



Certificate No. 02-004515/026259

TYPE APPROVAL CERTIFICATE

This is to certify that this product complies with the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

EMISSION REDUCTION CONTROL SYSTEM SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM VariNOx® VN

MANUFACTURER:

HUG Engineering AG
Elsau, Switzerland

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

Rules for the Classification of Ships, Part 8-Piping
Rules for the Classification of Ships, Part 9-Machinery

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: **2028-07-05**

Place and date: Split, 2024-07-05

Seal

Marinko Popović, dipl.ing.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

DETAILED PRODUCT DESCRIPTION:

The VariNOx® VN Selective Catalytic Reduction (SCR) System is designed for reduction of NOx emissions and approved for the use on propulsion and auxiliary marine diesel engines.

The NOx reduction is obtained by a catalytic process in an SCR reactor installed in the exhaust gas line after the combustion process. In the SCR reactor, the NOx is reduced catalytically to nitrogen and water by adding 32.5% or 40% aqueous urea solution as a reducing agent.

System includes the following main components:

- Control Unit (VNC)
- Reactant Supply Unit (VNR)
- Dosing Unit (VND)
- Injector Unit / Units (VNI)
- SCR Reactor
- Mixing Tube
- Supply Pump Safety Cabinet (VNRE; variant specific)

APPLICATION / LIMITATIONS:

Installations where multiple engines provide the required propulsion power redundancy and/or power generation redundancy.

Evaluation of exhaust gas cleaning efficiency capabilities and compliance with MARPOL Annex VI Reg.13 / NOx Technical Code is not in the scope of this certificate.

Urea storage arrangements, including tank instrumentation, filling, ventilation and sounding arrangements, drainage arrangements for urea tank/pump assembly spill tray is not in the scope of this type approval certificate.

Exhaust pipes, exhaust line insulation, exhaust connections, urea solution external piping, diesel particulate filter (DPF), regeneration burner is not in the scope of this type approval certificate.

The VariNOx® VN control and monitoring system including control unit (VNC) and supply pump safety cabinet (VNRE) is covered with another CRS type approval certificate.

TYPE APPROVAL DOCUMENTATION:

Approved by the Croatian Register of Shipping with letter No.(dated): 1829/TSE/KF/026259 (2024-07-05)

MARKING OF PRODUCT:

- manufacturer's mark
- location and year of manufacture
- serial number

CONDITIONS FOR CERTIFICATION:

For each application on board CRS classed vessels complete technical documentation and drawings shall be submitted for examination and approval prior installation on board, with reference to this Type Approval Certificate.