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Quality vocabulary —

Part 2: Quality concepts and related definitions

Committees responsible for this British Standard

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- Associated Offices Technical Committee
- British Telecommunications plc
- Chemical Industries' Association
- EEA (The Association of Electronics, Telecommunications and Business Equipment Industries)
- Institute of Quality Assurance
- Institution of Electrical Engineers
- National House-building Council

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Foreword

This Part of BS 4778 has been prepared under the direction of the Quality, Management and Statistics Standards Policy Committee. Together with BS 4778-3.1:1991 it is a revision of BS 4778-2:1979 which is withdrawn.

The changes in this revision are concerned mainly with the transfer of terms related to reliability, maintainability and availability to BS 4778-3.1.

BS 4778-1 contains terms accepted and published by the International Organization for Standardization (ISO) through its technical committee ISO/TC 176 Quality Management and Quality Assurance and is identical with ISO 8402.

This Part of BS 4778 duplicates some definitions given in Part 1 and adds concepts of the terms. Concepts are not at present a feature of the ISO Vocabulary.

BS 4778 is published in three Parts as follows.

- *Part 1: International terms;*
- *Part 2: Quality concepts and related definitions;*
- *Part 3: Availability, reliability and maintainability terms.*

Earlier editions of BS 4778 were arranged in a conceptual format which provided additional explanation and perspective for the major terms defined, as well as the formal definitions themselves. Many users found this conceptual approach helpful and this has been retained in this edition and in Section 3.1. BS 4778-1 and Section 3.2 do not currently include concepts.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

0 Introduction

This Part of BS 4778 gives concepts and defines terms that are in general use in the related fields of quality assurance, quality management, quality control and inspection. It is concerned only with terms that have a special meaning when used in the above environments.

Terms defined in previous editions of this Part of BS 4778 and not appearing in this edition are to be found in other Parts of BS 4778 or in appendix A.

Terms that are defined in BS 4778-1, and which by their omission would leave an unacceptable gap in the content of this Part of BS 4778, are given the same definition as in Part 1 and are identified as repeat definitions by the inclusion of the source in parentheses.

1 Scope

This Part of BS 4778 gives, in a structured form, concepts, terms and definitions designed to aid communication in quality control, quality assurance and quality management.

NOTE The titles of the publications referred to in this standard are listed on page 20.

2 Arrangement

2.1 General

The definitions have been arranged by concepts instead of alphabetically: also many of the principal interface terms are preceded by an explanation of the concepts on which the definitions are based.

Many of the terms used in quality assurance are ordinary words which are used in a special or restricted way compared with the full range of dictionary definitions, not all of which may be appropriate (see appendix A).

Where a term and its definition have been reproduced from another Part of BS 4778, the source document is indicated immediately after the term, e.g. **quality** (BS 4778-1).

The following abbreviations are used in the vocabulary:

IEV, International Electrotechnical Vocabulary;
AQL, Acceptable quality level;
AOQL, Average outgoing quality limit;
IEC, International Electrotechnical Commission;
ISO, International Organization for Standardization.

2.2 Terms which merit special note

2.2.1 Defect

Care should be taken in the use of this term. In the United Kingdom the term is frequently used for a product or service that is found to be unfit for its intended usage. Some national and international glossaries relate defect to a condition that renders an item unsafe or incapable of meeting functional or other customer expectation.

The IEC concept of a defect relates to all conditions that can give rise to losses and product liability. Legislation varies widely from one authority to another.

It appears likely that the definition of defect will remain under review for some considerable time and caution should be exercised in the use of this term.

The term should not be used as a general term and it would be prudent to avoid its use altogether if possible.

2.2.2 Item

Differing definitions of and associated notes on the term item appear in BS 4778-3.2 and BS 5532-1. This is mainly due to translation problems at the international level, but it is hoped that the differences can be resolved in future editions. The notes accompanying the definition of item in **191-01-01** of BS 4778-3.2:1991 explain this problem succinctly and allow the French version to use the term "entité" while the English version uses the term "item". This concept is extended to derived compound terms.

3 Related standards and publications

The following documents extend or amplify some of the aspects of quality covered by this document.

BS 600, *The application of statistical methods to industrial standardization and quality control*.

BS 2564, *Control chart technique when manufacturing to a specification, with special reference to articles machined to dimensional tolerances*.

BS 2846, *Guide to statistical interpretation of data*.

Part 1: Routine analysis of quantitative data;

Part 2: Estimation of the mean: confidence interval;

Part 3: Determination of a statistical tolerance interval;

Part 4: Techniques of estimation and tests relating to means and variances;

Part 5: Power of tests relating to means and variances;

Part 6: Comparison of two means in the case of paired observations;

Part 7: Tests for departure from normality;

BS 4891, *A guide to quality assurance.*

BS 5532, *Statistical terminology.*

Part 1: Glossary of terms relating to probability and general terms relating to statistics;

Part 3: Glossary of terms relating to the design of experiments;

BS 5701, *Guide to number-defective charts for quality control.*

BS 5703, *Guide to data analysis and quality control using cusum techniques.*

BS 5750, *Quality systems.*

Part 0: Principal concepts and applications;

Section 0.1: Guide to selection and use;

Section 0.2: Guide to quality management and quality system elements;

Part 1: Specification for design/development, production, installation and servicing;

Part 2: Specification for production and installation;

Part 3: Specification for final inspection and test;

Part 4: Guide to the use of BS 5750-1, "Specification for design/development, production, installation and servicing", Part 2 "Specification for production and installation" and Part 3 "Specification for final inspection and test";

BS 5760, *Reliability of systems, equipment and components.*

Part 0: Introductory guide to reliability.

Part 1: Guide to reliability and maintainability programme management.

Part 2: Guide to the assessment of reliability.

Part 3: Guide to reliability practices: examples.

Part 4: Guide to specification clauses relating to the achievement and development of reliability in new and existing items.

Part 5: Guide to failure modes, effects, and criticality analysis (FMEA and FMECA).

BS 5781, *Measurement and calibration systems.*

BS 6000, *Guide to the use of BS 6001, sampling procedures and tables for inspection by attributes.*

BS 6001, *Sampling procedures for inspection by attributes.*

Part 1: Specification for sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection.

Part 2: Specification for sampling plans indexed by limiting quality (LQ) for isolated lot inspection.

Part 3: Specification for skip-lot procedures.

BS 6002, *Specification for sampling procedures and charts for inspection by variables for percent defective.*

BS 7229, *Guide to quality systems auditing.*

Part 1: Auditing;

Part 2: Qualification criteria for auditors;

Part 3: Managing an audit programme;

BS 7373, *Guide to the preparation of specifications.*

EOQC Glossary¹⁾ *Glossary of terms used in the management of quality.*

¹⁾ European Organization for Quality, P.O. Box 5032, CH-3001 Bern, Switzerland.

Section 2. Basic terms

4 Quality

4.1 Concept of quality

The word quality is used for several distinct purposes:

- a) in a comparative sense as degree of excellence, whereby products may be ranked on a relative basis, sometimes referred to as grade (see BS 4778-1);
- b) in a quantitative sense as in manufacturing, product release and for technical evaluations, sometimes referred to as quality level (see 8.1.7);
- c) in a fitness-for-purpose sense which relates the evaluation of a product or service to its ability to satisfy a given need.

Within the context of this Part of BS 4778 and in accordance with established usage in the quality assurance field the word quality is used in the fitness-for-purpose sense as defined in 4.1.1.

In order to improve communication and distinguish precisely between these three principal uses, it is recommended that the concept of grade and quality level be utilized as appropriate to avoid confusion, ambiguity and misunderstanding.

4.1.1 *quality* (BS 4778-1)

The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

NOTE 1 In a contractual environment needs are specified, whereas in other environments implied needs should be identified and defined.

NOTE 2 In many instances, needs can change with time; this implies periodic revision of specifications.

NOTE 3 Needs are usually translated into features and characteristics with specified criteria. Needs may include aspects of usability, safety, availability, reliability, maintainability, economics and environment.

NOTE 4 The term “quality” is not used to express a degree of excellence in a comparative sense nor is it used in a quantitative sense for technical evaluations. In these cases a qualifying adjective shall be used. For example, use can be made of the following terms:

- a) “relative quality”, where products or services are ranked on a relative basis in the “degree of excellence” or “comparative” sense;
- b) “quality level” and “quality measure” where precise technical evaluations are carried out in a “quantitative” sense.

NOTE 5 Product or service quality is influenced by many stages of interactive activities, such as design, production or service operation and maintenance.

NOTE 6 The economic achievement of satisfactory quality involves all stages of the quality loop (quality spiral) as a whole. The contributions to quality of the various stages within the quality loop (quality spiral) are sometimes identified separately for emphasis. Two examples: “quality attributable to design”, “quality attributable to implementation”.

NOTE 7 In some reference sources, quality is referred to as “fitness for use” or “fitness for purpose” or “customer satisfaction” or “conformance to the requirements”. Since these represent only certain facets of quality, fuller explanations are usually required that eventually lead to the concept defined above.

4.2 Concept of defect

The term defect is applied to a product or service which does not fulfil its intended use. There are different views on the use of the term, particularly with regard to its product liability connotation and the possibility of a defect leading to the creation of a hazardous condition (critical defect).

The difference between a nonconformity and a defect is that a product or service which has a nonconformity is not in accordance with the specified requirement, but this does not necessarily cause the product to be defective. For example, a house brick which is outside its specified dimension by 5 mm small or large is a nonconformity, but it can still be used for building purposes.

Care should be taken that a series of nonconformities or imperfections do not accumulate to render an item unfit for use and therefore defective.

The term should not be used as a general term and it would be prudent to avoid its use altogether if possible.

4.2.1 *defect* (BS 4778-1)

The nonfulfilment of intended usage requirements.

NOTE 1 The definition covers the departure or absence of one or more quality characteristics from intended usage requirements.

NOTE 2 The basic difference between “nonconformity” and “defect” is that specified requirements may differ from the requirements for the intended use.

4.2.2 *critical defect*

A defect that analysis, judgement and experience indicate is likely to result in hazardous or unsafe conditions.

4.3 Concept of quality assurance

The term quality assurance can be applied by those seeking assurance of either other organizations, who may be potential or existing suppliers of product or service, or the organization or part of the organization that is under their control.

The systems and procedures that are required for quality assurance are those necessary to satisfy an internal or external customer.

It should be noted that the systems and procedures may contain many elements in addition to the minimum needed for quality assurance.

NOTE A register of organizations that satisfy the British Standard requirements for quality assurance set out in BS 5750-1, 2 or 3 is maintained and is available from the Department of Trade and Industry.

4.3.1 *quality assurance* (BS 4778-1)

All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.

NOTE 1 Unless given requirements fully reflect the needs of the user, quality assurance will not be complete.

NOTE 2 For effectiveness, quality assurance usually requires a continuing evaluation of factors that affect the adequacy of the design or specification for intended applications as well as verifications and audits of production, installation and inspection operations. Providing confidence may involve producing evidence.

NOTE 3 Within an organization, quality assurance serves as a management tool. In contractual situations, quality assurance also serves to provide confidence in the supplier.

4.3.2 quarantine store

A secure place in which supplies may be held pending a decision on their disposition.

4.3.3 bonded store

A secure place to which access is restricted to authorized persons only.

4.3.4 certification

The authoritative act of documenting compliance with requirements.

NOTE The requirements can relate to personnel, processes, products, organizations and services.

4.3.5 certification body

An impartial body, governmental or non-governmental, possessing the necessary competence and integrity to operate a certification system, and on which the interests of parties concerned with the functioning of the system are represented.

4.3.6 certification system

A system having its own rules of procedure and management for carrying out certification.

4.3.7 Certificate of conformance/conformity

A document signed by a qualified party affirming that, at the time of assessment, the product or service met the stated requirements.

NOTE Release certificate, release note and certificate of compliance are also considered to be synonymous with certificate of conformance/conformity.

4.3.8 capability approval

The status given to a supplier for a range of items or services for which it has been shown that his declared design rules, manufacturing processes and quality system are capable of producing items or services, the quality of which meets the specified requirements.

5 Management

5.1 Concept of quality management

To be successful any company or organization needs to have defined policies and objectives together with the necessary operational system to effect these aims in the provision of their product or service. For this operation to run efficiently and effectively requires there to be appropriate levels of management and control in the technical, administrative and personnel areas. A primary concern has to be the quality of the products or services supplied, which should be a key aspect of the organization's policy. The determination and implementation of the quality policy will itself require management.

The responsibility for and commitment to a quality policy belongs to the highest level of management. The attainment of quality involves all members of the organization operating in a system for quality, embracing planning, resourcing and operations, including quality measurement, from market research through to product or service delivery.

5.1.1 quality management (BS 4778-1)

That aspect of the overall management function that determines and implements the quality policy.

5.2 Concept of total quality management (TQM)

The word total used in this term refers to the concept of management and should not be confused with the totality of features and characteristics found in the definition of quality (see 4.1.1).

Total quality management (TQM) recognizes that customer satisfaction and business objectives are inseparable. It is applicable within any organization.

It assures maximum effectiveness and efficiency within an organization by putting in place processes and systems which will ensure that every aspect of its activity is aligned to satisfying customer needs and the organization's objectives without waste of effort by releasing the full potential of every person in the organization.