VIP VACUUM INSULATED PIPING

KrioSystem
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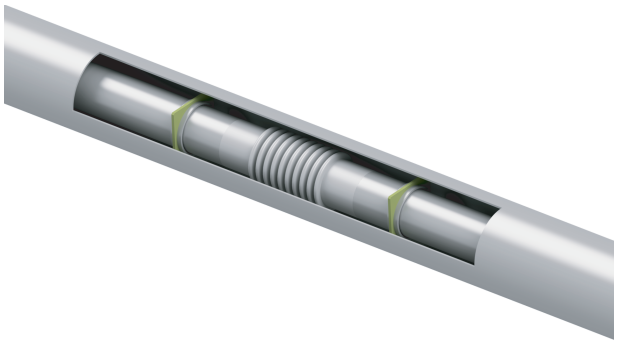
APPLICATION



Vacuum-insulated piping is used to transport cryogenic gases – nitrogen, oxygen, helium, argon, LNG, CO_2.

Technology of VIP piping makes it possible to reduce medium losses (up to 20 times lower losses compared with traditionally-insulated systems) while maintaining small dimensions.

Wide application mainly in the gas, food, pharmaceutical, laboratory, shipbuilding, machinery and metallurgical industries.

DESIGN AND BENEFITS

Stainless steel process pipe designed to work in high hygiene areas.

Stainless steel external pipe, which is a vacuum jacket, remains at the ambient temperature, providing excellent protection against cold burns.

The use of a bellows expansion joints makes it possible to compensate for thermal deformation of the piping.

Spacers ensure that the process pipe is centrally placed in relation to the jacket and minimise heat conduction.

Sufficient number of MLI layers minimises the inflow of heat through radiation.

High vacuum in the space between the pipes eliminates the inflow of heat through convection.

Independent vacuums in prefabricated sections protect against complete loss of vacuum in the whole system in the case of a failure.

Small vacuum jacket diameter compared with traditional insulation.

Combination of the vacuum technology with multi-layer insulation guarantees the lowest possible inflow of heat to the transported medium. The most efficient insulation available on the market.

Option to easy regenerate vacuum.

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TECHNICAL SPECIFICATION

AVAILABLE COUPLINGS

- Johnston bayonet couplings (screwed together)
- Sleeve coupling – welded
- Mixed couplings

OPTIONS

- Can be applied with different cryogenic media.
- Other sizes on request.
- Maximum pressure class PN40.
- Piping system available with/without required fittings, e.g. shut-off/control/safety valves or phase separators.
- Different types of materials.
- Different lengths and shapes of couplings.

MATERIALS

Internal pipe:	EN 1.4301/1.4307
External pipe:	EN 1.4301/1.4307
Bellow:	EN 1.4541
Spacers:	G10 epoxy glass
Insulation:	MLI + vacuum
Sealing:	bimetallic; O-rings

MANUFACTURE

- Pipes and materials according to EN standards.
- PED 2014/68/EU directive conformity.
- Welding processes according to ISO 3834-2 quality management system.
- Maximum permissible leak: $1 \cdot 10^{-9}$ mbar • l/s - verified with a helium leak detector according to PN-EN ISO 20485.
- Vacuum level ≤ 10^{-4} mbar

STANDARD PARAMETERS

Diameter		Int. pipe [mm]	Ext. pipe [mm]	Capacity* [l/h]	Inflow of heat*			
					Pipe [W/m]	Hose [W/m]	Bayonet coupling [W]	Sleeve coupling [W]
1/2"	DN15	21,3 x 1,6	60,3 x 2,0	500 - 1000	0,5	1,2	1,6	-
3/4"	DN20	26,9 x 1,6	76,1 x 2,0	1000 - 2000	0,6	1,5	2,1	-
1"	DN25	33,7 x 2,0	76,1 x 2,0	2000 - 3000	0,7	1,6	2,3	-
1 1/4"	DN32	42,4 x 2,0	88,9 x 2,0	3000 - 4000	0,8	1,7	3,0	3,2
1 1/2"	DN40	48,3 x 2,0	101,6 x 2,0	3000 - 4500	0,8	1,9	4,1	3,4
2"	DN50	60,3 x 2,0	114,3 x 2,0	4000 - 6000	1,0	2,0	4,5	3,9
3"	DN80	88,9 x 2,0	154 x 2,0	-	1,6	3,0	5,4	5,1

*- estimated value for liquid nitrogen

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KRIOSYSTEM Sp. z o.o.
ul. Fabryczna 16
53-609 Wrocław
Poland

Tel.: +48 71 349 00 20
Fax: +48 71 349 00 22
biuro@kriosystem.com.pl
www.kriosystem.com.pl