

CRANE

CRYOFLO_{H₂}

Keeping Cryogenics Cool

VACUUM JACKETED
TRANSFER

HOSE

www.cranecryoflo.com

brands you trust.

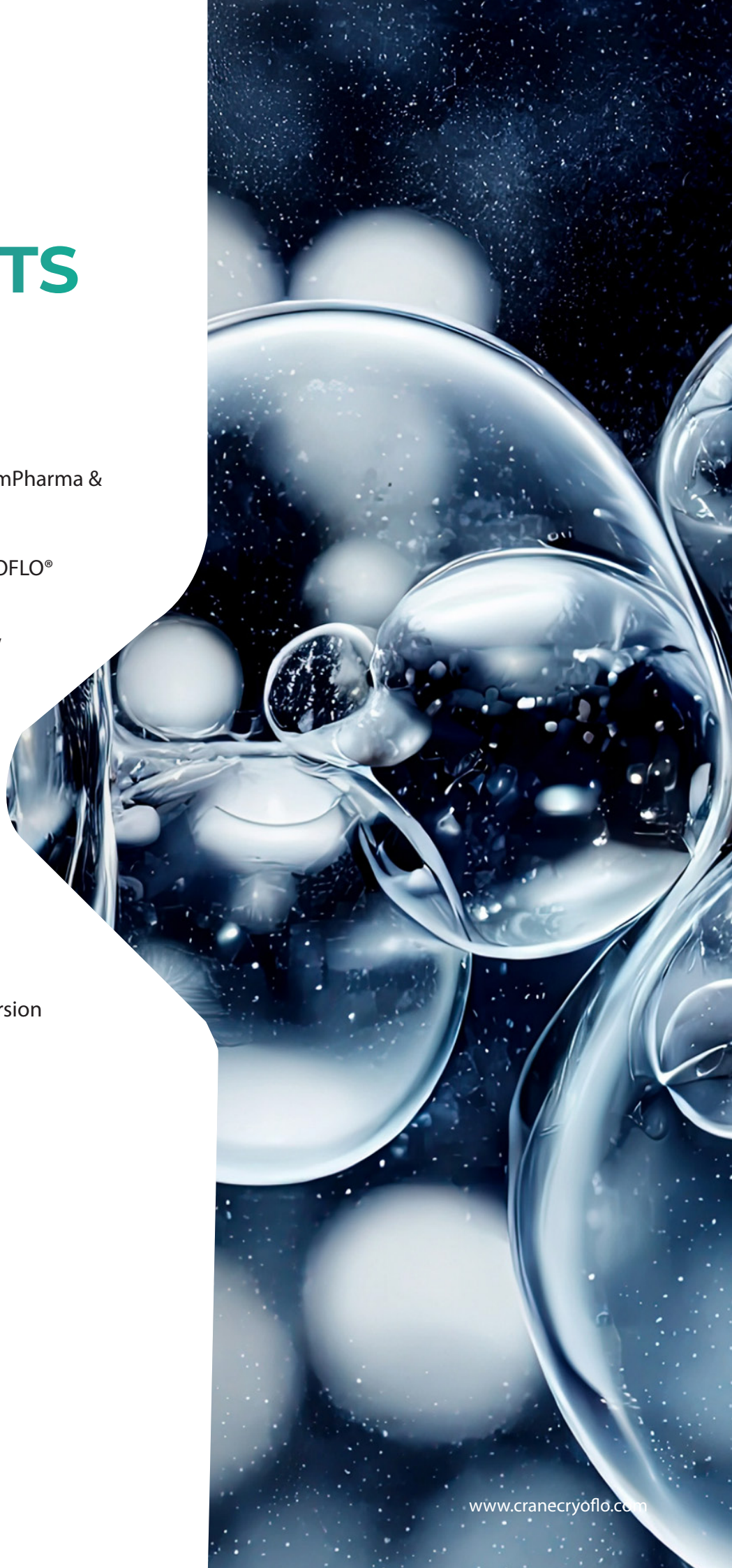
REDUCED HEAT FLUX. INCREASED FLOW RATE.

CRANE CRYOFLO[®] vacuum jacketed transfer hose is the optimal solution for transporting cryogenic liquids with minimal waste, maximum flexibility, and speedy delivery.

CRANE ChemPharma & Energy

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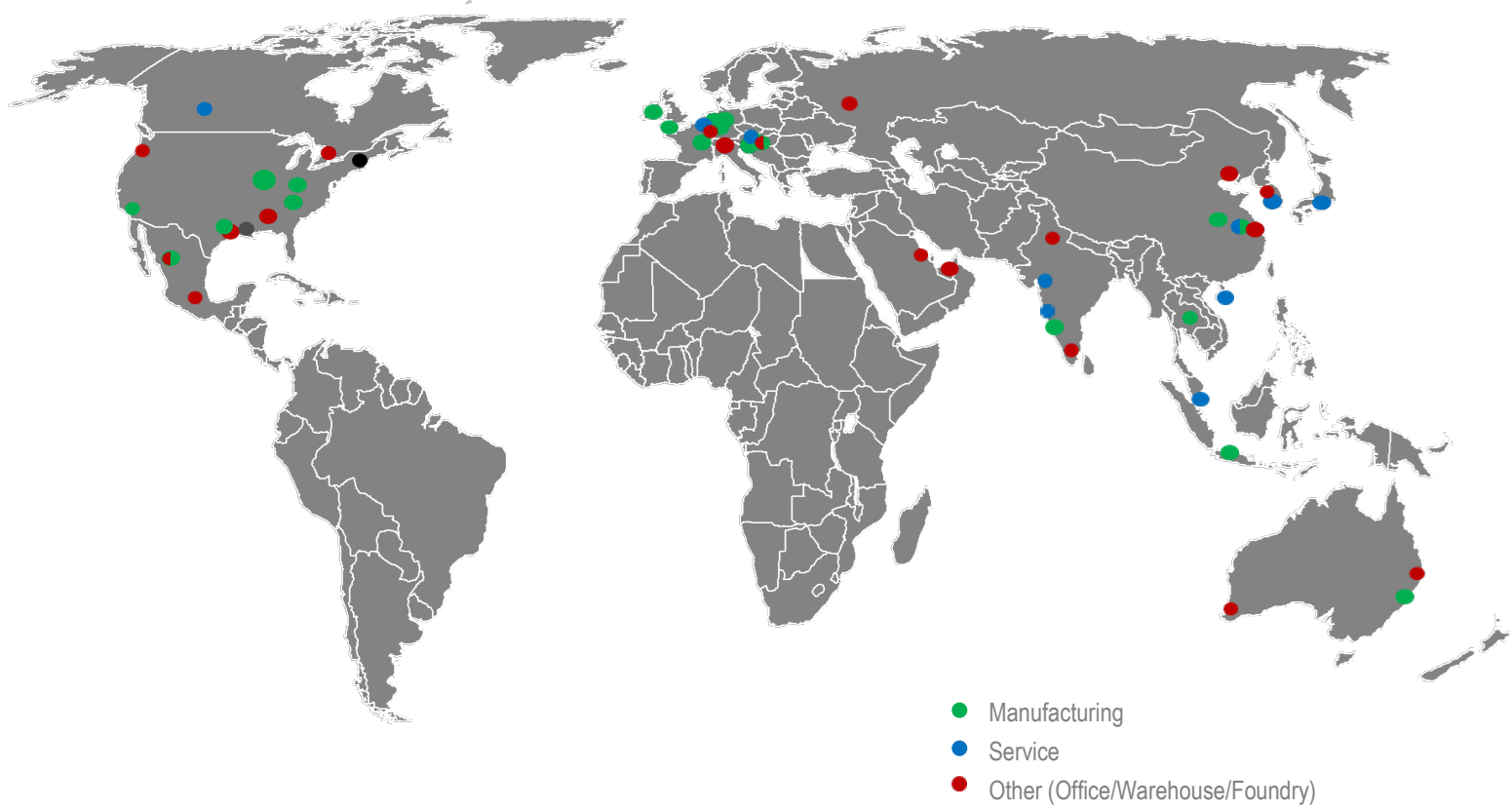


Crane ChemPharma & Energy **INTRODUCTION**

Crane Co. is a diversified manufacturer of highly engineered industrial products with a substantial presence in a number of focused niche markets. We are dedicated to integrity and honest dealings in all that we do.

Crane CP&E designs and manufactures a variety of high performance products including: highly-engineered check valves, sleeved plug valves, lined valves, process ball valves, high performance butterfly valves, bellows sealed globe valves, aseptic and industrial diaphragm valves, multi/quarter-turn valves, actuation, sight glasses, lined pipe, fitting and hoses, and air-operated diaphragm and peristaltic pumps. Its trusted brands are in use worldwide in many industries, including Oil & Gas, Oil Refining, Petrochemical, Power Generation, Chemical Processing, Biotechnology, and Pharmaceutical.

Crane CP&E WORLDWIDE



CPE MANUFACTURING SITES (Examples):



AMERICAS

CHIHUAHUA, MEX • CINCINNATI, OH
• CULLMAN, AL • EDMONTON, AB
GONZALES, LA • HOUSTON, TX
• MARION, NC MEXICO CITY, MEX
• PORTLAND, OR • SADDLE
BROOK, NJ • SPARTANBURG,
SC • CONROE, TX , HQ: THE
WOODLANDS (HOUSTON), TX



EUROPE

BELFAST, UK • CWMBRAN, UK,
CRONING , SL • DÜSSELDORF, DE
• KREUZTAL, DE • LINDAU, DE •
SZÉKESVERHÉRVÁR, HU MUTA, SL
• MAXDORF, DE • MONZA, IT • MUL-
HOUSE, FR • BERGSCHENHOEK,
NL WAALWIJK, NL • WAVRE, BE •
WR. NEUDORF, AT



ASIA

BEIJING, PRC • CHENNAI (MA-
DRAS), INDIA KANAGAWA, JAPAN •
NINJIN, PRC • PUNE, INDIA SATARA,
INDIA • SHANGHAI, PRC SINGA-
PORE • SUZHOU, PRC • VIRALI-
MALAI, INDIA



AUSTRALIA

BRISBANE • KEWDALE • MEL-
BOURNE • ST. MARYS



MIDDLE EAST

AL KHOBAR, SAUDI ARABIA • DUBAI,
UAE



Local **SERVICE**

CRANE is committed to delivering efficient service and local technical expertise.

Crane is built on quality principles and practices to achieve the best safety, quality, performance, delivery, service and total cost.

Our vision as a global provider is to be the Supplier of Choice for on/off process valve solutions in chemical, power and refining, known for best-in-class customer responsiveness.



Quick access to high-demand stock



Engineering support



System design and drawings



MRO services



Training and testing

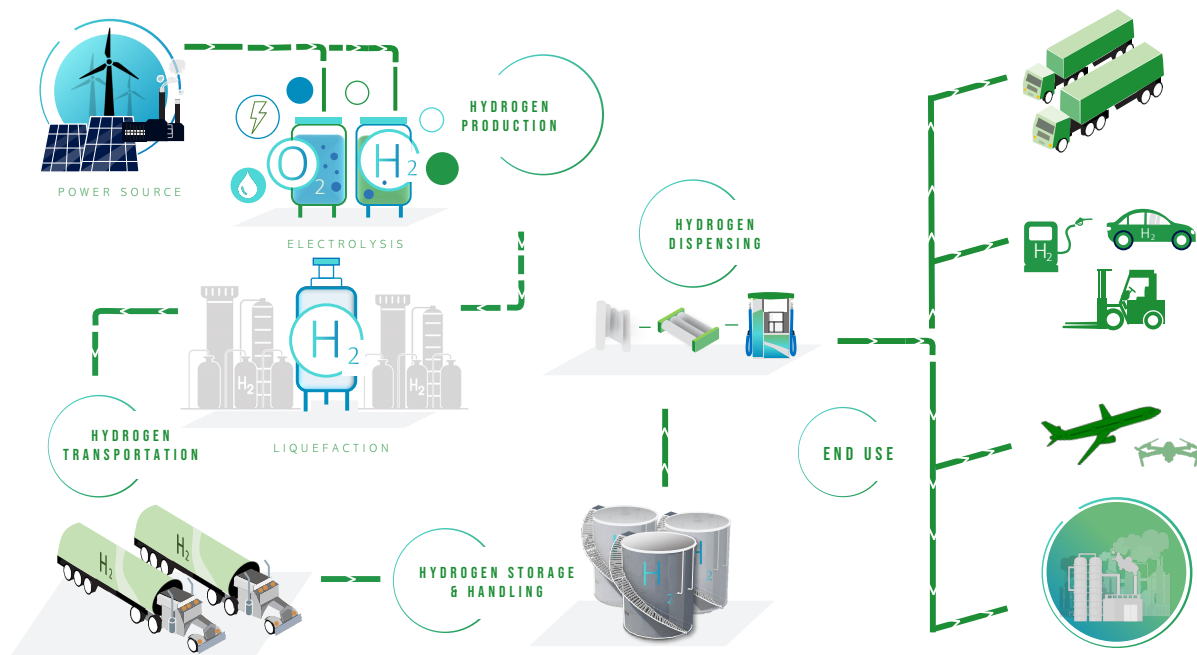


ABOUT CRANE CRYOFLO®

For hydrogen energy to be an effective and efficient alternative to fossil fuels, liquefaction plants, storage facilities, transportation methods and pipelines must be outfitted with state-of-the-art PVF (Pipe Valves and Fittings) components. Crane® CRYOFLO® is focused on solving Customer's toughest challenges within the Hydrogen Industry backed by decades of field experience in severe service applications.

Crane® CRYOFLO® Solutions for Cryogenic Applications:

- Production
- Liquefaction
- Transportation
- Transfer
- Storage





Our New Conroe Facility

Profile

- 80,000 Sq-ft
- Planned 90 Associates
- 1 Hour to downtown Houston

Core Technology

- Cryogenic Applications
- Vacuum Acquisition
- Welding/Fabrication
- Valve Automation
- Oxygen Cleaning



ABOUT OUR FLEX HOSE



Crane CRYOFLO® Vacuum Jacketed Transfer Hose is the gold standard for cryogenic applications. It is made of two stainless steel pipes, with the inner pipe carrying the cryogenic liquid and the outer pipe providing vacuum insulation.

Vacuum Jacketed Transfer Hose OVERVIEW

The vacuum insulation minimizes heat transfer, which helps to keep the cryogenic liquid cold and prevents it from evaporating. Vacuum jacketed transfer hose is also very flexible, making it easy to install and maneuver in tight spaces. It is also resistant to corrosion and chemicals, making it a durable and long-lasting solution for cryogenics applications.

If you are looking for a safe, efficient, and cost-effective way to produce, store, and transfer cryogenic liquids, then CRYOFLO® vacuum jacketed transfer hose is the best solution for you.

We have stocking sizes available with same-day shipment available.



Reduced Heat Leak

Minimize product loss and ice buildup vs standard hoses



Flexible and Durable

Easy to install and maneuver in tight spaces



Fast Product Availability

Stocking standard sizes with same day shipments available





KEY FEATURES

Size Range

- Inner Hose Size: ¼", 3/8", ½", 1"

Pressure Ratings

- 150 PSIG for Cryogenic

Materials of Construction

- 300 Series Stainless Steel

Design Standards and Compliance

- Built in accordance with ASME B31.3: Process Piping
- ISO 9001:2015 based Quality system

Temperature Range

- Designed for -452 °F

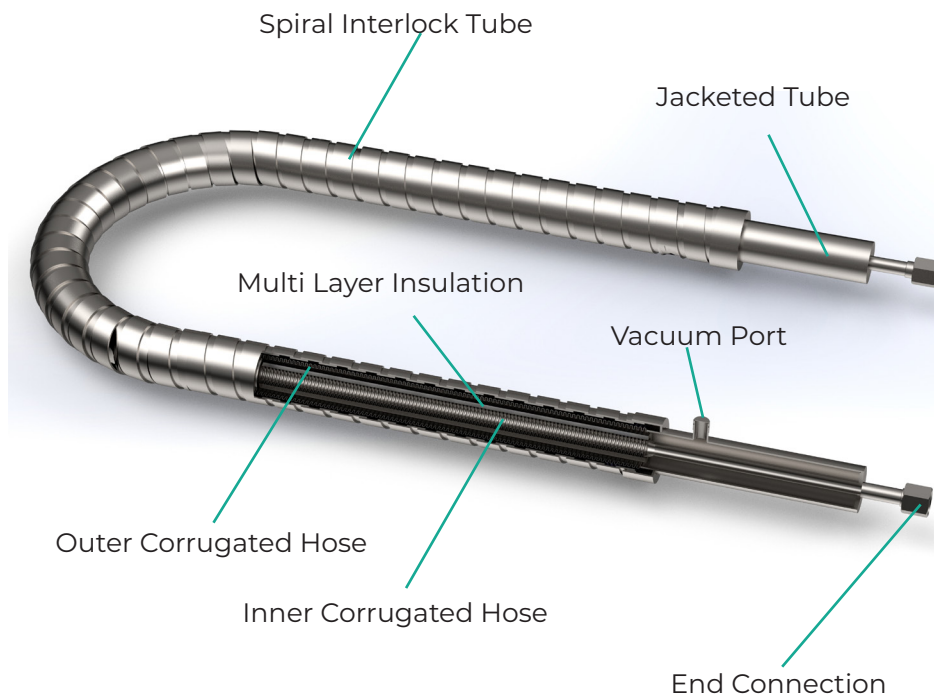
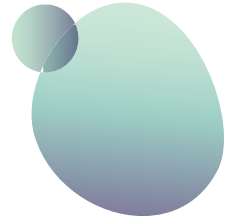
End Connections

- Plain End
- Flare Nuts
- Pipe Thread

Design Features

- Covered: Armored or Braided optional
- Temperature Control: Maintains ambient temperature on OD of Hose, and reduces boil off of the cryogenic media.
- Safety: Minimizes opportunities for cryoburns or ice-build up to reduce potential for slips & falls
- Static Vacuum – State of the art vacuum acquisition process
- Flexible: Allows movement and stays flexible during fluid transfer.

KEY COMPONENTS



Inner Corrugated Hose: This is the core of the piping system, where the cryogenic liquid flows. It is made of stainless steel that can resist low temperatures and high pressures. The hose has a corrugated shape that allows it to bend and stretch without breaking or leaking.

Multilayer Insulation: This is the layer that surrounds the inner hose and prevents heat transfer from the environment. It is composed of multiple layers of reflective material that reflect infrared radiation and reduce heat loss. The insulation is wrapped in a spiral pattern around the inner hose to create an even distribution of thermal resistance.

Jacketed Tube: This is a thin-walled tube that covers the multilayer insulation and provides additional support for the inner hose. It also helps to create a vacuum in the space between the inner and outer hoses, which further reduces heat transfer.

Spiral Interlock Tube: This is a flexible metal tube that coils around the jacketed tube and protects it from physical damage. It also helps to maintain the vacuum in the annular space by preventing air leakage.

Outer Corrugated Hose: This is the outermost layer of the piping system, which protects the inner layers from external factors such as weather, corrosion, and abrasion. It is also made of stainless steel and has a corrugated shape that gives it flexibility and strength.

Vacuum Port: This is a small opening in the outer hose that is used to evacuate the air from the annular space and create a vacuum. The vacuum port is usually sealed with a vacuum valve to preserve the vacuum level.

End Connections: Our product can be customized with different types of end connections to suit various applications. Some of the common end connections are bayonet fittings, which allow for quick and easy connection and disconnection of the piping system.

PRODUCT APPLICATIONS

Crane CRYOFLO® vacuum jacketed transfer hose is a versatile and reliable solution for a variety of applications, including:



Liquid Cylinder Filling

This piping can connect a liquid cylinder to a cryogenic storage tank or a dewar, allowing for safe and efficient filling of liquid nitrogen, liquid oxygen, liquid argon, or other cryogenic liquids. The hose prevents heat loss and pressure buildup during the filling process, ensuring that the liquid is transferred quickly and efficiently without any loss of product.



Dewars and Cold Plates

This piping can also connect a dewar or a cold plate to a cryogenic source, providing a constant supply of cold gas or liquid for cooling purposes. The hose maintains the desired temperature and flow rate of the cryogen, as well as prevents condensation and frost formation on the equipment. This is essential for maintaining the performance of sensitive equipment and ensuring the safety of personnel.



Cryo-storage Freezers and Laboratories

This piping can also be used to supply cryogenic liquids or gases to freezers or laboratories that store or handle biological samples, such as blood, DNA, RNA, or tissues. The hose ensures the optimal preservation and viability of the samples, as well as protects the personnel and the environment from exposure to hazardous or infectious materials.



Equipment Connections

This piping can also be used to connect various equipment that requires cryogenic or high-temperature fluids, such as valves, pumps, regulators, meters, or sensors. The hose provides flexibility and durability for the equipment, as well as reduces maintenance and operational costs.

HOW TO ORDER

PRODUCT SIZE APPLICATION LENGTH END CONNECTION (EVAC) END CONNECTION (Plain)

□ - □ □ □ - □ □ - □ □ - □ - □

* ORDER EXAMPLE AVAILABLE BELOW

PRODUCT	
F	Vacuum Jacketed Transfer Hose

SIZE	
004	1/4" Flex
006	3/8" Flex
008	1/2" Flex
016	1" Flex

APPLICATION	
N2	Nitrogen
AR	Argon
NG	Natural Gas
O2	Oxygen

LENGTH	
04	4 ft
06	6 ft
08	8 ft
10	10 ft
12	12 ft
20	20 ft

END CONNECTION (EVAC)	
A	CGA-295 Female Flare
B	MNPT
C	Plain Tube End

END CONNECTION (Plain)	
A	CGA-295 Female Flare
B	MNPT
C	Plain Tube End

ORDER EXAMPLE: F-008-N2-10-C-C

1/2" size VJ Transfer Hose of 10ft length with Plain Tube EVAC and plain end connections for Nitrogen Applications

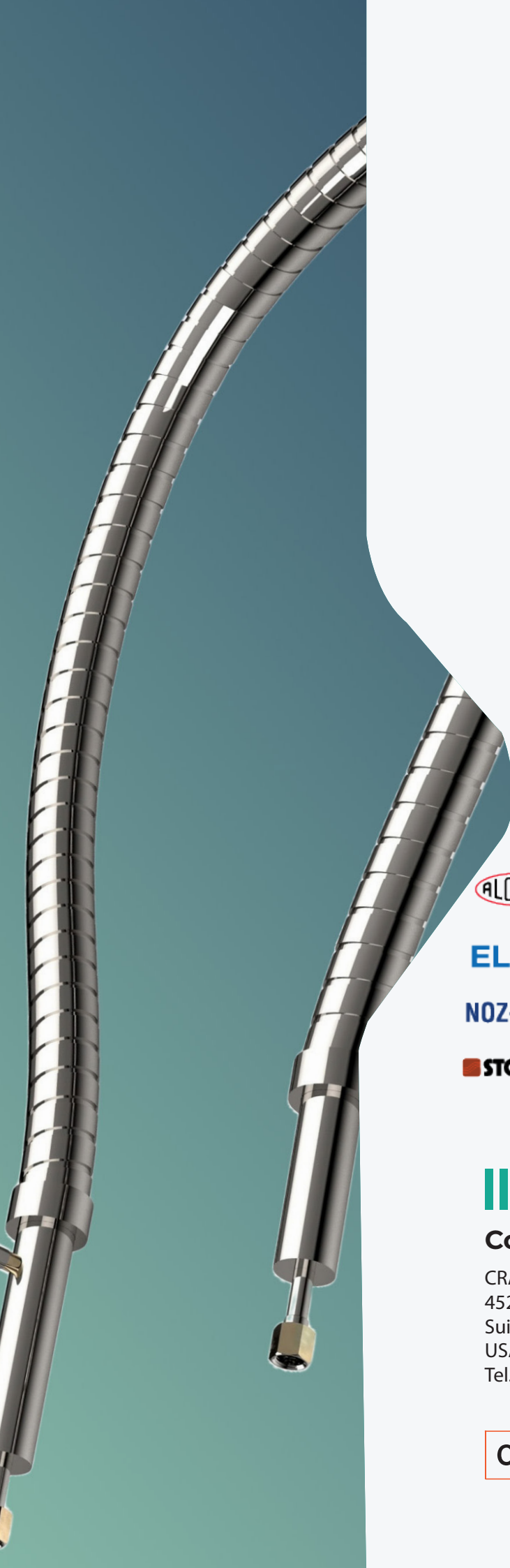
UNIT CONVERSION DATA FOR CRYOGENIC LIQUIDS

	WEIGHT		GAS		LIQUID	
	pounds (lbs)	kilograms (kg)	cubic feet (scf)	cu meters (Nm ³)	gallons (gal)	liters (l)
1 pound	1.0	.4536	192	5.047	1.6928	6.408
1 kilogram	2.205	1.0	423.3	11.126	3.377	14.128
1 scf gas	.00521	.00236	1.0	.02628	.00882	0.03339
1 Nm ³ gas	.19815	.08988	38.04	1.0	.3355	1.2699
1 gallon liquid	.5906	.2697	113.4	2.981	1.0	3.785
1 liter liquid	.15604	.07078	29.99	.7881	.2642	1.0

CRYOGEN	BOILING POINT (°F)	CRITICAL PRESSURE (PSIG ^a)	LIQUID DENSITY (g/L)	GAS DENSITY (27°C,g/L)	LIQUID-TO-GAS EXPANSION RATIO	TYPE OF GAS
Argon	-186(-303)	710	1402	1.63	860	Inert
Helium	-269(-452)	34	125	0.16	780	Inert
Hydrogen	-253(-423)	188	71	0.082	865	Flammable
Nitrogen	-196(-321)	492	808	2.25	710	Inert
Oxygen	-183(-297)	736	1410	1.4	875	Flammable
Methane	-161(-256)	673	425	0.72	650	Flammable
CO ₂	-79(-108)	1071	100	20	535	Inert

NOTES

Horizontal lines for notes.

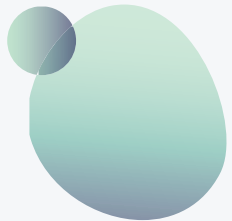


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CRYOFl_o

Keeping Cryogenics Cool

INNOVATION DRIVEN BY YOUR NEEDS



Our businesses are known for proprietary and differentiated technology, quality and reliability, deep vertical expertise, and responsiveness to unique customer needs.

brands you trust.



COMPAC-NOZ[®]

CRANE

DEPA[®]

ELRO[®] DUO-CHEK[®]



KROMBACH
ARMATUREN

NOZ-CHEK[®]



RESISTOFLEX[®]



Saunders[®]
the science inside

STOCKHAM

UNI-CHEK[®]

WESTLOCK
CONTROLS

wta:

XOMOX[®]



Corporate Office:

CRANE CHEMPHARMA & ENERGY
4526 Research Forest Drive,
Suite 400, The Woodlands, TX 77381
USA
Tel.: +1-936-271-6500

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