



VdS-Guidelines

VdS  
2552en

## **Approval of Welding Procedures for Pipes < DN 65**

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# VdS-Guidelines for the Approval of Welding Procedures for Pipes < DN 65

This document is binding only if its application has been agreed on a case-by-case basis. Otherwise, any consideration of this document is non-binding. An agreement for application of this document is entirely optional. On a case-by-case basis, third parties may also accept, at their discretion, other requirements that do not comply with this document.

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## 1 Scope

### 1.1 General

On application, VdS Schadenverhütung (VdS) approves welding procedures for the connection of pipes < DN 65 with each other, with larger pipes or with fittings, which are carried out in stationary welding plants on the premises of the applicant.

### 1.2 Effective date

These Guidelines come into force on 01.04.2018 and supersede the previous Guidelines for the Approval of Welding Procedures for Pipes < DN 65 VdS 2552 : 2014-08 (03).

Present approvals in accordance with VdS 2552 : 2014-08 (03) remain valid until expiry. For a renewal, the requirements of the VdS Guidelines 2552 valid at that time will fully apply.

### 1.3 Subject matter

Subject matter is the testing and approval of welding procedures for pipes < DN 65 of the applicant in accordance with the approval procedures regulated in these Guidelines.

### 1.4 Scope

The approval solely refers to the premises specified in the certificate.

The approval solely refers to the welding procedures and pipe dimensions specified in the certificate. The following welding procedures may be part of the approval:

- sleeve welding procedures
- welding procedures for pipe connections
- welding of branch pipes

## 2 Definitions and abbreviations

**Sleeve welding procedure:** welding of sleeves to pipes < DN 65

**Welding procedure for pipe connections:** connection of pipes < DN 65

**Welding of branch pipes:** welding of branch pipes to pipes < DN 65

**Standard employment:** according to these Guidelines, standard employment means that a non-independent employee is employed for more than 20 hours per week for a regular income under the authority of the employer, and is part of the operational structures of the company.

**Operating site:** fixed place of business at which services are partly or fully carried out. Operating sites may be e.g.

- the premises of the top management,
- a dependent branch,
- a production facility or warehouse,
- a workshop.

**Filler materials:** see General product standard for filler materials and powders for fusion welding of metallic materials

**Welding root:** underside of a welding seam

### **3 Normative references**

These Guidelines incorporate dated and undated references to other publications. For dated references, subsequent amendments to or revisions of any of these publications apply only when incorporated by amendment of these Guidelines. For undated references the latest edition of the publication referred to applies.

**DIN EN 13479** General product standard for filler materials and powders for fusion welding of metallic materials

**EN 10242** Threaded pipe fittings in malleable cast iron

**EN ISO 3834** Quality requirements for fusion welding of metallic materials

**EN ISO 9001** Quality management systems

**EN ISO 9606-1** Qualification testing of welders, Fusion welding

**EN ISO 14732** Welding personnel - Qualification testing of welding operators and weld setters for mechanised and automatic welding of metallic materials

**EN ISO 15609** Parts 1, 2 and 6 Welding instructions

**EN ISO 15614-1** Specification and qualification of welding procedures for metallic materials

**VdS 2132** Guidelines for the approval of installers for fire extinguishing systems

### **4 Requirements for the approval**

The client shall fulfil all the requirements specified in these Guidelines. The VdS Certification Body reserves the right to check compliance with these requirements by appropriate measures not specified here.

#### **4.1 Requirements for the company**

##### **4.1.1 Quality management system acc. to EN ISO 9001**

The client shall have a certified quality management system (QM system) in accordance with ISO 9001 for the operating site for which a certification is applied for. The QM system shall have been implemented for the automated welding of pipes.

The QM system shall be a specific one implemented for this client, or else the QM system of an affiliated company or holding shall explicitly include the client.

The certificates according to EN ISO 9001 and 15614-1 or EN ISO 3834 shall unambiguously state in their scope that the welding procedures of all operating sites applied for are included. In case of doubt, VdS requires a declaration signed by the accredited body.

#### 4.1.2 Public liability insurance

A public liability insurance shall be proven with a minimum coverage of 2 million EUR per claim for personal injury and 1 million EUR per claim for damage to property.

If the coverage of the public liability insurance is given in another currency, the figures shall be converted into EUR in accordance with the reference exchange rates<sup>1</sup> of the European Central Bank (ECB) as were valid at the time the application was submitted.

The public liability insurance shall be a specific one for this client, or else the public liability insurance of an affiliated company shall explicitly include the client.

### 4.2 Personnel

#### 4.2.1 General

The client shall have a sufficient number of his own qualified personnel at all times.

The personnel shall be employed with the client in standard employment.

In case of employed managing directors and executive partners, standard employment is assumed.

In the company, the personnel shall perform the function for which they are nominated by the client and be available to perform it. The function shall be explicitly specified in the employment contract or in the framework of a QM system (e.g. job description).

The client shall train and educate the personnel.

#### 4.2.2 Welding supervision

##### 4.2.2.1 General

The client shall have at least one qualified welding expert in accordance with EN ISO 14732 who is the responsible expert (welding supervisor). The responsible expert is responsible for the quality of the welding connections to be maintained and supervised, and also for instructing the welders.

##### 4.2.2.2 Further welding experts

In case of partial automation, all welders influencing the quality of the welding connections shall be qualified as approved welders in accordance with EN ISO 9606 for the respective welding procedure.

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<sup>1</sup> Reference exchange rates of ECB are available under <https://www.ecb.europa.eu/stats/exchange/eurofxref/html/index.en.html>

### 4.3 Condition of pipes

Pipes shall not be contaminated on the inside by welding connections or constricted by excessive seam root penetration. Wall elevations on the inside caused by seam roots or pipe offsets shall not exceed 1 mm average and 1,5 mm maximum.

### 4.4 Filler materials

For seam roots, only filler materials shall be used that have been approved for the respective manufacturing process by type testing.

### 4.5 Bending strength

The bending strength of welded pipes shall be at least 80% of the bending strength of non-welded pipes.

### 4.6 Flow resistance of welding connections

Welding connections shall not increase the flow resistance. This requirement is deemed fulfilled, if the samples do not deviate by more than 2,5% in the flow resistance test.

### 4.7 Pressure test under bending stress

Under bending stress, the pipes shall withstand the 4-fold nominal pressure.

### 4.8 Marking

Welded pipes shall be marked at 50 to 300 mm from each pipe end with the name or code of the client. The marking shall be even and at least two of those around the pipe shall be well legible and permanent. The marking shall undetectable, incombustible and permanent.

### 4.9 Preparation and follow-up

For preparation and follow-up purposes, the drilling and sawing procedure shall be described with regard to their non-reactive execution. The removal of borings, saw dust and other debris shall be given special consideration.

### 4.10 Test facility for pressure tightness tests

The pipes shall have a test facility including test instructions for regular pressure tightness tests.

### 4.11 Organisational matters

#### 4.11.1 Instructions and other planning criteria

The welding procedure shall be such that the quality of the welding connections is largely independent of the operating personnel and the seam quality is as required. The operator shall have been given the welding instructions including adjustments of the welding equipment. A facility for marking the pipes shall be combined with the welding equipment, or else a procedure shall make sure that the marking is automated.

#### 4.11.2 Trainings

The client is responsible for regular trainings of the personnel according to their employment. The client shall document the extent and contents of the trainings and submit these documentations to VdS on demand.

### 5 Approval procedure

#### 5.1 General

Communication with VdS is in German or English. We recommend a minimum language level B2 according to the Common European Framework of Reference for Languages.

The application for an approval of welding procedures for pipes < DN 65 shall be in writing using Annex A1 and submitted to the VdS Certification Body. The application shall be fully filled in.

The documents specified in the annex shall be enclosed.

The VdS Certification Body processes the applications for the approval procedure in the order in which they are received.

#### 5.2 Approval procedure

##### 5.2.1 General

If the VdS Certification Body does not receive all the required documents within 6 months after application, the VdS Certification Body will reserve the right to cancel the application. Any documents submitted up to then will be returned to the client.

In this case, any processing costs incurred according to the table of fees valid at the time will be invoiced nevertheless or not refunded, as the case may be.

Any additional efforts of the VdS Certification Body will be invoiced to the client accordingly.

#### 5.3 Inspections

##### 5.3.1 Inspection on site

VdS inspects the welding procedure on the client's premises for compliance with the requirements of clause 4.

##### 5.3.2 Check of documentation

The check of the application and submitted documentation shall not lead to any complaints. If the client consciously gives false information, the application will be cancelled.

##### 5.3.3 Inspection of the welding procedure

###### 5.3.3.1 General

Prior to the sampling, an inspection plan is drawn up.

The inspection is carried out with samples in accordance with clause 5.3.3.2.

The client will receive an inspection report.

### 5.3.3.2 Production of samples under supervision

The service personnel shall produce up to three samples for each type of connection and for each pipe diameter per inspection.

According to the inspection procedure, further samples may be demanded.

Samples shall be produced only for the respective procedure applied for.

For each pipe diameter a non-welded pipe shall be submitted for reference purposes.

During the inspection on site, the samples are welded, sealed and sent off by the client under the supervision of the VdS expert.

### 5.3.3.3 Testing of samples in the VdS Laboratories: Pressure test under bending stress

The test is carried out with samples in accordance with clause 5.3.3.2. Please refer to Annex C and Annex E (branch pipe) for sketches.

The test is carried out in the VdS Laboratories for compliance with the requirements of 4.5 and the sketches of Annex E (branch pipe) and/or Annex F. For each nominal diameter a non-welded reference pipe shall be submitted.

The test strengths are listed in Table 1.

Nominal width of welded pipe	Dimensions in mm	Bending moment in Nm	Test load N for test equipment in accordance with		
			Annex E (branch pipe supplies one sprinkler only)	Annex E (layout of pipework)	Annex F
20	26,9 x 2,65	132	132		220
25	33,7 x 3,25	252	252	up to 1000*	420
32	42,4 x 3,25	432	432	up to 1000*	720
40	42,3 x 3,25	576	576	up to 1000*	960
50	60,3 x 2,3	700	700	1000	
65	76,1 x 2,6	1280	1280	1280	

– 1000 Nm max., however, not more than the bending moment at which the pipe starts to deform plastically  
 – The specimen subjected to this test may be tested in accordance with 5.3.3.5.  
 – Specimens with a branch pipe that have been successfully tested in accordance with Annex E are automatically tested for supplying a sprinkler.

**Table 1:** Specifications on bending moments

### 5.3.3.4 Testing of samples in the VdS Laboratories: Flow resistance

The test for increased flow resistance is carried out in the VdS Laboratories. For this purpose, the samples are subjected to a comparative measurement for increased flow resistance in accordance with EN 10242.

For samples with welded sleeve a pipe with T-fitting is used as reference. The same nozzle is screwed to the sample and to the reference pipe in turn. The screw-in option shall be given even before the samples are sent to VdS.

The sample shall have a connection sleeve. The sample shall be designed in accordance with Annex D and have a flange in accordance with EN 1092-1 at one end and be pressure-sealed at the other end. The length of the sample shall not exceed 450 mm.

A nozzle with the following K factor is screwed into the thread:

- DN 10 - K 57
- DN 15 - K 80
- DN 20 - K 115

Samples with a welding seam to the pipe connection, as shown in Annex C, shall have flanges or roller grooves at both ends.

The K factor thus determined, shall meet the requirements of 4.6.

The client will receive a test report.

#### **5.3.3.5 Testing of samples in VdS Laboratories: Pressure test**

The samples are produced in accordance with clause 5.3.3.2 and Annex E (branch pipe) and/or Annex C.

These samples are fixed to a test facility as shown in Annex E (branch pipe) and Annex F. Then all openings are pressure-sealed and the pipe is completely filled with water via a connected sleeve (connection with  $\frac{1}{2}$  inch female thread). The pressure is increased to the 4-fold nominal pressure. This pressure level shall be maintained for at least 10 min.

This sample may then be used for the test in accordance with clause 5.3.3.3.

The client will receive a test report.

#### **5.3.3.6 Marking of samples**

On 10 consecutive working days, the sample is submerged in tap water (ambient temperature) once a day for 5 minutes. Every time the sample is taken out of the water, at least the area of the marking shall be rubbed dry with a clean and dry cotton or paper towel (10 rubbing actions in both directions; force applied to marked surface 10 N to 20 N). The marking shall not become detached or smear or leave traces on the towel. Afterwards, the marking of the same sample is covered in mineral oil based lubricant for 24 h at ambient temperature. Then the lubricant is removed from the sample with a clean and dry cotton or paper towel. The marking shall not become detached or smear.

#### **5.3.3.7 Further tests**

VdS reserves the right to carry out further tests, if required, by agreement with the client.

### **5.3.4 Check of personnel**

This check involves access to appropriate company documents, relevant for staff membership and qualification, e.g.

- Extracts from the employment contract for verifying surname, name, beginning of employment, type of work, contract date
- Extracts from documents of the quality management system, e.g. job descriptions
- Attestations and certificates on technical qualifications
- Documents on social security or other appropriate proof of employment up to the time of inspection in accordance with 4.2.1

By agreement with the VdS Certification Body, the evidence may also be submitted otherwise. If required, the VdS Certification Body will do additional checks of the personnel.

### **5.3.5 Initial inspection of the welding procedure**

Prior to the initial approval, the welding procedure shall be checked on site and in the VdS Laboratories for compliance with the requirements of 4.

### **5.3.6 Periodic inspection of the welding procedure**

24 months after approval of the welding procedure, the Certification Body will carry out a periodic inspection of the operating site and the welding procedure in accordance with 4 and 5.3. A third inspection will take place 44 months after the initial inspection at the latest.

If within the first 48 months of the approval no deficiencies are found, VdS will inspect the welding procedure at regular intervals of 48 months in accordance with 4 and 5.3.

Approved installers of fire extinguishing systems according to VdS 2132 may undergo this inspection together with the periodic inspection according to VdS 2132 cl. 5.1.5.

If the Certification Body reveals a deficiency, this shall be remedied and the period of time until the following inspection according to 4 and 5.3 shall be reduced to 24 months.

In this case, only 2 samples in the smallest and largest dimensions of the approvals are tested.

## **5.4 Initial approval**

If all approval conditions are fulfilled, the approval of the welding procedure will be granted for 48 months and documented by a certificate, and thus will become effective.

## **5.5 Renewal of the approval**

Not less than 2 months before the approval expires, the client shall submit an application for a renewal of the approval to the VdS Certification Body in accordance with Annex A. The renewal will be for 48 months.

During the term of the approval, the conditions of clauses 4 to 8 shall be met.

VdS checks whether the above conditions are met and confirms the renewal on the approval certificate.

The renewal is based on the VdS Guidelines valid at the time of the application.

VdS reserves the right to demand further documentation.

## 5.6 Change of the approval

### 5.6.1 General

Any changes with reference to the approval shall be indicated to the VdS Certification Body immediately using the application form in Annex A.

### 5.6.2 Welding supervision

If the welding supervisor leaves the company, the VdS Certification Body shall be informed in writing without delay.

Not less than 3 months after the supervisor has left the company, a new expert with the required qualification in accordance with 4.2.2 shall be nominated and the VdS Certification Body shall be informed accordingly.

If the requirements are not fulfilled within 6 months, the approval of welding procedures for pipes < DN 65 will be revoked.

### 5.6.3 Change of ownership and sale of operating sites

Any change of ownership or sale of operating sites for which an approval has been granted shall be indicated to the VdS Certification Body without delay and in writing. This also refers to changes in the corporate structures, where these affect the cooperation of the client and/or the operating site certified for the welding procedure.

Approvals may be transferred to a new owner only if the application and the above documentation as well as any further documents in accordance with Annex A are submitted to the VdS Certification Body within 3 months after the change/sale.

After the opening of insolvency proceedings, the approval cannot be transferred. In this case, a new application for an approval of the respective welding procedures shall be submitted.

### 5.6.4 Change of company registration

The VdS Certification Body shall be informed, without delay and in writing, of any change of the client's company registration, e.g. change of name or change of legal form.

The application and all documents in accordance with Annex A relating to the new company registration shall be submitted to the VdS Certification Body within 3 months of the change.

### 5.6.5 Relocation of operating sites

The VdS Certification Body shall be informed, without delay and in writing, of any relocations of operating sites.

The application and all documents in accordance with Annex A shall be submitted to the VdS Certification Body within 3 months of the relocation.

## 5.7 Termination or revocation of the approval

### 5.7.1 General

Approvals may terminate or be revoked and thus become invalid. From the moment the approval terminates or is revoked, any advertising with the VdS approval is no longer permitted (see clause 6).

The approval certificates shall be returned to the VdS Certification Body immediately after they have terminated or been revoked.

### 5.7.2 Termination of the approval

The approval terminates if the client does not apply for a renewal in accordance with 5.5 at the time the approval period ends.

### 5.7.3 Revocation of the approval

The approval is revoked if

- the guidelines that the approval is based on are modified, and the client does not implement these modifications within a given period of time for existing approved welding installations.
- there has been deceit or attempted deceit in relation to the approval, e.g. fraud or attempted fraud, falsification or modification of certificates or documents. (A criminal conviction is not necessary for a revocation, it is sufficient to prove the facts.)
- the approval or the VdS logo (see cl. 6) are used incorrectly (e.g. unfair advertising).
- the client does not fulfil their obligations according to these Guidelines or meet their financial obligations towards VdS Schadenverhütung.
- the client does not fulfil the requirements of cl. 7.

Prior to a revocation, the VdS Certification Body informs the client in writing about the facts and the reasons for the revocation. The client may then express his views on the facts and reasons within a period of 3 weeks. After this period has expired, the VdS Certification Body will make a final decision.

The VdS Certification Body will inform the client in writing of the revocation of the approval stating the reasons. The revocation will become valid once the client has received this information.

A renewed approval may be applied for 12 months after the revocation at the earliest.

## 5.8 Fees

The approval procedure and the VdS services involved are subject to fees. These fees are given in the table of fees of the VdS Certification Body. This table of fees can be forwarded on request. The fees are calculated on the basis of this table of fees valid at the time the services are rendered.

# 6 Advertising

VdS-approved companies may use the VdS approval for advertising purposes. However, it is prohibited to integrate the brand "VdS" or modifications thereof or the approval as such into the company name. If the company uses the VdS approval for advertising

purposes, the text printed on the certificates shall be rendered correctly and not in an anticompetitive way.

The specifications on the certificates shall be adhered to. Advertising shall be strictly in connection with the approved operating site using the company name given in the certificates. Any advertising with the VdS approval shall not refer to the services of the client that are not covered by the approval. In case of doubt, the advertising shall be agreed with the VdS Certification Body.

The client may refer to his VdS approval using the following logo:



VdS-approved welding procedure  
for pipes < DN 65: sleeves, pipe  
connection, branch pipe

The VdS logo may be enlarged or reduced maintaining its proportions. Its minimum height shall be 13 mm. It may be used on letter heads, advertising material and publications of the client.

In case of doubt, the advertising and use of the logo shall be agreed with the VdS Certification Body.

## 7 Complaints procedure

The complaints procedure is laid down in the General Terms and Conditions of Business of VdS Schadenverhütung GmbH for the provision of testing and certification services, VdS 3177en.

## 8 General Terms and Conditions

These Guidelines apply in connection with the General Terms and Conditions of Business of VdS Schadenverhütung GmbH for the provision of testing and certification services, VdS 3177en, in the version valid at the time the contract was concluded. The General Terms and Conditions may be downloaded free of charge under [www.vds.de](http://www.vds.de) or sent to the client on request.

In addition please note that the testing and approval of welding procedures for pipes < DN 65 does not involve VdS Schadenverhütung assuming any liability for the correct design or functionality of the installed or maintained fire extinguishing systems or for the correctness of any other products or services the client provides for or supplies to third parties.

## **Annex A**

## **Application for approval of certified welding procedure for pipes < DN 65**

The forms of Annex A may be downloaded and filled in under [www.vds.de](http://www.vds.de) and may also be sent to the client in paper on request.

We can only process applications that have been filled in completely and include all corresponding annexes.

The documents shall be submitted in German or English. Documents in other languages shall include an appropriate translation.

## Annex B      QM Certification

Certifications of QM systems not carried out by the VdS Certification Body are accepted as basis for a VdS approval for welding procedures of pipes < DN 65 under the following conditions:

- The Certification Body shall have been accredited by an Accreditation Body that is a member of the "European co-operation for Accreditation (EA)" and has signed the IAF "Multilateral Recognition Agreement" (MLA) for management system certification. Certification bodies accredited by the Deutsche Akkreditierungsstelle GmbH (DAkkS) fulfil this requirement.
- Upon expiry of the preliminary approval at the latest, the certificate shall clearly set out the welding of pipes < DN 65 in accordance with ISO 9001. In case of doubt, the VdS Certification Body requires a declaration to that effect signed by the certifying party.
- Every 2 years at the latest, the client shall prove to the VdS Certification Body that his QM system has a valid certification.
- Where justified, the VdS Certification Body will call on the client to send us process descriptions of the welding procedures for pipes < DN 65. A check of the documents will reveal whether the requirements for the welding of pipes < DN 65 are met in accordance with the relevant guidelines for planning and installation. In case of deficiencies, the VdS Certification Body will define correction measures to be taken within an appropriate period of time.

**Annex C****Samples for the welding of pipe connections**

If the approval includes the welding of pipe connections, the manufacturer shall submit the following samples. The design is given below.

The pipes shall be fully sealed at both ends.

The samples shall be marked with the corresponding pipe dimensions.

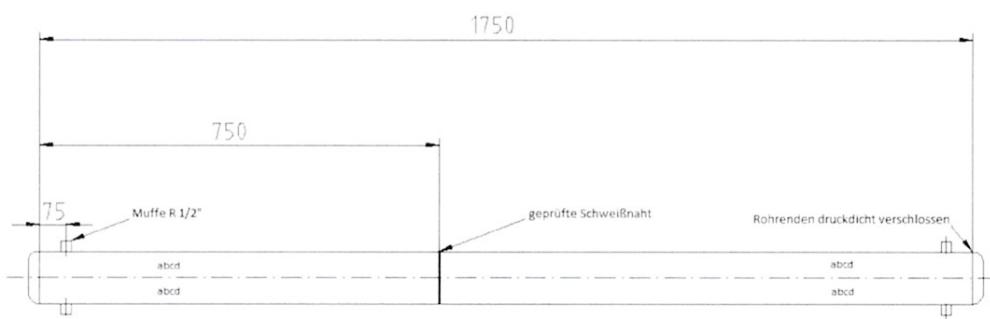


Abbildung 1:

For reasons of clarity, the dimensions are not to scale.

**Legend:**

Rohrenden druckdicht verschlossen = pipe ends with pressure-tight sealing

geprüfte Schweißnaht = tested welding seam

Muffe = sleeve

Abbildung 1 = Figure 1

**Annex D****Samples for sleeve welding**

If the approval covers sleeve welding procedures, the manufacturer shall submit samples. The design of these samples is given below.

*Please note:*

*The sleeves shall be designed such that a nozzle may be installed (e.g. DN 10, 15 and 20).*

*The samples shall be marked with the pipe dimensions and an appropriate **ventilation facility** of the pressure-tight pipe end shall be provided.*

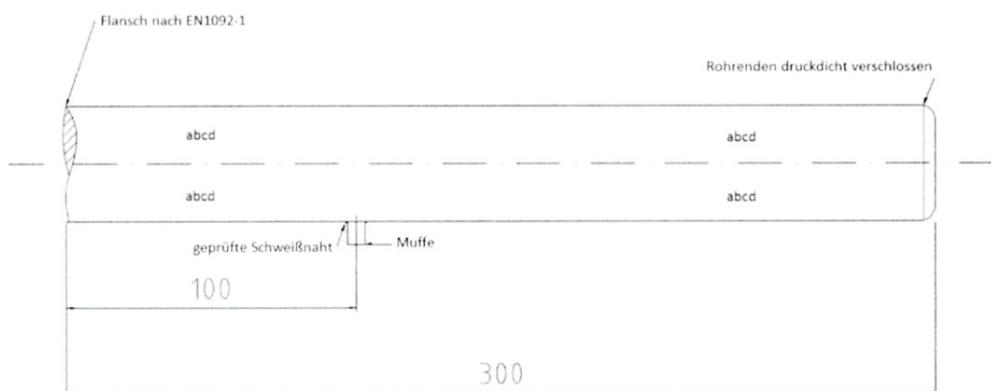


Abbildung 2

For reasons of clarity, the dimensions are not to scale.

**Legend:**

Flansch nach EN1092-1 = flange in accordance with EN 1092-1

Rohrenden druckdicht verschlossen = pipe ends with pressure-tight sealing

geprüfte Schweißnaht = tested welding seam

Muffe = sleeve

Abbildung 2 = Figure 2

**Annex E****Samples for the welding of branch pipes**

If the approval covers the welding of branch pipes, the manufacturer shall submit samples.

The design of the samples is given below.

Table 1 specifies the force to be applied to the branch pipe.

The samples shall be marked with the pipe dimensions.

For reasons of clarity, the dimensions are not to scale.

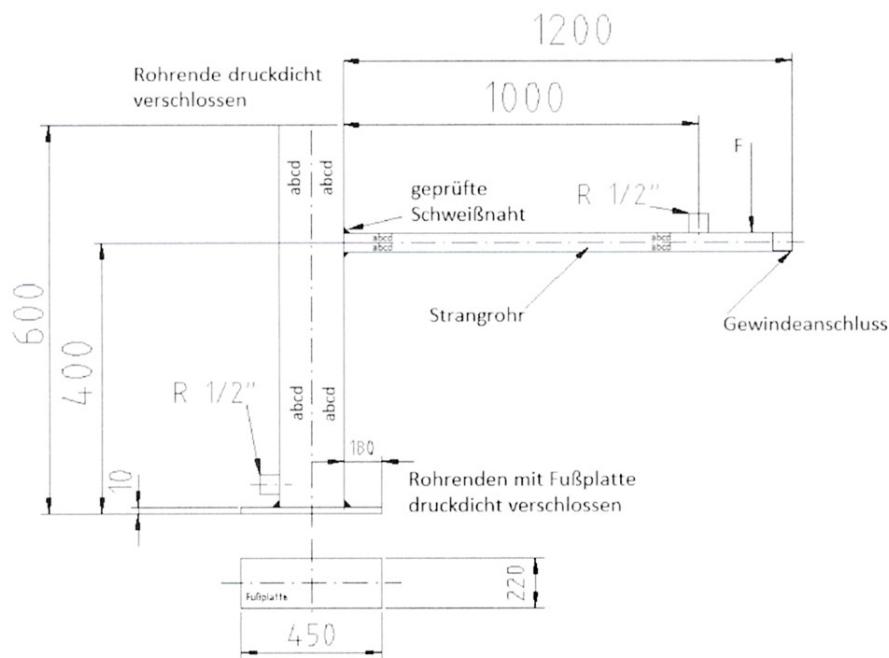


Abbildung 3

**Legend:**

Rohrende druckdicht verschlossen = pipe end with pressure-tight sealing

geprüfte Schweißnaht = tested welding seam

Strangrohr = branch pipe

Gewindeanschluss = thread

Rohrenden mit Fußplatte druckdicht verschlossen = pipe ends with pressure-tight foot plate

Abbildung 3 = Figure 3

## Annex F

### Layout for “Pressure test under bending stress”

Fix the pipe to be tested at one end. Fit it at the height of the welding seam and apply a force at the loose end. The force to be applied is specified in Table 1.



Figure 4