



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-13457**

This is to certify that the
Metallic Expansion Joints

with type designation(s)
AB1, AB6, AB6 // SW, AB30, SB1, SB6, SB6 // SW, SB10, SB10 // SW and SB16

Manufactured by
DURO DAKOVIC KOMPENZATORI d.o.o.
SLAVONSKI BROD, Croatia


is found to comply with
1981 amendments for SOLAS -74
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.80

Application

The expansion bellows may be used in the following systems (depending on type, see cert.): **Freshwater / Seawater / Lubrication Oil / Crude Oil / Steam**

Temperature range:	0 - 500 °C (dep. on type see cert.)
Max. working press.:	1 - 40 bar (dep. on type see cert.)
Sizes:	50 - 2000mm (dep. on type see cert.)


Høvik, 2010-03-24
for Det Norske Veritas AS


Helge Drange
Head of Section



DNV local office:
Rijeka

This Certificate is valid until
2013-12-31


Øyvind Skåra
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.
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

Type of expansion joint	Type of bellow	Design	Sizes	Bellow material
AR	SB1	Axial expansion bellow	DN 65-2000	316S16
UD	AB1	Double untied expansion bellow	mm	316S16
AR, UD, HS, HD,GS,GD	SB6	Axial and axial-lateral expansion bellow	DN 40-300 mm	321S12
AR, UD, HS, HD,GS,GD	SB10		321S12	
AR, UD, HS, HD,GS,GD	SB16 // -SW		DN 50-300 mm	Incoloy 825 (Monel 400)
AR, UD, HS, HD,GS,GD	SB10 // -SW			Incoloy 825 (Monel 400)
AR, UD, HS, HD,GS,GD	SB6 // -SW			Incoloy 825 (Monel 400)
UD	AB6		Axial-lateral expansion bellow	321S12
UD	AB6 // -SW		Incoloy 825 (Monel 400)	
TD, TS, TM	AB30	Double, tied axial expansion bellow	DN 50-150 mm	321S12

Application/Limitation

The expansion joints may be used in the following systems, with maximum working pressure and temperature range:

Type	Applicable Systems	Pressure	Temp.
SB1	Exhaust gas	1 bar	0 - 500 °C (see remarks)
AB1			
SB6	Water, Steam, Crude- and Lubrication Oil	6 bar	0 - 200 °C
SB10		10 bar	
SB16	Seawater	16 bar	0 - 100 °C
SB10 // -SW		10 bar	
SB6 // -SW		6 bar	
AB6	Water, Steam, Crude- and Lubrication Oil	6 bar	0 - 200 °C
AB6 // -SW	Seawater	6 bar	0 - 100 °C
AB30	Compressed Air	35 bar	0 - 80 °C

All surfaces, which may reach a temperature of 220 °C or more, are to be insulated or equivalently protected so that flammable fluids can not be ignited.

Pipelines with expansion bellows fitted are to be adequately adjusted, aligned and clamped.

The installation of expansion bellows shall be carefully planned, and thorough analyses of size and direction of all possible movements shall be performed.

The estimated total movement of the piping to be absorbed by the bellow shall include not only the elongation / contraction of the pipe, but also the movement of the ship, movements of attached vessels, anchors and possible misalignment during installation. Expansion bellow manufacturer should be consulted as to choice of correct type of bellow for the purpose.

Piping system drawings shall be sent to DNV whenever expansion bellows are to be installed in a ship classed by this society. The piping system design drawing(s) shall specify the location of all anchors, guides, supports, fixed points and type and location of all bellows.

Maximum working pressures, temperatures, axial stroke, bending angle, displacement and mounting to be in accordance with the manufacturer's instructions except where other limitations are stated.



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File No.: 792.50
Job Id.: 262.1-009469-1

All complete expansion bellows are to be hydraulically pressure tested to 1.5 times the design pressure. Non-destructive testing to be performed in accordance with the Type Approved drawings.

For bellows installed in piping class II and III systems, the materials of the bellows and pipes are to be furnished with Works certificates. For piping class I, NV material certificates are required.

Type Approval documentation

"Documentation of type tested expansion joints" dated November 1989 with drawing nos: SB 8139, SB 8140, SB 8141, SB 8142, SB 8143, SB 8144, SB 8145, SB 8146, SB 8147, SB 8148, SB 8491, SB 8492, SB 8493, SB 8494, SB 8495, SB 8496, SB 8497, SB 8498, SB 8499 and SB 8500
DNV retention survey report dated 2010-02-18

Tests carried out

Impulse test, vibration test, burst test, cyclic life test and leakage test

Marking of product

For traceability to this type approval, the final products are at least to be marked with:

- Manufacturer's name
- Type designation

Certificate Retention Survey

For retention of the Type Approval, a 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 burst testing of a selection of sizes.