



FLEXWELL CRYO PIPE

Efficient solution for cryogenic fluids

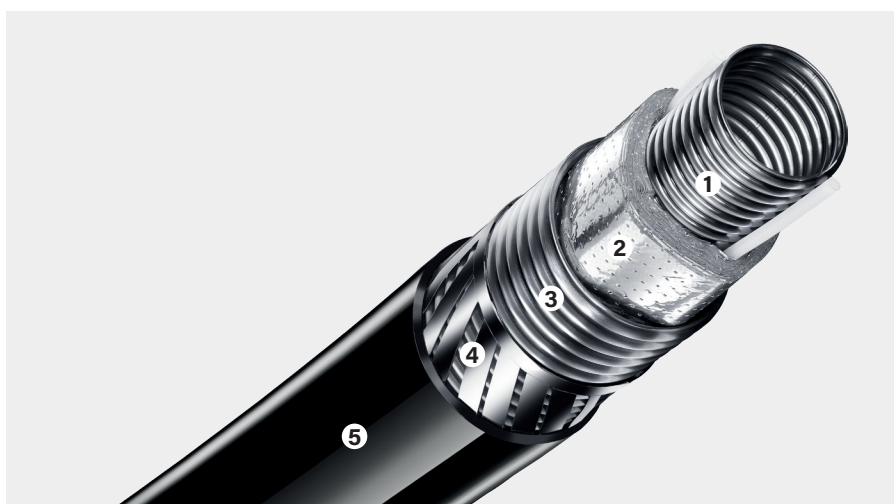
flexible, double-walled, vacuum-insulated pipe system
for the transport of all cryogenic liquefied gases

BRUGG
Pipes

Pioneers in Infrastructure



- 1 corrugated pipe, stainless steel
- 2 vacuum superinsulation
incl. spacer
- 3 corrugated pipe, stainless steel
- 4 flat steel armoring, stainless steel
- 5 protective jacket, PE-LD



Technical data FLEXWELL CRYO PIPE

Material:	inner pipe	1.4404 / AISI 316L
	outer pipe	AISI 316 L
	armoring	1.4301 / AISI 304
	corrosion protection	protective jacket, PE-LD
Operating pressure:	max. 30 bar (depending on nominal diameter and temperature)	
Operating temperature:	-255 °C (18 K) up to +50 °C (323 K)	

Dimensions (others on request)

Type	Nominal diameter	Pressure level	Inner diameter	Outer diameter	Volume	Weight	Bending radius	Heat inleak
		bar	mm	mm	l/m	kg/m	m	W/m
FCP 16/50	DN 15 / NPS 1/2"	25 (PN 25)	16	50	0.20	1.85	0.3	0.4
FCP 22/50	DN 20 / NPS 3/4"	25 (PN 25)	22	50	0.38	1.90	0.3	0.6
FCP 30/61	DN 25 / NPS 1"	25 (PN 25)	30	61	0.71	2.40	0.4	0.8
FCP 39/74	DN 32 / NPS 1 1/4"	25 (PN 25)	39	74	1.19	3.45	0.6	1.0
FCP 48/94	DN 40 / NPS 1 1/2"	30	40	94	1.81	4.75	0.8	1.2

Subject to change without notice.



The FLEXWELL CRYO PIPE is the simple and efficient cryogenic pipe solution. The vacuum insulated pipe is delivered in a ready-for-use condition with pre-installed end connections and pumped vacuum and can be installed easily and within a short time. BRUGG Pipes supports you in system design, product selection, fast delivery and installation to ensure your efficient project execution. Your PIONEERS IN INFRASTRUCTURE.

System description

FLEXWELL CRYO PIPE has been developed for above-ground and underground transport of cryogenic liquefied gases. The special super-insulation made of highly reflective foil together with spacers in the vacuum chamber, enables an efficient and safe transport with low heat inleak along the length of the pipeline.

The specially adapted stainless steel reinforcing bands of the outer pipe guarantee high pressure stability and small elongation of FLEXWELL CRYO PIPE, a small elongation and is a stiff component to ensure that the piping can be laid and pulled-in without risk. The pipe system is

designed for a maximum pressure of 30 bar (depending on the nominal diameter and temperature) in the temperature range between -255°C (18 K) and $+50^{\circ}\text{C}$.

Construction

FLEXWELL CRYO PIPE is a flexible, double-walled, vacuum-insulated pipe system for the transport of all cryogenic liquefied gases. The pipe consists of two concentric helically-corrugated stainless steel pipes with a cryogenic insulation in between. The insulation consists of highly reflective polymer foil and spacers in a vacuum chamber to minimize the total heat input into the pipe system. Stainless steel reinforcing bands are additionally applied to the outer pipe in order to provide a higher pressure stability of the pipe system and to increase the tensile strength of the pipe for the installation. The final layer is a PE protective coating.

Areas of application

Transport of cryogenic liquefied gases such as

- liquid nitrogen LN_2
- liquid argon LAr
- liquid oxygen LO_x
- liquid hydrogen LH_2
- liquid helium LHe
- liquefied natural gas LNG

Nominal diameters/pressure levels

FLEXWELL CRYO PIPE is currently available as a standard product in the nominal diameters DN 15 to DN 40 in the temperature range from -255°C to $+50^{\circ}\text{C}$ with the pressure level PN 25. The maximum pressures at temperatures below -200°C are available on request. Other nominal diameters and pressure levels on request. The maximum nominal diameter is DN 200.

Installation

The FLEXWELL CRYO PIPE can be laid above ground, directly in buildings. Suitable pipe brackets, etc. are offered for this purpose.

It is also possible to install in one piece directly in a pipe trench or on sand bed. The unique corrugated pipe geometry of the inner and outer pipe ensures excellent flexibility and simultaneously compensates for thermal expansion/shrinkage.



Figure: Connecting fitting long version



Figure: Connecting fitting short version

Connection fittings

The connecting fittings for the FLEXWELL CRYO PIPE are available in different designs.

Depending on the overall length of the pipe system, there are different requirements on the used connecting fitting design. Up to a pipe length of 30 m one long and one short connecting fitting is required.

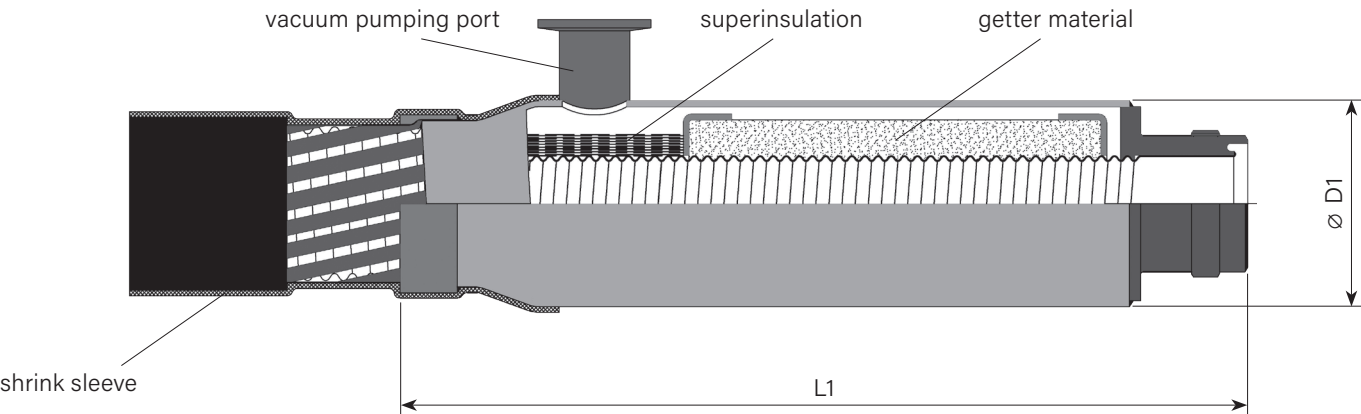
For longer pipe lengths two long connecting fittings are necessary.

All connecting fittings are made of stainless steel (1.4404/AISI 316L or 1.4571/AISI 316Ti) and are welded and tested in the factory. High quality getter materials and adsorption materials inside of the long connecting fitting are used inside

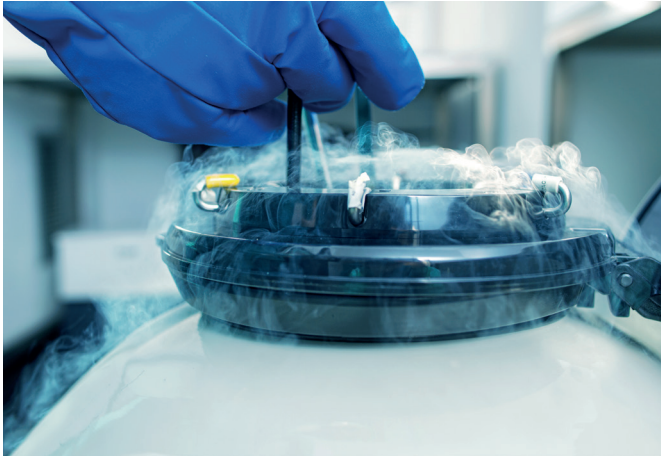
the vacuum to ensure a long-lasting good vacuum insulation.

- By standard the connecting fitting ends can be designed with any common pipe interface such as
- welding end
 - flange
 - screw connection
 - Johnston coupling

Connecting fitting long version with vacuum pumping port



Type	Nominal diameter	Pressure level	Outer diameter D1 "short version"	Outer diameter D1 "long version"	Length L1 "short version"	Length L1 "long version"
		bar	mm	mm	mm	mm
FCP 16/50	DN 15 / NPS 1/2"	25 (PN 25)	53	63.5	80	300
FCP 22/50	DN 20 / NPS 3/4"	25 (PN 25)	53	63.5	80	300
FCP 30/61	DN 25 / NPS 1"	25 (PN 25)	63	73.0	90	300
FCP 39/74	DN 32 / NPS 1 1/4"	25 (PN 25)	75	84.0	90	300
FCP 48/94	DN 40 / NPS 1 1/2"	30	100	102.0	105	340



Many good reasons to select FLEXWELL CRYO PIPE for your cryogenic application

Infinite length

- Time savings through easy installation
- No hot works on site
- No need to insulate joints on site

Self-compensation

- No need for costly compensation elements
- Corrugated pipe works as a bellow
- Each single corrugation compensates thermal expansion

Efficiency

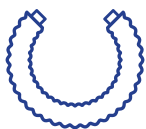
- Small heat inleak into pipe system
- Fast planning, no mm exact isometric planning required
- No need to insulate joints on site

Safe

- Possibility of leakage detection system

Flexible

- No prefabricated elbow fittings necessary
- Uninterrupted factory corrosion proofing jacket



Flexible

Fast installation and self-compensation



Easy

Fast and pre-assembled



Efficient

Small heat inleak



Reliable

100 % factory tested

