HOSE MASTER

ABS and DNV Type Approved Products

For Marine & Offshore Applications



Metal Hose Assemblies • Exhaust Bellows • Multipurpose Expansion Joints

ABS Product & DNV Type Approval Metal Hose

ABS Certificate Number 10-HS590543-PDA
DNV Certificate Number P-14119

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®

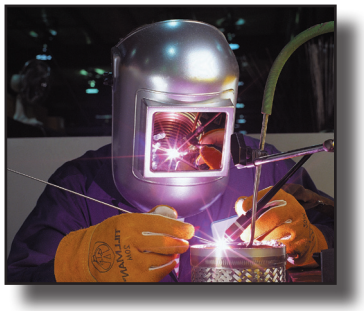
Hose Master's annular, heavy-wall corrugated metal hose, specifically designed for ULTRA-high-pressure applications. PressureMax HP® offers superior flexibility and is made from heavy-wall T321 & T316 stainless steel.

CHEMKING®

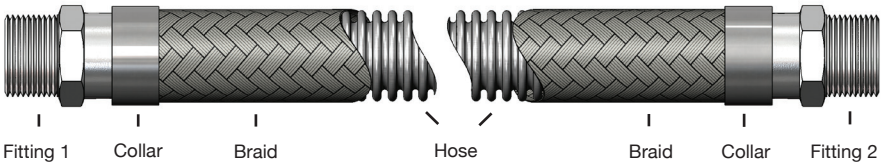
Hose Master's chemical-resistant, annular corrugated metal hose. Made from a special C276 alloy, ChemKing® offers excellent flexibility and corrosion resistance for many of the most severe applications found in chemical processing.

Metal Hose Assemblies - Fabrication

ABS Certificate Number 10-HS590543-PDA
DNV Certificate Number P-14119



- 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

ABS Certificate Number 10-HS590543-PDA
DNV Certificate Number P-14119

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 2	0.47 0.53	1.0	4.5	1777 2700	YES	YES
3/8	1 2	0.71 0.77	1.2	5.0	1558 2336	YES	YES
1/2	1 2	0.83 0.89	1.5	5.5	1186 1779	YES	YES
5/8	1 2	1.02 1.08	1.8	7.0	1205 1808	YES	YES
3/4	1 2	1.22 1.28	2.1	8.0	889 1347	YES	YES
1	1 2	1.53 1.59	2.7	9.0	718 1077	YES	YES
1 1/4	1 2	1.83 1.91	3.1	10.0	645 968	YES	YES
1 1/2	1 2	2.16 2.24	3.9	11.0	531 797	YES	YES
2	1 2	2.69 2.77	5.1	13.0	449 674	YES	YES
2 1/2	1 2	3.50 3.60	6.8	16.0	417 626	YES	YES
3	1 2	3.98 4.08	7.8	18.0	346 519	YES	YES
4	1 2	5.06 5.16	9.8	22.0	299 448	YES	——
5	1 2	6.12 6.24	12.8	28.0	275 412	YES	——
6	1 2	7.13 7.25	14.8	32.0	210 315	YES	——
8*	1 2	9.32 9.60	18.0	29.0	250 360	YES	——
10*	1 2	11.56 11.78	21.0	34.0	175 310	YES	——
12*	1 2	13.73 14.00	27.0	44.0	185 325	YES	——

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 2	1.28 1.40	4.0 4.0	10.0 10.0	2650 3600	YES	YES
1	1 2	1.57 1.70	5.0 5.0	11.0 11.0	2500 3000	YES	YES
1 1/4	1 2 3	1.88 2.00 2.13	6.5 6.5 7.0	12.5 12.5 14.0	1775 2600 3000	YES	YES
1 1/2	1 2	2.23 2.36	7.5 7.5	13.0 13.0	1450 2200	YES	YES
2	1 2	2.70 2.82	9.0 9.0	14.0 14.0	1100 1675	YES	YES
2 1/2	1 2	3.51 3.63	9.5 9.5	16.0 16.0	700 1050	YES	YES
3	1 2 3	3.83 3.95 4.08	10.5 10.5 23.0	20.0 20.0 75.0	600 900 1200	YES	YES
4	1 2 4	4.94 5.07 5.32	13.0 13.0 32.0	26.0 26.0 96.0	525 875 1200	YES	——

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.

ABS Certificate Number 10-HS590543-PDA
DNV Certificate Number P-14119

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 2	0.48 0.54	0.9	3.7	1777 2700	YES	YES
3/8	1 2	0.71 0.77	1.0	4.0	1558 2336	YES	YES
1/2	1 2	0.83 0.89	1.2	4.4	1186 1779	YES	YES
5/8	1 2	1.02 1.08	1.4	5.6	1205 1808	YES	YES
3/4	1 2	1.22 1.28	1.7	6.4	889 1347	YES	YES
1	1 2	1.53 1.63	2.1	7.1	718 1077	YES	YES
1 1/4	1 2	1.83 1.91	2.5	7.9	645 968	YES	YES
1 1/2	1 2	2.16 2.24	3.1	8.7	531 797	YES	YES
2	1 2	2.69 2.77	4.0	10.3	449 674	YES	YES
2 1/2	1 2	3.50 3.60	5.4	12.8	417 626	YES	YES
3	1 2	3.98 4.08	6.3	14.5	346 519	YES	YES
4	1 2	5.06 5.16	7.7	17.4	299 448	YES	——
5	1 2	6.12 6.24	10.0	21.9	275 412	YES	——
6	1 2	7.13 7.25	11.6	25.0	210 315	YES	——

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 2	0.83 0.89	1.5	5.5	1186 1779	YES	——
3/4	1 2	1.22 1.28	2.1	8.0	889 1347	YES	——
1	1 2	1.53 1.59	2.7	9.0	718 1077	YES	——
1 1/2	1 2	2.16 2.24	3.9	11.0	531 797	YES	——
2	1 2	2.69 2.77	5.1	13.0	449 674	YES	——
3	1 2	3.98 4.08	7.8	18.0	346 519	YES	——
4*	1 2	5.06 5.16	9.8	22.0	299 448	YES	——
5*	1 2	6.12 6.24	12.8	28.0	275 412	YES	——
6*	1 2	7.13 7.25	14.8	32.0	210 315	YES	——

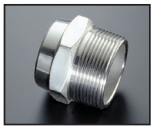
The minimum bend radius is measured from the center-line of the hose. • The working pressure decreases as temperature increases, consult factory.
For rapid pressure fluctuations, consult factory.
For ChemKing® series, braid is T316 stainless steel or C276 alloy. Monel™ braid is available upon request. 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



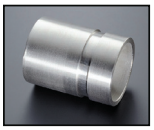
Male Pipe Nipple

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



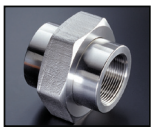
Grooved-End Fitting

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



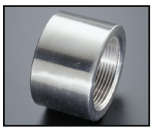
LiveLink® Swivel Fitting

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



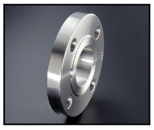
45° & 90° SAE (JIC)

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



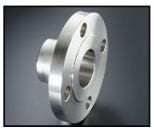
Slip-On Flange

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#



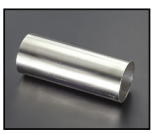
Weld Neck Flange

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



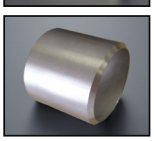
Part A & Part D (Cam-Lock)

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



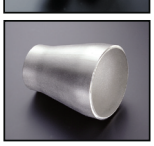
Beveled Pipe End

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)

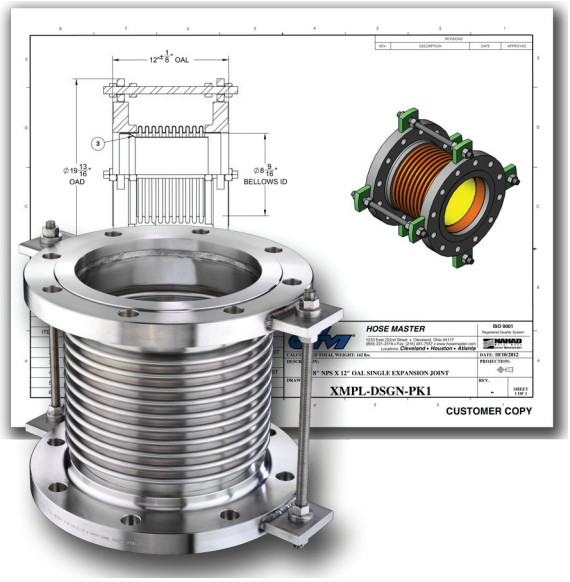
Bellows & Expansion Joints

ABS Certificate Number 08-HS396968-4-PDA



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

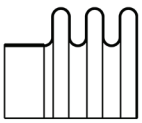
- ABS Class 2 & 3 Piping Systems
- Shipbuilding
- Engines
- Gas Turbines
- Power Generation
- OEM Replacement Engine Parts
- Workboat and Barge Repair
- Offshore Drilling Platform
- Bulkhead Seals
- Multiple Marine Applications



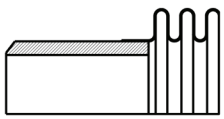


Bellows & Expansion Joint Fittings & Liner Options

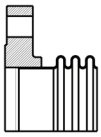
ABS Certificate Number 08-HS396968-4-PDA



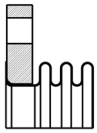
Banded Bellows
Ideal for slipping over pipe and welding in place or into a flange. They are available in 321 or 316 stainless steel.



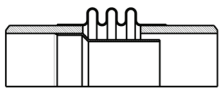
Weld Nipples
Weld ends are beveled to facilitate pipe-to-pipe welding. They are available in all commonly available schedules in carbon steel, 304 & 316 stainless steel alloys.



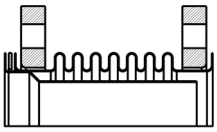
Fixed Flange
Fixed flanges are recommended for ease of replacement. They require correct bolt hole alignment. They are available in carbon steel, 304 & 316 stainless steel.



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

NAHAD Metal Hose Listed Manufacturer