

DIN EN 10253-4

For weld-in fittings in rustproof steels

Range of Application

In this part 4 of the standard the technical terms of delivery are settled for fittings made of austenitic and austenitic-ferritic (duplex) rustproof steels which are suitable for pressure- and corrosion-resistant cases of application at room temperature, low temperature or risen temperature. In accordance with this range of application a harmonization of this standard of the directive concerning pressure equipment is planned.

Kinds of Fittings

The draft of the standard acknowledges fittings defined by their outside diameter as well as fittings defined by their inside diameter. The following kinds are described:

- Tube turns with 45°, 90° and 180°

Fabrication R-1 D, R-1,5D, R-2,5 D (when defined acc. to outside diameter)

Fabrication r-ID, R-1,5 ID, R-3ID (when defined acc. to inside diameter)

- Reducers: concentric and eccentric design
- T-pieces: with same or reduced branches
- Caps

Strength against Internal Pressure

There are two different kinds of fittings:

- Type A: fittings with reduced utilization-factor,
- Type B: fittings with full utilization-factor.

Fittings of type A are so defined that the body of the fitting has the same minimum wall thickness as on the welding seams. An exception applies to tube turns where the minimum wall thickness at the outer side of the arch may be 25% below the nominal wall thickness. In general the strength against internal pressure for this type lies below the pressure-resistance of a straight pipe with the same nominal dimensions, concrete degrees of use are, however,

not noted. Fittings of type B have an increased thickness of walls of the body of the fitting so that they withstand the same internal pressure than a straight pipe with the same nominal dimensions made of the same material. In annex B the equations to apply are given for the calculation of wall thicknesses including examples, annex C contains lists for some preferred wall thicknesses that result for the body of the fitting.

Fabrication

The fittings may be produced from seamless tubes acc. to EN 10216-5, from welded pipes acc. to EN 10217-7, sheet steel or band acc. to EN 10028-7 or from bar steel acc. to EN 10227. The manufacturing process (bending, forging,...) is chosen by the producer. If welding is done during the manufacturing of the fittings made of sheet steel or band, the welding processes/methods of welding must be qualified acc. to EN 288-3 and the welder and/or operator of welding machinery acc. to EN 287-1 and/or EN 1418.

In the fittings are manufactured by hot forming, always a solution treatment is prescribed. If cold forming is used, no hot treatment is necessary for many materials if the deforming is smaller than 15 % or if can be proven that the material after deforming still has a remaining stretch A5 of 15 %. The surface of fittings must be metallic, the process used is at the choice of the producer again.

Materials

The draft of standard contains 20 austenitic and 5 austenitic-ferritic rustproof steels, the chemical composition and mechanical characteristics of which are also directly laid down in the draft of the standard.

Dimensions and Limited Tolerances

The following tests are obligatory:

- melting analysis of the starting material
- tension test at room temperature
- cross-breaking test of welding seams (for welded fittings)
- test of dimensions
- visual test
- non-destructive test of welding seam (100%)
- mix-up material test (each fitting)

In addition a number of optional tests are described. A test certificate 3.1. B acc. to EN 10204 must be established concerning the tests, as an option an acceptance test certificate 3.1.C or 3.2 can also be ordered as an exception.

Tests

The following are obligatory:

- melting analysis of the starting material
- tension test at room temperature
- cross-breaking test of welding seams (for welded fittings)
- test of dimensions
- visual test
- non-destructive test of welding seam (100%)
- mix-up material test (each fitting)

In addition a number of optional tests are described.

A test certificate 3.1.B acc. to EN 10204 must be established concerning the tests, as an option an acceptance test certificate 3.1.C or 3.2 can also be ordered as an exception.

Options

In the draft of standards 22 options are described by which the customer can choose his special requirements (for example starting material, heat-treatment of the surface, tests).

Other Parts of the Standard EN 10253

It is expected that the series of standards EN 10253 „Welding-fittings“ will consist of 4 parts. The part 1 „...plain steel for general use and without special test requirements“ has been published as a European Standard in September 1999. Concerning part 2 „...plain and alloyed steel with special test requirements“ the voting process still lasts. During the CEN inquiry in 1999 there were 4 dissenting votes and numerous commentaries. It now is planned that this part, too, will contain two types of fittings with full and reduced utilization factor. The part 3 „...austenitic and austenitic-ferritic rustproof steels without special test requirements“ has already been elaborated by the EC/SS/TC 29/SC 3// WG 4 working group and was handed over to the relevant committees for translation (German, French) and printing of the CEN-inquiry. If this procedure lasts as long as for part 4, the publishing of a draft can be expected approx. at the beginning of 2005.