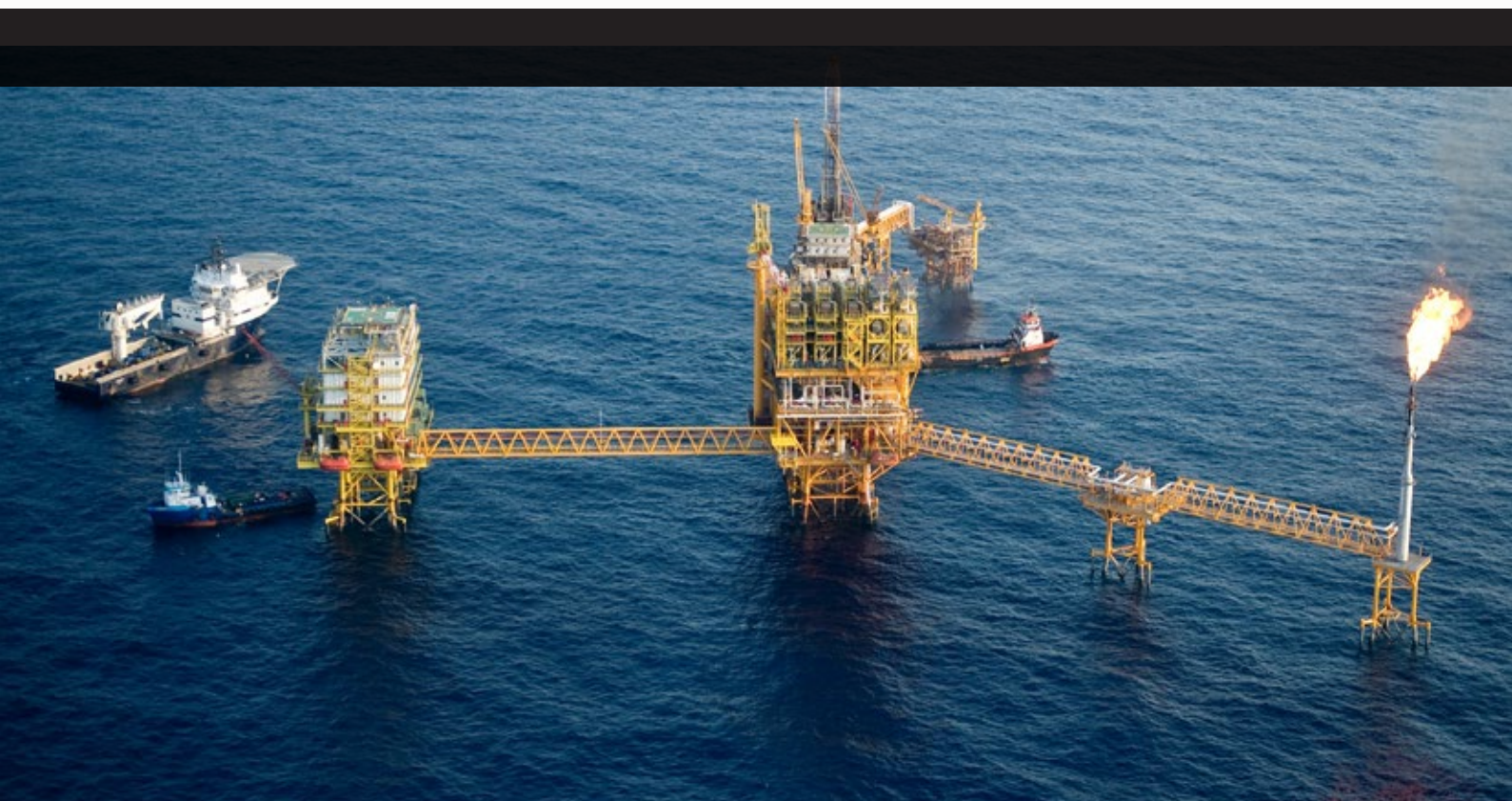


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# Flexible solutions for the Oil and Gas Industry



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## Rig supply hoses

Size

Temperature

WP - BP

Tensile breaking load



### PL Fuel

Drilling mud and oil delivery hose.

51 - 152 mm (2 - 6")

-20°C +90°C (-4°F +194°F)

20 - 80 bar (300 - 1200 psi)  
27 - 108 bar (405 - 1520 psi)

2000 kgf for inside diameter 51 mm (2")  
4000 kgf for inside diameter 76 mm (3")  
7000 kgf for diameters ≥ 102 mm (4")



### PL Fuel LL

Drilling mud and oil suction and delivery hose.

51 - 203 mm (2 - 8")

-20°C +90°C (-4°F +194°F)

20 - 80 bar (300 - 1200 psi)  
27 - 108 bar (405 - 1520 psi)

2000 kgf for inside diameter 51 mm (2")  
4000 kgf for inside diameter 76 mm (3")  
7000 kgf for diameters ≥ 102 mm (4")

51 - 127 mm (2 - 5")

-20°C +90°C (-4°F +194°F)

35 - 140 bar (525 - 2100 psi)



### PL Fuel LL float D1 and D2

Self floating delivery hose for oil and mud.

76 - 152 mm (3 - 6")

-20°C +90°C (-4°F +194°F)

20 - 80 bar (300 - 1200 psi)

4000 kgf



### PL Potable

Potable water delivery hose.

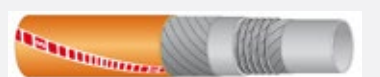
*FDA tit.21, BfR XXI cat.2, CE 1935/04 and CE 2023/06.*

76 - 102 mm (3 - 4")

-40°C +100°C (-40°F +212°F)

20 - 80 bar (300 - 1200 psi)

4000 kgf for inside diameter 76 mm (3")  
7000 kgf for inside diameter 102 mm (4")



### PL Potable LL

Potable water suction and delivery hose.

*FDA tit.21, BfR XXI cat.2, CE 1935/04 and CE 2023/06.*

51 - 102 mm (2 - 4")

-40°C +100°C (-40°F +212°F)

20 - 80 bar (300 - 1200 psi)

2000 kgf for inside diameter 51 mm (2")  
4000 kgf for inside diameter 76 mm (3")  
7000 kgf for inside diameter 102 mm (4")



### PL Potable LL float D1

Self floating delivery hose for potable water.

*FDA tit.21, BfR XXI cat.2, CE 1935/04 and CE 2023/06.*

76 - 102 mm (3 - 4")

-40°C +100°C (-40°F +212°F)

20 - 80 bar (300 - 1200 psi)

4000 kgf for inside diameter 76 mm (3")  
7000 kgf for inside diameter 102 mm (4")



### PL Abrasive

Abrasive material discharge hose.

102 - 127 mm (4 - 5")

-25°C +70°C (-13°F +158°F)

20 - 80 bar (300 - 1200 psi)

4000 kgf



### PL Abrasive LL

Abrasive material suction and discharge hose

102 - 127 mm (4 - 5")

-25°C +70°C (-13°F +158°F)

20 - 80 bar (300 - 1200 psi)

4000 kgf



### PL Abrasive LL float D2

Self floating abrasive material discharge hose.

102 - 127 mm (4 - 5")

-25°C +70°C (-13°F +158°F)

20 - 80 bar (300 - 1200 psi)

4000 kgf



### PL Splitfire

Fire protection hose in offshore applications.

*EN ISO 15540:99, fire resistance at 800°C for 30'.*

*DNV-GL Type Approval certificate P-14987.*

19 - 203 mm (3/4 - 8")

-30°C +70°C (-22°F +158°F)

25 - 100 bar (375 - 1500 psi)  
*B.P. 75 bar (1125 psi) for 203 mm (8")*



### PL Efestó

Suction and delivery hose for seawater, mud, oil and petroleum products.

*EN ISO 15540:99, fire resistance at 800°C for 30'.*

19 - 203 mm (3/4 - 8")

-30°C +90°C (-22°F +194°F)

25 - 105 bar (375 - 1575 psi)



### PL Mud

Drilling mud delivery hose.

76 - 102 mm (3 - 4")

-25°C +70°C (-13°F +158°F)

40 - 120 bar (600 - 1800 psi)

4000 kgf for inside diameter 76 mm (3")  
7000 kgf for inside diameter 102 mm (4")



### PL Grout

Liquid mud discharge hose.

51 mm (2")

-10°C +42°C (+14°F +108°F)

70 - 210 bar (1050 - 3150 psi)



### PL Seawater

Seawater delivery hose.

102 - 203 mm (4 - 8")

-30°C +70°C (-22°F +158°F)

Depending on service





## Dock hoses

Size

Temperature

WP - BP



### Marshall

Dock oil hose for discharge of petroleum products.  
EN 1765 type L 15, BS 1435 type L 15.

51 - 203 mm (2 - 8")

-20°C +82°C (-4°F +180°F)

15 - 60 bar (225 - 900 psi)



### Transoil

Dock oil hose for suction and discharge of petroleum products.  
EN 1765 type S 15, BS 1435 type S 15. RINA approved n. MAC054314CS/002.

51 - 254 mm (2 - 10")

-20°C +82°C (-4°F +180°F)

15 - 60 bar (225 - 900 psi)



### Filicudi

Ship to ship petroleum products loading and unloading hose.  
EN 1765 type S 15 - BS 1435 type S 15. RINA approved n. MAC054314CS/003.

51 - 254 mm (2 - 10")

-20°C +82°C (-4°F +180°F)

15 - 60 bar (225 - 900 psi)



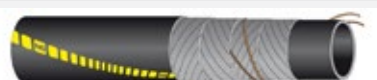
### Bahamas

Roof drain hose.

76 - 152 mm (3 - 6")

-25°C +80°C (-13°F +176°F)

5 - 20 bar (75 - 300 psi)



### Martin

Tank cleaning hose.

38 - 51 mm (1-1/2 - 2")

-30°C +100°C (-22°F +212°F)

20 - 60 bar (300 - 900 psi)



### Bitumenflex

Asphalt and tar hose, wire reinforced.  
EN 13482:2001.

152-203 (6-8")

-15°C +175°C (+5°F +347°F)

15-45 bar (225-675 psi)



## Fuel and oil hoses

Size

Temperature

WP - BP



### Genova global

Fuel and oil delivery hose.  
EN 12115:11 (16 bar), EN 1761 (10 bar), ISO 2929 (10 bar), TRbF.

13 - 100 mm (1/2 - 3-15/16")

-30°C +90°C (-22°F +194°F)  
w/peaks +110°C (+230°F)

16 - 64 bar (240 - 960 psi)



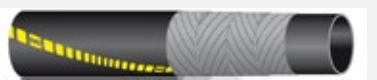
### Genova global LL

Fuel and oil suction and delivery hose.  
EN 12115:11 (16 bar), EN 1761 (10 bar), ISO 2929 (10 bar), TRbF.

25 - 100 mm (1 - 3-15/16")

-30°C +90°C (-22°F +194°F)  
w/peaks +110°C (+230°F)

16 - 64 bar (240 - 960 psi)



### Avio Global C

Aircraft refuelling hose, type C.  
BS EN ISO 1825, API 1529, AS 2683, VG 95955, NFPA 407.

19 - 100 mm (3/4 - 3-15/16")

-25°C +70°C (-13°F +158°F)

20 - 80 bar (300 - 1200 psi)



### Avio Global E

Fuel hose for aircrafts, type E.  
BS EN ISO 1825, API 1529, AS 2683, VG 95955, NFPA 407.

25 - 100 mm (1 - 3-15/16")

-25°C +70°C (-13°F +158°F)

20 - 80 bar (300 - 1200 psi)



### Avio Global F

Aircraft refuelling hose, type F.  
BS EN ISO 1825, API 1529, AS 2683, VG 95955, NFPA 407.

38 - 63,5 mm (1-1/2 - 2-1/2")

-25°C +70°C (-13°F +158°F)

20 - 80 bar (300 - 1200 psi)



### LPG/CORD/EN 1762:2003/D

Gas delivery hose.  
EN 1762:2003.

13 - 102 mm (1/2 - 4")

-30°C +100°C (-22°F +212°F)

25 - 100 bar (375 - 1500 psi)



### Pittsburgh Frac

Fracturing hose.

76 - 102 mm (3 - 4")

-30°C +70°C (-22°F +158°F)

27- 81 bar (405 - 1216 psi)



### Pittsburgh Frac Har

Fracturing hose, highly abrasion resistant cover.

76 - 102 mm (3 - 4")

-20°C +70°C (-4°F +194°F)

27- 81 bar (405 - 1216 psi)



## Steam hoses



### Victoria EN ISO 6134

Steel wire hose for steam at 210°C.  
EN ISO 6134/05 type 2 class A (Ω).

13 – 51 mm (1/2 - 2")

-40°C +210°C (-40°F +410°F)  
w/peaks +230°C (+446°F)

18 – 180 bar (270 – 2700 psi)



### Victoria Premium

Steel wire hose for steam at 210°C. IIR tube.

13 – 51 mm (1/2 - 2")

-40°C +210°C (-40°F +410°F)  
w/peaks +230°C (+446°F)

18 – 180 bar (270 – 2700 psi)



### Vapofer EN ISO 6134

Steel wire hose for steam at 210°C.  
EN ISO 6134/05 type 2 class B (Ω).

13 – 51 mm (1/2 - 2")

-40°C +210°C (-40°F +410°F)  
w/peaks +230°C (+446°F)

18 – 180 bar (270 – 2700 psi)



## Chemical hoses



### Supertop upe/LL

Suction and delivery of chemicals, solvents and food, UPE tube.  
EN 12115:11. Tube FDA tit.21, BfR III. CE 1935/04 and CE 2023/06.

19 – 102 mm (3/4 - 4")

-40°C +100°C (-40°F +212°F)

16 – 64 bar (240 – 960 psi)



### Supertop upe cond/LL

Conductive hose to convey chemicals and petroleum products, UPE tube.  
EN 12115:11, tested acc. EN 13463-1 / EN 60079-0.

19 – 102 mm (3/4 - 4")

-40°C +100°C (-40°F +212°F)

16 – 64 bar (240 – 960 psi)



### Teflex omega

Hose for chemicals and solvents, FEP tube.  
EN 12115:11. Tube USP Class VI and FDA tit.21. CE 1935/04 and CE 2023/06.

19 – 76 mm (3/4 - 3")

-40°C +150°C (-40°F +302°F)

16 – 64 bar (240 – 960 psi)



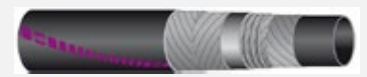
### Thunderflex

Conductive hose for chemicals, food and petroleum products, UPE tube.  
EN 12115:11. Tube FDA tit.21, BfR III. Tested acc. to EN 13463-1/EN 60079-0  
CE 1935/04 and CE 2023/06.

19 – 102 mm (3/4 - 4")

-30°C +100°C (-22°F +212°F)

16 – 64 bar (240 – 960 psi)



### Providence

Chemical and solvents suction and discharge, Viton® tube.

19 – 102 mm (3/4 - 4")

-25°C +100°C (-13°F +212°F)

10 – 40 bar (150 – 600 psi)



## Utility air - water hoses



### Utility air

Compressed air hose.

16 – 51 mm (5/8 - 2")

-40°C +70°C (-40°F +158°F)

20 – 60 bar (300 – 900 psi)



### Alaska

Steel wire compressed air hose.

13 – 102 mm (1/2 - 4")

-30°C +70°C (-22°F +158°F)

Depending on size



### Nitrogen

Nitrogen gas hose.

13 – 51 mm (1/2 - 2")

-25°C +100°C (-13°F +212°F)

20 – 60 bar (300 – 900 psi)



### Utility water – air

Water and compressed air discharge hose.

19 – 51 mm (3/4 - 2")

-40°C +70°C (-40°F +158°F)

10 – 30 bar (150 – 450 psi)



# Coupling solutions



IVG Fittings Division is a flexible unit working in synergy with IVG’s R&D. It can make assemblies fitted with any type of end connection applied by swaging, clamps, collars, etc..

## Different types of fitting styles available



Swaged fitting





Built-in fitting




Fitting with bolted clamps


## Types of couplings

THREADED	Type of thread	DN	Material
	BSP BSPT NPT API special upon request	from 1" to 12"	E355 AISI 304 AISI 316

FLANGE	Type of thread	DN	Material
	ASME B16.5 150lbs ASME B16.5 300lbs ASME B16.5 400lbs ASME B16.5 600lbs EN1092 – 1 PN6 EN1092 – 1 PN10 EN1092 – 1 PN16 EN1092 – 1 PN25 EN1092 – 1 PN40 special upon request	from 1" to 12"	A105 AISI 304 AISI 316

STEAM	Type of thread	DN	Material
	NPT	from 1/4" to 6"	carbon steel stainless steel 316

For saturated steam at +210°C (+410°F)  
Steam couplings can be fixed just through specific adjustable clamps with bolts.

KAMLOCKING According to MIL A-A-59326D	Type	DN	Material	Gasket material
	A B C D E F DC DP LAS LBS	from 1/2" to 8"	SS 316 brass aluminum polypropylene	nbr epdm viton® epdm covered with ptfe


## Kamlocking gaskets characteristic

Material	Shore hardness	Temperature		Medium resistance
nbr	60 +/-5 Shore A	-30°C / +120°C	-22°F / +248°F	hydraulic oil, animal and vegetable oils, liquids, greases, water and air
epdm	70 +/-5 Shore A	-40°C / +145°C	-40°F / +293°F	acids, steam, alcohol
viton®	70 +/-5 Shore A	-30°C / +200°C	-22°F / +392°F	mineral and other oils, aromatic oils, gasoline and diesel, silicone oils and greases, steam
epdm / ptfe	85 +/-5 Shore A	-25°C / +100°C	-13°F / +212°F	alcohol, acids, oils and greases


## Kamlocking working pressures

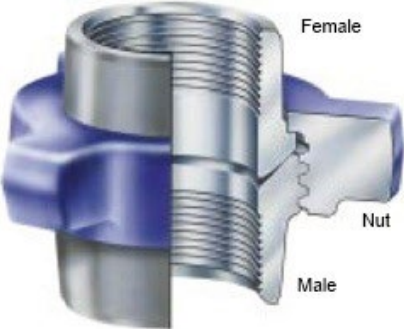
Material	1/2"		3/4"-2"		2"1/2		3"		4"		6"	
	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi
nbr	10	150	10	150	10	150	10	150	10	150	5	75
epdm	--		10	150	10	150	10	150	10	150	--	
viton®	10	150	10	150	10	150	10	150	10	150	5	75
epdm / ptfe	10	150	10	150	10	150	10	150	10	150	5	75



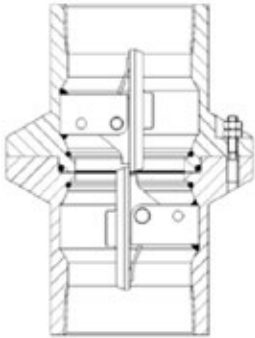
TANKWAGEN	Type	DN	Coupling material	Gasket material
	MK (female) VK (male) MB (female cap) VB (male cap)	2" 3" 4"	stainless steel 316 brass	buna viton® ptfе



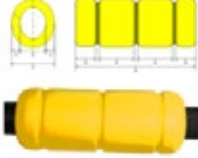
According to EN 14420-6 / DIN 28450.  
 Working temperature: from -30°C to +120°C (from -22°F to +248°F).  
 TW couplings can be swaged or fixed through DIN 2817 (EN14420-6) clamps.

DRY BREAK COUPLINGS	Types of terminals connection	DN	Material
	NPT male/female BSP male/female flange UNI EN 1092-1 flange ASME B16.5 flange DIN other upon request	from 1" to 6"	aluminum brass stainless steel 316 titanium other upon request

HAMMER UNION	Types	DN	Material
	the couplings are differentiated by their use in: figure, color, working pressure, fluid conveyed.	from 1/2" to 12"	carbon steel stainless steel 316 other upon request

For different couplings please consult [www.ivgspa.it](http://www.ivgspa.it)

BREAKAWAY VALVES	Types of terminals connection	DN	Material
	NPT male/female BSP male/female flange UNI EN 1092-1 flange ASME B16.5 flange DIN other upon request	from 1" to 6"	aluminum brass stainless steel 316 titanium other upon request

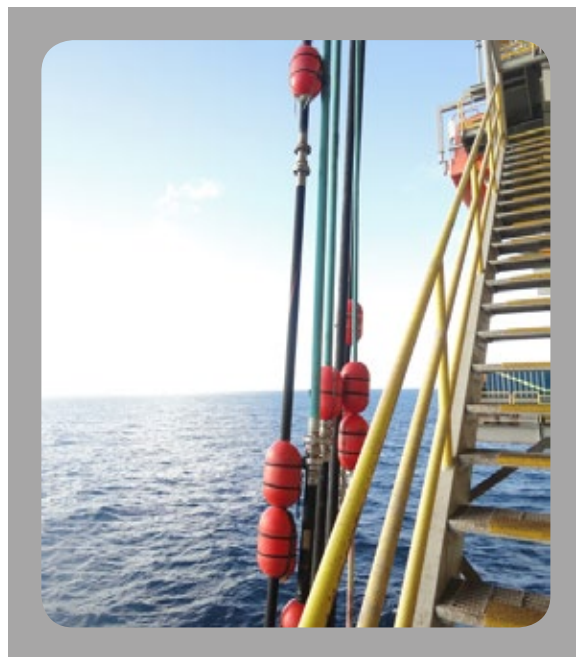
ACCESSORIES FOR HOSES	Type	Material	Description
	HOOKIE	carbon steel bronze	Hooking and lifting hose system. This equipment is placed at the ends of the hose, on the couplings.
	HOSE SADDLE	polyurethane	Hose lifting system. This equipment is positioned in the middle of the hose.
	FLOATING COLLARS	foam	Number and size of the floats is given by the study of following variables: weight of the hose - fluid conveyed - hose size - fluid buoyancy.





# Bulk Hose Systems Recommendations

## INTRODUCTION



The following recommendations were drawn up to improve the safety in the various processes involved with the application of the platform hoses during bunkering operations or loading/unloading between the supply vessel and rig. Past evidence shows that a significant amount oil spills into the sea were hose related. The most common cause for a bulk hose failure is due to abrasion of the outer cover of the hoses rubbing against the sides of the installation structures/rig. For this reason the continuous commitment towards safety during the operations of loading and unloading of bulk hoses plays a very important role. By complying with the proposed recommendations in these types of operations there will be a significant reduction of hose failure incidents. When the hose is working in the position between the rig and supply vessel and is in contact with the installation structure/rig, contact areas need to be adequately protected. Hose strings must never be suspended by wire slings as they may cut into the hose and damage the hose structure. Incidences of wear and damage are accelerated when the hoses work close to the minimum bending radius recommended by the manufacturer. We recommend visual inspections of the hose strings both prior to use and on completion of bunkering operations before returned to storage.

In the following are some recommendation proposed by Assogomma in their *Recommendation regarding choice, storing, use and maintenance of rubber hoses*, June 2004 and *Guidelines for Offshore Marine Operations*, November 2013, by Norwegian Ship owners Association, OLF (Norwegian Oil Industry Association), Netherlands Oil & Gas Production Association, Danish Ship owners Association, Oil & Gas UK, United Kingdom Chamber of Shipping.

## CHOICE CRITERIA

**In order to choose a hose suitable for a specific use it is necessary to determine at least the following basic points:**

- **Pressure - suction:** it is necessary to determine the maximum working pressure or suction values. It should be taken into consideration that the normal life of the hose will be negatively affected in the case of a sudden pressure variation or pressure peaks exceeding the maximum allowed.
- **Compatibility of conveyed substances:** the nature, designation, concentration, temperature and state (liquid, solid, gaseous) must be determined. In the case of solid substances conveyed, it is necessary to indicate granulometry, density, quantity of the solid substance conveyed as well as the nature, speed and flow of the fluid carrying it.
- **Environment:** it is necessary to know, ambient temperature, hygrometric conditions and exposure to atmospheric agents. Specific environment conditions such as ultraviolet rays, ozone, sea water, chemical agents and other aggressive elements could cause early degeneration of the hose.
- **Mechanical stress:** the minimum bend radius must be established as well as any stress related to traction, torsion, bending, vibration, compression, deflection and longitudinal or transversal loads.
- **Cover abrasion:** even though the hoses are manufactured to guarantee good resistance to abrasion, we suggest using further protection to avoid possible damage caused by shock, corrosion and/or dragging.

■ **Couplings:** this must be selected according to:

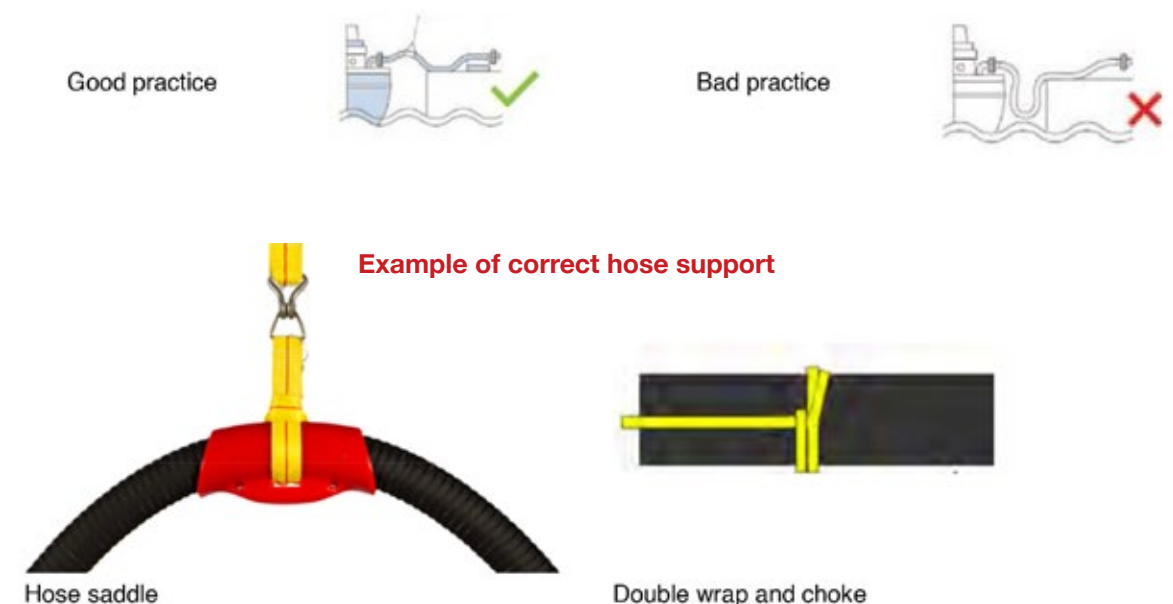
- coupling and flanges: type, dimension, type of thread, standard references and kind of application;
- ruffles: internal and external diameter and coupling length;
- brackets: type and dimension.

Compatibility between hose and couplings must be ensured to guarantee performance. The assembly must guarantee the working pressure suggested by the manufacturer.

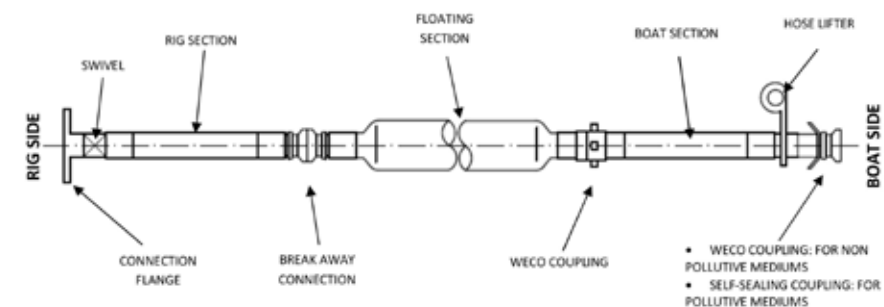
■ **Marking:** manufacturers must mark hoses with the information necessary for the proper use of the product. Prescriptions from North West European Area Guidelines (NWEA) are recommended.

## HANDLING AND ATTACHING HOSES

The handling and attaching of suspended hoses during the loading/unloading operations must be carried out with the suitable equipment e.g. round slings. The sling will be attached to the bulk hose using the “double wrap and choke” method and attached to the supply vessel. The hose should be not be suspended near the fittings; however if the hose is suspended when in movement or in use, it is necessary to apply a saddle to the hose to avoid damaging the hose cover.



## EXAMPLE OF A STRING LAYOUT



This example covers the minimum constructive characteristics that make up a string. The minimum configuration consists of at least three hoses where the first two sections of hose are a “hardwall” construction, whereas the last section, on the boat side, is a “softwall” construction. The central section must be floating, obtained by using floatation collars or self-floating hoses. Floatation collars can also be used to protect hoses from accidental contacts with the installation structure/rig. If floatation collars are used, we recommend reflective collars to assist during nocturnal operations.