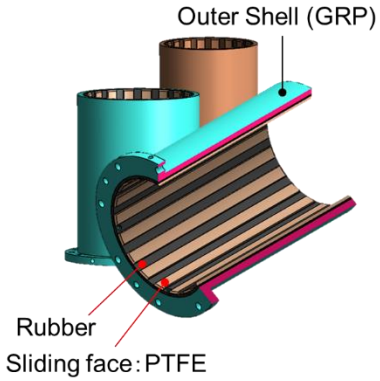
Doc. No. S550-22001e
Issue Date: 28/06/2022

EVP PTFE Bearing for Water Lubricated Stern Tube System

We offer rubber bearing (EVR) for water lubricated stern tube system and have rich track records.
EVP is a low friction and low wear bearing developed based on the technology of EVR experience, and used PTFE as the sliding face.

STRUCTURE

The bearing has 3-layer structure, PTFE, rubber and outer shell.
The sliding face is made of PTFE which has excellent self-lubricity and excellent heat resistance, the outer shell is made of reinforce plastic with glass cloth (=GRP), the rubber which has excellent flexibility is applied between outer shell and PTFE.
GRP of outer shell and rubber are same materials as EVR.



FEATURE

1. Low Friction Material

PTFE(Poly-Tetra Fluoro-Ethylene) is well known as a bearing material, since it has excellent self-lubricity and excellent heat resistance.

- ✓ Since PTFE has self-lubricity and low static friction, reducing the load at startup.
- ✓ Since lower friction coefficient than rubber bearings, which reduces fuel consumption.
  According to estimated calculation on ships equipped with 3,000PS output engine, the torque loss at the stern tube bearing is reduced by 50% compared with the rubber bearing, and the annual fuel consumption is reduced by 4,000 to 5,000L.

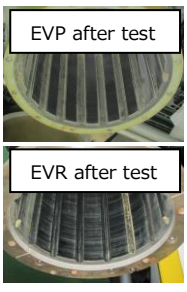
2. Bearing Pressure Resistance

- ✓ The allowable nominal bearing pressure is 0.6MPa, which is more than twice that of rubber bearings. (obtained class approval)

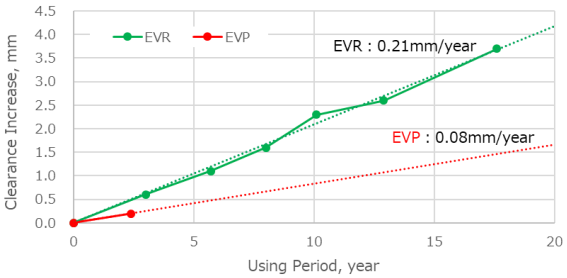
3. Wear Resistance

- ✓ Lifetime is more than twice that of rubber bearings.
- ✓ Sleeve wear is reduced because it is less aggressive to the mating material than rubber bearings. (Reduced to less than 1/3 of rubber bearings)

Test equipment of 300mm shaft dia.



Example of bearing wear data of modified ship from EVR to EVP



4. Mounting Compatibility

- ✓ Since it can be installed with the same connection as EVR, it also can be easily replaced from EVR.

5. Easy Handling

- ✓ The handling is much easier at light weight compared with handling the metal material, because reinforced plastic is used for the outer shell. (about 1/4 weight of the copper outer shell)
- ✓ In the same way as our rubber bearing "EVR", it will fit closely with stern tube by outer shell material expansion from water absorption. Therefore, there is no need to press fit to the Stern Tube and it can be inserted into the stern tube by clearance fit.

KEMEL

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EVP

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CHARACTERISTIC

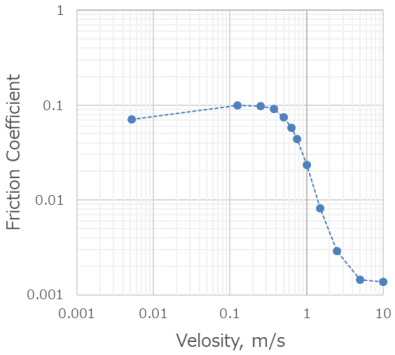
1. Physical Properties

Item		Sliding Face	Rubber	Outer Shell
Material		PTFE	CR	GRP
Hardness		64D	78A	89D
Tensile Strength		24.5MPa	20.3MPa	336MPa
Elongation		300%	300%	<1%
Specific Gravity		2.09	1.45	1.84
Compressive Strength		8.7MPa@ 0.2% compressed	-	441MPa(JIS K7018)
Coefficient of Thermal Expansion	Axial	100×10^{-6}/K	200×10^{-6}/K	15×10^{-6}/K
	Radial	145×10^{-6}/K	200×10^{-6}/K	58×10^{-6}/K

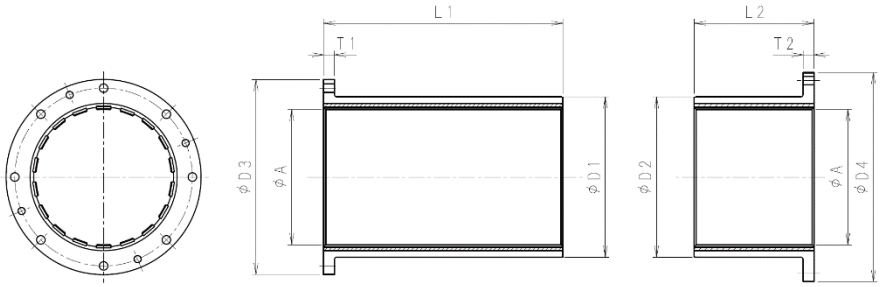
2. Friction Characteristics

PTFE used for sliding face is well known as a low friction material, and even in our bench test, it indicated very low friction coefficient of about 0.001.

【Test Condition】
Shaft Diameter: 100mm
Bearing Pressure: 2MPa



STANDARD DIMENSITON TABLE



Small Flange Type

Size	Inner Dia	Bearing Length		Outer Dia	Flange Dia	Thickness
	A	L1	L2	D1/D2	D3/D4	T1/T2
125	125	200	100	165	230	15
135	135	220	110	175	240	15
145	145	240	120	185	250	15
155	155	260	130	195	260	18
168	168	280	140	213	280	18
178	178	300	150	228	295	20
188	188	320	160	238	305	20
200	200	340	170	255	325	20
210	210	360	180	265	335	23
220	220	380	190	280	350	23
230	230	400	200	290	360	23
242	242	420	210	302	380	25
252	252	440	220	312	390	25
265	265	460	230	325	405	25
275	275	480	240	340	420	25
285	285	500	250	350	430	25

Size	Inner Dia	Bearing Length		Outer Dia	Flange Dia	Thickness
	A	L1	L2	D1/D2	D3/D4	T1/T2
295	295	520	260	360	440	25
308	308	540	270	370	450	28
318	318	560	280	380	470	28
328	328	580	290	390	480	28
338	338	600	300	400	490	28
350	350	620	310	415	505	28
360	360	640	320	425	515	28
370	370	660	330	435	525	28
382	382	680	340	448	540	28
392	392	700	350	458	550	30
405	405	720	360	470	565	30
415	415	740	370	480	585	30
425	425	760	380	490	595	30
435	435	780	390	500	610	30
445	445	800	400	510	620	30

- ✓ AFT bearing length is half that of EVR. (obtained class approval)
- ✓ Small flange type is also available.
- ✓ Sizes of 230 and above can be manufactured in the same install dimension of small flange type of EVR other than bearing length.