

Unipetrol RPA, s.r.o.	Seamless steel tubes used for high pressure equipment in chemical plants – Technical delivery terms	N 11 152
Service Division		

The standard is binding for all departments of the company and for the external organizations which order, accept and supply seamless steel tubes used for high pressure equipment in chemical plants of Chemopetrol, a.s.

The departments are obliged to present the standard to all external organizations performing these activities for them, and for whom the standard is also binding.

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1. General provisions

1.1 Scope of validity

This standard applies for determination of requirements when ordering high pressure tubes pursuant to standards N 16, N 17, N 18, N 20, N 21 and N 22.

1.2 Tube material and dimensions are opted for as per relevant N-standards and drawings including dimensional tolerance of outer diameter and thickness of the wall.

1.3 Surface of tubes needs to be scaled inside as well as outside with the first complementary digit .1 after the digit of the dimension standard pursuant to ČSN 42 0250, tab. 1. In case there is not dimension standard for the required dimension of the tube, require the scaled the inner and outer surface in words.

1.4 Tubes pursuant to this standard are delivered exclusively with acceptance in accordance with ČSN 42 0250.29. To be tested exclusively using the inner overpressure – testing overpressure 49MPa.

1.5 Designation of tubes must be performed by embossing on each tube in the following scope:

- a) Manufacturer's mark
- b) Heat number
- c) Numeral material mark
- d) Mark of manufacturer's OTK
- e) Common number of tube (or rolled product number)

It replaces:	Administrator:	Valid from:
N 11 152 from 5/1976	Maintenance Support Section	1.11.1996 (Validity verified 15.12.2020)

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1.5.1 The tubes are marked at one end only, approx. 300 mm from the edge, it is marked in numerical form on cleaned surface and the embossed data need to be protected by painting with non-washable colour.

1.6 Designation of steel – the tubes are marked by colours pursuant to ČSN 42 0010.

2. Technical requirements

2.1 Surface quality must conform to ČSN 42 0250 art.13,14.

2.2 Dimensions and shape of tubes must comply with respective dimension ČSN standards or with dimensions agreed with the manufacturer.

2.3 Chemical composition must comply with the material data sheet of ČSN.

3. Testing

3.1 Prescribed tests

3.1.1 Chemical analysis of the melt-down test

3.1.2 Steel (grade 15) creep point melt-down test – in case it is not performed, the manufacturer shall guarantee values for creep point as per material data sheets.

3.1.3 Hardness test HB at both ends pursuant to ČSN ISO 410 and ČSN ISO 6506, what concerns bigger dimensions, flattening tests are to be performed on separated rings

3.1.4 Flattening test at both ends as separated, only with tubes up to outer dimension of 45 mm and after agreement the flattening test as attached. Samples for flattening tests must be turned through 90 degree angle against each other.

3.1.5 Tensile testing in longitudinal direction pursuant to ČSN EN 10002-1 (42 0310).

3.1.6 Notch impact strength test in longitudinal direction pursuant to ČSN EN 10 045-1 (42 0381) for tubes with wall thickness from 12 mm.

3.1.7 Straightness checking pursuant to a respective dimension standard.

3.1.8 Inner overpressure test – the testing overpressure value must be defined in the order. Inner overpressure test is not performed at the manufacturer, it is replaced by a non-destructive test.

3.1.9 Non-destructive test - non-destructive method tests 100% of tubes of each delivery. The manufacturer shall state in the metallurgical certificate that the tubes passed the non-destructive test and thereby the prescribed testing overpressure.

3.1.10 Steel scope test for presence of alloying agents.

3.2 Confirmation tests

3.2.1 Random hardness test

3.2.2 Spectral test of rings of flattening test

3.2.3 Crack test using appropriate means

3.2.4 Material structure test (micro)

Performance of these tests may be agreed between the responsible representative of the Client and the manufacturer.

4. Acceptance and delivery

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- 4.1 Tubes are delivered exclusively with acceptance. For the acceptance purposes, the tubes are divided into groups – a group is composed of tubes of the same dimension from one heat.
- 4.2 The manufacturer is obliged to call on the Client to perform the acceptance at least 6 days before the acceptance date. In case the accepting body does not appear in time, the manufacturer performs the prescribed tests and sends the certificates to the Client. The manufacturer is obliged to submit a detailed list of all tubes prepared for testing and acceptance to the representative of the client or the accepting body.
- 4.3 The following tests are performed during the acceptance with participation of the Client:
- Pursuant to art. 3.1.4 at both ends of each tubes
 - Pursuant to art. 3.1.5 one test from a group
 - Pursuant to art. 3.1.6 one test from a group
 - Pursuant to art. 2.1 and 3.1.7 each tube
- 4.3.1 Taking samples for tests is carried out with presence of the customer.
- 4.4 With presence of the manufacturer's OTK , the following tests are performed:
- Pursuant to art. 3.1.1 from each heat
 - Pursuant to art. 3.1.2 from each heat upon agreement of the customer with the manufacturer, otherwise the manufacturer provides warranty for the values stated in the material data sheet.
 - Pursuant to art. 3.1.3 each tube
 - Pursuant to art. 3.1.9 each tube
 - Pursuant to art. 3.1.10 each tube
- 4.4.1 Results of these tests are stated in the Record of testing,
- 4.5 If any of the tests pursuant to art. 4.3 for individual groups fail, two repeat tests are to be performed instead, and if any one of these repeat tests fails, the whole respective group is excluded from the delivery.
- 4.6 The test may be declared null and void if it was performed incorrectly, and then the substitutionary test is performed, which is, however, not considered as a repeat test.
- 4.7 The manufacturer is entitled to submit for acceptance tubes of those groups which did not pass even the repeat tests, however only after new heat treatment.
- 4.8 Results of acceptance tests are recorded in the Report on tests and a list of accepted tubes is prepared that is signed by the responsible representative of the customer.
- 4.9 Tubes that did not pass the prescribed tests must not be used for the assumed purpose and are excluded from the delivery.
- 4.10 In case the supplying facility does not have appropriate testing equipment, it is possible to perform the test at other place upon agreement of both parties.
5. Handed over documentation and ordering
- 5.1 The manufacturer shall hand over to the customer the following:
- Report on tests
 - Certificate pursuant to ČSN EN 10204 3.1.B containing results of the prescribed tests.

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- c) What concerns tubes of material grade 15, to require list of tubes as per regular number (number of rolled product) as a part of certificate stating the values of HB at both ends.

5.2 Examples of ordering:

5.2.1 Example of ordering 100 pcs of seamless steel tubes with outer diameter 102 mm, wall thickness 16 mm and material 12 021.1.
100 pcs tubes 102x16, ČSN 42 5716.11 pursuant to ČSN 42 0250.29, testing overpressure 49 MPa.

5.2.2 Scope of tests:

- a) Chemical analysis of heat test
- b) Complete tensile test – one from group
- c) HB test at both ends – 100%
- d) Flattening test at both ends - 100%
- e) Non-destructive test – 100%
- f) Dimension check – 100%
- g) Impact test – 2 from the group
- h) Confirmation test of material identity for presence of alloying elements using the steel scope – 100%

5.2.3 Allowed tolerance: outer by +2,5 %, wall thickness +12,5%
-0 -15

5.2.4 Tubes to be marked in colour pursuant to ČSN 42 0010 and with embossed data:

- a) manufacturer's mark
- b) heat number
- c) numeral material mark
- d) mark of manufacturer's OTK
- e) common number of tube

5.3 We require handover of the list of tubes as per common numbers with stated HB values as a part of documentation.

5.3.1 When ordering tubes with wall thickness smaller than 10 mm, it is possible to claim tube delivery from VT Chomutov pursuant to VT 42 0254 scope of which complies with our requirements.

6. Packaging and transport

6.1 Tubes are delivered in bundles secured against shifting, collapsing and mechanical damage. Packaging method is dependent on tube dimensions and transport manner or on agreement between the manufacturer and the customer (client).

7. Amendment – list of quoted standards and documents

ČSN EN 10204
(42 0009)
ČSN 42 0250

Metallic products - Types of inspection documents.
Hot formed seamless tubes of steels grade 10 to 16. Technical delivery

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ČSN EN 10 045-1 (42 0381)

ČSN 42 0010

ČSN 42 5716

ČSN ISO 410

(42 0371)

ČSN ISO 6506

(42 0371)

ČSN EN 10002-1

(42 0310)

VT 42 0254

terms .

Metallic materials – Charpy impact test. Part 1: |Testing method (V and U notches)

Colour marking of steels.

Hot formed seamless steel tubes with reduced tolerances.

Dimensions.

Metallic materials. Brinell hardness tabs.

Metallic materials. Brinell hardness test.

Metallic materials. Tensile testing. Part 1, Method of test at ambient temperature.

Seamless steel tubes for piping with operating overpressure 33 MPa.

Technical delivery terms and dimensions.

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