

Composite Cryogenic hoses CRYOTEC 660 / 661



CRYOTEC hoses are designed for use with cryogenic products at temperatures down to -200°C and pressures up to 25 bar. This hose series has been designed around multilayers of polyamide fabrics and films, polyester films, reinforced with inner and outer wire spirals in 316 Stainless Steel. Additional Polyester fabrics and specific bi-oriented polypropylene films are provided to guarantee flexibility even at -200°C , ensuring the assemblies better performances than other hose types or loading arms, when accommodating for vessel movements during transfer operation.

CRYOTEC hose design includes FEP extruded tubular and Mylar® films. According to EN 13766:2010 they are manufactured in two types: Type 1 for LPG and Type 2 for LNG, each type is subdivided in two classes, one for onshore use (Class A) and one for offshore use (Class B).

For transport LPG or LNG gases it is standard economic practice liquefying them either by means of pressure or refrigeration. Hoses for this application must be ductile at low temperatures. **CRYOTEC** hoses for liquid gas transfer form an important part of the extensive range on non-metallic flexible hoses offered by the division of Matec group. The hoses are certified by DNV as complying the requirements of CE Directive 97/23 "PED" and are made to comply the requirements of EN13766; Paragraphs 5:4 and 5:7 of the IMO Gas Carrier Code, and 5:3 and 5:7 of the IMO Chemical Carrier Code. **CRYOTEC** hoses meet EN, CE, PED standards, U.S. Coast Guard requirements, are DNV approved. ATEX certification acc. Directive 94/EC is available on request.

ADVANTAGES

- Superior thermal performance
- Up to 5 times better thermal performance than competing insulation products
- Reduced thickness and profile
- Equal thermal resistance at a fraction of the thickness
- Zero Permeability due to integral vapour barrier
- Prevents ice formation on outer diameter
- Physically robust
- Soft and flexible but with excellent elastic recovery, Nanogel® recovers its thermal performance even after compression
- Eliminates expansion joints because the hose remains flexible even at cryogenic temperatures
- Environmental safe
- Landfill disposable, shot-free, with no respirable fibre content
- Flexible hoses are usually uninsulated due to severe stresses of cycling between ambient and LNG (-175°C) temperatures. This can result in heavy ice formation during operation, and dangerous ice falls during the subsequent warm up. **CRYOTEC** hoses insulated with Cryogel® Z are impervious to cryogenic cycling.



CRYOTEC 660 LG

This series is suitable for transferring fully refrigerated conveyants such as LPG, propane and butane down to -105°C as well as liquid ethane and liquid ethylene.

Suitable for fluids included in Chap XIX, Gas carrier Code.

Code	CRYOTEC 660 ZZ	CRYOTEC 660 ZX	CRYOTEC 660 XX
Application	Liquid Petroleum Gas LPG		
Colour	White		
Temperature range	-105 / + 100°C		
Inner wire	galv. steel	galv. steel	st. steel
Outer wire	galv. steel	st. steel	st. steel



Size		Maximum W.P.		Safety Factor	Bending radius (ENISO1746)		Weight kg	Maximum Length	
mm	Inch	bar	P.S.I.		mm	Inch		m	
20	¾"	25	360	5:1	80	3	0,8	40	132
25	1"	25	360	5:1	100	4	1,0	40	132
32	1 ¼"	25	360	5:1	125	5	1,3	40	132
40	1 ½"	25	360	5:1	140	6	1,5	40	132
50	2"	25	360	5:1	180	7	2,5	40	132
65	2 ½"	25	360	5:1	200	8	3,3	40	132
75/80	3"	25	360	5:1	260	10	4,0	40	132
100	4"	25	360	5:1	380	15	6,8	40	132
150	6"	25	360	5:1	500	20	13,2	40	132
200	8"	25	360	5:1	750	30	18,0	40	132
250	10"	15	200	5:1	900	36	26,0	25	82
300	12"	10	150	5:1	1500	60	34,0	25	82

CRYOTEC 661 N

These hoses are suitable for handling LNG Liquefied Natural Gas, liquid methane and liquid nitrogen at -200°C. **CRYOTEC** hoses assemblies are tested in accordance with EN ISO 1402. The ferrule is embossed with manufacturer's name, nominal bore, serial number and test date. Burst pressure indicated is at ambient temperature when tested in accordance with EN ISO 1402. Electrical continuity is achieved by the two wires bonded to the end fittings, this helps dissipating accumulated charge and avoiding static flash. The electric resistance of hose assemblies is less than 1 Ω/m as required by EN ISO 8031:2009 - 4.7.

Code	CRYOTEC 661 ZZ	CRYOTEC 661 ZX	CRYOTEC 661 XX
Application	Liquified Natural Gas LNG at extremely low temperatures		
Colour	White		
Temperature range	-200 / + 80°C		
Inner wire	galv. steel	galv. steel	st. steel
Outer wire	galv. steel	st. steel	st. steel



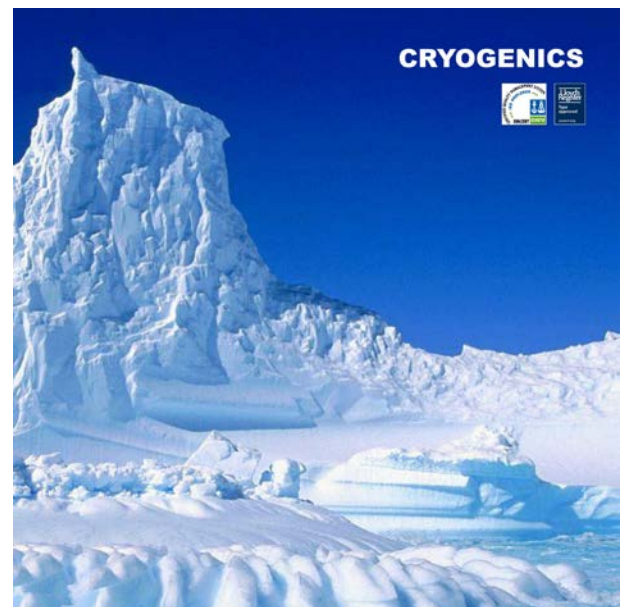
Size		Maximum W.P.		Safety Factor	Bending radius (ENISO1746)		Weight kg / m	Maximum Length	
mm	Inch	bar	P.S.I.		mm	Inch		m	Feet
20	¾"	15	200	8:1	80	3	0,8	40	132
25	1"	15	200	8:1	100	4	1,0	40	132
32	1 ¼"	15	200	8:1	125	5	1,3	40	132
40	1 ½"	15	200	8:1	140	6	1,5	40	132
50	2"	15	200	8:1	180	7	2,5	40	132
65	2 ½"	15	200	8:1	200	8	3,3	40	132
75/80	3"	15	200	8:1	260	10	4,0	40	132
100	4"	15	200	8:1	380	15	6,8	40	132
150	6"	13	185	8:1	500	20	13,2	40	132
200	8"	13	185	8:1	750	30	18,0	40	132
250	10"	13	185	8:1	900	36	26,0	25	82
300	12"	10	150	8:1	1500	60	34,0	25	82

CRYOTEC Nanogel® – Patented design

FLEXIBLE HOSE WITH INTEGRAL INSULATION VAPOR BARRIER FOR SUB-AMBIENT AND CRYOGENIC APPLICATIONS

Nanogel® is a flexible aerogel blanket insulation with an integral vapour barrier. It is engineered to deliver maximum thermal protection with minimal weight and thickness and zero water vapour permeability. Nanogel®'s unique properties, extremely low thermal conductivity, superior flexibility, compression resistance, hydrophobicity and ease of use make it essential for those seeking the ultimate in thermal protection for cryogenic applications. Using patented nanotechnology, Nanogel® insulation combines a silica aerogel with reinforcing fibres to deliver industry-leading thermal performance in an easy-to-handle and environmentally safe product. Nanogel®'s extremely low thermal conductivity reduces heat gain and its inherent flexibility makes the product durable and resistant to mechanical abuse.

Additional protection (ARAMEX braid and PU Red cover) on the outer diameter is available to minimize the abrasion damages and for further protection and insulation. CRYOTEC hoses with Nanogel® patented insulation can achieve an outer temperature of 23°C on hoses carrying LNG at -175 inside.



Burst pressure indicated is at ambient temperature.

Maximum temperature rating can only be maintained when working within limits of working pressure.
We reserve the right to change specification without prior notice !