UDC 669.14/.15 : 62-034.14/.15 : 001.4 : 620.1 June 1985

General technical delivery conditions for steel and steel products

DIN 17 010

Allgemeine technische Lieferbedingungen für Stahl und Stahlerzeugnisse

Supersedes January 1984 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

See the Explanatory notes for connection with International Standard ISO 404 – 1981 published by the International Organization for Standardization (ISO) and with EURONORM 21 published by the European Coal and Steel Community (ECSC).

1 Scope

1.1 These general technical delivery conditions apply

a) to hot and/or cold formed steel products, except for forged parts and pipes, and also

b) to crude steel products[1],

unless other delivery conditions were agreed at the time of ordering, for example conditions specified in quality standards or dimensional standards.

1.2 The general technical delivery conditions given in DIN 1690 Part 1 apply to castings made of metallic materials, and the technical delivery conditions given in DIN 7521 apply to forged parts.

2 Concepts

2.1 The concepts defined in EURONORM 20 shall apply for the distinction between steel and other materials and for the classification of steel grades into carbon steels and alloy steels and also into basic steels, quality steels and special steels.

2.2 The concepts defined in EURONORM 79 shall apply for the classification and designation of steel products according to their stage of manufacture, shapes and dimensions.

2.3 The concepts defined in DIN 17 014 Part 1 shall apply for the designation of types of heat treatment of steel products.

3 Ordering

3.1 The purchaser shall select the steel grade, the shape of the product and the dimensions, taking the intended processing and use into account. He may take the manufacturer's advice in making his choice.

3.2 The order shall provide all the information[2] necessary for describing the product required and its properties such as

- the steel grade,
- the shape of the product,
- the dimensions,

and, if required, technical data such as

- heat treatment condition,
- surface treatment and finish,
- permissible dimensional deviations and deviations in mass.

3.3 If the products ordered are standardized the information shall be specified by making reference to the appropriate standard. In the absence of a standard, the requirements shall be exactly specified.

3.4 The products may be ordered with or without documents on materials testing in accordance with DIN 50 049 being required. If, in the order, an inspection certificate is required, the relevant test conditions shall be specified by making reference to a standard or to a technical delivery condition. If this is not possible, the following shall be specified in the order, for example:

- product characteristics to be verified;
- type, size and composition of the acceptance unit (see subclause 6.2.2) including remainders;
- sampling;
- scope of test programme.

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1) See EURONORM 79 for definition of concepts.

2) See also the following for basic and quality steels: *Richtlinien für die Verwendung von Bestellvordrucken für Walzstahl* (Guidelines on the use of printed order forms for rolled steel), published by *Verlag und Vertriebsgesellschaft mbH*, Breite Strasse 69, D-4000 Düsseldorf.

Continued on pages 2 to 9

3.5 Other conditions for acceptance of the products supplied should also be specified in the order by referring, as far as possible, to existing standards and to technical delivery conditions.

3.6 If, in an order, reference is made to a standard or to a technical delivery condition without specifying its date of issue, delivery shall be effected taking the edition current at the time of ordering as the basis.

4 Manufacturing process

4.1 Unless otherwise agreed at the time of ordering, the choice of the manufacturing process is left to the discretion of the manufacturer.

4.2 The following are regarded as "manufacturing processes":

- the steelmaking process,
  e.g. oxygen process, open-hearth process, electric furnace process;
- the type (state) of deoxidation,
  e.g. rimming, killed, specially killed;
- the type of casting,
  e.g. ingot casting, continuous casting;
- the shaping and heat treatment process.

4.3 Details of the manufacturing process are only to be made known to the purchaser, if this is agreed at the time of ordering.

5 Requirements

5.1 The requirements set in the standards or technical delivery conditions agreed at the time of ordering shall be applicable to the material and the product.

5.2 Requirements regarding the chemical composition shall be considered requirements regarding the cast analysis, unless they refer expressly to the product analysis.

5.3 Requirements regarding the impact energy have respect to the procedure described in subclause 6.2.8.

5.4 If the values of product characteristics agreed in the order are classified according to the diameter or thickness of the product, the requirements referring to the nominal dimensions appropriate to the delivery at the location where samples are taken shall apply for this.

6 Documents and testing

6.1 Types of document

6.1.1 If it is a requirement that a document on materials testing be supplied, this shall be agreed at the time of ordering, reference being made to DIN 50049.

6.1.2 In special instances an agreement can be reached at the time of ordering that certification be provided on the continuous inspection of product characteristics for certain products. The details pertaining to the continuous inspection of the product characteristics shall be agreed at the time of ordering.

6.2 Inspection and testing

If inspection tests are to be carried out in accordance with the agreements made at the time of ordering (see subclause 3.4), then, apart from the specifications of DIN 50049, the details given in subclauses 6.2.1 to 6.2.11 of this standard shall apply.

6.2.1 Place of inspection and testing

The selection of samples, the taking of samples, the preparation of samples and the tests themselves shall, unless otherwise agreed, take place at the manufacturer's works.

In cases where the manufacturer's works do not have the necessary equipment for this, the preparation of the samples and/or the tests shall be carried out at another place agreed on by the manufacturer's representative and the inspection representative of the customer.

6.2.2 Batching of acceptance units [3] according to type

An acceptance unit [3] is that part of the quantity supplied for which the result of the test shall apply.

The following can be considered as acceptance units [3]:

a) individual pieces;

b) rolling unit, e.g. for strip or for sheet cut from strip: the coil, or for discontinuously rolled sheet: the rolled plate;

c) cast: the shape and dimensions of the product are comparable; the products come from the same cast and have been submitted to the same heat treatment conditions, or for cold formed products, to the same cold forming conditions;

d) batch: the shape and dimensions of the product are comparable; the products are of the same steel grade and are in the same state of treatment. However, they may come from different casts and product making processes.

If information on the method of batching of the quantity supplied according to acceptance units [3] is missing, the manufacturer may select the type of acceptance unit [3] using his own judgement.

6.2.3 Taking test pieces and samples and preparing samples

6.2.3.1 EURONORM 18 shall apply for taking and preparing samples for mechanical and technological tests and *Stahl-Eisen-Prüfblatt* 1805 shall apply for the analyses.

6.2.3.2 For other tests, the details of taking and preparing samples which are to be followed shall be agreed at the time of ordering. The manufacturer may proceed as he considers appropriate if the information is missing in the order.

6.2.3.3 For products which would be rendered unfit for use if samples were taken, either

additional pieces, or

products with prolongations

may be submitted for inspection and testing, depending on the technical feasibility. The number and type of these pieces shall be agreed at the time of ordering.

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[3] It should be noted that in statistics one talks of "inspection lots" and not of "acceptance units".

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6.2.4 Submission for inspection and testing

6.2.4.1 Submission for inspection and testing of part or all of the consignment shall be notified to the purchaser or his inspection representative by the manufacturer in good time. Reference shall be made to the order in this context.

6.2.4.2 In order to avoid interference with the normal operation of the works, the purchaser and the manufacturer or their representatives shall specify a time for inspection and testing, by mutual agreement.

6.2.5 Rights and duties of the inspection representative

The inspection representative shall have free access to the places where the products to be accepted are manufactured and stored in order to carry out the agreed inspection and testing. He may indicate the elements of the acceptance unit[3], from which samples are to be taken. He shall have the possibility of following the operations of sampling, machining of samples and of witnessing the tests.

He shall observe all the instructions in force in the manufacturer's works and particularly the safety rules. The works reserve the right to have him accompanied by a representative of the works.

The acceptance procedures shall be carried out so that the normal run of production is disturbed as little as possible.

6.2.6 Carrying out the tests

6.2.6.1 The tests shall be carried out in accordance with the test methods specified in subclause 3.4.

6.2.6.2 The accuracy of the testing machines shall be in conformity with the accuracy of the values to be determined.

6.2.6.3 Measured values shall be rounded in accordance with DIN 1333 Part 2, if required.

6.2.6.4 The chemical composition may be determined by chemical and spectrochemical methods of analysis. The data in the *Handbuch für das Eisenhüttenlaboratorium* shall apply for this purpose. For cases of arbitration, the method to be used shall be agreed.

6.2.7 Invalidation of tests

Test results which are due to improper taking and preparation of samples or to tests carried out improperly shall be considered invalid.

6.2.8 Interpretation of results obtained in the impact test

The results of impact tests are to be assessed as follows with regard to impact energy.

6.2.8.1 The requirements regarding the impact energy of a product shall be deemed to be satisfied, if the following conditions are met.

The mean value of the impact energy determined on three test pieces taken correctly from a single sample and tested correctly shall be equal to or greater than the minimum specified value of impact energy ($A_{v,\,min}$). Not more than one of the three individual values shall be less than the minimum specified value ($A_{v,\,min}$), but shall be not less than $0{,}7 \times A_{v,\,min}$.

6.2.8.2 If the conditions of subclause 6.2.8.1 are not fulfilled, the manufacturer may insist on tests to be carried out on three further test pieces to be taken from the sample section or the sample concerned, except for retests. In this case, the requirements regarding the impact energy shall be deemed to be satisfied, if the following conditions are met.

The mean value of the impact energy from the total of 6 individual values of the two series of tests shall be equal to or greater than the minimum specified value of the impact energy ($A_{v,\,min}$).

A maximum of two of the 6 individual values may be lower than the minimum specified value ($A_{v,\,min}$), but at most one may be lower than $0{,}7 \times A_{v,\,min}$.

6.2.8.3 If the manufacturer refuses to double the number of tests, as specified in subclause 6.2.8.2, when the first series of tests is unsatisfactory, or if the requirements are not satisfied after the additional tests specified in subclause 6.2.8.2 have been carried out, the product tested shall be rejected and the test described in subclause 6.2.9 or 6.2.11 shall be carried out at the manufacturer's discretion.

6.2.9 Retests

6.2.9.1 Introduction

The information provided in subclauses 6.2.9.2 to 6.2.9.4 shall apply for cases, in which

a) as is usual in tensile tests, only individual values are included in making the assessment, and also for cases, in which
b) as is usual in impact tests, the individual values and the mean value of a series of tests determined on test pieces taken from the same sample are included in making the assessment.

In case b), a test (as mentioned in the following) shall be understood to mean the usual series of tests, i.e. a series of three individual tests in the case of impact testing, as specified in subclause 6.2.8.1.

6.2.9.2 Basic information

Retests shall not be carried out if mixed material is suspected. In this case, the procedure described in subclause 6.2.11 is to be followed.

In all other cases, for each proper test, the results of which do not comply with the requirements, two retests are to be carried out taking the details of subclauses 6.2.3 and 6.2.6 into account, unless the manufacturer prefers to withdraw the acceptance unit[3], and to proceed as described in subclause 6.2.11.

6.2.9.3 Selecting test pieces or samples

6.2.9.3.1 The procedure shall be as follows when selecting test pieces or samples for tests where only individual values are to be assessed (e.g. for tensile tests).

If an acceptance unit[3] consists of only one product, then the samples for the two retests shall be taken from this product or from a sample section originating from this product (see also figure 1).

If an acceptance unit[3] consists of several products, the manufacturer has the choice of withdrawing the product

3) See page 2.

for which the unsatisfactory results were obtained, or of retaining it in the acceptance unit 3) (see also figure 2).

If he withdraws the product, then the retests shall be carried out on two other products which are selected by the inspection representative.

If he leaves the product, for which unsatisfactory results were obtained, in the acceptance unit 3), then one of the two retests shall be carried out on this product and the other retest on another product selected by the inspection representative.

6.2.9.3.2 In tests which assess mean values and individual values, such as impact tests, retests need only be carried out, in accordance with subclause 6.2.8.3, if the acceptance unit 3) consists of several products.

In this case, after rejecting the unsatisfactory product, as described in subclause 6.2.8.3 one normal series of tests, i.e. three samples for impact tests, are to be taken from two further products of the acceptance unit 3) (see also figure 3).

Doubling the number of tests per series of tests, as described in subclause 6.2.8.2 is not permitted for retests.

6.2.9.4 Test results

The results of the retests shall also satisfy the requirements.

6.2.10 Rejection in inspection tests

Unsatisfactory results of correct inspection tests or retests shall justify the rejection of the acceptance unit 3) concerned.

6.2.11 Sorting, re-treatment and repair

Unless otherwise agreed at the time of ordering, the manufacturer has the right to remove defects without prejudice to the purchaser, either before or after retests, in a suitable way, e.g. by heat treatment, by sorting out or by repairing, and to resubmit these products as a new acceptance unit 3).

Defects may be removed by suitable means, if the requirements laid down in the quality and dimensional standards are met.

Repair of defects by welding is only permitted with the purchaser's permission or that of his representative. This permission may be given for the whole consignment or several consignments or for only part of a consignment.

6.3 Tests after complaints and for arbitration

The information given in subclauses 6.2.3.1 and 6.2.6 to 6.2.8 shall also apply for tests after complaints and for arbitration. Subclause 6.2.11 shall apply as appropriate.

Arbitration tests shall be carried out in a laboratory approved by both parties.

7 Identification and marking

7.1 The manufacturer shall mark the products in accordance with the specifications given in the relevant quality standard or the agreements made at the time of ordering.

7.2 If the quality standard or the order do not provide any information on the marking procedure for the products, then the manufacturer shall be entitled to supply the products

a) without marking or

b) with marking of his choice in accordance with the specifications given in DIN 1599.

7.3 Item b) of subclause 7.2 shall apply, even if marking is required but nothing to this effect has been specified in the order.

8 Complaints 4)

8.1 Under current law, warranty claims may only be raised against defective products if the defects impair their processing and use to a more than negligeable extent.

8.2 It is normal and practical for the purchaser to give the supplier the opportunity to judge whether the complaints are justified, if possible by submitting the product objected to or samples of the products supplied.

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3) See page 2.

4) See Explanatory notes.

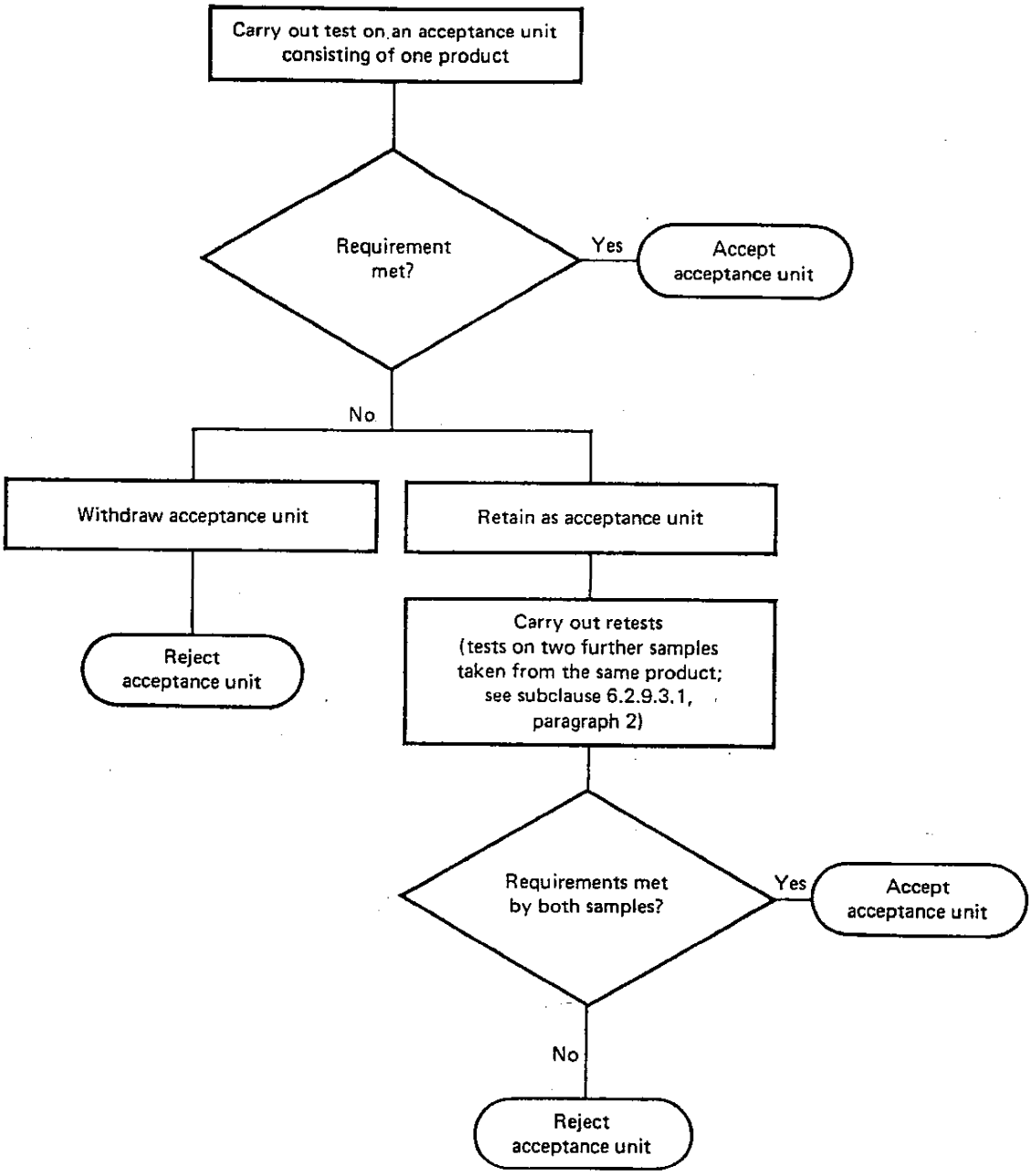

Figure 1. Flow chart for tests where the interpretation of results is based on individual values only (e.g. for tensile tests), for cases where the acceptance unit consists of only one product

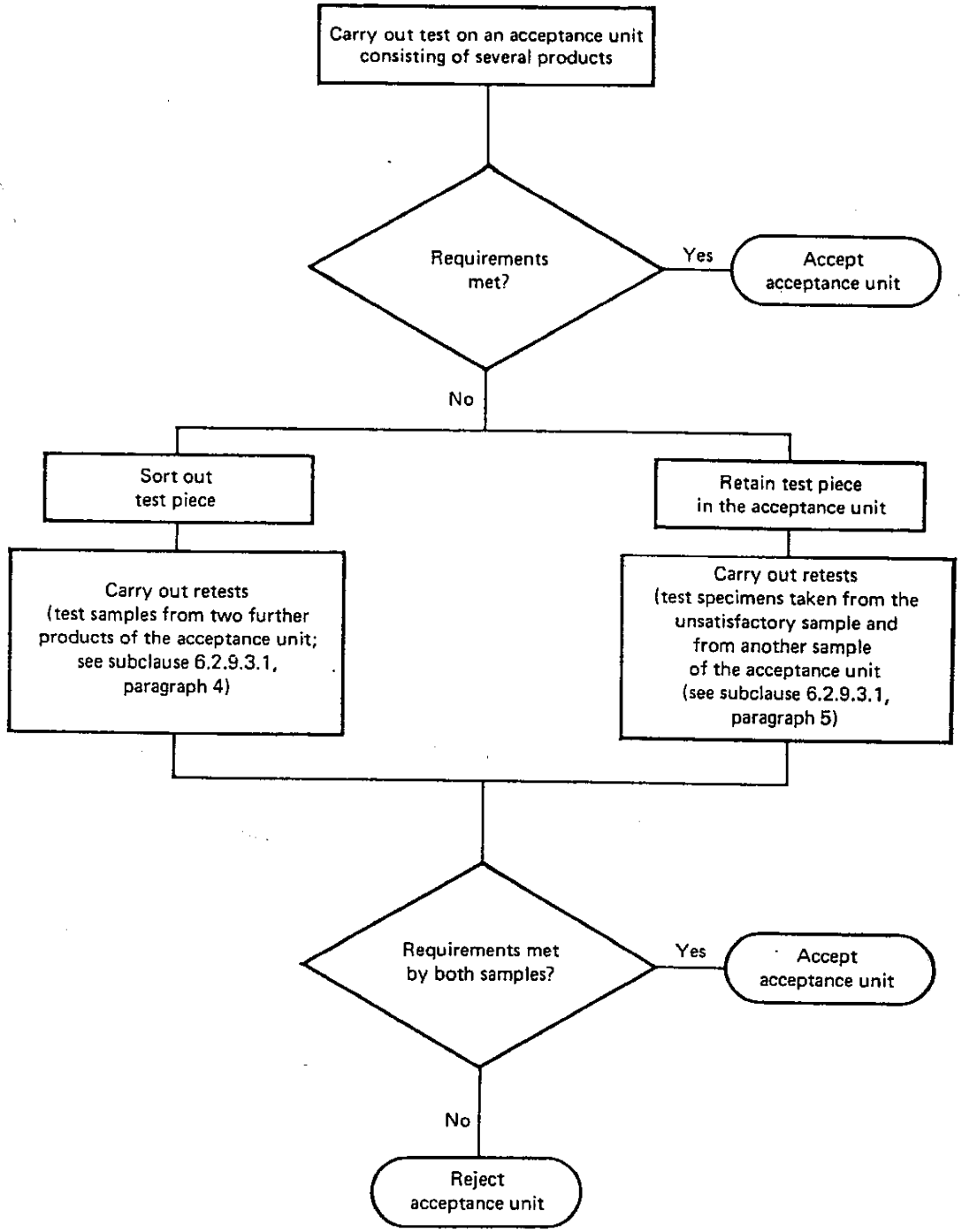

Figure 2. Flow chart for tests where the interpretation of results is based on individual values only (e.g. for tensile tests), for cases where the acceptance unit consists of several products

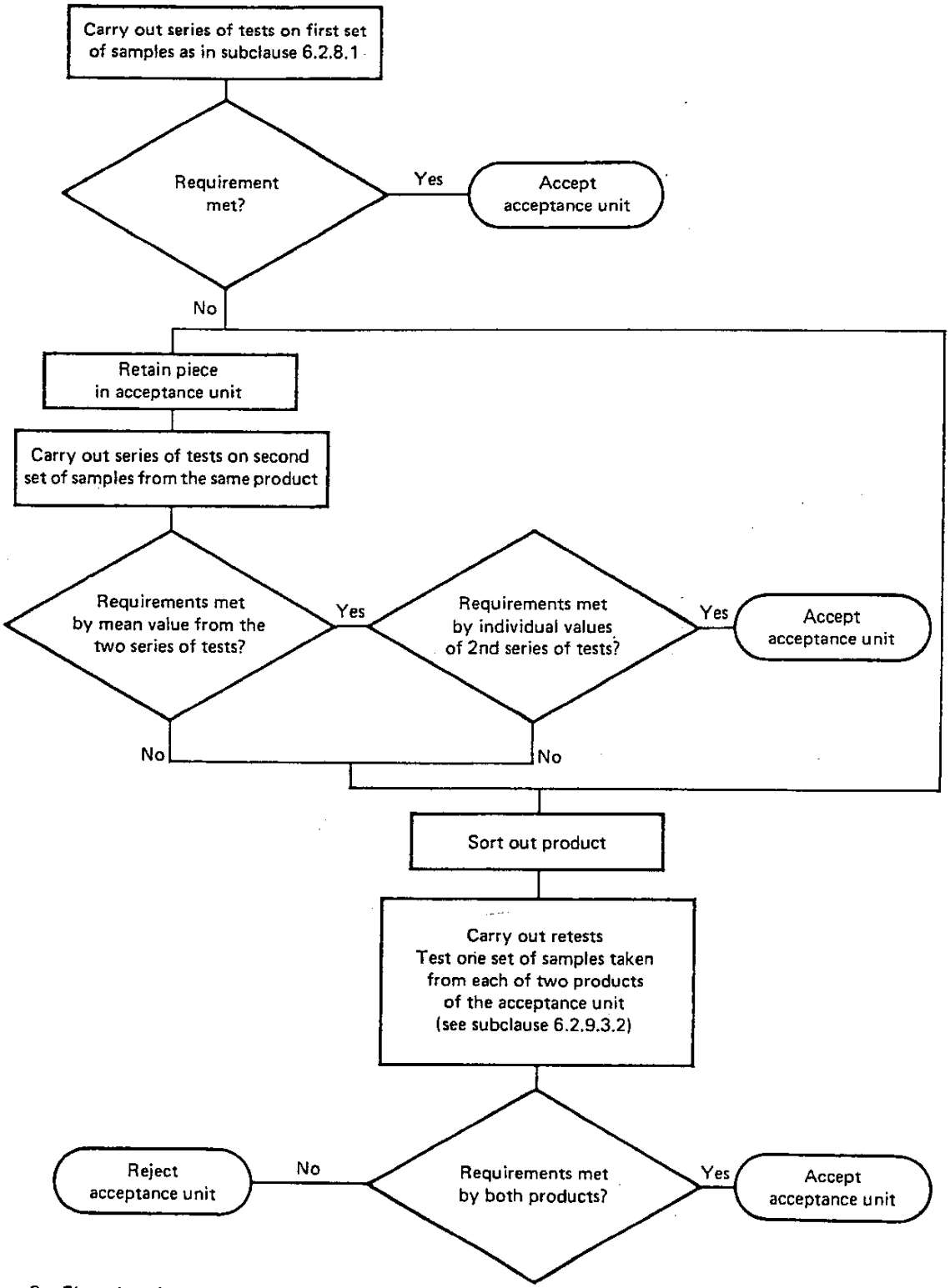

Figure 3. Flow chart for tests where the interpretation of results is based on individual and mean values (see subclause 6.2.8) in conjunction with retests as described in subclause 6.2.9.3.2

Standards and other documents referred to

DIN 1333 Part 2	Presentation of numerical data; rounding
DIN 1599	Identification marking of steel
DIN 1690 Part 1	Technical delivery conditions for castings made from metallic materials; general conditions
DIN 7521	Steel forgings; technical delivery conditions
DIN 17014 Part 1	Heat treatment of ferrous materials; terminology
DIN 50049	Documents on materials testing
EURONORM 18	Selection and preparation of samples and test pieces for steel and iron and steel products
EURONORM 20	Definition and classification of grades of steel
EURONORM 79	Classification and designation of steel products according to shapes and dimensions

Stahl-Eisen-Prüfblatt (Iron and steel test sheet) 1805

Probenahme und Probenvorbereitung für die Stückanalyse bei Stählen (Sampling and preparation of samples for the product analysis of steel), published by *Verlag Stahleisen mbH,* Düsseldorf.

Handbuch für das Eisenhüttenlaboratorium (Handbook for the ferrous metallurgy laboratory) published by *Verlag Stahleisen mbH,* Düsseldorf;

volume 2: *Die Untersuchung der metallischen Stoffe* (Investigation of metallic materials);

volume 5 (supplementary volume):

A 4.1 – *Aufstellung empfohlener Schiedsverfahren* (List of recommended arbitration procedures);

B – *Probenahmeverfahren* (Sampling procedures);

C – *Analysenverfahren* (Methods of analysis);

the most recent edition in each case.

Richtlinie über die Verwendung von Bestellvordrucken für Walzstahl 2)

Previous editions

DIN 17010: 08.81, 01.84

Amendments

The following amendments have been made in comparison with the January 1984 edition.

Clause 8 (Complaints) has been included, see Explanatory notes.

The structure of the standard has been brought into line with the rules laid down in the different Parts of DIN 820.

Explanatory notes

This standard is related to EURONORM 21 "General technical delivery requirements for steel and iron and steel products" published by the European Coal and Steel Community (ECSC) and to Standard ISO 404 – 1981 "Steel and steel products; general technical delivery requirements" published by the International Organization for Standardization (ISO).

Basically, this standard only differs from the above-mentioned EURONORM and ISO Standard in the following respects:

a) It provides no detailed information on the different types of documents on materials testing, because, as far as DIN Standards are concerned, the documents have always been specified in DIN 50049 which does not only apply for steel.

b) Its structure has been harmonized with the structure of DIN Standards specifying technical delivery conditions.

The factual content of DIN 17010 largely agrees with EURONORM 21 and ISO 404.

These general technical delivery conditions have been published with the following objectives:

- to make as large a contribution as possible towards the standardization of technical delivery conditions applicable to the individual steel groups and product shapes;
- to provide details pertaining, for example, to the location of the testing site and to the rights and obligations of the inspection representative which have been omitted to date in the standards for the steel groups and product shapes mentioned for reasons of scope but which can acquire importance in separate instances;
- to provide, by way of reference to this standard, the possibility of being able to apply the customary technical delivery conditions for steel with regard also, for example, to sampling, to deliveries of non-standardized steels.

As is the case for all other standards, this standard shall only apply, if reference has been made to it in the order and the conditions stated in clause 1 are given. However, the general technical delivery conditions contained therein shall assume the status of recognized rules of the art in all instances where no delivery conditions, or no explicit delivery conditions were agreed at the time of ordering and, as is customary practice in such cases, standards are taken as the yardstick for measuring technical perfection in ensuing disputes.

2) See page 1.

01-12-10;11:55AM;

In order not to have to make an additional reference to DIN 17 010 for orders made in accordance with the standards applicable for the individual groups of steel, such as DIN 17 200 (steels for quenching and tempering), provision shall be made to include the following clause in the section of the respective standards defining the scope, unless there are special reasons for not so doing:

> ". . . the general technical delivery conditions for steel given in DIN 17 010 shall apply in addition to the details given in this standard if nothing to the contrary is specified in the following."

Re clause 8 Complaints

As emerges from the *DIN-Mitteilungen* (DIN News), vol. 62 (1983), No. 11, pp. 663–665, only the reservations held by the *Bundeskartellamt* (Federal Cartel Office) had led to the deletion of clause 9 (Complaints) from the first edition (August 1981) of DIN 17 010. After succeeding in overruling these objections by reformulating this clause, as described in greater detail in the *DIN-Mitteilungen*, vol. 63 (1984), No. 9, pp. 516–517, it was reincluded in the subsequent present edition.

Subclause 8.1 is a meaningful formulation derived from article 459, par. 1 of the German Civil Code of the technical requirements for the justification of a complaint with regard to steel. However there are cases where deviations from the technical regulations are ascertained in steel products after delivery where the type of processing and use to which the products shall be subject has yet to be determined. In such cases, it is not the sense of subclause 8.1 that no complaints should be made about defects which can substantially impair the types of processing and use envisaged by the customer in the given instance.

Article 242 of the German Civil Code shall be observed in connection with subclause 8.2. This prescribes a code of practice based on good faith in accordance with accepted standards.

The following explanatory notes, drawn up by a small circle of lawyers and engineers and already printed in the *DIN-Mitteilungen*, vol. 40 (1961), No. 2, pp. 111–112, shall apply with respect to the formulation "as far as possible" appearing in subclause 8.2.

The aforementioned regulation does not prescribe the criteria by way of which proof is to be furnished that internal or external defects substantially impair the processing or use for which the particular type of steel and product are suited. These shall be inferred from the law or any agreements made.

However, besides his interest in the verification of the defect, the supplier has a considerable interest in inspecting the defective items and those without flaws in order to have as broad a foundation as possible for determining the cause of the defects. The obligation to furnish proof, mentioned at the beginning, has been provided to allow for this.

An unrestricted obligation to furnish proof would be an unreasonable burden to the customer. For this reason, this obligation has been limited to "as far as possible". Cases are conceivable where it is objectively (for all parties) or subjectively (for the customer) impossible to present proof or where it cannot be expected of the customer because it would entail expenses which stand in no reasonable relationship to the economic success at which the claim is aimed (economically unfeasible).

Cases shall be considered objectively unfeasible when it is no longer possible for anyone to submit the evidence, e.g. when the merchandise and specimens have been lost or destroyed.

Cases shall be considered subjectively unfeasible when, for example, the merchandise has meantime been passed on to a third-party, who refuses to submit the proof on grounds for which the customer does not have to answer.

One can speak of economic unfeasibility, for example, when the customer has already started processing the merchandise and cannot be expected to interrupt production with all the technical and economic inexpediencies involved because of his obligation to produce evidence. This also applies when the merchandise has already been installed and where its removal would involve destroying essential parts of a machine, for example, or would cause a disproportionate amount of damage as the result of interrupting running operations.

The question as to whether the production of evidence is feasible or not should not be confused with the question as to who is responsible for a defect. If, for example, a product has been mixed up with homogeneous products from other suppliers, economic unfeasibility cannot be cited as the grounds for refusing to sort out the products of a particular supplier; it would be impossible to furnish the indispensable evidence that the merchandise about which the complaint has been made does actually originate from the supplier against whom the claim has been lodged if it is not sorted out.

These examples should make it clear when the presentation of evidence demanded in the clause pertaining to complaints can be regarded as "unfeasible". A comprehensive list of all the separate instances is out of the question owing to the diversity of economic procedures.

International Patent Classification

C 22 C 38/00
C 21 D 9/00
G 01 N 33/20