UDC 669.14-42-122

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Cold Rolled Steel Sections
Technical Conditions of Delivery

DIN 17118

Kaltprofile aus Stahl; Technische Lieferbedingungen

1 Scope

This Standard applies to cold rolled sections manufactured on section mills, preferably in forms of delivery according to DIN 59413, and made from the steels listed in Section 2.

This Standard does not apply to drawn, extruded or chamfered cold rolled sections.

2 Material

2.1 Cold rolled sections according to this Standard are generally manufactured from hot or cold rolled strip of cold-workable steels according to

DIN 1614 Part 1 Flat products of steel; hot rolled strip and sheet of mild unalloyed steels; quality specifications

DIN 17100 Steels for general structural purposes; quality specifications

Stahleisen Data Sheet 092 - Hot rolled fine-grained steels for cold forming; quality specifications (at present still circulating as draft)

DIN 1623 Part 1 Flat products of steel; cold rolled strip and sheet of mild unalloyed steels; quality specifications

DIN 1624 Flat products of steel; cold rolled strip of mild unalloyed steels up to 650 mm width; quality specifications (follow-up issue at present still circulating as draft)

Stahleisen Data Sheet 093 - Cold rolled sheet and strip with guaranteed minimum yield point for forming; quality specifications (at present still circulating as draft). Cold rolled sections of other cold-workable steels, e.g. of stainless and acid-resistant steels according to DIN 17440 or of surface-treated steels may also be supplied.

2.2 No assurance can be given of the general suitability of cold rolled sections for any particular use. Instead, the customer, when selecting the steel grade, must have regard to the processing (e.g. welding, hot galvanizing, cold working, etc.) and use (e.g. in dynamically stressed structural components) envisaged. The customer may seek advice from the supplier when choosing the grade but, unless otherwise agreed, this is without obligation.

3 Designations

The code number or material number for the required steel grade is to be added to the designation of the cold rolled section as shown in the examples of designation given in the dimension standard.

4 Requirements

4.1 Manner of melting and de-oxidizing the steel

The provisions of the standards listed in Section 2.1 apply.

4.2 Shaping process

Cold rolled sections are manufactured from strip on section mills by the continuous process.

4.3 Chemical composition

The provisions of the standards listed in Section 2.1 apply.

4.4 Mechanical and technological properties

The provisions of the standards listed in Section 2.1 apply. Minor variations from the guaranteed values are permissible if the conditions according to Sections 6.3.1 and 6.3.2 are not fulfilled.

4.5 Surface condition

4.5.1 In general, the surface is subject to the conditions that must be met by the basic material to be processed. However, there may be slight scarring from flaked-off rolling skin, minor scoring, pressure marks etc. caused during shaping or straightening. In the case of chemically de-scaled surfaces, pickling marks on a limited scale are permissible.

4.5.2 It must be expected that traces of the lubricant used for the shaping process will adhere to the surface. Any special requirements regarding cleanliness of the surface must be agreed.

4.6 Edge condition

In general, cold rolled sections are supplied, at manufacturer's choice, either with sheared edges, in which case a slight burr is permissible, or with natural edges. If, in special cases, a particular edge condition is required, this must be agreed with the manufacturer; the same applies when other edge conditions are required (e.g. rounded or chamfered edges).

4.7 Permissible dimension and form variations

For permissible dimension and form variations, DIN 59413 Cold rolled steel sections; permissible dimension, form and weight variations, applies.

Continued on pages 2 and 3
Explanations on page 3

4.8 Calculation of weight and permissible weight variations

4.8.1 The density of the steels to be taken as a basis for calculation of weight will be found in the standards listed in Section 2.1.

4.8.2 Unless otherwise prescribed in DIN 59413, the permissible weight variations must be agreed.

5 Mode of delivery and packing

Normally, delivery is in the form of slinging bundles weighing 1 to 3 t, secured with wire or strip. Special packing - in particular for cold rolled sections liable to damage - must be agreed.

6 Testing

6.1 Delivery testings

Subject to the provisions of the quality standards according to Section 2.1, the customer may agree on delivery testings which are generally conducted by experts from the supplier's factory, but may also, by special agreement, be carried out by agents of the customer having no connection with the manufacturing plant.

6.2 Extent of testing

6.2.1 The number of specimens depends on whether testing takes place on a melt or lot basis. The type of testing appropriate to the particular steel grade is specified in the quality standards according to Section 2.1.

6.2.2 The test units consist of

20 t for testing by melts,

10 t for testing by lots,

or in each case a smaller fractional quantity submitted for testing.

6.2.3 One test length is to be taken from each test unit for verifying the guaranteed values.

6.2.4 For tensile tests, one tensile test specimen shall be prepared from each test length.

6.2.5 For bending tests, one bending test specimen shall be taken for each tensile test specimen.

6.2.6 If testing of the notch impact strength is required and has been agreed, three notch impact specimens are to be taken from the test length as described in Section 6.2.3. If the results of these tests meet the guaranteed test values, the test will be restricted to these three specimens (see Section 6.5.2.2).

6.3 Sampling

6.3.1 As far as possible, the points from which the specimens are taken from the cold rolled sections should correspond to the points selected for testing of the original material. However, the specimens must be taken at an adequate distance from the cold formed zones produced during rolling.

6.3.2 The longitudinal axis of the tensile and bending test specimens shall as far as possible have the same relationship to the direction of rolling of the original material as specified in the standards listed in Section 2.1.

6.3.2.1 In general, both rolled surfaces are to be retained for the flat specimens for the tensile test.

6.3.2.2 Rectangular specimens of the full thickness of the product are to be used for bending tests.

6.3.3 Notch impact specimens shall be taken along the direction of rolling of the product.

6.3.4 Every effort shall be made to avoid distortion when removing the specimens; if guillotines or cutting torches are used, an adequate allowance must be made, which should be machined off. If the hardening caused by flame cutting does not permit machining, heating to a maximum of 550 °C is permissible with unalloyed steels. Test lengths distorted by bending or twisting must always be straightened in the cold state.

6.3.5 When straightening specimens, cold working and heating which modify the properties in comparison with those of the products to be supplied, are to be avoided.

6.4 Test procedures to be adopted

6.4.1 Mechanical testings shall be conducted at room temperature (see DIN 50014), unless a lower temperature is stipulated for notch impact tests.

6.4.2 Tensile tests, bending tests and notch impact bending tests shall be conducted according to the test procedures laid down in the standards listed in Section 2.1 for the original material.

6.5 Retestings

6.5.1 If the unsatisfactory result of a testing can clearly be ascribed to short-comings in the test equipment or procedure or to a defect of limited extent in a specimen, the negative result should be ignored when assessing whether the requirements have been fulfilled and the corresponding test should be repeated.

6.5.2 If properly prepared specimens do not meet the stipulated requirements, the following procedure is to be adopted.

6.5.2.1 In the case of each unsatisfactory tensile or bending test specimen, the piece of material concerned should be discarded and two repeat specimens should be taken from other pieces of material in the same test unit; the test results on both these specimens must meet the requirements.

6.5.2.2 If the mean value of the three notch impact specimens tested lies below the guaranteed minimum value of notch impact strength, three further specimens shall be taken from the test length according to Section 6.2.3 and tested. The mean value of the six individual tests must conform to the guaranteed mean value; should this not be so, the piece of material tested shall be rejected and two further pieces from the same test unit tested. If one of these pieces again fails to meet the requirements when tested, then either the test unit must be rejected or, if specially agreed, the remainder of the test unit will be examined piece by piece.

6.5.3 The supplier is entitled to subject rejected pieces or test units to suitable processing and then to submit them for fresh testing.

6.6 Test certificates

The issue of a test certificate shall be agreed at the time of ordering according to the provisions of the standards listed in Section 2.1. Only one of the certificates according to DIN 50049 should be issued.

7 Objections

7.1 Objections to internal and external faults may only be raised if they impair to an appreciable extent appropriate working and utilization of the cold rolled section shape and steel grade ordered.

7.2 The customer must give the manufacturer the opportunity to check for himself the validity of the objection, where possible by submitting the material complained of together with samples of the material supplied.

Explanations

The new version of the dimension specifications for cold rolled steel sections according to DIN 59413 meant that revision of the technical conditions of delivery for these products was also necessary. The changes compared with the September 1969 issue are not very extensive. The information on materials usable for manufacture of cold rolled sections has been supplemented by references to the new quality standards that have been completed in the meantime or are in course of preparation (see Section 2.1). In accordance with normal practice for delivery and ordering, the edge condition has been left as a general rule to the manufacturer's choice although in particular cases, special agreements are possible on this (see Section 4.6). The references to the individual Parts of the dimension standard have been deleted, because these Parts have been withdrawn.