



STANDARDS FOR CERTIFICATION

No. 2.9

Approval Programme 785.70

TYPE APPROVAL FOR CRUDE OIL WASHING (COW) MACHINES

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DET NORSKE VERITAS

Veritasveien 1, N-1322 Høvik, Norway Tel.: +47 67 57 99 00 Fax: +47 67 57 99 11

FOREWORD

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DET NORSKE VERITAS AS is a fully owned subsidiary Society of the Foundation. It undertakes classification and certification of ships, mobile offshore units, fixed offshore structures, facilities and systems for shipping and other industries. The Society also carries out research and development associated with these functions.

DET NORSKE VERITAS operates a worldwide network of survey stations and is authorised by more than 120 national administrations to carry out surveys and, in most cases, issue certificates on their behalf.

Standards for Certification

Standards for Certification (previously Certification Notes) are publications that contain principles, acceptance criteria and practical information related to the Society's consideration of objects, personnel, organisations, services and operations. Standards for Certification also apply as the basis for the issue of certificates and/or declarations that may not necessarily be related to classification.

A list of Standards for Certification is found in the latest edition of the Pt.0 of the "Rules for Classification of Ships", and the "Rules for Classification of High Speed, Light Craft and Naval Surface Craft".

The list of Standards for Certification is also included in the current "Classification Services – Publications" issued by the Society, which is available on request. All publications may be ordered from the Society's Web site <http://exchange.dnv.com>. The list of publications is also available from this site.

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1. Scope

1.1 General

This Standard for Certification 2.9 – Type Approval Programme gives the requirements on which Det Norske Veritas base their type approval of Crude Oil Washing (COW) Machines.

1.2 Objective

The type approval of COW Machines is based upon the requirements in the following documents:

- DNV's Rules for Classification of Ships Pt.5 Ch.3 - Oil Carriers
- MARPOL 73/78 Annex I, Regulation 13B
- "Revised Specifications for the Design, Operation and Control of Crude Oil Washing Systems" (resolution A.446(XI), as amended by resolutions A.497(XII) and A.897(21))

The procedure for assessment of conformity of manufactured products (production) and the installation onboard is not part of the scope of the Type Approval Programme.

2. Conformity Assessment of Design of Product Type

2.1 Procedure

Type Approval Procedure consists of the following elements:

- design assessment
- type testing
- issuance of type approval certificate
- certificate retention survey.

See Det Norske Veritas Standard for Certification No.1.2 for the general procedure for type approval.

2.2 Documentation

Drawings (triplicate) and data showing all design details and materials are to be submitted together with application for type approval. The following data and information shall be given:

- Functional description.
- Design data/dimensions (pipe length, nozzle diameter, operating pressure, flow, jet length.)
- Assembly drawing and sectional drawings at scale including parts list and specification of materials and connected accessories.
- Detail drawings as applicable.
- Natural frequency calculations
- Type testing program
- Test reports.
- Makers installation, maintenance and operating manual.

2.3 Material Requirements

Materials are to comply with DNV Rules for Classification of Ships Pt.5, Ch.3, Sec.4.

2.4 Design Requirements

The COW machine shall be so designed that effective cleaning of all horizontal and vertical surfaces may be obtained. Also, means for indication of rotation and arc of the movement of the machine to be provided

3. Elements of Type Approval

3.1 Design assessment

The documentation evaluation is carried out to assess that the COW machine is in conformity with given documentation requirements as per 1.2 and functional requirements as stated in 2.4.

3.2 Type Testing

Each type and size of COW machines shall be subject to the following tests witnessed by a DNV surveyor:

- Visual inspection verifying compliance with drawings.
- Functional/performance test
- Indication of rotation and arc of the movement of the COW machine
- Pitch selection.
- Effective jet length:
 - 1) The horizontal distance from the nozzle at which the dynamic pressure of the water jet corresponds to 700mm water head or above. The following converting formula is to be applied:

$$Pd = (F/A) \times 10^6$$
 Pd: Converted dynamic pressure (mm Aq)
 F: Impact load (kg)
 A: Area of impact load disc (mm²) (See item 2 below)
 - 2) The dynamic pressure shall be recorded by means of a receiving disc mounted on a load cell and facing the water jet. The diameter of the receiving disc is to be 6 times the nozzle bore,
 - 3) Appropriate calibrated equipment is to be used in order to monitor and record figures on water flow, pressure and temperature.
 - 4) Continuous recordings are to be taken for at least one minute (5 minutes recommended). Three highest peaks to be above test criteria as given in 1 above.

3.3 Type Approval Certificate

When the design assessment and type testing are successfully completed a Type Approval Certificate will be issued to the manufacturer for the conformity of the design of the product type.

The Type Approval Certificate will include:

- Nozzle diameter
- Pipe length

- Corresponding pressure, flow and jet length

The Certificate is given a validity period of 4 years.

3.4 Renewal of the Type Approval Certificate

At least three months before the period of validity expires, the certificate-holder has to apply for renewal of the certificate.

Upon receipt of the request for renewal, Det Norske Veritas will perform a certificate retention survey. The main elements of a retention survey are:

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

The survey report will constitute the basis for the renewal of Type Approval and the issuance of a new certificate.

3.5 Design Changes

The Society is to be informed about any design changes which may have an influence on the performance data specified in the type approval certificate. Additional performance tests are to be carried out if considered necessary.

4. Makers Certificate

Each unit shall be furnished with a certificate issued by the maker. The certificate is to contain:

- Declaration that the design of the unit conform to the basis for the type approval.
- Details of shop testing carried out.
- Reference to DNV TA-certificate.