



Design Appraisal Document

Lloyd's Register EMEA
Rotterdam Technical Support Office
Address: K.P. van der Mandelelaan 41a, 3062MB Rotterdam
P.O. Box 701, 3000 AS Rotterdam
Tel.: +31(0)10 201 8422, Fax.: +31(0)10 201 84 51
Email: RTSO-Technical-Supprot@lr.org www.lr.org

Date
10 July 2023
Please quote this reference number on all future communications
RTS-ENG-232600-SMW

Client : Lagersmit Sealing Solutions B.V., Alblasserdam NL
Manufacturer : Lagersmit Sealing Solutions B.V., Alblasserdam NL
Subject : General Design Appraisal of "SUPREME" Sterntube and Thruster Seals
G.A. Registration No. : ROT.20.M.019

Valid until 10 August 2025

This Design Appraisal Document (D.A.D.) supersedes and cancels the previous D.A.D. No. RTS-ENG-201972, Issue No. 9, dated 11 August 2020.

The Plans and Documents as listed in paragraph 1 of the appendix have been examined for compliance with

- a) *Rules and Regulations for the Classification of Ships, July 2019
Part 5, Chapter 6;*
- b) *Rules and Regulations for the Classification of Special Service Craft, July 2019
Part 11, Chapter 2;*
- c) *Rules and Regulations for the Classification of Inland Waterways Ships, July 2019
Part 5, Chapter 4,*

and will be assigned an appraisal status, as indicated, in accordance with the following conditions and comments:-

A. Details

Equipment : Sterntube and Thruster Seals
Type : SUPREME STA, STA2, STA3, SVA, SVA2, SVA3
SUPREME SG, SG2, SG3, SGV, SGV2, SGV3
SUPREME STF, STF2, STF3
SUPREME TS3, TS4, TS4-2, TSV4
SUPREME LDA, LDF

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register EMEA
Is a member of Lloyd's Register group

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Lloyd's Register EMEA
Rotterdam Technical Support Office
Address: K.P. van der Mandelelaan 41a, 3062MB Rotterdam
P.O. Box 701, 3000 AS Rotterdam
Tel.: +31(0)10 201 8422, Fax.: +31(0)10 201 84 51
Email: RTSO-Technical-Supprot@lr.org www.lr.org

Date
10 July 2023

Please quote this reference number on all future communications
RTS-ENG-232600-SMW

Propeller Shaft Lubrication : SUPREME SAA, SAA2, SAA3
 SUPREME SGA, SGA2, SGA3
 Oil or Grease

Type	Seal Range [mm]	Shaft Range [mm]	Specification No.
Supreme STA - Aft seal assembly	110-1250	70-1176	04-10-100
Supreme SG - Aft seal assembly	110-1250	70-1176	04-20-100
Supreme SGV - Aft seal assembly	110-1250	70-1176	04-25-100
Supreme LDA - Aft seal assembly	110-260	70-248	04-30-100
Supreme LDF - Forward seal assembly	110-220	70-208	04-35-100
Supreme STF - Forward seal assembly	110-1250	70-1176	04-15-100
Supreme SVA - Aft seal assembly	110-1250	70-1176	04-12-100
Supreme SAA - Aft seal assembly	110-380	70-362	04-60-100
Supreme SGA - Aft seal assembly	110-380	70-362	04-65-100

B. General comments – All types

1. The seals are to be installed in accordance with the Manufacturer's instructions and to the requirements of the Rules, and tried under working conditions, all to the attending Surveyor's satisfaction. AQS
2. Sealing faces are to be examined at each drydocking. AQS
3. Materials for oil sealing between the sternbush and propeller boss, such as the stern tube AFT seals etc., are to be made and tested in accordance with the Rules "Manufacture, Testing and Certification of Materials". AQS
 - a) Materials for other applications, the manufacturer's materials will be accepted where they are in accordance with a recognised National Standard applicable to the intended services. The installation is to the attending Surveyor's satisfaction. --
4. It is noted that the material for the bolting intended for the inboard seal is "steel" and concluded that quality 8.8 or equivalent will be used. AQS

C. Oil Lubricated Seals:-

1. Vessels built in compliance with the Ship Rules being fitted with these type of oil glands may be eligible for the Notation OG in the supplement to the Register Book for Periodical Survey Purposes. (Part 5, Chapter 6, Section 3.12.10 refers). --
2. The frequency of the complete screwshaft survey and survey extensions are to comply with the requirements of Part 1, Chapter 3, Section 17 of the Ship Rules and Part 1, Chapter 3, Sections 11 & Chapter 4, Section 10 of the SSC Rules. --
3. For IWW vessels screw shafts are to be withdrawn at intervals of five (5) years as per Part 1, Chapter 3, Section 15 of the IWW Rules. --

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register EMEA
 Is a member of Lloyd's Register group

Lloyd's Register EMEA
Rotterdam Technical Support Office
Address: K.P. van der Mandelelaan 41a, 3062MB Rotterdam
P.O. Box 701, 3000 AS Rotterdam
Tel.: +31(0)10 201 8422, Fax.: +31(0)10 201 84 51
Email: RTSO-Technical-Supprot@lr.org www.lr.org

Date
10 July 2023

Please quote this reference number on all future communications
RTS-ENG-232600-SMW

- | | | |
|------------------------------------|--|-----|
| 4. | The above oil glands are also acceptable for ships having an IWS notation (Part 5, Chapter 6, Section 3.12.13 of the Ship Rules refers). However, it is noted that oil spillage could occur when removing the stainless steel plug which could be unacceptable for the relevant National Authorities. | -- |
| 5. | For vessels where ShipRight descriptive note SCM (Screwshaft Condition Monitoring) is requested, the oil glands are capable of being replaced without removal of the propeller or withdrawal of the screwshafts. The frequency of survey intervals and extensions are to comply with the relevant requirements in Part 1, Chapter 3, Section 17 of the Ship Rules or Part 1, Chapter 3, Section 11 of the SSC Rules. | -- |
| D. <u>Piping Diagrams:-</u> | | |
| 1. | The lubrication system is not part of the scope of supply of IHC Sealing Solutions. Final approval of the lubrication system diagram is to be arranged through the yard. | AQS |
| 2. | Wall thickness of pipes to be in compliance with the applicable Rule requirements (Part 5, Chapter 12 of the Ship Rules or Part 15, Chapter 1 of the SSC Rules or Part 5, Chapter 10 of the IWW Rules refers). | AQS |
| 3. | Connections on oil tanks other than top connections to be provided with a valve or cock secured to the tank. | AQS |
| 4. | Means for ascertaining the temperature of the oil in the stern tube are to be provided as per Part 5, Chapter 6, Section 3.12.10 of the Ship Rules or Part 11, Chapter 2, Section 4.16.9 of the SSC Rules, as applicable. | AQS |
| 5. | Grease lubrication system details were not available to be submitted for each application. | AQS |
| 6. | Hoses between tank and forward seal to be of an approved type. | AQS |
| 7. | Air release pipe on FWD Seal Tank to be led to above the loaded waterline in a safe position all to the Surveyor's satisfaction. | AQS |
| E. <u>VENTUS System:-</u> | | |
| 1. | The air supply system shall have sufficient redundancy i.e. a single failure shall not render the whole system inoperable. | AQS |
| 2. | Outlets of relief valves to be led to a safe position all to the Surveyor's satisfaction. | AQS |
| 3. | It is noted that the air release valve will be fitted with parallel thread and the locking or securing arrangements are to be to the Surveyor's satisfaction. | AQS |
| 4. | The VENTUS Valve is to be protected from mechanical damage all to the Surveyor's satisfaction. | -- |
| 5. | It is noted that the VENTUS Valve is a proprietary item and it is recommended to carry a spare on board for replacement if considered necessary. | -- |
| 6. | The SUPREME Ventus – Air Type Seal may be fitted on ships eligible for ECO Notation. | -- |
| 7. | Procedures covering the handling of the Lubrication Oil are to be in compliance with Part 7, Chapter 11, Section 2.6.12 for ships having ECO Notation. | AQS |

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register EMEA
Rotterdam Technical Support Office
Address: K.P. van der Mandelelaan 41a, 3062MB Rotterdam
P.O. Box 701, 3000 AS Rotterdam
Tel.: +31(0)10 201 8422, Fax.: +31(0)10 201 84 51
Email: RTSO-Technical-Supprot@lr.org www.lr.org

Date
10 July 2023

Please quote this reference number on all future communications
RTS-ENG-232600-SMW

F. Athmos System:-

1. The SUPREME Athmos – Air Type Seals may be fitted on ships eligible for ECO Notation.
2. Procedures covering the handling of the Lubrication Oil are to be in compliance with Part 7, Chapter 11, Section 2.6.12 for ships having ECO Notation.

--
AQS



LR031.20
Sanming Wang
Senior Specialist
Engineering Systems
Rotterdam Technical Support Office

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register EMEA
Is a member of Lloyd's Register group



Lloyd's Register EMEA
 Rotterdam Technical Support Office
 Address: K.P. van der Mandelelaan 41a, 3062MB Rotterdam
 P.O. Box 701, 3000 AS Rotterdam
 Tel.: +31(0)10 201 8422, Fax.: +31(0)10 201 84 51
 Email: RTSO-Technical-Supprot@lr.org www.lr.org

Date
10 July 2023

Please quote this reference number on all future communications
RTS-ENG-232600-SMW

Appendix

1. The documents listed below have been examined

Document No.	Rev.	Title	Status	Date
SUPREME LDA				
04-30-100	21-Jul-15	Product Specification - Supreme LDA – Aft Seal Assembly	SI	11-Aug-2020
PID-LD	C	Supreme LD Piping Diagram	SI	11-Aug-2020
PID-LD-G	A	Supreme Piping Diagram	SI	11-Aug-2020
TA-SUP-X30	C	Supreme LDA	AQ	11-Aug-2020
SUPREME LDF				
04-35-100	21-Jul-15	Product Specification - Supreme LDF – Forward Seal Assembly	SI	11-Aug-2020
TA-SUP-X31	C	Supreme LDF	AQ	11-Aug-2020
SUPREME SAA				
04-60-100	07-Okt-19	Product Specification - Supreme SAA – Aft Seal Assembly	SI	11-Aug-2020
PID-SAA-2017	C	Supreme Athmos Piping Diagram MK2017	SI	11-Aug-2020
TA-SUP-X60	A	Supreme SAA	AQ	11-Aug-2020
SUPREME SG				
04-20-100	07-Okt-19	Product Specification - Supreme SG – Aft Seal Assembly	SI	11-Aug-2020
PID-SG	E	Supreme SeaGuard Piping Diagram	SI	11-Aug-2020
TA-SUP-X10	B	Supreme SG	AQ	11-Aug-2020
SUPREME SGA				
04-65-100	07-Okt-19	Product Specification - Supreme SGA – Aft Seal Assembly	SI	11-Aug-2020
PID-SGA-2017	C	Supreme SeaGuard Athmos Piping Diagram MK2017	SI	11-Aug-2020
TA-SUP-X65	A	Supreme SGA	AQ	11-Aug-2020
SUPREME SGV				
04-25-100	07-Okt-19	Product Specification - Supreme SGV – Aft Seal Assembly	SI	11-Aug-2020
PID-SGV-2017	G	Supreme SeaGuard Ventus Piping Diagram MK2017	SI	11-Aug-2020
TA-SUP-X15	B	Supreme SGV	AQ	11-Aug-2020
SUPREME STA				
04-10-100	4-Okt-19	Product Specification - Supreme STA – Aft Seal Assembly	SI	11-Aug-2020
PID-ST	D	Supreme ST Piping Diagram	SI	11-Aug-2020
TA-SUP-X01	B	Supreme STA	AQ	11-Aug-2020

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register EMEA
 Rotterdam Technical Support Office
 Address: K.P. van der Mandelelaan 41a, 3062MB Rotterdam
 P.O. Box 701, 3000 AS Rotterdam
 Tel.: +31(0)10 201 8422, Fax.: +31(0)10 201 84 51
 Email: RTSO-Technical-Supprot@lr.org www.lr.org

Date
10 July 2023

Please quote this reference number on all future communications
RTS-ENG-232600-SMW

Appendix

Document No.	Rev.	Title	Status	Date
SUPREME STF				
04-15-100	04-Okt-19	Product Specification - Supreme STF – Forward Seal Assembly	SI	11-Aug-2020
PID-ST	C	Supreme ST Piping Diagram	SI	11-Aug-2020
TA-SUP-X20	B	Supreme STF	AQ	11-Aug-2020
SUPREME SVA				
04-12-100	04-Okt-19	Product Specification - Supreme SVA – Aft Seal Assembly	SI	11-Aug-2020
PID-SVA-2017	H	Supreme Ventus Piping Diagram MK2017	SI	11-Aug-2020
TA-SUP-X05	D	Supreme SVA	AQ	11-Aug-2020
SUPREME TS3				
PID-TS3	B	Supreme TS3 Piping Diagram	SI	11-Aug-2020
TA-SUP-X40	B	Supreme TS3 Thruster Seal Assembly	AQ	11-Aug-2020
SUPREME TS4				
PID-TS4	B	Supreme TS4 Piping Diagram	SI	11-Aug-2020
TA-SUP-X41	C	Supreme TS4 Thruster Seal Assembly	AQ	11-Aug-2020
SUPREME TSV4				
PID-TSV-AZIM	A	PID-TSV-AZIM Lip Seal Monitoring Piping Diagram	SI	11-Aug-2020
TA-SUP-X43	C	Supreme TSV4 Thruster Seal Assembly	AQ	11-Aug-2020
TA-FWD-OT	A	FWD Oil Tank	SI	11-Aug-2020
TA-SUP-OPT	B	Optional Extras	SI	11-Aug-2020

2. The documents listed below have been considered together with the submitted documents in the appraisal

Document No.	Rev.	Title
01-60-100	06-Apr-16	Lagersmit Engineering Manual
01-60-105	23-11-2017	Encoding Seals

Appraisal Status Key

AQ	Approval subject to the matters raised that require resolution – and provided the arrangements are to the surveyor's satisfaction
AQS	Details to be submitted by the client to the local surveyor's Office responsible for surveying the building and the arrangements verified in accordance with the Rule/Regulations requirements by the surveyor.
SI	Retained as supporting documentation for information only

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register EMEA
 Is a member of Lloyd's Register group