



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-13067
This Certificate consists of 5 pages

This is to certify that the
**Flexible Hoses of Non-Metallic Material with Permanently
Fitted Couplings**
with type designation(s)
**X'el 100 R1AT; X'el 100 R2AT; X'pulse 4SP; X'pulse
4SH; X'pulse R13-350**

Manufactured by
Pix Transmissions Limited
Nagpur, India

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70

Application
The hoses may be used for hydraulic applications

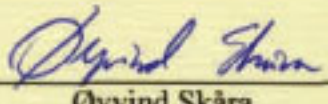
Type:	Temperature range:	Max. working press.:	Sizes:
X'el 100 R1AT	See certificate	See certificate	1/4" (DN 6) to 2" (DN 50)
X'el 100 R2AT	See certificate	See certificate	1/4" (DN 6) to 2" (DN 50)
X'pulse 4SP	See certificate	See certificate	3/8" (DN 10) to 1 1/4" (DN 32)
X'pulse 4SH	See certificate	See certificate	5/8" (DN 16) to 1 1/4" (DN 32)
X'pulse R13-350	See certificate	See certificate	3/8" (DN 10) to 1 1/4" (DN 32)

Place and date
Høvik, 2009-03-09
for DET NORSKE VERITAS AS


Helge Drange
Head of Section


Local Office
DNV Mumbai Maritime
Services

This Certificate is valid until
2013-06-30


Øyvind Skåra
Surveyor

Notice: 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.



Cert. No.: P-13067
File No.: 791.70
Job No.: 262.1-006634-1

Product description

X'el 100 R1AT:

The hoses are designed according to EN853 1SN, SAE 100 R1S-AT, ISO 1436

Tube: Seamless oil resistant synthetic rubber

Reinforcement: One high tensile steel wire braid

Cover: Synthetic rubber – abrasion, ozone, oil and weather resistant

X'el 100 R2AT:

The hoses are designed according to EN853 2SN, SAE 100 R2S-AT, ISO 1436

Tube: Seamless oil resistant synthetic rubber

Reinforcement: Two high tensile steel wire braid

Cover: Synthetic rubber – abrasion, ozone, oil and weather resistant

X'pulse 4SP:

The hoses are designed according to EN856 4SP, ISO 3862-1 4SP

Tube: Seamless oil resistant synthetic rubber

Reinforcement: Four alternating layers of spiralled high tensile steel wire

Cover: Synthetic rubber – abrasion, ozone, oil and weather resistant

X'pulse 4SH:

The hoses are designed according to EN856 4SH, ISO 3862-1 4SH

Tube: Seamless oil resistant synthetic rubber

Reinforcement: Four high tensile steel spirals

Cover: Synthetic rubber – abrasion, ozone, oil and weather resistant

X'pulse R13-350:

The hoses are designed according to EN856 R13, ISO 3862-1 R13, SAE 100R13

Tube: Seamless oil resistant synthetic rubber

Reinforcement: Four/six alternating layers of spiralled high tensile steel wire

Cover: Synthetic rubber – abrasion, ozone, oil and weather resistant

The couplings are manufactured by PIX Transmissions Limited.

Part numbers according to drawings: A762 (06E) rev. 0, A763 (06E) rev. 0, A764 (06E) rev. 0, A765 (06E) rev. 0, A766 (06E) rev. 0, A767 (06E) rev. 0



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Application/Limitation

Design temperatures:

X'el 100 R1AT, X'el 100 R2AT, X'pulse 4SP, X'pulse 4 SH:

-40°C to +100°C continuous and +120°C intermittent (10% of total working hours)

Air: +70°C (Max.)

Water: +85°C (Max.)

X'pulse R13-350:

-40°C to +121°C continuous

Design pressures [bar]:

Sizes		X'el 100 R1AT	X'el 100 R2AT	X'pulse 4SP	X'pulse 4SH	X'pulse R13-350
Inches	mm					
1/4	6	250	400	-	-	-
5/16	8	225	350	-	-	-
3/8	10	180	330	445	-	350
1/2	12	160	275	415	-	350
5/8	16	130	250	350	450	350
3/4	20	105	215	350	420	350
1	25	90	165	280	380	350
1 1/4	32	63	125	280	325	350
1 1/2	40	50	90	210	-	-
2	50	40	80	-	-	-

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.

Each hose assembly is before delivery to be hydraulic pressure tested to 1.5 times the maximum working pressure.

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 following conditions:

- The assembler is authorised by a written authorization from the certificate holder. The certificate holder shall keep record of all assembler authorisations.



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- Hose assemblies are in accordance with an assembly procedure issued by the certificate holder and the assembler has proved their qualifications by burst testing of a selection of hose/coupling combinations.

- One sample of each hose type is to be burst tested and the testing is to be witnessed by DNV. This testing is to be performed at least once a year.

Hose assemblies delivered from an authorized assembler shall in addition to the pressure test report with reference to the type approval certificate be delivered with a copy of the written authorization stamped by DNV.

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.

For use in gas applications the hose cover is to be pin pricked.

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.

The Rules Pt.4 Ch.1 Sec.6D and the respective Government Authorities Regulations are to be complied with.

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

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

Manufacturer's catalogue

Drawings:

A762 (06E) rev. 0, A763 (06E) rev. 0, A764 (06E) rev. 0, A765 (06E) rev. 0, A766 (06E) rev. 0, A767 (06E) rev. 0

Qualification Test reports from Pix Transmissions Limited

Fire test reports from Pix Transmissions Limited dated 2008-11-(10-11-13-14-15)

Material test reports

Oil resistance test reports from Pix Transmissions Limited dated 2009-03-05



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Tests carried out

Dimension, Concentricity, Proof pressure, Burst, Impulse, Cold flex, Adhesion, Abrasion, Ozone, Change in length, Minimum bend radius, Fire endurance and Oil resistance.

Marking of product

For traceability to this Type Approval, the products are at least to be marked with:

- Manufacturer's name or trademark
- Type designation

Certificate retention survey

For retention of the Type Approval, DNV Surveyor shall perform a survey every second year and before the expiry date of this certificate, to verify that the conditions for the type approval are complied with and to witness the following tests on a selection of sizes:

- Dimensional check.
- Change in length
- Leakage test
- Burst test

The tests shall be performed in accordance with procedures given in Det Norske Veritas' Certification Notes 2.9 No. 5-791.70, "Type Approval of Flexible Hoses of Non-Metallic Material", or another recognized standard.

The tests are to be performed with the type of couplings fitted that is Type Approved with the hoses. Hose assemblies from assemblers authorized by the certificate holder are also subjected to testing during the retention survey.

The record of assembler authorisations will be surveyed during the retention survey.

END OF CERTIFICATE