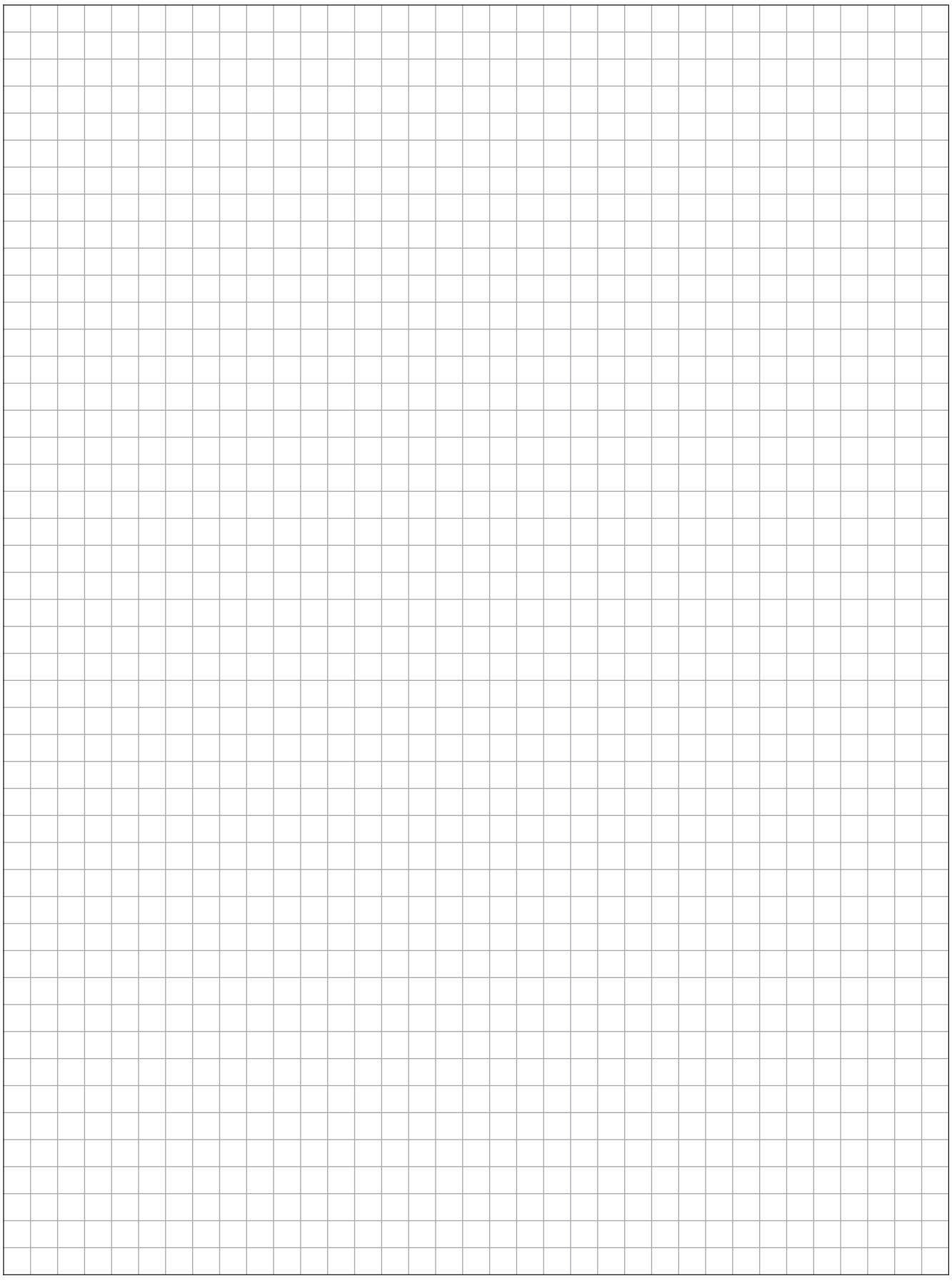
FLEXWELL® Safety Pipe

Pipe systems for installations

Technical details

BRUGG PIPESYSTEMS
Flexible solutions

Notes



Contents

System description

Construction and function

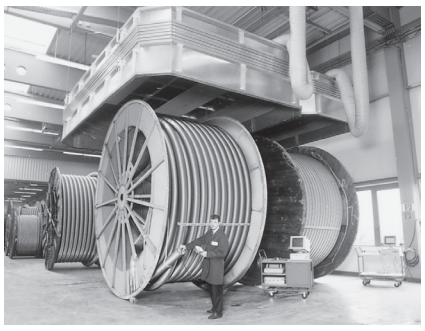
The FLEXWELL® Safety Pipe is a:
- double-walled, monitorable, flexible and factory produced pipe system with all necessary quality tests
- approved for the transport of water-hazardous, flammable or otherwise dangerous fluids
- recognized and approved leak detection system
- Dimensions: DN 12 – DN 100
- Pressure range: 25 bar, PN 25
- Temperature range: –10 °C and +50 °C
- DIBt Approval Number: Z – 38.4 - 253

Leak monitoring

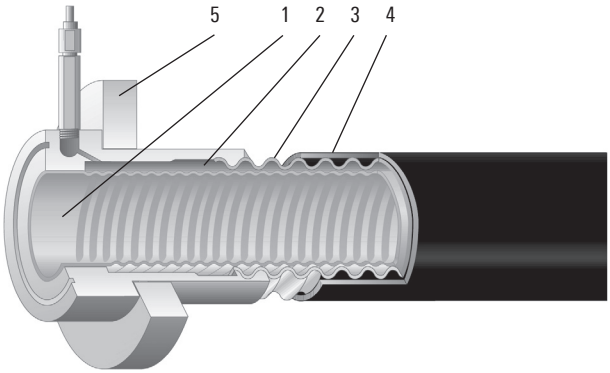
The surveillance space between the inner and outer pipe enables permanent leak monitoring using approved leak detection devices operating either on the positive pressure or vacuum principle. The use of these systems is compliant with the highest European safety standards. The system is constructed with safety in mind and will detect any leak above or below the fluid level within a double-walled protective system.

Legal basis

Many laws, standards and regulations determine the requirements for leak detection systems and their use. Here are just a few of the principal ones:
- European Standardisation of Leak Detection Systems (DIN EN 13160, DGRL 97/23/EG)
- Environmental legislation and requirements for water safety (DIN EN 13480, WHG § 62)
- Fulfillment the requirements for fire and explosion prevention for hydrological engineering and construction of buildings (TRbF 50, MLAR)



Quality, process, pressure and material tests are carried out as part of the approval procedure by external technical inspection agencies as well as our internal quality assurance department



Construction of the FLEXWELL® Safety Pipe:

1 corrugated inner pipe (1.4404/1.4571)
2 surveillance space
3 corrugated outer pipe (1.4301)
4 Corrosion proofing (PE casing)
5 Connecting fitting

Laying and installation

- fast, simple laying in continuous lengths directly from drum/coil into trench or in building
- underground and above ground
- changes of direction are compensated by the flexible pipe system
- acceptance test after completion of laying and installation by means of a function test of the leak monitoring system.
- All connecting fittings and double-walled flanged moulded fittings are mounted either on the surface or in manholes and canal ducts
- All non-detachable double-walled moulded fittings (integrated elements) in a pipe can also be laid underground
- laying and installation is done only by trained and accredited specialist firms (acc. to WHG or VAUwS)
- optional technical support by BRUGG intallation and service staff

The Advantages of the system

- double-walled, monitorable, flexible pipe system
- delivery in lengths up to 1000 m
- short construction periods, fast laying
- flameless (non-weld) connecting fitting
- no moulded fittings/welded connections along the pipe route
- optionally, BRUGG can provide the entire range of installation and support services
- approved system Z – 38.4 - 253
- for highly aggressive substances other materials can be applied on a project basis (e.g.1.4539)

System description

Leak monitoring

The FLEXWELL® Safety Pipe is permanently monitored using pneumatic leak detection devices/leak detectors. These regulate the monitoring pressure in the surveillance space and register any changes of pressure which may occur.

The surveillance space prevents the uncontrolled escape of the transport medium into the environment in the event of a leakage. The surveillance space must be constructed in such a way that the proper functioning and operating safety of the leak detection system is ensured under all operating conditions.

In the case of a leakage the alarm is given by acoustic and optical signals.

Definition of a leak detection system

A "leak detection system" according to currently valid regulations is a device which is capable of warning automatically of leaks in the walls of double-walled piping transporting water-hazardous (flammable and non-flammable) fluids under all operating conditions. All equipment necessary for the detection of leaks is included under the term leak detection system/leak detector.

The main components are:
- the leak detector(LAZ)/leak detection device
- the surveillance space (ÜR)
- the connection to the leak detector ÜR – LAZ
- the double-walled piping
- a leak detection medium

The use of these systems is compliant with the highest European safety standards (Class I). Systems of this Class will detect any leak above or below the fluid level within a double-walled protective system. They are constructed with safety in mind and ensure that no fluid can escape into the environment.

Leak detector (LAZ)/leak detection device

A distinction is made between two types of differential pressure leak detection device for leak monitoring to detect and report leaks in surveillance spaces of double-walled piping either the **vacuum principle** or the **positive pressure principle** with an inert gas.

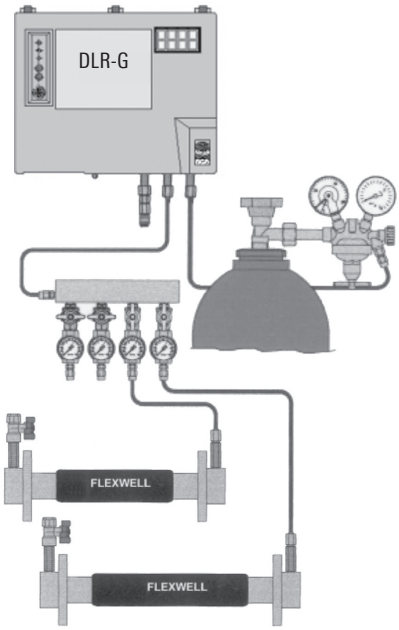
Approval/suitability

All leak monitoring systems must comply with the established construction and testing principles. This means that all the conditions must be considered which might influence the function and operating safety of the system. Consequently the conditions for operation are tested by the competent authorities and clearly defined and stipulated in the approvals issued by them.

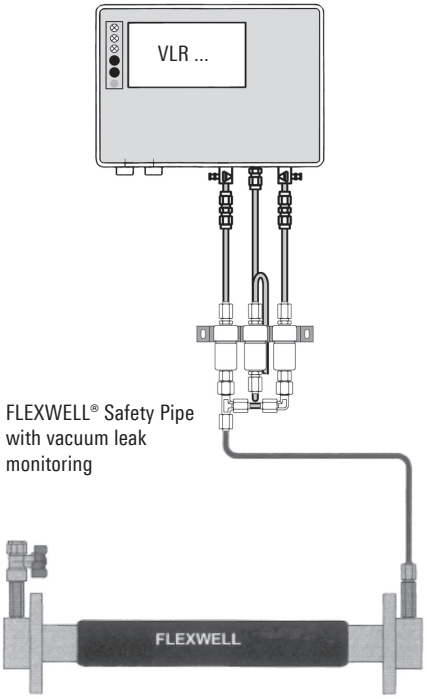
FLEXWELL® Safety Pipe with leak monitoring is an approved leak detection system.

Advantages of the system

The use of double-walled FLEXWELL® Safety Pipe with leak monitoring has, besides offering excellent operational safety, significant economic advantages:
- the entire system can be simply checked at any time without any downtime in operations
- requirements such as e.g. pressure or volume measurements, pressure tests or inspection of the route can be eliminated



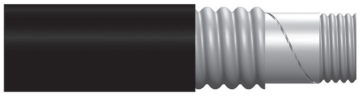
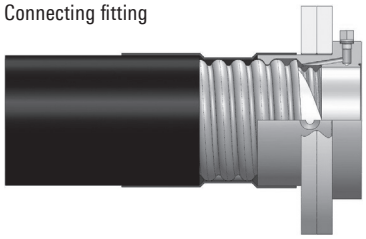
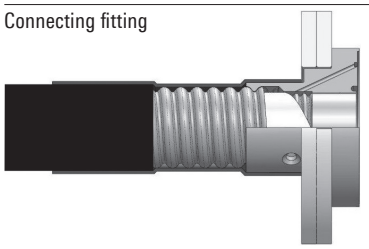
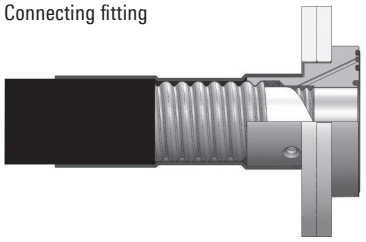
FLEXWELL® Safety Pipe with positive pressure leak monitoring



FLEXWELL® Safety Pipe with vacuum leak monitoring

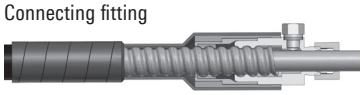
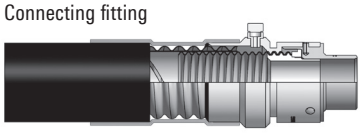
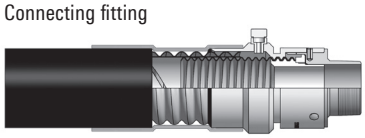
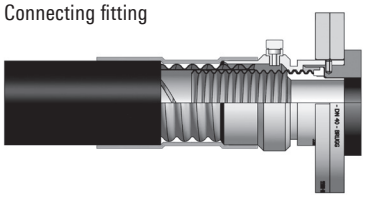
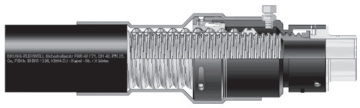
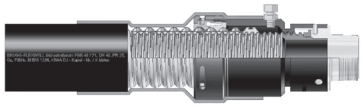
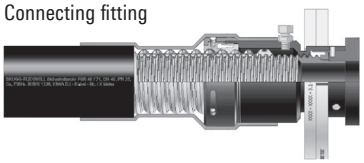
Product overview

Piping/Connecting fittings TIG welding

Version	Type FSR	Nominal bore/ Connector DN/DN	Pressure PN	Connector Type of joint inner/outer	Material No.	Worksheet
Pipe 	FSR 13/ 25	12	25	smooth-bore inner pipe corrugated outer pipe	1.4404 1.4301	FSR 4.130
Pipe 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25 32 40 50 65 80 100	25	corrugated inner pipe corrugated outer pipe	1.4404 1.4301	FSR 4.131
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25/ 25 32/ 32 40/ 40 50/ 50 65/ 65 80/ 80 100/125	25	collar with split loose flange TIG welding/hard soldering	collar 1.4404	FSR 4.211
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83	25/ 40 / 1 ½" 32/ 50 / 2" 40/ 65 / 2 ½" 50/ 65 / 2 ½"	25	external R thread TIG welding/hard soldering	socket with thread 1.4404	FSR 4.221
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25/ 40 32/ 50 40/ 65 50/ 65 65/100 80/100 100/150	25	collar with split loose flange and monitorable sealing surface with O-rings (Part 1) TIG welding/hard soldering	collar 1.4404	FSR 4.216
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25/ 40 32/ 50 40/ 65 50/ 65 65/100 80/100 100/150	25	collar with split loose flange and monitorable sealing surface with O-rings (Part 2) TIG welding/hard soldering	collar 1.4404	FSR 4.217

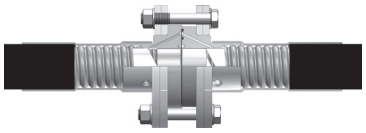
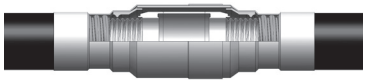
Product overview

Connecting fittings GRAPA graphite compression joint

Version	Type FSR	Nominal bore/ Connector DN/DN	Pressure PN	Connector Type of joint inner/outer	Material No.	Worksheet
Connecting fitting 	FSR 13/25	12/ 12	25	pipe end 15 x 1 compression-type screwed joint/ graphite screwed joint	1.4404	FSR 4.202
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134	25/25 32/32 40/40 50/50 65/65 80/80	10	welded end graphite seal/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.222
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134	25/25 / 1" 32/32 / 1 ¼" 40/40 / 1 ½" 50/50 / 2" 65/65 / 2 ½" 80/80 / 3"	10	external thread graphite seal/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.223
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134	25/25 32/32 40/40 50/50 65/65 80/80	10	collar with split loose flange graphite seal/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.224
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83	25/25 32/32 40/40 50/50	25	welded end graphite seal/ shaped ring screw joint	in contact with medium 1.4404 outer 1.4301	FSR 4.230
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83	25/25 / 1" 32/32 / 1 ¼" 40/40 / 1 ½" 50/50 / 2"	25	external thread graphite seal/ shaped ring screw joint	in contact with medium 1.4404 outer 1.4301	FSR 4.231
Connecting fitting 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83	25/25 32/32 40/40 50/50	25	ollar with split loose flange graphite seal/ shaped ring screw joint	in contact with medium 1.4404 outer 1.4301	FSR 4.232

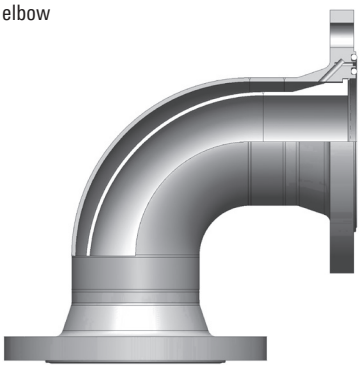
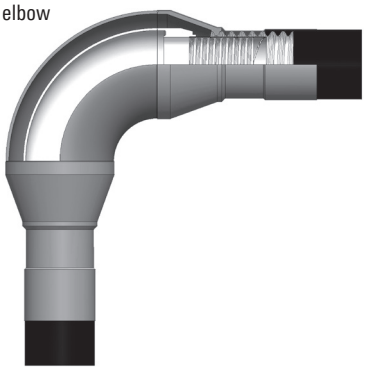
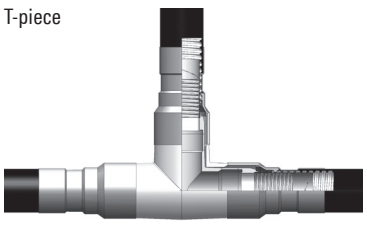
Product overview

Through-connections

Version	Type FSR	Nominal bore/ DN	Pressure PN	Connector Type of joint inner/outer	Material No.	Worksheet
Through-connection 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25/ 40 32/ 50 40/ 65 50/ 65 65/100 80/100 100/175	25	TIG welding/hard soldering	collar 1.4404	FSR 4.401
Through-connection 	FSR 13/ 25	12	25	TIG welding/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.403
Through-connection 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25 32 40 50 75 80 100	25	TIG welding/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.404
Through-connection 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83	25 32 40 50	25	graphite seal/ shaped ring-screw joint	in contact with medium 1.4404 outer 1.4301	FSR 4.405

Product overview

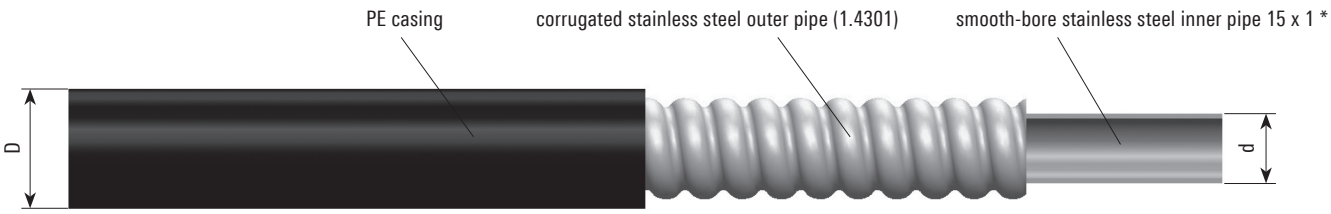
Elbows, T-pieces

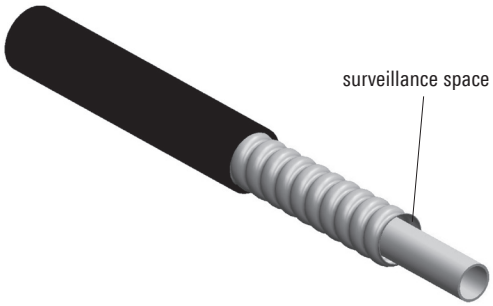
Version	Type FSR	Nominal bore/ Connector DN/DN	Pressure PN	Connector Type of joint inner/outer	Material No.	Worksheet
elbow 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25/ 40 32/ 50 40/ 65 50/ 65 65/100 80/100 100/150	25	complete assembly	inner/ sealing surface 1.4404 outer 1.4301	FSR 4.410
elbow 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25 32 40 50 65 80 100	25	TIG welding/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.413
T-piece 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25/ 40 32/ 50 40/ 65 50/ 65 65/100 80/100 100/150	25	complete assembly	inner/ sealing surface 1.4404 outer 1.4301	FSR 4.420
T-piece 	FSR 30/ 48 FSR 39/ 60 FSR 48/ 71 FSR 60/ 83 FSR 75/107 FSR 98/134 FSR 127/175	25 32 40 50 65 80 100	25	TIG welding/hard soldering	in contact with medium 1.4404 outer 1.4301	FSR 4.433

FLEXWELL® Safety Pipe

with stainless steel smooth-bore inner pipe, stainless steel outer pipe and PE casing

FLEXWELL® Safety Pipe Type FSR 13/25





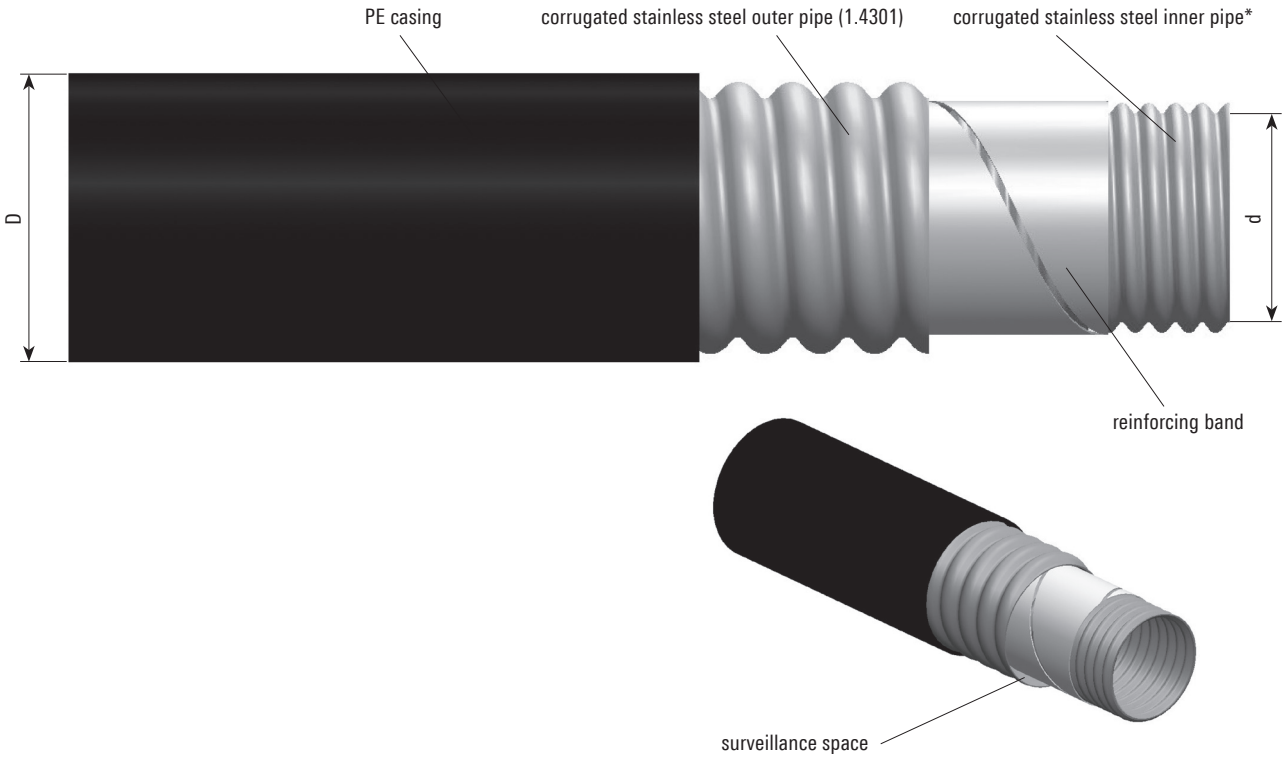
*** inner pipe: Material No. 1.4404/1.4571**

Type ID/OD	DN	PN	d	D	PE WT	Volume inner pipe	surveillance space	Weight	Bending radius	Article No.
			mm	mm	mm	l/m	l/m	kg/m	cm	
FSR 13/25	12	25	13	25	1.8	0.13	0.12	0.52	30	1015299

FLEXWELL® Safety Pipe

with stainless steel inner pipe, stainless steel outer pipe and PE casing

FLEXWELL® Safety Pipe Type FSR 30/48 – FSR 127/175



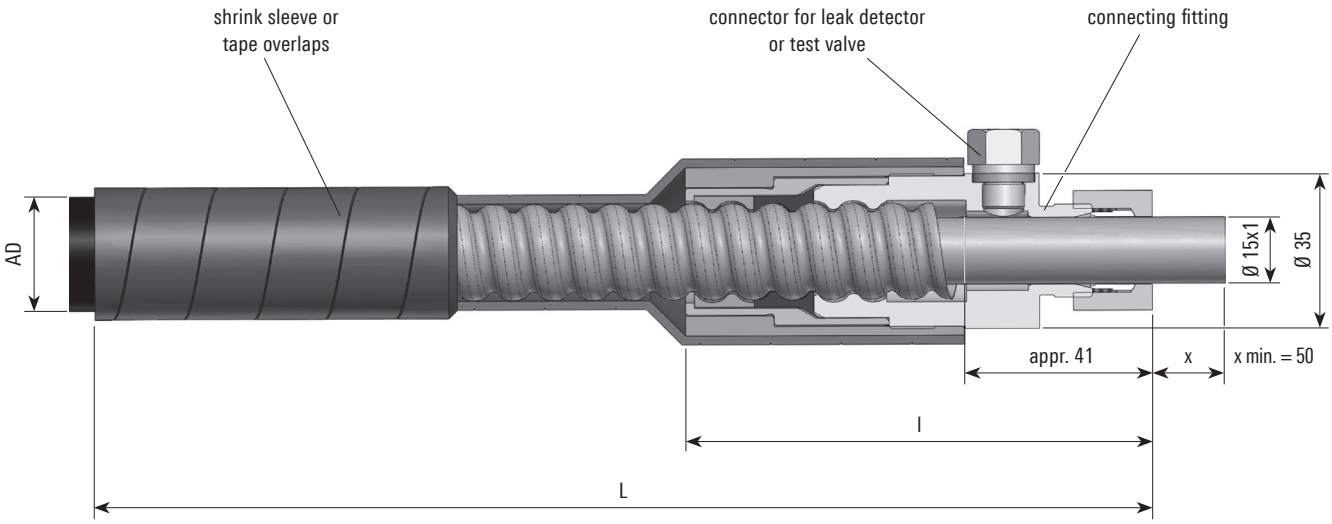
*** inner pipe: Material No. 1.4404/1.4571**

Type ID/OD	DN	PN	d	D	PE WT	Volume inner pipe	surveillance space	Weight	Bending radius	Article No.
			mm	mm	mm	l/m	l/m	kg/m	cm	
FSR 30/ 48	25	25	30	48	1.8	0.8	0.38	1.4	50	1015304
FSR 39/ 60	32	25	39	60	1.8	1.3	0.41	2.0	60	1015306
FSR 48/ 71	40	25	48	71	2.0	2.0	0.65	2.9	60	1015302
FSR 60/ 83	50	25	60	83	2.2	3.0	0.73	3.8	70	1015309
FSR 75/107	65	25	75	107	3.0	5.1	1.30	6.2	90	1015311
FSR 98/134	80	25	98	134	3.5	8.4	1.45	9.0	120	1015297
FSR 127/175	100	25	127	175	4.0	14.0	4.00	18.1	150	1015296

Connecting fitting FSR 13/25 GRAPA

Inner pipe: compression-type screwed joint; outer pipe: graphite compression joint

Connector: pipe 15 x 1
Pressure stage PN 25

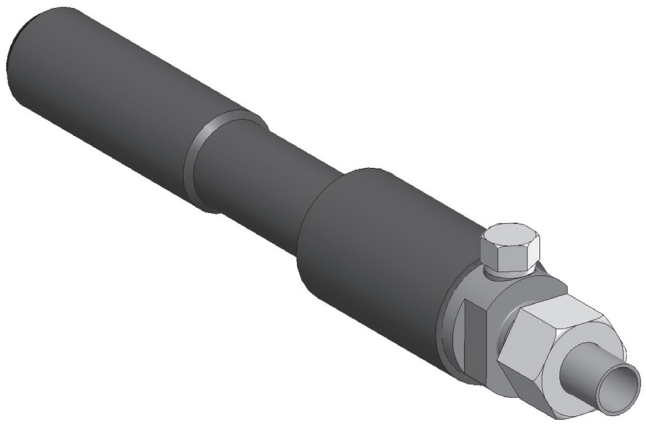


All dimensions in mm

Materials: stainless steel

Connecting fitting:	Material No. 1.4571/1.4404
Sliding collar:	brass, not in contact with medium
Sealing ring:	graphite

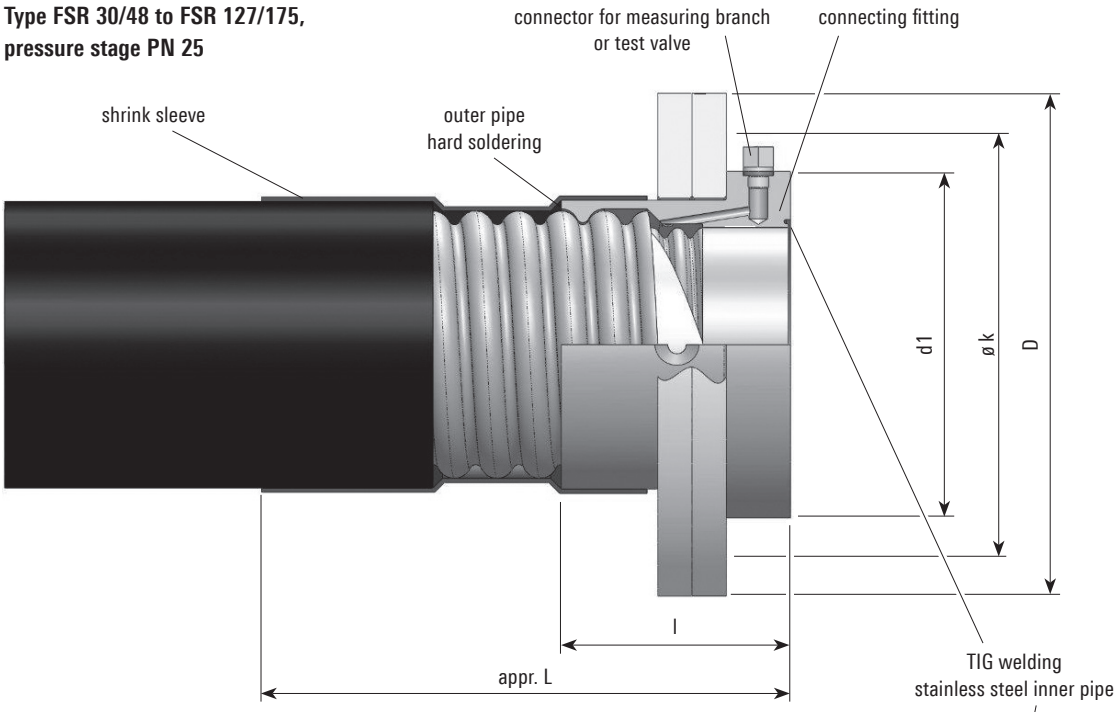
Type	ID/OD	DN	l	L appr.	x	Article No.
			mm	mm	mm	
AV-FSR	13/25	12	105	246	100	1015613

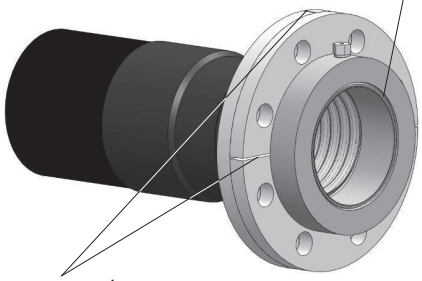


Connecting fitting with collar and split loose flange

Joining method: TIG welding/hard soldering

FLEXWELL® Safety Pipe
Type FSR 30/48 to FSR 127/175,
pressure stage PN 25





Version:
Collar and split loose flange according to DIN EN 1092-1

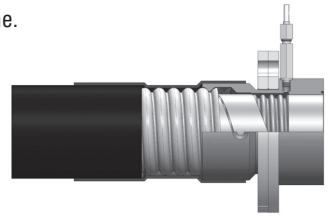
Material:
Threaded socket made of material no. 1.4404/1.4571
flange made of material P265GH/P250GH, hot-galvanised

Installation instruction for split loose flange:
The splitting of the loose flange needs to be installed staggered 90° in reverse order.

Type	ID/OD	DN	d1	Flange acc. to DIN EN 1092-1					l	L	Article No.	Article No.
				DN	D	ø k	screws*			appr.	split loose flange	split loose flange
			mm		mm	mm		pcs.	mm	mm	galvanised steel	stainless steel 1.4404
AV-FSR	30/ 48	25	68	25	115	85	M12 x 100	4	85	223	1015619	1015620
AV-FSR	39/ 60	32	78	32	140	100	M16 x 100	4	85	222	1015639	1015640
AV-FSR	48/ 71	40	88	40	150	110	M16 x 110	4	82	216	1015616	1015617
AV-FSR	60/ 83	50	102	50	165	125	M16 x 110	4	90	242	1015663	1015664
AV-FSR	75/107**	65	122	65	185	145	M16 x 120	8	140	300	1015687	1015688
AV-FSR	98/134**	80	138	80	200	160	M16 x 120	8	153	307	1015723	1015724
AV-FSR	127/175	100	190	125	270	220	M24 x 130	8	125	284	1015731	1015732

* Screw length is given for the connector to a welding-neck flange acc. to DIN EN 1092-1.
Screws and nuts are not included in the delivery volume.

** Construction AV-FSR 75/107 and FSR-AV 98/134:

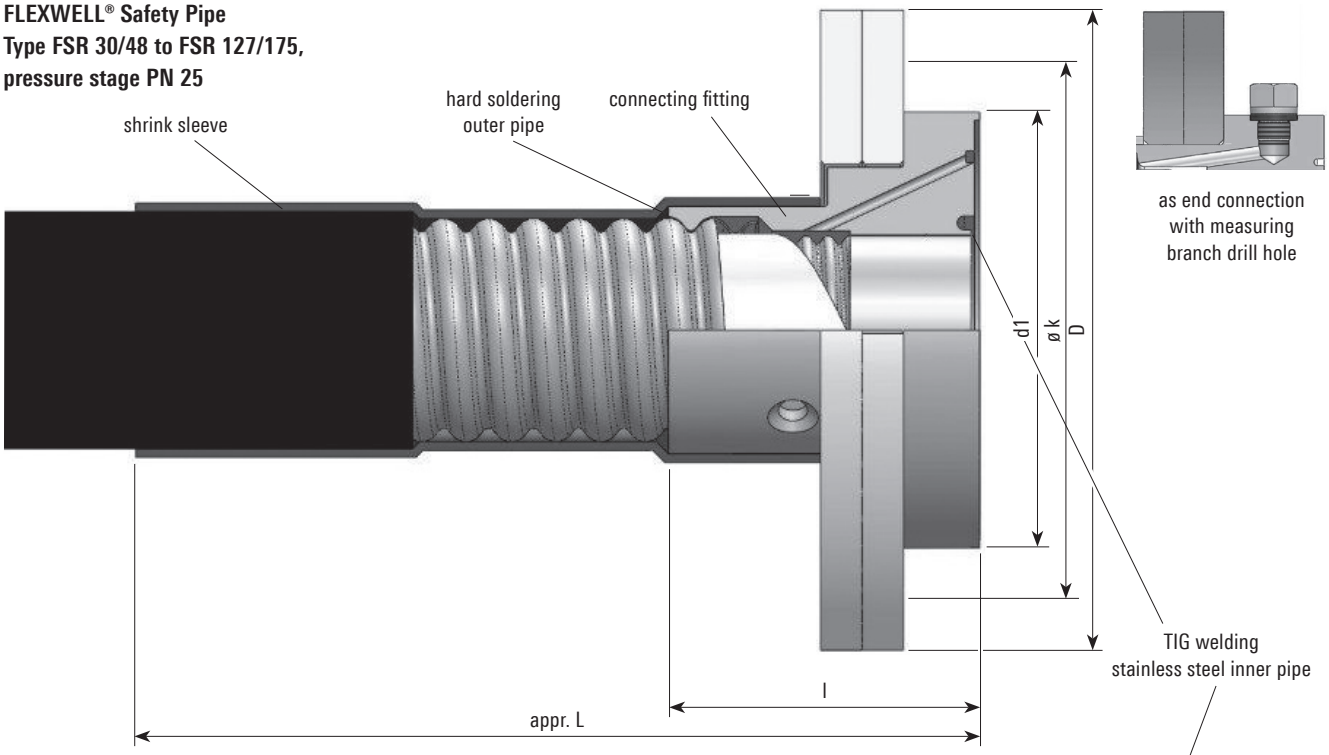


Only BRUGG solder Type BRL 8.50.34 may be used!

Connecting fitting monitorable with collar and split loose flange

with monitorable sealing surface (Part 1), joining method: TIG welding/hard soldering

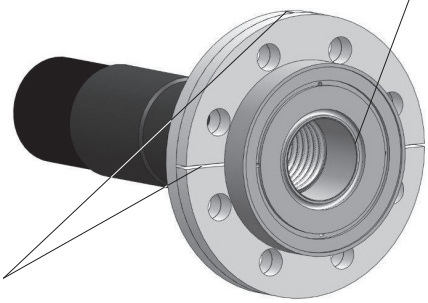
FLEXWELL® Safety Pipe
Type FSR 30/48 to FSR 127/175,
pressure stage PN 25



Version:
Collar and split loose flange acc. to DIN EN1092-1

Material:
Threaded socket made of material no. 1.4404/1.4571
Flange made of material no. 1.4404/1.4571

Installation instruction for split loose flange:
The splitting of the loose flange needs to be installed staggered 90° in reverse order.



Type	ID/OD	DN	d1	Flange acc. to DIN EN 1092-1					l	L	Article No. without measuring branch
				DN	D	ø k	screws*			appr.	split loose flange
			mm		mm	mm		pcs.	mm	mm	stainless steel 1.4404
AV-FSR	30/ 48	25	91	40	150	110	M16 x 80	4	85	222.5	1015893
AV-FSR	39/ 60	32	105	50	165	125	M16 x 90	4	85	222.5	1015911
AV-FSR	48/ 71	40	126	65	185	145	M16 x 90	8	90	242.5	1015928
AV-FSR	60/ 83	50	126	65	185	145	M16 x 90	8	90	242.5	1015952
AV-FSR	75/107	65	166	100	235	190	M20 x 110	8	132	277.5	1015966
AV-FSR	98/134	80	166	100	235	190	M20 x 110	8	136	295.5	1015983
AV-FSR	127/175	100	223	150	300	250	M24 x 120	8	140	299.0	1015999

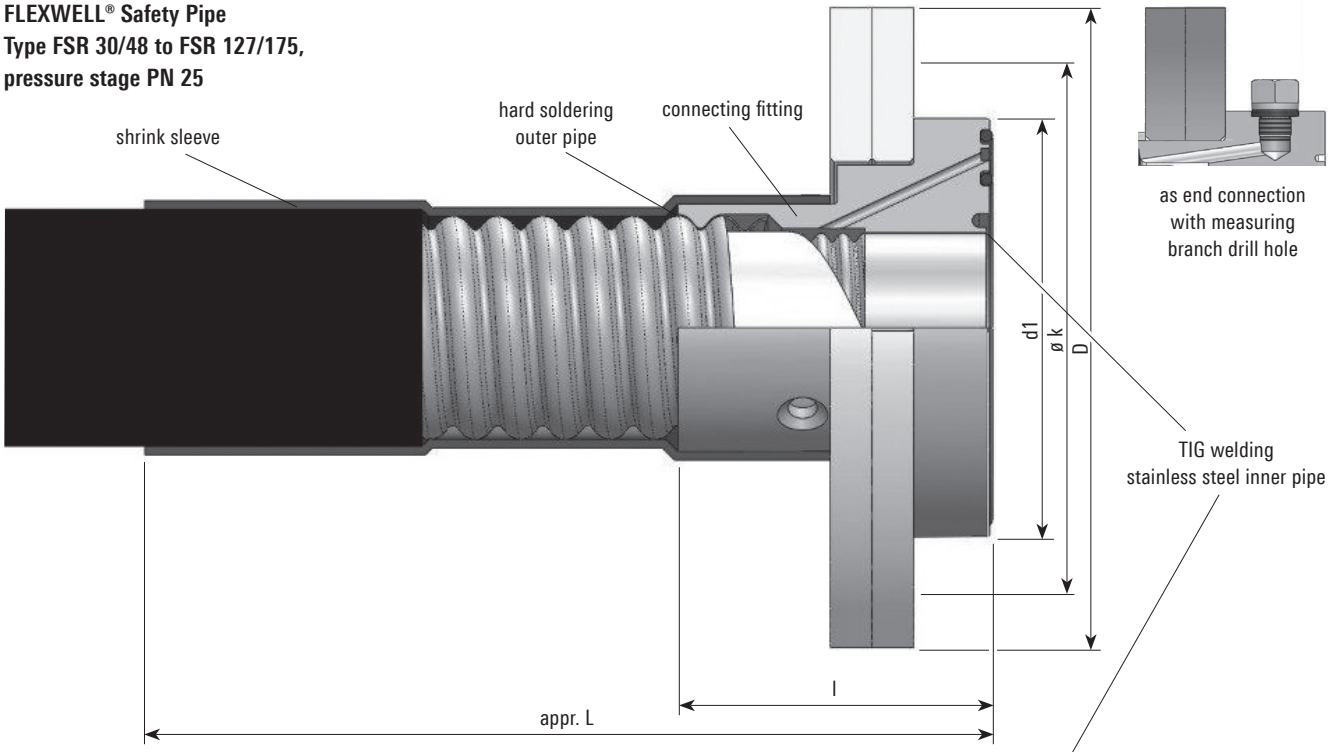
Threaded socket can be delivered with or without measuring branch drill hole (Article No. for drill hole 1015565)
* Screw length is given for the connector to a welding-neck flange acc. to DIN EN 1092-1.
Screws and nuts are not included in the delivery volume.

Only BRUGG solder Type BRL 8.50.34 may be used!

Connecting fitting monitorable with collar and split loose flange

with monitorable sealing surface (Part 2), joining method: TIG welding/hard soldering

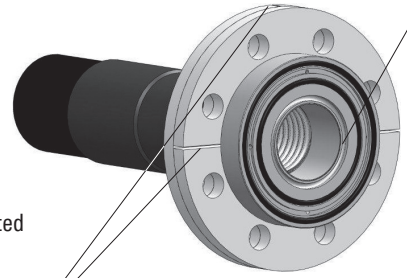
FLEXWELL® Safety Pipe
Type FSR 30/48 to FSR 127/175,
pressure stage PN 25



as end connection
with measuring
branch drill hole

Version:
Collar and split loose flange acc. to DIN EN 1092-1

Material:
Threaded socket made of Material No. 1.4404/1.4571
Flange made of Material No. 1.4404/1.4571
O-rings: Viton
O-rings in other materials according to the substances being transported can also be used.



Installation instruction for split loose flange:
The splitting of the loose flange needs to be installed staggered 90° in reverse order.

Type	ID/OD	DN	d1	Flange acc. to DIN EN 1092-1					l	L	Article No. without measuring branch	Article No.	
				DN	D	ø k	screws*			appr.	split loose flange	O-rings	O-rings
			mm		mm	mm		pcs.	mm	mm	stainless steel 1.4404	Viton	PTFE
AV-FSR	30/ 48	25	87	40	150	110	M16 x 80	4	85	223	1015894	1016003	1016008
AV-FSR	39/ 60	32	101	50	165	125	M16 x 90	4	85	222	1058317	1016004	1016009
AV-FSR	48/ 71	40	121	65	185	145	M16 x 90	8	90	244	1015929	1016005	1016010
AV-FSR	60/ 83	50	121	65	185	145	M16 x 90	8	90	242	1015953	1016005	1016010
AV-FSR	75/107	65	162	100	235	190	M20 x 110	8	132	279	1015967	1016007	1016012
AV-FSR	98/134	80	162	100	235	190	M20 x 110	8	136	276	1015984	1016007	1016012
AV-FSR	127/175	100	217	150	300	250	M24 x 120	8	140	350	1016000	1016006	1016011

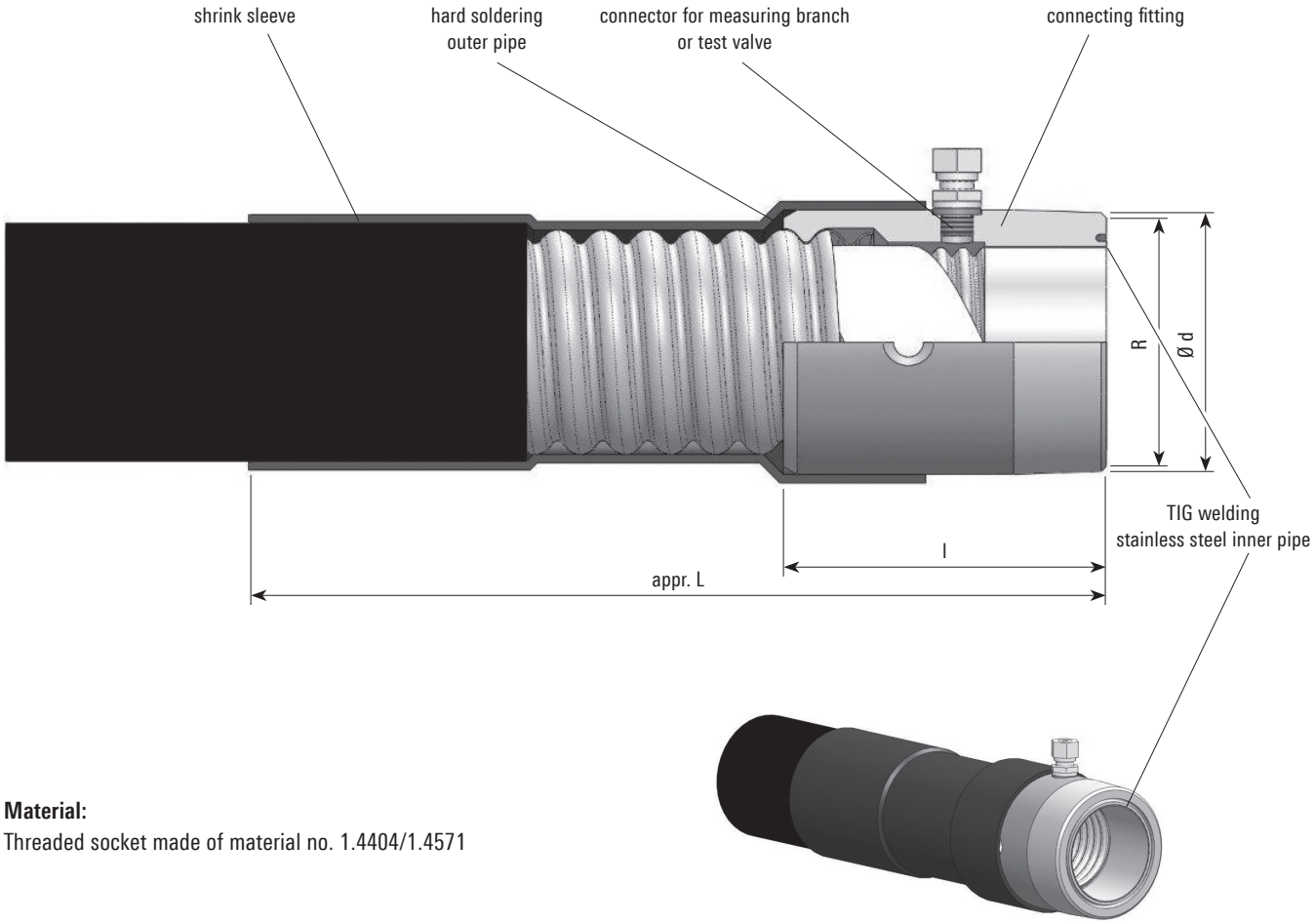
Threaded socket can be delivered with or without measuring branch drill hole (Article No. for drill hole 1015565)
* Screw length is given for the connector to a welding-neck flange acc. to DIN EN 1092-1.
Screws and nuts are not included in the delivery volume.

Only BRUGG solder Type BRL 8.50.34 may be used!

Connecting fitting with screw connection

Joining method: TIG welding/hard soldering

FLEXWELL® Safety Pipe Type FSR 30/48 to FSR 60/83, pressure stage PN 25



Material:
Threaded socket made of material no. 1.4404/1.4571

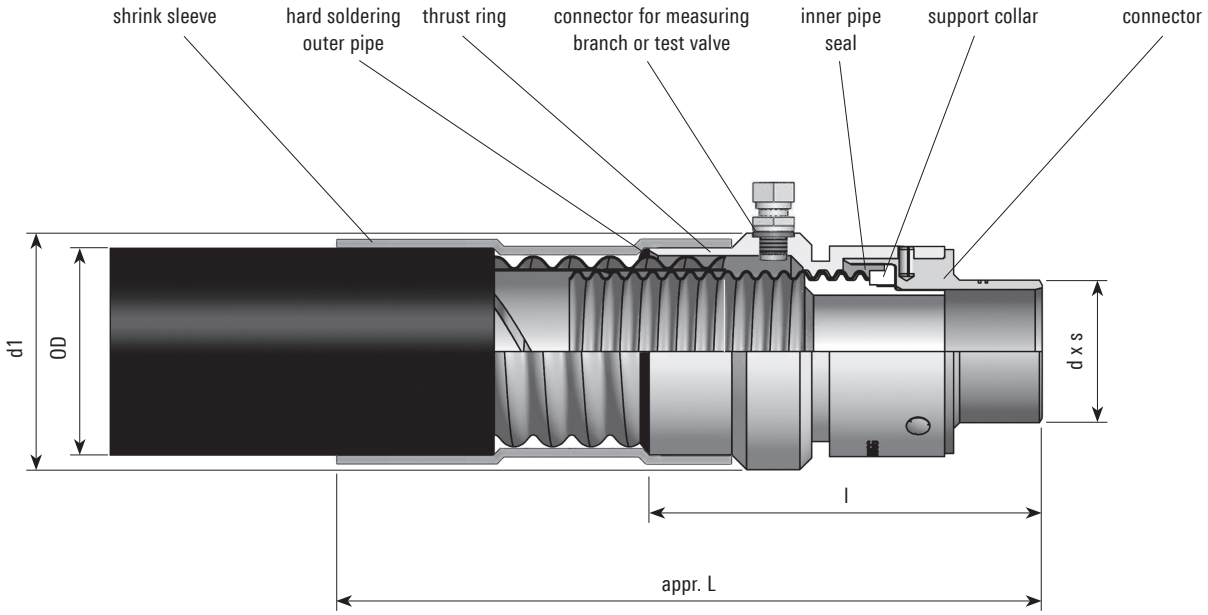
Type ID/OD	DN	Connector Whitworth pipe thread	Connector DN	d mm	l mm	L appr. mm	Article No. 1.4404
AV-FSR 30/48	25	R 1 ½"	40	52.0	93	231	1015637
AV-FSR 39/60	32	R 2"	50	63.5	100	232	1015656
AV-FSR 48/71	40	R 2 ½"	65	76.1	93	247	1015679
AV-FSR 60/83	50	R 2 ½"	65	85.0	110	262	1015707

Only BRUGG solder Type BRL 8.50.34 may be used!

Connecting fitting GRAPA with welded end

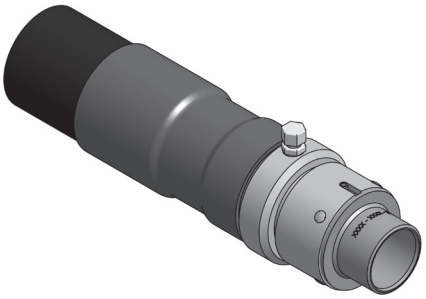
Compression joint, joining method: outer pipe hard soldering

FLEXWELL® Safety Pipe Type FSR 30/48 to FSR 60/83
with compression-type graphite seal inner pipe
and hard soldering outer pipe,
pressure stage PN 10



Materials:

Connector, support collar:	Material No. 1.4404
Thrust ring:	Material No. 1.4301
Inner pipe seal:	graphite
Outer pipe hard soldering:	silver solder



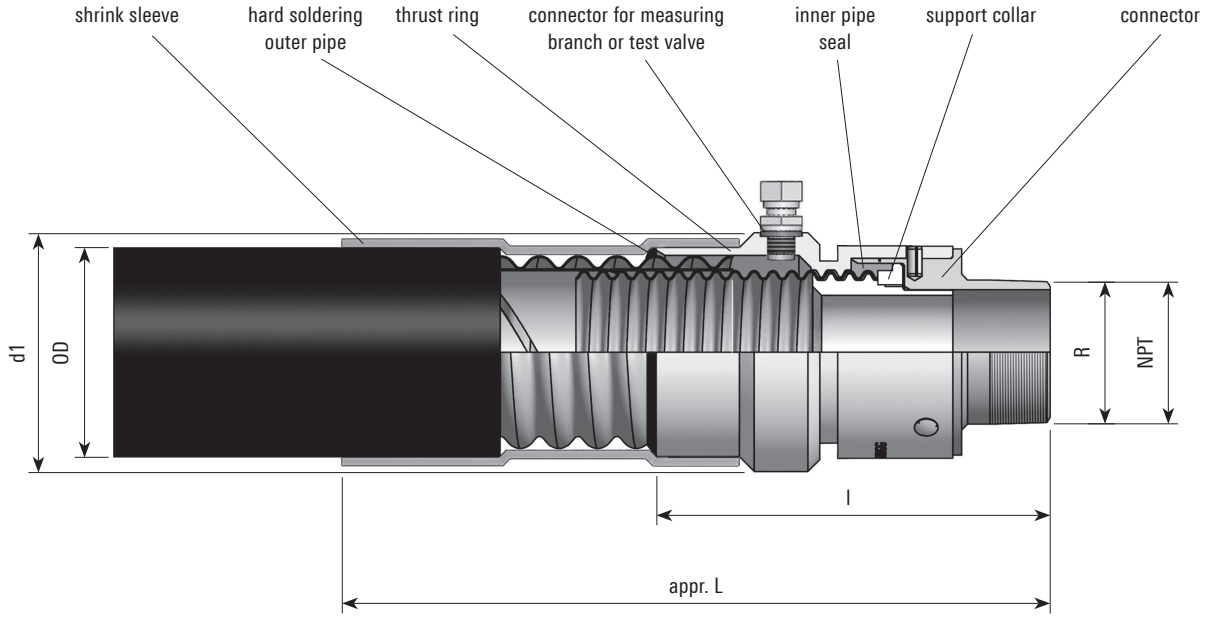
Type ID/	DN	OD mm	d x s mm	d1 mm	l mm	appr. L mm	Article No.
AV-FSR 30/ 48	25	46	33.7 x 2.6	60	117	290	1015623
AV-FSR 39/ 60	32	57	42.4 x 2.6	70	115	285	1015644
AV-FSR 48/ 71	40	69	48.3 x 2.6	80	128	305	1015668
AV-FSR 60/ 83	50	81	60.3 x 2.9	90	147	310	1015695
AV-FSR 75/107	65	107	76.1 x 2.9	120	178	345	1015689
AV-FSR 98/134	80	132	88.9 x 3.2	140	240	400	1015725

Only BRUGG solder Type BRL 8.50.34 may be used!

Connecting fitting GRAPA with external thread

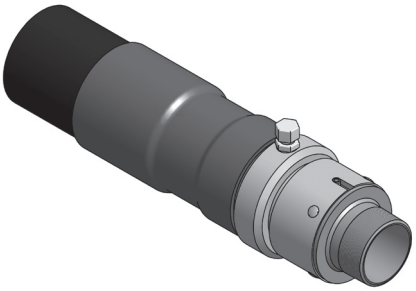
Compression joint, joining method: outer pipe hard soldering

FLEXWELL® Safety Pipe Type FSR 30/48 to FSR 60/83
with compression-type graphite seal inner pipe
and hard soldering outer pipe,
pressure stage PN 10



Materials:

Connector, support collar:	Material No. 1.4404
Thrust ring:	Material No. 1.4301
Inner pipe seal:	graphite
Outer pipe hard soldering:	silver solder



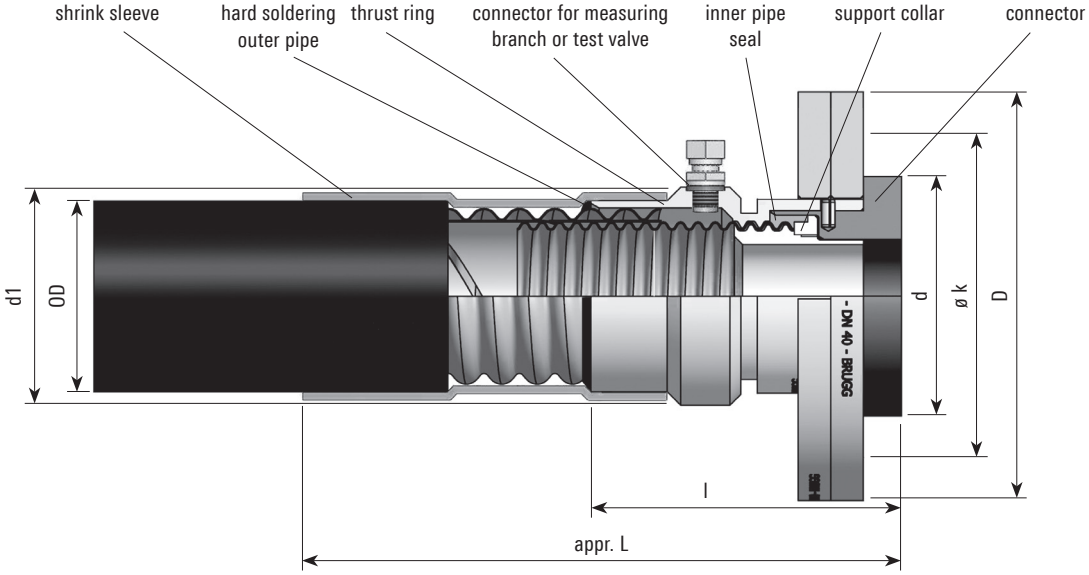
Type ID/	DN	OD	Connector R-thread	Connector NPT-thread	d1	l	L appr.	Article No. R-thread	Article No. NPT-thread
		mm			mm	mm	mm		
AV FSR 30/ 48	25	46	R 1"	1" - 11.5	60	117	280	1015624	1015625
AV FSR 39/ 60	32	57	R 1 ¼"	1 ¼" - 11.5	70	115	275	1015645	1015646
AV FSR 48/ 71	40	69	R 1 ½"	1 ½" - 11.5	80	128	290	1015669	1015670
AV FSR 60/ 83	50	81	R 2"	2" - 11.5	90	147	295	1015696	1015697
AV FSR 75/107	65	107	R 2 ½"	2 ½" - 8	120	178	327	1015690	1015691
AV FSR 98/134	80	132	R 3"	3" - 8	140	201	342	1015726	1015727

Only BRUGG solder Type BRL 8.50.34 may be used!

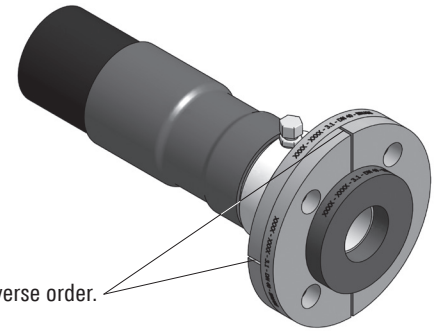
Connecting fitting GRAPA with collar and split loose flange

Compression joint, joining method: outer pipe hard soldering

FLEXWELL® Safety Pipe
with compression-type graphite seal inner pipe
and hard soldering outer pipe,
pressure stage PN 10



Version:
Collar and split loose flange acc. to DIN EN 1092-1



Materials:

Connector, support collar:	Material No. 1.4404
Thrust ring:	Material No. 1.4301
Inner pipe seal:	graphite
Outer pipe hard soldering:	silver solder

Installation instruction for split loose flange:
The splitting of the loose flange needs to be installed staggered 90° in reverse order.

Type ID/	DN	OD	collar and split loose flange acc. to DIN EN 1092-1					d1	l	L appr.	Article No. split loose flange galvanised steel	Article No. split loose flange stainless steel 1.4404
			d	D	ø k	screws*	pcs.					
		mm	mm	mm	mm			mm	mm	mm		
AV-FSR 30/ 48	25	46	68	115	85	M12 x 75	4	60	104	275	1015626	1015627
AV-FSR 39/ 60	32	57	78	140	100	M16 x 80	4	70	99	265	1015647	1015648
AV-FSR 48/ 71	40	69	88	150	110	M16 x 80	4	80	114	280	1015671	1015672
AV-FSR 60/ 83	50	81	102	165	125	M16 x 80	4	90	128	290	1015698	1015699
AV-FSR 75/107	65	107	122	185	145	M16 x 85	8**	120	180	347	1015692	1015693
AV-FSR 98/134	80	132	138	200	160	M16 x 95	8	140	204	365	1015728	1015729

* Screw length is given for the connector to a welding-neck flange acc. to DIN EN 1092-1.
Screws and nuts are not included in the delivery volume.

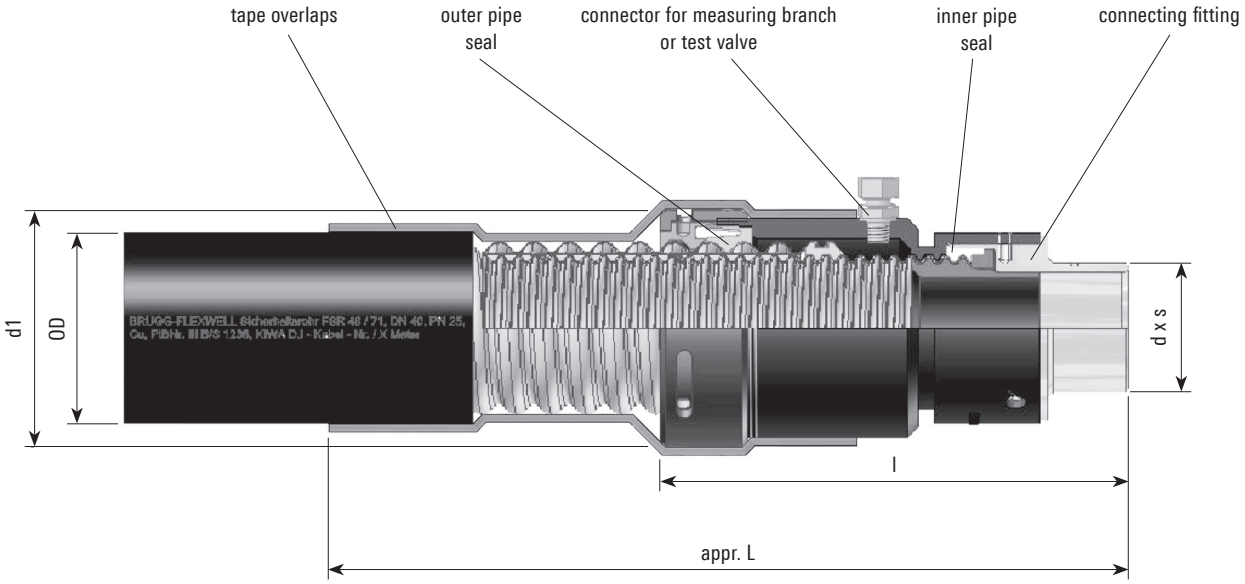
** Welding-neck flange: PN 25 = 8 pieces, PN 10 = 4 pieces (8 boreholes in the split loose flange)

Only BRUGG solder Type BRL 8.50.34 may be used!

Connecting fitting GRAPA with welded end

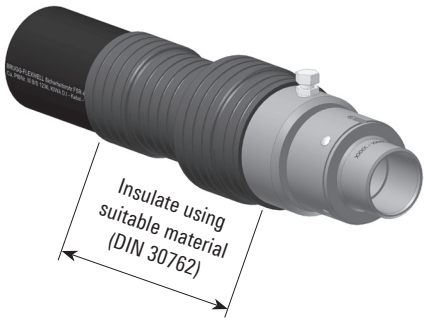
Compression joint/screwed joint

FLEXWELL® Safety Pipe Type FSR 30/48 to FSR 60/83
with compression-type graphite seal inner pipe
and screwed outer pipe seal,
pressure stage PN 25



Materials:

Medium contact elements:	Material No. 1.4404
other elements:	Material No. 1.4301
inner pipe seal:	graphite
outer pipe seal:	moulded elastomer ring

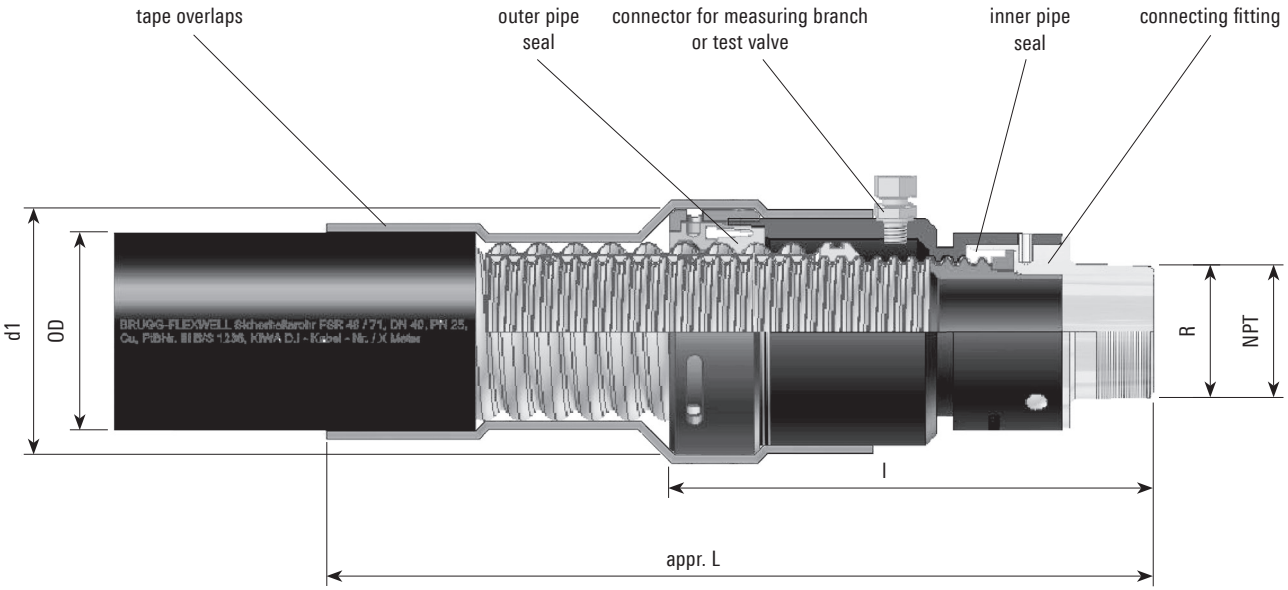


Type ID/	DN	OD	d x s	d1	l	appr. L	Article No.
		mm	mm	mm	mm	mm	
AV-FSR 30/48	25	46	33.7 x 2.6	68	157	315	1015634
AV-FSR 39/60	32	57	42.4 x 2.6	78	158	310	1015653
AV-FSR 48/71	40	69	48.3 x 2.6	88	174	335	1015677
AV-FSR 60/83	50	81	60.3 x 2.9	105	191	335	1015703

Connecting fitting GRAPA with external thread

Compression joint/screwed joint

FLEXWELL® Safety Pipe Type FSR 30/48 to FSR 60/83
with compression-type graphite seal inner pipe
and screwed outer pipe seal,
pressure stage PN 25



Materials:

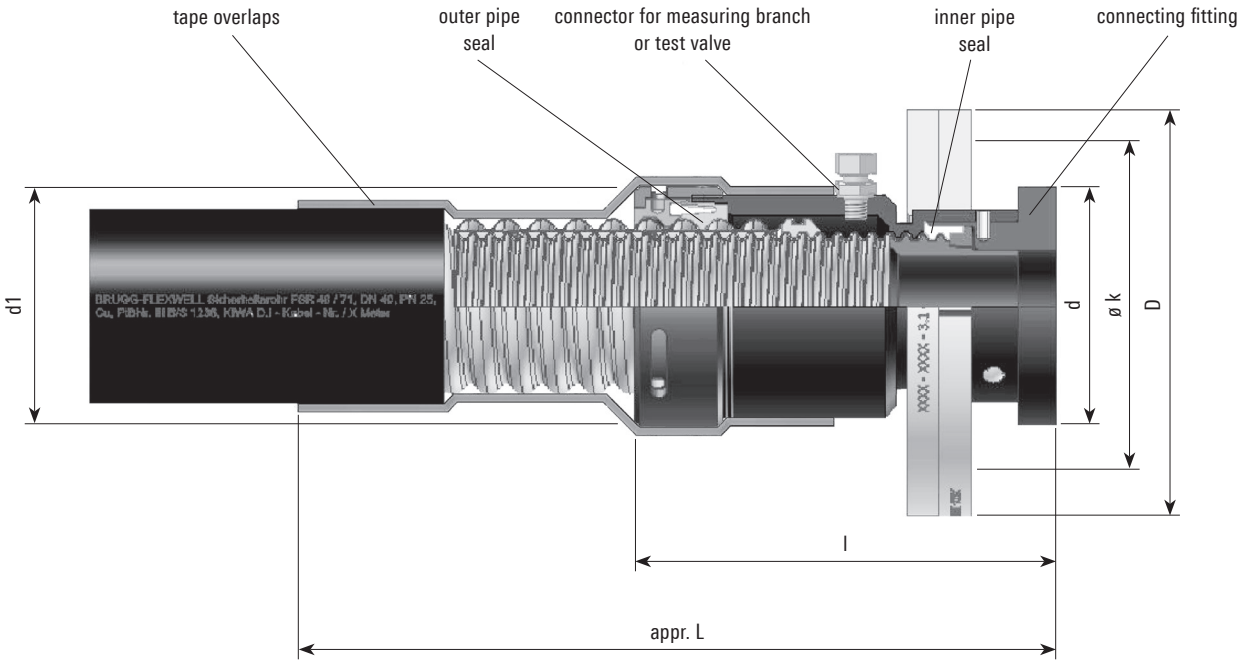
Medium contact elements:	Material No. 1.4404
other elements:	Material No. 1.4301
inner pipe seal:	graphite
outer pipe seal:	moulded elastomer ring

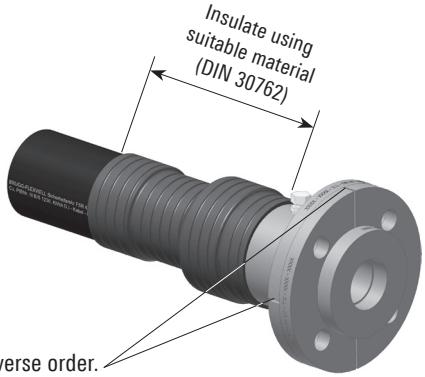
Type ID/	DN	OD	Connector R-thread	Connector NPT-thread	d1	l	L appr.	Article No. R-thread	Article No. NPT-thread
		mm			mm	mm	mm		
AV-FSR 30/48	25	46	R 1"	1" - 11.5 NPT	68	157	305	1015638	1015735
AV-FSR 39/60	32	57	R 1 ¼"	1 ¼" - 11.5 NPT	78	158	300	1015657	1015736
AV-FSR 48/71	40	69	R 1 ½"	1 ½" - 11.5 NPT	88	174	320	1015680	1015737
AV-FSR 60/83	50	81	R 2"	2" - 11.5 NPT	105	191	320	1015708	1015738

Connecting fitting GRAPA with collar and split loose flange

Compression joint/screwed joint

FLEXWELL® Safety Pipe Type FSR 30/48 to FSR 60/83 with compression-type graphite seal inner pipe and screwed outer pipe seal, pressure stage PN 25





Materials:

Medium contact elements:	Material No. 1.4404
other elements:	Material No. 1.4301
inner pipe seal:	graphite
outer pipe seal:	moulded elastomer ring

Installation instruction for split loose flange:
The splitting of the loose flange needs to be installed staggered 90° in reverse order.

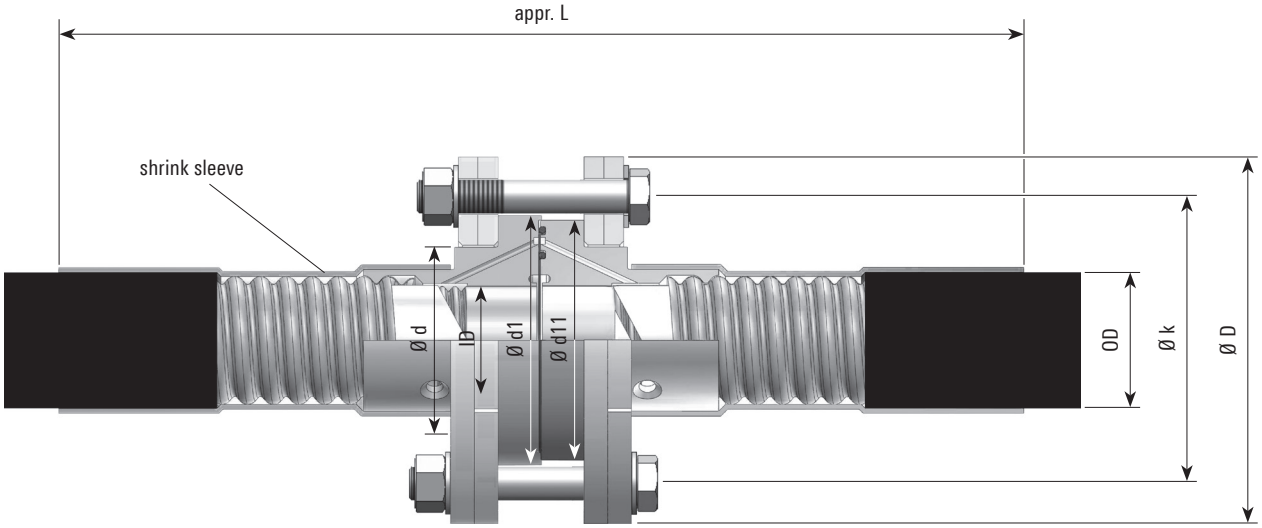
Type ID/	DN	OD	collar and split loose flange acc. to DIN EN 1092-1					d1	l	L appr.	Article No. split loose flange galvanised steel	Article No. split loose flange stainless steel 1.4404
			d	D	ø k	screws*	pcs.					
		mm	mm	mm	mm			mm	mm	mm		
AV-FSR 30/48	25	46	68	115	85	M12 x 75	4	68	141	300	1015635	1015631
AV-FSR 39/60	32	57	78	140	100	M16 x 80	4	78	139	290	1015654	1015652
AV-FSR 48/71	40	69	88	150	110	M16 x 80	4	88	174	310	1015678	1015676
AV-FSR 60/83	50	81	102	165	125	M16 x 80	4	105	169	315	1015705	1015702

* Screw length is given for the connector to a welding-neck flange acc. to DIN EN 1092-1.
Screws and nuts are not included in the delivery volume.

Monitorable through-connection with flanged connection

Joining method: TIG welding/hard soldering

pressure stage PN 25

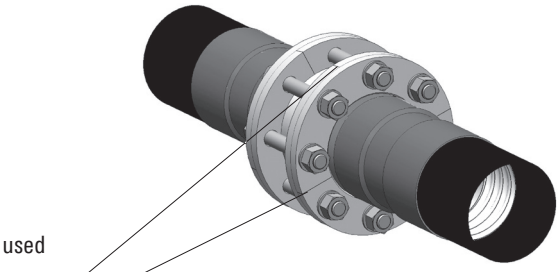


Part 1 **Part 2**

monitorable via O-ring seal

Version:
Collar and split flange acc. to DIN EN 1092-1

Material:
Threaded socket made of material no. 1.4404/1.4571
Flange made of material no. 1.4404/1.4571
O-rings: Viton (see Worksheet FSR 4.217)
O-rings in other materials according to the substances being transported can also be used



Installation instruction for split looseflange:
The splitting of the loose flange needs to be installed staggered 90° in reverse order.

Part 1 + 2

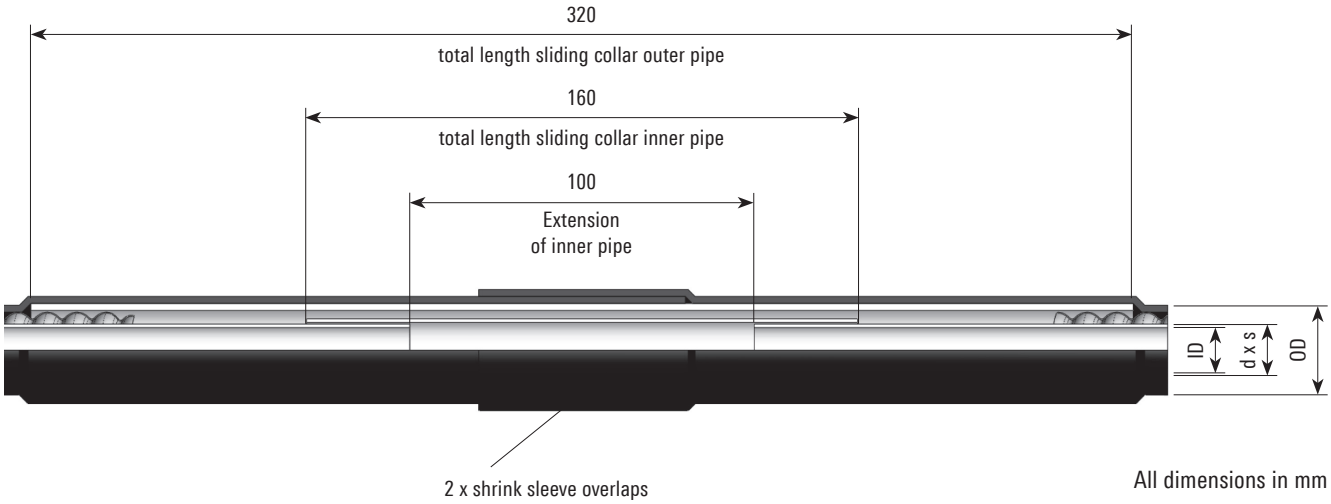
Type	ID/OD	DN	d1	d11	flange	Ø D	Ø k	screws	number of drill holes	L appr.	Article No. split loose flange stainless steel 1.4404
			mm	mm	DN	mm	mm			mm	
DV-FSR	30/ 48	25	91	87	40	150	110	M16 x 110	4	440	1016014
DV-FSR	39/ 60	32	105	101	50	165	125	M16 x 120	4	440	1016020
DV-FSR	48/ 71	40	126	121	65	185	145	M16 x 130	8	480	1016026
DV-FSR	60/ 83	50	126	121	65	185	145	M16 x 130	8	480	1016030
DV-FSR	75/107	65	166	162	100	235	190	M20 x 160	8	550	1016038
DV-FSR	98/134	80	166	162	100	235	190	M20 x 160	8	586	1016043
DV-FSR	127/175	100	223	217	150	300	250	M24 x 160	8	600	1016047

Screws and nuts are not included in the delivery volume.
Only BRUGG solder Type BRL 8.50.34 may be used!

Integrated through-connection

with smooth-bore inner and outer pipe, joining method: TIG welding/hard soldering

FLEXWELL® Safety Pipe Type FSR 13/25
pressure stage PN 25



All dimensions in mm

Material:
All parts made of stainless austenitic steel
Material No. 1.4404/1.4571 inner
Material No. 1.4301 outer

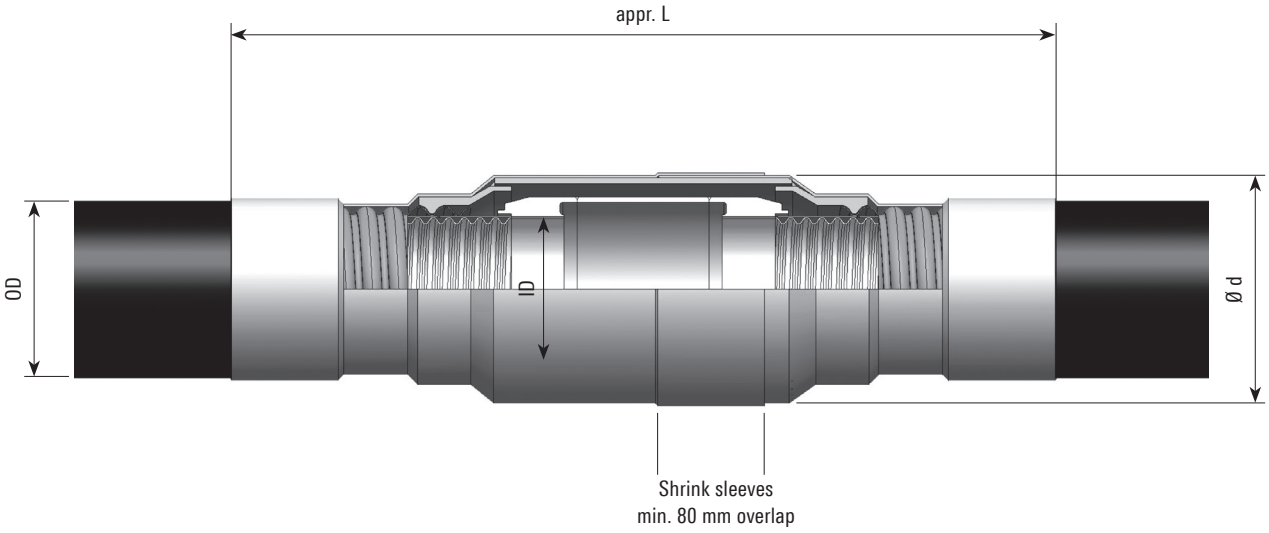
Type ID/OD	DN	d x s mm	Article No. 1.4404/1.4571
DV-FSR 13/25	12	15 x 1	1015611

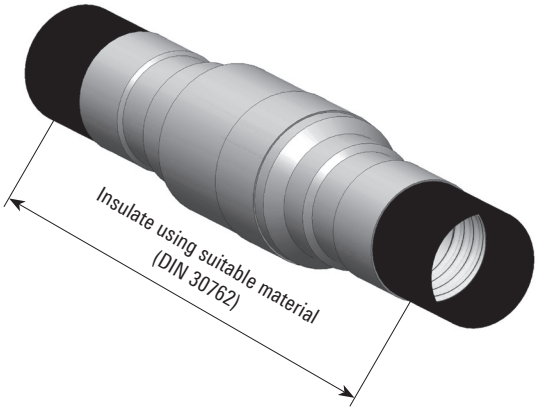
Only BRUGG solder Type BRL 8.50.34 may be used!

Integrated through-connection

Joining method: TIG welding/hard soldering

Pressure stage PN 25





Material:
All parts made of stainless austenitic steel
Material No. 1.4404/1.4571 inner
Material No. 1.4301 outer

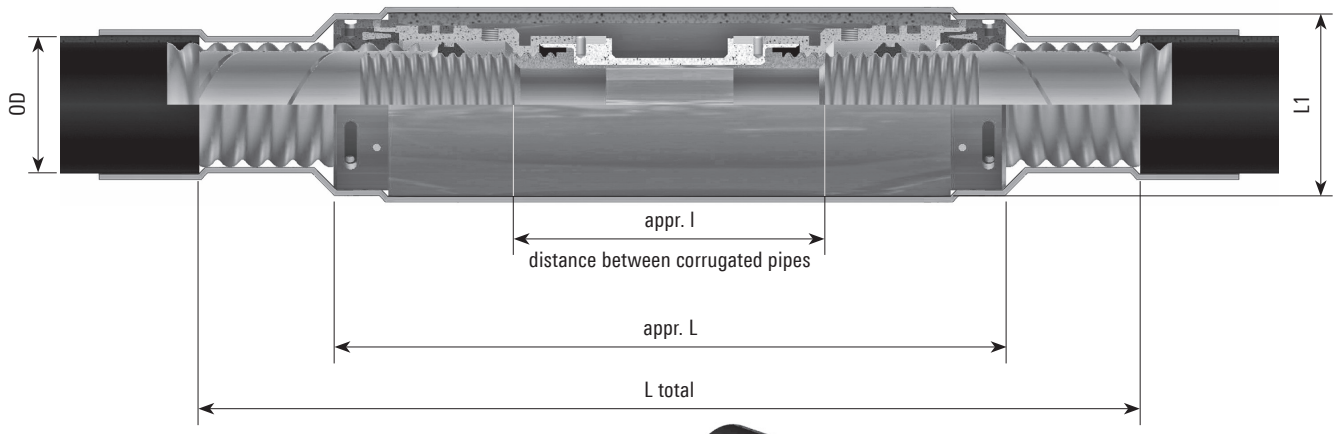
Type	ID/OD	DN	Ø d	L appr.	Article No.
			mm	mm	1.4404/1.4571
DV-FSR	30/ 48	25	60.3	550	1015757
DV-FSR	39/ 60	32	76.1	550	1015761
DV-FSR	48/ 71	40	88.9	610	1015765
DV-FSR	60/ 83	50	101.6	610	1015766
DV-FSR	75/107	65	139.7	640	1015770
DV-FSR	98/134	80	168.3	660	1015773
DV-FSR	127/175	100	193.7	690	1015774

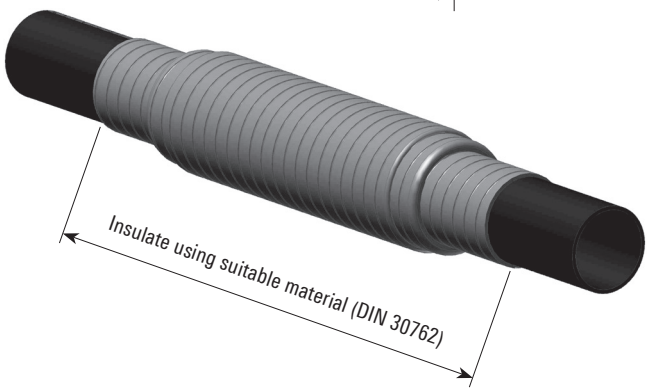
Longer through-connections available on request.
Only BRUGG solder Type BRL 8.50.34 may be used!

Integrated through-connection GRAPA

Compression joint/screwed joint

Pressure stage PN 25





Materials:

elements in contact with medium:	Material No. 1.4404/1.4571
other elements:	Material No. 1.4301
inner pipe seals:	graphite
outer pipe seals	moulded elastomer ring

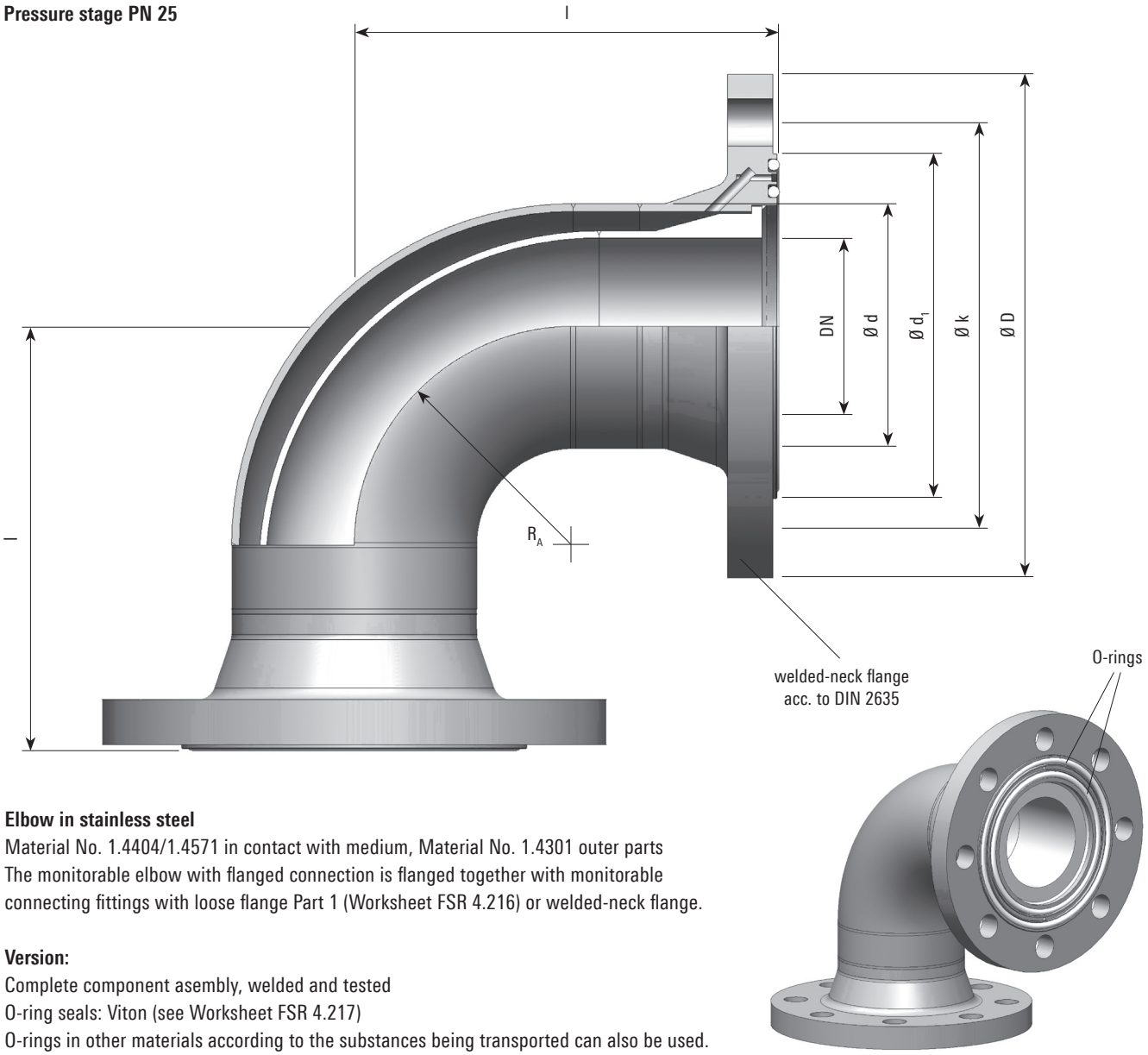
The fitting cannot be detached after installation.

Type	DN	OD	D1	appr. l	appr. L	L total	Article No.
		mm	mm	mm	mm	mm	
DV-FSR 30/48	25	46	76.1	107	307	400	1015628
DV-FSR 39/60	32	57	85.0	107	315	420	1015649
DV-FSR 48/71	40	69	95.0	117	348	460	1015673
DV-FSR 60/83	50	81	114.3	130	373	480	1015700

Monitorable elbow with flanged connection

with monitorable sealing surface, complete assembly

Pressure stage PN 25



Elbow in stainless steel

Material No. 1.4404/1.4571 in contact with medium, Material No. 1.4301 outer parts
The monitorable elbow with flanged connection is flanged together with monitorable connecting fittings with loose flange Part 1 (Worksheet FSR 4.216) or welded-neck flange.

Version:

Complete component asembly, welded and tested
O-ring seals: Viton (see Worksheet FSR 4.217)
O-rings in other materials according to the substances being transported can also be used.

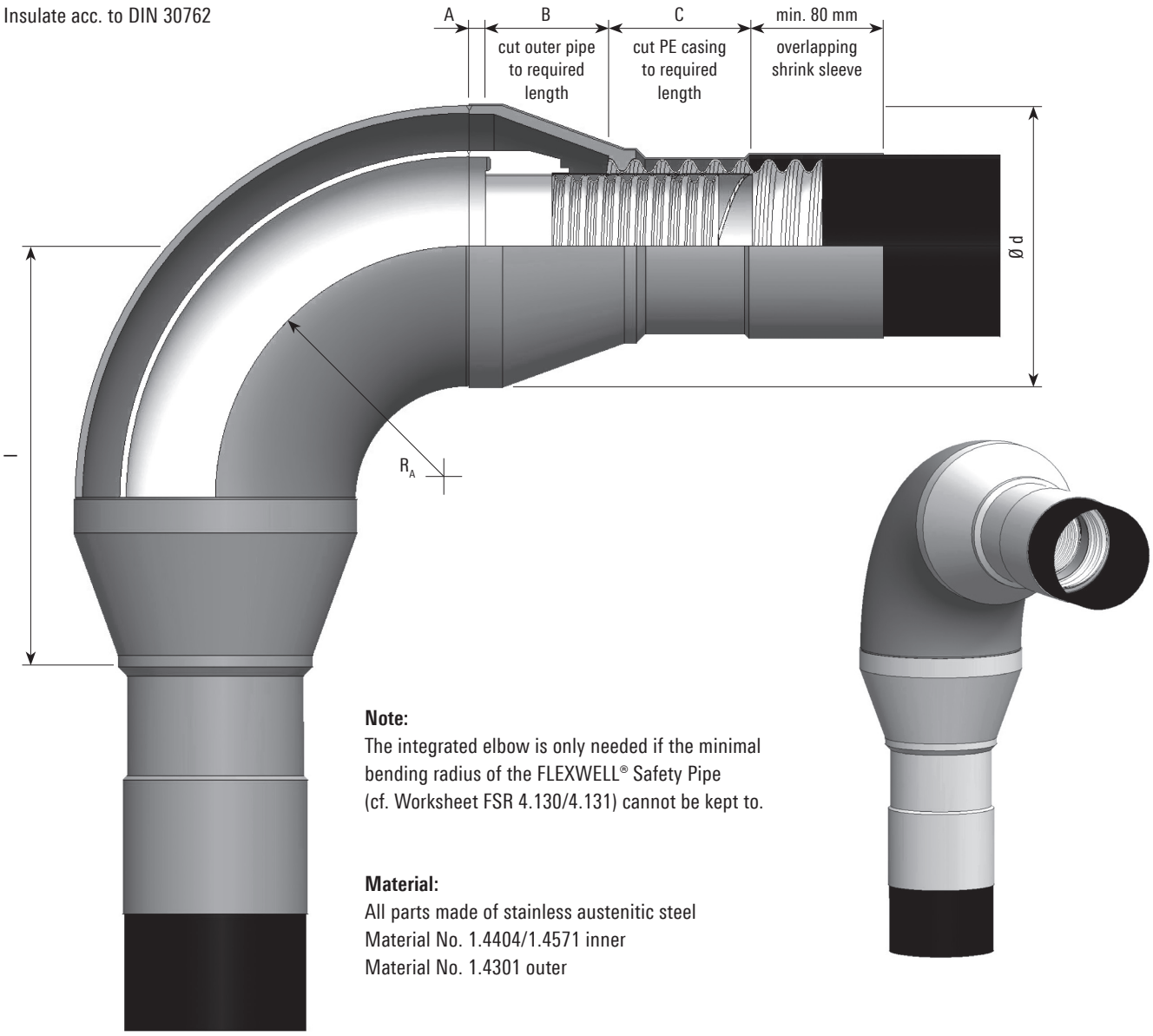
Type	DN	l	R_A	Ø d	Ø d_1	flange DN	Ø D	Ø k	screws for steel	Number of screws	Article No.
		mm	mm	mm	mm		mm	mm			
Elbow FSR 30/ 48	25	131	43	48.3	87	40	150	110	M16 x 80	4	1015858
Elbow FSR 39/ 60	32	140	55	60.3	101	50	165	125	M16 x 90	4	1015860
Elbow FSR 48/ 71	40	139	70	76.1	121	65	185	145	M16 x 90	8	1015862
Elbow FSR 60/ 83	50										
Elbow FSR 75/107	65	197	105	114.3	161	100	235	190	M20 x 100	8	1015866
Elbow FSR 98/134	80										
Elbow FSR 127/175	100	265	155	168.3	217	150	300	250	M24 x 110	8	1015869

Screws and nuts are not included in the delivery volume.

Integrated elbow

Joining method: TIG welding/hard soldering

Insulate acc. to DIN 30762



Note:
The integrated elbow is only needed if the minimal bending radius of the FLEXWELL® Safety Pipe (cf. Worksheet FSR 4.130/4.131) cannot be kept to.

Material:
All parts made of stainless austenitic steel
Material No. 1.4404/1.4571 inner
Material No. 1.4301 outer

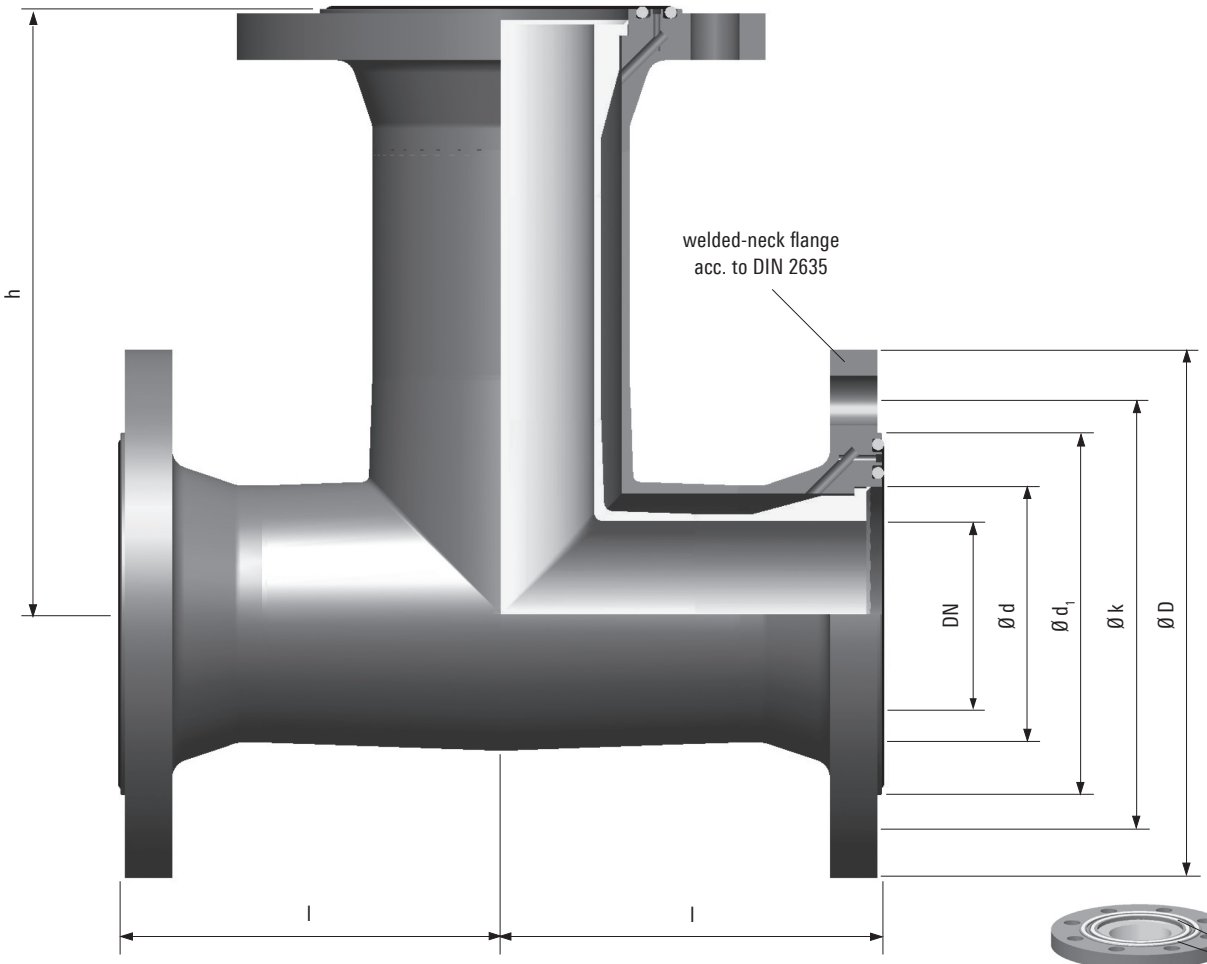
Type	DN	Ø d mm	l mm	R_A	A mm	B mm	C mm	Article No.
Elbow FSR 30/ 48	25	60.3	appr. 145	55	5	60	80	1015859
Elbow FSR 39/ 60	32	76.1	appr. 165	70	5	60	80	1015861
Elbow FSR 48/ 71	40	114.3	appr. 182	102	10	51	100	1015863
Elbow FSR 60/ 83	50	114.3	appr. 210	105	10	58	100	1015864
Elbow FSR 75/107	65	168.3	appr. 252	152	10	58	100	1015865
Elbow FSR 98/134	80	168.3	appr. 237	152	10	60	120	1015868
Elbow FSR 127/175	100	219.1	appr. 410	203	15	90	160	1015870

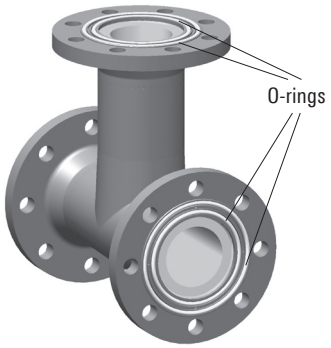
Only BRUGG solder Type BRL 8.50.34 may be used!

Monitorable T-piece with flanged connection

with monitorable sealing surface, complete assembly

Pressure stage PN 25





T-piece in stainless steel
Material No. 1.4404/1.4571 in contact with medium, Material No. 1.4301 outer parts
The monitorable T-piece with flanged connection is flanged together with monitorable connecting fittings with loose flange Part 1 (Worksheet FSR 4.216) or welded-neck flange.

Version:
Complete component asembly, welded and tested
O-ring seals: Viton (see Worksheet FSR 4.217)
O-rings in other materials according to the substances being transported can also be used

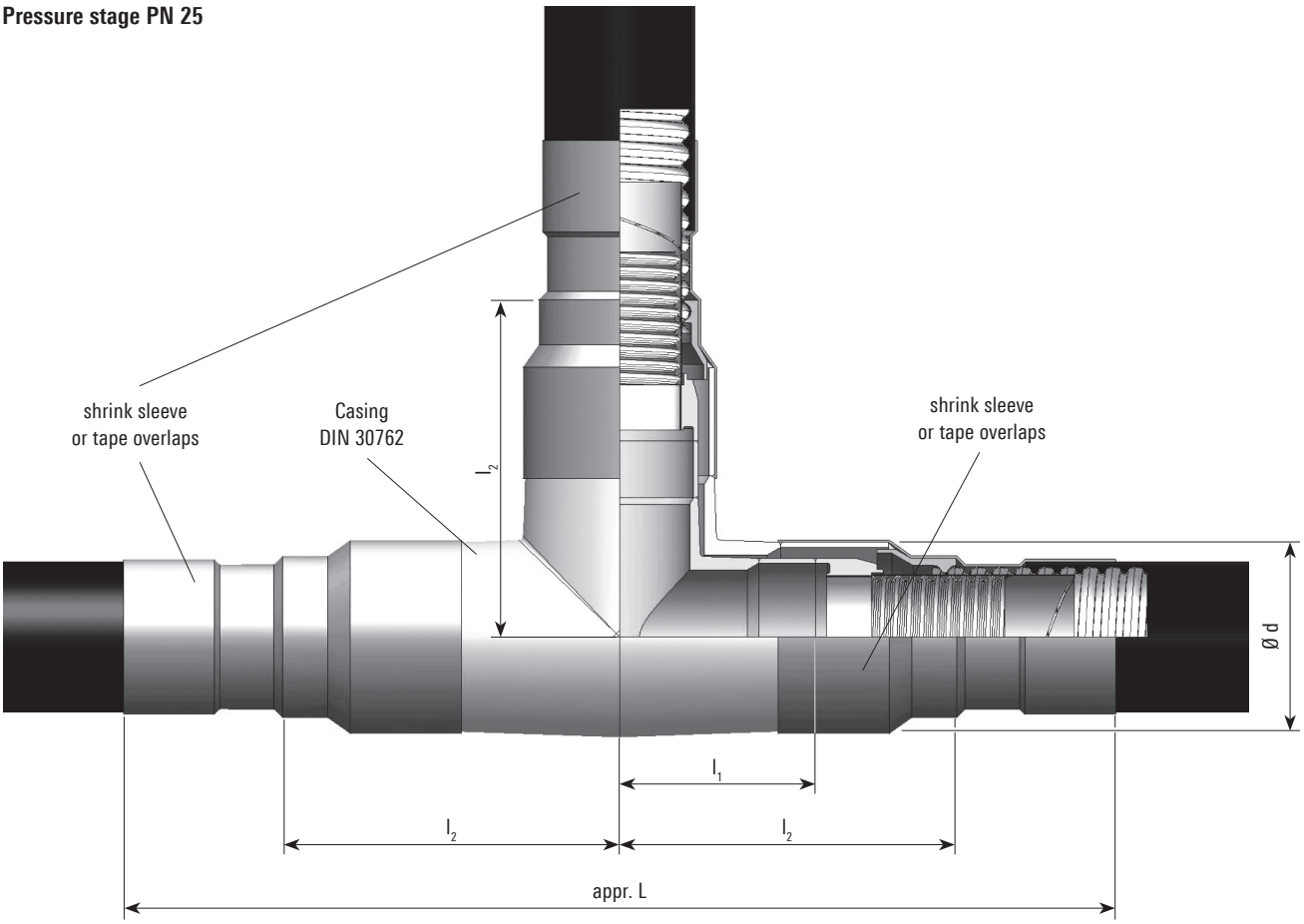
Type	DN	l	h	Ø d	Ø d1	flange DN	Ø D	Ø k	screws for steel	Number of screws	Article No.
		mm	mm	mm	mm		mm	mm			
T-piece FSR 30/ 48	25	101	151	48.3	87	40	150	110	M16 x 80	4	1015871
T-piece FSR 39/ 60	32	111	161	60.3	101	50	165	125	M16 x 90	4	1015873
T-piece FSR 48/ 71	40	127	177	76.1	121	65	185	145	M16 x 90	8	1015875
T-piece FSR 60/ 83	50										
T-piece FSR 75/107	65	169	269	114.3	161	100	235	190	M20 x 100	8	1015879
T-piece FSR 98/134	80										
T-piece FSR 127/175	100	217	317	168.3	217	150	300	250	M24 x 110	8	1015881

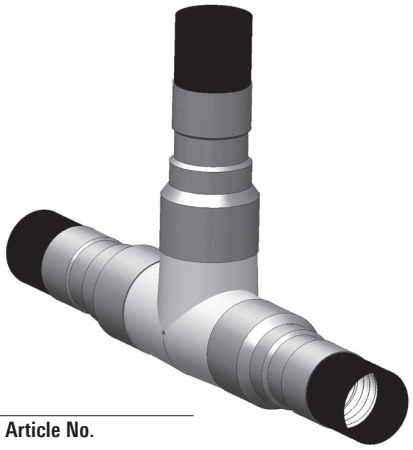
Screws and nuts are not included in the delivery volume.

Integrated T-piece

Joining method: TIG welding/hard soldering

Pressure stage PN 25



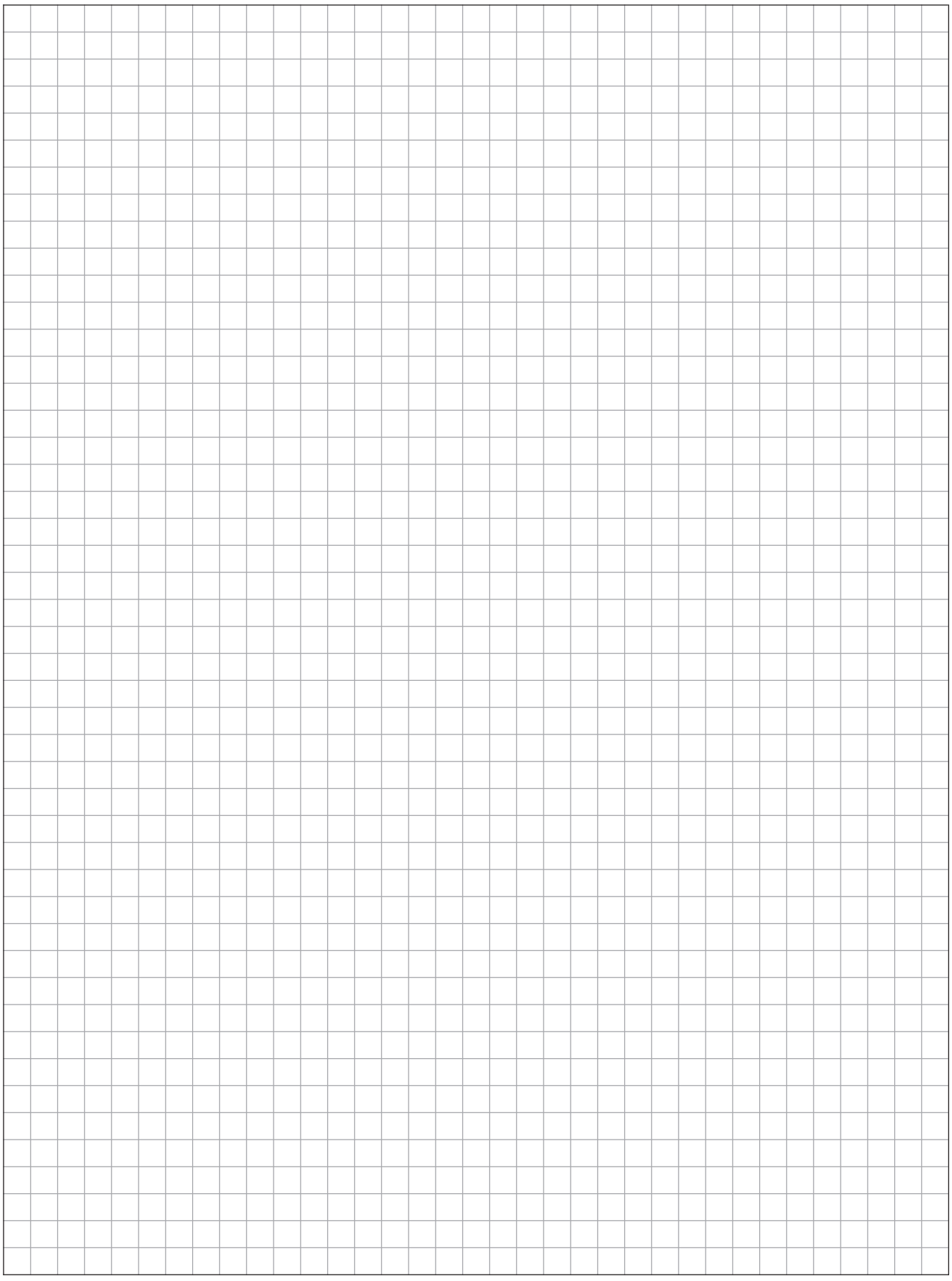


Material:
All parts made of stainless austenitic steel
Material No. 1.4404/1.4571 inner
Material No. 1.4301 outer

Type	DN	Ø d	l_1	l_2	L appr.	Article No. 1.4404
		mm	mm	mm	mm	
T-piece FSR 30/ 48	25	60.3	appr. 87	appr. 174	624	1015872
T-piece FSR 39/ 60	32	76.1	appr. 94	appr. 188	638	1015874
T-piece FSR 48/ 71	40	88.9	appr. 104	appr. 201	668	1015876
T-piece FSR 60/ 83	50	114.3	appr. 131	appr. 233	772	1015877
T-piece FSR 75/107	65	139.7	appr. 145	appr. 263	820	1015878
T-piece FSR 98/134	80	168.3	appr. 174	appr. 300	922	1015880
T-piece FSR 127/175	100	219.1	appr. 248	appr. 383	1086	1015882

Only BRUGG solder Type BRL 8.50.34 may be used!

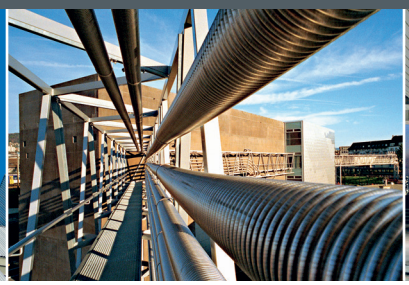
Notes



Pipe systems for the future

District heating – Industry – Petrol stations – System packages

02/16 / 250 ex. / 1016593 / pictures by Key

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