Vacuum Insulated Transfer Hose

CryoWorks Vacuum Insulated Transfer Hoses are lightweight, extremely flexible, and thermally-efficient. They provide faster, more consistent liquid delivery with a safe to touch jacket.

Features:

Durable Cover — Braided, light weight, and flexible outer.
Static Vacuum — Factory evacuated and sealed.
Thermally Efficient — Low cool down and low product loss.
Fast Cool Down — Thin wall bellows material.
Quick Delivery — Popular styles maintained in stock.
Hose Builder Tool — Choose from a wide variety of inner sizes, end connections, lengths, pressure ratings, and protective covers.

Benefits:

- Eliminate and reduce hazards such as condensation, water hazards, moisture problems, mold, foreign object debris (FOD) concerns, frost, and ice buildup that is normally seen with non-insulated or foam insulated hoses.
- Safely handle your cryogenic fluids with a vacuum insulated transfer hose that is warm to the touch and remains flexible during fluid transfer.
- Transfer hose material is designed for strenuous conditions.
- Maneuver around obstructions with our extremely flexible corrugated hose design.
- Get better liquid performance: each hose vacuum space includes Super-Insulation (Multilayer Insulation, MLI) that keeps thermal heat loss to a minimum.
- Long Term Vacuum Levels: Chemical gettering is installed within the vacuum and each hose assembly is baked (heated) and helium leak tested, with a no-leak indication, to 1 x 10^{-9} std. cc/sec.

Applications:

- From portable dewar and use point locations to equipment.
- For moving or vibrating equipment.
- Where liquid quality and improved flow is a must.
- Facilitates connections to cold plates, environmental test chambers, cryo-storage freezers, ice cream dosing, and cryotherapy saunas.

Vacuum Insulated Transfer Hose with Dewar T-Handle Accessory

Standard Hose Details:

Temperature Rating — Standard: -320°F (--196°C/77K)
Optional: -452°F (-269°C/4 K)

Pressure Rating — Low Pressure (LP): 150 PSIG (10.34 Bar)
Medium Pressure (MP): 500 PSIG (34.47 Bar)
High Pressure (HP): See Technical Specifications

Standard Materials — 321 Stainless Steel: Inner and Outer Hose
304 Stainless Steel: Braid, Braid Band, Tube, Pipe, and End Fittings

CryoWorks, Inc.® | 951.360.0920 | www.CryoWorks.net | 3309 Grapevine Street, Jurupa Valley, CA 91752

Technical Specifications:

Inner ID	Jacket ID	Inner Braid	MAWP psi	Inner Nominal ID		Braided Jacket Nominal OD		Spiral Jacket Nominal OD		Dynamic Bend Radius		Static Bend Radius		Heat Leak	
				in	mm	in	mm	in	mm	in	mm	in	mm	BTU/hr/ft	Watt/m
¼"	¾"	N	200	0.25	6.35	1.18	29.97	1.26	32.00	6.65	168.91	2.09	53.09	0.65	0.62
	1"	Y	2500	0.03	6.35	1.43	36.32	1.65	41.91	7.68	195.07	2.52	64.01	0.70	0.67
⅜"	1"	N	150	0.38	9.53	1.43	36.32	1.65	41.91	7.68	195.07	2.52	64.01	0.80	0.77
	1"	Y	1680	0.38	9.53	1.43	36.32	1.65	41.91	7.68	195.07	2.52	64.01	0.80	0.77
½"	1¼"	N	150	0.50	12.70	1.79	45.47	1.90	48.26	8.86	225.04	3.11	78.99	0.98	0.94
	1¼"	Y	1240	0.50	12.70	1.79	45.47	1.90	48.26	8.86	225.04	3.11	18.99	0.98	0.94
¾"	1½"	N	150	0.75	19.05	2.14	54.36	2.28	57.91	10.04	255.02	3.86	98.04	1.21	1.17
	2"	Y	940	0.75	19.05	2.65	67.31	2.91	73.91	11.54	293.12	4.72	119.89	1.32	1.27
1"	2"	Y	630	1.00	25.40	2.65	67.31	2.91	73.91	11.54	293.12	4.72	119.89	1.44	1.38
1¼"	2½"	Y	575	1.25	31.75	3.28	83.31	3.41	86.61	13.58	344.93	5.90	149.86	1.61	1.55

ID = Inner Diameter, OD = Outer Diameter, MAWP = Maximum Allowable Working Pressure
Note: Data subject to change.

Flow Data:

Length ft (m)	4' (1.22) gpm (lpm)	6' (1.82) gpm (lpm)	8' (2.43) gpm (lpm)	10' (3.04) gpm (lpm)	12' (3.65) gpm (lpm)	15' (4.57) gpm (lpm)	20' (6.09) gpm (lpm)	25' (7.62) gpm (lpm)	30' (9.14) gpm (lpm)	40' (12.2) gpm (lpm)	50' (15.2) gpm (lpm)
¼"	1.07 (4.05)	0.96 (3.63)	0.89 (3.37)	0.82 (3.10)	0.77(2.91)	0.71 (2.69)	0.64 (2.42)	0.58 (2.20)	0.54 (2.04)	0.47 (1.78)	0.43 (1.63)
⅜"	4.15 (15.7)	3.53 (13.4)	3.12 (11.8)	2.83 (10.7)	2.61 (9.88)	2.36 (8.93)	2.06 (7.79)	1.85 (7.00)	1.70 (6.44)	1.47 (5.56)	1.32 (5.00)
½"	9.67 (36.6)	8.04 (30.4)	7.03 (26.6)	6.32 (23.9)	5.79 (21.9)	5.20 (19.7)	4.51 (17.1)	4.05 (15.3)	3.70 (14.0)	3.20 (12.1)	2.87 (10.9)
¾"	30.0 (114)	24.5 (92.7)	21.2 (80.3)	18.9 (71.5)	17.3 (65.5)	15.5 (58.7)	13.4 (50.7)	12.0 (45.4)	10.9 (41.3)	9.45 (35.8)	8.44 (31.9)
1"	65.4 (248)	53.0 (201)	45.8 (173)	40.9 (155)	37.2 (141)	33.3 (126)	28.8 (109)	25.7 (97.3)	23.4 (88.6)	20.3 (76.8)	18.1 (68.5)
1¼"	119 (450)	96.2 (364)	82.9 (314)	73.9 (280)	67.3 (255)	60.1 (227)	51.9 (196)	46.3 (175)	42.3 (160)	36.5 (138)	32.6 (123)

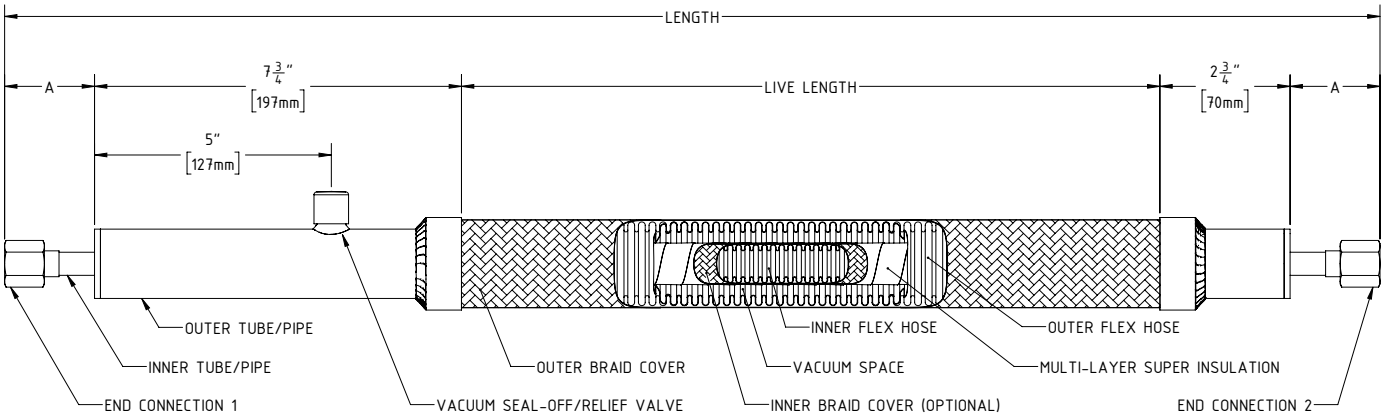
Based on: 22 psi LN2 Dewar, 4 psi Pressure Drop (Max), flex ID and end tube sizes match.

LN2 Loss Comparisons:

CryoWorks is frequently asked to determine the cost savings when a non-insulated transfer hose is replaced with a Vacuum Insulated Transfer Hose. Losses at the uninsulated ends, equipment and dewar connections are not included in the below losses. It's not unusual for a CryoWorks Vacuum Insulated Transfer Hose to have a 6 month payback. Your total LN2 costs are relative to all components collectively. Your hose and setup might be less, but this would be indicated only by a thorough analysis.

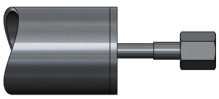
Transfer Hose LN2 Loss Comparisons	Daily Cost of LN2 @ $1/Gal			Yearly Cost of LN2 @ $1/Gal		
Based on 1/2" ID x 10' Long	Per Hr			Hrs/Day x 5 Days/Wk		
	1	8	24	1	8	24
No Vacuum or Foam Insulation	$1.48	$11.85	$35.54	$385	$3,080	$9,240
Foam Insulated (3/4" thick)	$0.44	$3.49	$10.46	$113	$907	$2,720
CryoWorks Vacuum Insulated	$0.02	$0.14	$0.42	$4.55	$36	$109

Assembly:



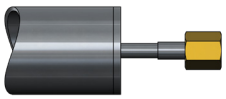
Standard End Connnections:

A. Female Swivel Flare w/SST Nut

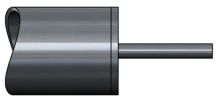


Most Common End

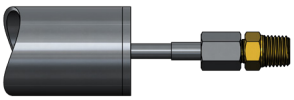
B. Female Swivel Flare w/ Brass Nut



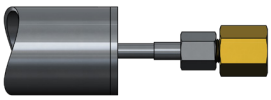
C. Plain Tube End (PTE)



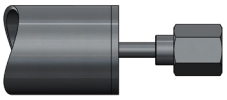
D. Female Swivel Flare w/SST Nut & Brass M. NPT Adapter



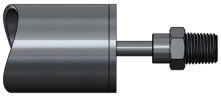
E. Female Swivel Flare w/SST Nut & Brass F. NPT Adapter



F. Female Nominal Pipe Thread (F. NPT)

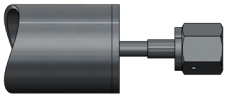


G. Male Nominal Pipe Thread (M. NPT)



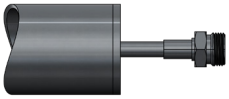
H. Female Metal Gasket Face Seal

*VCR® Compatible



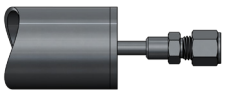
J. Male Metal Gasket Face Seal

*VCR® Compatible

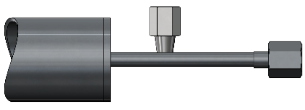


K. Compression Tube Fitting

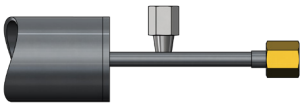
**Swagelok® Compatible



M. Female Swivel Flare w/SST Nut & 1/4" SRV Port



N. Female Swivel Flare w/ Brass Nut & 1/4" SRV Port



Vacuum Insulated Transfer Hose

Hose Builder Tool:

VH – 08 B 06 – A 08 – A 08 – LP

(A 08 = End Connection 1; A 08 = End Connection 2)

Inner Flex Diameter Inch (mm)
04 = ¼" (6.35)
06 = ⅜" (9.52)
08 = ½" (12.70)
12 = ¾" (19.05)
16 = 1" (25.40)
20 = 1¼" (31.75)

Outer Protective Cover
B = Braided
S= Spiral

Overall Length Feet (m)
04 (1.22)
06 (1.83)
08 (2.44)
10 (3.05)
12 (3.66)
15 (4.57)
20 (6.10)
25 (7.62)
30 (9.14)
40 (12.19)
50 (15.24)

End Connection Type	End Connection Sizes**				
	04 ¼" (6.35)	06 ⅜" (9.52)	08 ½" (12.7)	12 ¾" (19.1)	16 1" (25.4)
	"A" Dimension - See Drawing, Page 3				
A	1.5" (38.1)	1.5" (3.81)	1.5" (38.1)	1.5" (38.1)	1.5" (38.1)
B					
C					
D					
E					
F			1.75" (44.5)	1.75" (44.5)	2" (50.8)
G					
H			2" (50.8)	2" (50.8)	2.5" (63.5)
J					
K			1.75" (44.5)	1.75" (44.5)	2" (50.8)
M	4.5" (114)	4.5" (114)	4.5" (114)	4.5" (114)	4.5" (114)
N					

Pressure Rating
LP = Low Pressure (150 PSIG)
MP = Medium Pressure (500 PSIG)
HP = High Pressure (___ PSIG) ¼" = 2,500 ⅜" = 1,680 ½" = 1,240 ¾" = 940 1" = 630 1¼" = 575

Note: Our A08 end is the most popular end as it mates to a standard CGA295 male dewar connection
**Dimensions - Inch (mm)

Hose Builder Tool Examples:

1. VH-08B06-A08-A08-LP
   Vacuum Insulated Hose —
   ½" ID, Braided Outer Cover, 6' Overall Length —
   ½" Female Flare Swivel SST Nut Ends, 150 PSIG

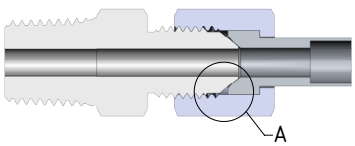
2. VH-04S12-G08-C08-HP
   Vacuum Insulated Hose —
   ¼" ID, Spiral Outer Cover, 12' Overall Length —
   ½" Male Pipe Thread End — ½" Plain Tube Ends, 2,500 PSIG

Outer Cover Options:

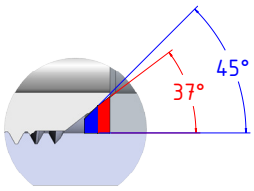
Braided Outer Cover (Top)
Spiral Outer Cover (Bottom)

Dual Angle Flare Detail:

- All female flare ends come standard with dual-angle seat, and accepts both 37° and 45° male flare fittings.



Dual Angle Flare Detail
(Cross Section)



Detail A
Scale 8:1

Various Sizes and Ends: