SEMIFLEX®/Triax Piping Systems

For over 50 years Vacuum Barrier has provided innovative solutions to the challenges associated with handling liquid nitrogen.
A continuing commitment to research and development in cryogenic and vacuum technology has made Vacuum Barrier the pioneering force and given our customers a competitive edge.

Vacuum Barrier's dynamic or sealed SEMIFLEX® pipe is available in either OHFC Copper or stainless steel and boasts the lowest cool down heat loss of any liquid nitrogen piping system. The Triax Liquid/Vapor Phase Separator delivers liquid nitrogen at low pressure in single-phase condition.

Warranty
Vacuum Barrier's Sealed and Dynamic pipe and vacuum components are backed by the longest industry warranty, 10 years for dynamic and 3 years for sealed.

VACUUM BARRIER CORPORATION VBC

SEMIFLEX® system configurations

To meet the liquid nitrogen pressure and quality requirements of various industrial applications, Vacuum Barrier offers SEMIFLEX® liquid nitrogen pipe in three system configurations.

SEMIFLEX® both dynamic and sealed systems deliver liquid nitrogen at bulk tank pressure in two-phase condition. Basic SEMIFLEX® systems are commonly used in applications that simply require transfer of liquid nitrogen.

SEMIFLEX®/Vapor Vent systems employ a mechanical float operated device which minimizes two phase flow – maintaining liquid nitrogen in SEMIFLEX® at storage pressure. SEMIFLEX®/Vapor Vent systems are commonly used in applications where the piping system is required to be cold and ready for immediate use.

SEMIFLEX®/Triax/Liquid Vapor Phase Separator systems deliver liquid nitrogen in pure liquid form at atmospheric pressure. The addition of Triax pipe and Liquid /Vapor Separators eliminates two-phase flow to use points. In this special system, all of the losses of the total system are vented to the atmosphere. Sub-cooled liquid nitrogen is delivered by gravity to each use point.
By separating losses and venting them prior to liquid delivery, no gaseous nitrogen passes through your equipment. SEMIFLEX®/Triax systems are commonly used in applications where single-phase liquid is critical to the production process.

Major Component Descriptions

SEMIFLEX® is available with either a sealed or dynamic vacuum insulation. The sealed vacuum pipe is constructed of stainless steel and the dynamic vacuum pipe is constructed in either OHFC copper or stainless steel. Dynamic SEMIFLEX® is continuously evacuated by a pump to provide a dynamic vacuum insulation. Both sealed and dynamic systems consist of SEMIFLEX® pipe with the addition of elbows, crosses, tees and end fittings for connection to the source of supply and the points of outlet.

These systems are simple point-to-point hook up, or for a multi-branch network supplying an entire plant from an outside storage tank. Triax pipe is similar to SEMIFLEX® pipe, but consists of three concentric tubes. Vacuum is maintained in the outer annular space. Triax systems consist of SEMIFLEX® line and fittings from the supply source to a Liquid/Vapor Phase Separator. The separator continuously removes any gas generated by heat loss and pressure drop, venting it to the outside. Liquid is supplied to the use points via Triax pipe from the separator. Gaseous nitrogen returns continuously to the separator in the annular space between the inside and middle tubing.

SEMIFLEX® Engineering Data

Size	A-5	S-5	FS-5	A-10	S-10	FS-10	A-15	A-20
Material	OFHC Copper	St Stl	St Stl	OFHC Copper	St Stl	St Stl	OFHC Copper	OFHC Copper
Inside Diameter								
Inches	0.62	0.66	0.62	1.25	1.40	1.00	1.73	2.21
Millimeters	16	17	16	32	36	25	44	56
Outside Diameter								
Inches	1.58	2.0	1.90	2.39	3.0	2.79	2.99	3.54
Millimeters	40	51	48	61	76	71	76	90
Steady State Heat Loss								
BTU per foot	0.9	0.9	0.9	1.8	1.8	2.8	2	2.4
Watts per meter	0.9	0.9	0.9	1.7	1.7	2.7	1.9	2.3
Cool Down Heat Loss								
BTU per foot	8	4	6	15	9	16.5	21	28
Watts hours per meter	8	4	6	14	9	16	20	27
Bayonet Heat Loss								
BTU per hour	5	5	5	6	6	6	10	17
Watts	1.5	1.5	1.5	1.8	1.8	1.8	2.9	5
Design Pressure								
PSI	175	175	175	175	175	175	125	85
Bars	12	12	12	12	12	12	8.6	5.9
Weight								
Lbs. per foot	1.2	1.2	0.9	1.5	1.7	2.0	1.9	2.4
Kg per meter	1.8	1.8	1.3	2.2	2.5	3.0	2.8	3.6
Minimum Bend Radius								
Inches	20	12	8	32	18	10	40	48
Cm	51	30	20	81	46	25	102	122

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