

CRYOTEC



COMPOTEC® CRYOTEC hoses are designed for use with cryogenic products at temperatures down to -200°C and pressures up to 25 bar.

COMPOTEC® CRYOTEC hoses has been designed around multi-layers of polyamide fabrics and films, polyester films, reinforced with inner & outer wire spirals in 316 Stainless Steel. Additional Polyester fabrics and specific bi-oriented Polypropylene films are provided to guarantee flexibility even at minus 200°C, ensuring the assemblies better performances than other type of hoses or loading arms, when accommodating for vessel movements during transfer operation.

COMPOTEC® CRYOTEC hoses includes in the construction **FEP** extruded tubular and **Mylar®** films. Outer extra protection, to prevent accidental burns, can be provided if required. **COMPOTEC® CRYOTEC** hoses are manufactured according to EN 13766:2010, in two types: Type 1 for LPG, and Type 2 for LNG, each type is subdivided into two classes, one for onshore use (Class A), and one for offshore use (Class B).

To transport LPG or LNG gases it is standard economic practice to liquefy them either by means of pressure or refrigeration. Hoses for this application must be ductile at low temperatures. **COMPOTEC® CRYOTEC** hoses for liquid gas transfer form an important part of the extensive range on non-metallic flexible hoses offered by the COMPOTEC® 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 and Paragraphs 5:4 and 5:7 of the IMO Gas Carrier Code, and 5:3 and 5:7 of the IMO Chemical Carrier Code. Meets EN, CE, PED, U.S. Coast Guard requirements, DNV Approved. ATEX Cert. Directive 94/EC on request.

CRYOTEC 660 LG 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.

CRYOTEC 661 N hose is suitable for handling **LNG** Liquefied Natural Gas, Liquid Methane and liquid Nitrogen down to -200°C.

COMPOTEC® 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 dissipate accumulated charge and to avoid static flash. The electric resistance of hose assemblies is less than 1 ohm/mt, as required by EN ISO 8031:2009, 4.7.

CRYOTEC Nanogel® – Patented design by Matec® Group
FLEXIBLE COMPOTEC HOSE WITH INTEGRAL INSULATION VAPOR BARRIER FOR SUB-AMBIENT AND CRYOGENIC APPLICATIONS.

Nanogel® is flexible aerogel blanket insulation with an integral vapor barrier. It is engineered to deliver maximum thermal protection with minimal weight and thickness, and zero water vapor 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 fibers 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 liquid boil-off, its blanket form minimizes installation labor, and its inherent flexibility makes the product durable and resistant to mechanical abuse. Additional Rope lagging 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.

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 Vapor Barrier
- Provides redundant moisture protection in an easy-to-install package
- Physically Robust
- Soft and flexible but with excellent springback, **Nanogel®** recovers its thermal performance even after compression.
- Eliminates Contraction Joints because it remains flexible even at cryogenic temperatures,
- Environmentally Safe
- Landfill disposable, shot-free, with no respirable fiber 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 **Nanogel®** are impervious to cryogenic cycling.



TYPE LG: LG= Hoses for Liquid Petroleum Gas (LPG) handling

Size		Maximum W.P.		Safety	Bend Radius (ENISO1746)		Weight		Maximum Length	
mm	Inch	Bar	P.S.I.	Factor	mm	Inch	Kg. / mt	Mt.	Feet	
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 660 LG

Code	CRYOTEC 660 ZZ	CRYOTEC 660 ZX	CRYOTEC 660 XX
Applications	Liquid Petroleum Gas LPG		
Colour	White		
Temperatures	-105 + 100°C		
Inner wire	Galv. Steel	Galv. Steel	Stain. Steel
Outer wire	Galv. Steel	Stain. Steel	Stain. Steel



TYPE N: N= hoses for Liquefied Natural Gas (LNG) at extremely low temperatures

Size		Maximum W.P.		Safety	Bend Radius (ENISO1746)		Weight		Maximum Length	
mm	Inch	Bar	P.S.I.	Factor	mm	Inch	Kg. / mt	Mt.	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 661 N

Code	CRYOTEC 661 ZZ	CRYOTEC 661 ZX	CRYOTEC 661 XX
Applications	Liquefied Natural Gas LNG at extremely low temperatures		
Colour	White		
Temperatures	-200 + 80°C		
Inner wire	Galv. Steel	Galv. Steel	Stain. Steel
Outer wire	Galv. Steel	Stain. Steel	Stain. Steel



CRYOGENICS

DNV Det Norske Veritas Cert. n. CERT-04193-99-AQ IND-SINCERT
EN 13765:2010, approved from CEN
Directive 97/23/CE "PED" with operating Procedures certified from DNV - CE PED 07.0056.06/2585
Directive 94/9/CE "ATEX" hose for explosive atmospheres, Cert. held by DNV Rec. nr. CE ATE 08.0117.06/2617 - (AS 2430.1-1987)
BS 5842:1980 (Conf. 1986)
BS 3492:1987
AS 2683-2000 (Hose & hose assemblies for distribution of petroleum and petroleum products)
AS 2117-1991 (Hose & hose assemblies for petroleum and petroleum products - Marine suction and discharge)
NAHAD Guidelines (NAHAD 600/2005)

Test procedures:

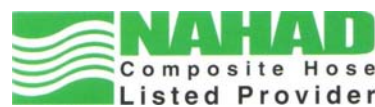
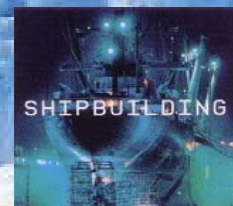
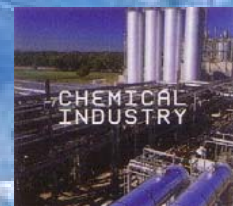
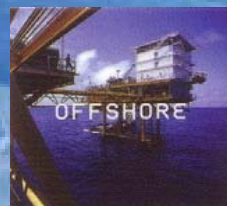
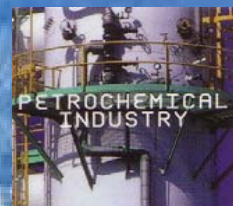
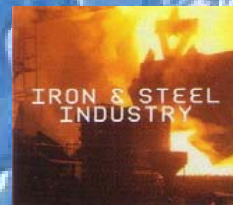
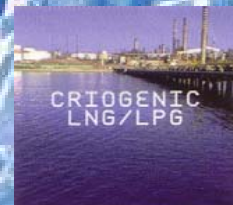
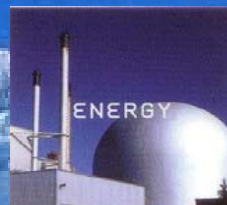
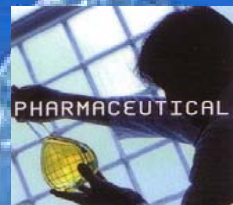
BS 5173-102.10:1990 section 102.10 - (EN ISO 1402)
AS1180.5-1999 (method 5)
AS 1180.13B (Electrical resistance)
AS1180.13C (Electrical continuity)

Type Approval

Lloyd's Register Type Approved - Cert. N° 13/00002
DNV - Det Norske Veritas - Type Approval Cert. N° P-12369
RINA - Registro Italiano Navale - Cert. N° MAC/81398/1/TO/99
Russian Maritime Register of Shipping
IBC Code Chapter 5 - Ship's Cargo hoses
IMO Chemical Carrier Code - Paragraphs 2:12 and 5:7

Welding Process

in according to EN 15608:2005 - EN 439:1996 - EN 15614-1:2005 - EN 6848:2005 - EN 12072:2001 certified by DNV - Det Norske Veritas
in according to ASME IX certified by RINA



MATEC GROUP SRL
VIA I MAGGIO, 7 - PESCHIERA BORROMEO (MILANO) - ITALIA
Tel. +39 02 55 30 17 88 - Fax +39 02 54 72 158
matec@matecgroup.com
www.matecgroup.com

COMPOTEC®