

Vacuum Insulated Hose (VIH)



SemiFlex

CSM provide Vacuum Insulated Hose (VIH) or flexible modules with various flexibility to suit different piping needs and applications.

All VIH comes with static vacuum as standard and dynamic vacuum as option. Static VIH is vacuum sealed at the factory, providing many years of trouble free vacuum insulation. All hoses come with high quality wear resistant stainless steel outer braid or kink resistant spiral wrap protection cover.

SemiFlex

SemiFlex, a semi-rigid bendable pipe with optimal flexibility is suitable for **long distance piping system application**, an alternative to traditional rigid piping.

Its lightweight stainless steel construction reduces cool-down losses to an absolute minimum. Available in sizes of DN16 (1/2") & DN50 (2") and lengths up to 59 ft (18 m).



CryoFlex

CryoFlex

CryoFlex is designed to meet high flow capacity without compromising its flexibility. Mainly used to overcome **misalignment** in rigid piping system; and as a **final tie-in to equipment**.

Cryo-Flex are available in many sizes from DN16 up to DN50 to meeting almost all the standard or custom requirements.

UltraFlex

UltraFlex is an ultra-flexible vacuum insulated hose with low to medium flow applications. It has the lowest dynamic bend radius among all cryogenic hoses in the market, ideal for operations requiring **frequent movement or repositioning**. Mainly used to **transfer liquid nitrogen from dewar** to equipment.

UltraFlex are available with sizes from DN8 up to DN12 to meet most the applications.



UltraFlex

Features and Benefits

- Superior vacuum insulation eliminates moisture, condensation and frost build-up
- Due to very low heat gain, liquid nitrogen losses can be reduced by 10 to 20 times
- Product flexibility facilitates installation especially above ceilings and below raised floors

SemiFlex / CryoFlex Technical Specifications

Model	Inner Hose Size, or Actual Flow Dia.	Nominal Jacket OD, excl. pump out port	Nominal OD with Braid	Min. Bend Radius (mm)	Hole Required for Pump Out, w/o Thermocouple	Bayonet Female Clamp OD	Linear Density (kg/m)
F16	DN16 (16.2 mm)	DN40 (52.1 mm)	53 mm	450 / 200	4" (100 mm)	51 mm	2.3 / 1.44
F25	DN25 (25.1 mm)	DN50 (62.8 mm)	63 mm	550 / 300		64 mm	3.18 / 1.94
F32	DN32 (34.2 mm)	DN65 (81.2 mm)	82 mm	450	4.5" (120 mm)		4.5
F40	DN40 (40.0 mm)	DN100 (120 mm)	120 mm	600	6" (150 mm)	91 mm	7.9
F50	DN50 (50.1 mm)	DN100 (120 mm)		720	180 mm (7")	120 mm	8.2

SemiFlex / CryoFlex LN₂ Performance Data

Model	Cool Down @ 45 psi (3 bar) & -181 °C			Static Heat Leak		Bayonet Pair Heat Leak	
	kJ/m	kg/m	lb/ft	Btu/hr/ft	W/m	Btu/hr	W
F16	64	0.43	0.29	1.4	1.3	4.0	1.2
F25	122	0.84	0.56	1.5	1.4	8.1	2.4
F32	135	0.90	0.60	1.6	1.5	7.8	2.3
F40	252	1.68	1.13	1.8	1.7	9.2	2.7
F50	292	1.95	1.31	1.7	1.6	11.3	3.3

SemiFlex / CryoFlex LN₂ Flow Guide Line

@ 90 psi (6.0 bar) saturation pressure for 100 ft (30 m) piping length, exclude pressure drop due to elevation changes

Model	Nominal Flowrate @ ΔP 0.1 bar			Maximum Flowrate @ ΔP 0.3 bar		
	GPM	LPM	kg/hr	GPM	LPM	kg/hr
F16	1.1 / 1.2	4.23 / 4.7	180 / 200	1.9 / 2.1	7.4 / 8.2	315 / 350
F25	3.9 / 4.3	14.7 / 16.3	630 / 700	6.7 / 7.4	25.2 / 28.0	1080 / 1200
F32	8.8 / 9.8	33.6 / 37.3	1400 / 1600	16.6 / 18.4	63.0 / 70.0	2700 / 3000
F40	13.2 / 14.7	50.4 / 56.0	2160 / 2400	23.2 / 25.8	88.2 / 98.0	3780 / 4200
F50	24.3 / 27.0	92.4 / 102.7	3960 / 4400	45.9 / 51.0	174.3 / 193.7	7470 / 8300

SemiFlex / CryoFlex Pressure Drop (bar/m)

LN₂ @ 90 psi (6.0 bar) saturation pressure, not accounting elevation changes. Recommendation: pressure drop < 4.35 psi (0.3 bar)

Model	Flow (kg/hr)						
	450	1200	2200	5500	11400	17000	23000
F16	0.0155	0.109	0.369				
F25	0.0011	0.008	0.027	0.167	0.718		
F32		0.0015	0.005	0.0319	0.137	0.304	
F40			0.0024	0.0152	0.065	0.144	0.265
F50			0.00064	0.0040	0.0171	0.0380	0.069