



# TECHNICAL MEMO

Patentec LRT-VCR-DCE Engine

## Witnessing of Engine Functionality

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**To:**  
Patentec AS

**From:**  
DNV AS, Norway  
Maritime Advisory  
Machinery & Systems

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## EXECUTIVE SUMMARY

DNV Maritime Advisory, section Machinery & Systems was contracted by Patentec AS to witness the functionality of the developed 4X72X4 engine according to patent publication number WO 2019/145105 A1 /1/ utilizing Linear-Rod Technology (LRT), Variable Compression Ratio (VCR), and Double Expansion (DCE).

The functionality witnessing consisted of static compression checks in low, mid and high settings, in addition to steady-state engine running with low and high compression ratio settings, with the compression ratio being changed dynamically. All engine running was done without load at approximately 1650-1700 rpm running on commercially available gasoline. Following the engine running, the top cover of the crankcase was disassembled to inspect the LRT and VCR mechanisms for comparisons with the defined patent descriptions /1/.

Based on the witnessed running tests and inspections, it is hereby confirmed that the Patentec 4X72X4 engine is witnessed to be functional, running in stable steady-state conditions with dynamic changes of the compression ratio, and that the engine design is found to be in accordance with the patent publication number WO 2019/145105 A1 /1/.

See attached sections for further details.

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