



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-14119

This is to certify that the  
**Flexible Hoses of Metallic Material with permanently fitted couplings**

with type designation(s)  
**MasterFlex, Annuflex, PressureMaxHP**

Manufactured by  
**Hose Master**  
**Cleveland OH, United States**

is found to comply with  
**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**

### Application

The hoses can be used in short lengths for the following systems: Hydraulic where pressure pulses don't occur, Lubricating oil, Fuel oil, Compressed air, Fresh water and Sanitary.

Type:	Temperature range:	Max. working press.:	Sizes:
MasterFlex	-32°F to +400°F For higher temps see cert	14 to 2700 size and type dependent	1/4" to 3"
Annuflex	-32°F to +400°F For higher temps see cert	14 to 2700 psi size and type dependent	1/4" to 3"
PressureMaxHP	-32°F to +400°F For higher temps see cert	36 to 3600 psi size and type dependent	3/4" to 3"

This Certificate is valid until 2017-12-31.

Issued at Høvik on 2013-07-31

DNV local station: **Houston - Systems & Components**

Approval Engineer: **Tom Berg-Nielsen**



for **Det Norske Veritas AS**  
Digitally Signed By: Marveng, Marianne Spæren

Location: DNV Høvik, Norway

Signing Date: 2013-07-31

**Marianne Spæren Marveng**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed. If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

### Hose types :

Masterflex: 321 Stainless Steel corrugated hose core with 316 Stainless Steel single and double outer braid. Also available without braidings

Annuflex: 321 Stainless steel corrugated hose core with 316 stainless steel single and double outer braid. Also available without braidings.

PressureMax HP: T321 stainless steel corrugated hose core with T321 stainless steel double outer braid

### Couplings

#### Types:

Male Pipe Nipple, Hex Male, Grooved End Fitting, LiveLink Swivel Fitting Female Union, Female Half Coupling, straight, 45° and 90° JIC, Sanitary Flange, Slip-on Flange, Plate Flange, Weld Neck Flange, TTMA Flange, C-Stub with floating flange, A-Stub with Lap Joint Flange, TTMA C-Stub Swivel, Cam-Lock, Tube End, Short and Long Radius Elbow (45° and 90°), Reducer, Bevelled Pipe End, Ground Joint Female, Gas Nuts

Hose and coupling manufacturer: Hose Master, 1233 East 222<sup>nd</sup> Street, Cleveland, Ohio

## Application/Limitation

May be used for the systems mentioned on the front page with the following max. working pressure, psi:

Size	Type									
	MasterFlex			AnnuFlex			PressureMaxHP			
No of braids	0	1	2	0	1	2	0	1	2	3
¼"	90	1800	2700	90	1800	2700	-	-	-	-
3/8"	70	1558	2336	70	1558	2336	-	-	-	-
½"	70	1186	1779	70	1186	1779	-	-	-	-
5/8"	57	1205	1808	57	1205	1808	-	-	-	-
¾"	43	898	1347	43	898	1347	250	2650	3600	-
1"	43	718	1077	43	718	1077	180	2500	3000	-
1 ¼"	43	645	968	43	645	968	190	1775	2600	3000
1 ½"	28	531	797	28	531	797	110	1450	2200	-
2"	14	449	674	14	449	674	100	1100	1675	-
2 1/2"	14	417	626	14	417	626	46	700	1050	-
3"	14	346	519	14	346	519	36	600	900	1200

The max. temperature is to be reduced with increasing temperature according to the below table:

Temp		Stainless steel
°C	°F	
20°C	68°F	1,00
50°C	122°F	0,95
100°C	212°F	0,85
150°C	302°F	0,77
200°C	392°F	0,71
250°C	482°F	0,67
300°C	572°F	0,63
350°C	662°F	0,60
400°C	752°F	0,58
450°C	842°F	0,57
500°C	932°F	0,56
550°C	1022°F	0,55
600°C	1112°F	0,50

Certificate No.: P-14119  
File No.: 791.80  
Job Id.: 262.1-015532-1

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the holder (named as manufacturer) of this certificate.

All hose assemblies delivered under this type approval certificate shall be in compliance with an assembly procedure issued by the certificate holder.

Hose assemblies delivered from the certificate holder shall be delivered with the following documentation:

- Pressure test report with reference to the type approval certificate.

The hose assemblies covered by this type approval may be assembled and delivered by other than the certificate holder under the conditions as stated in DNV Type approval programme 5-791.70.

Hoses used for continuous operation at temperatures higher than 100°C will have their lifetime reduced. In such cases more frequent inspections and planned exchange should be a part of the maintenance program.

Flexible hoses are only to be used where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/required.

The hoses must only be fitted in places where they are always accessible.

The hoses are to be mounted in accordance with the manufacturer's instructions.

It must be possible to shut off from the system all flexible hoses used in systems for compressed air, lubrication oil, fuel oil and petroleum base hydraulic oil.

Each hose is to be hydraulic pressure tested to 1.5 times the working pressure and to be delivered with manufacturer's pressure test certificate.

Hose assemblies with couplings made of carbon steel are not to be used at temperatures below -10°C unless the material is normalized.

### **Type Approval documentation**

Fatigue test report dated 4/2/12, Static bend test report dated 4/2/12, DNV Survey report dated 2012-04-25

### **Tests carried out**

Static bend test, Fatigue test, burst test

### **Marking of product**

For traceability to this type approval each hose is to be marked with:

- Manufacturers name or trade mark
- Type designation

### **Certificate Retention Survey**

For retention of the Type Approval, DNV Surveyor shall perform a survey every second year, to verify that the conditions for the type approval are complied with and to witness a burst test on a selection of sizes.

Obtained burst pressure shall at least be:

- 4 times maximum working pressure.

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.

END OF CERTIFICATE