

STAMANT Safety Pipe

The BRUGG STAMANT Safety Pipe is a double pipe system prefabricated in modular units, comes in the sizes:

DN 15/32 to DN 800/900,

which is especially suitable for transporting inflammable and non-inflammable, water pollutant products.

The installation and laying of the modular units is carried out by authorised technical workshops in compliance with §19 I WHG, TRbF 180/280 No. 1.7 with proof of the required procedure and welding tests.

The annular gap between the inner and outer pipe serves forms a surveillance space for connecting a leak detector that takes over the complete and permanent leak monitoring. In case of a leak, an optical and acoustic alarm is issued and, if required, the material transport will be halted.

The leak detector regulates the monitoring pressure in the surveillance space of the safety pipe and registers pressure changes, even for minor leaks in the inner or outer pipe.

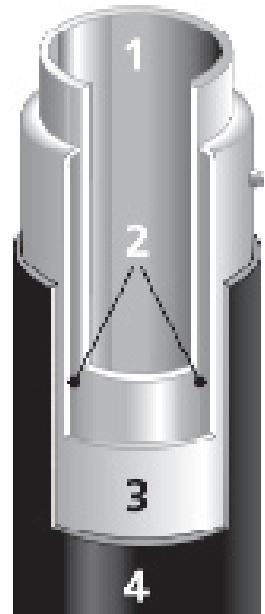
Additional functions when alarm is issued, e.g. forwarding the alarm signal, turning off delivery pumps or closing solenoid valves, also increase the operational safety.

There are two monitoring systems:
Leak monitoring according to the

1. Vacuum principle
2. Positive pressure principle (inert gas)

In addition to high operational safety, the use of a leak monitor offers significant profitable advantages:

1. Easy monitoring of the complete system is possible any time without stopping operation.
2. Requirements such as pressure/volume measurements, pressure tests or pipework trench inspections can be omitted.



Construction of the STAMANT safety pipe

- 1 Primary pipe
- 2 Surveillance space
- 3 Outer containment pipe
- 4 Corrosion proofing

The modular units prepared at the factory include all necessary project-related structural parts (such as bend, T-piece, wall ducts etc.), including the complete external corrosion protection for underground pipework in accordance to the DIN 30672 standards.

The material-specific laying of the outer containment pipe and the media-bearing primary pipe is subject to the expected mechanical, thermal and chemical loads as well as the applicable legal construction rules.

The conventional planning of double-walled piping system especially for larger pipe sizes for transporting inflammable, polluting media has high standards for the technical laying as well as knowledge of fire, explosion and water protection.

Through long years of experience in the planning and implementation of steel casing piping projects in the long-distance heating area and with FLEXWELL safety piping systems in the industry, chemical and tank systems, we are oriented towards these standards.

Qualification approval

The STAMANT safety pipe with leak monitoring is designed and manufactured according to the approval description as well as the construction rules of the TRbF 131 T.1 / TRbF 231 T.1.

The system complies with the § 4 Para.1 VbF standards, the 11. GSGV as well as the § 19 g WHG and the country-specific standards of the VAWS.

Testing and evaluation fundamentals of the leak monitor

(Definition of the surveillance space, the leak detector with connection line and the leak detection medium according to TRbF 503)

- Act for inflammable liquids -
- Technical rules for inflammable liquids - TRbF
 - TRbF 131/231 (Part 1)
Pipelines within the factory grounds
 - TRbF 502
Guidelines / Construction and testing principles for leak detectors for double-walled piping systems
- Water Resources Law - WHG
- Act on systems for handling water pollutant materials - VAWS and its relevant act - VVAWS

Tests

According to the "Technical Description" for approval and construction and test principles in compliance with TRbF.

Preliminary, construction and pressure tests

During manufacture, we conduct the necessary preliminary, construction and pressure tests with the authorised experts at our factory.

The field tests conducted at the construction site are likewise carried out by the experts with the support of the technical experts of the workshop.

Acceptance test

The function test and commissioning of the leak monitoring is carried out according to the description of the approval documents of the leak detector used.

Proof of qualification

In addition to our experience, the following proof of qualification guarantees a proper, quality-oriented order execution:

- Workshop acc. to § 19 WHG
- Workshop acc. to TRbF 180 No. 1.7
- Workshop acc. to TRbF 503
- Procedure test according to AD code of practice HP 2/1
- Welding qualification according to AD code of practice HP 3
- Workshop for the manufacture and construction of piping systems
- Monitoring the acceptance according to guidelines for pressure devices 97/23/EG

Leak monitor: BRUGG STAMANT Safety Pipe

Technical Description

Leak monitor

(Safety piping system and leak monitoring)
permitted for transporting water pollutant media
(inflammable and non-inflammable)
in compliance with VbF i.Vm. of the 11. GSGV,
WHG, VAwS

Safety pipe

as double-walled steel pipe construction with sur-
veillance space as part of a leak detector.
Type: BRUGG STAMANT Safety Pipe

Leak monitoring (acc. to TRbF 502)

Negative pressure leak indicator:
Vacuum leak detector:

Manufacturer

BRUGG-Rohrsysteme GmbH

Installation/Laying

through authorised workshops acc. to § 19 I WHG
and TRbF 180/280 No. 1.7

Usage

Underground or overground piping for transpor-
ting...

Transported material

water pollutant [inflammable and non-inflammable]
media

Dimensions

Outer containment pipe DN 32 to DN 900
Primary pipe DN 15 to DN 800

Operating conditions:

Operating pressure in the primary pipe:
- up to max. 16 bar for positive pressure leak mo-
nitoring
- up to max. 20 bar for vacuum leak monitoring

Calculated pressure [PN]:

- acc. to TRbF 131/231 No. 3.23 / 3.32
Monitoring pressure:
- according to the approval description

Testing pressure

Primary pipe:
- 1.3 times the operating pressure in the primary
pipe, min. 5 bar
Surveillance space:
- 1.3 times the monitoring pressure,
min. 5 bar

Material specification**Primary pipe**

seamless according to DIN 2448/2462, welding in compliance with DIN 2458/2463
Technical delivery conditions:
DIN: 1626, 1629, 1630, 17172, 17175, 17440
Acceptance test certificate in compliance with DIN EN 10204 - "3.1.B"

Outer containment pipe

welding according to DIN 2458/2463, seamless in compliance with DIN 2448/2462
Technical delivery conditions:
DIN: 1626, 1629, 1630, 17172, 17175, 17440...
With external PE corrosion-proof cover in compliance with DIN 30670 or DIN 30671.
Test certificate in compliance with DIN EN 10204 - "2.2" or
Acceptance test certificate in compliance with DIN EN 10204 - "3.1.B"

IR bend

Pipe bend DIN 2605
Test certificate in compliance with DIN EN 10204 - "3.1.B"
Implementation according to the approval description (also see Worksheet SMR 5.03.01/02)

AR bend

Pipe bend, radius according to the inner pipe bend with corresponding material specification outer containment pipe
DIN 2605 or in segments
PE Corrosion-proof jacket according to DIN 30672.
Implementation according to the approval description (also see Worksheet SMR 5.03.01/02)

T-branch

consisting of: outer containment pipe, primary pipe branch,
T-branch according to DIN 2615, 2618 or Weldolet
Implementation according to the approval description (also see Worksheet SMR 5.04.01 - 5.04.05)

Seal end

as pressure and vacuum sealed end of the annular gap between outer containment pipe and primary pipe, welded non-positive, during simultaneous implementation of the primary pipe, incl. connection for leak detector.
Implementation according to the approval description (also see Worksheet SMR 5.14.01/02/03)

Guide bearing

Spacer
Thrust bearings help in the proper guiding of the primary pipe and guarantee the continuity of the surveillance space.
Implementation according to the approval description (also see Worksheet SMR 05.10.01/02)

Leak monitoring

The existing annular gap between primary pipe and outer containment pipe, annular gap volumedm³, serves as surveillance space.
The piping system is monitored according to the negative pressure or vacuum system, designed according to the actual operating pressure of the primary pipe, through permitted leak detector.

Inflammable liquids of the danger class

AI, AII, AIII and B
- Negative pressure leak detector D-FFL 10 (08/PTB No. III B/S 2254),
Worksheet: LDS 6.27. ... ff

Inflammable liquids (AIII) and non-inflammable liquids

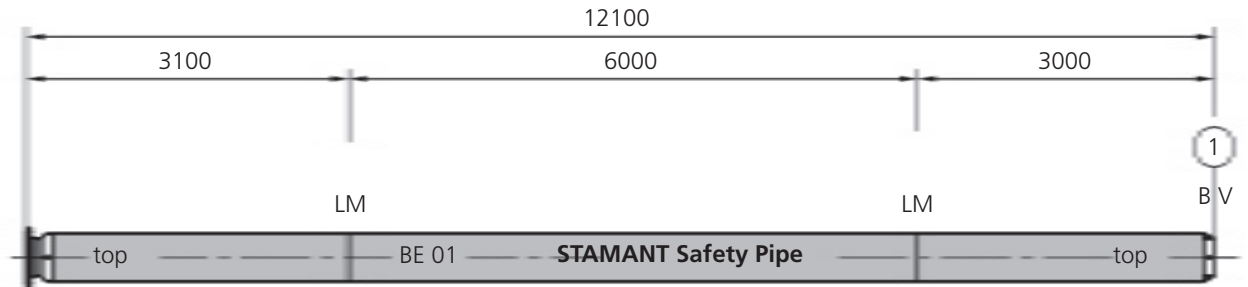
- Vacuum leak detector VL-HFw2 (PTB No. III B/S 1237)
Worksheet: LDS 6.23. ... ff

as part of a leak detector for double-walled piping systems.

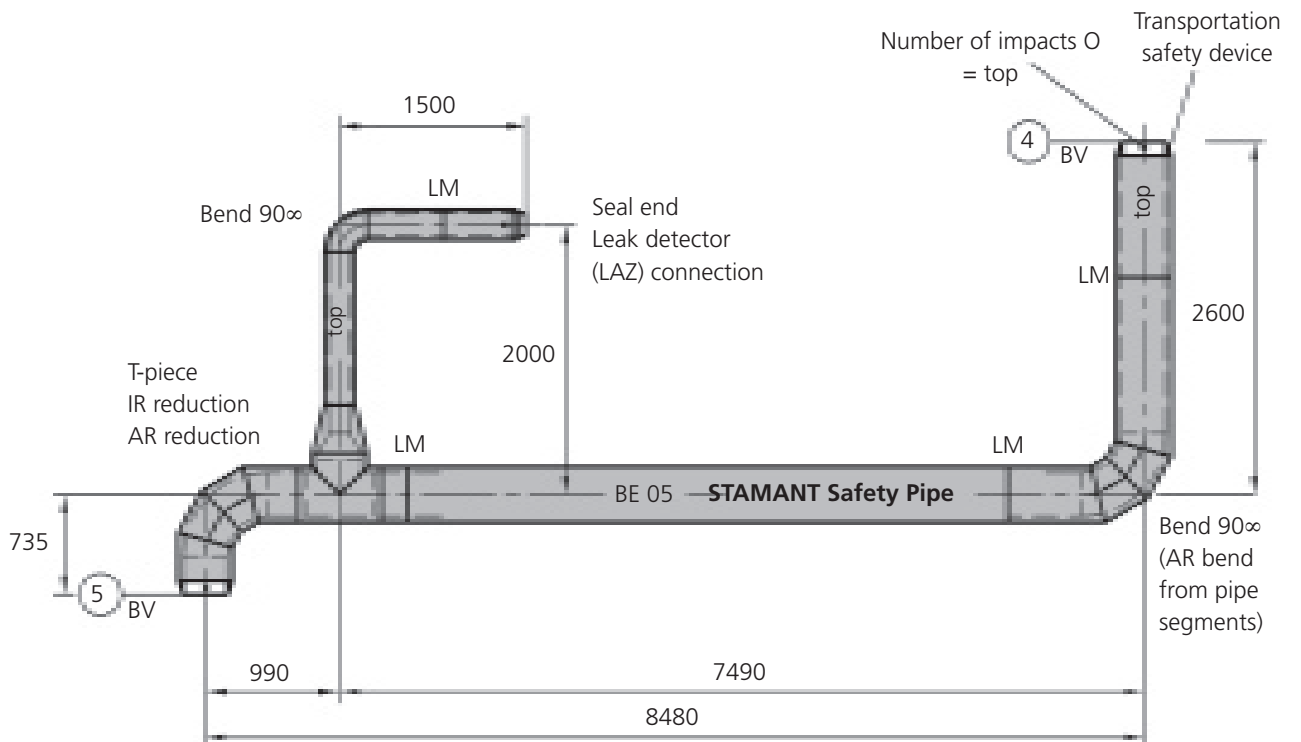
Implementation according to the approval description.

STAMANT safety pipe modular units contain all necessary formed parts such as bends, T-branches, reductions and end seals. The standard length of the modular units is 12.0 m. Greater lengths are possible on request. The maximum length of the modular units is limited by the transportation options.

Modular units of an implemented system



- Flange
- Seal end
- Leak detector
- (LAZ) connection



- Subject to technical modifications -

The leak monitoring

The STAMANT safety pipe is permanently monitored with pneumatic leak detectors/monitors. These detectors regulate the monitoring pressure in the surveillance space and register any pressure changes.

The surveillance space holds the leak detection medium (inert gas) and during leakages prevents an uncontrolled leakage of the transported material. The surveillance space must be designed in such a way that while connecting a leak monitoring under all operating conditions, the function and operational safety of the leak detector is assured.

In case of damage, the alarm is displayed by an acoustic and optical signal.

Definition of leak monitor/leak detector

According to the applicable rules, "Leak monitor"/"Leak detector" is a device that automatically displays leakages in the walls of the double-walled pipes in which water pollutant (inflammable and non-inflammable) liquids are transported under all operating conditions.

The term leak monitor/leak detector implies all equipment required for detecting leaks.

Main components area:

Leak detector (LAZ) / Leak monitor, connection pipe ÜR - LAZ,
double-walled piping system,
Surveillance space (ÜR),
Leak detection medium, ...

The use of this system corresponds to the highest European safety level (Class I). Systems of this class display a leak above or below the liquid level in a double-walled protection system. They are built safety-oriented and ensure that no product leaks into the surroundings.

Leak detector (LAZ)/ leak monitor

There are two difference pressure leak detectors: Leak monitoring to display leaks in surveillance spaces of double-walled piping systems according to the vacuum principle and the negative pressure principle (inert gas).

STAMANT Safety pipe with vacuum leak detector

STAMANT Safety pipe with negative pressure leak detector

Approval/qualification

All leak detection systems must correspond to the stipulated construction and test principles. Therefore, one must comply with all conditions that can affect the function and operational safety of the system.

Consequently, the conditions of use are tested by the authorised test institutions and are clearly defined and stipulated in the approvals.

STAMANT safety pipe with leak monitoring is an approved leak detection system/leak detector.

System advantage

In addition to high operational safety, using the double-walled STAMANT safety pipe with leak monitoring offers significant profitable advantages:

- Easy monitoring of the complete system is possible any time without stopping operation.
- Requirements such as pressure/volume measurements, pressure tests or pipework trench inspections can be omitted.

Vacuum - leak monitoring STAMANT Safety Pipe

According to the approval, the vacuum leakdetector is suitable for monitoring STAMANT piping systems through which:

- water pollutant, inflammable materials
 <= 55°C only in Ex-model
- water pollutant, non-inflammable materials are transported.

Function principle

The vacuum pump installed in the leak detector produces a vacuum in the surveillance space. By monitoring this vacuum, leakages in the pipe walls are ascertained automatically.

In case of vacuum loss (pressure increase) following a leak below the lower value of the monitoring vacuum, an optical and acoustic alarm is triggered.

Minor, unavoidable leaks are controlled automatically by the leak detector without alarm within the upper and lower value of the monitoring vacuum. Post-evacuation through vacuum pump in leak detector.

Each time the alarm is triggered, the vacuum pump is automatically turned off. It can be turned on again only after pressing the flip switch located outside on the leak detector.

Technical principles

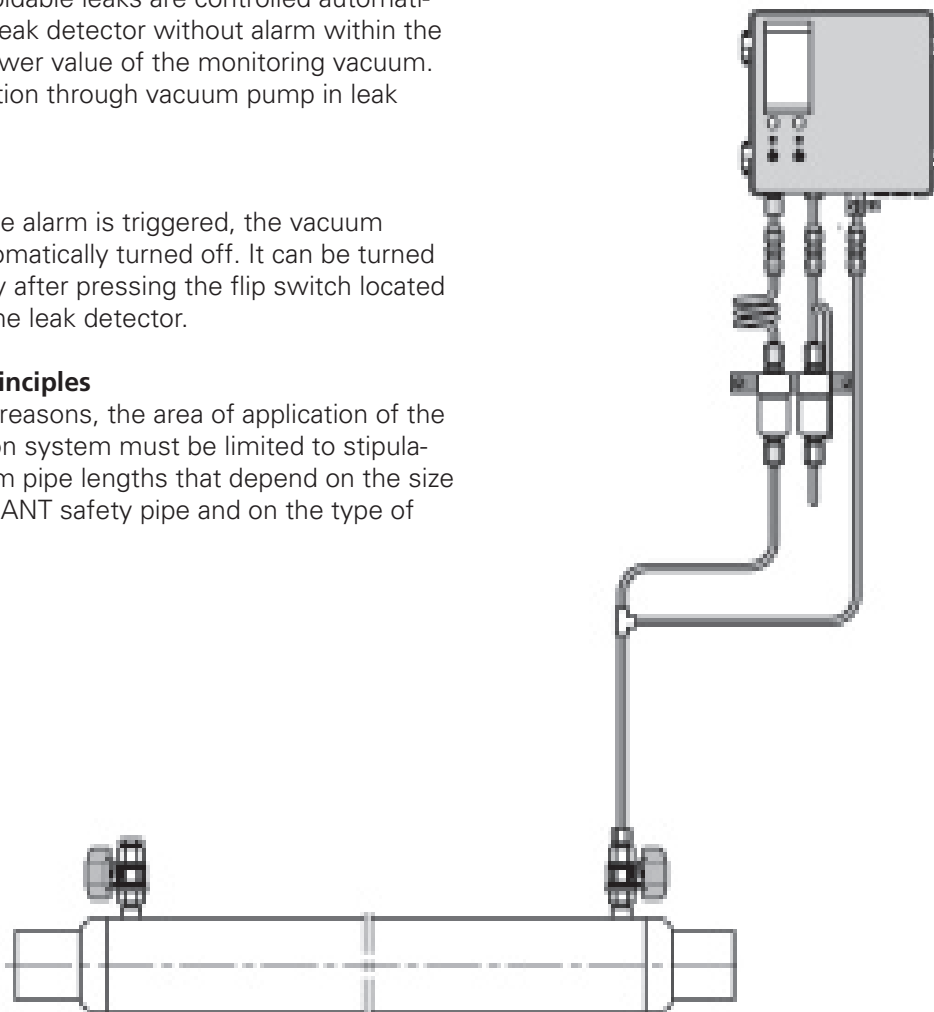
For physical reasons, the area of application of the leak detection system must be limited to stipulated maximum pipe lengths that depend on the size of the STAMANT safety pipe and on the type of laying.

Approval/qualification

All leak detection systems must correspond to the stipulated construction and test principles. Therefore, one must comply with all conditions that can affect the function and operational safety of the system.

Consequently, the conditions of use are tested by the authorised test institutions and are clearly defined and stipulated in the approvals.

STAMANT safety pipe with leak monitoring is an approved leak detection system/leak detector.



Leak monitoring STAMANT Safety Pipe

According to the approval, the negative pressure leak detector is suitable for monitoring STAMANT piping systems through which:

- water pollutant, inflammable materials
- water pollutant, non-inflammable materials are transported.

Function principle

The required negative pressure in the surveillance space of the FLEXWELL piping system is based on the actual operating pressure in the operation piping system (primary pipe) and is produced

- by pressure-controlled refilling from a nitrogen accumulator connected to the surveillance space.

Operating mode stationary

- produced by mobile accumulator to be connected only during commissioning or function test.

Operating mode mobile

The operating modes S and M must be preselected by an operating mode switch located outside on the leak detector.

The surveillance space is connected with the leak detector by the connection pipes. The built-up negative pressure is measured by the pressure absorber. In case of vacuum loss following a leak at the stipulated value ALARM-ON, an optical and acoustic alarm is triggered.

In the operating mode S, after commissioning, the monitoring pressure is controlled by pressure-controlled feed from the nitrogen accumulator connected permanently with the surveillance space with pressure reducer attached on top.

In operating mode M, on commissioning, the monitoring pressure (RATED PRESSURE) in the surveillance space is produced once by an accumulator that is not connected permanently. No pressure-controlled feed is done on further operation. Any pressure loss up to the ALARM switch point must thus be compensated in case of alarm

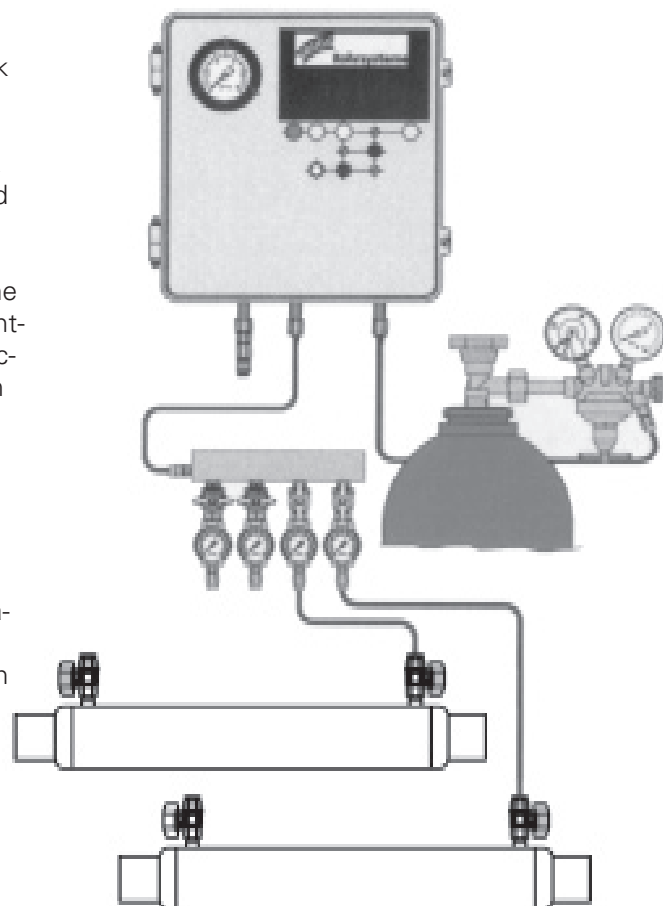
by the accumulator to be then connected until the set value of the RATED pressure.

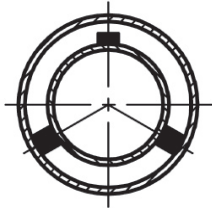
Approval/qualification

All leak detection systems must correspond to the stipulated construction and test principles. Therefore, one must comply with all conditions that can affect the function and operational safety of the system.

Consequently, the conditions of use are tested by the authorised test institutions and are clearly defined and stipulated in the approvals.

STAMANT safety pipe with leak monitoring is an approved leak detection system/leak detector.





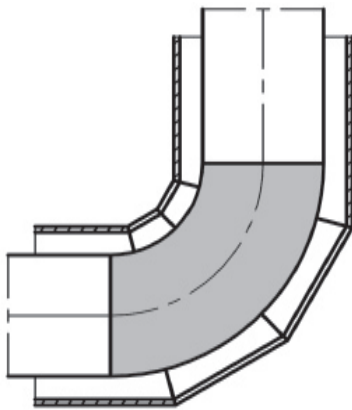
acc. to Worksheet SMR 4.610 ...

Spacer

Thrust bearing
acc. to Worksheet SMR 4.610 ...

Forced guide
acc. to Worksheet SMR 4.611 ...

Bearing plate
acc. to Worksheet SMR 4.612 ...

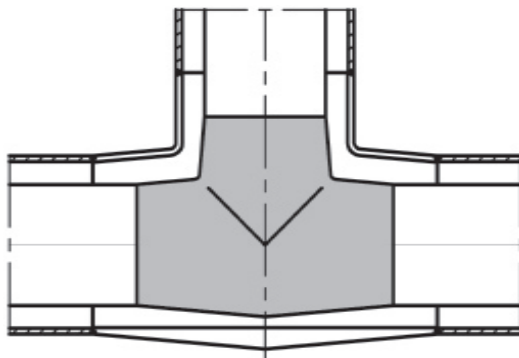


acc. to Worksheet SMR 4.603 ...

Double-walled bend

Bend in bend
acc. to Worksheet SMR 4.603 ...

Outer containment pipe bend from pipe segments
acc. to Worksheet SMR 4.603 ...



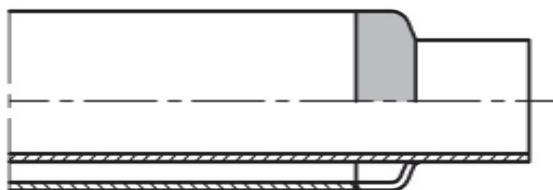
acc. to Worksheet SMR 4.604 ...

Double-walled T-piece

T-piece according to DIN 2615
acc. to Worksheet SMR 4.604 ...

T-piece with welding saddle
acc. to Worksheet SMR 4.604 ...

T-piece with Weldolet
acc. to Worksheet SMR 4.604 ...



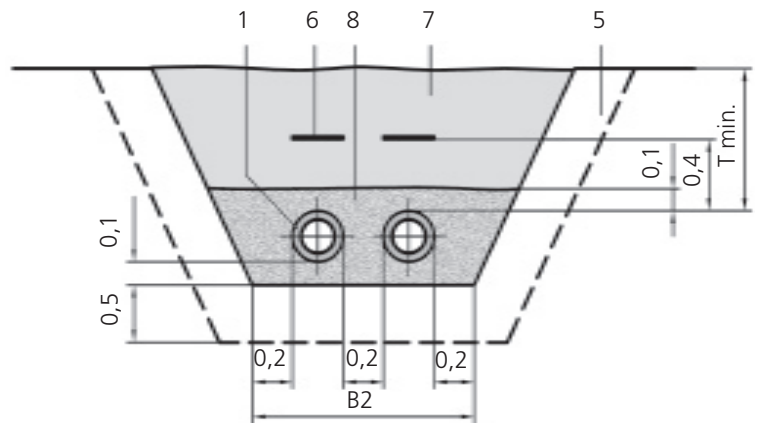
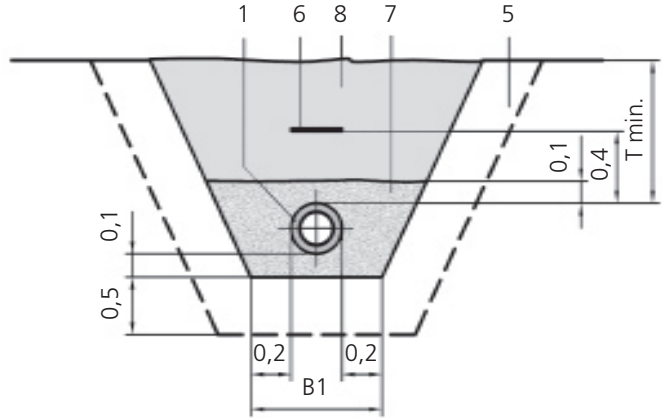
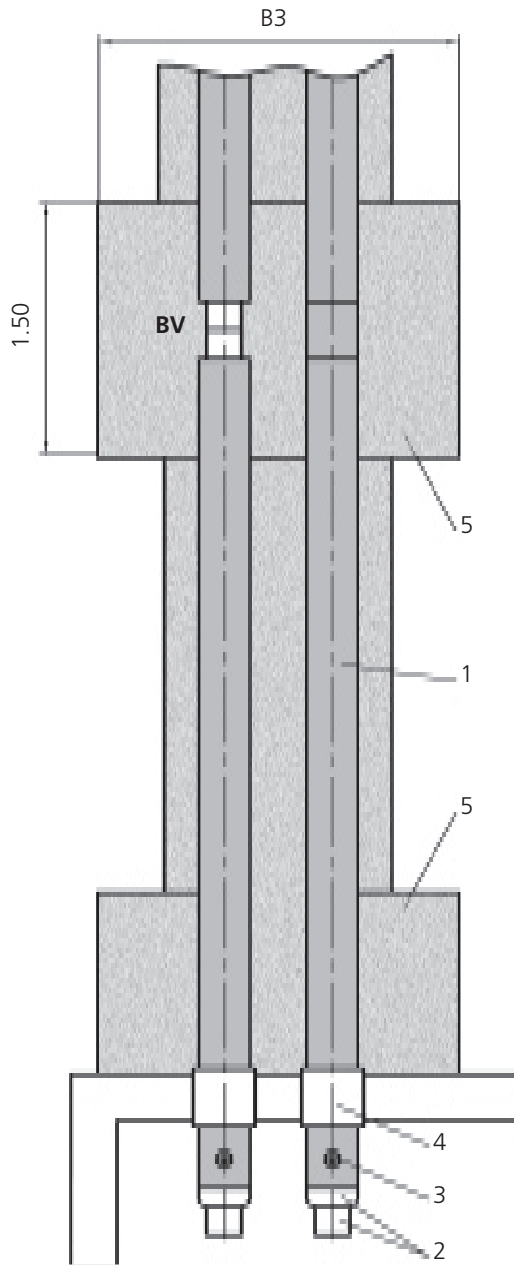
acc. to Worksheet SMR 4.602 ...

Seal end

Seal end
acc. to Worksheet SMR 4.602 ...

Axial compensator end
acc. to Worksheet SMR 4.602 ...

Lens compensator end
acc. to Worksheet SMR 4.602 ...



- 1 STAMANT Safety Pipe
- 2 Pipe connection with seal end
- 3 Connection to LAZ
- 4 Wall duct/sealing
- 5 Work space in front of buildings, shafts and in the area of construction connections
- 6 Line warning belt (delivery by BRUGG Rohrsysteme, laying by customer)
- 7 Sand filling (K ≤ 2 mm)
- 8 Filler

The trench widths -Bi are recommended values.
Please observe general applicable technical rules, guidelines and accident prevention rules.

STAMANT Safety Pipe(Outer containment pipe)		DN 65	DN 80	DN 100	DN 150	DN 200	DN 300	DN 400	DN 500	
min. outside diameter	d (mm)	77,9	90,7	116,3	170,3	221,1	326,1	408,6	612,1	
min. overlap height t in SLW 60	(m)	min. 0.90								
min. overlap height t in SLW 30	(m)	min. 0.75								
Trench width	B1 (m)	0,48	0,49	0,52	0,57	0,62	0,73	0,81	0,91	1,02
Trench width	B2 (m)	0,76	0,78	0,84	0,94	1,04	1,25	1,42	1,62	1,83
Head hole width	B3 (m)	1,56	1,58	1,64	1,74	1,84	2,05	2,22	2,42	2,63