

Amendments to the “Rules for the Type Approval and Testing of Air Pipe Automatic Closing Devices”

RFP/034/AMN/01

Effective from 1/7/2022

List of the amendments:

Paragraph amended	Reason
[4.3.3]	to introduce IACS UR P3 (Rev 5 - Apr 2021) “Air Pipe Closing Devices”

1 FOREWORD

Part C, Ch 1, Sec 10 of the Rules for the Classification of Ships requires that air pipe automatic closing devices be of a type approved by the Society and specifies the list of type tests to be performed.

2 FIELD OF APPLICATION

These Rules are applicable for the purpose of issuing the "Type approval certificate" and to testing operations to be carried out on air pipe automatic closing devices.

3 REQUIRED DOCUMENTATION

For the purpose of issuing the type approval certificate, the Manufacturer is to forward an application to Tasneef and submit for approval, in triplicate, the following documents:

- cross-section assembly plan of the closing device;
- plan of the closing device components. This is to be a working plan, with full dimensions, and is to contain all specifications necessary for interpretation, checking and approval, including the mass of the float, with indication of the allowed tolerance;
- specification relevant to the properties of materials for closing device components. In particular, for non-metallic floats, the manufacturing procedure and control methods adopted to guarantee compliance with approved plans are to be specified.

4 CHECKS AND TESTS TO BE CARRIED OUT FOR TYPE RECOGNITION

4.1 General

For each type and size of air pipe closing device, the checks and tests detailed in 4.2 and in 4.3.1 to 4.3.5 are to be carried out, as appropriate.

Where, in addition to the characteristics required in Part C, Ch 1, Sec 10 of the Rules for the classification of ships, it is requested to certify the watertightness of the air pipe closing devices at a certain design draught, the test indicated in 4.3.6 is also to be carried out.

4.2 Dimensional check

Before the tests are carried out, compliance of the closing device with the relevant approved plan is to be checked.

4.3 Tests

4.3.1 Determination of the flow characteristics of the air pipe closing device

Measurement of the pressure drop versus rate of volume flow is to be carried out using water and with any intended flame or insect screens in place.

4.3.2 Tightness test during immersion / emerging in water.

An automatic closing device is to be subjected to a series of tightness tests involving not less than two immersion cycles under each of the following conditions:

- a) The automatic closing device is to be submerged slightly below the water surface at a velocity of approximately 4 m/min and then returned to the original position immediately. The quantity of leakage is to be recorded.
- b) The automatic closing device is to be submerged to a point slightly below the surface of the water. The submerging velocity is to be approximately 8 m/min and the air pipe vent head is to remain submerged for not less than 5 minutes. The quantity of leakage is to be recorded.
- c) Each of the above tightness tests is to be carried out in the normal position as well as at an inclination of 40 degrees under the strictest condition for the device. In cases where these strictest conditions are not clear, tests are to be carried out at an inclination of 40 degrees with the device opening facing three different directions: upward, downward, sideways (left or right). (See Figures 1 to 4).

The maximum allowable leakage per cycle is not to exceed 2 ml/mm of the nominal diameter of the inlet pipe during any individual test.

4.3.3 Discharge/reverse flow test

The air pipe head is to allow the passage of air to prevent excessive vacuum developing in the tank.

a) Reverse flow test

- 1) A reverse flow test is to be performed. A vacuum pump or another suitable device is to be connected to the opening of the air pipe leading to the tank. The flow velocity is to be applied gradually at a constant rate until the float gets sucked and blocks the flow; and
- 2) The velocity at the point of blocking is to be recorded. 80% of the value recorded will be stated on the certificate.

b) Alternative to the reverse flow test

- 1) For pipe heads of 400 mm nominal diameter and above, as an alternative to the reverse flow test, a numerical simulation test based on computational fluid dynamics (CFD), to be carried out in conjunction with limited representative testing to establish the validity of the CFD modelling and results, may be accepted;
- 2) CFD predictions for air pipe heads can be validated against the available actual reverse flow test results of same size and type of air pipe heads;
- 3) The accuracy of the CFD modelling and the major assumptions used for the calculation are to be documented;
- 4) Mesh convergence studies are to be carried out and documented; and
- 5) The requirement as per the preceding a) 2) applies.