



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-14209

Holder of Certificate  
**OLEODINAMICA TOSCANA S.N.C.**  
Calenzano FI, Italy

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

with type designation(s)  
**Model D12**

is found to comply with  
Det Norske Veritas' Rules for Classification of Ships  
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.80

Application  
**May be used for the following:**  
Lube -, Cargo- and Fuel oil, Gaseous fuel, Compressed air, Steam and Condensate, Fresh water, Sanitary and Firefighting systems.

Temperature range: -20°C to +350°C  
Max. working press.: 25 bar to 180 bar size dependent  
Sizes: 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2", 3", 4", 5" and 6"

Høvik, 2012-09-04  
for Det Norske Veritas AS

  
Giorgio Saia  
Head of Section



DNV local office:  
Milan

This Certificate is valid until  
2015-12-31

  
Tom Berg-Nielsen  
Surveyor

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.



Certificate No.: P-14209  
 File No.: 791.80  
 Job Id.: 262.1-011224-2

## Product description

Corrugated flexible metal hoses with 2 wire braids as reinforcement

Specification of the materials:

The D12 flexible hose is manufactured in the following materials:

USA	GERMANY (DIN)	Spain (UNE)	Fance (AFNOR)	SWEDEN (SS)	U.K. (BS)	ITALY (UNI)
AISI321	X10CrNiTi 18 19 / W. no. 1.4541	X7CrNiTi 18 11	Z6CNT 18.10	2337	321 S12	X6CrNiTi18 11

The D12 hoses are equipped with two reinforcement braids as follows:

USA	GERMANY (DIN)	Spain (UNE)	Fance (AFNOR)	SWEDEN (SS)	U.K. (BS)	ITALY (UNI)
AISI304	X2CrNi 18 9 / W. no. 1.4301	X5CrNi 19 10	Z6CN 18.10	2352	304 S12	X2CrNi18 11

The couplings:

Material name	USA	GERMANY (DIN)	SPAIN (UNE)	FRANCE (AFNOR)	SWEDEN (SS)	U.K. (BS)	ITALY (UNI)
AISI304	AISI304L	X2CrNi 18 9 / W.no. 1.4301	X5CrNi 19 10	Z6CN 18.10	2352	304 S12	X2CrNi18 11
AISI316	AISI316L	X2CrNiTi 18 19 / W.no. 1.4404	X2CrNiMo 17 12	Z2CND 18.13	2348	316 S11 316 S12	X2CrNiMo17 12
AISI321	AISI321	X10CrNiTi 18 19 / W.no. 1.4541	X7CrNiTi 18 11	Z6CNT 18.10	2337	321 S12	X6CrNiTi18 11
Aluminium	ASTM B179-75	DIN1725 B1.2 331	UNIEN1676 EN-AB 46100	NS A57-702	/	1490 B.S. Aerospace LM2	EN1676 EN-AB 46100
Carbon Steel	/	RSt 37-2 / W.no 1.0038	S355JR	/	/	40 B	Fe 360 BFN
	A283 g D	St 44.2 / W.no. 1.0044	S235JR	/	/	43 B	Fe 430 B
	ASTM A 105	C21 / W.no 1.0432	/	/	/	/	/
	/	C22.3 / W.no. 1.0427	/	/	/	/	P245GH

## Manufactured by

Venturi s.a.s.  
 Serravalle Pistoiese PT, Italy

## Responsibility

OLEODINAMICA TOSCANA S.N.C.  
 Calenzano FI, Italy

*TOBU*



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## Application/Limitation

May be used for the following:

Lube -, Cargo- and Fuel oil, Gaseous fuel, Compressed air, Steam and Condensate, Fresh water and Sanitary with the following working pressures:

DN	Code	O.D. (mm)	Max. working pressure, bar
3/8"	D12010	16	180
1/2"	D12012	22	180
3/4"	D12020	31	125
1"	D12025	37	100
1 1/4"	D12032	46	100
1 1/2"	D12040	54	80
2"	D12050	65	62
2 1/2"	D12065	85	50
3"	D12080	98	40
4"	D12100	124	30
5"	D12125	156	30
6"	D12150	179	25

Temperature range: -20°C to +350°C

### Pressure reduction factors due to high temperatures:

Max temperature of system		Correction factor, (K)
°C	°F	
-20	-4	1.00
20	68	1.00
50	122	0.97
100	212	0.93
150	302	0.88
200	392	0.84
250	482	0.79
300	572	0.76
350	662	0.71

Interpolation shall not be applied. The factor for the higher temperature is to be used instead

Coupling made of aluminium are not to be used where fire resistance is required by the Rules.

Flexible hoses are only to be used in short lengths (up to 2 m) where it is necessary due to vibrations or flexible mounting of the machinery. The hose shall not be used to replace fixed piping.

The hoses must only be fitted on places where they are always accessible for inspection.

It must be possible to shut off from the system all hoses used in the fuel oil, lubricating oil and compressed air systems.

The hoses are not to be used in bilge- and ballast systems.

The hoses may not be used in systems subjected to high-pressure impulses

The hoses are to be mounted according to the manufacturer's instructions, and the hoses are to be supplied with end couplings from the manufacturer.

The Rules Pt.4 Ch.6 Sec.6 D, Pt.5 Ch.5 Sec.6 and the respective Government Authorities Regulations are to be complied with.

Each hose is to be hydraulically pressure tested to 1, 5 times the maximum working pressure before installation/delivery.  
 Minimum bending radius according to manufacturer's instructions/specifications.

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## Type Approval documentation

The approval is based on the following documents:

Manufacturers brochure: "Project documentation" D12 Rev 1 and "Attachment of Project Documentation"

Manufacturers impulse test reports nos 20110202-01/02/03 and 04 dated 02.02.2011

Burst test report witnessed by DNV dated 26/1/11

Bend test report witnessed by DNV dated 26/1/11

## Tests carried out

Bend test, burst test, impulse test

## Marking of product

All products will be marked as follow:

Venturi sas
Code: D12xxxXXYY00000
SN xxxxx.zz-yy

When:

- Venturi sas* - is the company name;
- Code* - is the particular code of a flexible hose (to see page 2nd and 3th);
- S.N.* - is the lot number that identifies the product. It consists of five numbers (xxxxx) that identify the internal order of production, two numbers (zz) that identify the position of the internal order of production and two numbers (yy) that identify the year of manufacture.

## 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

*JOBU*