



PAKISTAN NAVY SPECIFICATION 01/2021
PROMULGATION DATE: 23 AUGUST 2021

BUCKLE BRASS FOR CPO's AND **SAILOR's** (Amended)

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PROMULGATION ORDER

1. This specification is hereby approved and promulgated for information, guidance and compliance by the relevant person.
2. The details contained in the specification are to be studied, interpreted and implemented with due regards to the interest of the Service.

SUGGESTIONS FOR AMENDMENT

1. The specification has been prepared to bring the test methods and procedures in line with up-to-date PN requirements and facilities held in Pakistan. CINS may request to amend any test requirement/ test procedure in light of the experience emanating from its inspection history, through the feedback form placed at Annex F. However, such an alteration will be effective when the amendment is promulgated by this Directorate, and will be effective on the contracts which materialize after the promulgation date of respective amendment

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RECORD OF CHANGES /AMENDMENT

[illegible]

0101 **DESIGNATION**

1. Buckle Brass.

0102 **USAGE**

1. This Buckle Brass will be worn by CPOs and Sailors with Dress No. 1 & 3.

0103 **INTRODUCTION**

1. This specification is prepared by Directorate of Indigenous Technical Development, Karachi, to provide necessary guidance to the potential manufacturers/ suppliers of the items mentioned herein. This specification is to be used for testing and deciding upon acceptance, or otherwise, of the items mentioned. Any alteration or addition in this specification can be suggested to ITD Directorate. However, it cannot be implemented without prior approval of DNS. This specification supersedes and replace PN Specification No PN/DID/03/9192437 dated 30 Apr 21, and any other specifications promulgated earlier in relation to the item mentioned herein.

2. This specification booklet includes **06** Annexes and consists **18** pages, including the cover.

0104 **SCOPE**

1. This specification covers the technical/ manufacturing requirements of Buckle Brass to be used by CPOs/ Sailors of Pakistan Navy. It defines and lays down the quality, standards, and details of materials, workmanship and finish. It also defines briefly procedure of sampling, testing, inspection acceptance/rejection, marking, preservation, packing and delivery etc.

2. The supplier/ manufacturer shall comply in every respect with the terms of this specification and ensure that the stores conform to it, in all respects.

0105 **RELATED DOCUMENTS**

1. The latest standards documents that have been referred to in this specification are:

| | | |
|----|-------------|---|
| a. | ASTM E-478 | Standard test method for chemical analysis of Copper alloys |
| b. | ASTM E 415 | Analysis of material (chemical) |
| c. | ASTM B 748 | Analysis of metal coating through electronic microscope. |
| d. | ASTM B 568 | Test method for measurement of coating Thickness by X-Rays spectrometry |
| e. | ASTM D 1654 | Evaluation of corrosion on coated specimen |

0106 **TERMS & DEFINITIONS**

1. Definitions for the terms used in this standard are given at Annex A of this specification.

0107 **TECHNICAL DETAILS OF BUCKLE BRASS FOR CPOs/SAILORS**

1. The Technical Details of Buckle Brass are mentioned at Annex B of this specification.

0108. **DRAWING OF BUCKLE BRASS**

1. All dimension and drawing is given at Annex C.

0109. **GUIDELINE FOR BUCKLE BRASS MANUFACTURING**

1. The Buckle Brass will be manufactured by die casting process or hot pressing process using a uniform/homogenous raw material of brass sheet as specified at Annex B of this specification.
2. Flash and spew on edge of the molding and the surplus material on the edges of buckle shall be properly trimmed off/ removed.
3. Locking mechanism shall be as specified in the drawing at Annex C of this specification.

Note: Manufacture is liable to pay all the testing charges.

0110. **QUALITY OF WORKMANSHIP AND FINISHING**

1. Workmanship and finish of the Buckle Brass shall be fine, smooth without pits, blemishes, stains, discoloration and equal to the sealed pattern/drawing at Annex C of this specification. It shall be the best of its class and to the entire satisfaction of the inspector. Sealed/ Approved sample is either held with DNS or accepted/approved from bulk supply held with CINS.

0111. **TESTING**

1. The material shall be subjected to tests laid down in this specification at Annex B and related documents. At least five samples of Buckle Brass will be required to complete all the tests mentioned at Annex B of this specification. The material may also be subjected to such tests which are deemed necessary by the inspection authority in order to determine their suitability. Inspecting Authority reserves the right to get any B/R samples tested from any reputable Laboratory other than PN. However, any test considered important by Inspecting Authority other than Annex B may also be conducted in order to check its suitability.

0112. **DRAWING OF BUCKLE BRASS SAMPLES FROM LOTS/BATCHES**

1. Sample quantity will depend upon lot/batch quantity. Samples quantity will be as per Annex E or based on 100% Inspection as here to fore depending on discretion of Inspecting Authority.

0113. **TENDER SAMPLE**

1. Tender sample to be approved by TSR Committee.
2. For each contract 05 samples of Buckle Brass shall be supplied by the manufacturer at the time of tendering along with samples of materials used in manufacturing of Buckle.

0114. **ADVANCE SAMPLE**

1. Advance sample or pre-production sample, when required, shall be submitted in accordance with terms of the contract for inspection and testing as per B, C, D and E and approved by CINS. The minimum quantities required are 10 x Nos along with samples of materials used in manufacturing of Buckle Brass as mentioned above.
2. Whenever Tender, Advance or pre-production sample is not required, the suppliers /manufacturer are advised in their own interest to submit to the Inspecting Officer or his representative an initial delivery of One % of the contract or 10 x Nos along with samples of accessories/ materials for inspection and testing.
3. The approval of the sample, authorizes the commencement of bulk production but does not relieve the suppliers/ manufactures from compliance with all the provisions of this specification.
4. One approved sample shall be properly sealed by INS and returned to the firm for guidance; rest of the approved sample shall be retained by INS for future use in bulk Inspection (if deemed necessary).
5. The Pre-production sample shall be manufactured by the manufacturer with the same facilitates which will be used for manufacture of the bulk items.
6. Firm shall provide advance sample along with quality verification reports from an accredited laboratory, whenever asked/ required by Inspecting authority to ensure compliance of quality assurance parameters during production/ final internal inspection.

0115. **INSPECTION**

1. **Bulk Representative Sample** (B/R) random sampling will be carried out as per rules in vogue.
2. **Bulk Inspection** Bulk inspection will be carried out after satisfactory completion of Visual Examination and Testing of B/R Sample as per Annex B, C and D.
3. **Inspection Of Buckle Brass.** 100% of the offered store shall be inspected. The guide lines for such examination/inspection are listed at Annex E Stage inspection of Buckle Brass may be carried out as considered appropriate by CINS
4. **Inspection/ Acceptance and Rejection of Stores.** Inspection/ acceptance is to be carried out to the entire satisfaction of Chief Inspector of Naval Stores or as per instruction/ procedure laid down in unit/department Standing Order

- a. The Buckle Brass shall be examined for the correctness of material, shape, design, dimension, size, workmanship and finish.
- b. Buckle Brass shall be inspected especially for pits, blemishes, stains, discoloration. Fine edges and uniform, coating of Buckle Brass are to be especially checked.
- c. CINS reserves the right to reject the whole supply in case, upon examination, material or packing of any sample or portion of the consignment is found NOT CONFORMING to this specification. All stores and packing NOT fully in accordance with this specification shall be rejected.
- d. If on examination of 5% of any delivery, 20% of those examined from bulk supply are found NOT CONFORMING to this specification in respect of the pattern, dimensions, workmanship and finish, the whole consignment may be rejected without any compromise.
- e. All stores and packing NOT fully in accordance with this specification shall be rejected.
- f. Buckle Brass with major/minor defects as described in Annex D of this specification will be rejected.

5. **Responsibility for Inspection.** The supplier is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. PN reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

6. **Responsibility for Compliance.** The inspection set forth in this specification shall become a part of the supplier'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 PN 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 PN to acceptance of defective stores (material).

7. **Replacement by the Contractor.** The supplier /manufacture is responsible for replacement of the consignment or any part thereof whenever it is found to be not conforming to this specification or does not curtail its quality till the useful life of an item. . The supplies so tendered in replacement, shall be subjected to testing/Inspection and acceptance by the Inspecting Officer.

8. **Responsibility for Safety.** The supplier/manufacture is wholly responsible for the safety of supplies during inspection, storage at firm's premises, proper packing, dispatch and delivery up to consignee.

9. The CINS is the authority in all matters pertaining to Inspection.

0116. **STAMPING OF ACCEPTED/ REJECTED STORES BY THE INSPECTOR.**

1. While stamping of accepted/ rejected stores following instructions are to be followed:
 - a. **Stamping of Accepted Stores.** The acceptable Buckle Brass shall be stamped with Inspector's Individual Acceptance Mark's on inside of the quarter right side or as per instructions of inspecting officer. The stamping shall be legible.
 - b. **Stamping of Rejected Stores.** The rejected Buckle Brass shall be marked with Inspector's Rejection Mark to avoid re-submission by the supplier.
 - c. The Inspector is the authority in all matters pertaining to inspection.

0117. **PACKING DETAILS**

1. Each Buckle Brass shall be packed in a butter paper and polythene sheet. Same will be inspected as per Annex E or will be carried out as per instructions/order of Chief Inspector of Naval Stores After inspection 200 accepted Buckle Brass shall be further packed in cardboard boxes along with packing list.

0118. **IDENTIFICATION LABEL**

1. Each Buckle Brass shall bear following minimum information written on polyethylene packing:
 - a. Item name/ item description with size and NSN/ Patt no.
 - b. Contract number and Date.
 - c. Year of manufacture.
 - d. Firm's name, initials, or trade mark.
 - e. Batch no.

0119. **PACKING LIST**

1. Firm is bound to provide a packing list of store offered for inspection along with the challan, which include complete details about the store i.e. Pattern No., Description of stores, size, quantity, contract No., and Date, Challan No. date and I/Note No. or voucher no. and date, consignee, Manufacturer/ firm's name, date of packing and packer's signature, QA certificate /Lab test report from any accredited lab.

0120. **MARKING OF STORES**

1. In addition to any special marking required by contract or order, the marking of packages shall be stenciled with quick drying Black ink/ Paint in accordance with Specification No. NS/MISC/002/80 with clearly defined characters as described below:
 - a. On Front and Top
 - (1) Consignee Address.
 - (2) Contract No and date.

- (3) Description of Stores Packed and NSN/Patt No.
- (4) Stowage / Stacking Instructions.
- (5) Quantity of the Item packed.
- (6) Signature along with stamp of Packaging Manager/ rep of firm.

b. On Back

- (1) Manufacturers name / Firm's name.
- (2) Voucher No. or inspection note no. and date.
- (3) The No. of individual Package and the total No of Packages in the consignment joined by the word 'of 'e.g. 2 of 300.
- (4) Weight of the package.
- (5) Month and year of packing.
- (6) Destination i.e. Railway station/ (Navy).

0121 **DELIVERY**

1. The consignment of store will be delivered in accordance with the terms of contract.
2. The store shall be delivered in Brand new, clean and dry condition.
3. The contractor/ manufacturer is fully responsible for the safety of the supplies during inspection, stage inspection, storage at firm's and consignee premises, proper packing, dispatch and delivery up to consignee.

XXXXXXSDXXXXX

MUHAMMAD AFSAR
Captain Pakistan Navy
DID

Annexes:

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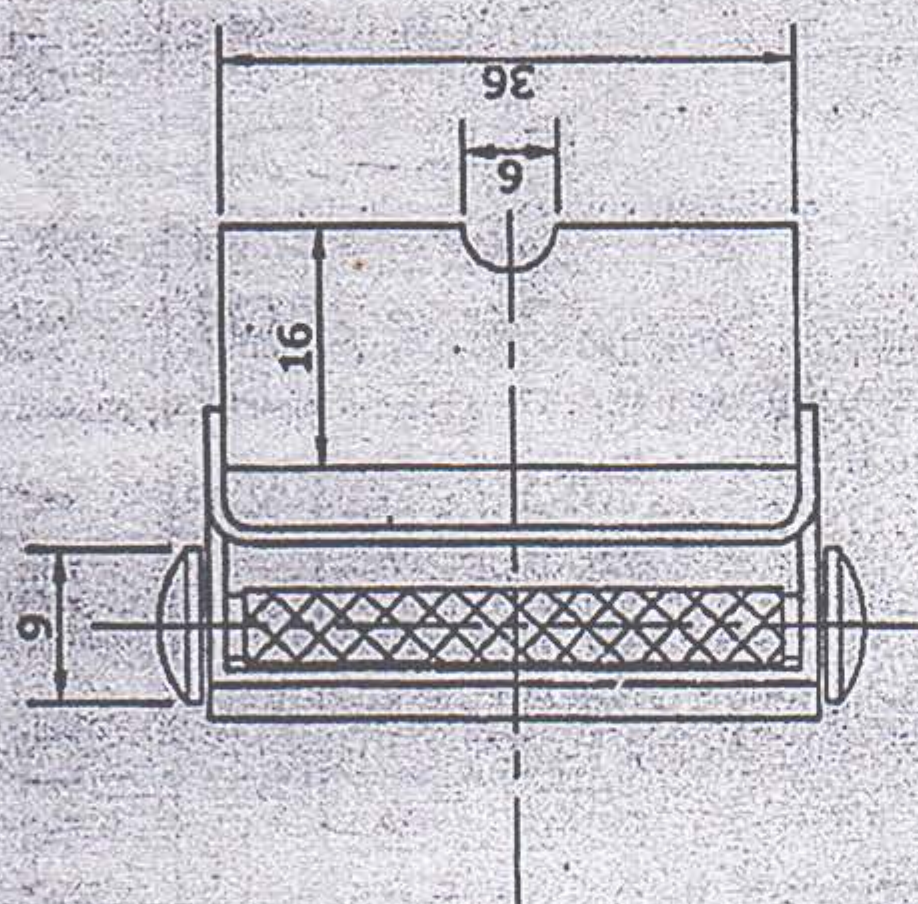
TERMS & DEFINITIONS

1. **CINS:** Chief Inspector of Naval Stores
2. **DITD :** Directorate of Indigenous Technical Development
3. **DNS:** Directorate of Naval Store.
4. **PNCSD:** Pakistan Navy Clothing Store Depot
5. **PNCTA:** Pakistan Navy Central Testing Authority
6. **Inspector:** The term inspector shall include the “inspection Authority”, inspecting officer and their representatives, duly authorized for the purpose of discharging inspection duties involved.
7. **Inspection Authority:** Chief Inspector of Naval Stores (CINS). His verdict in respect of Sealed Inspection matters is to be taken as final.
8. **Inspecting Officer:** An officer nominated by the CINS for carrying out inspection of stores supplied by the supplier, against a specified contract or order, in accordance with the particulars stipulated therein.
9. **Acceptance Quality Level (AQL):** It represent allowable limit/ tolerance of defects or non-conformities in an offered store/ lot/batch. It represent in percentage, also known as Allowable Quality Limits.
10. **Minor Defects:** They are small insignificant issues that don't affect the function or form of the item. Highest tolerance of AQL has been set for minor defects.
11. **Major Defects:** They would likely result in product return but don't poses safety risk. AQL tolerance depend upon the description/ quality of finished product.

TECHNICAL DETAILS OF BUCKLE BRASS

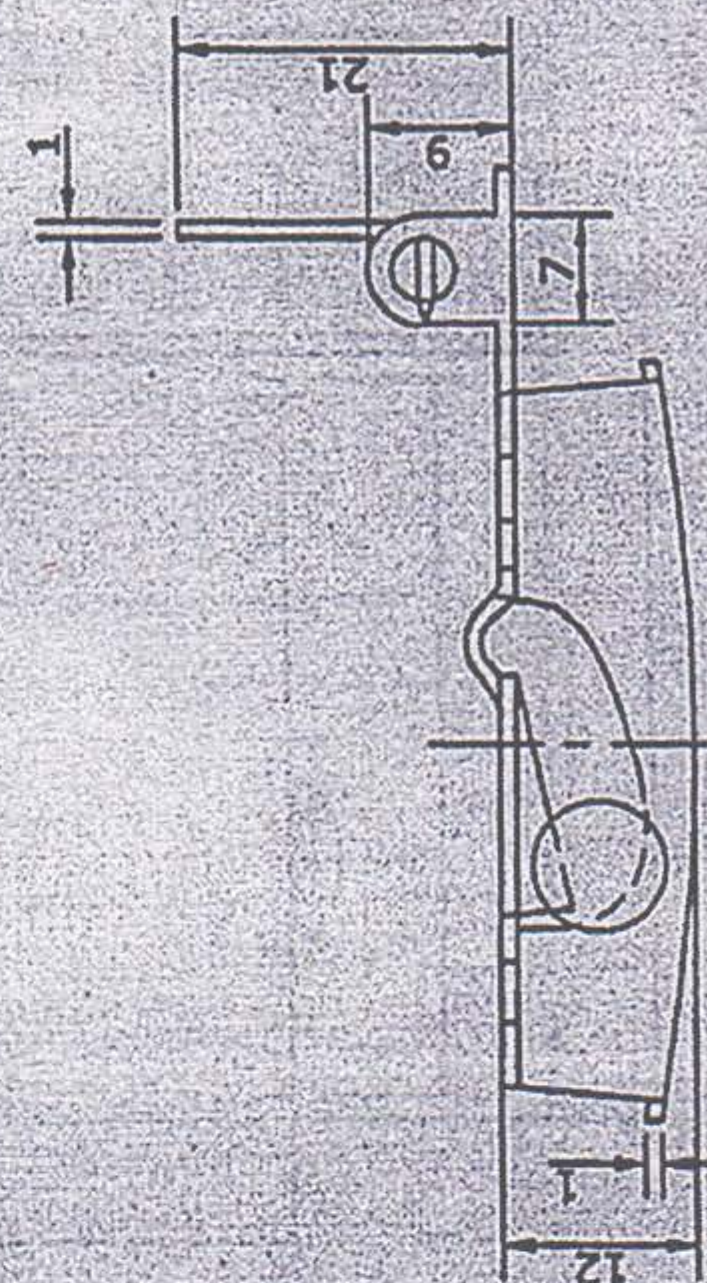
| S NO | ITEM | REQUIREMENT |
|-----------|-----------------------------------|------------------------------------|
| 1. | Material | Composition% |
| a. | Aluminum | <0.005 |
| b. | Magnesium | <0.002 |
| c. | Iron | 0.05- 0.07 |
| d. | Nickel | 0.01 - 0.02 |
| e. | Tin | 0.01 - 0.02 |
| f. | Silicon | <0.005 |
| g. | Lead | < 0.15 % |
| h. | Zinc | 35 ± 1% |
| i. | Copper | 65 ± 1% |
| 2. | Buckle | |
| a. | Material | Yellow Brass |
| b. | Grade | Cz 107 (BSI No) C26800 (UNS No) |
| c. | Thickness | 16± 1 SWG |
| 4. | Securing/Locking Mechanism | As per drawing attached at Annex C |

FRONT VIEW



SIDE VIEW

1362



TOP VIEW

NOTE:
FOR FURTHER DETAILS SEE STOCK/APPROVED SAMPLE

EDITD KARACHI

TABLE:

BUCKLE UP! BRASS (CPOs, Sailors)

| | | |
|----------|--------------|----------------|
| DWG. NO. | TD-2555/2021 | DIMENSIONS: mm |
|----------|--------------|----------------|

| | | |
|-------|------------|--------|
| DATE: | 19-02-2021 | SCALE: |
|-------|------------|--------|

| | | |
|----------|------------|-------------|
| DRAWN BY | CHECKED BY | APPROVED BY |
| | | |

HDM /
M.ASGHAR
1/c DWG

LT PW
SANA KANWAL
SO TEX

LT CORPN
M SHAHZAD
DD ID

ANNEX D TO DITD**PN SPECIFICATION NO 01/2021****PROMULGATION DATE 23 AUG 21****GENERAL DEFECTS**

| Defect | Description | Major | Minor |
|-------------------------------|--|--------------|--------------|
| Blowhole | Cavities either pinhole or subsurface created by entrapping gases, which result in oval or round cavity. | X | |
| Flow marks | These are marks left on the surface of the casting due to poor gating, sharp corners, or excessive lubricant. | X | |
| Cold shuts | This defect can be caused by cold dies, low metal temperature, dirty metal, and lack of venting or too much defect. | X | |
| Misran | It is a kind of incomplete casting defect. The edge of the defect is round and smooth. When the metal is unable to fill the mould cavity completely and thus leaving unfilled portion. | X | |
| Gas porosity | Air present in the cavity before shot. It can be easily trapped as the metal starts to fill the cavity. | X | |
| Mismatch | Mismatch in mold defect is because of the shifting molding flashes. It will cause the dislocation at the parting line. | X | |
| Flash | It is unwanted excess metal which comes out of die attached. | X | |
| Cracks or tears | Cracks appear on the surface of casting. | X | |
| Shrinkage defect | It occurs when standard feed metal is not available to compensate for shrinkage as the thick metal solidifies. | X | |
| Incorrect dimension and shape | Dimension and shape of casting is incorrect. | X | |
| Improper packing | Packing is not as specified in the specifications. | X | |
| Identification label | Identification labels not present. | X | |
| Improper marking | Marking not as per standard. | X | |

ANNEX E TO DITD**PN SPECIFICATION NO. 01/2021****PROMULGATION DATE 23 AUG 21**

Acceptable Quality Levels (AQLS)
Materials and Finished Buckle Brass

1. Acceptable Quality Level (AQL) is maximum average defective items in a lot or limit / percentage of defective items in product /offered store. It is expressed in a percentage. Number of average defective items is determined by following formula:

$$\text{Average defective item} = \frac{\text{No.of defective item found during inspection}}{\text{Total no.of item to be inspected}} \times 100$$

2. AQL process: it is used for inspection of finished product by the QC professionals. AQL standard is depend on the quality of the product to be inspected, random sampling, and experience of inspector Following AQL table is used to determine lot size/ offered store quantity, least No. of sample to be inspected, AQL %, and acceptance & rejection points:

| <u>Lot/Batch Size</u> | <u>Sample Size</u> | <u>Materials</u> | | <u>Finished Buckle</u> | | | | | |
|------------------------------|---------------------------|-------------------------|------------------|--|------------------|------------------|------------------|------------------|------------------|
| | | | | <ul style="list-style-type: none"> Acceptable/ sample (Ac) Rejected /Exceed allowable limit of defective item (Re) | | Allowable | | defective | |
| | | | | Critical Defects | | Major Defects | | Minor Defects | |
| | | <u>Ac</u> | <u>Re</u> | <u>Ac</u> | <u>Re</u> | <u>Ac</u> | <u>Re</u> | <u>Ac</u> | <u>Re</u> |
| 2 - 8 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 9 ~ 15 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 16 ~ 25 | 5 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 2 |
| 26 ~ 50 | 8 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 2 |
| 51 ~ 90 | 13 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 3 |
| 91 ~ 150 | 20 | 1 | 2 | 1 | 2 | 2 | 3 | 3 | 4 |
| 151 ~280 | 32 | 2 | 3 | 2 | 3 | 3 | 4 | 5 | 6 |
| 281 ~ 500 | 50 | 3 | 4 | 3 | 4 | 5 | 6 | 7 | 8 |
| 501 ~ 1200 | 80 | 5 | 6 | 5 | 6 | 7 | 8 | 10 | 11 |
| 1201 ~ 3200 | 125 | 7 | 8 | 7 | 8 | 10 | 11 | 14 | 15 |
| 3201 ~ 10000 | 200 | 10 | 11 | 10 | 11 | 14 | 15 | 21 | 22 |
| 10001 ~ 35000 | 315 | 14 | 15 | 14 | 15 | 21 | 22 | 21 | 22 |
| 35001 ~ 150000 | 500 | 21 | 22 | 21 | 22 | 21 | 22 | 21 | 22 |
| 150001 ~ 500000 | 800 | 21 | 22 | 21 | 22 | 21 | 22 | 21 | 22 |
| 500001 ~ Over | 1250 | 21 | 22 | 21 | 22 | 21 | 22 | 21 | 22 |

3. If the inspector have time constrain then AQL is beneficial/ helpful in inspection of whole lot/ offered store. It safe time, cost and give effective/ statistical result of product /offered store.

e.g. If inspector needs 5 minutes to check the item , the quantity to be inspected is 2,500 items then it took 208 hours to check the whole consignment/ offered store. It means 26 days approx. for one store. Calculation is as follows:

$$\frac{5 \text{ min} \times 1 \text{ hr}}{1 \text{ item} \times 60 \text{ min}} \times 2,500 \text{ items} = 208.33 \text{ hrs} \cong 26 \text{ days}$$

After Implementing AQL standard so the sample taken from the lot/ offered store is 200 items/ sample:

$$\frac{5 \text{ min} \times 1 \text{ hr}}{1 \text{ item} \times 60 \text{ min}} \times 2,00 \text{ items} = 16.66 \text{ hrs} \cong 02 \text{ days}$$

4. Quality parameters/ AQL limits may be defined by Inspecting Authority (if deemed appropriate) and communicate to the manufacturer, so the manufacturer set their quality levels (AQL limits) accordingly for their internal audit. Therefore, good quality product is ready for inspection.

ANNEX F TO DITD
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FEED BACK FORM

Item Designation: _____

Pattern #: _____

Parent Equipment: _____

PN SPEC #: _____

Problem Faced: _____

Technical Solution: _____

Financial Effect (if any): _____

Name Stamp

COUNTERSIGNED

Name Stamp

Blank Page

PN SPECIFICATION 01/2021