assure the accuracy of calibrated test and measuring equipment? | Yes | No |
| 16. | Are inactive standards identified as "inactive" or "calibration not required"? | Yes | No |
| 17. | Is new equipment calibrated before use? | Yes | No |
| 18. | Are the services of an outside organization(s) used for calibrations and certifications? | Yes | No |
| | If "Yes", attach a list of sources used. | | |
| 19. | Is equipment stored in a manner to prevent damage or loss of calibration when not in use? | Yes | No |
| 20. | Are the types and quantities of inspection equipment used adequate for the type and volume of work performed? | Yes | No |

F. STAMP AND SIGNATURE CONTROL

- | | | | |
|----|---|-----|----|
| 1. | Is a record maintained showing stamps issued, date of issue, and the individual to whom the stamp was assigned? | Yes | No |
| 2. | Are written procedures used for the control and use of acceptance and rejection stamps? | Yes | No |
| 3. | Are records of signatures and initials maintained for verification of approval/rejection sign-off authorization? | Yes | No |
| 4. | Are appropriate actions included in the stamp and signature control system to deal with lost stamps, reassigned stamps and removal of names of previously authorized but reassigned people? | Yes | No |

- | | | | |
|----|--|-----|----|
| 5. | Are obsolete signatures/initials removed and stamps returned? | Yes | No |
| 6. | Are supplier stamps distinctly different from government stamps? | Yes | No |
| 7. | Are procedures adequately followed? | Yes | No |

7270 HUMAN (Personnel Qualifications)

- | | | | |
|----|---|-----|----|
| 1. | Is the Quality Control (QC) Department under the leadership of a technically qualified person familiar with Q.C. practices, Q.C. management, and Q.C. improvement techniques? | Yes | No |
| 2. | Are the quality control laboratory personnel required to have some chemical training? | Yes | No |
| 3. | Are quality control technicians trained by formal or apprentice training programs? | Yes | No |
| 4. | Does training continue after initial orientation? | Yes | No |
| 5. | Are laboratory and inspection personnel certified by the supplier management? | Yes | No |
| 6. | Is a person assigned to determine conformance to safety requirements for labeling, shipping and product handling and use? | Yes | No |
| 7. | Is there a procedure in place for training production workers and maintaining proper manufacturing procedures? | Yes | No |
| 8. | Is there follow-up training for production workers? | Yes | No |

7280 PERFORMANCE

A. SAMPLING INSPECTION

- | | | | |
|----|--|-----|----|
| 1. | Do sampling procedures call for 100% sampling, testing and inspection of all batches? | Yes | No |
| 2. | Do inspection personnel have written instructions regarding the sampling of raw material, in-process material and final product? | Yes | No |
| 3. | Do inspection records relate samples to lot identity and lot size? | Yes | No |
| 4. | Are samples retained from each batch of manufactured and approved product? | Yes | No |

5. Are the samples retained in a protected environment equivalent to that recommended in product literature and for the full shelf life of the product? Yes No
6. Are the samples adequately labeled? Yes No
- B. FINAL INSPECTION**
1. Are adequate written procedures used for acceptance, testing and approval of finished goods? Yes No
2. Are tests conducted by quality control personnel? Yes No
3. Are quality control personnel required to assure that the procedures and tests used conform to contract and specification requirements? Yes No
4. Are the final acceptance test criteria called out or referred to on the traveler accompanying the batch? Yes No
5. Do the final test reports reference appropriate customer specifications and/or requirements? Yes No
6. Are written procedures adequately followed? Yes No
- C. NONCONFORMING MATERIALS (Raw material, in-process, finished goods)**
1. Does the supplier provide adequate written procedures for controlling nonconforming material and ensuring corrective action? Yes No
2. Are nonconforming materials identified as such and segregated in a controlled area until disposition is made? Yes No
3. Are the procedures for material review and authorization for corrective action graduated to deal with different levels of nonconformance and the different types of nonconforming material involved? Yes No
4. If nonconforming material is used for formulation of a batch, is it documented for traceability in the in-process paperwork? Yes No
5. Do the procedures call for a material review board composed of representatives from quality control, manufacturing and R & D to determine the disposition or corrective actions necessary for in-process or finished goods which are uncorrectable by in-process control personnel? Yes No
6. Are corrective actions adequately documented? Yes No

- | | | | |
|----|--|-----|----|
| 7. | Do the corrective action procedures call for the removal from stock of any residual material from a batch found to be nonconforming through the investigation of a customer complaint? | Yes | No |
| 8. | Is there a procedure for recall of nonconforming material? | Yes | No |
| 9. | Are all procedures followed? | Yes | No |

7290 SUPPLIER SELF-AUDIT

- | | | | |
|-----|--|-----|----|
| 1. | Does the supplier have a system for self-audit and self-inspection? | Yes | No |
| 2. | Do written procedures call for a given depth and frequency of self-audit? | Yes | No |
| 3. | Is the self-audit performed against a particular standard: | Yes | No |
| | U.S. Government _____ | | |
| | Industry _____ | | |
| | Company _____ | | |
| | Other _____ | | |
| 4. | Does the internal audit team include personnel from quality control, manufacturing, R & D and safety who are not a part of daily production and inspection operations? | Yes | No |
| 5. | Are audit results summarized in a report to management and do they include recommendations for specific corrective actions as appropriate? | Yes | No |
| 6. | Does the system call for documentation of the actual corrective actions taken? | Yes | No |
| 7. | Does the supplier periodically audit his repackaging distributors? | Yes | No |
| 8. | Are these audits documented? | Yes | No |
| 9. | Are the quality assurance requirements for repackaging distributors equivalent to those under which the supplier operates for accredited functions and operations? | Yes | No |
| 10. | Does the supplier require the repackaging distributor to have a formal quality assurance system? | Yes | No |
| 11. | Attach a list of supplier approved repackaging distributors. If there are no repackaging distributors, indicate by circling "No". | Yes | No |
| 12. | Are procedures in place to update the list? | Yes | No |

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APPENDIX B
QUALITY ASSURANCE SYSTEM
Continuous Audit Checklist

METHOD OF USE

On each inspection visit to the supplier to monitor or approve orders or bulk batches of product, the inspector will also review a portion of the supplier's quality assurance system as a part of a continuing audit.

Use SAE document AS7200/1, Appendix A, "NADCAP Aerospace Sealant Suppliers Accreditation Program - Facility and Quality Assurance System Audit," as the source of specific questions. Cover 5-10 questions per visit. Assuming one visit per week, all the questions will be covered in approximately six months.

Date and initial the questions asked on the check list below. Make a copy of the check list and send it to PRI headquarters. Use the same check list* each time the particular supplier is visited, adding further monitoring and dating of the questions asked. In this manner, the most recent copy will contain a complete history of the items reviewed to date and the collection of copies will provide the history of problems encountered and the corrective actions taken.

After all the questions have been asked, the continuing audit shall be started again. Use a new form, AS7200/1, Appdix B, to start the next review.

*Use a new Page B-5 of AS7200/1 each time to record information concerning any new problem areas and corrective actions.

CONTINUOUS AUDIT CHECKLIST

SUPPLIER NAME _____

7210 SUPPLIER IDENTIFICATION (No questions)**7220 INFORMATION****A. FACILITY (Questions)**

- | | | | |
|----------|----------|----------|-----------|
| 1. _____ | 3. _____ | 5. _____ | 8. _____ |
| 2. _____ | 4. _____ | 6. _____ | 9. _____ |
| | | 7. _____ | 10. _____ |

B. ORGANIZATION

Check the Q.C./Production manpower ratio: _____

- | | | |
|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ |
| 2. _____ | 4. _____ | 6. _____ |

C. ADMINISTRATIVE & FINANCIAL

- | | | | | |
|----------|----------|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ | 7. _____ | 9. _____ |
| 2. _____ | 4. _____ | 6. _____ | 8. _____ | |

7230 QUALITY ASSURANCE SYSTEM

- | | | | | |
|----------|----------|----------|-----------|-----------|
| 1. _____ | 4. _____ | 7. _____ | 10. _____ | 13. _____ |
| 2. _____ | 5. _____ | 8. _____ | 11. _____ | 14. _____ |
| 3. _____ | 6. _____ | 9. _____ | 12. _____ | |

7240 PRODUCT SPECIFICATIONS AND CHANGE CONTROL

- | | | |
|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ |
| 2. _____ | 4. _____ | 6. _____ |

7250 PROCUREMENT

- | | | | | |
|----------|----------|----------|----------|-----------|
| 1. _____ | 3. _____ | 5. _____ | 7. _____ | 9. _____ |
| 2. _____ | 4. _____ | 6. _____ | 8. _____ | 10. _____ |

7260 PRODUCTION**A. MATERIAL CONTROL**

- | | | | |
|----------|----------|-----------|-----------|
| 1. _____ | 5. _____ | 9. _____ | 13. _____ |
| 2. _____ | 6. _____ | 10. _____ | 14. _____ |
| 3. _____ | 7. _____ | 11. _____ | 15. _____ |
| 4. _____ | 8. _____ | 12. _____ | 16. _____ |

B. IN-PROCESS CONTROL

- | | | | |
|----------|----------|-----------|-----------|
| 1. _____ | 5. _____ | 9. _____ | 13. _____ |
| 2. _____ | 6. _____ | 10. _____ | 14. _____ |
| 3. _____ | 7. _____ | 11. _____ | 15. _____ |
| 4. _____ | 8. _____ | 12. _____ | 16. _____ |

C. PACKAGING AND SHIPPING

- | | | | |
|----------|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ | 7. _____ |
| 2. _____ | 4. _____ | 6. _____ | 8. _____ |

D. INSPECTION

- | | | | | |
|----------|----------|-----------|-----------|-----------|
| 1. _____ | 5. _____ | 9. _____ | 13. _____ | 17. _____ |
| 2. _____ | 6. _____ | 10. _____ | 14. _____ | |
| 3. _____ | 7. _____ | 11. _____ | 15. _____ | |
| 4. _____ | 8. _____ | 12. _____ | 16. _____ | |

E. INSPECTION, MEASURING AND TEST EQUIPMENT

- | | | | | |
|----------|----------|-----------|-----------|-----------|
| 1. _____ | 5. _____ | 9. _____ | 13. _____ | 17. _____ |
| 2. _____ | 6. _____ | 10. _____ | 14. _____ | 18. _____ |
| 3. _____ | 7. _____ | 11. _____ | 15. _____ | 19. _____ |
| 4. _____ | 8. _____ | 12. _____ | 16. _____ | 20. _____ |

F. STAMP AND SIGNATURE CONTROL

- | | | | |
|----------|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ | 7. _____ |
| 2. _____ | 4. _____ | 6. _____ | |

7270 HUMAN (Personnel) Qualifications

- | | | | |
|----------|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ | 7. _____ |
| 2. _____ | 4. _____ | 6. _____ | 8. _____ |

7280 PERFORMANCE

A. SAMPLING INSPECTION

- | | | |
|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ |
| 2. _____ | 4. _____ | 6. _____ |

B. FINAL INSPECTION

- | | | |
|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ |
| 2. _____ | 4. _____ | 6. _____ |

C. NONCONFORMING MATERIALS

- | | | | | |
|----------|----------|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ | 7. _____ | 9. _____ |
| 2. _____ | 4. _____ | 6. _____ | 8. _____ | |

7290 SUPPLIER SELF AUDIT

- | | | | |
|----------|----------|----------|-----------|
| 1. _____ | 4. _____ | 7. _____ | 10. _____ |
| 2. _____ | 5. _____ | 8. _____ | 11. _____ |
| 3. _____ | 6. _____ | 9. _____ | 12. _____ |

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PROBLEM AREAS - CORRECTIVE ACTIONS

Note to inspector: If a problem is discovered during the audit review, inform the supplier's manager of quality control and obtain an acknowledgement and a commitment date for correction of the item.

Use the form below for the description of the problem, the date the corrective action is to be completed and the signature of the quality control manager.

INSPECTION DATE: _____

PROBLEM: _____

DATE OF EXPECTED COMPLETION OF CORRECTIVE ACTION: _____

SIGNATURE OF QUALITY CONTROL MANAGER: _____

SIGNATURE OF INSPECTOR: _____

If more than one problem is found, use the format above and provide the information on an additional sheet of paper.

FOLLOW UP ON CORRECTIVE ACTIONS FROM PREVIOUS VISITS
(Quality Assurance audit problems only) Indicate completion or status below:

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APPENDIX C
SEALANT INSPECTION CHECKLIST

INSTRUCTIONS TO THE INSPECTOR:

Given below are the actions of inspections and audit to be accomplished on each visit to a supplier:

INSPECTION

1. Observe the execution of some of the acceptance tests in the laboratory.
2. Review and initial all of the acceptance/lab test results after comparison with specification/contract acceptance criteria.
3. Inspect labeling information on kits to confirm conformance to contract requirements.
4. Inspect packaging to confirm conformance to contract requirements.
5. Attach copies of lab/acceptance test reports to this document. INDICATE WHICH TESTS WERE OBSERVED. Send the AS7200/1-I document with attachments to SAE headquarters.

AUDIT

1. Audit the supplier Quality Assurance System by asking 5-10 questions from the SAE audit document AS7200/1-A. Use the Continuous Audit Check List, Document AS7200 A-1 to initial and date the numbers of the questions asked.
2. Follow the instructions given in AS7200/1-A1 regarding the reuse of the checklist with the same supplier. Forward to SAE a copy of the updated checklist plus a new copy of page A1-5 of that document if new problems or follow-up actions must be reported.