Approval of Synthetic Materials Used for Aftmost Stern Tube Bearings and Aftmost Shaft Bracket Bearings

Object of Amendment

Rules for the Survey and Construction of Steel Ships Parts D and I

Guidance for the Survey and Construction of Steel Ships Parts D

Rules for High Speed Craft

Rules / Guidance for the Survey and Construction of Inland Waterway Ships

Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use

Reason for Amendment

IACS Unified Requirement (UR) M52 specifies requirements related to the length of stern tube bearings and the approval of bearing materials. These requirements have already been incorporated into the NK Rules.

Since the handling of shaft bracket bearings and of stern tube bearings with two bearings (i.e. a fore bearing and aft bearing) was unclear, IACS reviewed UR M52 to clarify said handling and adopted UR M52(Rev.3) as a result.

In addition, since there were no clear requirements on the type approval procedures for bearing materials, IACS also examined the matter, and newly established UR M85 as a result.

Accordingly, relevant requirements are amended based on UR M52(Rev.3) and UR M85.

Outline of Amendment

The main contents of this amendment are as follows:

- (1) Clarifies that the requirements of stern tube bearings and shaft bracket bearings apply to aftmost bearings of these bearings.
- (2) Amends the requirements for the approval of stern tube bearings and shaft bracket bearings used for oil lubricated and water lubricated propeller shafts.

Effective Date and Application

This amendment applies to bearings for which the date of application for approval is on or after 1 January 2026.

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

ID:DD25-02

est Shaft Bracket Bearings)

(Approval of Synthetic Materials Used for A	ftmost Stern Tube Bearings and Aftmost Shaft Bracket 1	Bearings)
Amended	Original	Remarks
RULES FOR THE SURVEY AND	RULES FOR THE SURVEY AND	
CONSTRUCTION OF STEEL SHIPS	CONSTRUCTION OF STEEL SHIPS	
Part D MACHINERY	Part D MACHINERY	
INSTALLATIONS	INSTALLATIONS	
Chapter 6 SHAFTINGS	Chapter 6 SHAFTINGS	
6.2 Materials, Construction and Strength	6.2 Materials, Construction and Strength	
,	,	
6.2.10 Stern Tube Bearings and Shaft Bracket	6.2.10 Stern Tube Bearings and Shaft Bracket	
Bearings* 1 The aftmost stern tube bearing or the aftmost shaft	Bearings* 1 The aftermost stern tube bearing or shaft bracket	Clarifies that "aftmost"
bracket bearing which supports the weight of propeller is to	bearing which supports the weight of propeller is to comply	is also applied to shaft
comply with the following (1) to (3) requirements:	with the following requirements (1) to (3):	bracket bearing
(1) In the case of oil lubricated bearings.	(1) In the case of oil lubricated bearings.	according to
(a) In the case of white metal	(a) In the case of white metal	M52(Rev.3).
i) The length of the bearing is not to be less	i) The length of the bearing is not to be less	
than twice the required diameter of the	than twice the required diameter of the	
propeller shaft given by the formulae in	propeller shaft given by the formulae in	
either 6.2.4-1 or -2. However, where the	either 6.2.4-1 or -2. However, where the	
nominal bearing pressure (determined by the	nominal bearing pressure (determined by the	
static bearing reaction calculation taking into account shaft and propeller weight which is	static bearing reaction calculation taking into account shaft and propeller weight which is	
deemed to be exerted solely on the aftmost	deemed to be exerted solely on the aft	
stern tube bearing (or aftmost shaft bracket	bearing divided by the projected area of the	Amends to aftmost stern
bearing, if provided) divided by the	shaft in way of the bearing, hereinafter	tube bearing from aft
projected area of the shaft in way of the	defined the same way in this chapter) is not	bearing.
	, , , , , , , , , , , , , , , , , , , ,	

	tmost Stern Tube Bearings and Attmost Snatt Bracket	2 /
Amended	Original	Remarks
bearing, hereinafter defined the same way in	more than 0.8 MPa and special consideration	
this chapter) is not more than 0.8 MPa and	is given on the construction and arrangement	
special consideration is given on the	in accordance with <u>provisions</u> specified	
construction and arrangement in accordance	elsewhere, the length of the bearing may be	
with <u>requirements</u> specified elsewhere, the	fairly shorter than that specified above.	
length of the bearing may be fairly shorter	However, the minimum length is to be not	
than that specified above. However, the	less than 1.5 times the actual diameter of the	
minimum length is to be not less than 1.5	propeller shaft.	
times the actual diameter of the propeller		
shaft.		
ii) The stern tube is to be always filled with oil.	ii) The stern tube is to be always filled with oil.	
Adequate means are to be provided to	Adequate means are to be provided to	
measure the temperature of oil in the stern	measure the temperature of oil in the stern	
tube.	tube.	
iii) In cases where a gravity tank supplying	iii) In cases where a gravity tank supplying	
lubricating oil to the stern tube bearing is	lubricating oil to the stern tube bearing is	
fitted, it is to be located above the load water	fitted, it is to be located above the load water	
line and provided with a low level alarm	line and provided with a low level alarm	
device. However, in cases where the	device. However, in cases where the	
lubricating system is designed to be used	lubricating system is designed to be used	
under the condition that the static oil pressure	under the condition that the static oil pressure	
of the gravity tank is lower than the water	of the gravity tank is lower than the water	
pressure, the tank is not required to be above the load water line.	pressure, the tank is not required to be above the load water line.	
iv) The lubricating oil is to be cooled by	iv) The lubricating oil is to be cooled by	
submerging the stern tube in the water of the	submerging the stern tube in the water of the	
aftpeak tank or by some other suitable	after peak tank or by some other suitable	
means.	means.	
(b) In the case of materials other than white metal	(b) In the case of materials other than white metal	
(Deleted)	i) The materials, construction and arrangement	D-1-4
(Dolotton)	are to be approved by the Society.	Deletes conventional test requirements for
i) For bearings of synthetic rubber, reinforced	ii) For bearings of synthetic rubber, reinforced	approval related to
		approvar related to

	tmost Stern Tube Bearings and Aitmost Shaft Bracket	ξ,
Amended	Original	Remarks
resin or plastics materials which are	resin or plastics materials which are	materials, construction
approved for use as oil lubricated stern tube	approved for use as oil lubricated stern tube	and arrangement.
bearings, the length of the bearing is to be not	bearings, the length of the bearing is to be not	
less than twice the required diameter of the	less than twice the required diameter of the	
propeller shaft given by the formulae in	propeller shaft given by the formulae in	
either 6.2.4-1 or -2. However, where nominal	either 6.2.4-1 or -2. However, where nominal	
bearing pressure is not more than 0.6 MPa	bearing pressure is not more than 0.6 MPa	
and bearings have a construction and	and bearings have a construction and	
arrangement in accordance with	arrangement in accordance with provisions	
<u>requirements</u> specified elsewhere, the length	specified elsewhere, the length of the bearing	
of the bearing may be fairly shorter than that	may be fairly shorter than that specified	
specified above. However, the minimum	above. However, the minimum length is to	
length is to be not less than 1.5 times the	be not less than 1.5 times the actual diameter	
actual diameter of the propeller shaft.	of the propeller shaft.	
<u>ii</u>) Notwithstanding the requirement <u>i) above</u> ,	<u>iii</u>) Notwithstanding the requirement given in ii),	
the Society may allow use of bearings whose	the Society may allow use of bearings whose	
nominal bearing pressure is more than 0.6	nominal bearing pressure is more than 0.6	
MPa where the material has proven	MPa where the material has proven	
satisfactory testing and operating histories.	satisfactory testing and operating histories.	
iii) The synthetic materials used for bearings are	(Newly added)	UR M52(Rev.3)
to be approved by the Society in accordance		Para.2.3 & 2.4
with Part 6, Chapter 14, Guidance for the		Describe as approval of
Approval of Materials and Equipment for		synthetic material used
<u>Marine Use.</u>		for bearings.
(2) In the case of water lubricated bearings	(2) In the case of water lubricated bearings	
(Deleted)	(a) The materials, construction and arrangement are	Same as above
	to be approved by the Society.	Same as above
(<u>a</u>) The length of the bearing is to be not less than 4	(b) The length of the bearing is to be not less than 4	
times the required diameter of the propeller shaft	times the required diameter of the propeller shaft	
given by the formulae in either 6.2.4-1 or -2, or 3	given by the formulae in either 6.2.4-1 or -2, or 3	
times the actual diameter, whichever is greater.	times the actual diameter, whichever is greater.	
However, for bearings of synthetic materials,	However, for bearings of synthetic materials,	

(Approval of Synthetic Materials Osca for All	tmost Stern Tube Bearings and Attmost Shaft Bracket	Dearings)
Amended	Original	Remarks
such as rubber or plastics, that are approved for use as water lubricated stern tube bearings and where special consideration is given to their construction and arrangement in accordance with provisions specified elsewhere, the length of the	such as rubber or plastics, that are approved for use as water lubricated stern tube bearings and where special consideration is given to their construction and arrangement in accordance with provisions specified elsewhere, the length of the	
bearing may be fairly shorter than that specified above. However, minimum length is to be not less than twice the required diameter of the propeller shaft given by the formulae in either 6.2.4-1 or -2, or 1.5 <i>times</i> the actual diameter, whichever is greater. (b) Synthetic materials used for bearings are to be	bearing may be fairly shorter than that specified above. However, minimum length is to be not less than twice the required diameter of the propeller shaft given by the formulae in either 6.2.4-1 or -2 , or 1.5 <i>times</i> the actual diameter, whichever is greater. (Newly added)	URM52(Rev.3)
approved by the Society in accordance with Part 6, Chapter 14, Guidance for the Approval of Materials and Equipment for Marine Use. (3) In the case of grease lubricated bearings In cases where the actual diameter of the propeller shaft is not more than 100 mm, grease lubricated bearings may be used. The length of the bearing is to be not less than 4 times the required diameter of the propeller shaft given by the formulae in either 6.2.4-1 or -2.	(3) In the case of grease lubricated bearings In cases where the actual diameter of the propeller shaft is not more than 100 <i>mm</i> , grease lubricated bearings may be used. The length of the bearing is to be not less than 4 <i>times</i> the required diameter of the propeller shaft given by the formulae in either 6.2.4-1 or -2.	Para.3.3&3.4

(Approval of Synthetic Materials Used for Af	tmost Stern Tube Bearings and Aftmost Shaft Bracket	Bearings)
Amended	Original	Remarks
Part I SHIPS OPERATING IN POLAR	Part I SHIPS OPERATING IN POLAR	
WATERS, POLAR CLASS SHIPS	WATERS, POLAR CLASS SHIPS	
AND ICE CLASS SHIPS	AND ICE CLASS SHIPS	
ANNEX 1 SPECIAL REQUIREMENTS FOR THE MATERIALS, HULL STRUCTURES,	ANNEX 1 SPECIAL REQUIREMENTS FOR THE MATERIALS, HULL STRUCTURES,	
EQUIPMENT AND MACHINERY OF POLAR CLASS SHIPS	EQUIPMENT AND MACHINERY OF POLAR CLASS SHIPS	
Chapter 4 MACHINERY INSTALLATIONS	Chapter 4 MACHINERY INSTALLATIONS	
4.5 Design	4.5 Design	
4.5.5 Propulsion Line Components	4.5.5 Propulsion Line Components	
(-1 and -2 are omitted.)	(-1 and -2 are omitted.)	
3 Propeller shafts	3 Propeller shafts	
(1) Blade failure loads F_{ex}	(1) Blade failure loads F_{ex}	
(a) Blade failure loads F_{ex} (4.4.9) applied parallel to	(a) Blade failure loads F_{ex} (4.4.9) applied parallel to	
shafts (forwards or backwards) are not to cause yielding, bending moments need not be	shafts (forwards or backwards) are not to cause yielding, bending moments need not be	
combined with other loads. In addition, the	combined with other loads. In addition, the	A 1 4
diameter d_p in way of aftmost stern tube bearing	diameter d_p in way of aft stern tube bearing are	Amends to aftmost stern tube bearing from aft
is not to be less than the value of the following	not to be less than the value of the following	stern tube bearing.
formula:	formula:	
$d_p = 160^{3} \sqrt{\frac{\frac{F_{ex} \cdot D}{\sigma_{0.2} \cdot \left(1 - \frac{d_i^4}{d_p^4}\right)}}{mm}} $	$d_p = 160^{3} \sqrt{\frac{F_{ex} \cdot D}{\sigma_{0.2} \cdot \left(1 - \frac{d_i^4}{d_p^4}\right)}} (mm)$	
where	where	

(Approval of Synthetic Materials Used for Attmost Stern Tube Bearings and Attmost Snatt Bracket Bearing	al of Synthetic Materials Used for Aftmost Stern Tube Bear	rings and Aftmost Shaft Bracket Bearings
---	--	--

	(Approval of Symmetic Materials Used for An	unost s	Stern Tube Bearings and Aftmost Shaft Bracket	Bearings)
	Amended		Original	Remarks
	d_b : Propeller shaft diameter (mm)		d_b : Propeller shaft diameter (mm)	
	d_i : Propeller shaft inner diameter (mm)		d_i : Propeller shaft inner diameter (mm)	
	(b) Forward of aftmost stern tube bearings, shaft		(b) Forward of aft stern tube bearings, shaft	Same as above
	diameters may be reduced based on direct		diameters may be reduced based on direct	
	calculation of the actual bending moment, or on		calculation of the actual bending moment, or on	
	the assumption that the bending moments caused		the assumption that the bending moments caused	
	by F_{ex} are linearly reduced to 25 % at the next		by F_{ex} are linearly reduced to 25 % at the next	
	bearing and in front of this linearly to zero at the		bearing and in front of this linearly to zero at the	
	third bearing.		third bearing.	
	(c) Bending due to maximum blade forces F_b and F_f		(c) Bending due to maximum blade forces F_b and F_f	
	is to be disregarded since the resulting stress		has been disregarded since the resulting stress	
	levels are much lower than the stresses caused by		levels are much lower than the stresses caused by	
	the blade failure load.		the blade failure load.	
(2)	(Omitted)	(2)	(Omitted)	
	9 -9 are omitted.)		o -9 are omitted.)	
	Bearings	10	Bearings	Q 1
(1)	Aftmost stern tube bearings and next shaft line	(1)	Aft stern tube bearings and next shaft line bearings are	Same as above
	bearings are to withstand the F_{ex} given in 4.4.9 in such		to withstand the F_{ex} given in 4.4.9 in such a way that	
	a way that allows ships to maintain operational		allows ships to maintain operational capability.	
	capability.	(2)	D 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
(2)	Rolling bearings are to have L10a lifetimes of at least	(2)	Rolling bearings are to have L10a lifetimes of at least	
, .	40,000 <i>hours</i> according to <i>ISO</i> 281:2007.	(2)	40,000 <i>hours</i> according to <i>ISO</i> 281:2007.	
(3)	Thrust bearings and their housings are to be designed	(3)	Thrust bearings and their housings are to be designed	
	to withstand with a safety factor $S = 1.0$ the maximum		to withstand with a safety factor $S = 1.0$ the maximum	
	response thrusts in 4.4.11 and the axial forces		response thrusts in 4.4.11 and the axial forces	
	resulting from the blade failure load F_{ex} in 4.4.9. For		resulting from the blade failure load F_{ex} in 4.4.9. For	
	the purpose of calculation, except for F_{ex} , shafts are		the purpose of calculation, except for F_{ex} , shafts are	
	assumed to rotate at rated speed. For pulling		assumed to rotate at rated speed. For pulling	
	propellers, special consideration is to be given to		propellers, special consideration is to be given to	
	loads from ice interaction on propeller hubs.		loads from ice interaction on propeller hubs.	

Amended	Original	Remarks
RULES FOR HIGH SPEED CRAFT	RULES FOR HIGH SPEED CRAFT	
Part 9 MACHINERY INSTALLATIONS	Part 9 MACHINERY INSTALLATIONS	
Chapter 5 SHAFTINGS, PROPELLERS, WATERJET PROPULSION SYSTEMS AND TORSIONAL VIBRATION OF SHAFTINGS	Chapter 5 SHAFTINGS, PROPELLERS, WATERJET PROPULSION SYSTEMS AND TORSIONAL VIBRATION OF SHAFTINGS	
5.1 Shafting	5.1 Shaftings	
5.1.7 Stern Tube Bearings and Shaft Bracket Bearings	5.1.7 Stern Tube Bearings and Shaft Bracket Bearings	
The aftmost stern tube bearing or the aftmost shaft		Same as above
bracket bearing which supports the weight of propeller is to	bearing which supports the weight of propeller is to comply	
comply with 6.2.10-1, Part D of the Rules for the Survey	with 6.2.10-1, Part D of the Rules for the Survey and	
and Construction of Steel Ships.	Construction of Steel Ships.	

(Approval of Synthetic Materials Used for A	ttmost Stern Tube Bearings and Aftmost Shaft Bracket	Bearings)
Amended	Original	Remarks
RULES FOR THE SURVEY AND	RULES FOR THE SURVEY AND	
CONSTRUCTION OF	CONSTRUCTION OF	
INLAND WATERWAY SHIPS	INLAND WATERWAY SHIPS	
Part 7 MACHINERY INSTALLATIONS	Part 7 MACHINERY INSTALLATIONS	
Chapter 4 SHAFTINGS	Chapter 4 SHAFTINGS	
4.2 Materials, Construction and Strength	4.2 Materials, Construction and Strength	
4.2.10 Stern Tube Bearings and Shaft Bracket Bearings*	4.2.10 Stern Tube Bearings and Shaft Bracket Bearings*	
1 The aftmost stern tube bearing or the aftmost shaft	1 The aftermost stern tube bearing or shaft bracket	Same amendment as Part
bracket bearing which supports the weight of propeller is to	bearing which supports the weight of propeller is to comply	D of the Rules
comply with the following (1) to (3) requirements:	with the following requirements (1) to (3):	
(1) In the case of oil lubricated bearings	(1) In the case of oil lubricated bearings	
(a) In the case of white metali) The length of the bearing is not to be less	(a) In the case of white metali) The length of the bearing is not to be less	
than twice the required diameter of the	than twice the required diameter of the	
propeller shaft given by the formulae in	propeller shaft given by the formulae in	
either 4.2.4-1 or -2. However, where the	either 4.2.4-1 or -2. However, where the	
nominal bearing pressure (determined by the	nominal bearing pressure (determined by the	
static bearing reaction calculation taking into	static bearing reaction calculation taking into	
account shaft and propeller weight which is	account shaft and propeller weight which is	
deemed to be exerted solely on the aftmost	deemed to be exerted solely on the aft	
stern tube bearing (or aftmost shaft bracket	bearing divided by the projected area of the	
bearing, if provided.) divided by the	shaft in way of the bearing, hereinafter	
projected area of the shaft in way of the	defined the same way in this chapter) is not	

Amended	Original	Remarks
		IXCIIIaIKS
bearing, hereinafter defined the same way in	more than 0.8 MPa and special consideration	
this chapter) is not more than 0.8 MPa and	is given on the construction and arrangement	
special consideration is given on the	in accordance with <u>provisions</u> specified	
construction and arrangement in accordance	elsewhere, the length of the bearing may be	
with requirements specified elsewhere, the	fairly shorter than that specified above.	
length of the bearing may be fairly shorter	However, the minimum length is to be not	
than that specified above. However, the	less than 1.5 <i>times</i> the actual diameter of the	
minimum length is to be not less than 1.5	propeller shaft.	
times the actual diameter of the propeller		
shaft.	''\ 701 1 1	
ii) The stern tube is to be always filled with oil.	ii) The stern tube is to be always filled with oil.	
Adequate means are to be provided to	Adequate means are to be provided to	
measure the temperature of oil in the stern	measure the temperature of oil in the stern	
tube.	tube.	
iii) In cases where a gravity tank supplying	iii) In cases where a gravity tank supplying	
lubricating oil to the stern tube bearing is	lubricating oil to the stern tube bearing is	
fitted, it is to be located above the designed	fitted, it is to be located above the designed	
maximum load line and provided with a low	maximum load line and provided with a low	
level alarm device. However, in cases where	level alarm device. However, in cases where	
the lubricating system is designed to be used	the lubricating system is designed to be used	
under the condition that the static oil pressure	under the condition that the static oil pressure	
of the gravity tank is lower than the water	of the gravity tank is lower than the water	
pressure, the tank is not required to be above	pressure, the tank is not required to be above	
the designed maximum load line.	the designed maximum load line.	
iv) The lubricating oil is to be cooled by	iv) The lubricating oil is to be cooled by	
submerging the stern tube in the water of the	submerging the stern tube in the water of the	
<u>aftpeak</u> tank or by some other suitable	after peak tank or by some other suitable	
means.	means.	
(b) In the case of materials other than white metal.	(b) In the case of materials other than white metal.	
(Deleted)	i) The materials, construction and arrangement	
i) For boorings of south stip with an activity and	are to be approved by the Society.	
<u>i</u>) For bearings of synthetic rubber, reinforced	<u>ii</u>) For bearings of synthetic rubber, reinforced	

(Approval of Symmetic Waterials Osed for Ar	tmost Stern Tube Bearings and Aftmost Shaft Bracket	Bearings)
Amended	Original	Remarks
resin or plastics materials which are approved for use as oil lubricated stern tube bearings, the length of the bearing is to be not less than twice the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2. However, where the nominal bearing pressure is not more than 0.6 MPa and bearings having a construction and arrangement in accordance with requirements specified elsewhere, the length of the bearing may be fairly shorter than that specified above. However, the minimum length is to be not less than 1.5 times the actual diameter of the propeller shaft. ii) Notwithstanding i) above, the Society may allow use of bearings whose nominal bearing	resin or plastics materials which are approved for use as oil lubricated stern tube bearings, the length of the bearing is to be not less than twice the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2. However, where the nominal bearing pressure is not more than 0.6 MPa and bearings having a construction and arrangement in accordance with provisions specified elsewhere, the length of the bearing may be fairly shorter than that specified above. However, the minimum length is to be not less than 1.5 times the actual diameter of the propeller shaft. iii) Notwithstanding ii) above, the Society may allow use of bearings whose nominal bearing	<u> </u>
pressure is more than 0.6 MPa where the material has proven satisfactory testing and operating histories. iii) Synthetic materials used for bearings are to be approved by the Society in accordance with Part 6, Chapter 14, Guidance for the Approval of Materials and Equipment for Marine Use. (2) In the case of water lubricated bearings. (Deleted) (a) The length of the bearing is to be not less than 4 times the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2, or 3	pressure is more than 0.6 MPa where the material has proven satisfactory testing and operating histories. (Newly added) (2) In the case of water lubricated bearings. (a) The materials, construction and arrangement are to be approved by the Society. (b) The length of the bearing is to be not less than 4 times the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2, or 3	
times the actual diameter, whichever is greater. However, for bearings of synthetic materials,	times the actual diameter, whichever is greater. However, for bearings of synthetic materials,	

		illosi k	Stern Tude Dearings and Alunost Shalt Bracket i	<u> </u>
	Amended		Original	Remarks
	such as rubber or plastics, that are approved for		such as rubber or plastics, that are approved for	
	use as water lubricated stern tube bearings and		use as water lubricated stern tube bearings and	
	where special consideration is given to their		where special consideration is given to their	
	construction and arrangement in accordance with		construction and arrangement in accordance with	
	provisions specified elsewhere, the length of the		provisions specified elsewhere, the length of the	
	bearing may be fairly shorter than that specified		bearing may be fairly shorter than that specified	
	above. However, minimum length is to be not less		above. However, minimum length is to be not less	
	than twice the required diameter of the propeller		than twice the required diameter of the propeller	
	shaft given by the formulae in either 4.2.4-1 or -		shaft given by the formulae in either 4.2.4-1 or -	
	2, or 1.5 <i>times</i> the actual diameter, whichever is		2, or 1.5 <i>times</i> the actual diameter, whichever is	
	greater.		greater.	
<u>.</u>	(b) Synthetic materials used for bearings are to be		(Newly added)	
	approved by the Society in accordance with Part			
	6, Chapter 14, Guidance for the Approval of			
	Materials and Equipment for Marine Use.			
` /	In the case of grease lubricated bearings.	(3)	In the case of grease lubricated bearings.	
	In cases where the actual diameter of the propeller		In cases where the actual diameter of the propeller	
	shaft is not more than 100 mm, grease lubricated		shaft is not more than 100 mm, grease lubricated	
	bearings may be used. The length of the bearing is to		bearings may be used. The length of the bearing is to	
	be not less than 4 <i>times</i> the required diameter of the		be not less than 4 <i>times</i> the required diameter of the	
-	propeller shaft given by the formulae in either 4.2.4-1		propeller shaft given by the formulae in either 4.2.4-1	
	or -2 .		or -2.	

Amended	Original Original	Remarks
GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS	GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS	
Part D MACHINERY INSTALLATIONS	Part D MACHINERY INSTALLATIONS	
D12 PIPES, VALVES, PIPE FITTINGS AND AUXILIARIES	D12 PIPES, VALVES, PIPE FITTINGS AND AUXILIARIES	
D12.3 Construction of Valves and Pipe Fittings	D12.3 Construction of Valves and Pipe Fittings	
D12.3.4 Flexible Hose Assemblies	D12.3.4 Flexible Hose Assemblies	
1 The wording "approved by the Society" referred to in 12.3.4-2, Part D of the Rules means one whose approval is obtained in accordance with 2.4.2-10, Chapter 2, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use.	1 The wording "approved by the Society" referred to in 12.3.4-2, Part D of the Rules means one whose approval is obtained in accordance with 2.4.2-11, Chapter 2, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use.	

Amended	Original Original	Remarks
GUIDANCE FOR THE SURVEY AND	GUIDANCE FOR THE SURVEY AND	
CONSTRUCTION OF	CONSTRUCTION OF	
INLAND WATERWAY SHIPS	INLAND WATERWAY SHIPS	
Part 7 MACHINERY INSTALLATIONS	Part 7 MACHINERY INSTALLATIONS	
Chapter 10 PIPES, VALVES, PIPE FITTINGS AND AUXILIARIES	Chapter 10 PIPES, VALVES, PIPE FITTINGS AND AUXILIARIES	
10.3 Construction of Valves and Pipe Fittings	10.3 Construction of Valves and Pipe Fittings	
10.3.4 Flexible Hose Assemblies	10.3.4 Flexible Hose Assemblies	
1 The wording "to be approved by the Society" in 10.3.4-2, Part 7 of the Rules means that approval is to be made in accordance with 2.4.2-10, Chapter 2, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use.	1 The wording "to be approved by the Society" in 10.3.4-2, Part 7 of the Rules means that approval is to be made in accordance with 2.4.2-11, Chapter 2, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use.	

(Approval of Synthetic Materials Used for A)	ttmost Stern Tube Bearings and Aftmost Shaft Bracket	Bearings)
Amended	Original	Remarks
GUIDANCE FOR THE APPROVAL AND	GUIDANCE FOR THE APPROVAL AND	Scheduled to be
TYPE APPROVAL OF MATERIALS AND	TYPE APPROVAL OF MATERIALS AND	changed to "Guidance for the Approval of
EQUIPMENT FOR MARINE USE	EQUIPMENT FOR MARINE USE	Materials and
		Equipment for Marine
		Use" by other rule amendment.
Part 6 MACHINERY	Part 6 MACHINERY	amenument.
Tarto MACIIIVERI	Taito MACIIINENI	
Chapter 2 TYPE APPROVAL OF USE OF	Chapter 2 TYPE APPROVAL OF USE OF	Scheduled to be
MACHINERY AND EQUIPMENT	MACHINERY AND EQUIPMENT	changed to "Type Approval of Machinery
		and Equipment " by
		other rule
2.1 General	2.1 General	amendment.
2.1 General	2.1 General	
2.1.1 Scope	2.1.1 Scope	
The requirements of this chapter deal with the tests and	The requirements of this chapter deal with the tests and	
inspection relating to the approval of the machinery and	inspection relating to the approval of the machinery and	
equipment listed for which approval of the Society is to be	equipment listed for which approval of the Society is to be	
obtained in advance before they are used in ships as required	obtained in advance before they are used in ships as required	
by the Rules for the Survey and Construction of Steel Ships (hereinafter referred to as "the Rules").	by the Rules for the Survey and Construction of Steel Ships (hereinafter referred to as "the Rules").	
(1) Power transmission systems other than gearings	(1) Power transmission systems other than gearings	
(5.2.4-1, Part D of the Rules)	(5.2.4-1, Part D of the Rules)	
(2) Kind 1 propeller shafts with rubber sleeve (6.2.7-1,	(2) Kind 1 propeller shafts with rubber sleeve (6.2.7-1,	
Part D of the Rules) (2) Vind 1 propeller shofts with synthetic resin classes	Part D of the Rules) (2) Vind 1 monollar shefts with synthetic resin classes	
(3) Kind 1 propeller shafts with synthetic resin sleeve (6.2.7-1, Part D of the Rules)	(3) Kind 1 propeller shafts with synthetic resin sleeve (6.2.7-1, Part D of the Rules)	
(vier. 1) I with of the Italies)	(vizir 1) 1 mit D vi tile itules)	

(4) Propeller shafts made of corrosion resistant materials (6.2.7-1, Part D of the Rules) (Deleted) (5) Stem tube sealing devices (6.2.10-2, Part D of the Rules) (6) Pipes of special materials (12.1.6, Part D of the Rules) (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (4) Propeller shafts made of corrosion resistant materials (6.2.7-1, Part D of the Rules) (5) Stem tube sealing devices (6.2.10-1(1)(bii) and (2)(a), Part D of the Rules) (6) Stem tube bearings (6.2.10-1(1)(bii) and (2)(a), Part D of the Rules) (7) Pipes of special materials (12.1.6, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Rules) (9) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes the requirements relating to stem tube bearings (6.2.10-1(1)(bii) and (2)(a), Part D of the Rules) (2) Stem tube sealing devices (6.2.10-1(1)(bii) and (2)(a), Part D of the Rules) (3) Stem tube sealing devices (6.2.10-1(b)(bii) and (2)(a), Part D of the Rules) (4) Propeller She Rules (5) Stem tube sealing devices (6.2.10-1(b)(bii) and (2)(a). Part D of the Rules) (7) Pipes of special ma		(Approval of Synthetic Materials Used for A	tmost S	stern Tube Bearings and Altmost Shalt Bracket	Bearings)
(6.2.7-1, Part D of the Rules) (Deleted) (5.2.5 tern tube sealing devices (6.2.10-2, Part D of the Rules) (6.2.7-1, Part D of the Rules) (6.2.5 tern tube sealing devices (6.2.10-2, Part D of the Rules) (6.2.5 tern tube sealing devices (6.2.10-2, Part D of the Rules) (7.2.5 pecial valves and pipes fittings (12.3.2, Part D of the Rules) (8.2.5 Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules) (8.2.5 Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules) (8.2.5 Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules) (9.2.5 Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10.5 Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11.5 Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12.5 Others which are considered necessary by the Society 2.4 Approval Tests (6.2.7-1, Part D of the Rules) (6.5 Stem tube bearings (6.2.10-1(1)(b)i) and (2)(a), Part D of the Rules (Part D of the Rules) (7.5 Pipes of special materials (12.1.6, Part D of the Rules) (9.5 Special valves and pipes fittings (12.3.2, Part D of the Rules) (10.5 Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Rules) (11.5 Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part G		Amended		Original	Remarks
(Deleted) (5) Stern tube scaling devices (6.2.10-2, Part D of the Rules) (6) Pipes of special materials (12.1.6, Part D of the Rules) (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (5) Stern tube bearings (6.2.10-1(1)(b)i) and (2)(a), Part D of the Rules) (6) Stern tube sealing devices (6.2.10-2, Part D of the Rules) (7) Pipes of special materials (12.1.6, Part D of the Rules) (8) Special valves and pipes fittings (12.3.2, Part D of the Rules) (9) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Rules) (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(4)	Propeller shafts made of corrosion resistant materials	(4)	Propeller shafts made of corrosion resistant materials	
(5) Stern tube scaling devices (6.2.10-2, Part D of the Rules) (6) Pipes of special materials (12.1.6, Part D of the Rules) (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests Dof the Rules) (6) Stern tube sealing devices (6.2.10-2, Part D of the Rules) (7) Pipes of special materials (12.1.6, Part D of the Rules) (8) Special valves and pipes fittings (12.3.2, Part D of the Rules) (9) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to		(6.2.7-1, Part D of the Rules)		(6.2.7-1, Part D of the Rules)	
(5) Stern tube sealing devices (6.2.10-2, Part D of the Rules) (6) Pipes of special materials (12.1.6, Part D of the Rules) (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) (6) Stern tube sealing devices (6.2.10-2, Part D of the Rules) (2) Pipes of special materials (12.1.6, Part D of the Rules) (3) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of the Rules) (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Elexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to ap	(Dele	eted)	(5)	Stern tube bearings (6.2.10-1(1)(b)i) and (2)(a), Part	
Rules) (b) Pipes of special materials (12.1.6, Part D of the Rules) (c) Special valves and pipes fittings (12.3.2, Part D of the Rules) (d) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (d) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (d) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (d) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (e) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (b) Pipes of special materials (12.1.6, Part D of the Rules) (g) Special valves and pipes fittings (12.3.2, Part D of the Rules) (g) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Special valves and pipes fittings (12.3.2, Part D of the Rules) (20) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4 Details of Tests (b) In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig					•
(6) Pipes of special materials (12.1.6, Part D of the Rules) (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Chapter 14. Chapter 15. Rules) (2) Special walves and pipes fittings (12.3.2, Part D of the Rules) (3) Special valves and pipes fittings (12.3.2, Part D of the Rules) (4) Special valves and pipes fittings (12.3.2, Part D of the Rules) (5) Special valves and pipes fittings (12.3.2, Part D of the Rules) (6) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules) (13) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Test (1) Drawing of the test rig	(<u>5</u>)		(<u>6</u>)	` ` '	
Rules) (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (2) Pipes of special materials (12.1.6, Part D of the Rules) (2) Special valves and pipes fittings (12.3.2, Part D of the Rules) (3) Special valves and pipes fittings (12.3.2, Part D of the Rules) (4) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (beleted) Deletes conventional test requirements for approval related to		· · · · · · · · · · · · · · · · · · ·		,	
 (7) Special valves and pipes fittings (12.3.2, Part D of the Rules) (8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society (13) Others which are considered necessary by the Society (14) Details of Tests (15) Details of Tests (16) In the approval tests plan of stern tube bearings, the following items are to be included: (17) Drawing of the test rig 	(<u>6</u>)		<u>(7)</u>	1 ,	Chapter 11.
the Rules) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (Deleted) the Rules) (9) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deletes conventional test requirements for approval related to approval related to the survey and construction of Steel Ships)	\	,		, , , , , , , , , , , , , , , , , , ,	
(8) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (9) Systems and equipment for ships carrying liquefied gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to appr	(<u>7</u>)		(<u>8</u>)		
gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) gases in bulk (Part N of the Rules and Part N of the Guidance for the Survey and Construction of Steel Ships) (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(0)	,		,	
Guidance for the Survey and Construction of Steel Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests Coleted Guidance for the Survey and Construction of Steel Ships) (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests Coleted) Deletes conventional test requirements for approval related to	(<u>8</u>)		(<u>9</u>)		
Ships) (9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests Ships) (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to				`	
(9) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (10) Air pipe automatic closing devices (13.6.2-2, Part D of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests Deletes conventional test requirements for approval related to					
of the Rules) (10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) of the Rules) (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(0)	1 /	(10)	* /	
(10) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (11) Flexible hose assemblies (12.3.4-2, Part D of the Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (13) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(<u>9)</u>		(<u>10</u>)	1 1	
Rules) (11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Rules) (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (13) Others which are considered necessary by the Society 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(10)	,	(11)	,	
(11) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests (12) Systems and equipment for ships using low-flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (13) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests (Deleted) 2.4 Details of Tests 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to	(<u>10</u>)		(<u>11</u>)		
flashpoint fuels (Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests (Deleted) 1 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the Rules and Part GF of the Rules and Part GF of the Guidance for the Survey and Construction of Steel Ships) (13) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(11)	,	(12)	,	
of the Guidance for the Survey and Construction of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) 2.4.3 Details of Tests (Deleted) 2.4.4 Details of Tests (Deleted) 2.5 Details of Tests (Deleted) Deletes conventional test requirements for approval related to	(<u>11</u>)	• • • • • • • • • • • • • • • • • • • •	(<u>12</u>)	• • • • • • • • • • • • • • • • • • • •	
of Steel Ships) (12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) 2.4.2 Details of Tests (Deleted) 2.4.3 Details of Tests (Deleted) 2.4.4 Approval Tests 2.5 Details of Tests (Deleted) Deletes conventional test requirements for approval related to		•		1	
(12) Others which are considered necessary by the Society 2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) 2.4.2 Details of Tests (Deleted) 2.4.3 Details of Tests (Deleted) 2.4.4 Approval Tests 2.4.5 Details of Tests (Deleted) 3.6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig (1) Drawing of the test rig		· ·		· ·	
2.4 Approval Tests 2.4 Approval Tests 2.4.2 Details of Tests (Deleted) 2.4.2 Details of Tests 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to	(12)	= /	(13)	1 /	
2.4.2 Details of Tests (Deleted) 2.4.2 Details of Tests 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to	(<u>12</u>)	others which are considered necessary by the society	(<u>13</u>)	Others which are considered necessary by the Society	
2.4.2 Details of Tests (Deleted) 2.4.2 Details of Tests 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to					
(Deleted) 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to	2.4	Approval Tests	2.4	Approval Tests	
(Deleted) 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to					
(Deleted) 6 In the approval tests plan of stern tube bearings, the following items are to be included: (1) Drawing of the test rig Deletes conventional test requirements for approval related to	2.4.2	Details of Tests	242	Details of Tests	
following items are to be included: (1) Drawing of the test rig requirements for approval related to					Deletes conventional test
(1) Drawing of the test rig approval related to	(DON	,			
				-	_
			~_/_	Drawing of the test product (specified the materials,	materials, construction

	itmost Stern Tube Bearings and Aitmost Shaft Bracket	2 /
Amended	Original	Remarks
	dimensions, etc.)	and arrangement.
	(3) Condition of tests (lubrication system, shaft speed,	
	bearing load, hydraulic pressure, test time, etc.)	
	(4) Content of tests	
	(a) Confirmation tests for the characteristics of	
	<u>materials</u>	
	i) In the case of vulcanized rubber, the	
	following tests specified in JIS K 6251,	
	6252, 6253, 6256, 6257, 6258 and 6262 :	
	1) Tensile test	
	2) Hardness test	
	3) Tension permanent set test	
	4) Adhesion test	
	5) Test for adhesion to metals (except those	
	not to be adhered to metals)	
	<u>6) Tear test</u>	
	7) Compression permanent test	
	8) Dipping test (in the case of a	
	waterlubricated system, tests are to be	
	<u>carried out using sea water)</u>	
	ii) In the case of materials other than those	
	specified above in i), tests according to	
	pertinent national standards or other	
	equivalent standards concerning the contents	
	of i) according to the materials.	
	(b) Abrasion test	
	(c) Seizure critical load test	
	(d) Running test (in this case, confirm that the	
	bearing pressures during the tests are to be	
	verified are not less than 0.8 MPa for an oil	
	lubricated system, and are not less than 0.2 MPa	
	for a water lubricated system respectively.)	

Amended	Original	Remarks
6 In the approval tests of stern tube sealing devices, the	7 In the approval tests of stern tube sealing devices, the	
following items are to be included:	following items are to be included:	
(Omitted)	(Omitted)	
7 In the approval tests of pipes of special materials, the	8 In the approval tests of pipes of special materials, the	
following items are to be included according to their	following items are to be included according to their	
applications and kinds of materials as deemed necessary by	applications and kinds of materials as deemed necessary by	
the Society:	the Society:	
(Omitted)	(Omitted)	
$\underline{8}$ In the approval tests of special valves and pipe fittings	9 In the approval tests of special valves and pipe fittings	
(except mechanical joints specified in Chapter 9 and flexible	(except mechanical joints specified in Chapter 9 and flexible	
hose assemblies specified in $-1\underline{0}$), the following (1) through	hose assemblies specified in $-1\underline{1}$), the following <u>items</u> (1)	
(7) as deemed necessary by the Society are to be included	through (7) as deemed necessary by the Society are to be	
according to the application and type:	included according to the application and type:	
(Omitted)	(Omitted)	
<u>9</u> Air pipe automatic closing devices are to be designed	10 Air pipe automatic closing devices are to be designed	
and tested in accordance with (1) and (2) respectively.	and tested in accordance with (1) and (2) respectively.	
(Omitted)	(Omitted)	
<u>10</u> Flexible hose assemblies are to be approved for each	<u>11</u> Flexible hose assemblies are to be approved for each	
size in accordance with the following tests. Hose assemblies	size in accordance with the following tests. Hose assemblies	
with more than 3 different diameters are to be tested at least	with more than 3 different diameters are to be tested at least	
for the largest diameter, the smallest diameter and an	for the largest diameter, the smallest diameter and an	
intermediate diameter (intermediate diameters selected within	intermediate diameter (intermediate diameters selected within	
a range of 2 <i>times</i> the smallest diameter to 0.5 <i>times</i> the largest	a range of 2 <i>times</i> the smallest diameter to 0.5 <i>times</i> the largest	
diameter). For fire resistance tests, the specimens are to be	diameter). For fire resistance tests the specimens shall be	
selected in accordance with ISO 15540:2016.	selected in accordance with ISO 15540:2016.	
(Omitted)	(Omitted)	

(Approval of Synthetic Materials Used for Aftmost Stern Tube Bearings and Aftmost Shaft Bracket Bearings)

Amended	Original	Remarks
2.5.1 Notification of Approval 1 The Society, when satisfied upon examination of the submitted documents as required per 2.2 to 2.4 and the attending surveyor's report, will issue a certificate of approval specifying the following (1) to (6), put approval stamps on those documents as deemed necessary by the Society out of those submitted in accordance with 2.2.2 and 2.4.4 deemed necessary by the Society, and return them back to the applicant. (1) Approval number (2) Approval date (3) Approval items (4) Approval conditions (5) For air pipe automatic closing devices, 80% of the value of the flow velocity recorded in 2.4.2-9(2)(c) (6) Other information considered necessary by the Society	1 The Society, when satisfied upon examination of the submitted documents as required per 2.2 to 2.4 and the attending surveyor's report, will issue a certificate of approval specifying the following (1) to (6), put approval stamps on those documents as deemed necessary by the Society out of those submitted in accordance with 2.2.2 and 2.4.4 deemed necessary by the Society, and return them back to the applicant. (1) Approval number (2) Approval date (3) Approval items (4) Approval conditions (5) For air pipe automatic closing devices, 80% of the value of the flow velocity recorded in 2.4.2-10(2)(c) (6) Other information considered necessary by the Society	
2.7 Announcement of Approval	2.7 Announcement of Approval	
Flexible hose assemblies approved by the Society in accordance with 2.4.2-10 are to be marked with the followings. (a) Manufacturer's name or trademark (b) Date of manufacture	Flexible hose assemblies approved by the Society in accordance with 2.4.2-11 are to be marked with the followings. (a) Manufacturer's name or trademark (b) Date of manufacture	

	tmost Stern Tube Bearings and Attmost Shaft Bracket	<u> </u>
Amended	Original	Remarks
(c) Type number	(c) Type number	
(d) Nominal diameter	(d) Nominal diameter	
(e) Pressure rating	(e) Pressure rating	
(f) Temperature rating	(f) Temperature rating	
Chapter 14 TYPE APPROVAL OF SYNTHETIC MATERIALS USED FOR AFTMOST STERN TUBE BEARINGS AND AFTMOST SHAFT BRACKET BEARINGS	(Newly added)	Specifies according to URM85(New)
14.1 General		
14.1.1 Application		
This chapter applies to the tests and inspections required for		
the type approval of synthetic materials used for aftmost stern		URM85 Para.1.1
tube bearings and aftmost shaft bracket bearings which		
supports the weight of propeller in accordance with 6.2.10-		
1(1)(b)iii) and 6.2.10-1(2)(b), Part D of the Rules for the		
Survey and Construction of Steel Ships.		
14.1.2 Qualification		
The qualification for design and application of aftmost		URM85 Para.1.3
propeller shaft bearings or aftmost shaft bracket bearings are		
to be provided and guaranteed by the manufacturer and these		
are not guaranteed by this type approval.		
me not pominteed of this type approvant		<u>l</u>

Amended	Original	Remarks
	Original	Remarks
14.2 Application		
14.2.1 Application Forms		
Manufacturers who intend to obtain type approval are to		
submit a completed appropriate application form (Form 6-2)		
to the Society's Head Office.		
		URM85 Para.2
14.2.2 Documents		CIGWIOS I dra.2
1 Water Broadments		
The following (1) through (13) documents are to be		URM85 Para.2.1
submitted together with the application forms specified in		
14.2.1.		
(1) Product name		
(2) Name and address of the manufacturer, including		
details for all relevant production places.		
(3) Reference of applicable rules and standards which the		
product is to comply with.		
(4) Product description;		
(a) Material type		
(b) Lubrication type		
(c) Isotropic or anisotropic behaviour		
(d) Elastomeric or non-elastomeric type		
(5) Limitations of the product		
(6) Product specification, technical data sheet, and		
installation manual including;		
(a) Maximum nominal surface pressure		
(b) Product dimensions(minimum and maximum		
dimensions, other if relevant)		
(c) Commonly acceptable matching material (type of		
shaft material, roughness, hardness, etc.)		

	ftmost Stern Tube Bearings and Aftmost Shaft Bracket	<u> </u>
Amended	Original	Remarks
(d) Running clearance		
(e) Maximum operating temperature		
(7) Safety data sheet		
(8) Description of production processes		
(9) Description of quality assurance system or copy of		
ISO 9001 certificate		
(10) Records of manufacture and delivery		
(11) Test plan (including test items)		There are no
(12) List of measuring equipment including calibration		requirements in UR M85
certificate		but add "outline of
(13) Outline of manufacturing plant		manufacturing plant"
(13) Outline of manufacturing plant		considering the
		requirements for other equipment.
		equipment.
14.2.3 Approval of Test Plan		
14.2.3 Approval of Test Hall		
The Society is to examine test plans submitted for approval		There are no
in accordance with 14.2.2, approve such plans and return them		requirements in UR M85
to the applicants. In cases where the Society examines the		but add "Approval of test
documents in 14.2.2 and considers appropriate, a part of the		plan" considering the
** *		requirements for other
approval test items may be omitted.		equipment.
14.2.4 Confirmation of Manufacturing and Quality		
Control Procedure		
On the basis of the documents submitted in accordance with		There are no
14.2.2(8), (9), (10) and (13), the Society may investigate the		requirements in UR M85
condition of the manufacturing plant when deemed necessary.		but add "Confirmation of
		manufacturing and
		quality control
		procedure" considering
		the requirements for
		other equipment.

Amended	Original	Remarks
14.3 Approval Test		URM85 Para.3
		URM85 Para.3.1
14.3.1 Test Plan		UKIVI85 Para.5.1
14.5.1 16st 1 lan		
1 Test plan is to include following items:		
(1) Description of products to be approved		
(2) Description of the selected test samples		
(3) Content of tests (test items, test standards, test		
conditions, acceptance criteria, etc.)		
(4) Description of the wear testing stands and the test		
conditions		
2 The test plan is to include tests for the material		
properties specified in 14.3.3.		
3 In particular, a relaxation or complete omission of		
approval tests may be accepted by the Society taking into		
account the documentation of approval tests performed or		
proven track records.		LIDM05 D 2 2
14.3.2 Wear Test		URM85 Para3.2
14.3.2 Weat lest		
1 The wear test is to refer to ASTM G77-17 or other		
national or international standards deemed equivalent thereto,		
with respect to the following data:		
(1) Material of the shaft used in the test and its properties		
are to be specified and is to be equivalent to typical		
mating material (e.g. alloyed steel or stainless steel or		
copper alloy).		
(2) The shaft diameter is to depend on the bearing size		
and the running clearance is to be considered in the		
wear test. (2) Matien of shoft is to be continuous notation		
(3) Motion of shaft is to be continuous rotation.		

	ttmost Stern Tube Bearings and Altmost Shaft Bracket	8 /
Amended	Original	Remarks
(4) Circumferential velocity is to be 6 m/s for oil or water		
<u>lubrication.</u>		
(5) Temperature of lubrication is to be as follows		
according to the applicable lubrication type.		
Sea water or substitute ocean water: 23 °C \pm 2 °C		
Mineral oil: $80 ^{\circ}\text{C} \pm 2 ^{\circ}\text{C}$		
(6) Surface roughness (Ra) of test shaft is not to exceed		
following values according to shaft material.		
Stainless steel: 0.5 µm		
Copper alloy: $0.80 \mu m$		
(7) Interface pressure is to be maximum nominal surface		
pressure \pm 10 %.		
(8) Duration of test is to be until the coefficient of friction		
and wear rate remains constant at least 192 hours.		
Wear of bushings is to be measured continuously or		
regularly. If regularly, wear to be measured by		
disassembling every 48 hours until a constant wear		
rate is to be achieved (minimum of four points of		
measurements).		
2 The following parameters are to be recorded.		
(1) Dimensions of test specimen		
(2) Wear versus time		
(3) Coefficient of friction versus time		
(4) Temperature of test specimen during test cycle		
(5) Deviation of load from the maximum nominal surface		
<u>pressure</u>		
		URM85 Para.3.3
14.3.3 Material Properties		
Matarial managements to the analysis of Table C14.1 and		
Material property tests are to comply with Table 6.14-1 and		
<u>Table 6.14-2 according to non-elastomeric materials and elastomeric materials.</u>		
erastometre materiais.		

	Amended	iais esea for r	Tunost Stern Tuoc Dearm	Original	Remarks
Table 6.14-1 Material Property Tests for Non-elastomeric Materials					Describes only Amended
<u>Test items</u>	Test standard (1)	Number of specimens for each sample, at least (2)	Test conditions	Acceptance criteria	URM85 Table 1
Compressive strength (N/mm²)	ISO 604:2002; ASTM D 695-2015	<u>5 ⁽³⁾</u>		Isotropic materials; Minimum 85 N/mm² Anisotropic materials; For specimens parallel to sheet plane: Minimum 85 N/mm² For specimens normal to sheet plane: Minimum 100 N/mm²	
Compressive modulus (N/mm²)	<u>ISO 604:2002;</u> <u>ASTM D 695-2015</u>	<u>5 ⁽³⁾</u>		Isotropic materials; Minimum 850 N/mm² Anisotropic materials; For specimens parallel to sheet plane: Minimum 850 N/mm² For specimens normal to sheet plane: Minimum 1000 N/mm²	
Water swelling (volume %) Only required for water lubrication	<u>ISO 175:2010</u>	<u>3</u>	 Four weeks in substitute ocean water (ASTM D 1141-98(2021)) at 20 °C ± 2 °C and maximum temperature (60 °C ± 2 °C or advised maximum working temperature by manufacturer, whichever is higher) Dimension of specimens: 50 x 50 x t mm ("t" is minimum 4 mm or the minimum thickness of the 	Volumetric swelling ≤ 3 %	

(Approval of Synthetic Materials Used for At Amended			Original	
		 bushing products) Testing immediately after extraction (wet condition) 		
Oil swelling (volume %) Only required for oil lubrication	<u>3</u>	 For weeks in oil No.3 (ISO 1817:2022) at 20 °C ± 2 °C. Dimension of specimens: 50 x 50 x t mm ("t" is minimum 4 mm or the minimum thickness of the bushing products) Testing immediately after extraction (wet condition) 	Volumetric swelling ≤ 3 %	
Compressive strength and modulus change when immersed in water Only required for water lubrication	<u>5 ⁽³⁾</u>	• Four weeks in substitute ocean water (ASTM D 1141-98(2021)) at 20 °C ± 2 °C	Minimum 80 % retention of minimum specified compressive strength and modulus before water immersion.	
Temperature ISO 604:2002; resistance ASTM D 695-201.	5 (3)	Compressive strength and compressive modulus at maximum temperature (60 °C ± 2 °C or advised maximum working temperature by manufacturer, whichever is higher)	Minimum 80 % retention of minimum specified compressive strength and modulus at 20 °C ± 2 °C	
Wear Refer to 14.3.2	<u>1</u>			
· · · · · · · · · · · · · · · · · · ·		vided that they are suitable for testing of aftmost shaft bracket bearings.	the synthetic material selected	
(2) The number of specime	ns is to be prepared for each			

(Арр		ended	is Osca for Alt	niost Stern Tube Bearing	riginal	Remarks
	Table 6.14-2 Material property test for elastomeric materials					
	Test items	Test standard (1)	Number of specimens for each sample, at least (2)	Test conditions	Acceptance criteria	Describes only Amended URM85 Table 2
	Tensile strength (N/mm²)	ISO 37:2024 Method A of ASTM D 412-16(2021) ASTM D 638-22	<u>3</u>		Rubber bearing: Minimum 10 N/mm² Other elastomeric bearing: Minimum 30 N/mm²	ISO37:2017 has been revoked.
,	Elongation (%)	ISO 37: 2024 Method A of ASTM D 412-16(2021) ASTM D 638-22	<u>3</u>		Rubber bearing: Minimum 150 % Other elastomeric bearing: Minimum 60 %	
	<u>Hardness</u>	ISO 48-4:2018 <u>ASTM D 2240-</u> <u>15(2021)</u>	<u>3</u>			
<u>C</u>	Water swelling (volume %) Only required for water lubrication	<u>ISO</u> 1817:2024	<u>3</u>	 Four weeks in substitute ocean water (ASTM D 1141-98(2021)) at 20 °C ± 2 °C and maximum temperature (60 °C ± 2 °C or advised maximum working temperature by manufacturer, whichever is higher) Dimension of specimens: 50 x 50 x t mm ("t" is minimum 4 mm or the minimum thickness of the bushing products) Testing immediately after extraction (wet condition) 	Volumetric swelling ≤ 3 %	ISO1817:2022 has been revoked.
	Oil swelling (volume %)	<u>ISO 1817:2024</u>	3	• For weeks in oil No.3 (ISO 1817:2022) at 20 °C ± 2 °C.	Volumetric swelling ≤ 3 %	

Amended			Original	Remarks
Only required for oil lubrication			Dimension of specimens: 50 x 50 x t mm ("t" is minimum 4 mm or the minimum thickness of the bushing products) Testing immediately after extraction (wet condition)	
Tensile strength and elongation change when immersed in water Only required for water lubrication	ISO 37: 2024 Method A of ASTM D 412-16(2021) ASTM D 638-22	<u>3</u>	Four weeks in substitute ocean water (ASTM D 1141-98(2021)) at 20 °C ± 2 °C Minimum 80 % retention of minimum specified tensile strength and elongation before water immersion.	
<u>Temperature</u> <u>resistance</u>	ISO 37: 2024 ISO 7743:2017 Method A of ASTM D 412-16(2021) ASTM D 638-22	<u>3</u>	Tensile strength and elongation at maximum temperature (60 °C ± 2 °C or advised maximum working temperature by manufacturer, whichever is higher) Minimum 80 % retention of minimum specified tensile strength and elongation at 20 °C ± 2 °C	
Adhesion to metals (except those not to be adhered to metals)(N/mm²)	ISO 813:2019 ISO 1827:2022	<u>3</u>		
Change of properties due to aging (%)	ISO 37: 2024 ISO 7743:2017 Method A of ASTM D 412-16(2021) ASTM D 638-22	<u>3</u>	After oven aging for tension and elongation tests Test specimens are to be subjected to circulating air at maximum temperature (60 °C ± 2 °C or advised maximum working temperature by manufacturer, whichever is higher) for 96 hours. Tensile and elongation tests	

(<i>F</i>			is Used for Aft	most Stern Tube Bearing		iait Bracket i	U
	Am	ended		O.	riginal		Remarks
				are to be performed not less than 20 hours but not more than 48 hours after removal from the aging environment.			
	Wear	Refer to 14.3.2	1	from the aging environment.			
	Notes: (1) Oth	er testing standards ma	aftmost stern tube bear	ovided that they are suitable for testing ings and aftermost shaft bracket bearin ch sample.	•		
<u>14.3.4 T</u>	<u> Sest Laboratories</u>	<u>s</u>					URM85 Para.3.5
according to recording the 2 The states that the states when	o <i>ISO/IEC</i> 1702 e material propert Society's surveyo	cility is to have 25:2017 for carr ty tests required b or is to be present a cory does not have bove.	ying out and y this chapter. at the specified				
	Test Reports						
specified in 14.3.3 and	14.3.2 and the m submit them to	aterial property to o the Society (est specified in branch office				
according to the Society							Specifies the case in which a Society's surveyor attends to the test.

Amended	Original	Remarks
14.4 Approval		
14.4.1 Notification of Approval		
		11D 10 5 D
The Society, when satisfied upon examination of the		URM85 Para.4
documents submitted in accordance with 14.2.2 and 14.3.5		
and the attending surveyor's report, will issue a approval		
certificate specifying the approval number, approval date,		
items of approval and approval conditions (including at least		
the product description and properties in accordance with the		
material property test, maximum nominal surface pressure and		
maximum operating temperature). In addition, the Society will		
stamp those documents submitted in accordance with 14.2.2		
and 14.3.5 that it deems necessary with approval stamps and		
return them back to applicants.		
14.4.2 Term of Validity		
Time Term of variately		
1 The term of validity of the approval certificate		
specified in 14.4.1 is 5 years from the date of approval. In		
cases where the renewal of approval is carried out in		
accordance with the requirements in -2 and -4, the term of		
validity is 5 years from the next day after the expiry date of		
the previous term of validity.		
2 In cases where renewal of validity is intended,		
manufacturers are to submit copies of existing certificates		
along with new copies of the materials required by 14.2. In		
such cases, however, the data required per 14.2 may be limited		
to only that which has been modified.		
3 When approval has been granted for applications with		
partial changes in the content of approval, the Society may		

	timost Stern Tube Bearings and Attmost Shaft Bracket	2 /
Amended	Original	Remarks
require additional approval tests.		
4 Manufacturers whose renewal is approved are to		
return the old approval certificate to the Society as soon as		
possible after receiving the new certificate and the term of		
validity of the old certificate expires.		
14.4.3 Revocation of Approval		
Where any of the following (1) through (4) is relevant, the		
Society may revoke approval and notify the applicant		
accordingly.		
(1) In association with the implementation or revision of		
international conventions, laws and regulations,		
products for which the approval was previously		
granted no longer satisfy relevant requirements.		
(2) In cases where the term of validity for the approval		
expires and no application for the renewal of the		
approval is submitted.		
(3) When serious shortcomings are found in the quality		
of materials already approved after being installed on		
ships.		
(4) When an application for revocation is made by the		
manufacturer.		
EFFECTIVE DATE A	AND APPLICATION	
4 771 00 1 1 01 1 1 1 2 2 2 2 2 2 2 2 2 2 2		
1. The effective date of the amendments is 1 January 202		
_	ments apply to bearings for which the application of approval is	
submitted before the effective date.		