

HDS CRYOGENIC

HDS CRYOGENIC hoses are designed for use with cryogenic products at temperatures down to -200°C and pressures up to 25 bar. HDS CRYOGENIC 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. HDS CRYOGENIC hoses includes in the construction FEP extruded tubular and Mylar® films. HDS CRYOGENIC hoses are manufactured according to EN 13766:2010, 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).

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. HDS CRYOGENIC hoses for liquid gas transfer form an important part of the extensive range on non-metallic flexible hoses offered by HDS. 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. Meets EN, CE, PED, U.S. Coast Guard requirements, DNV Approved. ATEX Cert. Directive 94/EC on request.

CYROGENIC 660 LG is suitable for transferring fully refrigerated conveyants such as **LPG, Propane and Butane down to -105°C**, as well as liquid Ethane at and liquid Ethylene. Suitable for fluids included in Chap XIX, Gas carrier Code.

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

HDS CRYOGENIC 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.

CYROGENIC Nanogel® – Patented design
FLEXIBLE HDS 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. CYROGENIC 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 Vapour Barrier
 - Provides ice formation on outer diameter
 - Physically Robust
 - Soft and flexible but with excellent spring back, Nanogel® recovers its thermal performance even after compression.
 - Eliminates Expansion Joints because it remains flexible even at cryogenic temperatures,
 - Environmentally Safe
 - Landfill disposable, shot-free, with no respirable fibre content



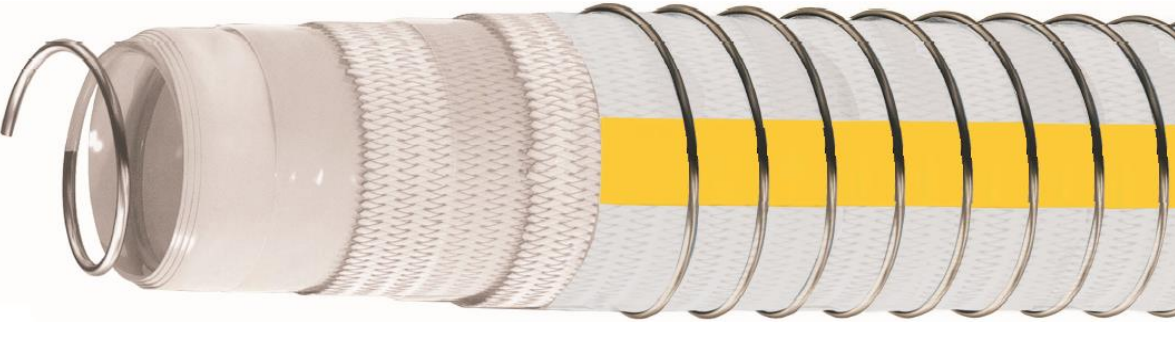
TYPE LG: Hoses for Liquid Petroleum Gas (LPG) handling

Size		Maximum W.P.		Safety factor	Bend Radius		Weight kg/m	Maximum Length	
mm	inch	Bar	P.S.I.		mm	inch		Mt.	Feet
20	3/4	25	360	5:1	80	3	0.8	40	132
25	1	25	360	5:1	100	4	1	40	132
32	1 1/4	25	360	5:1	125	5	1.3	40	132
40	1 1/2	25	360	5:1	140	6	1.5	40	132
50	2	25	360	5:1	180	7	2.5	40	132
65	2 1/2	25	360	5:1	220	8	3.3	40	132
75/80	3	25	360	5:1	260	10	4	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	40	132
250	10	15	200	5:1	900	36	26	25	82
300	12	10	150	5:1	1500	60	31	25	82

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

Size		Maximum W.P.		Safety factor	Bend Radius		Weight kg/m	Maximum Length	
mm	inch	Bar	P.S.I.		mm	inch		Mt.	Feet
20	3/4	15	200	5:1	80	3	0.8	40	132
25	1	15	200	5:1	100	4	1	40	132
32	1 1/4	15	200	5:1	125	5	1.3	40	132
40	1 1/2	15	200	5:1	140	6	1.5	40	132
50	2	15	200	5:1	180	7	2.5	40	132
65	2 1/2	15	200	5:1	200	8	3.3	40	132
75/80	3	15	200	5:1	260	10	4	40	132
100	4	15	200	5:1	380	15	6.8	40	132
150	6	13	185	5:1	500	20	13.2	40	132
200	8	13	185	5:1	750	30	18	40	132
250	10	13	185	5:1	900	36	26	25	82
300	12	10	150	5:1	1500	60	31	25	82

HDS Hoses Australia



Code	660 ZZ	660 ZX	660 XX
Applications	Liquid Petroleum Gas LPG		
Colour	White		
Temperature	-105 + 100°C		
Inner Wire	Galv. Steel	Galv. Steel	Stainless Steel
Outer Wire	Galv. Steel	Stainless Steel	Stainless Steel

Code	661 ZZ	661ZX	661XX
Applications	Liquefied Natural Gas LNG at extremely low temperatures		
Colour	Green		
Temperature	-200 +80°C		
Inner Wire	Galv. Steel	Galv. Steel	Stainless Steel
Outer Wire	Galv. Steel	Stainless Steel	Stainless Steel



Certificate No.: 73Q14710

HDS Hoses Australia

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- Quality Certificates**
EN 13765:2010, approved from CEN
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)
AS1180.5-1999 (method 5)
AS 1180.13B (Electrical resistance)
AS1180.13C (Electrical continuity)
- Type Approval**
Lloyd's Register Type Approved
RINA - Registro Italiano Navale
Russian Maritime Register of Shipping

Welding Process
in according to EN 15608:2005 - EN 439:1996 - EN 15614-1:2005 - EN 6848:2005 - EN 12072:2001 and to ASME IX