

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Vent Head for Tank**with type designation(s)
SWS, SWC

Issued to

Se-Won Ind. Co., Ltd.
Gyeongsangnam-Do Korea, Republic of Korea

is found to comply with

Det Norske Veritas' Standards for Certification 2.9 No. 5-793.10-1
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"**Application :****The air vent heads are approved for use on air pipes from tanks according to Det Norske Veritas' Rules Pt.4, Ch.6, Sec.4 K and the International Convention on Load Line 1966, Ch.II, Reg. 20.****Type: Sizes:****SWS 65A/80A/100A/125A/150A/200A/250A/300A/350A/400A/450A****SWC 65A/80A/100A/125A/150A/200A/250A/300A/350A/400A/450A**This Certificate is valid until **2019-06-30**.Issued at **Høvik** on **2015-07-15**for **DNV GL**DNV GL local station: **Changwon**Approval Engineer: **Adel Samiei**

On behalf of Marianne Spæren Marveng
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.

Product description

- Air vent heads with disc float types SWS & SWC. The two products (SWS & SWC type) are same shape and structure and there is no difference of inside structure and area.
- Material:
 - Body: SWS TYPE:SS400/SWC TYPE:FCD450
 - Top cover & side Cover: SS400
 - Guide bar: Copper (C3604 according to JIS H3250) / SS400 / Duplex stainless steel 2205 (UNS 31803)
 - Disc float: Plastic / Duplex stainless steel 2205 (UNS 31803)
 - Disc Packing and Top cover Packing: N.B.R.
 - Wire Net: Copper (ASTM B49)/ SB-164/ SB-649 / Hot dip galvanized SS400 mild steel / Duplex stainless steel 2205 (UNS 31803)
- The carbon steel parts have to be hot dip galvanized.

Application/Limitation

- The certificate covers design assessment of air vent heads. Installation and other additional requirements related to installation are out of scope of this certificate.
- The air vent heads are not considered as devices to prevent the passage of flame into cargo tanks of tankers and combination carriers carrying crude oil and petroleum products having a flashpoint of 60°C (closed cup) or less, and a Reid vapor pressure below atmospheric pressure and other products having a similar fire hazard.
- Product certificate is not required for air vent heads installed in ship class vessels.
- Average blocking velocity resulted from Discharge/Reverse test are as follows:

Size	Average blocking velocity (m/s)	80% of blocking velocity (m/s)
65A	31.8	25.5
80A	33.8	27.1
100A	29.3	23.4
125A	33.4	26.7
150A	23.3	18.6
200A	27.5	22.0
250A	24.7	19.8
300A	21.1	16.9
350A	27.3	21.8
400A	26.7	21.4
450A	31.5	25.2

Type Approval documentation

Tests carried out

Impact test and compression loading test for plastic float, Tightness test, Flow Characteristics, Discharge/Reverse flow test

Marking of product

For traceability to this type approval the products are to be marked:

- Manufacturer's name or trade mark
- Type designation
- Body material
- Size
- Wire net Material

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment every second year and before the expiry date of this certificate. The scope of the periodical assessment survey is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the certificate retention survey are:

- Review of Type Approval documentation
- Review of possible changes in design, materials and performance
- Ensure traceability between manufacturer's product type marking and Type Approval Certificate.

END OF CERTIFICATE