

NOT MEASUREMENT SENSITIVE

MIL-A-48078A (AR)
16 DECEMBER 1988
 SUPERSEDING
 MIL-A-48078 (PA)
 1 NOVEMBER 1973

MILITARY SPECIFICATION

AMMUNITION, STANDARD QUALITY ASSURANCE PROVISIONS, GENERAL SPECIFICATION FOR

This specification is approved for use within the US Army Armament, Munitions and Chemical Command, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers general quality assurance provisions for all types of nuclear and non-nuclear ammunition, including all components, propellants, explosives, pyrotechnics and other supplies used.

1.2 Application. This general specification is to be used in conjunction with an item detail specification. In the event of conflict, the item detail specification shall take precedence.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

MIL-D-1000	- Drawings, Engineering & Associated Lists
MIL-A-2550	- Ammunition, General Specification for

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Armament, Munitions and Chemical Command, Attn: AMSMC-QA, Picatinny Arsenal, New Jersey 07806-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter

AMSC N/A

FSC 1395

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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MIL-A-70625 - Automated Acceptance Inspection Equipment Design, Testing and Approval of

STANDARDS

MILITARY

MIL-STD 100 - Engineering Drawing Practices
MIL-STD 105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109 - Quality Assurance Terms and Definitions
MIL-STD-785 - Reliability Program for Systems and Equipment Development and Production
MIL-STD-1168 - Lot Numbering of Ammunition
MIL-STD-1171 - Acceptance and Description Sheets (Propellants and Explosives)
MIL-STD-1235 - Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 Other publications - Other documents applicable to a specific munitions item are listed in the item detail specification.

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, (except for associated detail specifications, specification sheets or MS standards) the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. All item requirements are stated directly or by reference in the item detail specification.

3.2 Critical defect material handling system for conventional Army fuzes and Safing and Arming (S&A) devices. The contractor's quality program plan or detailed inspection plan shall include a documented material handling system to be utilized for each critical defect characteristic defined by the item detail specification for fuzes and S&A devices. The documentation shall assure that the contractor has positive procedures in effect

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for identifying and controlling material with features identified as critical defects. The contractor shall provide this information to the procuring contracting officer for review by the cognizant technical agency (CTA) in accordance with the approved Data Item Description (DID) specified on the Contract Data Requirements List (CDRL) in the contract (see 6.3). When specified in the contract, or detail specification, material handling procedures for critical defects may be required for items other than fuzes and S&A devices.

3.2.1 System definition. The critical defect material handling system for an item is defined as all operations (e.g., manufacturing, inspection, material transport, storage, marking, rework, repair, disposal, etc.) subsequent to the creation of the feature classified as a critical defect.

3.2.2 System description/analysis requirements.

3.2.2.1 System description. The description of the system shall include the following, as a minimum:

- a. Flow chart and block diagram.
- b. Identification of all material handling devices (automated and manual), including load/off-load points.
- c. Description of method for identification and traceability of items being manufactured which contain critical defects.
- d. Reference to all operating procedures of the system, including manufacturing inspection, record keeping, handling of non-conforming material, and material handling equipment operation, under all conditions (e.g., normal operation, power failure, recall, etc.)
- e. Controls used at reject/accept stations to assure mixing of good and defective material cannot occur.

3.2.2.2 System analysis. The analysis of the system shall include the following, as a minimum:

- a. Identification of each potential failure mode which could inadvertently permit material with a critical defect to leave the plant as "acceptable" product.
- b. Description of methods employed by the contractor to prevent the occurrence of each failure mode.

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3.3 Process controls. The contractor's quality program plan or detailed inspection plan shall include documented process controls which detail the specific procedures involved in the application of adhesives, sealants and lubricants during manufacture of conventional fuzes and S&A devices. These documented process controls shall be submitted to the contracting officer for review and approval by the CTA in accordance with the approved DID specified on the CDRL in the contract (see 6.3). The contractor shall not initiate production without written approval from the contracting officer. Once approved, the contractor shall not change the process without written approval from the contracting officer. When specified in the contract or detail specification, process controls may be required for items other than fuzes and S&A devices. The document process controls shall include the following information as a minimum.

- a. Item nomenclature.
- b. Applicable assembly.
- c. List of applicable drawings and specifications.
- d. List of inspection equipment
- e. List of materials and suppliers.
- f. Process flow chart.
- g. Bonding procedure for adhesives/sealants.

(1) Surface preparation method (i.e., cleaning, etching, primer application, protection of prepared parts, as applicable).

(2) Quantities to be mixed, if not pre-mixed.

(3) Method for measuring mix quantities.

(4) Potlife of mixed adhesive and controls to preclude use of deteriorated mixes.

(5) Labeling method for mixed adhesives.

(6) Storage procedures for mixed and un-mixed adhesives to prevent deterioration.

(7) Method of controlling contamination in bonding area (e.g., positive pressure filtered air, exclusion of parting agents such as silicone sprays).

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(8) Application method of adhesive/sealant, including physical orientation of item.

(9) Method of controlling location of application (prevention of runs).

(10) Curing method (including temperature, time, orientation of the assembly, fixturing used, specification of when safe to move bonded part).

(11) Tests used to verify the adequacy of bond or seal, including method, equipment, procedure, sample size and frequency.

h. Procedure for lubricant application

(1) Surface preparation method.

(2) Methods of controlling quality of lubricant before application such as storage procedure.

(3) Methods of controlling application amount, location, and preventing contamination.

(4) Tests used to verify presence, quality and thickness of applied lubricant.

i. Listing of workstation instructions.

j. Method and frequency of verification that work instruction are being followed.

k. Description and action taken upon discovery of failure to adhere to work instructions.

l. Revision record sheet.

3.4 Fuze and safing and arming devices (S&A) critical defects.

3.4.1 Applicability. This requirement is applicable to all non-destructive fuze and S&A critical inspections unless exempted by the detailed specification. When specified in the contract or detail specification, this requirement may be applied to items other than fuzes and S&A devices.

3.4.2 System reliability. Unless otherwise specified in the detailed item specification, the contractor shall provide, for each defect identified as critical, a manufacturing and inspection system which assures no more than one in a million fuzes or S&As contain the defect. This shall be assured by controlling the

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maximum defect rate produced and the error rate of the inspection equipment such that the product of the two terms when multiplied together is less than one in a million.

3.4.2.1 Maximum defect rate produced. The maximum defect rate produced shall be defined as the largest defect rate expected for the characteristic of concern on a monthly or lot basis. The maximum defect rate shall be established by the contractor, however, it may not exceed one percent without approval of the procuring contracting officer. Once established, the contractor shall monitor the defect rate to assure it does not exceed the maximum rate allotted. If the established maximum defect rate is exceeded, the production of that feature shall be terminated until the cause is determined and corrected. Additionally, all product for that period of time shall be rejected and reinspected.

3.4.2.2 Maximum error rate of the inspection system. The error rate of the inspection equipment shall be defined as the expected ratio of the number of defective parts accepted to the number of defective parts inspected by the equipment. The maximum error rate allowed is defined by the contractor to meet the system requirement as defined in 3.4.2. However, it may not exceed 1/500 without approval of the procuring contracting officer. Based on the maximum error rate defined for the equipment, the contractor shall develop a demonstration test procedure to demonstrate the error rate of the equipment. When specified in the contract or order, a test procedure shall be prepared (see 6.3) in accordance with MIL-STD-785 and include the maximum defect rate required. The test shall be performed using defective parts or reject standards. No part or standard shall be accepted during the test. If a part or standard is accepted, the cause for failure shall be isolated and corrected and the test rerun. Unless otherwise specified in the detailed item specification, the minimum number of test samples to be run shall be equal to 0.7 divided by the error rate (e.g. If the required error rate is 1/1000, the sample size would be $0.7 \div (1/1000) = 700$).

When specified in the contract or order, the test data shall be analyzed and results reported (see 6.3).

3.4.2.3 Periodic verification. Periodic verification of the system error rate shall be performed (see 6.3).

3.4.2.4 Redundant inspection equipment. The contractor may elect to use redundant inspection equipment in lieu of using a single piece of equipment with a very low error rate. Where redundant equipment is used, the inspection system error rate is defined as the error rates of the two pieces of equipment multiplied together.

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3.5 Inspection equipment accuracy. Inspection equipment used for acceptance of product shall be capable of repeatable measurements, by various experienced inspection/test personnel, to an accuracy of 10% of the total tolerance of the characteristic being inspected.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. In addition, the Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements. Reference shall be made to MIL-STD-109 to define terms used herein. The provisions of MIL-A-2550 shall apply.

4.1.1 Responsibility for compliance. All items shall meet all requirements of section 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspections. Unless otherwise specified in the item detail specification, or contract, the following types of inspection shall be conducted on the unit of product:

- a. First Article Inspection
- b. Quality Conformance Inspection

4.3 First article inspection

4.3.1 Submission. See appropriate contract clause and detail specification.

4.3.2 Inspections to be performed. First article assemblies, components and test specimens may be subjected by the Government to any or all of the examinations and tests specified in the item detail specification and to any or all requirements of the applicable drawings.

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4.3.3 Rejection. If any assembly, component or test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate its inspection upon any failure of an assembly, component, or test specimen in the sample to comply with any of the stated requirements.

4.4 Quality conformance inspection

4.4.1 Inspection lot formation. The term "inspection lot" is defined as a homogeneous collection of units of product from which a representative sample is drawn or which is inspected 100 percent to determine conformance with applicable requirements. Units of product selected for inspection shall represent only the inspection lot from which drawn and shall not be construed to represent any prior or subsequent quantities presented for inspection. Homogeneity shall be considered to exist provided the inspection lot has been produced by one manufacturer, in one unchanged process, using the same materials and methods, in accordance with the same drawings, same drawing revisions, same specifications and same specification revisions, and complies with the provisions for submission of product as specified in MIL-STD-105. All material submitted for inspection in accordance with this specification shall comply with the homogeneity criteria specified herein, regardless of the type of inspection procedure which is being applied to determine conformance with requirements. Lot numbering, as required, shall be in accordance with MIL-STD-1168. Further restrictions on inspection lot formation such as interfix number, batches of explosives, or explosives train elements shall be as provided in the item detail specification when required.

4.4.2 Examination. The examinations listed in the item detail specification for Classification of Defects shall be performed on inspection lots as defined in 4.4.1 of this specification.

4.4.2.1 Classification of defects. See item detail specification. For definitions, see 6.5.3 and 6.5.4 of this specification.

4.4.2.2 Critical and special defects. Unless otherwise specified, inspection for these defects should be at least 100% and, whenever possible, utilize non-operator dependent test equipment. Acceptable (conforming) items shall be marked accordingly.

4.4.2.3 Sampling plans. Sampling plans are incorporated in the item detail specification either by reference to appropriate military standards or by stipulating other specific acceptance criteria. In cases where sampling is specified in accordance with MIL-STD-105, the contractor may request permission from the procuring activity to use an equivalent continuous sampling plan from MIL-STD-1235.

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4.4.2.4 Major and minor defects. Major and Minor defects shall be inspected by sampling to the AQL indicated in the Classification of Defects and Tests paragraphs cited in the item detail specification, unless 100 percent inspection or other provisions are indicated.

4.4.3 Testing. The tests (First Article and Quality Conformance) listed in the item detail specification shall be performed on inspection lots as defined in 4.4.1 of this specification. The sampling plans for testing shall conform to the provisions of 4.4.2.3 above.

4.4.4 Inspection equipment. Requirements for inspection equipment to perform examinations and tests are specified in the item detail specification and in specific contract clauses as applicable. MIL-A-70625 shall apply to Automatic Inspection Equipment. See Section 6 of this specification for general provisions applicable to inspection equipment designs.

4.4.5 Alternative inspection provisions. Alternative inspection procedures, methods or equipment (including tool inspection, statistical process control, substitute sampling plans, etc.) may be used by the contractor when they provide as a minimum, the level of quality assurance required by the provisions herein and the detail specification. Prior to applying such alternative inspection procedures, methods or equipment, the contractor shall describe them in a written proposal submitted to the procuring contracting officer for evaluation and approval by the government. When required, the contractor shall demonstrate that the effectiveness of the proposed alternative(s) is equal to or better than the specified quality assurance provisions herein. In cases of dispute as to whether the contractor's proposed alternative(s) provide equal assurance, the provisions of the technical data package (see 6.5.2) shall apply. Approved alternative provisions shall be incorporated in the contractor's quality program plan or detailed inspection plan.

4.5 Methods of inspection. All methods of inspection are specified directly or by reference in the item detail specification.

5. PACKAGING - See item detail specification.

5.1 Data cards. When required, data cards shall be prepared for each lot in accordance with the approved DID specified on the CDRL in the contract (See 6.3) except that for propellant or explosive lots, acceptance and description sheets will be prepared in accordance with MIL-STD-1171.

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6. NOTES

6.1 Intended use. This specification is intended for use as a supplement to the item specification for use on various army munitions.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this and the item detail specification.
- b. Quantity required and delivery schedules.
- c. Serialization requirements, if applicable.
- d. First Article Sample requirements, if other than specified in Section 4 of item detail specification.
- e. Quality Conformance Inspection, if other than specified in section 4 of item detail specification.
- f. Packaging requirements, if other than specified in Section 5 of item detail specification.
- g. Certificates of conformance for each lot or shipment of product.

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/ provided and that the DIDs are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Ref. Para.</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
3.2	DI-R-5297	Quality Program Plan	Material Control
3.3	DI-R-5297	Quality Program Plan	Process Controls
3.4.2.2	DI-R-7035	Procedures, Reliability Test and Demonstration	---
3.4.2.2	DI-R-7035	Reports, Reliability Test and Demonstration (Final Report)	---
5.1	DI-MIS-80043	Ammunition Data Card	---
6.4	DI-R-1714	Quality Engineering Acceptance Inspection Equipment Descriptive Documentation	---

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The above DID's were those cleared as of the date of this standard. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 Inspection equipment designs. Inspection equipment designs are of two types - Government Special Inspection Equipment (SIE) designs and contractor designs. SIE designs are designated by drawing numbers under the "Method of Inspection" heading in Section 4, or on the Equipment Lists referenced on the Equipment Tabulation, whichever is specified in the item detail specification. Design responsibility for all other inspection equipment is assigned to the contractor. However, the contractor need not furnish any design when a complete Government SIE design is part of the Technical Data Package (TDP). Unless otherwise specified, the contractor may submit alternate or modified contractor designs of SIE in accordance with 6.4.2 and 6.4.3 should he elect to do so.

6.4.1 SIE designs. SIE designs may consist of any of the following:

a. Detailed drawings which completely depict all information necessary for the fabrication and use of the item of inspection equipment.

b. A source control drawing or a specification control drawing as defined in MIL-STD-100.

c. An envelope drawing, as defined in MIL-STD-100, which establishes the criteria which a detailed design shall meet. When envelope drawings are specified, the contractor shall prepare designs which comply with the criteria therein.

6.4.2 Contractor designs. Contractor designs are required for all inspection equipment for which SIE designs are not specified and may include commercial equipment which the contractor proposes to use. (Commercial equipment is defined as unmodified equipment which is catalogued and available for purchase by the general public.) Contractor designs shall include appropriate operating instructions, calibration procedures and maintenance procedures. Commercial equipment shall be fully described by catalog listings or other means which provide sufficient information to permit identification and evaluation by the Government and may include illustrations and engineering data. Designs shall be prepared for any special fixture(s) required to be used with commercial equipment, or with SIE designs if not otherwise covered thereby (see 6.4.1c). Designs shall be of the

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level per MIL-D-1000 specified in the Contract Data Requirements Lists (DD Form 1423). The item model number, component or assembly drawing number, and a narrative description of the defect characteristic (as written in Section 4 of the applicable specification) shall be shown on each contractor design.

6.4.3 Submission of designs for approval. Contractor designs shall be approved by the Government prior to fabricating or procuring the equipment. Designs shall be submitted for approval in accordance with the stipulations, time frame and distribution specified in the Contract Data Requirements List (DD Form 1423) or in the contract. Partial submission of inspection equipment designs is permissible and encouraged. However, the completion date for design review will be based on the date of the final submission of designs and the required delivery schedule as stipulated in the contract. The specific organizational element of AMCCOM to which the Contractor designs shall be sent will be specified in the item detail specification or in the contract. When the contractor submits inspection equipment designs to the Government for approval he shall give the following information in the letter of transmittal:

a. The contract number.

b. The contract item (name, model number, etc.) specification number, paragraph number and defect number; component or assembly drawing number, revision letter and date to which the specific design applies.

6.4.4 Automatic inspection equipment. In addition to the requirements as specified in this specification and in the applicable contract, the requirements of MIL-A-70625 shall apply to automatic inspection equipment.

6.5 Definitions.

6.5.1 Contractor. Unless otherwise specified, the word Contractor used throughout this or the item detail specification shall mean any supplier or producer of the item or materials to the Government. This shall include commercial contractors, sub-contractors, Government Owned, Contractor Operated (GOCO) plants, Government Owned, Government Operated (GOGO) plants.

6.5.2 Technical Data Package (TDP). A technical description of an item adequate for use in procurement. The description defines the required design configuration and assures adequacy of item performance. It consists of all applicable technical data such as plans, drawings, and associated lists specifications, standards, models, performance requirements, quality assurance provisions, and packaging data.

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6.5.3 Critical defect. A defect that judgement and experience indicate is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product; or a defect that judgement and experience indicate is likely to prevent performance of the tactical function of a major end item such as an aircraft, tank, land vehicle, missile, artillery or other major weapon system.

6.5.4 Special defect. A defect, other than Critical, that judgement and experience indicate may, depending upon the degree of variance from the design requirement:

- a. Result in hazardous or unsafe conditions for individuals using, maintaining or depending upon the product, or
- b. Prevent performance of the tactical function of major end item.

6.5.5 Automatic inspection equipment. Equipment for which no, or minimal, human involvement is required in the acceptance determination. This would include equipment employing probes/sensors/transducers that are automatically manipulated to perform measuring and detection functions. If a readout is provided, the equipment will be categorized as automatic even if operator interpretation is needed in the accept/reject decision.

6.6 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

6.7 Subject term (key word) listing.

Ammunition
 Defect classifications
 Inspection equipment criteria
 Lot criteria
 Material handling
 Process controls
 Special defects

Custodian:
 Army - AR

Preparing activity:
 Army - AR

(Project 1395-A254)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER
MIL-A-48078A (AR)

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

 VENDOR USER MANUFACTURER OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)

(TO DETACH THIS FORM CUT ALONG THIS LINE.)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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