DNV·GL

Certificate No:
**TAP00001E4**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Pressure Vessel**

with type designation(s)
**Ausschubbehälter 100L, Vakuumtank 200L, Vakuumtank 600L, Vakuumtank 770L, Vakuumtank 900L, Vakuumtank 1300L, Vakuumtank 1500L**

Issued to
**MARTIN Membrane Systems AG**
**Sonneberg, Germany**

is found to comply with
**DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**
**DNV GL rules for classification – Naval vessels**

## Application :

| Type: | Max. working temp.: | Design pressure: | Operating Medium |
|---|---|---|---|
| **Ausschubbehälter 100L** | **50 °C** | **2 bar** | **water** |
| **Vakuumtank 200L** | **50 °C** | **-1 to 0.5 bar** | **water** |
| **Vakuumtank 600L** | **50 °C** | **-1 to 0.5 bar** | **water** |
| **Vakuumtank 770L** | **50 °C** | **-1 to 0.5 bar** | **water** |
| **Vakuumtank 900L** | **50 °C** | **-1 to 0.5 bar** | **water** |
| **Vakuumtank 1300L** | **50 °C** | **-1 to 0.5 bar** | **water** |
| **Vakuumtank 1500L** | **50 °C** | **-1 to 0.5 bar** | **water** |

Issued at **Hamburg** on **2018-06-19**
This Certificate is valid until **2023-06-18**.
DNV GL local station: **Augsburg**

for **DNV GL**

Approval Engineer: **Le Loi Nguyen**

**Harald Pauli**
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.


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## Product description

The vacuum tanks, designed as assembly according to DNVGL Pt.4 Ch.7, DNVGL NAVAL Pt.3 Ch.5 Sec. 16 and graded as Pressure Equipment Class III with a joint efficiency v=0.85.
Technical details according to approved drawings. See type approval documentation as stated below.

Manufacturing location:
KKS Apparatebau GmbH
Oberhäuser Weg19
06268 Querfurt
Germany

## Application/Limitation

The used materials shall meet the certificate requirements of DNVGL Rules Pt.4 Ch.7 Tab.7 and the requirements as specified in the drawings. Comparable materials have to be submitted for approval.

Each pressure vessel shall be hydraulic pressure tested to the test pressure (1.5 x design pressure) certified by a DNV GL surveyor and to be delivered with a DNV GL product certificate when it is required by DNV GL Rules or by purchaser.

## Type Approval documentation

| | |
|---|---|
| Festigkeitsberechnung des Vakuumtanks 1500L | Drwg. No.: VA 1500 301 000 Rev. A |
| Vakuumbehälter 1500L | Drwg. No.: VA 1500 301 000 Rev. A |
| Vakuummbehälter 1500L, Einzelteile | Drwg. No.: VA 1500 301 000 |
| Festigkeitsberechnung des Vakuumtanks 600L | Drwg. No.: VA 600 210 000 Rev. A |
| Vakuumtank 600L, Einzelteile | Drwg. No.: VA 600 210 000 |
| Vakuumtank 600L | Drwg. No.: VA 600 210 000 Rev. A |
| Festigkeitsberechnung des Vakuumtank 900L, liegend | Drwg. No.: VAL 900 100 000 Rev. 0B |
| Vakuumtank 900L liegend, Einzelteile | Drwg. No.: VAL 900 100 000 Rev. 0B |
| Vakuumtank 900L liegend | Drwg. No.: VAL 900 100 000 Rev. 0B |
| Festigkeitsberechnung des Vakuumtanks 1300L | Drwg. No.: VA 1300 210 000 |
| Vakuumtank 1300L, Einzelteile | Drwg. No.: VA 1300 210 000 |
| Vakuumtank 1300L | Drwg. No.: VA 1300 210 000 |
| Festigkeitsberechnung des Vakuumtanks 200L | Drwg. No.: VA 827 401 000 Rev. A |
| Vakuumtank 200L, Einzelteile | Drwg. No.: VA 827 401 000 |
| Vakuumtank 200L | Drwg. No.: VA 827 401 000 Rev. A |
| Festigkeitsberechnung des Vakuumtanks 770L | Drwg. No.: 13035 201 000 Rev. G |
| Vakuumbehälter 770L, Einzelteile | Drwg. No.: 13035 201 000 Rev. F |
| Vakuumbehälter 770L | Drwg. No.: 13035 201 000 Rev. G |
| Festigkeitsberechnung des Ausschubbehälters | Drwg. No.: AGS 080 200 000 |
| Auschubbehälter | Drwg. No.: AGS 080 200 000 |
| Pumpbehälter Einzelteile | Drwg. No.: AGS 80 200 000 Rev. A |

## Marking of product

The pressure vessel is to be permanently and legibly marked with following information:

- Date of manufacture (month/ year)
- Manufacturer's serial number
- Manufacturer's name/ symbol
- Total shell volume in liters
- Allowable temperature range in degree Celsius
- Maximum allowable pressure in bar
- Test pressure in bar
- DNVGL's identifying mark

The location and process of stamping of the pressure vessel shall not be detrimental to its strength.

## Periodical assessment

The objective of the periodical assessment is to verify that the conditions for the type approval (TA) have not been altered.

The main scope of the periodical assessment will normally include:

- verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the TA products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products
- review of TA documentation and that this is still used as basis for the production
- review of possible changes in the design, the materials and the performance of the product
- verification of the product marking

For retention of the TA certificate in its validity period the periodical assessments will be carried out bi-yearly.

Unscheduled assessments for retention of the certificate may be carried out when there is reason to believe that the type approval applicant has not adhered to the obligations stipulated in the Type Approval certificate.

## End of Certificate