

BRUGG

Pipes

FLEXWELL® CRYO PIPE

Energy efficient and cost effective solutions for cryogenic fluids: flexible, double-wall, monitored, vacuum-insulated pipe systems for the transport of all cryogenic liquefied gases

PIONEERS IN INFRASTRUCTURE





- 1 corrugated pipe, stainless steel
- 2 vacuum superinsulation layer including 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	AISI 316 L
	outer pipe	AISI 316 L
	armoring	AISI 304
	corrosion protection	protective jacket, PE-LD
Operating pressure:	DN 15 – DN 32	max. 25 bar
	DN 40	max. 30 bar
Operating temperature:	–200 °C (73 K) up to +50 °C (323 K)	

Dimensions

Type	Nominal diameter	Inner diameter	Outer diameter	Volume	Weight	Bending radius	Heat inleak
		mm	mm	l/m	kg/m	m	W/m
FCP 16/50	DN 15	16	50	0.20	1.85	0.3	0.4
FCP 22/50	DN 20	22	50	0.38	1.90	0.3	0.6
FCP 30/61	DN 25	30	61	0.71	2.40	0.4	0.8
FCP 39/74	DN 32	39	74	1.19	3.45	0.6	1.0
FCP 48/94	DN 40	48	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 layer enable an efficient and safe cryogenic fluid transport with low heat inleak along the whole length of the pipeline.

The specially adapted stainless steel armoring of the outer pipe guarantees high pressure stability and minimal elongation of FLEXWELL® CRYO PIPE. The stainless steel armoring also provides a stiffening component to ensure that the piping can be laid and pulled-in without risk. The pipe system is designed for

a maximum pressure of 25 bar (PN 25) for the DN 15 to DN 32 pipe and for a maximum pressure of 30 bar for the DN 40 pipe in the temperature range between -200 °C (73 K) and $+50\text{ °C}$.

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 of highly reflective polymer foil and spacers in a vacuum layer minimizes the total heat input into the pipe system. Stainless steel armoring is 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 LN₂
- liquid argon LAr
- liquid oxygen LOX
- liquid hydrogen LH₂
- 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 -200 °C to $+50\text{ °C}$ with the pressure level PN 25 for the sizes DN 15 to DN 32 and with a maximum pressure of 30 bar for the size DN 40. 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

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 it 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.



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.

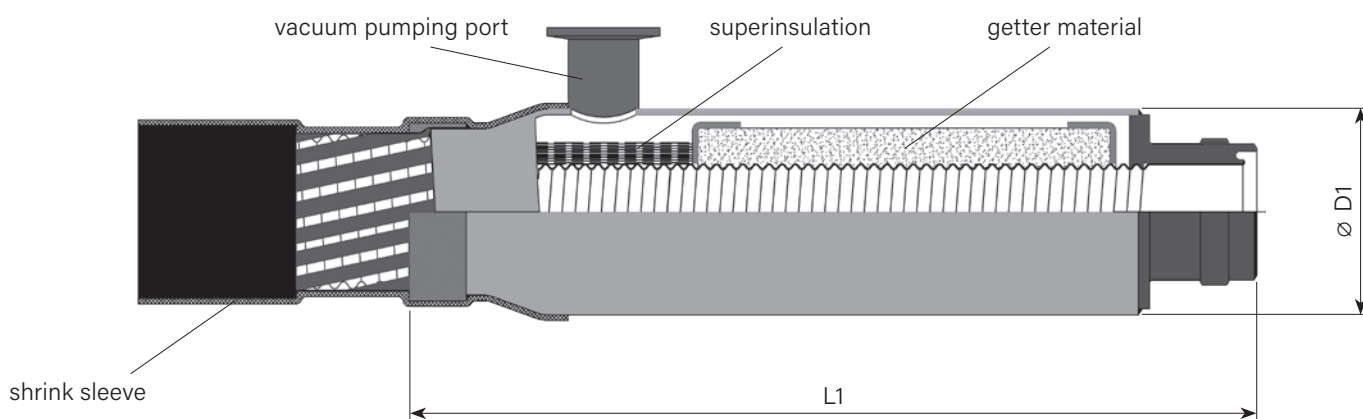
All connecting fittings are made of stainless steel (1.4404/AISI 316L or 1.4571/AISI 316TI) and are welded and tested in the factory.

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 fittings ends with a welding end, which can be adapted to any common pipe interface (flange or screw connections).

Connecting fitting long version with vacuum pumping port



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



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

Flexible

- Fast installation
- No compensation elements required
- Self-compensation

Easy

- Uninterrupted factory production
- No hot work on site
- No prefabricated elbow fittings necessary

Efficient

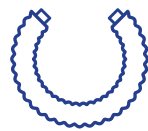
- Vacuum superinsulation
- Small heat inleak into pipe system
- Uninterrupted PE corrosion protection

Safe

- 100 % made in Germany
- 100 % factory checked quality
- Possibility of leakage detection system

Reliable

- Fast planning and fast installation
- Qualified technical advices
- Short delivery times



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