

HOSE MASTER

ABS and DNV Type Approved Products
For Marine & Offshore Applications



Metal Hose Assemblies • Exhaust Bellows • Multipurpose Expansion Joints



Hose Master has achieved the significant accomplishment of being the only metal hose manufacturer in North America able to produce ABS Product and DNV Type approval on all major lines of their metal hose offering.

Both ABS and DNV have audited Hose Master's unique fabricating techniques and have granted their approval on sizes (*all diameters for ABS and diameters up to 3 inch for DNV*) and every configuration of Annuflex, Masterflex, and PressureMax HP®.

Made for ultimate corrosion resistance, Hose Master also carries ABS Product Type Approval on all diameters and configurations of their ChemKing® C276 alloy product line.



ABS Metal Hose Assemblies Qualify For and Feature:

- Steel Vessel Rules 2010
- Steel Vessel Under 90 Meters
- Class 1, 2, & 3 of ABS Pressure Ratings
- Mobile Offshore Drilling Units
- Fixed Platform
- Available from Three ABS Audited Fabrication Facilities: Cleveland, Houston, Atlanta
- 321, 316L, 304L, & C276 Stainless Steel Alloys



DNV Metal Hose Assemblies Qualify For and Feature:

- Det Norske Veritas' Rules for Classification of Ships
- Det Norske Veritas' Offshore Standards
- Det Norske Veritas' Standards for Certification 2.9 No. 5-791.80
- Available from Three Fabrication Facilities: Cleveland, Houston, Atlanta
- 321, 316L, & 304L Stainless Steel Alloys

Products

ANNUFLEX

The foundation of Hose Master's extensive line of annular products. Hose Master's proprietary forming process produces a hose with minimal residual stress, uniform wall thickness throughout the corrugations, and minimal work hardening. This process creates a very flexible, long-lasting corrugated metal hose.

MASTERFLEX

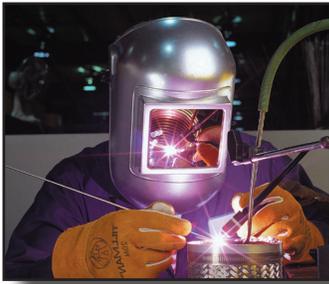
Manufactured using the same high quality process used to make Annuflex hose, but the number of corrugations per foot is increased to provide for greater flexibility.

PRESSUREMAX HP®

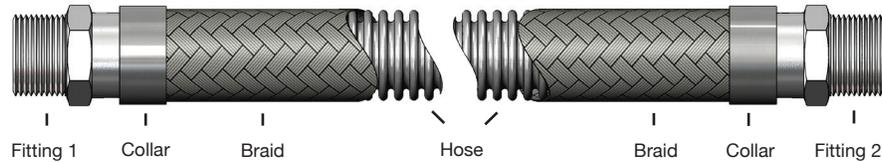
Hose Master's annular, heavy-wall corrugated metal hose, specifically designed for ULTRA-high-pressure applications. PressureMax HP® offers superior flexibility and is made from heavy-wall T321 & T316 stainless steel.

CHEMKING®

Hose Master's chemical-resistant, annular corrugated metal hose. Made from a special C276 alloy, ChemKing® offers excellent flexibility and corrosion resistance for many of the most severe applications found in chemical processing.



- ISO 9001 manufacturing standards in Cleveland, Ohio; Houston, Texas; Atlanta, Georgia; and Reno, Nevada.
- All facilities are Audited ABS Type Class Approved
- 90+ ASME IX Certified Welders
- Available in any assembly length
- Wide array of Fittings offered
- Designed for long service life



Hose Master's team of skilled ASME IX Certified welders are experts in hose and fitting attachment methods. Combining years of experience and metal understanding, Hose Master welders are adept in producing the highest quality welds. Offering all lengths and a host of fitting possibilities, Hose Master ABS & DNV Type approved assemblies offer safe, versatile solutions to meet the widest variety of marine applications.



Metal Hose Solutions For Marine & Offshore Applications

- Steam Lines
- Condensate Lines
- Compressed Air
- Fresh Water
- Sea Water (ChemKing® only)
- Lubricant Lines
- Hydraulic Lines
- Inert Gas Lines
- Fuel Oil Burner Connections
- Ventilation Lines for Natural Gas Feed Pipes of Engines
- Fuel Oil Piping Systems
- Sanitary Lines
- External Shielding for Fuel Injection Pipes
- Workboat and Barge Repair
- Conduit



ANNUFLEX Metal Hose Series

Inside Diameter (in.)	Number of Braids (#)	Outside Diameter (in.)	Static Minimum Bend Radius (in.)	Dynamic Minimum Bend Radius (in.)	Maximum Working Pressure (psi)	ABS Product Type Approved Certificate # 10-HS590543-PDA	DNV Type Approval Certificate # P-14119
1/4	1	0.47	1.0	4.5	1777	YES	YES
	2	0.53			2700		
3/8	1	0.71	1.2	5.0	1558	YES	YES
	2	0.77			2336		
1/2	1	0.83	1.5	5.5	1186	YES	YES
	2	0.89			1779		
5/8	1	1.02	1.8	7.0	1205	YES	YES
	2	1.08			1808		
3/4	1	1.22	2.1	8.0	889	YES	YES
	2	1.28			1347		
1	1	1.53	2.7	9.0	718	YES	YES
	2	1.59			1077		
1 1/4	1	1.83	3.1	10.0	645	YES	YES
	2	1.91			968		
1 1/2	1	2.16	3.9	11.0	531	YES	YES
	2	2.24			797		
2	1	2.69	5.1	13.0	449	YES	YES
	2	2.77			674		
2 1/2	1	3.50	6.8	16.0	417	YES	YES
	2	3.60			626		
3	1	3.98	7.8	18.0	346	YES	YES
	2	4.08			519		
4	1	5.06	9.8	22.0	299	YES	—
	2	5.16			448		
5	1	6.12	12.8	28.0	275	YES	—
	2	6.24			412		
6	1	7.13	14.8	32.0	210	YES	—
	2	7.25			315		
8*	1	9.32	18.0	29.0	250	YES	—
	2	9.60			360		
10*	1	11.56	21.0	34.0	175	YES	—
	2	11.78			310		
12*	1	13.73	27.0	44.0	185	YES	—
	2	14.00			325		

The minimum bend radius is measured from the center-line of the hose. • The working pressure decreases as temperature increases, consult factory. For rapid pressure fluctuations, consult factory. 8", 10", & 12" Annuflex is supplied with braided braid.

PRESSUREMAX HP® Metal Hose Series

Inside Diameter (in.)	Number of Braids (#)	Outside Diameter (in.)	Static Minimum Bend Radius (in.)	Dynamic Minimum Bend Radius (in.)	Maximum Working Pressure (psi)	ABS Product Type Approved Certificate # 10-HS590543-PDA	DNV Type Approval Certificate # P-14119
3/4	1	1.28	4.0	10.0	2650	YES	YES
	2	1.40	4.0	10.0	3600		
1	1	1.57	5.0	11.0	2500	YES	YES
	2	1.70	5.0	11.0	3000		
1 1/4	1	1.88	6.5	12.5	1775	YES	YES
	2	2.00	6.5	12.5	2600		
	3	2.13	7.0	14.0	3000		
1 1/2	1	2.23	7.5	13.0	1450	YES	YES
	2	2.36	7.5	13.0	2200		
2	1	2.70	9.0	14.0	1100	YES	YES
	2	2.82	9.0	14.0	1675		
2 1/2	1	3.51	9.5	16.0	700	YES	YES
	2	3.63	9.5	16.0	1050		
3	1	3.83	10.5	20.0	600	YES	YES
	2	3.95	10.5	20.0	900		
	3	4.08	23.0	75.0	1200		
4	1	4.94	13.0	26.0	525	YES	—
	2	5.07	13.0	26.0	875		
	4	5.32	32.0	96.0	1200		

The minimum bend radius is measured from the center-line of the hose. • The working pressure decreases as temperature increases, consult factory. For rapid pressure fluctuations, consult factory.



MASTERFLEX Metal Hose Series

Inside Diameter (in.)	Number of Braids (#)	Outside Diameter (in.)	Static Minimum Bend Radius (in.)	Dynamic Minimum Bend Radius (in.)	Maximum Working Pressure (psi)	ABS Product Type Approved Certificate # 10-HS590543-PDA	DNV Type Approval Certificate # P-14119
1/4	1	0.48	0.9	3.7	1777	YES	YES
	2	0.54			2700		
3/8	1	0.71	1.0	4.0	1558	YES	YES
	2	0.77			2336		
1/2	1	0.83	1.2	4.4	1186	YES	YES
	2	0.89			1779		
5/8	1	1.02	1.4	5.6	1205	YES	YES
	2	1.08			1808		
3/4	1	1.22	1.7	6.4	889	YES	YES
	2	1.28			1347		
1	1	1.53	2.1	7.1	718	YES	YES
	2	1.63			1077		
1 1/4	1	1.83	2.5	7.9	645	YES	YES
	2	1.91			968		
1 1/2	1	2.16	3.1	8.7	531	YES	YES
	2	2.24			797		
2	1	2.69	4.0	10.3	449	YES	YES
	2	2.77			674		
2 1/2	1	3.50	5.4	12.8	417	YES	YES
	2	3.60			626		
3	1	3.98	6.3	14.5	346	YES	YES
	2	4.08			519		
4	1	5.06	7.7	17.4	299	YES	—
	2	5.16			448		
5	1	6.12	10.0	21.9	275	YES	—
	2	6.24			412		
6	1	7.13	11.6	25.0	210	YES	—
	2	7.25			315		

The minimum bend radius is measured from the center-line of the hose. • The working pressure decreases as temperature increases, consult factory. For rapid pressure fluctuations, consult factory.

CHEMKING® Metal Hose Series

Inside Diameter (in.)	Number of Braids (#)	Outside Diameter (in.)	Static Minimum Bend Radius (in.)	Dynamic Minimum Bend Radius (in.)	Maximum Working Pressure (psi)	ABS Product Type Approved Certificate # 10-HS590543-PDA	DNV Type Approval Certificate # P-14119
1/2	1	0.83	1.5	5.5	1186	YES	—
	2	0.89			1779		
3/4	1	1.22	2.1	8.0	889	YES	—
	2	1.28			1347		
1	1	1.53	2.7	9.0	718	YES	—
	2	1.59			1077		
1 1/2	1	2.16	3.9	11.0	531	YES	—
	2	2.24			797		
2	1	2.69	5.1	13.0	449	YES	—
	2	2.77			674		
3	1	3.98	7.8	18.0	346	YES	—
	2	4.08			519		
4*	1	5.06	9.8	22.0	299	YES	—
	2	5.16			448		
5*	1	6.12	12.8	28.0	275	YES	—
	2	6.24			412		
6*	1	7.13	14.8	32.0	210	YES	—
	2	7.25			315		

The minimum bend radius is measured from the center-line of the hose. • The working pressure decreases as temperature increases, consult factory. For rapid pressure fluctuations, consult factory.

For ChemKing® series, braid is T316 stainless steel or C276 alloy. Monel™ braid is available upon request. When Monel™ braid is used, stated pressure ratings need to be reduced by 0.75. • For delivery of 4", 5", & 6" ChemKing®, consult factory.

Metal Hose Assemblies Fittings



Male Pipe Nipple
Alloys T304 & T316 Stainless, Carbon Steel, 276
Size Range 1/8" - 12"
Schedules 40, 80



Hex Male
Alloys T304 & T316 Stainless, Carbon Steel, Brass
Size Range 1/4" - 4"
Schedules n/a



Grooved-End Fitting
Alloys T304 & T316 Stainless, Carbon Steel
Size Range 1" - 12"
Schedules 40



LiveLink® Swivel Fitting
Alloys T304 Stainless Steel
Size Range 1/4" - 2"
Schedules Consult factory for pressure rating



Female Union (Threaded/Socket Weld)
Alloys T304 & T316 Stainless, Carbon, M.I., Brass
Size Range 1/4" - 4"
Class 125#, 150#, 300, 3000#



Female Half Coupling (Threaded/Socket Weld)
Alloys T304 & T316 Stainless, Carbon Steel
Size Range 1/4" - 4"
Class 150#, 3000#



1, 2, or 3 Piece SAE (JIC)
Alloys T316 Stainless, Carbon, Brass (nut only)
Size Range 1/4" - 2"
Schedules n/a



Short & Long Radius Elbows (45° & 90°)
Alloys T304 & T316 Stainless, Carbon, 276
Size Range 1/4" - 12"
Schedules Various



C-Stub with Floating Flange
Alloys T304 & T316 Stainless Steel
Size Range 1/2" - 10"
Schedules 10



A-Stub with Lap Joint Flange
Alloys T304 & T316 Stainless, Carbon Steel, 276
Size Range 1/2" - 8"
Schedules 10, 40



45° & 90° SAE (JIC)
Alloys Stainless Steel, Carbon Steel
Size Range 1/2" - 2"
Schedules n/a



Sanitary Flange
Alloys T304 & T316 Stainless Steel
Size Range 1" - 3"
Schedules n/a



Slip-On Flange
Alloys T304 & T316 Stainless, Carbon Steel
Size Range 1/2" - 12"
Class 150#, 300#



Plate Flange
Alloys T304 & T316 Stainless, Carbon Steel
Size Range 1/2" - 12"
Class 150#



Weld Neck Flange
Alloys T304 & T316 Stainless, Carbon Steel
Size Range 1/2" - 6"
Class 150#, 300#



Part A & Part D (Cam-Lock)
Alloys T316 Stainless, Brass, Aluminum
Size Range 1/2" - 8"
Schedules n/a



Tube End
Alloys T304, T316 & T321 Stainless, Carbon Steel
Size Range 1/8" - 12" (seamless or welded)
Schedules Various



Beveled Pipe End
Alloys T304 & T316 Stainless, Carbon Steel, 276
Size Range 1/8" - 12"
Schedules Various



Ground Joint Female
Alloys Carbon Steel
Size Range 1/2" - 4"
Schedules n/a



Reducer
Alloys T304 & T316 Stainless, Carbon Steel
Size Range 3/4" - 12"
Schedules 10, 40 (carbon steel)

SPECIFICATION INFORMATION Metal Hose Series

Quantity: _____ ABS or DNV (Circle One) Date Required: _____

Hose (type and diameter): _____ Length (inches): _____ Live Length / Overall Length (Circle One)

End #1 Size: _____ Type: _____ Material: _____

End #2 Size: _____ Type: _____ Material: _____

Liner Required: _____ Yes _____ No If "Yes," Liner Material: _____

Special Fabrication: _____

Accessories: _____

Temperature: Media: Min. _____ °F. Max. _____ °F. Environment: Min. _____ °F. Max. _____ °F. (Assum. is 70° F. for all)

Media: _____ (Assumption is the media is compatible with all available materials)

Max. Pressure (psi): _____ Fluctuations (Circle One) None / Pulsating / Shock (Assumption is nominal pressure, no fluctuation)

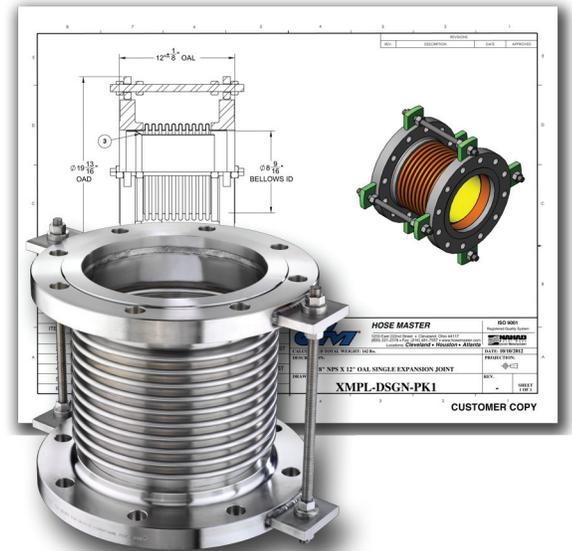
Max. Velocity (feet/second): _____ (Assumption is velocity is too slow to affect performance)

Type of Motion: (Circle One) Static / Constant / Vibration (Assumption is static)



Hose Master Expansion Joints are manufactured to EJMA Standards and are ABS Product Type Approved in many diameters and lengths. All are designed for optimum movement and service life.

- Standard and Customized Lengths
- Greatest Axial and Lateral Movement
- Multi-Ply (Exhaust Bellows Only)
- T321 & T316 Stainless Steel Alloys
- ISO 9001 Registered Quality System
- 90+ ASME IX Certified Welders
- Standard and Customized End Connections
- Designed for Long Service Life



15 PSI Exhaust Bellows

ABS Metal Exhaust Bellows Sizes

15 PSI - 2 inch - 60 inch I.D.

ABS Metal Exhaust Bellows Qualify For

- Steel Vessel Rules 2013
- Steel Vessel Under 90 Meters
- Mobile Offshore Drilling Units
- Fixed Platform

50, 100, 150 PSI Multipurpose Expansion Joints

ABS Multipurpose Expansion Joint Sizes

50 PSI - 2 inch - 48 inch I.D.

100 PSI - 2 inch - 36 inch I.D.

150 PSI - 2 inch - 24 inch I.D.

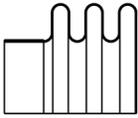
ABS Multipurpose Expansion Joints Qualify For

- Class 2 & 3 of ABS Pressure Ratings
- Steel Vessel Rules 2013
- Steel Vessel Under 90 Meters
- Mobile Offshore Drilling Units
- Fixed Platform

APPLICATIONS ABS Exhaust Bellows and Multipurpose Expansion Joints

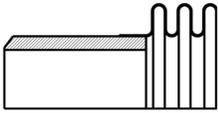
- ABS Class 2 & 3 Piping Systems
- Shipbuilding
- Engines
- Gas Turbines
- Power Generation
- OEM Replacement Engine Parts
- Workboat and Barge Repair
- Offshore Drilling Platform
- Bulkhead Seals
- Multiple Marine Applications





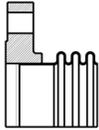
Banded Bellows

Ideal for slipping over pipe and welding in place or into a flange. They are available in 321 or 316 stainless steel.



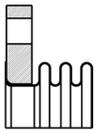
Weld Nipples

Weld ends are beveled to facilitate pipe-to-pipe welding. They are available in all commonly available schedules in carbon steel, 304 & 316 stainless steel alloys.



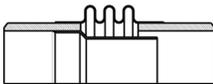
Fixed Flange

Fixed flanges are recommended for ease of replacement. They require correct bolt hole alignment. They are available in carbon steel, 304 & 316 stainless steel.



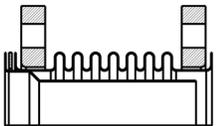
Floating Flange

A floating flange is an economical solution for piping systems with misaligned bolt holes. They are available in carbon steel, 304 & 316 stainless steel.



Single Welded Liner

Single Welded Liners are the most common type of internal liner and offer maximum durability on flange and weld end expansion joints. Welded liner is fixed. Liner alloy matches bellows alloy.



Single Drop-In Liner

Single Drop-In Liners are a standard option on floating "Vanstone" flanges. They are also available on Fixed Flanges. Liner alloy matches bellows alloy. Drop-In Liner ring is 304 for 321 bellows and liner material and 316 for 316 bellows and liner material. Liner can be removed for cleaning. Add 1/4" to OAL for liner. Gaskets for Drop-In Liners are NOT included. A 1/16" gasket allowance is provided.

SPECIFICATION INFORMATION Expansion Joint Designs

Company Name: _____ Contact Name: _____

Date: _____ Contact Phone Number: _____

Quantity: _____ Nominal Diameter (in/mm) _____ Bellows Material (321/316) _____

Media: _____ Pressure: _____ Temperature: _____

Fitting 1: _____

Fitting 2: _____ Flow Direction: (with liner ONLY) _____

Axial Movement (in/mm) _____ Axial Spring Rate (lbs/in) _____

Lateral Movement (in/mm) _____ Lateral Spring Rate (lbs/in) _____

Tie Rods (Yes/No) _____ Limit Rods (Yes/No) _____

Protective Cover (Yes/No) _____

Upon completion please fax request to (216) 481-7557 or email to ejquotes@hosemaster.com



HOSE MASTER

1233 East 222nd Street • Cleveland, Ohio 44117
 (800) 221-2319 • Fax: (216) 481-7557 • www.hosemaster.com
 Cleveland • Houston • Atlanta • Reno

ISO 9001
 Registered Quality System

