



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 90.1-2023

Fasteners - Acceptance inspection

紧固件 验收检查

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1 Scope

GB/T 90.1-2023 specifies the acceptance inspection of fasteners. Fasteners are bought by the million and inspected by sample, so the whole commercial relationship rests on a sampling plan: how many bolts are drawn from a lot, what constitutes a failure, and what happens when the purchaser's result disagrees with the supplier's. The standard exists for the case where the parties did not agree any of this in advance, which is the usual case. It sets the inspection procedures the purchaser uses without prior agreement and the arbitration procedure for accepting or rejecting a lot when the parties cannot agree or when conformity with the specification is disputed, together with the inspection results and their disposition, with informative annexes on the basis of the sampling plans and their operating characteristic curves. It took effect on 1 December 2023.

This document specifies the inspection procedures to be used by the purchaser without prior agreement, and specifies the arbitration acceptance procedures for inspection lot acceptance or rejection when no agreement can be reached between the purchaser and the supplier or when there is a dispute over compliance with the technical specification. This document applies to acceptance inspection of bolts, screws, studs, nuts, pins, washers, rivets and other related fasteners. This document does not apply to fasteners for high-speed mechanical assembly, special purpose applications, or special engineering applications requiring more advanced process control and lot traceability. For process control or final inspection of manufacturing and sorting, see GB/T 90.3.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their

content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 2828.1, Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (GB/T 2828.1-2012, ISO 2859-1:1999, IDT)

GB/T 3099.4, Terminology of fasteners - Control, inspection, delivery, acceptance and quality (GB/T 3099.4-2021, ISO 1891-4:2018, MOD)

GB/T 3358.2, Statistics - Vocabulary and symbols - Part 2: Applied statistics (GB/T 3358.2-2009, ISO 3534-2:2006, IDT)

3 Terms and definitions

For the purpose of this document, terms and definitions determined by GB/T 2828.1, GB/T 3099.4 and GB/T 3358.2, as well as the following apply.

5 Fastener acceptance inspection procedures

5.1 General requirements The requirements of this document apply to the fasteners in the delivery state of the supplier, that is, the delivery state of the fasteners has not been changed. If the purchaser changes the delivery state of the fastener or reprocesses it, the purchaser shall bear the responsibility for changes in the consistency of characteristics caused by such processing. The acceptance inspections specified in this document apply after receiving the fasteners and before releasing the lot to any subsequent processing. Inspections carried out in accordance with this document shall be as specified in Tables 1 and 2. Any non-conforming, once found during the inspection, shall be dealt with according to the requirements of

6.2 and/or 6.3. Before any disposition, the purchaser shall give the supplier the opportunity to verify any unverified nonconformity.

5.2 Inspection procedures

5.2.1 General The purchaser may choose this document to verify whether the fastener meets the technical requirements of the product standard or other specified requirements.

5.2.2 Sample size The sample size shall be based on the number of inspection lots specified in Table 1. If the sample size is larger than the number of inspection lots, non-destructive testing requires 100% inspection. The sample size n , the acceptance number A_c and the rejection number R_e shall be determined separately for each selected characteristic.

10 Limiting quality at 10% probability of acceptance, % AQL

95 Acceptance quality limit at 95% probability of acceptance, % N Lot size Pa Probability of acceptance, %

Appendix A

(Informative) Basic information of sampling plans Acceptance inspection is generally carried out by the purchaser to confirm whether the production of the delivered fasteners meets the technical specifications. Table 1 provides the acceptance inspection sampling plans for the three categories of characteristics based on different statistical methods. Different statistical methods have different risk results for the purchaser and the supplier. The party conducting the acceptance inspection is responsible for selecting the sampling plan and appropriate tests. Category 1 characteristics are mechanical properties that are critical to the function of the fastener. It is assumed that a deviation in process parameters during lot production will result in a substantial proportion of non-conformity of the lot and is expected to be detected in a small sample. Based on the above assumptions, the acceptance inspection sampling plans for Category 1 characteristics require acceptance number $A_c=0$, and do not provide statistical information. When non-conformity is found, verification is required to reach agreement on the disposition of the lot (see Chapter 6). Category 2 characteristics are dimensional characteristics that affect the usability of the fastener. It is assumed that the properties due to normal variation of the production process satisfy a statistical distribution. The sampling plans for Category 2 characteristics are based on the acceptance number $A_c=0$; however, a single non-conformity does not automatically require rejection of the lot. An additional sampling with the same acceptance number $A_c=0$ increases the confidence in lot consistency while avoiding rejection based on the detection of a single non-conformity. The sample size selected for Category 2 characteristics must meet the "consumer risk" similar to the AQL=